iCTESM 2020
Singapore

JANUARY 6, 2020

3rd International Conference on Current Trends in Engineering, Sciences & Management

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Edited by:
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3rd International Conference on Current Trends in Engineering, Sciences & Management
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Dr. Harsh Sadawarti
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Dr. Anurag Sharma

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Proceedings of
3rd International Conference on
Current Trends in Engineering, Sciences & Management

iCTESM 2020

Edited by:
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Message

Throughout its well endowed presence, **CT Group** has established an outstanding reputation at state, national and international level, with the CT University at Ludhiana, 02 mega campuses which include 17 institutions and 02 schools in Jalandhar. This is due to the continuous dedication of our team members and their research activities, our modern pedagogical techniques, modern facilities, state of the art infrastructure and the most important is our quality of education. CT Group contributes significantly to the society through its programmes from Pre-Nursery to PhD and CSR activities.

As an **Executive Program Chair** of **3rd International Conference on Current Trends in Engineering, Sciences and Management (ICTESM-2020)**, I feel elated that we, at CT Group are taking successful stride towards our goals of imparting quality education. We always envisage the need of the hour and synchronize the analytical and descriptive aspect of the knowledge which ensures good employability avenues. We have been creating successful entrepreneurs and professionals, who can aid in the generation of employment opportunities.

This 3rd International Conference by our CT University, Ludhiana is in associated with CTIMIT & Lincoln University, USA is a continuous attempt of ours to portray the need of research, dynamic thought, creativity and innovation, necessary for the growth of any organization at micro level and for economy at macro level.

I would like to give my warm regards to all the academicians, scholars and participants for being a part of this international conference and my best wishes to the entire team behind the conference for taking such endeavor.

S. Charanjit Singh Channi
Chancellor, CT University
Executive Program Chair, ICTESM-2020

Message

It gives me immense pleasure to share that CT University is organizing its third International Conference on **"Current Trends in Engineering, Sciences and Management"** on **January 06, 2020 at Singapore.** It is a matter of great satisfaction that **CT University,** Ludhiana is in association with CTIMIT & Lincoln University, USA has picked up the theme of **"Current Trends in Engineering, Sciences and Management"** and started deliberating on the various dimensions of Technical Education.

As part of our vision to incorporate relevance in technical education, an innovative initiative was launched this year in the form of collaboration with NPTEL, CIHT. The University of Derby, BOSCH, EC Council & Autodesk, Tally for the enhancing the technical capabilities of the students.

I congratulate Dr. Harsh Kumar Sadawarti, Vice Chancellor CT University, Dr. Jasdeep Kaur Dhami, Director (Maqsudan Campus), Dr. Anurag Sharma, Dean Academics of CT Group of Institutions, Maqsudan Campus for organizing this conference. My appreciation and good wishes for our team for their endeavour and success in life and career.

Mr. Manbir Singh
Managing Director, CT Group
Executive General Chair, ICTESM-2020

Message

It is my great pleasure to welcome you to the **3rd International Conference on "Current Trends in Engineering Sciences and Management**: ICTESM -2020, organized by **CT University on January 06, 2020 at Singapore.** It has been a real honor and privilege to serve as the Executive General Chair of the conference.

This conference provides a platform to bring together not only researchers, academicians, research scholars, postgraduate students but also industrial people. With this platform, ICTESM- 2020 will embark on a whole process of making new dimensions in the field of education.

The conference would not have been possible without the enthusiastic and hard work of a number of colleagues. I would like to express my appreciation to the convener(s), Dr. Anurag Sharma for their valuable contribution in organizing this conference. We have received over 60 papers for oral presentation. Special thanks to members of our Technical Program Committee for reviewing these papers and offering advice to upkeep and enhance high quality papers for this conference.

A conference of this size relies on the contributions of many volunteers, and we would like to acknowledge the efforts of our CT members and referees and their invaluable support review process. We are also grateful to all the authors who trusted the conference with their work. Special thanks to all the Keynote Speakers and all the panelists for sharing their views on current research topics.

I look forward to an exciting days of insightful presentations, discussions, and sharing of technical ideas with colleagues from around the world. I thank you all for attending the conference and we hope that you enjoy your visit to the Singapore.

Mr. Harpreet Singh
Vice Chairman, CT Group
Executive General Chair, ICTESM-2020

Preface

On behalf of the CT University Management and on my own behalf, I am immensely delighted in extending a cordial welcome to our international presenters and delegates from across the world, who will be participating in the **3rd   International Conference on Current Trends in Engineering, Sciences and Management** (ICTESM-2020).

We must consider two things. First, the innovations in science and technology are the engines of the 21st -century economy, and the Second, there must be perforations between the walls of science and technology, which must not operate in isolation, rather work in an interdisciplinary mode. These two things have been kept in mind while designing the themes of the ICTESM-2020. It is hoped that the conference will genuinely challenge and inspire and lead the participants to an array of new interdisciplinary knowledge, collaborations, and friendships. The ICTESM-2020 has also been exclusively designed with a focus on bringing together researchers and practitioners from academia and industry to brainstorm on the prevailing and upcoming concepts and fostering networking in identified areas.

Whereas this multi-disciplinary conference providing an inclusive discussion forum recognizes the rapid global advances being made in fundamental and innovative research and the largely felt need for their translation from the laboratory to application field, it aims at bridging the Research and Practice Gap in relevant scientific areas through sharing knowledge and research findings in theory, methodology and applications of engineering, sciences, education, management and information technology.

I am sure the deliberations will bring out some tangible recommendations of value to researchers, academicians, industry, professionals, students and the policy planners.

On behalf of the Organizing Team I would like to thank all the sponsors, exhibitors, speakers and most of all the delegates of ICTESM-2020. We always aspire to get whole-hearted cooperation of all concerned towards this international event.

Dr. Harsh Sadawarti
Vice Chancellor
CT University, Ludhiana, India
Program Chair, ICTESM-2020

Preface

I am very glad to present my appreciation for your participation in the **3rd International Conference on Current Trends in Engineering Sciences and Management** (ICTESM 2020) in Singapore. The conference provides a good chance for all the participants to discuss and to exchange their research ideas. The research ideas will be presented in technical sessions and round table discussions during the conference period.

The main program of ICTESM 2020 includes streams of technical sessions. The program will further be enriched by two keynote presentations offered by world-renowned researchers in the field of engineering & management.

We are grateful to all authors who trusted us with their work. The final result would not have been possible without the dedication and hard work of many colleagues. My Special thanks a to the track chairs, the members of the Technical Program Committees, the Executive program chair, Executive General Chair to all external referees for the quality and depth of the reviews, and their sense of responsibility and responsiveness under very tight deadlines.

Dr. Jasdeep Kaur Dhami
Director, CTIMIT
CT Group of Insitutions, India
Program Chair, ICTESM-2020

Convener Message

The present volume of conference proceedings contain the written versions of most of the contributions presented during the "**3rd International Conference on Current Trends in Engineering, Sciences and Management**": **ICTESM-2020**, which organized by **CT University, Ludhiana on January 06, 2020 at Singapore**. The topics that were covered in the conference include Design and Manufacturing Engineering, Material Science and Engineering, System Engineering, Automobile Engineering, Modern Trends in Engineering, Building Energy conversation, Green Architecture, Robotics, Big data, Machine Leaning, Social Networks and Media, Artificial Intelligence, Automatic Control and Computer Science Etc.

I would like to thank all participants for their contributions to the conference. Many thanks to all the team members of the CT group for their hospitality. My special thanks to our colleague Ms. Anshu Sharma for her devoted assistance in the overall organization of the conference. I also express sincere thanks to our publication committee for their help with proof reading of the contributed papers and preparing the proceedings volume. I also want to thanks Mr. Tarun Sharma for his support. My gratitude to all organizing committee members and HOD for their contribution.

I offer my deep sense gratitude to S. Charanjit Singh Channi (Chairman), Mr. Manbir Singh (Managing Director), Mr. Harpreet Singh (Vice Chairman), Dr. Harsh Kumar Sadawarti, Vice Chancellor CT University, Dr. Jasdeep Kaur Dhami, Director (Maqsudan Campus), Jalandhar for their support and encouragement.

Dr. Anurag Sharma
Convener, ICTESM-2020

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Keynote Address

Title: Future of Leadership by Algorithm

The influence of machine learning and artificial intelligence (AI) has progressed over the last decades and is now starting to penetrate how organizations work and decide (Reeves, 2015). The implementation of AI in the organizational setting is, however, just beginning. Indeed, a survey by Accenture (2017) revealed that 85% of surveyed executives want to invest more extensively in AI-related technologies over the next 3 years. How will AI implementation influence what many consider the heart of any organization, that is, its leadership? Leadership is a dynamic social process, in which the leader represents the values and pursues the interests of the collective and motivates and inspires its members to do the same. Up until now, organizations have been populated by human actors, but today they are facing a new type of diversity in which both AI and humans are members of the same collective. Such a reality begs the question of whether the leadership of today will still be needed tomorrow? The importance of this question cannot be underestimated because it is directly linked to many leaders' uncertainties such as whether their job will still be relevant in the new technology era and what kind of knowledge in their training they should prioritize when AI becomes part of the decision-making process. It is also those kinds of uncertainties that I am faced with when executives ask me whether leadership courses at Business Schools that provide insights into human motivation will disappear as they seem to be irrelevant in the new technology era. Much of the uncertainty exists and is fed by the discussion of whether or not AI will replace people's jobs. Borrowing René Descartes distinction between mind and body (Hoffman, 1986), proponents of the idea that AI will replace humans, argue that with the industrial revolution replicated the body utilizing the machines that we developed. With the emergence of AI, the moment has arrived to replace the mind. Combined, these historical events make today seem ready to replace the human in its totality. However, is this true? It is easy to see that AI can be used for administrative and supportive tasks, but—as critics would argue—surely not for more complex decisions in the social context of any organization. The business world does seem to have a different perspective on this.

Dr. David De Cremer

Provost Chair & Professor

Management and Organization

National University of Singapore

Keynote Address

Title: Emergence of Magnesium in Engineering and Biomedical Applications

Magnesium is a nutritional element for the livings and the lightest of all metals that can be used as principal element for structural applications both inside and outside the body. The nutritional characteristics of magnesium has opened biomedical sector to magnesium based materials for use as bioresorbable temporary implants including stents thus eliminating the need for revision surgery and hence to subject's trauma and medical cost for management of an injury. The lightweight of magnesium is seen more and more favorably by the transportation sector as it can reduce the emission of greenhouse gases such as CO_2 thus assisting in mitigation of global warming. Further, magnesium is abundantly available in earth crust and water bodies making it much more sustainable than aluminum such as in engineering applications. The sustainability and non-toxicity of magnesium is key for a sustainable environmental solution for a greener planet earth. In view of outstanding attributes of magnesium, the present talk will highlight the unique characteristics of magnesium, its potential market and material development.

Dr Manoj Gupta
Associate Professor Materials
Department of Mechanical Engineering
National University of Singapore

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Design and Development of a Bird Trapping Device

Abdul Hafiz Bin Saharudin, Research Scholar, ME, Singapore Institute of Technology & University of Glasgow
Singapore
Patrick S.K. Chua, Associate Professor, ME, Singapore Institute of Technology, Singapore

Abstract: This paper is concerned with the design and development of a portable bird trap which targets common species of birds found in urban areas with the purpose of reducing the bird population so as to reduce problems due to noise generated by the birds, diseases from bird droppings, rubbish scattered by scavenging birds and corrosion caused to parked vehicles and metallic building structures due to corrosive bird droppings. Stability and ergonomical issues were addressed in the design and all requirements were analysed and evaluated. The trap uses elastic band and net which is launched from a portable platform to trap birds in a single launch. A prototype which satisfied stakeholders' requirements translated into product design specifications was designed, fabricated and tested.

Keywords — bird trap, bird droppings, cage, diseases, manpower, net, pest control

I. INTRODUCTION

The presence of flocks of birds such as Rock Pigeons and Javan Mynah in the public housing estates in Singapore is of great concern because they create numerous problems which could negatively affect hygiene, human health.

The environment, An example is the HistoplasmaCapsubtum disease and meningitis which can be easily spread to humans from bird droppings [1]. Besides health issues, these birds are a nuisance as they can be noisy and aggressive to humans. Such problems can occur in places such as cafeterias and food centres where the birds would scavenge for leftover food. In addition, their messy acidic droppings are unsightly and cancorrode metallic structures and vehicles.

Many methods have been implemented by pest control companies to manage the bird problems such as placing metal barriers and nettings around cafeterias and open-air food centres and also using bird poisons. Most methods use bird trapping devices such as cages and baits but they need to wait for the birds to enter the cages one at a time and is therefore a slow process. Besides, the cages need to be large in order to trap many birds and are therefore heavy to transport. In 2018, a giant bird trapping device using a huge net was built and used to trap Javan Mynah birds in PotongPasir, Singapore [2]. Even though many other methods have been introduced over the decades, the problem still remains an issue. A new bird trap design is needed to reduce these pests more effectively. In this paper, the process of designing a new bird trap is described.

II. OBJECTIVE

The objective of this project was to design and construct a bird trapping device that is able to catch a flock of birds in a single trapping attempt in an urban setting. The targeted birds are mainly Javan Mynah, Common Mynah, and Rock/Feral Pigeon due to their large population but House Crow, the Eurasian Tree Sparrow and other birds may also be caught.

III. METHODOLOGY

Engineering design methodology was applied to this work. The main design process generally follows the flow shown in Figure 1. Each of the main processes consists of a few sub processes that will be further elaborated in the paper.

Figure 1: Design Process

From the problem definition, literature review was carried out to study past and on-going works related to trapping of birds. This was followed by understanding of stakeholders' requirements, product design specifications, and selecting of design concepts, detailed design, Computer Aided Drawing (CAD), material selection,parametric studiesand structural integrity studyusing simulation. Finally, fabrication and testing on the prototype were carried out.

IV. LITERATURE REVIEW

Several bird trap devices were studied in the literature. They are mainly cages of different designs that use baits to lure the birds into the cage. The cages are designed such that once the birds enter the cage, they are unable to escape. There are disadvantages as follows:

a) One bird at a time is lured into the cage. This takes time.
b) The trapped birds might feel distressed if left too long in the cage.Their distress can cause other birds not to enter the cage.
c) The cage is usually left on site for one or two days. This is time consuming and taxing on resources as during this period the cage cannot be deployed elsewhere.
d) Birds may learn to avoid the cage.
e) Not suitable in an urban setting where such trapping operation is normally needed as there will be many people watching and some who are bird lovers may consider it cruel to trap birds in this manner.
f) The cages may be damaged if left unattended or birds set free by people.
g) It is a slow process and pest control staff involved may not be efficiently deployed resulting in poor utilisation of manpower.

A particular method of trapping birds using net blaster appears to provide a better solution. The Net Blaster [3]. has projectiles attached to the corners of a large net which launches using pressurised gas. The user has to first scatter food on a targeted area on the ground to lure the birds. As the birds gather to feed on the food, the user activates the trap which will launch the net. The net flies over the birds and traps the birds upon landing on the ground as shown in Figure 2. The weight of the projectiles prevents the birds from escaping. The net is then retrieved with the birds inside it. It is claimed that it catches the birds in an instant with a capture rate of 90%. However, gas blasting causesvery loud noise which can shock passers-by or scare away the birds some of which are able to fly off quickly. Other birds will remain scared and may desert the site immediately. The large explosive noise during net launching makes it unsuitable for use in an urban setting.
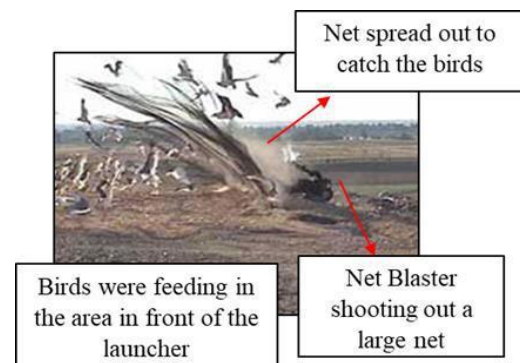
Figure 2: Net Blaster shooting the net

A new method [2] called the "roost net system" to control the JavanMynah population by trapping them in a giant net and culling them using carbon dioxide was trialed in PotongPasir, Singapore, following complaints by residents about the noise made by flocks of such birds. According to Agri-Food and Veterinary Authority (AVA) of Singapore the non-native, invasive bird species could cause hygiene, healthand noise problemsas there were about 2,800 mynahs roosting in the area at that time[2]. Their nests When the tree was sealed, carbon dioxide was then pumped into the huge 'bag'as shown in Figure 3. The costly operation requires a great deal.

Manpower and logistic resources as well as safety planning due to the densely populated residential site and can only cover one tree at a time. It takes time to cover the tree and birds may still be able to escape due to the slow process.It is difficult to retrieve the dead birds from the trap as some may be caught by the branches and in the nests.
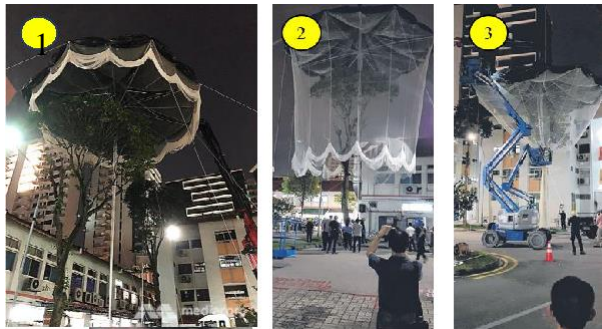
Figure 3 : Bird trapping using giant net and crane lorry.

V.   ANTHROPOMETRY STUDY

The portable bird trap to be designed in this work would require the user to carry it. Therefore, there is a need to understand the proportions of the human body so that the trap will be comfortable for the average user to use. Since the product is mainly used in Singapore, the anthropometry study was based on the body structure of Asians [4]such as stature, shoulder height, elbow height, shoulder breadth, waist height and knee height. This was carried out in this work.

VI.   MORPHOLOGICAL CHART

The morphological chart shown in Table 1 is used to determine the various mechanisms that can be used for each function as analysed in the functional analysis.

Table 1: Morphological Chart

Function	Mechanism options			
Launch net	Pressurised Gas	Elastic Band		Spring
Close trap door	Gear Box	Pneumatic Actuator	Pressurised Gas	Spring
Install one-way	Spring		Gear Box	
Sense presence	Motion Sensor	Weight Sensor	Camera	Arduino

VII. PRODUCT DESIGN SPECIFICATION (PDS)

Some of the key Product Design Specification (PDS) was produced as listed below.Able to catch pigeons andJavanMynahs.Easy to retrieve the trapped birds from the (within 1 minute by one user)Safe for the birds (no injuries should be caused during trapping)Able to catch 70% of the birds which are within range of the trap when activated.Lightweight and portable (< 6 kg)Does not alarm the people nearby when activated (noise produced to be under 65 db at 1 m away).

The Digital Logic Method [5] shown in Table 2 is applied to determine the ranking system for each specification shown above. The specification with the highest value is generated. As a result, the more critical specifications are to focus on the two species, JavanMynahs and Rock/Feral Pigeons, and to catch 70% of the birds that are within the range.

The Digital Logic Method [5] shown in Table 2 is applied to determine the ranking system for each specification shown above. The specification with the highest value is generated. As a result, the more critical specifications are to focus on the two species, JavanMynahs and Rock/Feral Pigeons, and to catch 70% of the birds that are within the range.

VIII.   CONCEPT GENERATION

In this section, five different concepts were generated including the Venus Flytrap, Self-foldingCage and Net Launcher which is an improvisation of the Net Blaster.

A.Concept Selection

The Weighted-Properties Method [6] is used to determine the concept to be focused on for this project. Each concept is compared to the value of the product design specification that was calculated using the digital logic method described previously using a ranking value ranging from 0 to 10. The value 10 states that the idea fully satisfies the design specification while 0 states the opposite. With these values, they are multiplied by the weighting factor to obtain the weighted property values. The Net Launcher concept was found to achieve the highest accumulated value and was therefore selected for this project.

Table 2: Digital Logic Method for ranking

Specification Number	Decision Pair (Number)															Positive Decision's Number	
	1 2	**1 3**	**1 4**	**1 5**	**1 6**	**2 3**	**2 4**	**2 5**	**2 6**	**3 4**	**3 5**	**3 6**	**4 5**	**4 6**	**5 6**		
1	1	1	0	1	1											4	0.27
2	0					0	0	1	1							2	0.13
3		0			1					0	1	1				3	0.2
4			1			1				1			1	0		4	0.27
5				0			0				0		0		1	1	0.07
6					0			0				0		1	0	1	0.07
															Total	15	1

The Theory of Inventive Problem Solving method, also known as TRIZ [7], is used to improve the selected concept further. Instead of all the 40 Principles available in TRIZ, only threeof the principles are used as listed below.

TRIZ Principle 1: Segmentation - A low-resolution prototype isconstructed to determine whether an elastic band is able to launch four projectiles that are attached to the net (Figure 4). The prototype is made out of acrylic and wood. It has four launchers that launchfour cylindrical shaped projectiles. A main trigger activates the four launches. This trigger is directly in contact with the elastic band. Therefore, Principle 1 is used to improve the system. Instead of having the four launchers sharing one elastic band, each launcher will have its own elastic band instead.

TRIZ Principle 27: Cheap Short-lived Objects - Elastic band loses its elasticity overtime due to heat and constant stretching which may eventually yield and reach its plastic zone overtime. Therefore, the best kind of elastic band to use is a resistance band, which is readily available in the market with a suitable size and are low cost. The resistance band
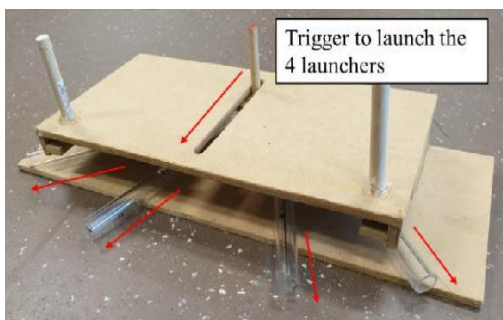
Figure 4: Low-resolution Prototype

that is used for the prototype is the Decathlon's Medium Mini Resistance Band [8] as shown in Figure 5.

TRIZ Principle 28: Mechanics Substitution - An elastic band is used to launch the net instead as it is much quieter and does not alarm the residents in the housing estates compared to pressurised gas

IX. ELASTIC POTENTIAL ENERGY AND HORIZONTAL LAUNCH DISTANCE

Figure 5: Decathlon's Mini Resistance Band

In order to estimate the horizontal distance the projectiles will travel upon launching using the above resistance bands, a test was performed to first obtain the elastic potential energy when the resistance band is stretched over a certain displacement. The test platform is placed vertically at the edge of a table without the slider. Weights are hung onto the elastic band to determinethe force required as shown in Figure6.
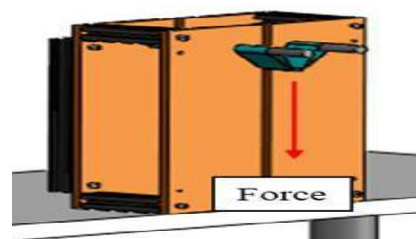
Figure 6: Setup for determining elastic potential energy

The initial length of the band from the shaft to the tip of the mini resistance band is 100mm. The mass required to pull the mini band at every 10mm is recorded. This experiment is repeated thrice to obtain the average force required for each extension. Figure7shows the summarised results in a line graph.
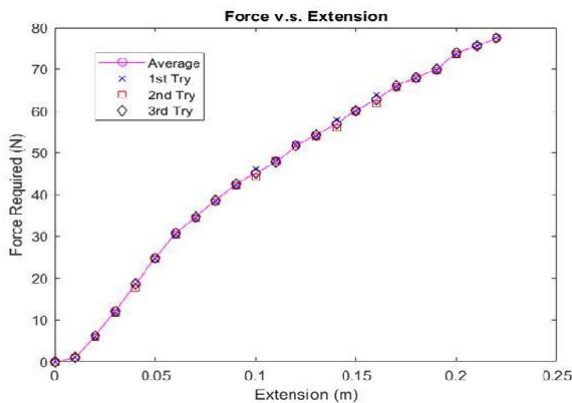
Figure 7: Line Graph of Force versus Extension

The results show a slight curve from the extension 0m to 0.1m. This is due to the tangled polymer chains which start to uncoil when a force is initially applied and as the force increases a roughly linear relationship is obtainedbetween applied force and extension. To determine the maximum horizontal distance the projectile can travel, the elastic potential energy stored in the mini band, stretched to 0.22m
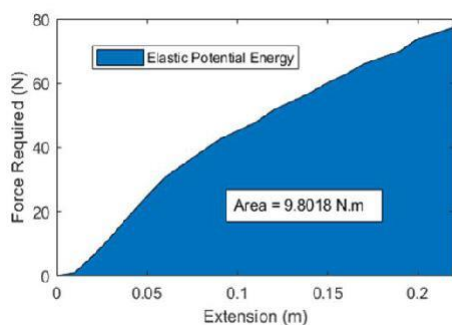
Figure:8

extension, is required. This value can be obtained using the area of the plotted graph in Figure8.

The elastic potential energy obtained is $9.80\,J$ which is determined using MATLAB.By substituting the values, the horizontal velocity (v_x) can be obtained from the energy conservation principle as follows.

$$9.018\,J = \frac{1}{2}(0.1\,kg)v_x{}^2$$
$$v_x = 14.00\ m/s$$

The height of the projectile at the initial start (Δv) is the sum of the waist height and the height of the test product.

$$\Delta y = 1\,m + 0.15\,m = 1.15\,m$$

The formula can be used as shown to study the movement of the projectile in both x and y directions. In the y-direction, a_v is gravitational acceleration, $9.81\ m/s^2$. However, there is no initial velocity at the y-direction ($v_y = 0\ m/s$). By substituting the values into the kinematic equation in y-direction, $\Delta y = v_y t + \frac{1}{2}a_y t^2$, the time, t, for the projectile to reach the ground can be obtained[9].

$$\Delta y = v_y t + \frac{1}{2}a_y t^2$$
$$-1.15\,m = \frac{1}{2}\left(-9.81\,\frac{m}{s}\right)t^2$$
$$t \approx 0.48\ \frac{m}{s}$$

The time obtained can also be used in the formula for x-direction which has no initial acceleration in that Direction ($a_x = 0\ m/s^2$). Therefore, by sub situating the values in the horizontal kinematic Formula, $\Delta x = v_x t + \frac{1}{2}a_x t^2$, the horizontal distance (Δx) can be obtained.

$$\Delta x = v_x t + \frac{1}{2}a_x t^2$$
$$\Delta x = \left(14\,\frac{m}{s}\right)(0.48) = 6.72\ m$$

Thus, the expected horizontal distance the projectile should travel is 6.72m.

An experiment is performed to compare the result with the theoretical value. The test product is placed at waist level (1.0 m above the ground Despite air resistant and some misalignment at each launch due to manual handling, the plot at the third attempt, resulting in a maximum distance of 6.275 m travelled by the projectile at the third try.
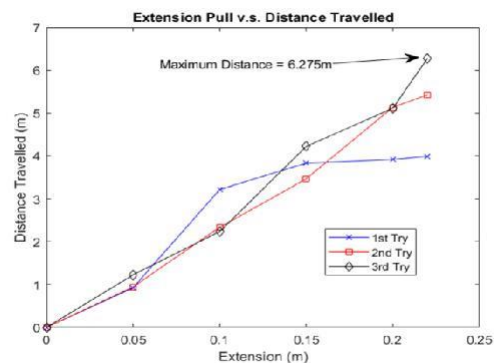
Figure9: Experimental result of extension versus distance travelled

X. MATERIAL SELECTION

As each components has different specifications, the materials also differ from each other. The components that need to be manufactured are divided into four categories, namely the laser cutting materials, shafts, trigger components and the sliders. The software CES [10] is used to determine the materials.

For the Top, Middle and Base Body, since the component priorities are on weight, aluminium is chosen as their materials. Due to their thin and complexed shapes, laser cutting will be preferable to manufacture them.

The shafts have direct contact as the holder shafts support the elastic band, while the trigger shaft and handle grip shafts form part of the trigger. Based on Young's Modulus, yield strength, density and price, High Carbon Steel SUJ2 is preferred for the components.

For the trigger bar and guard, their main purpose is to provide support and alignments for the trigger shaft. They are designed for easy manufacturing. Since they are not in direct contact with the forces from the launchers, the density and machinability properties are more important compared to the material strength. By comparing the metal alloys in CES based on the density and machinability, the age-hardening wrought Aluminium alloys are chosen as the materials for the trigger bar and guard. The sliders are to be manufactured using injection molding due to its complexed shape. Polyamide is chosen due to their high fatigue strength.

XI. STRUCTURAL INTEGRITY CONSIDERATIONS

A. *Holder Shafts Force Calculation*

Figure 10(left) shows the top view of the two holder shafts (shaded grey) withstanding the forces from the
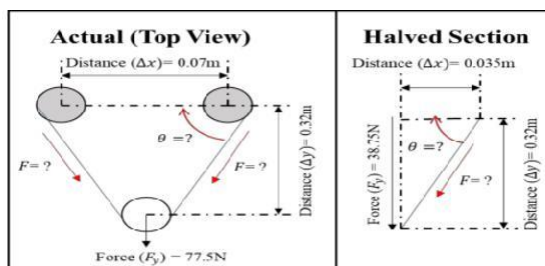
Figure 10: Plan view of holder shafts

Since the diagram is symmetrical, the model is halved as shown in Figure 10 (right). Pythagoras theorem is used to obtain θ as shown below.

$$\theta = \tan^{-1} \frac{\Delta y}{\Delta x} = \tan^{-1} \frac{0.32 \; m}{0.035 \; m} \approx 83.76°$$

With this value, Pythagoras theorem is used again to obtain the force (F).

$$F = \frac{F_y}{\sin \theta} = \frac{38.75}{\sin (83.76°)} \approx 38.98 \; N$$

A. *11.2 Simulation Results for Holder Shafts*

Using ANSYS, the 38.98N force is applied to a holder shaft (red arrows) to simulate the results with the two ends fixed (blue rectangular box) as they are supported by the two main bodies and nuts as shown in Figure 11. The shaft is meshed using hexahedral method and face sizing of 3mm. The maximum von Mises stress value is 3.9156MPa, which is lower than the yield strength of 400MPa for High Carbon Steel, while the maximum deformation located in the middle of the shaft is $8.9377 \times 10^{-5} mm$. This deformation is very small and is considered negligible.
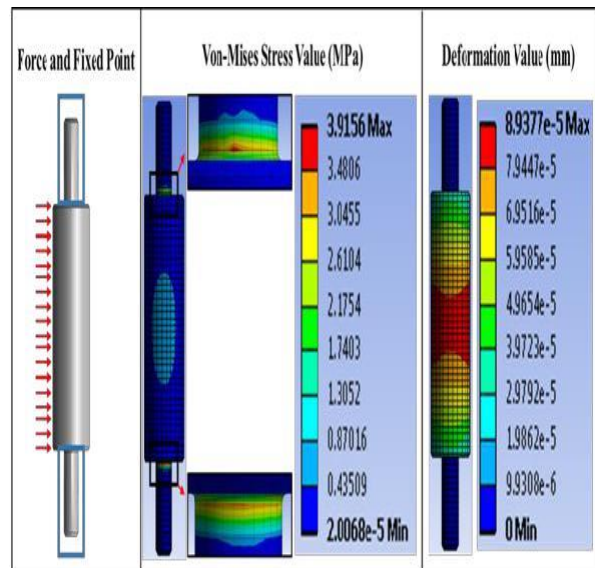
Figure11: Holder Shaft Boundary Condition and Simulation

B. *Trigger Shaft Force Calculation*

This trigger shaft is a vital component as it supports all the eight launchers. Failure could lead to serious injury to the user and the people around. The top view of the shaft with the forces acting on the trigger is shown in Figure 12. The value of each force is 77.5N calculated from the previous sections.
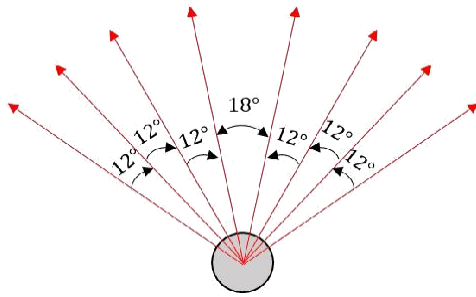
Figure12: Forces applied to Trigger Shaft (Top view)

C. *Simulation Results for Trigger Shaft*

With this understanding, the trigger shaft is simulated using ANSYS to find the maximum von Mises stress and deformation. Similar to the holder shafts, hexahedral method with face sizing of 3mm is used for the meshes. The applied forces (red arrows) and fixed point (blue rectangular box) are shown in Figure 13.
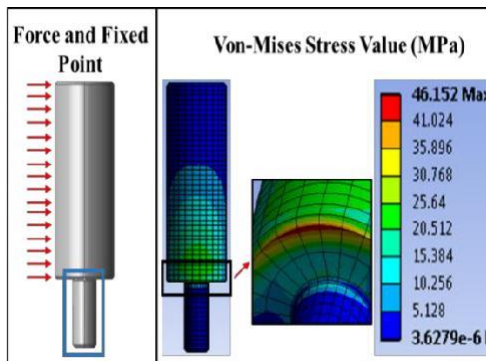
Figure 13: Trigger Shaft Boundary Condition and Simulation

As a result, the maximum von Mises stress is 46.15MPa, which is lower than the yield strength of High Carbon Steel. The maximum deformation is 0.0094197mmwhich is very small and is considered negligible.

D. *Top and Middle Body – Force Calculation*

The forces that the two bodies experience come from the smaller ends of the holder shafts. The two bodies are 5 mm thick and is in contact with the smaller ends of the shaft shown in Figure 14. Similar to a beam fixed at both ends, the smaller ends are fixed for boundary conditions. The forces in the centre of the shaft (F_B) is 39.98 N as stated in the previous calculation.
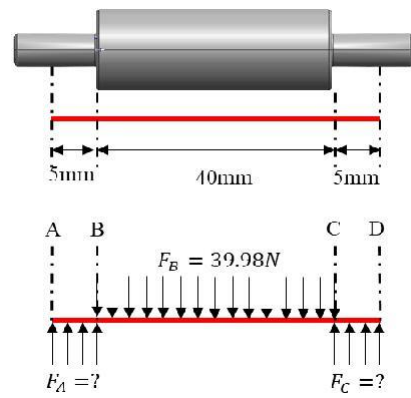
Figure 14: Holder Shaft (Side view)

Based on Newton's law the sum of forces is 0N as it is in static equilibrium.

$$\sum F_y = F_A - F_B + F_c = 0$$
$$F_A - 39.98\,N + F_c = 0 \quad N$$

By symmetry,
$$F_A = F_c = 19.99 \quad N$$

The two bodies experience eight of these forces (red arrows) while the fixed points (blue boxes) come from the holes used to attach the bodies with conditions in Figures15 and 16. However, since the middle body has the trigger, it experiences the 77.5N forces (blue arrows) from the trigger shaft as well as shown in Figure 16.

A. *Simulation Results*

Tetrahedrons method is the meshing method used for these two components due to their complex shapes. The face sizes are 3mm for every meshing element. The maximum von Mises stress that the top body experience is 0.92134 MPa, which is lower than the yield strength of 30 MPa for aluminium, as shown in Figure 15. On the other hand, the maximum deformation result is 0.0010364 mm which is negligibly small.
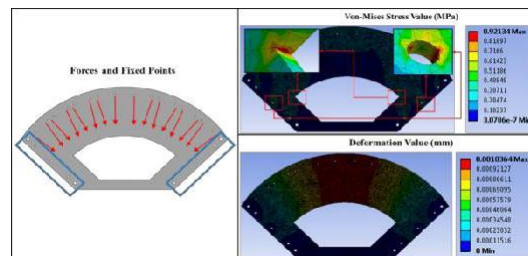
Figure 15: Top Body Boundary Condition and Simulation

For the middle body, the maximum von Mises, 7.1496 MPa, and maximum deformation, 0.00223 mm, occurs at the trigger slot as shown in Figure 16. However, it manages to withstand the forces as the

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stress value does not exceed the aluminium yield strength value.
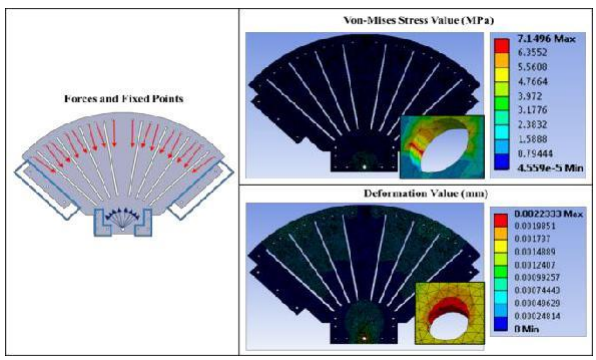
Figure 16: Middle Body Boundary Condition and Simulation

XII. FINAL DESIGN& PROTOTYPE

A finalised concept design is made using Solidworks[11] as shown in Figure 17.
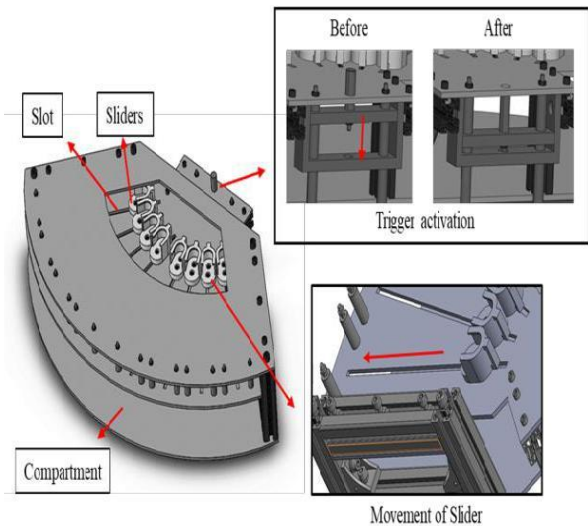
Figure 17: Final Design

A simplifiedprototype shown in Figure 18was made to determine the feasibility of the concept. Due to the limited tools and materials available at hand, acrylics are used for the main bodies while the trigger and sliders are 3D-printed. Furthermore, four launchers are used instead of eight as acrylics are fragile and may fail when the forces are applied. The 3 m x 3 m net is tennis net customized to simulate the large nylon net which pest control companies generally use. Drawstring is also absent in the customized net. The projectiles are attached to the top edge of the net using strings while the other side is tied to the compartment as shown in Figure 18. Figure 19 shows how the net is folded and placed in the launching compartment of the device. Figure 20 shows how the launching is done.
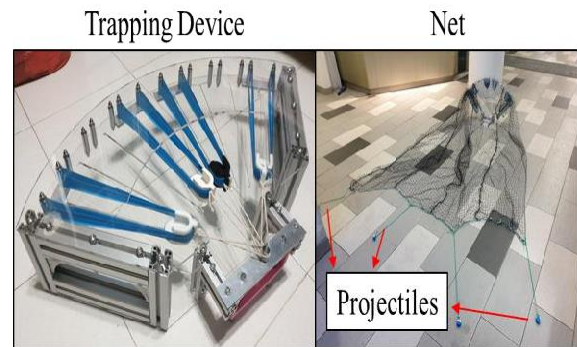
Figure 18: Prototype Launcher set-up and launched net

Figure 19: Folding the ne

Figure 20: Allocating target area and showing how the net is to be launched

XIII. CONCLUSION

In conclusion, the design of the bird trapping device is produced using elastic band and launching mechanisms. The key advantages of this design are thatit does not alarm the people nearby due to the quieter sound made by the elastic band compared to pressurized gas for launching the net and it effectively facilitates a 'touch-n-go' operation in that the whole operation will take a much shorter time compared to the cage-n-wait methods. This speeds up trapping operation and enables productive and efficient deployment of manpower to other sites. The mesh net sizes are designed for the Pigeons or JavanMynahs but other birds of similar sizes can also be caught. As the

capture rate is unknown due to time constraint, tests are required on birds to obtain the successful capture rate of the device and for further improvement.

XIV. ACKNOWLEDGEMENT

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APPENDIX (BIRD TRAP DEVICE)

All measurements are in millimeters (mm)
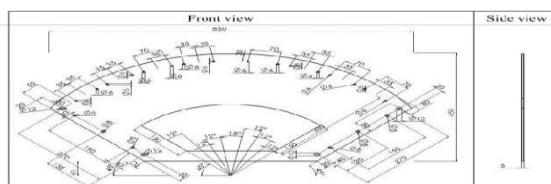
Figure A-1: Top Body Dimension
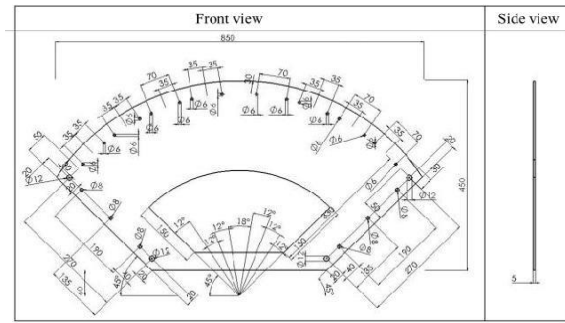
Figure A-2: Middle Body Dimensions
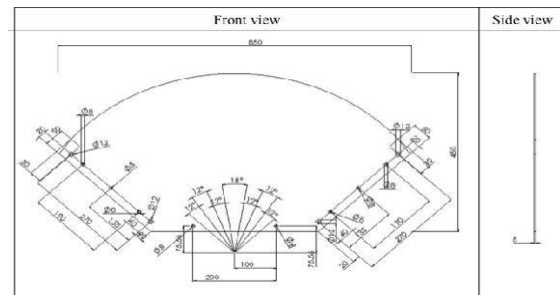
Figure A-3: Base Body Dimensions

Design of a Portable Oxygen Cylinder Holder for Attachment to Walking Frame

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Singapore
Patrick S.K. Chua, Associate Professor, ME, Singapore Institute of Technology, Singapore

Abstract: This paper is concerned with the design and development of a portable oxygen cylinder holder which is to be easily attached to a standard wheeled walking frame for physiotherapist assessment of patients with respiratory diseases. Stability and ergonomical issues were addressed in the design and all requirements were analyzed and evaluated. A prototype which satisfied stakeholders' requirements translated into Product Design Specifications was designed, fabricated and tested.

Keywords — manpower, oxygen cylinder holder, patient, physiotherapist, respiratory diseases, walking frame

I. INTRODUCTION

Four out of ten of the most common causes of death and disability are due to lung diseases and this is predicted to increase in the next decade [1] due to urban lifestyle and diet. One of the chronic diseases that is related to the respiratory system is Chronic Obstructive Pulmonary Disease (COPD) which is predicted to become the third leading cause of death worldwide by 2030 [2]. As part of the treatment process for the above, physiotherapy requires patients to do a "Six Minute Walking" test to measure the patient's functional exercise capacity before the course of physiotherapy treatment could begin. It was recommended for the patient's oxygen level to be maintained above 85% during the test [3]. The patient usually requires supplementary oxygen during the test. Studies also showed that performance during the test was improved with supplementary oxygen and the use of walking frames. The test requires the patient to walk at his own pace to acquire an accurate assessment of the patient [3]. A physiotherapist monitors the patient's progress and assesses his health condition.

A second physiotherapist is needed just to pull the oxygen cylinder, which is mounted inside a holder, alongside the patient while the first physiotherapist focuses on monitoring and assessing the patient. It is desirable that only the first physiotherapist be needed for this part of the Treatment process and the second physiotherapist be deployed to look after other patients so as to ensure better deployment of scarce manpower.

Existing oxygen cylinder holders are of low height and poorly designed ergonomics as the cylinders are required to be lifted significantly high for mounting on and dismounting from the holders which also are unable to be attached to a wheeled walking frame. Other problems include cylinder holder's weight, safety and ergonomics. Some oxygen cylinders are simply strapped onto the wheeled walking frame. The patient moves forward aided by the walking frame by pushing the walking frame forward. The overall weight of the frame significantly increases when the cylinder is suspended on it. This is undesirable as the rear legs of the walking frame are not wheeled which have high coefficient of friction. Therefore, heavier load requires the patient to exert more force which leads to huge inaccuracy in the assessment of the patient. If the cylinder holder is attached on the inner side of the walking frame, it will obstruct the movement of the patient. If it is attached onto the outer side of the waking frame, it will alter the centre of gravity significantly and reduce the critical angle (topple forward easily).

II. OBJECTIVE

The aim of this work was to design and fabricate a new oxygen cylinder holder so that it can be easily attached to and removed from the wheeled

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walking frame and that it would not hinder the patient using the walking frame. Only one physiotherapist would be needed to monitor and assess the patient who is using the walking frame. This would overcome the current challenges of a lack of manpower, poorly designed cylinder holder ergonomics, enhances stability during usage and remove the hindrance by the oxygen cylinder to the patient using the walking frame. It would also allow the oxygen cylinder to be easily mounted on and dismounted from the holder.

III. METHODOLOGY

Engineering design methodology was applied to this work. The main design process generally follows the flow shown in Figure 1. Each of the main processes consists of a few sub processes that will be further elaborated in the paper.
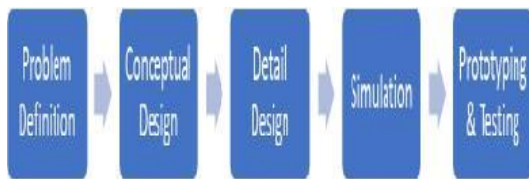
Figure 1: Design Process

From the problem definition, literature review was carried out to identify the problems. This was followed by understanding of stakeholders' requirements, product design specifications, generating and selecting of design concepts, detailed design, Computer Aided Drawing (CAD), material selection, simulation of structural analysis and parametric studies. Finally, fabrication and testing on the prototype was carried out.

a) *Quality Functional Diagram (QFD) and Product Design Specification (PDS)*

One of the initial steps was applying Quality Function Diagram (QFD) which is a method to define stakeholders' requirements and transform qualitative stakeholder demands into quantitative values (design specifications) based on the importance of each requirement. This is to ensure that the product features fulfil the stakeholder'sdemands. The project QFD is wn in Figure 2.

Figure 2

The next step involves Product Design Specifications (PDS) to set the specifications of individual key features of the product that was agreed upon with the stakeholders. The result from the QFD was taken into consideration in finalizing the target for the PDS. Some key specifications are that the dimensions of the cylinder holder must be no larger than 300 mm

(L) x 300 mm (W) x 800 mm (H), its weight is to be below 6 kg, corrosion and chemical resistance, ease of attachment to and removal from the walking frame, suitability for two sizes of oxygen cylinder of specific dimensions, chemical resistance (disinfectants are used for cleaning walking frame), corrosion resistance, costs and ergonomics.
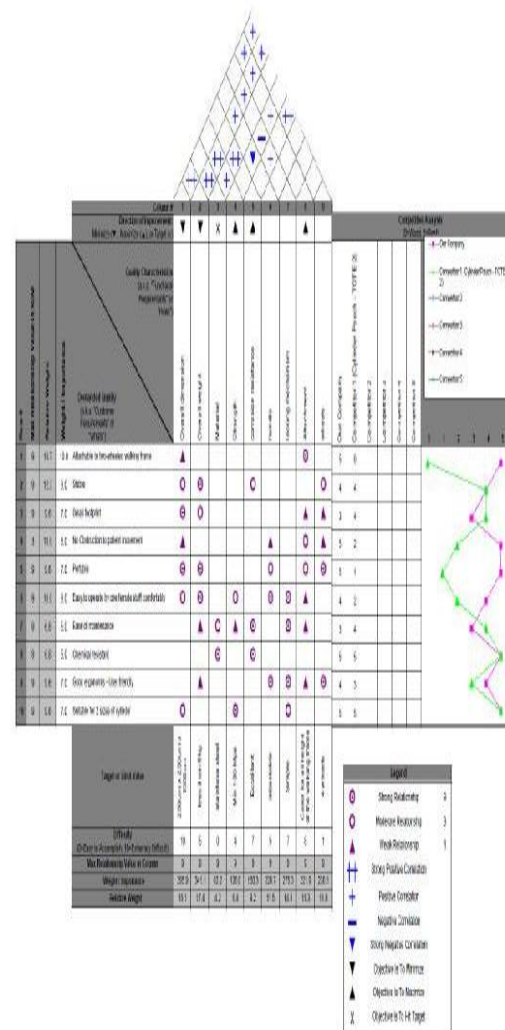
b) Concept Generation and Selection

With the aid of TRIZ principles [4], three design concepts were generated. The advantages and disadvantages of each concept were identified as well in the initial concept generation. These concepts were put through a weighted concept selection matrix using weighted criteria to determine the best design concept for the project. The three concepts were analyzed using the weighted selection matrix with the cylinder as the reference to determine the best concept. They were compared based on a list of criteria as shown in Table 1. It was identified that ease of user effort and modularity held a higher weightage as the main consideration was the practicality of the product in terms of the user. Based on the result shown in Table 1, concept B (Straps and Buckles) achieved the highest score. Even though concept B achieved the highest score, there was a need to prove the selected concept is feasible for its intended purpose. Therefore, a low resolution mock-up prototype was made to prove the concept as shown in Figure 3.

Table: 1 Comparison of weighted selection matrix with the cylinder

Selection Criteria	Weightage (%)	Rating	Score	Rating	Score	Rating	Score	Rating	Score
Universal	15	4	0.6	1	0.15	5	0.75	3	0.45
Low Cost	5	5	0.25	2	0.1	5	0.25	3	0.15
Security	10	2	0.2	5	0.5	2	0.2	3	0.3
Ease of Assembly	15	1	0.15	5	0.75	3	0.45	4	0.6
Ease of Maintenance	10	4	0.4	2	0.2	5	0.5	2	0.2
Ease of user effort	20	1	0.2	5	1	5	1	5	1
Modularity	25	1	0.25	5	1.25	5	1.25	5	1.25
Total Score	100		2.05		3.95		4.4		3.95
Rank			4		2		1		2
Continue?			No		No		Develop		No

Figure 3: Low Resolution Prototype (Concept B - Straps and Buckles)

The Body was made up of wood with the straps, buckles and castor wheels attached to it. The low-resolution prototype was strapped to the walking frame (front and side) for testing. The mock-up prototype was tested by a team of eight physiotherapists and survey was conducted to obtain their feedbacks.

There were a few points to be highlighted in the survey. Firstly, the cylinder holder was preferred to be attached to the front of the walking frame. The weight distribution was not balanced when the holder was attached to the side of the walking frame, hence, more difficult to push. Secondly, 37.5% of the staff felt that the size and stability of the low-resolution prototype were sufficient and 50% of the staff would prefer higher stability. This would give the final design a more accurate and balanced product characteristic to suit the stakeholders. Lastly, the procedure to setup was deemed easy.

The prototype was found to be prone to topple over whenever the walking frame was adjusted above a certain height. The problem could be resolved if the height of the force was lower than 0.42 m from the ground or the width of the base was larger than 0.194 m (assuming the center of gravity is at the middle). The concept was modified to prevent the cylinder holder from toppling over. A flat bar was added and it was tested and proved to be able to prevent the cylinder holder from toppling as shown in Figure 4. The straps would act as a secondary feature in securing the cylinder holder to the walking frame.
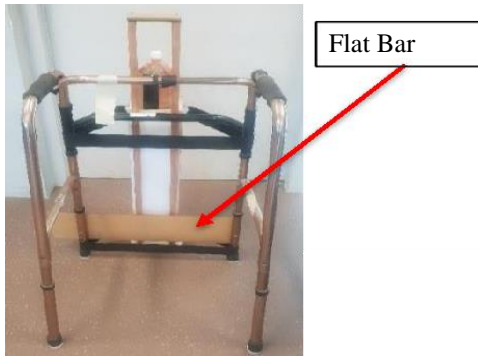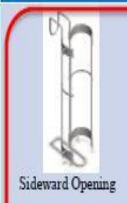
Figure 4: Flat Bar Attachment

c) Morphological Chart

After completion of the concept selection, other features were studied and the best combination was selected to be in cooperated to the design through a morphological chart. Subsequently, the overall design of the prototype with the best combination of the features were incorporated into the design. A morphological chart is a tool to assist in achieving the best combination of features to be used. It is sub-divided to individual features of the cylinder holder and each feature has several means/options. Therefore, there will be numerous combinations of options. However, one combination was chosen as shown below in Table 2.

Table 2: Morphological Chart [5]

Casing: The casing is to hold the cylinder in place and to prevent it from falling off. However, the casing needs to open for the user to change the cylinder easily. Sideward Opening was chosen over the other two because of security, space and ergonomics. It takes a lesser footprint than downward opening when it is open and users do not need to bend over to lift up the casing. As for the cylindrical clamps feature, it uses only its material elasticity property to hold the cylinder in place which is less secure.

Locking Mechanism: Rod latch was chosen over magnetic holder because of security as magnetic holder is purely dependent on its magnetic field strength which is less secure. In addition, the rod latch could be easily modified to be able to interlink both locking points (top and bottom) as compared to shutter latch.

Handle: The handle is to provide comfort for the user while manoeuvring the cylinder holder. As the cylinder holder would not be used by a specific individual, a telescopic handle would be preferred as it is adjustable to different heights based on the user's comfort.

Wheels: Wheels are to allow the cylinder holder to be portable. Swivel castor wheels were chosen due to lower cost as compared to omni directional wheels and a higher ground clearance compared to ball transfer unit.

d) Computer Aided Drawing (CAD)

CAD is a tool to assist design enginher to virtually design and provide the stakeholders with visual illustrations. The new portable oxygen cylinder Holder was designed as shown in Figure 5. The material thickness was standardised at 2 mm to ensure low manufacturing cost, except the flat bar which was designed to be 3 mm. To minimise manufacturing cost, the pipes used are readily available in the market.

e) Material Selection

After the design of the product was achieved on the CAD, material selection was then performed usimg the Cambridge Engineering Selector (CES) to shortlist materials. The requirements for the materials are Formability and Weldability, Yield Strength, Environmental and Chemical

Resistance (Disinfectant contains Ethanol ingredient are commonly used to clean the walking frame), density and costs.
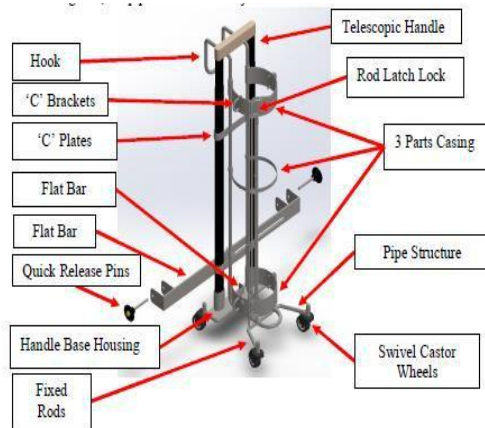
Figure 5: Design Features[6]

Subsequently, based on the identified material properties, a specific specification of each property was chosen to best fit the material requirements. Figure 6 shows the physical material properties and their specifications. A level 3 material library was chosen to be used in the CES software. With the above specifications defined, 279 of 3985 materials passed the specifications above.
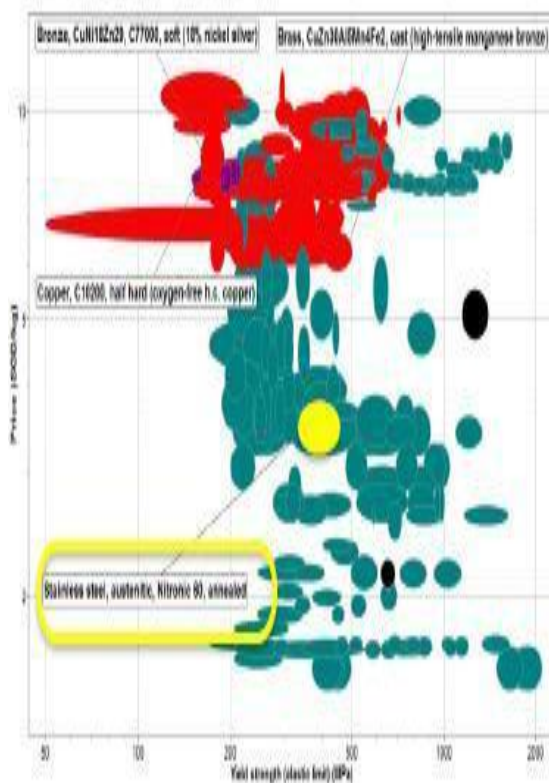
Figure 6: Price vs Yield strength graph[7]

The flat bar was made of stainless steel, austenitic, Nitronic 60, annealed. Data imported from CES. The telescopic handle (Figure 7(a)) was made from aluminium due mainly to its low weight and environmental resistant properties. The castor wheels were made from polyurethane and steel. Polyurethane is known for its high load bearing capacity, good tear, abrasion, impact resistance and ability to maintain its performance even in harsh environments [8].

As a preventive measure for the oxygen cylinder from rocking in the holder and the flat bar from damaging the walking frame, a foam called Polyethylene Foam Plank (EPE) was added onto the inner surface of the casings and the flat bar (Figure 7(b)). It was chosen as it had excellent impact absorption and resilience characteristics, good chemical resistance, low water pick up due to its closed cell structure and was 100% recyclable [9].
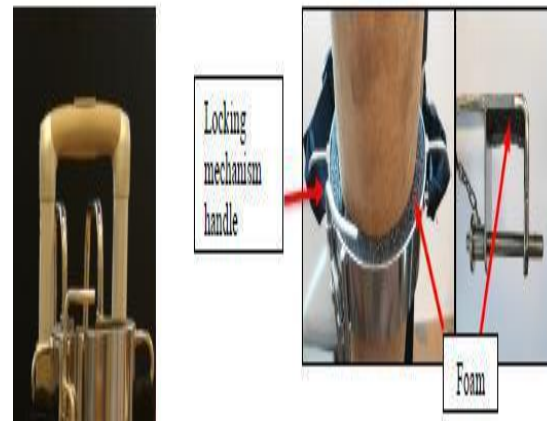
Figures 7(a) & 7(b) Telescopic handle and foam protection as cushion between cylinder and holder

f) Assembly Method

The product structure was designed mainly with the use of stainless steel. Therefore, the joining method suitable was welding, Gas Tungsten Arc Welding (GTAW). GTAW is suitable for thin materials and it produces clean and high-quality appearance on the welded area. The inert gas also helps to shield the weld puddle and protects the weld from contamination [10]. The threaded stem castor wheels would be screwed in mechanically. The telescopic handle was made of aluminium and

could not be welded with stainless steel. Therefore,

the telescopic handle was secured to the stainless steel structure mechanically using bolts and nuts.

g) Simulation Analysis

Static structural analysis was performed to simulate the forward pushing force on the flat bar attachment by the walking frame. This ensures that the design and materials selected were able to support and sustain the planned loading with a safety factor of 2.

Meshing: In order to balance between the accuracyof the analysis, computation time, limitations of ANSYS R18.2 Academic and still achieve acceptable mesh quality, non-critical components were suppressed for simulation. The remaining critical components were meshed at an element size of 0.5 mm to 1.0 mm. The patient would push the walking frame forward which pushes the flat bar attachment of the cylinder holder. In order to design a suitable thickness for the flat bar, the force required to push the cylinder holder was needed.

There were many factors affecting the coefficient of rolling friction. Some of the factors were load, wheels, flooring and atmosphere. The castor wheel was made of polyurethane and the hospital flooring was laminated flooring. Therefore, the closest thread material and floor material that fit the product scenario was polyurethane (castor wheels) and steel (laminate flooring in hospital) respectively. The coefficient of rolling friction was taken as 0.057 (worst case scenario)[11]. The frictional force was calculated to be 11 N and using a safety factor of 2.5 and for ease of simulation, a force of 30 N was used.

Boundary Conditions: The 30 N force was set on flatbar with 15N (A-B) on each side (Figure 8).. There were total of 3 fixed supports defined (C-E). The material used was stainless steel, austenitic, nitronic 60, annealed. The mesh method used was Automatic. Tetrahedrons, Hex Dominant and Wedge. The setting was fine for Relevance Center and Span Angle Center. Mesh Size was 1.0 mm. The total number of elements were 589,206 and the element quality was deemed sufficiently good as the majority of the elements were above 0.5 element metrics.
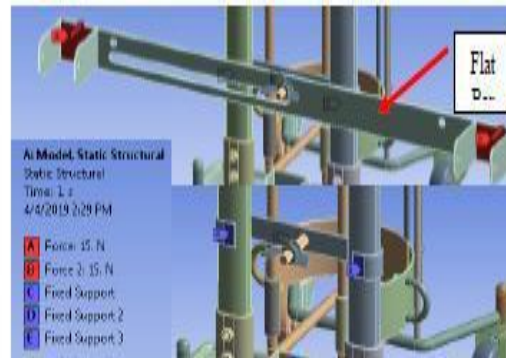
Figure 8: Boundary Conditions

*Simulation Result:*Using the 556 mm x 40 mm flatbar with 3 mm thickness, static structural analysis was performed to determine the total deformation and stress. The stress was then compared with the material yield strength to ensure no permanent deformation. The deformations were 3.85 mm and 2.57 mm on the left and right end of the flat bar respectively. There was a difference in deformation as one side had less material due to a slot cut-out as shown in Figure 9. The maximum stress of 103.38 MPa was at the back of the flat bar Figure 10. The yield strength of the material (stainless steel, annealed) was 345 MPa. Therefore, the minimum safety factor was 3.33.
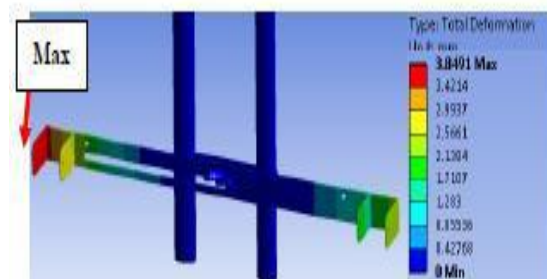
Figure 9: Deformation
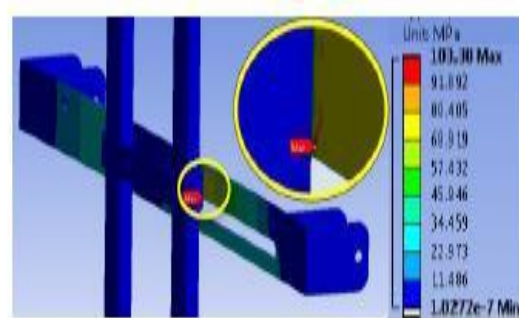
Figure 10: Von-Mises Stress

Prototype: Before the fabrication of the physicalprototype, the assembly simulation must be done virtually through CAD to give the engineers an idea of how the overall assembly would look like and ensure no dimensioning errors or obstructing problems. Figure 11 shows the CAD display showing before and after assembly of prototype to walking frame. The physical prototype was finally fabricated and Figure 12 shows before and after assembly of the physical prototype to walking frame.

Figure 11: Before Attachment (Left) and After Assembly (Right)
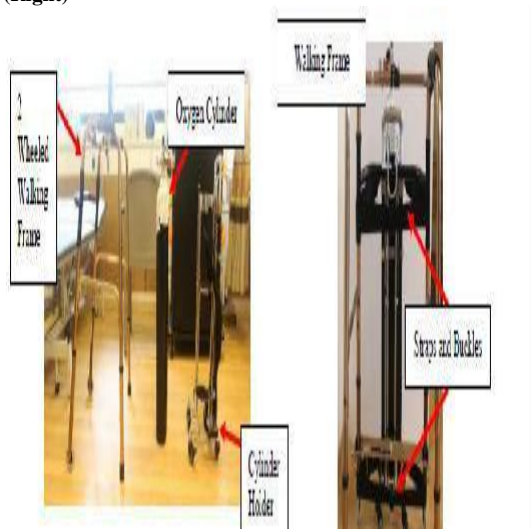
Figure 12: Walking Frame, Oxygen Cylinder and Cylinder Holder Before and After Assembly

Prototyping Testing: The prototype, attached tothe two-wheeled walking frame, was tested by the staff and deemed suitable for their targeted patients (Figure 13). As the cylinder holder is rested on the ground, the additional effort to push the walking frame is minimum (< 30N). The design concept was proven that it could reduce the manpower by 50%.

Figure 13: Test on the Cylinder Holder

IV. CONCLUSION

The objectives to design, fabricate and conduct testing of a new portable oxygen cylinder holder for physiotherapy were met with the PDS fully achieved as well. The redesigned prototype had a minimum safety factor of 2 for the maximum expected load and scenarios. The prototype solved the main problems of low handle height, complex locking mechanism, problematic mounting and dismounting of cylinder, obstruction to user, and poor usage of scarce manpower resources.

V. ACKNOWLEDGEMENT

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Review on Associated Technologies in Big Data Environment

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Abstract- **Worldwide business, agents, government are producing and devouring tremendous measure of information much of the time. So in the realm of advanced processing, it's gotten extremely testing to manage this assortment and speed of the information. To beat these difficulties, Big Data is assuming a significant job by giving, catching, overseeing and examining these huge informational collections. Programming and innovations of enormous information encourages the expansion in authoritative development. To think about complete huge information, concentrated has made on the developing advances for example distributed computing, Internet of Things (IoT) and Hadoop that are firmly identified with the huge information. For each related innovation, a portrayal and key highlights have been featured. At last the creators inspected the relationship and advantages among huge information and its partner advances.**

Keywords-Big Data, Cloud Computing, Hadoop framework. Internet of Things (IOT)

I. INTRODUCTION

Enormous information alludes to high volume of heterogeneous datasets which can't be effectively overseen by the customary database the board apparatuses. The development of huge information essentially expanded the administrative, strategic and operational abilities of an association as far as information preparing, data recovery, protection and security, and above all basic leadership. This all is conceivable through cutting edge huge information devices and strategies. The ceaseless appropriation of Big Data Systems (BDS) are quickly giving different points of interest, for example, (a) putting away tremendous measure of information (as far as Petabyte (1015), Exabyte (1018), and Zettabyte (1021), (b) structure (content based information) and unstructured information (pictures, sound, video and so on.), (c) information can be spared over a significant stretch of time, (d) causes chiefs to look for unanticipated information expectations all through the datasets to improve judgment to develop in the commercial center [1]. The huge information has the capacity to hold huge measure of semi-organized and unstructured information in the databases. Information could be of any sort, for example, web information (for example website pages); Internet of Things (IoT) based information, endeavor information, (for example, stock information, money related information, and deals information), and so forth.

Huge information utilizes fast correspondence system, for example, symmetrical recurrence division multiplexing (OFDM), server farms (DC) which are bunches of changing number of servers, information pre-preparing strategies, for example, repetition disposal, information cleaning and so forth., [2]. Notwithstanding this huge information likewise utilize different business factual procedures, for example, anticipating examination, AI, mining of information and different measurable techniques, for example, R programming model, Microsoft Excel, Pentaho/weka to see unanticipated future forecast from tremendous measure of databases which at that point help the leaders to actualize advantageous methodology to advance their business [3][4][5].

II. CLOUD COMPUTING

The cloud computing has change the entire facet of the information technology (IT) which helps the leading organizations whether it is large scale or medium scale [6][7][8]. Traditional information processing systems are now adapting the growing and emerging technologies of the cloud computing. The cloud computing is the next generation of distributed computing. With the help of cloud computing the resources can used at any location. With the help of cloud computing, client can acquire any kind of needed services with a subscription amount. Such service may be

hardware, software, etc. Cloud computing has the capability to deliver the resources/ services either local cloud users or to users of geographical distributed locations.

A. Cloud Service Model

Distributed computing give offers different significant administrations to its proposed clients, it could be programming or equipment or anything These administrations are given by methods for virtualization. Cloud specialist co-op can offer huge and changing number of information stockpiling gadgets and computational assets. The service layer architecture of cloud computing paradigm is Depicted.
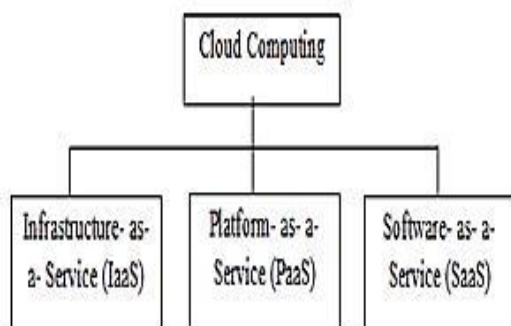
Figure:1 types

Fundamentally cloud gives three processing administration model. These are IaaS, PaaS and SaaS.IaaS represents Infrastructure-as-a-Service, PaaS for Platform-as-a-Service and SaaS is term which represents Software-as-a-Service.IaaS offers different administrations, for example, stockpiling gadgets, processors and other computational gadgets. These administrations can be given by methods for virtualization. In PaaS, the client makes the product utilizing different programming and different utilities gave by the administration provider.A customer client can likewise effectively deal with the product arrangements and other design setting [8]. In SaaS, the product's are given to the clients as indicated by his needs. It is otherwise called "on request administration model".

Important highlights of distributed computing

- Services, for example, email, applications, system or servers can be offered to cloud customers with negligible membership charges. Significant cloud specialist co-ops are Amazon EC2 and Microsoft.[9]

- Network access to sundry territories: Cloud registering has the ability to convey its administrations to any area of any locale. It very well may be a sundry territory or savvy city through the cell phones, PCs and PDAs [10][11].

- Resource Sharing: Virtualization highlights of distributed computing empowers the sharing of capacity gadgets and calculation assets. [12].

- Elasticity: The offices offered by the cloud specialist organization will be scaled to a huge appropriated area relying on the method of subscription.[13].

A. Cloud computing with big data

The development of big data hurries the progress of cloud computing environment. Cloud computing provides various benefits to big data. Table 1, shows the advantages of cloud computing with big data platform are:

TABLE 1Benefits of cloud computing to big data

Ref. No.	Benefits of cloud computing to big data
[13]	Cloud computing provides large- scale physical resources such as storage and computing resources to big data platform to process vast amount of data.
[14]	Cloud computing platform have inbuilt resource scheduling and work- load management capabilities which then helps the big data systems to manage large data sets.
[14]	Reduce infrastructure installation cost And administration cost.
[15]	Business Intelligence-as- s- service (BIaaS) layer of cloud computing delivers various business analytic software such as R programming tool, weka For clustering and classification of large datasets which helps decision makers to make profitable decisions.
[16]	Remote Data Auditing (RDA) techniques of cloud computing efficiently protect the users' private information stored in the data sets.
[17]	Provides Reliable Computational frameworks such as Hbase, Sailfish i.e. similar to the Hadoop map- reduce programming model, helps to save vast variety of unstructured and semi- structured datasets.

Cloud computing not only provides computational and processing for big data, but also is a service mode. The improvements of cloud computing also support the progress of big data, both of which supplement each other.

III. INTERNET OF THINGS

The idea of IoT depends on the utilization of various heterogeneous virtual machines, which are associated with the Internet. This stage comprises of previously existing and rising Internet improvements. The fundamental thought of the IoT is to interface the various gadgets, for example, sensors, BCR (Bar Code Reader) and cell phones, to acknowledge data trade and cooperatively complete the given errand proficiently. For instance: sensors can be utilized to procure and create climate gauging report, sensors installed inside a cell phone can speak with Global Positioning System (GPS) to recognize the area [17]. Sensors with Radio wave recurrence empowered gadgets can be utilized for submerged correspondence to recognize suffocated objects .Following are the significant Key parts of IoT. *Key Components of IoT are:*

• Sensor based innovation: Vast measure of data for example dampness, pressure, climate determining report can be move to some other area.
• IoT passages: It is utilized to interface the inside system of sensors with the outside web. The gathered information is then transmitted to the www or web framework.
• Cloud/Server framework &big information: The information transmitted through the entryway is put away and prepared safely inside the cloud foundation utilizing huge information expository motor. End-client portable applications: These versatile applications will help end clients to control and screen their gadgets from remote areas [19].Consider the Fig. 3 to illustrate the working of IoT technology.
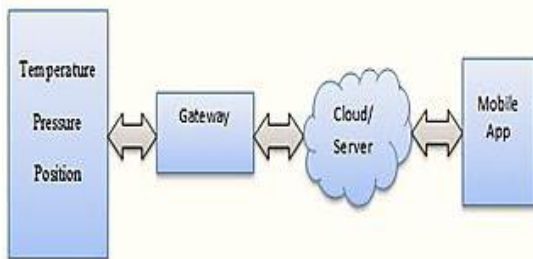
Fig2. Key components of Cloud computing technology

A. Benefits of IoT
• With the assistance of sensors and remote innovation, medicinal services gear's can without much of a stretch exchange the patient information to the approved specialist or attendant who have authorization to get to the versatile application.Information, for example, vitality utilization inside various branches of an association can be accumulated utilizing IoT based innovation.IoT innovation empowers the advancement of brilliant urban communities and urban arranging utilizing huge information examination[20].
• IoT is broadly embracing in the field of agribusiness which causes the ranchers to see the ripeness level of soil, dampness, temperature, pressure and so forth.

B. Relationship of IoT with Big data.

Table:2 Benefits of IoT with big data

Ref. No	Benefits of IoT with Big data
[17]	IoT devices generates enormous amounts of data and transmits it to the business intelligence and business analytics tools for humans to make beneficial decisions such as to increase customer satisfaction, market trends etc.
[18][19]	IoT plays a vital role in organizations where employees can get their tasks on IoT enable devices.
[20][21]	Using big data analytics with IoT technology paradigm, consumer can manage their basic needs such as water usage and water sustainability.
[21]	IoT technology paradigm can make a use of Hadoop framework to increase its security, scalability of IoT datasets.
[22]	Big data and Hadoop framework can be used for outlier detection and duplicate content elimination in IoT datasets.

IoT creates huge measure of picture based information. appropriation of huge information stage and its administrations not just the give the office of putting away the huge measure of IoT datasets yet in addition gives different administrations, for example, protection and security, high preparing and versatility abilities to IoT datasets.

IV. HADOOP

In this computerized universe of processing every single field is creating immense measure of information possibly it will be as content or sound and video based substance. Preparing and breaking down such sort of this enormous amount of datasets and to mine significant data is a difficult assignment. This will require a huge scale information escalated applications and capacity groups alongside prerequisites, for example, adaptation to internal failure, versatility, parallel handling, load adjusting and high accessibility.

Hadoop is the best answer for the above said prerequisites [23].Hadoop is open source execution of guide diminish handling model. Hadoop is a lot of programming structure alongside progressing tasks, for example, Pig, Hive and Hadoop Distributed File System (HDFS) and Map-Reduce preparing model are two significant parts. Hadoop runs on low product equipment gadgets, for example, Linux working framework based inserted gadgets.

HDFS is an exceptionally open and flaw tolerant in nature and can store record which is huge in size over numerous hubs in a bunch. sGuide decrease is like the Google File System (GFS) [25] which can be utilized to oversee and process land parallel-dispersed datasets. Hadoop HDFS can spare organized, semi-organized and unstructured datasets though Map-Reduce can perform calculations over these datasets.

a) Benefits of Hadoop

- Scalability: Hadoop structure allows the improvement and shrinkage of equipment framework without changing the organization of information.
- Flexibility: it might oversee various types of datasets from different information sources [26].
- Fault-resistance: Hadoop has inbuilt adaptation to internal failure usefulness. Errand of one hub can be effectively reproduce to differenthubs by the HDFS.

Table:3

Sr.No.	Benefits of Hadoop with big data.
1	Hadoop framework can be used to manage and analyze the big data social networking applications such as Facebook, twitter, etc. [26]
2	Hadoop ongoing project named as Hbase not only save the unstructured data but also enables the storage of structured datasets.
3	With the help of Pig, one of Hadoop Project, enables the programmers to write Map- reduce based programs for storing big data.
4	Hadoop framework with various business analytic tools such as R programming model, weka, etc. can be used to classify the relevant and irrelevant data from big data sets. [27]
5	Map- Reduce programming model of Hadoop enables the programmers to scale the data mining algorithms on large data sets.[28]

The following table shows the tremendous advantages of Hadoop with big data.

Hadoop is acts as business analytic for big data platform. It has the ability to deal with any kind of failure while processing with big data sets.

V. CHALLENGES OF BIG DATA

The following shows the challenges that are arising in big data environment.

TABLE :4 Challenges of big data platform
.

Sr. No.	Challenges in Big Data
1	Security issues are the major concern in big data. One of the important security issues on the input part of the big data is to make sure that the sensors, log files, web crawlers etc. will not be compromised by attacks.
2	Security problem on the communication between the big data and other external system is also major concern.
3	Dealing with security issues on the analysis part of big data is also a challenging task.
4	To identify the Advanced Persistent (APTs) security issues through the disparate systems is a crucial task.
5	Leakage of private information by the data analytics techniques to other people after the big data analysis process is a challenging task.
6	Different convergence speeds of the same data mining algorithms leading to the problem of synchronization.
7	How to mitigate the impact of noise, outliers, incomplete and inconsistent data in big data storage is becoming an open issue.
8	Manually cleaning data in big data is considered as the main challenge in the arena of big data due to the increasing volume, velocity and variety of data.
9	Challenge is to develop a filtering mechanism to keep the useful information in big data.
10	Deciding the location where to store the big data is another challenging task.
11	To find the root cause failure of distributed compute nodes, databases middleware is an extremely laborious process.

VI. CONCLUSION

Quick improvement in enormous data improves the status of distributed computing, IoT and Hadoop framework. Cloud processing gives different advantages, for example, stockpiling gadgets which will spare immense measure of huge information with least cost. Issues, for example, (1)Migrating enormous information applications to distributed computing stage is a

difficult assignment since client's private data will be uncovered and leasing the cloud framework is very costly.(2) Failure of virtual hub will hinder the exhibition of huge information application in cloud condition. In [29], creators proposed an Ant Colony Optimization system to give most limited way during correspondence connect disappointment. Such sort of procedures will be actualized in enormous information condition to expand the accessibility of the assets. Replication of assignment will be better alternative for huge information so expands accessibility of assets [30].There is a stringent necessity of protection and security component which lessens the opportunity of data spillage while movement of enormous information to the cloud. Web of-things (IoT) innovation worldview don't have information preprocessing devices to kill excess from IoT datasets. IoT innovation should utilize information preparing devices of huge information for information purging and copy content end. Then again, Hadoop system likewise stood up to with numerous disappointments, for example, (I) Hadoop structure isn't well alright with cloud foundation on the grounds that Hadoop requires homogeneous product equipment though cloud gives heterogeneous kinds of registering assets.

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Diabetes Diagnosis Using Data Mining Techniques: A Review

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ABSTRACT: Diabetes is defined as a disorder of insulin and leptin which evolves over a long duration of time. In this paper, different types of diabetes along with their symptoms and causes have been studied. Different data mining techniques used to early diagnose various types of diabetes have been discussed in this paper because early prediction will help in appropriate treatment of diabetic patient. Hybrid techniques have shown promising results in the prediction of diabetes.

KEYWORDS: diabetes, types of diabetes, symptoms, data mining techniques

I. INTRODUCTION

Literal meaning of diabetes mellitus is "siphoning off sweet water", illustrates a pair of metabolic diseases that occurs either because of inadequate production of insulin, or improper response of body cells, or both. The amount of glucose in the blood is controlled by hormone known as Insulin. Diabetes results in high blood sugar, which can harm organs, blood vessels and nerves. The insulin is required by body to use sugar as an energy source. Due to scarcity of insulin, inappropriate sugar level develops in your blood which can prompt numerous medical issues [1].

II. CLASSIFICATION OF DIABETES

A. Type 1 Diabetes

- Consistent craving
- Weight reduction
- Obscured vision
- Exhaustion
- Genital itchiness

B. Causes of Type 1 Diabetes

In this diabetes, the cells present in the pancreas are responsible for creating insulin if the immunity system erroneously targets and kills beta cells. The symptoms of diabetes become more prominent when the body looses its control on its blood glucose levels as maximum insulin producing cells are killed off in the pancreas [4].

- Consistent craving
- Weight reduction
- Obscured vision
- Exhaustion
- Genital itchines

C. Signs of Type 1 Diabetes [3]

It can metabolic disturbance which causes hyperglycemia because of ineffectiveness of body in utilizing the produced insulin. The body to create sufficient insulin. It is characterized by the body being incapable in metabolizing sugar level which could lead to enlarged levels of blood glucose which may harm different organs. Since Type 2 diabetes occurs mainly in people over 40 so it is also known as non-insulin-dependent or adult-onset diabetes However, it is presently getting to be more common in youthful grownups, youngste accounts positive diabetes cases for approximately .90%

D. Signs of Type 2 Diabetes [6]

- Increased thirst and continual urination
- Increased appetite
- Weight reduction
- Fatigue
- Obscured vision
- Darkened skin areas
- Slow-healing bruises or recurrent infections

E. Causes of Type 2 diabetes

- Body becomes resistant to insulin due to ineffective use of insulin which causes sugar levels of blood to raise (hyperglycemia). In progressed stages.
- By losing weight, scheduling a proper healthy feed, doing enormous work out, checking of blood glucose levels, this disease can be controlled.
- Obese individuals have an increased risk of this type of than those with a normal body weight [7].

F. Gestational diabetes

Gestational diabetes is due to insulin blocking hormones produced during pregnancy. This type of diabetes only occurs during pregnancy. Some women have very high levels of glucose in their blood, and their bodies are unable to produce enough insulin to transport all of the glucose into their cells, resulting in progressively rising levels of glucose. The majority of gestational diabetes patients can control their diabetes with exercise and

diet. Between 10% to 20% of them will need to take some kind of blood-glucose-controlling medications. Undiagnosed or uncontrolled gestational diabetes can raise the risk of complications during childbirth. It develops in 2% to 10% of all pregnancies but usually disappears when a pregnancy is over. Gestational diabetes occurs more frequently in African Americans, Hispanic/Latino Americans, American Indians, and people with a family history of diabetes than in other groups. Women who have had gestational diabetes are at increased risk for later developing Type 2 diabetes. In some studies, nearly 40 percent of women with a history of gestational diabetes developed diabetes in the future.

G. Signs of Gestational Diabetes

- Unclear vision
- Deadness in the hands and/or feet
- Uncontrolled thirst
- Continual urination
- Sores that recuperate slowly
- Excessive exhaustion

H. Causes of Gestational diabetes

The placenta produces hormones that can increase level of glucose within the blood during pregnancy. Ordinarily, the pancreas can produce sufficient insulin to maintain that. Otherwise, the blood sugar level will increase and can cause gestational diabetes.

I. Diagnosis of Diabetes

Diabetes, specialist may utilize blood or urine. Specialists oug ht to diagnose which sort of diabetes a person has because this may influence how that person should be treated [8]. If the type of diabetes is vague, specialist may choose to perform one or more of the following tests:
- Ketone test
- GAD autoantibodies test
- C-pepide test
- Blood glucose testing
- Fasting blood sugar test

III. RELATED WORK

N. Sneha and Tarun Gangil in **2019** were aimed to discover the optimal classifier to provide the closest outcomes for comparison with the clinical results. The main objective of this proposed strategy was focused on choosing the features which cause difficulty in early diagnosis of diabetes mellitus using predictive examination. The results clearly shown that the DT algorithm and RF had the best value of specificity of around 98.2% and 98%. The accuracy of NB method was 82.3%. The research also emphasized on generalization of choosing best features from dataset to increase the classification accuracy of proposed models [1]

Mrs. P. Laura Juliet, T. Bhavadharani et al. in **2019** described a proposed novel method based on different data mining techniques to anticipating Type 2 diabetes mellitus. The major issues to enhance the accuracy of prediction results and adaptability of the mode were attempted to resolve. PIDD from UCI Machine Learning Repository was used to get an experimental result, and clustering algorithm (K-means) was used on the database in the pre-processing. Also, for choosing feature CFS (correlation-based feature selection) Subset Evaluation method was employed. The purpose the

work was to choose the correlated features. The work showed that to reduce information K-means method was utilized. In conclusion, this model showed better results in comparison to other models and ensured that the database quality was sufficient[5].

Prema N S et al. in **2019** analyzed the work basedon specific attributes, different machine learning algorithms were used for diagnosing diabetes. The algorithms performances were compared in terms of accuracy, voting based ensemble techniques was applied for the normalized PIMA diabetes data for which a highest accuracy was achieved[3]. The majority voting classifier applied for various methods such as K-NN, logistic regression, DT, random forest, NB, linear SVM, RBF SVM, Gaussian Proc, AdaBoost, QDA. The prediction made by all these classifiers on a test case is voted and the prediction with the highest votes is considered as a final prediction. In conclusion, comparison with different classification algorithms, the highest accuracy of 80% and 81% is achieved for information set by utilizing 10-fold cross approval and by spitting data into 30% testing and 70% training [9].

Deeraj Shetty et al. in **2018** investigated PredictionSystem for Intelligent Diabetes Disease which gave investigation about diabetes by utilizing database of patient's suffering from diabetes. The NB and KNN (K-Nearest Neighbor) were used in this system on diabetes patient's database [10].

Arka Haldar et al. in **2018** compared variousalgorithms by using Waikato Environment for Knowledge Analysis (WEKA) and analyzed which algorithm was most appropriate for client working on hematological information of diabetic patients. Based on the data, the best algorithm was NB having an accuracy of 76.3021% and the overall time taken to construct the model was 0.06seconds. It had the least average error of 29.71% in comparison to others [4].

Quan Zou et al. in 2018 to predict diabetes mellitusDT, random forest and k-NN were used. The hospital physical examination data used as dataset which consisted of 14 attributes in Luzhou, China. In the work, different models were evaluated by utilizing 5-fold cross validation. Also some methods were chosen that had way better execution to conduct individual test experiments in arrange to confirm the widespread appropriateness o f the strategies. The data was randomly collected of about 68994 health.

conscious people and patients suffering from diabetes, considered as training database. Due to imbalance of infrmation, data was extricated 5 times and the output was the mean of all the five experiments. In this work, to decrease the dimensionality, minimum redundancy maximum relevance and principal component analysis were used. The outcomes revealed that the diagnosis done by using RF algorithms reached the maximum accuracy of 80.84% by using all the attributes [11].

Deepti Sisodiaa, Dilip Singh Sisodia in 2018,

A designed of a system that can estimate the probability of diabetes in patients with most noteworthy exactness. In this work, three most common machine learning classification programs named as DT, support vector machine and NB were used to diagnose diabetes at an early age. Tests were executed on PIDD which was inputted machine learning repository from UCI. The different features like precision, exactness, and F-Measure were utilized to evaluate the execution of all the three calculations. Results obtained shown that NB outperformed with the greatest accuracy of 76.30% as compared to another algorithms. These outputs were confirmed employing Receiver Operating Characteristic (ROC) curves in an appropriate and precise way [12]

J. Steffi et al., in 2018, explored the earlyexpectation of diabetes using data mining methods. The training information set had used 768 occasions from PIDD to find out the accuracy in prediction of the data mining techniques. Also, naïve bayes, logistic regression, ANN, C5.0 DT and SVM predictive models developed utilizing nine input factors and one output factexactness of the proposed models in forecast.

T.Nithyapriya, S.Dhinakaran et al.,2017
A explored the early prediction of diabetes using naïve bayes, SVM and J48 classification techniques. The real time diabetic based dataset was taken with 203 occasions for preparing the data set (training) and 52 instances for data set (testing) in determining .
V. Mareeswari et al. in 2017, emphasized on thediagnosis of diabetes using K-NN. The dataset of diabetes was considered as the training dataset and testing data was taken from the details of the patient. Firstly, the training data was classified by using KNN classifier and then, prediction of target information was being done. The KNN algorithm was considered

as more proficient for both classification and expectation. Also, the results were examined by taking distinctive values for the parameter k [15].

P. Suresh Kumar and V. Umatejaswi et al., in **2017**, diagnosed diabetes by using650 patient'sdatawith which the severity of the diabetes analyzed and identified. Simple k-means calculation was utilized by clustering the database into three clusters i.e., for gestational diabetes:

cluster-zero, for type-1 diabetes (juvenile diabetes): cluster-one and for type-2 diabetes:

cluster-two. The input to the classification model such as NB, random tree, C4.5 and simple logistics was the clustered dataset. Further, execution investigation of distinctive algorithms had been done on this data to analyze diabetes [2].

Tahani Daghistani, Riyad Alshammar in 2016

A presented a diabetes prediction system to diagnosis diabetes. Moreover, this paper explored the approaches to improve the accuracy in diabetes prediction using medical data with various machine learning algorithms and methods[12].The test methods such as 10-fold cross validation (FCV), use percentage split with 66% (PS), and use training dataset (UTD) as the test dataset were used. In this paper, the supervised machine learning algorithms namely probabilistic-based NB, function-based multilayer perceptron (MLP), DT based random forests (RF) were used to build the machine learning model to carry out the diagnosis of diabetes. The pre-processing technique produced better accuracy for random forest: accuracy with pre-processing method (WPP) of 84.77% and accuracy without pre-processing method (WOPP) of 84.93% [16].

IV. CONCLUSION

This review was conducted on recent literature on the applications of the techniques related to data mining used for the diabetes diagnosis. The prevention of diabetes, controlling techniques and awareness about this disease is imperative as it leads to other health issues. There has been a lot of research made in this domain i.e. prediction of diabetes using data mining technique. Each researcher has made an attempt to work with different data sets, various types of diabetes along with different kind of conditions among patients. The intention is quite clear; if the diabetes is diagnosed at early stage a patient can be saved from critical complications in future.

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Internet of Things: A Review of Enabling Technologies and Its Applications in Healthcare Sector

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Abstract- **Internet of Things (IoT) is another worldview which gives a lot of new administrations for thefollowing rush of mechanical developments. IoT applications are almost boundless while empowering consistent combination of the digital world with the physical world. Broad research has been committed to the investigation of different advances, for example, data innovations (IT) in supplementing and reinforcing existing medicinal services administrations. Specifically, the Internet of Things (IoT) has been broadly applied to interconnect accessible therapeutic assets and give dependable, successful and savvy human services administration to the older and patients with an incessant disease. In this paper, creators have made checked on IoT advances in social insurance industry. Different applications alongside the difficulties have been talked about. Difficulties are refined through exact examination and it will support the academicians, scientists and researchers to take a shot at this field.**

Keywords: *Internet of Things, Big Data, Medical Health Record Systems, Cloud Computing.*

I. INTRODUCTION

The developing pace of the maturing populace has realized numerous difficulties in medicinal services administration. For instance, the administration of after stroke restoration for the older is a developing test, which requires a long- lasting duty of therapeutic and Human resource[1]. Restorative recovery is a moderately new subject, which was presented in the twentieth century, and has been treated as another part of treatment targeting easing or relieving physical or mental dysfunctions by curing or re-building inabilities. It has been perceived as a powerful means in improving physical elements of numerous sorts of patients. Nonetheless, the advancement of therapeutic recovery to a more extensive extent of uses faces a ouple of impediments. Initially, most of recovery treatment needs long haul and serious treatment. Also, extra assistive offices are required to give patients with simple access to restoration administration. Thirdly, the accessibility of restoration assets is getting moderately scarcer because of the quicker expanding pool of the maturing populace in current society. One promising strategy to ease the previously mentioned issues is to embrace the Internet of Things (IoT) advances and intelligentize the therapeuticassistance frameworks. Lately, applying Internet-based advancements for recovery administrations has gotten well known in the wake

of presenting some new ideas, for example, Smarter Planet and Smart City [2]. The idea of "More intelligent Planet" was proposed by the International Business Machines Corp. (IBM) in 2008. It was at first acquainted with managing the necessities of constant detecting, compelling data trade, the decrease of vitality utilization, and the expansion of profitability and productivity of the organization[3]. Following the possibility of 'More brilliant Planet', a comparable idea of 'Keen City' was presented and has pulled in significant consideration. For instance, numerous urban areas in China have respected structure an IoT-based more intelligent city as their long haul key plans [4]. IoT permits an unavoidable availability, i.e., open offices and assets in urban areas are flawlessly organized. Along these lines, inescapable communications exist among things, people, or both. In IoT, radio recurrence distinguishing proof labels (RFID), sensors, and individual computerized collaborators (PDAs) are made omnipresent so as to secure continuous information and bolster basic leadership exercise.Different IoT empowered advances in the field of medical healthcare have been highlighted in table1.

Table:1 survey

Ref	Technology Adopted	Advantages	Limitations	Challenges
[1]	Hadoop Distributed File System (HDFS) and Map Reduce(MR).	This approach used by the authors can help the Government to repair the existing Medical health care system using the HDFS and MR.	• Presently, few hospitals are maintaining the Electronic Medical Records (EMR) only because of the Privacy problems and cost of EMR's System Setup.	• There is a stringent requirement to develop anE- medical Health System with High privacy requirements.
[2]	Cloud Computing, IoT enabled Devices and Wearable Medical Devices.	With the Storage capability of Cloud Computing, huge amount of unstructured data such as MRI scan reports, etc, can be easily stored using Cassandra, type of NoSql.	• There is need to design an adequate programming abstraction that can equip with process for complex medical health data such as (e.g. Images, Streams.)	• Big data analytic framework such as Hadoop, Spark stack, Apache Mahout can be used in order to mine information from sea of big data for real time analysis. • There is a requirement to design such kind of decision support system for Medical Health care System.
[3]	Hadoop Distributed File System (HDFS) and Infrastructure- as- a- Service (IaaS) layer of Cloud Computing.	• Able to Store and Process varying number of Electronic Health Records (EHR) in the hospitals.	Authors just provide the theoretical implementation of the model.	• Issues such as Implementation cost of Hadoop framework, high time consumption rate of Hadoop and privacy issues imposed by Cloud computing is a challenging task.
[4]	Role- based access control (RBAC) and a Hybrid Access Control Model.	• Maintain the privacy of the patient's data from an authorized access.	NA	• There is need to develop model which have less security overhead issues and may prevent from the potential access- control abuses.
[5]	Amazon web service (AWS) integrated with Geographical Information System (GIS) and Fuzzy logic System	• (Begum Mahmuda Welfare Trust Hospital (BMWT)). • . The proposed model effectively achieved high prediction rate for health shock.	• Data privacy and security and reliability are still performance hindering issues.	NA
[6]	Big data analytics and cloud computing.	• Transfer data quickly among healthcare IT systems to obtain unique information about the patients. • Improve the data quality and accuracy of clinical decisions. • Gain insights quickly about challenging healthcare trends in the market.	• Employing the public cloud infrastructure increases privacy concerns.	Privacy by Design modeling approach improves the level of abstractions for designing a healthcare system.
[7]	Hadoop Distributed File System (HDFS)	• Analytical skills of Hadoop framework help to shorten the waiting time of the patients at different queues. • Doctors will provide patients details through a unique number anytime and anywhere.	• Linking the information about patients from its associated college branches under M. Y. Hospital causes the scalability interoperability and privacy issue.	NA.
[8]	Hadoop, Cloud Computing.	• Human genome based data can be migrate to cloud storage for fast processing.	• Getting the data into and from cloud causes delay issues. • The privacy of "anonymised" Electronic Health Records may be extremely difficult to define. • Hospitals can utilize and exploit these anonymized datasets for their economic benefits. •	• Hadoop is totally a command based paradigm, there is need to develop a front- end visualization framework which then help the data analyst, programmers and most importantly users to use it.

[9]	A framework is proposed for ranking the users and users on the basis of their hierarchical positions in the medical health care.	• Syntactically interoperability has low- level technical issues as compared to the sematic interoperability. •	• Lack of privacy while sharing Electronic health records of hospitals among other Electronic Health Record systems (EHRS), other private health care services and Government Sector. • Interoperability issues such as Interpreting Medical Terminologies, platform for profile similarity of different attributes, Existence of semantic difference in attributes cause confidentiality, data integrity issues.	• It is challenging to determine authorized and consolidated access to disparate access control policies Electronic Health Records (EHRs). • Another important factor is the assignment of authorized signatory permitting legitimate access to the required data.
[10]	CancerLinQ(Cancer Learning Intelligent Network for Quality). (A new initiative of the American Society to aggregate data through direct feeds from EHRs and Practises Mgt Systems in Oncology Practises)	• Cloud infrastructure helps to store medical health care data (cancer data) from multiple Institutions	• Most of Electronic Health Record Systems do not readily support real- time analysis of patient data (Unstructured Data sets.)	• Difficult to process and analyze unstructured data into structured data. (Fromradio- genome data into text form.) • Cloud infrastructure introduces additional challenges such as Privacy and security.
[11]	Flatiron Health an Electronic Health Record Systems (New York, NY)	• Focuses on the extraction of clinical data (Key Radiation and medical oncology parameters) from Patient Records to enable research to define optimal care.	• NA	• How we can collect information from many thousands of cancer patients who received Radiology Therapy (RT) and other treatments and outcomes data are often incomplete and located in fragmented and disparate databases. • How we can translate the big data gained from radio- genomics studies into clinically useful information.
[12]	Radiation Oncology Incident Learning System (RO-ILS) sponsored by ASTRO and AAPM	• Helps to obtain safety critical data from Radiology- therapy.	• Unable to handle large amount of datasets. • Unable to collect vast amount of datasets through disparate resources. • Privacy issues.	• There is a requirement to adopt automated approaches such as machine learning and NLP to handle the large amount of data from multiple resources.
[13]	Arian, Varian Medical Systems, Palo Alto, California.	• Provide the ability to extract, transform and process	• Scalability issues. • Less Reliable.	• Presently, most radiation oncology

		information from these databases directly.		organizations are still lacking how to use the data in their systems effectively (e.g. to improve operational efficiency and enhance outcomes)
[14]	Big Data Analytics, Hbase(No-Sql)	• Analyze historical health care data.	• The model is yet to be implemented.	• In India, there is a compelling need of inclusive system that can store the data and also provide insights to the information. • Most of medical institutions are creating their own data pockets because of non-availability of a central storage space.
[15]	Artemis: (University of Ontario' Institute of Technology partnered with IBM.) • Applied Software Algorithm.	• Helps to predict the early disease infections (nosocomial infections) 24 h before symptoms appeared to new born babies in neonatal intensive care unit of a hospital.	• NA	• Disclosure of Personal Health Information is a major task. • Existing policies have to revisit to ensure that PHI data is handled with utmost care. • There is a need to have Data scientist and Data analyst to perform big data analytics. •
[16]	Hadoop, K- means, Mahout, NoSql.	• Effectively collects and process large amount of data sets.	• Follows batch processing approach.	• Electronic Medical Health records based system must employ privacy methods to preserve patient data.
[17]	• Extensible messaging and presence Protocol	• (Purpose: monitoring System for efficient collaboration between care givers and healthcare professionals.) • Target Beneficiary: Healthcare Professionals and Care Givers	• Security issues hinders the performance of the proposed system.	• NA
[18]	• Clustering Technique	• (Purpose: Diagnostic system for analyzing healthcare data using data mining)	• Sensitive attributes related to particular patients was exposed during data mining and migrating to the cloud infrastructure via cloud service provider.	• NA
[19]	• Integrated and interoperable solution technologies.	• Diagnostic System for analyzing patient's EMR to help professionals in study and process improvement.	• Giving authority to Cloud service provider can access the confidential information about the patient.	• NA
[20]	• AI techniques for real time monitoring of patient data.	• Intelligent system to monitor user health data for diagnostic of chronic illness such as	• Privacy issue. • Medical identity theft.	• NA

		diabetes.		
[21]	• Support Vector Machine (SVM) for classifying text or images.	System for diagnosing neurological disease.	• Problem of Over-fitting and privacy issues.	• NA
[22]	• Develop an e- health consultancy system utilizing cloud computing ("On-Cloud Healthcare clinic"), BIRDIM hospital Dhaka.	Enables the doctor and healthcare workers to identify and treat non- communicable disease in rural and remote communities in Bangladesh.	• Computational intensive.	• NA
[23]	• Department of Surgical Gastroenterology and Liver Transplantation at Sir Ganga Ram Hospital (SGRH) has recently adopted an EMR called Raxa EMR (raxa.io)	We can details like clinical features, operation steps, etc. •	• Major issue while using the Raxa EMR is the data Connectivity.	• NA
[24]	• One of the largest networks of hospitals and healthcare clinics in America. • Covers 153 VA hospitals, 773 community based outpatient clinics.	• Authorized access to the patient databases which then help in process of diagnosis etc.	• NA	• There is a lack of advanced algorithms to sift through its Veterans Health Information Systems and Technology Architecture (VistA) EHR systems.
[25]	• Primarily started in Ontario and BC areas.	• Designed by doctors for doctors used by various countries. • The primary objective of the OSCAR system development was to produce a state- of- art web based EMR to support diverse academic and clinical functions.	• NA	• NA
[26]	• Open- source electronic medical record and a practice management application suite that includes patient billing and patient portal.	• Used to track patient care and clinical outcomes in clinics.	• NA	• NA
[27]	• Implemented During 2013 at Jan Swasthya Sahyog (JSS), a healthcare clinic non-governmental organization in rural and underserved community in India.	Open- source Raxa system is health information management system designed to provide decision support to health workers, and improve patient's access to their own personal health information. Functionalities are: (a) Includes voice recognition and speech processing capabilities. (b) System backups to a secure location using cloud	• Problem of data connectivity in rural areas other countries such as India and South Africa.	• NA

		computing. (c) Use of SMS cell phones alerts for medications, surgical appointments as well as two- way communication.		
[28]	• Voice Messages: SMS messages provide advice for healthy pregnancy otherwise community health works use cell phones to record health services provided.	Purposes: • Improve the healthcare of pregnant women and babies in Ghana. • MOTECH has been implemented in several developing countries to improve healthcare delivery: in India and Africa, for child and maternal care, and for TB and HIV.	• Efficient. • Provide remote based medical health service.	• NA
[29]	• Clinical Data management and Analyzing System (CDMAS) which uses XML databse, Hbase/Hadoop Infrastructure.	• Handle big amount of heart disease clinical data analysis Online. • They helped six hospitals to in chine to establish a heart disease clinical documents managing, sharing and analyzing platforms. • (Changai Hospitals and Zhongshan Hospital in Shanghai, Fuwai Hospital, Anzhen Hospital and PLA 301 hospital in Beijing and Peoples hospitals in Guangzhou.)	• NA	• NA
[30]	• Electronic Medical Record Systems. (EMRs)	• NA	• Privacy of electronic records in urban hospital is a critical issue in the Turkish Country. • Quality assurance of health records is also an important issue.	• In Turkish Country, Hospital administration having started to shift their paper- oriented task to Electronic Medical Records. • There is requirement of privacy policies to increase the privacy of recently developed EMR Systems. • There is strict need of predictive analytic techniques for such medical big data.
[31]	• Patient Health Record Systems (PHR), Electronic Medical Record Systems (EMRs) and Electronic Health Record Systems (EHR). (EMR stores Institutional data, the HER shares	• Use of EMR/ EHR can improve therapeutic outcome and medical care as well as Patient Safety. • One of the major advantage of HER in medical pratise is the availability of cross- provider medical information.	• Most of the clinicians who do not adopt the system are concerned with productivity loss and initial financial cost of setting up the systems. [9] • An additional challenge for many providers is to create complete	• Private and secure clouds are now more prevalent. • There is a need of big data analysis methods and tools for improving health care decision making. • Privacy by design

		interoperability in the healthcare sector.[10-11-12] • The main challenge is information security and privacy of patient's data. (Such as abortions, mental problem, sexual behavior, STD, etc.). • Unlimited access to these records can cause social embarrassment. • To the date, health information systems providers have not yet agreed on one common standard.[52]. • Data integration	approach should be followed to solve the problem of interoperability.
[32]	• Electronic Health Record System (EHRs) • Privacy Preserving Data Mining with AdaBoost Algorithm Machine Leaning.	• NA	• NA	• NA

II. CONCLUSION

In entirety, the possibilities for savvy medicinal services are tremendous. For singular clients, keen medicinal services can encourage better wellbeing self-administration. Auspicious and proper medicinal administrations can be gotten to when required, and the substance of therapeutic administrations will be progressively customized. For restorative establishments, shrewd medicinal services can decrease costs, ease work force pressure, accomplish brought together administration of materials and data, and improve the patient's therapeutic experience. For look into organizations, keen human services can decrease the expense of research, diminish inquire about time, and improve the general effectiveness of research. With respect to large scale basic leadership, savvy human services can improve the norm of restorative asset imbalance, push the procedure of therapeutic change, advance the usage of avoidance methodologies, and lessen social medicinal expenses. Be that as it may, there are still a few issues in the advancement procedure. The answer for these issues depends on innovative advancement, yet in addition on the joint endeavors of patients, specialists, wellbeing foundations, and innovation organizations.

III. FUTURE DIRECTIONS

There is need to employ open- source software tools into the open- source EMR systems to produce effective predictive analytic models that will contribute to improving the health of the poorest population and nations. These tools may be:

1. Business intelligence and reporting tools.
2. Data Integration tools (e.g. Weka)
3. Predictive analysis tools (e.g. RapidMiner, and Rattle),
4. "Big Data" Management tools (e.g. Hadoop)

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A Unification of Firefly Algorithm Plus WiMAX Improving Throughput

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Abstract—The newest promising technology which delivers to the customer end data amenities at a high speed is the Worldwide Interoperability for Microwaves Access (WiMAX). By witnessing the basis of the WiMAX physical layer a thought has been excellently attained regarding the system of WiMAX. The foundation refining the Throughput vs. Time variation using the Firefly algorithm has been talked over in this paper using MATLAB (R2013b) simulator. The studies and research of the Research Scholars and scholars are centered on the meadow of WiMAX can use this model as a useful reserve. The reimbursements of using Firefly algorithm in a WiMAX system have been represented in this paper.

Keywords—Orthogonal Frequency Division Multiplexing (OFDM), FA(Firefly Algorithm), Wide Area Ntwork(WAN).

I. INTRODUCTION

The showground of telecommunication has a blowup demand of a superior set of amenities, for instance, immediate messaging, video conferencing, or any other kind of communication provision. New technologies are settled for the attainment of high data rates with the hundreds of persons demanding to get entree at an analogous tower. WiMAX (Worldwide Interoperability for Microwave Access) is an encouraging elucidation or a technology conveying digital Broadband Wireless Access (BWA) with augmented rapidity and distance that marks it underneath the Fourth Generation (4G) of expertise [1].

Expansion of the WiMAX was completed by IEEE (Institute of Electrical and Electronics Engineers), a society that mechanisms for the educational and technical origination in innumerable castigations. IEEE 802.16 was the profitable standardization of the WiMAX family for which a group in June 2001 was molded baptized as WiMAX Forum. A wireless auxiliary to cables, DSL, and fiber providing much-advanced bandwidth over the corresponding reportage areas. Another headway in the clan of wireless communication is the forefront version of WiMAX, commonly known as WiMAX 2+ that can exert in amalgamation with LTE (Long Term Evolution) [2]. It is also from time to time termed as MAN (Metropolitan Area Network) interrelating the operators in a geographical section proposing resourceful interconnection to a Wide Area Network (WAN) [3].

Two groups of WiMAX have been volunteered to discourse the supplication of dissimilar types of access. IEEE802.16-2004 is the first version of WiMAX also designated as Fixed WiMAX intended for fixed applications from its base stations. It is centered upon the two standards specifically ETSI HiperMAN (High-Performance Radio Metropolitan Area Network) in addition to IEEE 802.16 agreeing global deployment. It encompasses the usage of 256 carriers Orthogonal Frequency Division Multiplexing (OFDM) and the profiles aimed at compliance testing. This version has its provision expanding to both line-of-sight and non-line-of-sight provinces providing a bit rate ranging from 32 Mbps to 134 Mbps. The second version or the modification i.e. IEEE 802.16e provisions mobile applications [4, 5]. This standard reinforced a lower bit rate of 15 Mbps while providing access in the non-line-of-sight domain. It enabled full nomadic besides mobile users organized with roaming and handoff [6].

In the existence of noise, WiMAX writhes from stark enactment deprivation. In the literature, plentiful approaches have been offered to correct channel noise either in the time domain otherwise in the frequency domain. In previous papers, numerous computational intelligence techniques have been used that does not deliver a better result, here the

proposed technique is utilized to deliver an improved result in comparisons to already implemented intelligence technique. For such circumstances, the proposed method in this paper i.e. the firefly algorithm is appropriate wherever performance is very authoritative although the computational cost is less indispensable [7-10].

The result is amended by the application of the firefly algorithm in the MATLAB (R2013b) simulator. The numerous iterations will be evaluated and the finest possible result retains the objective of entire operation i.e. improvement of Throughputin CODED-OFDM based WiMAX System by the application of FA [10, 11].

Section II of the paper describes the literature survey and while section III describes problem statement and Section IV provides specifics about the system model. Section V describes the simulation results and Section VI describes the Conclusion.

II. RELATED WORK

In [1] the model construction of the WiMAX physical layer and the enactment valuation for real-time audio data communication in WiMAX using convolution coding has been discussed. The performance of the signal communicated over the AWGN channel is improved in the WiMAX system by the use of convolution coding. In [5] authors emphases on examining significant QoS parameters in the WiMAX system. Results showed that an optimum WiMAX network should have very a small value of delay and packet plummeted, while high values of throughput. In [6] WiMAX know-how, its simple conceptions, uses, and advantages/disadvantages are studied. Operation of the WiMAX system is corroborated under numerous channels in addition to modulation systems. The graph amongst Throughput and Time for performance exploration has been drawn. In [10] discussion is made about various security problems in each version of the WiMAX system. The handling of the security problems and basic evolution of the technology has also been deliberated. The various solutions to tackle such security issues have also been proposed. Basically, a light has been thrown on the security issues and related solutions in the WiMAX system. Under the security's umbrella numerous authentication, access control in addition to encryption technologies fall. After the clearance of all the problems related to security, this broadband technology plays a major role as a future

technology of wireless communication. In [29]Non-linear design problems solution by utilizing the newly developed Firefly Algorithm has been shown in this paper. As compared to solutions obtained in the literature previously, FA performs better for an optimization related standard pressure vessel design optimization. Nonlinear design optimization is successfully optimized using the Firefly Algorithm. Some standard test functions were used to validate the algorithms. Unconstrained stochastic functions were solved using the FA after new test functions are designed utilizing the singularity and stochastic components.

III. PROBLEM STATEMENT

WiMAX network lacks quality service because there are hundreds of people trying to get access at the same tower accompanied by various environmental factors like distraction, diffraction, etc. due to this maintaining high throughput becomes difficult.Hence an efficient technique i.e. Firefly algorithm has been amalgamated with the WiMAX system for the improvement of throughput.

IV. PROPOSED ALGORITHM

The Firefly Algorithm was advanced on the foundation of the idealized behavior of the fireflies and their flashing characteristics.
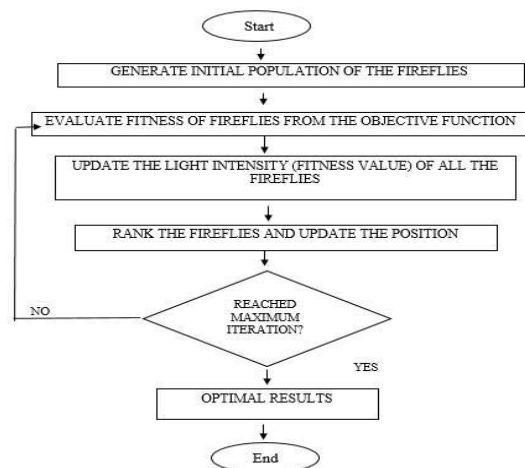
Figure: 1

As per the following three rules, the flashing characteristics are idealized as:

- Regardless of the sex, each firefly is attracted to other fireflies as all fireflies are unisex.
- For any two flashing fireflies, towards the brighter one, the less bright firefly moves since attractiveness and brightness are proportional to each other. Both attractiveness and brightness reduce as their

distance upsurges as the attractiveness is proportional to the brightness. A firefly will randomly move in case of non-existence of a brighter firefly.

The objective function's landscape helps to determine the firefly's brightness or light intensity[11-13].

V. System Model

Following are the steps to be followed in building up the system model in the MATLAB (R2013b) simulator.

Assumption and Configuration

Create the input environment with Length of FFT= 256, length of cyclic prefix= 256/8 =32, modulation size =64, 128, and 256, system bandwidth= 20 MHz, null subcarriers (guard and dc) =368, pilot subcarrier= 560, data subcarriers=1120, subchannels

= 30, subcarrier spacing =10.93 KHz, guard time=11.4 us, symbol time= 91.4 us, OFDM symbol duration=102.8 us, number of OFDM symbols in 5ms frame=48.

Steps followed in model building

Signal generation for Transmission

Generate random data that is further passed through various processes such as interleaving, forward error correction, and modulation. Now, implement the subchannelization and frame generation process. Convert the signal to time samples and add the cyclic prefix to it.

Signal transmission

Now the message signals are transmitted through the AWGN channel.

Improved performance

Convert the signal to frequency samples and remove the cyclic prefix from it. Now the signals are demodulated and decoded. Necessary random data is now obtained. Computational intelligence technique (i.e. firefly algorithm) is used for the improvement of throughput.

Necessary computation and comparison

Measure the value of throughput after the implementation of the Firefly algorithm using the following formula.

Throughput= total data transferred to the receiver per total simulation time

Comparison

Compare the base paper result with proposed results of performance improvement in CODED-OFDM based WiMAX system.

VI. Simulation Results

Various results and comparison of proposed results with existing technique result in terms of throughput in MATLAB (R2013b) simulator have been shown in this section.

A. *Variation of Throughput vs. Time using different modulation techniques*

In table 1 and figure 2, it is observed that from the comparison of different modulation techniques and their performance against Throughput versus Time results show that 256 QAM performs best(hence also termed as new results in next sub-section).
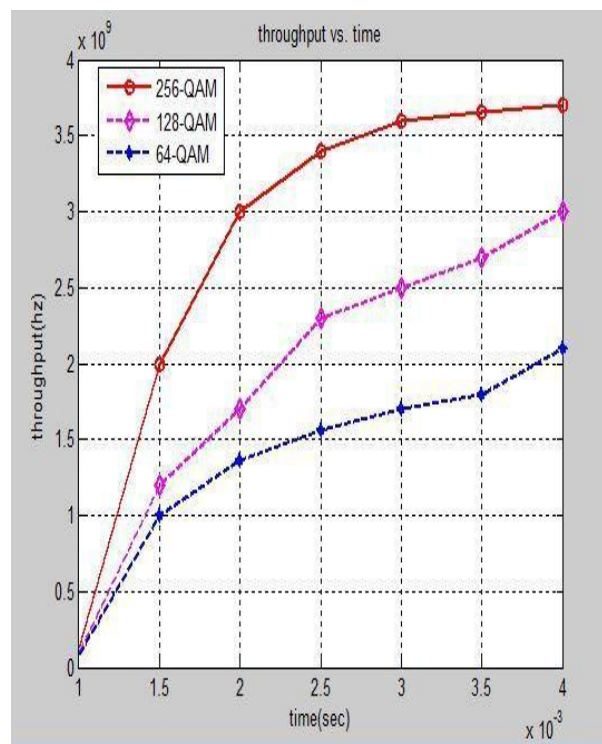
Fig. 2 Variation of Throughput vs. Timefor 64-QAM, 128-QAM, and 256-QAM

B. *Variation of Throughput vs. Time for the previous and new results*

In table 2 and figure 3, it is observed that from the comparison of previous results and new results using Firefly algorithm and their performance against Throughput versus Time results show that WiMAX system performs best with Firefly algorithm

TABLE 2 shows the variation of Throughput for previous and new results

S.NO	PREVIOUS-RESULTS	NEW-RESULTS
1.	$1*10^9$	$1.3*10^9$
2.	$1.2*10^9$	$2*10^9$
3.	$1.4*10^9$	$3*10^9$
4.	$1.6*10^9$	$3.4*10^9$
5.	$1.72*10^9$	$3.6*10^9$
6.	$1.85*10^9$	$3.65*10^9$
7.	$2.1*10^9$	$3.66*10^9$
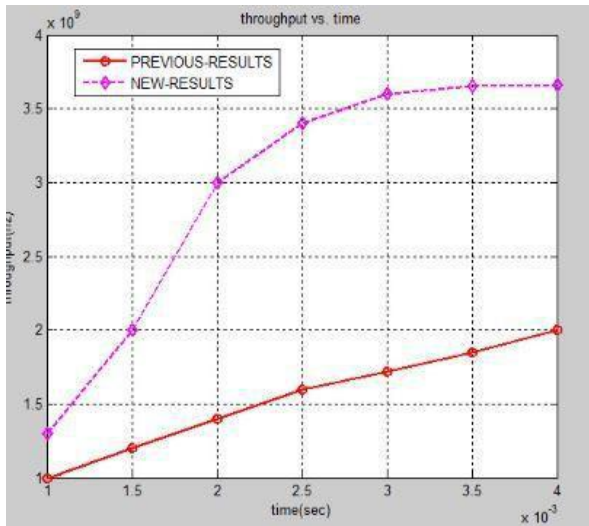
Fig. 3 Variation of Throughputfor previous and new results

TABLE 2 shows the variation of Throughput for previous and new results

S.NO	16-QAM	64-QAM	128-QAM
1.	$0.89*10^9$	$1*10^9$	$1.3*10^9$
2.	$1*10^9$	$1.2*10^9$	$2*10^9$
3.	$1.36*10^9$	$1.7*10^9$	$3*10^9$
4.	$1.56*10^9$	$1.99*10^9$	$3.4*10^9$
5.	$1.76*10^9$	$2.15*10^9$	$3.6*10^9$
6.	$1.8*10^9$	$2.53*10^9$	$3.65*10^9$
7.	$2.1*10^9$	$2.81*10^9$	$3.7*10^9$

VII. CONCLUSION

In the noise presence, WiMAX wriggles from stark enactment deprivation. In the collected works, plentiful approaches have been presented to spot-on channel noise either in the time domain or else in the frequency domain. In previous papers, several computational intelligence techniques have been used that does not make available a better result, here the proposed technique is used to provide better upshot in comparisons to previously implementedintelligence technique. For the circumstances, the proposed system is appropriate wherever performance is very authoritativeeven though the computational cost is less vital.

The result is improved by the application of the firefly algorithm. The numerous iterations are evaluated and the best possible result preserves the objective of the entire operation i.e. improvement of Throughput inWiMAX System by the use of FA.

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A Research Review on Fault Tolerance Techniques in Cloud Computing

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Abstract: - Distributed computing stipulate is expanding because of which it is essential to offer right benefits in the presence of issues moreover. The Resources in distributed computing can be powerfully scaled that too in a financially savvy way. Adaptation to non-critical failure is the strategy of discovering shortcomings and disappointments in a framework. In the event that a shortcoming happens or there is an equipment disappointment or programming disappointment then likewise the framework should work appropriately. Disappointments ought to be controlled in a powerful manner for dependable Cloud Computing. It will likewise ensure accessibility and strength. In this paper, creators talked about the different systems, procedures, approaches identified with the adaptation to internal failure alongside their focal points and constraints. In spite this; authors also highlight the various Service Level Agreements such as fault tolerance (FL), Availability (AL), Reliability (RL), Stability (SL), availability (AL), Load balancing (LB).

Keywords —Service Level Agreements, Load balancing, Unibus, Checkpointing

I. INTRODUCTION

Distributed computing is new strategy which can be utilized for the benefit of figuring model where IT administrations are conveyed by means of web advances. These have included a large number of clients. Distributed storage gives us the gigantic processing foundation as well as the financial matters of scale. Such a pattern requires announcement of the estimation of information stockpiling administrations which includes two worries from both cloud clients and cloud specialist organizations: information unwavering quality and capacity capability. It is a lot more straightforward than web. It is an assistance that enables client to contact applications that really exist at area other than client's own PC or different gadgets on arrange. There are many benefit of this innovation. For instance some other organization has client application.

Distributed computing is a similar old thing as it utilizes approaches, thoughts, and frameworks that have recently been made. In any case, on the contrary side everything is new as distributed computing changes how we make, make, send, scale, update, keep up, and pay for applications and the establishment on which they run. Distributed computing is a capable technique for figuring as it unites the limit, memory, and taking care of. Adjustment to inward disappointment has the property to assess the capacity of the structure to respond easily to hardware and programming dissatisfaction which isn't ordinary. In assortment to achieve power or obscurity in conveyed figuring, disillusionment should be settled and dealt with circumspectly. This paper will give crucial data about Fault flexibility Approaches. The Methods used for blemish the officials in the cloud we moreover study some present weakness the board procedures which suffers lack in cloud condition. By then understand the best model of adjustment to inside disappointment. Adjustment to inside disappointment deals with each and every different approach that gives generosity, openness, and dependability. The noteworthy use of approving adjustment to non-basic disappointment in circulated registering consolidate recovery from different hardware and programming frustrations lessened cost and besides improves execution. Quality is the property of outfitting with exact help in an unwanted condition that can rise because of an amazing system state. Relentlessness is something that ought to be cultivated. It is one of the huge perspectives for cloud providers. It joins reliability similarly as availability. It is related to a bit of the Quality of organization issues passed on by the system.

II. FAULT TOLERANCE TECHNIQUES

Table 1. Fault Tolerant techniques in cloud Environment

Ref. No#	Proposed Fault Tolerant Technique(s)/ Model(s)	Advantages
[1]	**Methodology:** • Adaptive file Replication algorithm PopStore approach is proposed with the help of data access and popularity threshold. • Replication algorithm for replica allocation and replica placement are proposed for cloud data centers. • Yahoo Hadoop audit log as a data access pattern is applied to analyze the performance of the replication algorithm.	**Outcome(s):** • Pop Store save storage cost than the other existing replication algorithms i.e. LALW. • Network Usage is also saved up to 35% more than LALW strategy.
[2]	**Methodologies:** • Centralized replication management based model is developed named CRMS. • Replica placement problem is formulated in as a 0- 1 programming Optimization problem. • From feasible set of solution, heuristic technique is applied to process the adjustment of the replicas step by step. • CRMS batches 4 adjustment steps together to keep the node storage usage in balance and stops the adjustment when satisfactory internal traffic reduction is reached.	**Outcome(s):** • The proposed model reduces the internal traffic. • Maintain the cluster's storage usage in balance.
[3]	**Methodology:** • In depth examination of Hypervisor- based Fault Tolerance (HBFT) is performed which is based on check- pointing mechanism. • Two optimizations, read fault reduction, and write fault prediction, for the memory tracking mechanism is performed. • At last, software superage, which efficiently maps large memory regions between the virtual machines.	**Outcome(s):** • Developed optimization improves the performance of the primary virtual machines.
[4]	**Methodology:** • An Approach to improve MapReduce fault tolerance in the cloud is developed. • Heuristics are proposed to schedule backups, move backups, and select backups upon failure for fast recovery.	**Outcome(s):** • Improve MapReduce fault tolerance performance in the cloud. • Reduce Latency for individual high- priority user jobs.

[5].	**.Methodology:**
	(This paper describes our on- going project, termed Unibus, in the context of facilitating fault- tolerance executions of MPI applications on computing chunks in the cloud. In general Unibus focuses on resource access virtualization and automatic, user transparent resource provisioning that simplify use of heterogeneous resources available to users.)
	Methodology: In this paper, main concepts of the (project) Unibus infrastructure framework:
	   (1) Virtualization of access to various resources. (The capability model, composite operations.)
	   (2) Automatic resource provisioning (soft and successive conditionings, and transformation chains.)
	DMTCP (Distributed Multi-Threaded Checkpointing) is used at the User's level
		.Outcome(s):
		• Support fault tolerance and achieves low overhead.

[6]	**Methodology:** • An architectural blueprint for managing server system dependability in a pro- active fashion is proposed. • The concept of anticipatory virtual machine migration is introduced. Health indicators are used for the migration purpose. • Based on global probabilistic reliability measure, live migrations triggered to move computation to healthy machines even before a failure brings the system down.	**Outcomes(s):** • The pro- active fault tolerance approach has good chances to act as supplement to reactive fault tolerance schemes.
[7]	**Methodology:** • This paper identifies a number of characteristics that affect the ability for a Real Time Applications (RTA) to fulfill specified deadlines in a federated cloud environment. • The authors designed and performed the initial experiments using real- world cloud federation to justify the feasibility of virtual machine configurations.	**Outcome(s):** • Deploying Real Time Applications (RTAs) in federated Cloud environment can potentially increase the deadline violations.
[8]	**Methodology:** • According to the characteristics of virtual infrastructure, mathematical definition of the evaluation metrics of performance, fault- tolerance and scalability. • Centralized, hierarchical and peer- to- peer structures studied and quantitatively analyze their performance, fault- tolerance and scalability.	**Outcome(s):** • Ability to make more informed choices for building virtual infrastructure management systems before undergoing the expensive process of constructing and evaluating multiple prototypes. • Results work will help system architects

	• Based on quantitatively criterion, some useful rules and conclusions are made (drawn) and proved which are directive and with the reference value for the construction of the virtual infrastructure management systems with higher performance, fault tolerance and scalability.	make informed choices for building virtual infrastructure.
[9]	**Methodology:** • A Fault- Tolerant mechanism to support the reconfigurable fault- tolerant mechanisms on application servers. • The authors presented how the sandbox indicates multiple error detection and recovery mechanisms, and how to reconfigure at runtime. • They implement the prototype and perform a set of controlled experiments to exemplify the sandbox's capabilities.	**Outcome(s):** • Helps the application maintainers to improve the availability and reliability of application components at runtime, without modifications on the components. • Perform better for coordinated recovery mechanisms.
[10]	**Methodology:** • The paper addresses the checkpointing cost issue through the reduction of the checkpoint file sizes. • Different solutions to reduce the size of the checkpoints generated at the application level are proposed and implemented in a checkpointing tool (ALC and CPPC tool, obtaining important file size reductions).	**Outcome(s):** • Particularly useful for parallel applications with a large number of parallel process. • The results indicates that merging the checkpoint files before transferring them to the computation nodes could significantly reduce restart times. • Reduce the overhead of the both checkpoint file writing and restart phase. **(Disadvantages):** • Implementation of the live variables analysis does not perform optimal bounds checks for pointer and array variables. • Scalable solutions are required.
[11]	**Methodology:** The authors presented the performance analysis and design challenges of implementing a fault- tolerant parallel exact MOTIF mining algorithm leveraging the services provided by the underlying cloud storage platform. • Firstly, the authors presented the design of the intermediate data structures and data models that are required for the motif mining algorithm on cloud. • Second, the authors present the design and implementation of a fault tolerant parallel motif mining algorithm. • Data caching scheme is also presented.	**Outcome(s):** • Helps the data analytic system to recover from arbitrary node failures in the cloud environment by detecting the node failures and redistributing remaining computational tasks in the real- time. • The proposed algorithm exhibits superior performance over the traditional algorithms.
[12]	**Methodology:** • An application level data flow error recovery approach which combines checkpointing with instruction level fault tolerance is proposed. • For the protected codes in the instruction level, data is copied with two versions. • Identification procedure is applied in order to identify the error. • The proposed checkpointing algorithm is based on program slice.	**Outcome(s):** • Recover soft errors. • System reliability with this approach is higher than the reliability with SWIFTR. **Uncovered Things** • Furthermore, with the improvement of checkpointing technique, performance sacrifice of checkpointing could be optimizing.
[13]	**Methodology:** • This paper provides a foundation for proactive Fault- Tolerance by defining its architecture and classifying implementations. • Feedback- loop control mechanism is used which is made up of health monitoring, reallocation of application allocation in application health.	**Uncovered Things:** • Failure Injection mechanism are not considered.
[14]	**Methodology:** • A fault tolerance model for real time cloud computing is proposed. • A metric model is come into use for the reliability assessment. • Mainly focused on the forward recovery. • The weight values are assigned to each processing node to determine the reliability.	**Outcome(s):** • Probability of failure is very less. • The main advantage of this approach is that the proposed technique does not suffer from the domino effect.

[15]	**Methodology:**
	• In this paper, the authors leverage the two key technologies which is already deployed in the cloud computing infrastructure are:
	  (1) Replicated state machines.
	  (2) Intrusion detection systems.
	• General framework for constructing Byzantine failures detectors based on intrusion detection system.
	• Based on failure detector, a practical byzantine fault- tolerant protocol is built.
		Outcome(s):
		• Achieves safety even if all the Intrusion Detection System (IDS) fails.
		• Robust against a number of important attacks.
		• Equipped IDS aided ByzID protocol is more efficient than other BFT protocols.
		
		Disadvantage:
		• Marginally slower than Paxos.

[16]	**Methodology:** • Monitoring technique based on the Markov's chain model is proposed for the prediction of the resources.	**Outcomes(s):** • Avoid unnecessary state information. • Reduced the communication overhead of the

	• Viterbi algorithm is applied with the basic Markov modelling.	information collection.
[17]	**Methodology:** • This paper investigates the idea of tolerating outages by inter-cloud replication. (Through service replication on multiple, fail independent clouds.). • For inter- cloud replication, they have chosen to the use state machine replication. • A two- stage ordering protocol is proposed. • An outage- tolerant replication easily implemented in the proposed protocol.	**Outcome(s):** • Shorter infrastructure cloud communication delays. • Throughput gains and reduced latencies.
[18]	**Methodology:** • In this paper, a new proposed algorithm i.e. Binary Vote Assignment on cloud quorum (BVACQ) applied to manage the fragmented database replication and transaction management for Malaysian greater Network (MyGRANTS). • The proposed technique combines the replication and fragmentation. • The proposed technique partition the database into the disjoint fragments.	**Outcome(s):** • Preserves the data consistency. • Increase the degree of parallelism.
[19].	**Methodology:** • Proposed an encryption message using DES and to encode the message using Reed Solomon code when compared to with tornado code.	**Outcome(s):** • The performance of storing time is reasonable good in Reed Solomon code when compared with tornado code.
[20]	**Methodology:** • The node reliability and relevant failure degree, data replication strategy based on relevant failure is provided in this paper.	**Outcome(s):** • Improves the utilization of the resources. **Uncovered things:** • Doesn't consider the load balancing between the storage nodes.
[21]	**Methodology:** • Game theory is used to solve the problem of resource allocation. A practical approximated solution with the following two steps is proposed. **(1)** Each participant solves its optimal problem independently and binary integer programming method is proposed to solve the independent optimizations.' **(2)** An evolutionary mechanism is designed, which changes strategies of the initial optimal solutions of different participants with minimizing their efficiency losses. **(3)** By introducing the concepts of SPELR and GELR, three algorithms for strategy evolution of all the participants considering minimizing of their efficiency losses are designed.	**Outcome(s):** • Useful tool analytical tool for shedding light on seeking optimal scheduling for the complex and dynamic problems that can be divided into multiple cooperative subtasks in many cloud- based computing and data- store services.
[22]	**Methodology;** • Security limitations in the single cloud and usefulness of adopting rather multi- clouds strategy is opted in this paper. DepSky architecture, a virtual storage system, is proposed in this paper. • DepSky system consists of two algorithms: (1) DepSky- A(Available Sky) (2) DepSky- CA (Conidential& Available DepSky)	**Outcome(s):** • Better availability and high confidentiality of data.
[23]	**Methodology:** • An efficient algorithm (GVMTPR) based on greedy technique is proposed. • A two- path routing algorithm is proposed.	**Outcome(s):** • Reduce traffic load on the network. • Resilient and provides good load balancing. **Uncovered things:** • Reservation of the backup resources.
[24]	**Methodology:** • A continuously active, time monitored framework to support a wide of grid applications in a standard manner designed to leverage cloud computing is proposed. • A PMU- based state estimation application is characterized.	**Outcome(s):** • Fault- tolerance and securable for data. **Uncovered things:** • Need to develop a large- scale distributed operating system for real- time applications running in commodity clouds.
[25]	**Methodology:** • BlobCR with low overhead technique, i.e. Selective copy- on-write. • Include the support for application- level and process- level checkpointing.	**Outcome(s):** • Reducedowntimetoimprovethe performance.

Table Data II. Intensive Fault tolerance techniques in IaaS model of Cloud computing

Technique	Ref.	Advantage(s)	Disadvantage(s)	Assumptions	SLA Metrics				
					FT	AT	ST	RT	LB
Distributed data replication protocol for file versioning	[26]	Data recovery, no single point of failure, load sharing	Consumes more storage resources, no reconstruction of failed nodes	More access to newer versions, no dynamic addition of nodes	√	√	√	√	√
Cost-effective dynamic replication management scheme	[27]	Improved access latency, system stability	Failed nodes containing stripped pieces of files are not handled	All data nodes in the system are equally secure	√	√	√	√	√
A self-organized, fault-tolerant And scalable replication Scheme for cloud storage	[28]	Cost efficient	Potentially large routing tables, elected Server may become bottleneck	Trustworthiness of the elected server	√	√	√	×	√
Lazy update propagation for data replication	[29]	Improves throughput and reduces response time	Exhausted database connections due to a large number of threads.	Communication network is FIFO	×	√	√	×	×
Cloud storage design based on hybrid Of replication and Data partitioning	[30]	Better user perceived update response and read access latency	Calculation of geographical distances and maintaining routing table entries are costly	Reliable channel, super node can never fail	√	√	√	×	×
Hadoop high availability through metadata replication	[31]	Improved failover time	Services cannot be Replaced.	NA	√	√	√	√	×
DEPSKY: Dependable and secure storage in A cloud-of-clouds	[32]	Improved access latency	No provision of IaaS model, Lack of data protection, cost of implementation is higher than other cloud implementations	NA	√	×	×	×	×
Service replication with MapReduce in clouds	[33]	Flexible, services can be replaced	Complicated to Finish the Map Reduce process, If CMS overloads thenPSRS will degrade the performance of the cloud	NA	√	√	×	×	√
Dolly: Virtualization-driven database provisioning for the cloud	[34]	Reduced latency of starting new database replicas in virtualized public and private clouds	High storage requirements due To large number of replicas, Over time some paused VMs and VM snapshots become obsolete and are not cost effective to be resumed	NA	√	√	√	×	√
Mirror file system for cloud computing	[35]	Better security, Improved network speed and bandwidth, better control of hardware and software resources	NA	NA	√	√	√	√	√

Schism: a workload driven approach to database replication and partitioning	[36]	Minimize number of distributed transactions, balanced partitions, and high performance.			×	√	√	×	√
Cloud data management platforms									
Trident scientific workflow workbench for data management in the cloud	[37]	Smaller code base, Unique to scientific workflow	Workflow timer cannot resume. Custom activity within a workflow cannot be added twice.		√	√	√	×	×
Efficient multi-dimensional index for cloud data management	[38]	Efficient index maintenance, Platform independent improved query efficiency	Update schedules are unknown		√	√	√	√	√
Transactional data management over the Cloud	[39]	Cost-effective	Possible inconsistencies due to data replication occurring only on the subset system of a small number of nodes		×	√	√	√	√
Big-table: A distributed storage system for structured data	[40]	Dynamic control over data layout and format.	Does not support a full relational data model, If Chubby is unavailable then Big-Table is unavailable		√	√	√	√	√
PNUTS: Yahoo!'s hosted data serving platform	[41]	Multiple records retrievals in parallel	No support for complex queries and join operations		√	×	√	×	√
Dryad: distributed data-parallel programs from sequential building blocks	[42]	Fine control over the communication graph and subroutines, Greater flexibility to easily compose basic common operations	Support sequential programs only	Vertices are deterministic	√	√	√	×	√
ElasTraS: an elastic transactional data store in the cloud	[43]	Transactional guarantees in a scalable manner, Light-weight	ElasTraS provides Atomicity, Consistency, Isolation, and Durability (ACID) guarantees for transactions limited to a single partition	Reads and writes to the storage layer are atomic	√	√	√	×	√

III. CONCLUSION

Resistance of flaws makes a significant issue in the extension of conditions of distributed computing. Adaptation to internal failure technique Actuates when a flaw enters the limits i.e. hypothetically these methodologies are actualized for distinguishing the disappointments and make a fitting activity before disappointments are going to happen. Authors have taken care of the requirement for adaptation to non-critical failure with its different techniques for actualizing adaptation to non-critical failure. Different called models for adaptation to non-critical failure are talked about. In the present scene, there are various models that give extraordinary components to improve the framework. Yet at the same time, there is a number of issues which require some worry for each structure. There are a few disadvantages none of them can full fill the every single anticipated part of issues. So maybe there is plausibility to carry over the limitations of all previous techniques and try to make an efficient and appropriate model which can cover maximum fault tolerance aspects.

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Blockchain Technology in IoT, Security and Healthcare- A Systematic Review

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Abstract: Blockchain technology is a matter of concern these days.it is a new technology which is considered as a disruptive core technology. Researchers have realized the necessity of blockchain and implementing in in various areas. However, the research is still in its infancy. it has some lacks reports too. Specifically, this paper describes multiple aspects of blockchain research conducted by researchers worldwide. This study also focuses on the consumption of blockchain and its algorithms. Block chain is an emerging digital technology allowing common financial transactions among distributed untrustworthy parties, without the need of intermediaries such as banks. In this paper the impact of block chain technology in IoT, Security, agriculture and food supply chain, challenges and potential, smart contract applications in areas ranging from financial services, life sciences and health care to energy resources and voting.

Keywords — Blockchain, IoT, Security, Health care, Agriculture, Bitcoin, Smart Cities, ERP.

I. INTRODUCTION

The blockchain is a technology which accumulates and compiles data into a chain of multiple blocks.. The future of distributed ledger technology such as blockchain is dependent on its ability to interact and integrate with other systems. The concepts of bitcoin and blockchain were first proposed in 2008 by someone using the pseudonym Satoshi Nakamoto, who described how cryptology and an open distributed ledger can be combined into a digital currency application (Nakamoto 2008). At first, the extremely high volatility of bitcoin and the attitudes of many countries toward its complexity restrained its development somewhat, but the advantages of blockchain—which is bitcoin's underlying technology—attracted increasing attention. Some of the advantages of blockchain include its distributed ledger, decentralization, information transparency, tamper-proof construction, and openness. The evolution of blockchain has been a progressive process. Blockchain is currently delimited to Blockchain 1.0, 2.0, and 3.0, based on their applications [1].

A block chain is a digital transaction ledger, maintained by a network of multiple computing machines that are not relying on a trusted third party. Individual transaction data files (blocks) are managed through specific software platforms that allow the data to be transmitted, processed, stored, and represented in human readable form. In its original bitcoin configuration, each block contains a header with a time-stamp, transaction data and a link to the previous block. A hash gets generated for every block, based on its contents, and then becomes referred in the heading of the subsequent block (see Figure 1). Hence, any manipulation of a given block would result in a mismatch in the hashes of all successive blocks [2].

A promising use case which constantly evolves the blockchain technology is the concept of smart contracts. Smart contracts are a value flow based on certain terms and conditions. They are just like contracts in the real world[3].

Another great use of Block chain technology is seen in the field of SCM. Supply chain management (SCM) is an established and essential business process in every organization today. Customer's requirement with a supplier through a channel using SCM which further use some of its processes to do so. For instance, in the last four decades, supply chain technology has evolved from material requirement planning (MRP) to manufacturing resource planning (MRP II), to enterprise resource planning (ERP), and, finally, to advanced supply chain planning and optimization (APS/APO). With

block chain, ERP systems can come together to form an integrated platform across partners/stakeholders, providing data that cannot be manipulated (true record) and an audit trail for transactions that happen within the extended ERP network.[4]
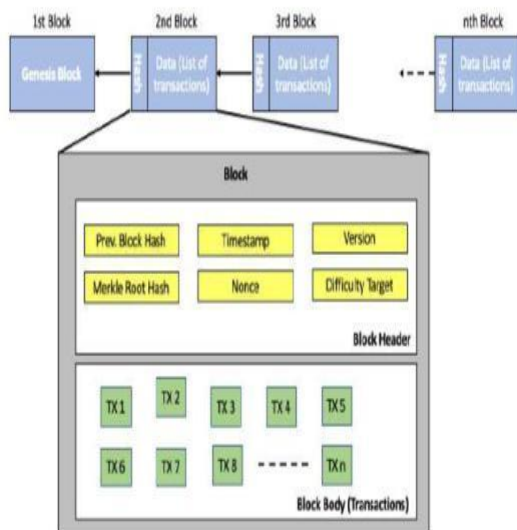
Figure 1: Example of a blockchain containing n blocks, in which each successive block contains the hash of the previous block, a timestamp, the transaction information, the nonce number for the mining process and other details needed for the protocol to work. [2]

II. BLOCKCHAIN ABLE TO SOLVE SECURITY ISSUES IN INTERNET OF THINGS (IoT)

"As this generation and the analysis of such dataare fundamental in the operation of the IoT, they must be protected throughout the entire life cycle of the device."

Blockchain technology began to be known with the advent of crypto coins mining since it is its main technology. But now, it also has much to do with the IoT.The amount of data processed by IoT devices is enormous, all supplied in a chain and exposed to attacks by cybercriminals. [5]

A DistBlockNet model which is distributed mesh network architecture for IoT using SDN and blockchain is introduced. In this model, propose pf the flow rule update scheme to update securely and the flow rule tables in the mesh network are verified. Extending the work a blockchain based distributed cloud architecture enabled with SDN fog nodes for a scalable IoT network was introduced [14]. Christidis, et al. [15] reviewed the applications of blockchains and smart contracts for IoT. Trustless

medical data sharing among cloud service providers using blockchain was proposed by Xia, et al. [16]. It provides shared medical data in cloud storage and enables auditing, data provenance, and control for shared medical data. Li, et al. [17] proposed a secure energy trading system for IoT. To the best of our knowledge, research work on smart city and blockchain is very limited in literature. Majority of the work focuses on using blockchain technology to benefit IoT either in a very general way or specific to a problem. Designing a new architecture platform specific to the smart city network is needed, taking into account all aspects of current and future challenges. [6]
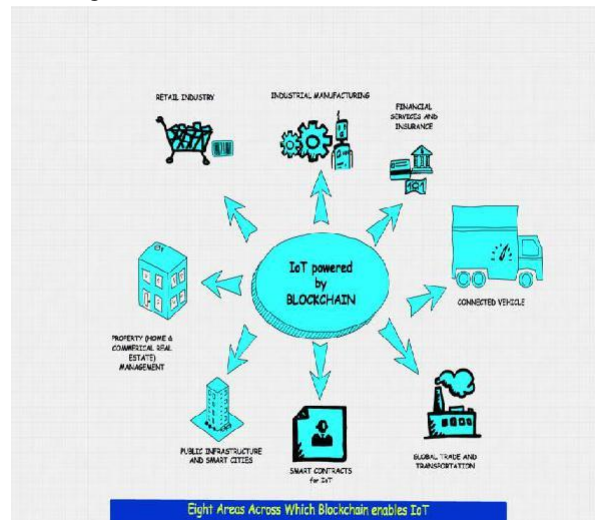
Figure 2: The IoT encompasses the world of sensors,moving objects like vehicles and really any device that has embedded electronics to communicate with the outside world – typically over an IP protocol.[12]

III. BLOCKCHAIN IN CRYPTOCURRENCY, AGRICULTURE AND FOOD SUPPLY CHAIN

Blockchain technology after gaining success started spreading like fire in the field of cryptocurrencies, To control the transparency and fault tolerance of cryptocurrencies in order to solve problems in scenarios where numerous untrusted actors get involved in the distribution of some resource various organizations and other entities were aiming to do so . Two important, highly relevant areas are agriculture and food supply chain. The products of agriculture almost always are used as inputs in some multiactor distributed supply chain, where the consumer is usually the final client so they are highly interlinked.

Much evidence is there on blockchain applications started to become used in the supply

chain management soon after the technology appeared. Block chain in supply chain management is expected to grow at an annual growth rate of 87% and increase from $45 million in 2018 to $3,314.6 million by 2023.

As a successful example, in December 2016, the company AgriDigital executed the world's first settlement of the sale of 23.46 tons of grain on a block chain. Since then, over 1,300 users and more than 1.6 million tons of grain has been transacted over the cloud based system, involving $360 million in grower payments. [2]

Focusing on existing initiatives, projects and case studies, and not on the general potential of block chain in the field papers were searched out of which only 29 papers were identified. From these papers, just 23 were relevant, in terms of using block chain technology in food supply chain. Based on their purpose and overall target/goal, these initiatives were divided into six main categories, as follows:

a) Food security (2 projects/initiatives, 4%),
b) Food safety (3 projects/initiatives, 6%),
c) Food integrity (24 projects/initiatives, 49.5%),
d) Supportof small farmers (8 projects/initiatives, 16%),
  e) Wastereduction and environmental awareness (5 projects/initiatives, 10%), and
f) Better supervision and management of the supply chain (7 projects/initiatives, 14.5%) [2].
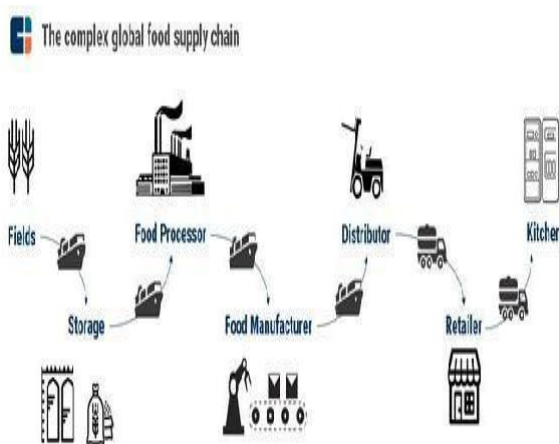
Figure 3: Block Chain in the field of food supply chain and agriculture. [19]

IV. BLOCKCHAIN IN HEALTHCARE

Digital healthcare trends are largely driven by the need for better patient care, faster and more accurate analysis, and on-demand access to medical data. The pace of innovation in digital healthcare began gaining momentum with artificial intelligence (AI), and it is set to further accelerate as the industry turns to blockchain technology.

Blockchain technology is being leveraged to remodel the collaborative exchange of vital research and useful healthcare data, thereby enabling key stakeholders such as clinical researchers, doctors, pharmacists, and other healthcare providers to gain secure, faster, simplified and reliable access to electronic medical information. The industry already has a similar platform called the health informationexchange (HIE). Many healthcare technology vendors -- including my company, a medical data and image management cloud-based service -- can integrate with HIE systems. [7]
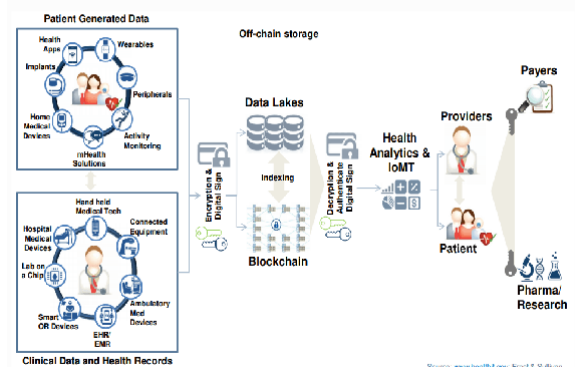
Figure 4: Using Blockchaining in IOT Healthcare providers and family members can securely access the patient data with the permission of the owner as shown in the figure. [14]

V. BLOCKCHAIN IN ERP

Distributed ledger techniques can be optimal for managing master data — cheaper, more efficient, and more trustworthy than a centralized approach.Missing piece is matching and linking records reliably. By building permissioned networks of nodes, master data management can get cheaper, more efficient, more transparent, and more trustworthy.

It's easy to think of large organizations as centralized and monolithic, but the reality is often the opposite. For banking, healthcare, transportation, energy, manufacturing, and other sectors, the trend is decentralized locations and teams managing local data. But it's a trend that comes with the potential for chaos — especially for master data, where accuracy, security, and conformity are essential.

Master Data Management (MDM) depends on creating consensus truth for the enterprise. If

Hospital A merges with Hospital B, their big stores of master data need to merge as well. It's critical that the process reliably matches patient records when it should, while carefully avoiding false matches. Real lives can depend on the accuracy of the master data matching process.

Traditionally, matching has meant linking the records within the two different databases, based on identifiers like Social Security Number, date of birth, drivers' license information, and so on. The MDM system could write the linkage information to a central database accessible from different locations. But having a single copy of the linkage data in a single location has meant that admins need to take special care to ensure that the data is highly available and secure. Private Blockchain networks (also called 'permissioned networks') offer an intriguing alternative.
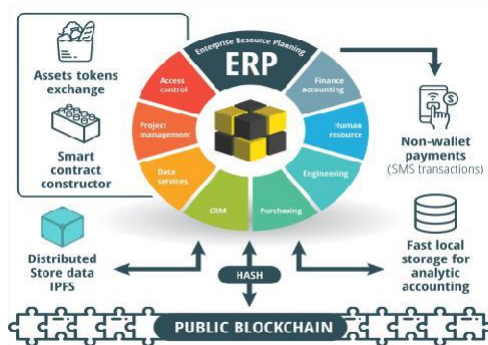
Figure 5: Blockchain and ERP. [19]

VI. A NEW ROLE OF BLOCKCHAIN

What started as a digital ledger for assets and currency is expanding into new realms. Over time, large enterprises will adopt distributed ledger models to record and manage biographic and biometric data. For example, imagine hospitals, banks, and governments all wanting to maintain their master data on the blockchain. But those organizations will need ways to match and link that data across private networks.

Consider Hospital A and Hospital B. If they each maintain their patients' records, how will they combine those records in the event of a merger?

The hospitals could first create a business network using the blockchain technology. That offers an advantage because data sharing then happens on the blockchain network as opposed to being centralized. Once the teams create the network and begin sharing data on the network, sophisticated algorithms kick in

to perform matching and linking — and the linking information is also stored natively on the blockchain.

Teams could also choose whether each node should maintain its own copy of the linkage information on the ledger. If not, the node can simply consume the linkage information that's maintained elsewhere on the network. That option keeps transaction activity from swamping any nodes that might have less compute power or connectivity, while helping to ensure that the linkage data is stored redundantly across multiple nodes. [10]
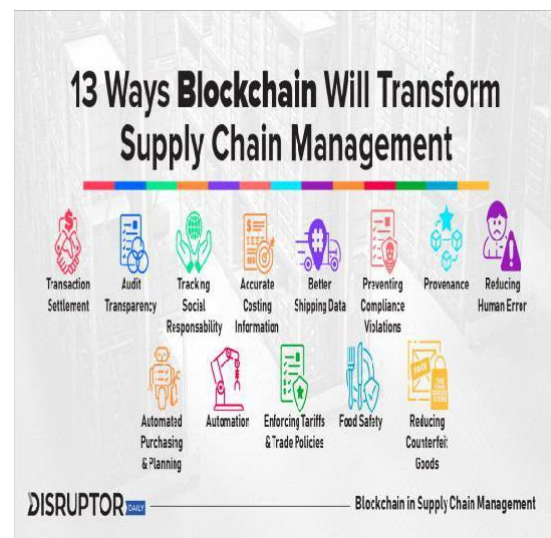
Figure 6: Blockchain in Suppy Chain Management. [18]

VII. WHY MODEL-DRIVEN ENGINEERING FITS THE NEEDS FOR BLOCKCHAIN APPLICATION DEVELOPMENT

Blockchain has attracted a broad range of interests from start-ups, enterprises and governments. A large number of projects have been conducted to explore how to use blockchain to rearchitect systems and to build new applications and business models. The application areas for blockchain are diverse, including digital currency, payments, trade finance, asset registry, identity management, and business processes.

However, building blockchain applications is challenging for developers. First, blockchain is a new technology with still limited tooling and documentation, so there can be a steep learning curve for developers. According to a survey by Gartner [8], 23% of [relevant surveyed] CIOs said

that blockchain requires the newest skills for implementation at various application areas, while 18% said that blockchain technique itself is one of the most difficult. Second, the blockchain is by design an immutable record, so it is non-trivial or even infeasible to update the smart contracts . This can impede the way to fix bugs by releasing new versions of smart contracts. Mistakes in smart contracts have led to massive economic loss, such as the DAO exploit [9]. we adopt MDE to facilitate the development of blockchain applications in the space of business processes and asset registries, which can also be applied to other blockchain applications.[11]

VIII. CONCLUSION

Blockchain technology is used in the various sectors. As it is used to run the bitcoin cryptocurrency.The aim behind this is to make decentralized environment for transactions, where all the transactions are recorded to a public ledger, visible to everyone. Moreover, Blockchain is used in IOT, healthcare, agriculture, to provide anonymity, security, privacy, and transparency to all its users.To describe where the current research on Blockchain technology stands, we decided to map all relevant information by reviewing it using research papers and by studying about the technology.The goal of this systematic mapping study was to examine the current status and research topics of Blockchain technology. We excluded the economic, law, business, and regulation perspectives, and included only the technical perspective.

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A Comparative study of Network structure based Routing Protocols in Wireless Sensor Networks

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Abstract- WSN emerges as a giant development and excited research area in the past couple of years in the field of scientific and engineering world. Its main objective is to sense the essential data and send it to the Base station so that further action can be taken. Sensor nodes work together through different Routing protocols. This paper surveys architecture of network and operations of network on the basis of routing protocols, and clarifies the progress of every routing protocol. This paper discusses three major types of routing protocols (Data centric, Hierarchical and Location-based protocol) that are further sub categorized into various parts. Subsequently, different QoS protocols are also reviewed with their ongoing research work. Further, this paper may enable researchers about ongoing research and future directions in the field of WSN.

Keywords- WSN, PEACH, TEEN, SPIN, HEED, GBR, GAF and SPAN.

I. INTRODUCTION

Recent developments in the area of sensing, communications, and computations have led interest of researchers from different areas to make huge investments in the area of wireless sensor networks. However, WSN technique are still used in research phase and in many areas like checking of environmental conditions in various area, crop , traffic in urban area, volcanic explosion, wave, and landslides detection, health related problems [2]. WSN is self organized cluster of a multiple nodes (motes) that can detect the nearby natural state, for example, dampness, light, and temperature. Every node detects the information and sends it to Base Station for performing explicit application [1].

Maximum consumption of battery energy of nodes is at the time of data transmission and reception. Thus,

it is necessary for routing protocols to extend sensor node's duration by utilizing energy well, transfer the data through those paths which can dodge low energy sensor nodes and reduce the power of transmission to maximize WSN's lifetime. This paper examined different routing protocols which gives potential solutions to the problems.

Section 1 shows the different routing strategies in wireless sensor network. A complete study of the network structure and network operations based routing protocols are classified in section 2.

Here we sum up old and new developments in each categorized protocol. Section 3 determines the current research and future research directions in routing. The final conclusion is defined in Section 4.

II. VARIOUS ROUTING TECHNIQUES

Network structure and Network operations are the two basic routing techniques [1] as shown in Fig 1. These two routing techniques are further sub categorized into three parts as data centric, hierarchical and location based on the basis of the architecture of the network. QoS based protocols and their recent developments of are explained on the basis of operations of network.

A. Data centric Routing- Data centric routing technique is based on query so in this data are requested only through queries. Data centric technique totally depends on naming scheme for data which eliminates the repetitive transmissions. Attributes of data are determined by using attributes based naming scheme.

Here, Sensor nodes selects the relevant information and then transmit it to the base station only andconsequently diminishing the number of transmissions.

B. Hierarchical Routing- A hierarchical routing is cluster based routing. It follows the method of

A. *QOS - BASED ROUTING PROTOCOL*

Periodic and event-based data reporting is supported by QoS based routing protocol. In QoS-based routing Protocols, data is transfer in the form of packets. Multiple queues are created in order to transfer data. Various rings or congestion control
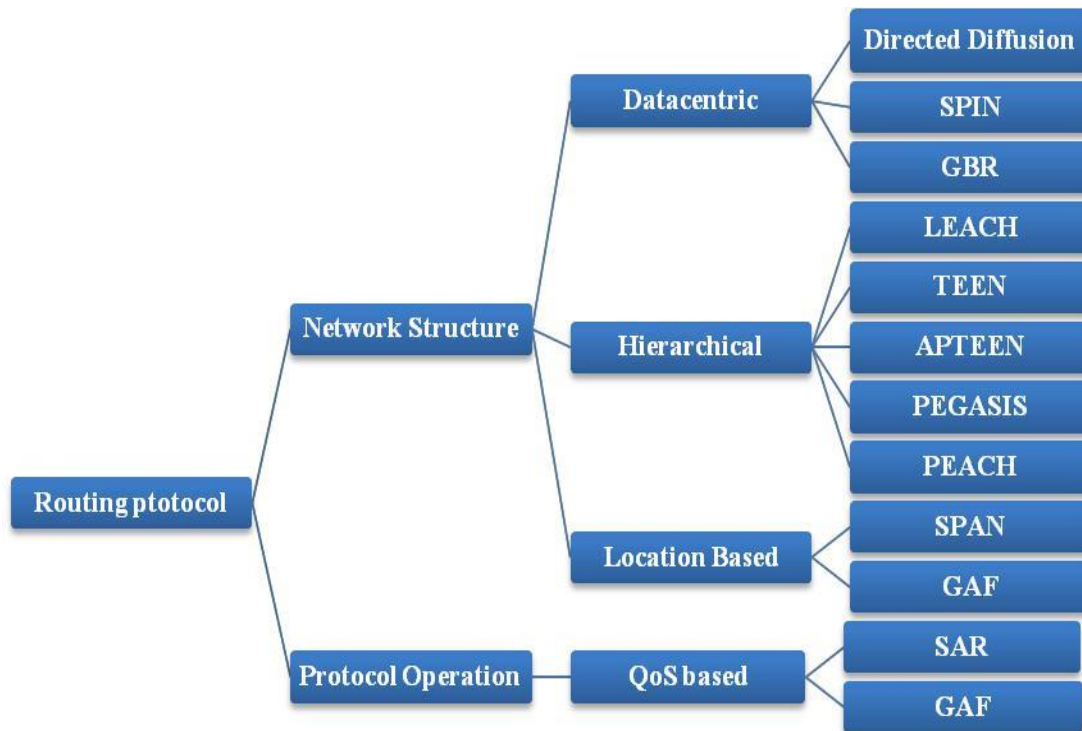
Fig 1: Routing Protocols

breaking down the network into layers of cluster. Nodes are bind together to form a cluster. Cluster head nodes are responsible for routing the information to base station. Data route from one layer of cluster to another (lower –to- higher). It covers larger distance from one layer to another cluster layer. This provides the facility to move data faster from one Base station to another base station. Clustering gives inherent streamlining capacities at the cluster heads [3]. For examples: LEACH, PEGASIS, TEEN.

Location based Routing-Location based routingis scalable in nature. Location information of the sensor nodes is required to transfer data to the particular area. It can be achieved by Global Positioning System (GPS) signals, radio signals etc. mechanism are implemented

in QoS based routing protocol which allows efficient data aggregation and avoid energy depletion. These protocols follow optimal paths during connection of nodes. Each nodes keep information about every adjacent nodes and uses geographic forwarding to paths. QoS concept was introduced by SAR.

B. Data Aggregation

Data aggregation technique is used to eliminate redundancy as same data is sensed by multiple nodes in a network because of high node density. Duplicate suppression is the easiest function of data aggregation. In data aggregation multiple sensor nodes compute the desired information and then send this information to the BS. The main focus of researchers is to improve network lifetime. All this can be achieved by decreasing energy consumption and bandwidth of sensor nodes but on the other hand

value of fault tolerance, data accuracy and security will reduce. Design implementation of data aggregation is very difficult task as designer has to take care of all the metrics of WSN.

TABLE 1. CLASSIFICATION OF ROUTING PROTOCOLS

Routing protocol & Author & Year & Routing technique	Key features & Recent developments
[4] [5]	Here, communication between various nodes is totally for named data. The primary objectives reside at transmission of data through sensor nodes by using a naming scheme for each data to be transmitted. Caching improves performance of direct Diffusion [4]. Fault Tolerant and Storage Efficient Directed Diffusion (FTSDD) - with the help of updated version of this protocols, hop count creation and data transmission become an easy task in the network [4]. DDBCI (Direct Diffusion based on clustering and inquiry), 2010-DDBCI combines all the nodes into one group to form a cluster. Here the data of every cluster is placed in cluster head using member information table for record. It eliminates redundancy and conserves the energy of Cluster heads and all the members of cluster [5].
[7]	Residual energy is also considered in this Cluster based model (centralized or distributed clustering). It includes two phased protocol: Setup Phase which is used for Cluster Establishment & steady phase for actual data transmission [7]. Researchers categorized LEACH for better performance, for example, A-LEACH, S-LEACH, M-LEACH, C-LEACH, Multi-bounce LEACH (Multihop LEACH), F-LEACH, B-LEACH, E- LEACH,TL-LEACH, Solar-mindful LEACH.
[7] [8] [9] [10]	sLEACH), I-LEACH,V-LEACH, Cell-LEACH and LEACH-SC. Maximum Quality of Service is provides by sLEACH. Various harvesting techniques are used by sLEACH to boost the overall performance [7][8]. Q-LEACH (Quadrature LEACH) - 2013- It provides optimized network lifetime in WSN by divining the entire network into different parts [9]. MODLEACH, 2013-Here, to minimize energy consumption and to maximize network lifetime authors has used efficient replacement scheme and dual transmitting power levels. Concepts of both Hard and Soft threshold are also included in TEEN [10].
[11]	Similar as LEACH but performance of TEEN is totally depends on value of thresholds. TEEN protocol performs well in time-critical applications. The value of soft threshold can be modified according to the target application. Small value of threshold provides clear picture of the network, which helps to utilize energy efficiently [11].
[12]	In SPIN, the high level data descriptors called Meta-data are used for communication. SPIN applications are resource adaptive and resource-aware. Its main objective is to conserve energy and operate efficiently. SPIN use three stages for message transmission i.e. ADV-REQ-DATA. SPIN protocols are categorized in four parts, namely SPIN-PP (point to point), SPIN-EC (energy conservation), SPIN-BC (broadcast network) and SPIN-RL (reliable version)[12]. SPIN hold the guarantee of accomplishing superior performance at very low costs. SPIN protocol can deliver 60-70 % more data than traditional protocols.
[13] [14] [15]	PEGASIS is an improved version of LEACH [13]. Chain is form to transmit data in every round and out of various nodes only one node transfer data to the BS (base station) [13]. Benefits of PEGASIS over LEACH is that it reduces the amount of energy require to send data [14]. PEGASIS eliminates long distance transmission of data [14]. Problem of packet delay and data gathering techniques are resolved in Hierarchical PEGASIS [14]. Energy Efficient PEGASIS Based (EEPB) - here greedy chain method is used for communication process; it allows communication between two distant nodes. [15]. PEGASIS with double Cluster Head(PDCH) - here load of each node is balanced and it helps to increase the life of network Improved Energy Efficient PEGASIS Based (IEEPB)-It removes the limitations of EEPB. It helps to build a long chain of sensor nodes by taking complex threshold values. [15].
[16] [17]	The clustering procedure is done at various levels; one cluster head is selected in each level on the basis of residual energy of nodes that are uncovered by any cluster head. For example, such nodes give energy to its neighbors or node degree. H-HEED (Heterogeneous Hybrid Energy Efficient Distributed), 2010- In order increases network lifetime, number of packets and throughput H-HEED uses various degree of heterogeneity. HEED is also performing well to balance load of cluster heads [16].

	RHEED- In order to achieve the goal of production of efficient energy, RHEED changes its clustering head. Motive: to move the cluster heads among various nodes until energy of one cluster head reduces below particular threshold. [17].
[18]	Here, formation of cluster is done by using overhearing features. It support hierarchical concept of clustering. PEACH is appropriate for both location aware and location unaware networks. [18].
[19] [20]	The structure of APTEEN is same as in TEEN. Here one cluster overall manages the working of nodes. Here the one cluster head is selected out of various cluster heads to broadcast the attributes, to calculate the delay time, schedule and count time and both hard and soft threshold frequency [19]. APTEEN performs better than LEACH. APTEEN is catching occasional information accumulations and responding to time-basic occasions. APTEEN immediately responds to sudden changes. Energy consumption is controlled in APTEEN. [19] It sends data on periodically basis to the BS [20].
[21] [22]	SPAN is defined as multi-hop adhoc network which elimination the no. of network connections and increases energy efficiency [21]. SPAN integration with IEEE 802.11 provides various advantages such as good communication latency, network lifetime and capacity [21]. E-SPAN - Distributed Protocol and performs data aggregation technique within an event region. The average lifetime of sensor nodes and network is high as compared to the Directed Diffusion. [22].
[23] [24]	SPEED is localized and stateless protocol, SPEED is meant to form real time applications. It avoids Network Traffic and maintains certain level of speed across WSN. It maintains the record of neighboring nodes [23]. SPEED uses novel backpressure re-routing technique to re-route packets .it uses various techniques to balance load between various concurrent routes. It does not use routing table to carry out routing. Multipath multi SPEED- an extension of SPEED. It introduces multiple levels of speed in order to deliver packets [24].
[25] [26]	It is a topology management protocol which turned off the unnecessary nodes that creates traffic. It also maintains a constant level for transmission [25]. Idea: node acts as a main coordinator, which transmit content to various other nodes in each grid region [25]. HGAF (Hierarchical GAF) expands the life of battery power by enlarging the cell of GAF [26]. HGAF performs better than GAF both the cases i.e. energy consumption and communication of nodes [26].
[27]	SAR integrates QoS with energy efficiency. Routing of sensor nodes is performed on energy resources, QoS and the priority level of packets [27]. The main motive of SAR is to minimize the average weighted QoS Metric [27]. It provides facility of fault tolerance and easy recovery.
[28] [29] [31]	GBR is used to design applications using natural information gradient in wireless sensor network. Minimum hop count and remaining energy of each node is considered by GBR for data transmission. It increases network lifetime by upgrading energy utilization [28]. Establishment of ideal routes freely with our routing protocols. It implemented Back-off waiting scheme in order to handle explosive message flooding issue in routing [28]. EEOGRP (energy-efficient optimal gradient-based routing protocol) 2014- EEOGRP used the look ahead algorithm in combination with gradient based routing [29]. A new gradient based protocol to maximize lifetime of the network [30]. Here, least-loaded path avoids the most over-burden sensor node selected for forwarding [31].

III. CURRENT RESEARCH AND FUTUREINSTRUCTIONS IN ROUTING

In the future, the authors can focus more on how to utilize energy efficiently because major problem we are facing is lack of resources of energy. Energy efficiency is considered to be the true aspect in current scenario. For simple architecture, routing protocols and algorithms, European research project (EYES) developed a new scheme. It will now be possible to transfer data between various nodes that are not within a range of one another [32].

The main goal of WSN is to enhance the overall performance of routing by utilizing energy, send data without any delay to large distance [33].

Further approach of authors must be to develop such a routing protocol by taking into consideration the concept of harvesting the energy with energy efficiency.

The field of wireless sensor network QoS is still not much explored in research. Designing QoS based

routing protocol in integration with wireless sensor network is still a true bottleneck in current wireless sensor networks. Researchers must concentrate on this issue while structuring the whole network and energy aware QoS routing protocol.

Hence, wireless sensor will be widely used all over the world for designing sensitive applications; the primary goal of these applications will be security. SPIN is a best example of security protocol which has greatly optimized sensor networks. Current routing protocols focus on other factors like optimizing the limited capabilities of the sensor nodes and the networks for particular application, but do not take security into an account. In spite of the fact that security isn't the significant objective of these routing protocols however it is essential to assess the properties of security. Nowadays, researcher's main focus is on data aggregation, which is the main part of wireless sensor network that makes the design complex of secure routing protocol. [33].

Node mobility is also one of the remarkable problems that rise for routing protocols. A lot of routing protocols consider that the BS and the Sensor nodes are immobile. However, in future there may be a situations happen where BS and sensor nodes needs to mobile. In this environment, there is a need of new routing protocols which balances the load of nodes or can handle the burden of mobility.

Other best field for research includes IoT (Internet of things). IoT exists at a more significant level as compare to wireless sensor networks. Wireless sensor network technology is mostly used in IoT. In IoT large number of sensors nodes individually collects data and transmit data to the internet via router. The main difference between WSN and IoT is that WSN consist of networks of wireless sensors but IoT includes both (wired and wireless) i.e. any device or group of devices associated with internet is characterized as IoT. Application developed for security purposes and to detect environmental related problems need valuable data collected from the sensor nodes to be transmitted to a workstation with the help of internet so that further examination should be possible [34].

IV. CONCLUSION

Wireless sensor nodes have special attributes and are locate for specific needs; Stability, classification and the security are of the main significance of such network systems. In this paper different types of routing protocols are discussed along on the basis of their design and operation of system. Different versions of protocols has been discussed in paper as per there structure. Some new protocols like SAR AND SPEED which follows QoS methodology are also surveyed. We also determine in table, whether data aggregation is properly used in each protocol or not because it is the important factor for routing protocol in terms of network structure and energy saving. Some of the protocols like LEACH, PEGASIS TEEN, and GBR perform well in terms of energy efficiency bit still many more challenges need to be resolve. This research will help various researches to study about different routing protocols and their attributes. There are various routing protocols techniques which may work on various bearings; however all have one common goal of achieving high level of network lifetime. We explored various challenges to the routing protocol and also highlighted future research direction in this manner.

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Tuberculosis Detection System Based on Segmentation & Feature Selection with knn Classifier Approach

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Abstract—Tuberculosis is the biggest infectious disease in human that mainly affects lungs, this tuberculosis isone the top ten prominent cause of death for human. When any patient is suffer from the tuberculosis firstly the person is not aware about he/she is affected with tuberculosis or not because it is a type of disease whose maximum symptoms are very much normal and related to other disease also. So without testing it is not sure that patient has TB. But, it is cureable or not a untreated problem. We can overcome from this problem if we can detect it at their earlier stage and save the number of lives because at higher stage medicine getting more costly and patients require to treat and observe more carefully. In this paper proposed a technique of image segmentation and machine learning to diagnosis and classify the types of the tuberculosis (TB). These tools and techniques are used to prior expose of tuberculosis (TB) disease. Also classify the type of TB. The type and the stage of tuberculosis show accuracy 88% of system.

*Keywords-***Tuberculosis, types of Tuberculosis cell detection, enhancement, classification**

I. INTRODUCTION

In the medical industries we required many different types of engineering tools, which help doctors to access, stores and reused the relevant medical data to understand the main problem and give the proper diagnosis and medicine for treatment of the disease. The computer system and Expert Interface System (EIS) is a tool that use the different rules and facts for finding the solution of real life problems based on information or knowledge obtained from different human expert in the specific location [2].

Healthcare is top demands of generation. So, different methods are used to improve the method of treatment of the patients. One of the method is used by the doctors is Clinical Diagnostic Decision Support System (CDSS). CDSS is the computer based program that helps the professional for making the clinical related decisions. In that we provide the relevant pre-diagnosis data and that information CDSS can provide the output that helps the decision by the physician [4].

TB was assumed to be completely in control, but once again TB becomes a dangerous problem world-widely. TB is an infection which is happen because of bacterium whose named as mycobacterium tuberculosis. This infection can spread from human to human, and patients which are experiencing tuberculosis may kick the bucket except if they get the right treatment. This microorganism for the most part exists on different species like people, creatures and winged animals. Each organ in the bodyb can be influenced

by this sickness, yet for the most part the tuberculosis happens in lungs [6].

As it is transferable sickness it tends to be transmitted through the air when the contaminated individual hack, sniffle or from spit. Pneumonic tuberculosis is an infectious bacterial disease that includes lungs, however may spread to different organs. TB illness happens under different phase of life in grown-ups and youngsters. At the point when the principal meeting occurs with bacillus that is chiefly occurs in the youth period of an individual, lymphatic organs which are positioned at the beginning stage of the lungs are picked by this microorganism for the primary establishing point on the body. Because of this occasion, those organs extend (hilar lymphadenopathy) and this called as essential tuberculosis. The grown-up sort (optional) tuberculosis is unique in relation to this situation. In those cases, the individual's lung is polluted with the microorganism previously. In the event that the safe framework is sufficient, microorganism can't cause any affliction yet can keep itself alive. At the point when the safe arrangement of the individual debilitates for an explanation, microorganism gets actuated and starts to make disorder. Average outward signs of pneumonic tuberculosis incorporate diligent hack, chest agony, haemoptysis, and infrequent fever, loss of craving, smoke compulsion,

BCG antibody, disquietude and Weight decrease. The relations among analyses and their side effects are barely ever balanced, in this manner, separation of findings that offer a covering scope of side effects is accordingly naturally troublesome [7].

Image processing is a method in which digital images are used for extraction of helpful information from image. Image processing involved various others subjects like recognition of Character, pattern recognition and extract information from digital Medical images to improve the method of diagnostic for various diseases [8]. Tuberculosis is a lung based disease which can nowadays threaten people's life. The basic microscopy methods that are utilized for tuberculosis detection that includes Ziehl-Neelsen and fluorescence microscopy. Fluorescence microscopy is expensive method so detection that includes Ziehl-Neelsen and fluorescence microscopy. Fluorescence microscopy is expensive method so mainly Ziehl-Neelsen sputum smear microscopy is used. Ziehl-Neelsen is method that uses the sputum sample of the person to perform a TB test and according to that this test tells that person is affected with TB or not [9]. Tuberculosis has many types and these types are:

II. TYPES OF TUBERCULOSIS
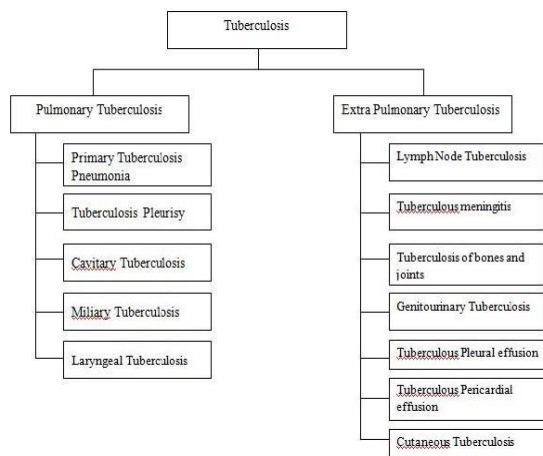
Fig.1: Types of Tuberculosis

A. Pulmonary Tuberculosis

Pulmonary Tuberculosis is the maximum commonplace and potentially maximum contagious sort of active TB and constitutes about eighty five% of total instances of TB. Small areas inside the lung infected with bacilli steadily shape a larger lesion packed with inflamed cloth. This material can emerge as liquid, that's then coughed out, leaving a hollow space inside the lung. The method maintains causing good sized damage to lung tissues and blood vessels, generating greater infectious fabric and inflammations. Damage to blood vessels can also cause Haemoptysis (coughing out blood) which can be deadly [32].

1) Primary Tuberculosis Pneumonia: This is rareform of TB which named as pneumonia & is highly infectious. In this case patients suffered from intense fever and dynamic cough. It mostly happens in children and the elders. It is also present in patients with immune suppression, like people who affected with HIV/AIDS and using term corticosteroid therapy for a long time [32].

2) Tuberculosis Pleurisy: This typically grows notlong after beginning contamination. Granuloma situated at the border of the lung bursts into the pleural cavity which is the space in between the lungs and the chest divider. Normally, two or three tablespoons of liquid can be enacting in the pleural cavity. When the microscopic organisms attack this space, the measure of liquid expands drastically and pack the lung, which cause brevity of breath (dyspnea) and sharp chest torment that intensifies with a full breath (pleurisy). Chest x-beam demonstrates noteworthy measures of liquid. Gentle or poor quality fever generally is available. Tuberculosis pleurisy for the most part settle without treatment; in any case, 66% patients with tb pleurisy create dynamic pneumonic TB inside 5 years [32].

3) Cavitary Tuberculosis: Cavitary TBincorporates the higher projections of lung. The miniaturized scale living being reason progressive lung decimation by methods for shaping pits, or developed air spaces. In this case of TB happens in renewal affliction. The top projections of lung are influenced due to the reality they're massively oxygenated (a situation where M. Tuberculosis prospers). This TB can, seldom, happen rapidly after essential contamination. Indications incorporate powerful hack, evening time sweats, weight decrease, fever & shaky area. Hemoptysis (hacking up blood) can be present there. Patients with this type of TB are fairly infectious Occasionally, scatter expands into the pleural zone and which can cause TB empyema [32].

4) Miliary TB: Miliary TB is scattered TB."Miliary" portrays the appear on chest x-beam of exceptionally little knobs all through the lungs that resemble millet seeds. Miliary TB can happen rapidly after number one contamination. The influenced individual turns out to be intensely unwell with inordinate fever and is in possibility of death. The malady additionally may likewise bring about incessant pollution and languid decline. Symptoms may incorporate evening time sweats, fever and weight decrease. It very well may be difficult to analyze in light of the fact that the underlying chest x-beam can be typical. Patients who're resistant smothered and youths who've been presented to the microscopic organisms are at more chances for creating miliary TB [32].

5) Laryngeal TB: In this case TB can mainly affectthe larynx or the vocal chord area. It is infectious level is high [32].

B. EXTRA PULMONARY TUBERCULOSIS:

Extra aspiratory tuberculosis (EPTB) is a disease because of M. Tuberculosis, which impacts tissues & organs out of entryways the lungs. The AIDS pandemic has underlined the significance of EPTB. TB can influence almost every organ in our body. The most extreme typical sorts of more prominent aspiratory TB are lymph hub TB, gastrointestinal TB, spinal TB and joint TB. In greater part of these extra pneumonic sites, without aspiratory or laryngeal contribution, TB is normally not infectious. Nonetheless, in some cases water system of tuberculous injuries can create irresistible bead cores bringing about expansion of M. Tuberculosis. EPTB might be irresistible while demonstrative or remedial procedures are finished on aroused sores [32].

1) Lymph Node Disease: Lymph hubs fuse macrophagesthat catch the microscopic organisms. Any lymph hub can harbor uncontrolled replication of microscopic organisms, making the lymph hub develop to be broadened. The tainting can widen a fistula (path) from the lymph hub to the pores and skin v [32].

2) Tuberculosis Meningitis: M. Tuberculosis can infectthe meninges (the primary membrane surrounding the brain and spinal twine). This can be devastating, main to everlasting impairment and dying. TB may be hard to discern from a mind tumor because it could present as a focal mass in the mind with focal neurological symptoms. Headache, sleepiness, and coma are common symptoms. The patient may appear to have had a stroke [32].

3) Tuberculosis of bones and joints: Spinal TB,additionally referred to as Pott ailment, become first reported via Percivall Pott in 1779. One-1/3 of kids inflamed with Mycobacterium tuberculosis have more pulmonary involvement. Skeletal TB happens in 1–6% of them with vertebra being the most typical web page in India. Pure tubercular osteomyelitis without joint involvement occurs in best 2–three% of instances of osteoarticular TB. Commonly websites are the femur, tibia, and fibula. Announced skeletal involve may be very rare in kids (7%), and calvarial osteomyelitis is even rarer (1%) [32].

4) Genitourinary Tuberculosis: (Genitourinary (GU)TB illness alludes to TB infection anyplace inside the genitourinary tract, alongside the renal parenchyma. Genitourinary TB includes 6–7 % of EPTB cases based absolutely at the US and European epidemiologic records, however has been referenced to symbolize up to forty % of EPTB cases in explicit zones. It is thought that most extreme cases of GU TB result from hematogenous dispersal during essential tainting. Dysuria, hematuria,

clean pyuria, or potentially flank hurt isn't strange restorative signs identified with renal TB, despite the fact that renal component is ordinarily safeguarded and sufferers can be asymptomatic [32].

5)Tuberculous pleural effusion: Tuberculous serous membrane effusion is one in all the utmost common sorts of a lot of respiratory organ TB. The moment reason behind the effusion could be a not on time hypersensitivity reaction response to mycobacterial antigens within the serous membrane space. For this purpose microbiological analyses are often dangerous and confined via the prolonged table in getting effects. In regions with high TB incidence, serous membrane fluid ADA (ADA) levels additional than forty U/l argue powerfully for TB [32].

6)Tuberculous Pericardial:TB carditis will expandthanks to contiguous unfold from adjacent systems (mediastinal nodes, respiratory organ tissue, or backbone), as a results of dissemination to the serosa (as is visible in cases of miliary TB) or, less sometimes, due to reactivation in serous membrane tissue. Globally, mortality related to TB carditis is as high as twenty six nada, and even higher among those with HIV coinfection. Clinical capabilities are constant with carditis and might embrace chest ache, dyspnea, and obstruction physiology once excessive; fever and cough also can be visible [32].

7) Cutaneous Tuberculosis: Cutaneous tuberculosisoccurs not often, despite a high and increasing incidence of tuberculosis worldwide. Mycobacterium tuberculosis, Mycobacterrium bovis, and the Bacille Calmette-Guérin vaccine can cause tuberculosis related to the pores and skin. Cutaneous tuberculosis may be obtained exogenously or endogenously and gift as a large number of differing clinical morphologies. Diagnosis of these lesions can be difficult, as they resemble many different dermatological conditions which might be often on the whole taken into consideration [32].

III. BACKGROUND AND LITERATURE REVIEW

Kant S. et al. [10] proposed a methodology that uses to diagnosis TB disease with the help of the new deep neural network. According to the aurthor this system need microscopy image of sputum which is properly magnified as the input to the system and after the processing it provides the position of suspicious Mycobacterium tuberculosis bacilli. This proposed system with the help of microscopy image of sputum for detection of TB achieved 83.78% and 67.55% of recall and precision respectively. Payasi

Y et al. [14] proposed a system which used the digital image processing with ZN-stained sputum smear images for diagnoses TB. For detecting and counting of bacilli of TB MATLAB software is used. By thresholding the hue range the segmentation of bacilli is achieved by Hue color component based approach. By thresholding the particular area, perimeter and characterizations of shape the unwanted artifacts were removed. Counting process is complete after clumps and segmentation of bacilli. In this method results show with the help of many different images taken from several patients that represented that the system detects the existence of TB accurately and efficiently. R.S. Chithra et al. [15] proposed a system named fractional crow search-based support vector neural network which is used to automatic classifying the TB.

This proposed method is used sputum images of the patients. The classification method is integration of fractional theory in the crow search algorithm that increases the computational speed and reduces the cost and time spent on analyzing the test samples. These methods require minimum manual power. The Ziehl–Neelsen sputum smear microscopy image database is used that proves that classifier is highly accurate and provides better performance. The accuracy rate, TPR and FPR is found to be 0.9487, 0.96, and 0.04 respectively.

Methodology: After studying the literature, we reviewfollowing general methodology for the Tuberculosis detection by sputum smears slides.

* **Microscopic images:** The sputum mobile informationhave been amassed the use of virtual microscope this is attached to a digital camera, connected to a PC and runs with devoted software program for image collection.
* **Enhancement:** Images may contain some artifactsstarting, so there is a need to enhance the taken images. Many pictures have some lot of noise, so before processing further these problems should be discard with the help of image enhancement method like to remove noise usage types of operators i.e. peewit and sober, canny etc.
* **Segmentation**: Segmentation is a process of dividedan image into sub parts, so that proper each and every part is scanned completely. Microscopic images collection different kind of sputum cell we can easily detect the TB from appearance of cells. So, with the use of segmentation process we will separate the affected and Non-affected cell. Various method used for segmentation are region-based segmentation, k-means etc.
* **Feature Selection**: In this part we try to extract someof the properties from the processed image. Feature extraction is the process of replace the image into data so that we can verify these values with the standard values and finally we can differentiate between the regular and irregular data. Some of the

features which are necessary to be calculated are listed below.
  o Color Features
  o Geometric Features
  o Texture Features
  o Statistical Features

Radius –measured by averaging the length of the cell and their length.

* **Classifier:** In this final step, the finding featuresare used to provide the final answer. All feature extracted are listed into the different columns with their values. When we give any image as an input to the proposed system then we 1st calculate the feature values. The cost of the test image features are cross checked with the lastly calculated values which are Based on the input image. And the classifier classifies that microscopic appearance and concludes the result cells are normal or not.

IV. PROPOSED SYSTEM

The proposed system became execute with the aid of "MATLAB 2017b" on "Windows 7 (64bit). The dataset changed into supplied via Department of Pulmonologist [9]. The dataset become fascinated by an optical labs microscope coupled with HD digital camera. All photos are in JPG, tiff format with 24-bit colour intensity. The pictures have been catch with a variety magnification of microscope limit from three hundred to 500. The ZNSM-iDB database has two distinct variations ZNSM-iDB 1and ZNSM-iDB 2).

The proposed system worked on the ZNSM-iDB1 model which has been designed for trying out the performances of type structures. The ZNSM-iDB1 is a asortment of clip element of hobby of balanced and burst cells that belongs to the ZNSM-iDB1 dataset. It consists of a couple of pics, of sputum smear slides The accuracy (Eq. Nine) became used to test the classification overall performance of the proposed machine:

$$\text{Accuracy} = \frac{TP + TN}{TP + TN + FP + FN}$$

where
• TP (True positives) is the counting of components that are absloutly classified as perfect by the test.[7]
• TN (True negatives) is the counting of components that are correctly classified as anti positive by the test.[7]
• FP (False positive) is also known as type I error, it is the number of components that are classified as positive by the test, but they are not.[7]
• FN (True positive) is well-known as type II error, it is the counting of components that are classified as anti positive by the test, but they are not.[7]
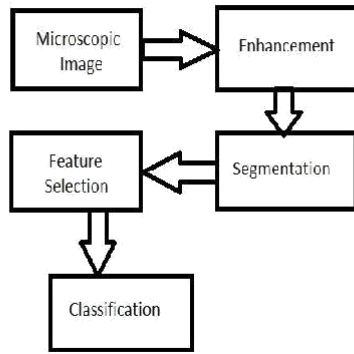
Fig.2: Block diagram of automatic Tuberculosis detection

Above fig shows the representation of automatic tuberculosis detecting using image processing method. Microscopic pictures is taken which goes through an enhancement proceed further the image is part into sub parts to get the proper result using k-mean algorithm. The specification such as accuracy, efficency are account and classification are done.

from ZNSM-iDB1.Next step is photo preprocessing and alternate the coloration of image in to gray scale. Followed by using the use of filtering the appearance, discard of noise from the image and subsequently is accomplished to upward thrust the fee of photo in phrases of evaluation. Third step is detected the effected circle and highlights the cells. Next step technique the use of algorithm, in which k is taken into consideration 3 and nucleus is focused for the analysis technique. In the training component capabilities of natural most cancers cell is stored in expertise base. In the checking out component, the cell which desires to be tested is taken as input. And ultimately knn classifier with using records in the know-how base is used for class, where selection is finished whether or not the mobile is everyday or no longer.

In the proposed approach microscopic photograph is better using pre-processing steps, accompanied by means of segmentation Fig. Four suggests gray Scale photograph The proposed approach is implemented to microscopic snap shots. Fig. 3 suggests the microscopic enter photograph.

Fig.3: Flowchart of system architecture

- Take the microscopic image
- do the pre-processing on the image with the help of enhancement technique
- do the segmentation of the image
- Feature selection is done on the parameters .
- Finally, the classification is done on the data obtained whether the image has problem or not.

V. EXPERIMENTAL RESULTS

In Proposed device has two factors schooling and checking out. Both the factors undergo following steps. Image preprocessed is the initial step gathers snap shots of the blood from microscope with full magnification

Fig.4: Input Image

Fig.5: Gray Scale image
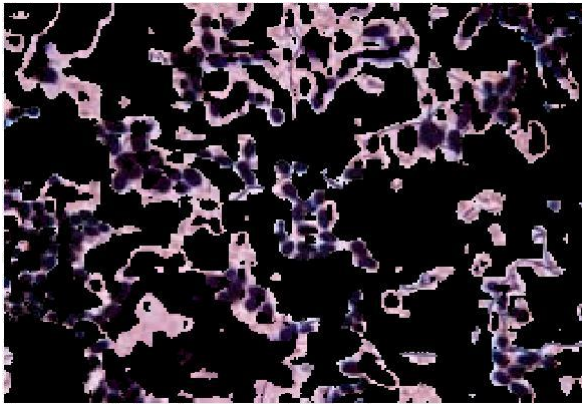
Fig.6: circle detected (a)
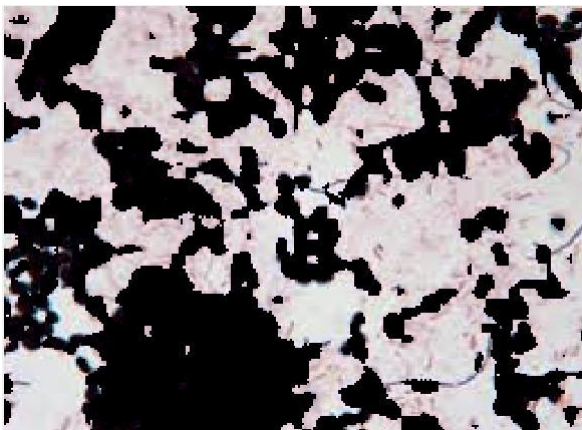
Fig.7: Highlight cell
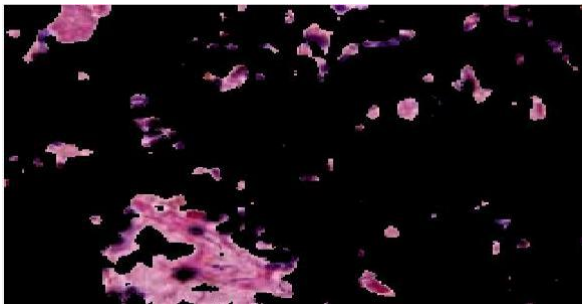
Fig.8: Classified result
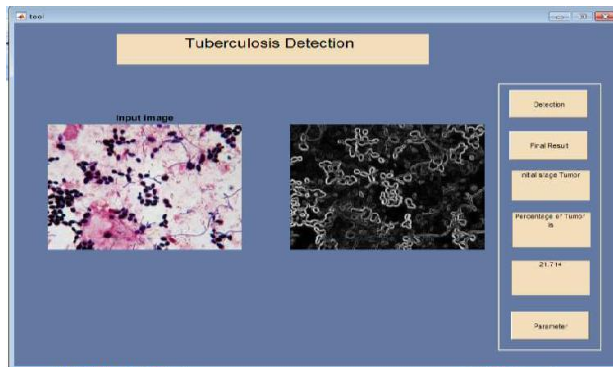
Fig.9: final result with stage of TB and accuracy

For segmentation we have selected classes. i.e., k is taken Fig 5. show gray scale image ,fig 5 detected circle , the detected circles and Fig. 8 show segmentation outputs.

After obtaining segmentation, Fig. 5 is taken for feature extraction as it has fully nucleus which is the apart of interest. Feature extraction is done. Finally knn classifier is need to analyze input microscopic apperance as normal or not. And fig 8 show final result of system with accuracy of system

& fig 9. stage of TB with percentage. How much TB cell Spread.

VI. CONCLUSION

Incident rates of tuberculosis have been rising since last decade. So, early fast and effective detection of tuberculosis is paramount important. If detected at early stage, lungs have one of the biggest cure rates. At earlier stage, tuberculosis is easy to treat, but at later stage it becomes very difficult, infectious usually result in near fatal consequences and extremely high costs associated with necessary treatments. We performed tuberculosis detection and feature extractions, k-nn algorithm for classify them. Using all these, the final output given by the system will tell whether the disease is recoverable or not. The future scope of the tuberculosis detection system could be implemented as a standalone application and can be more accurate and efficient. In this system they could classify stages and also need introduce self learning mechanism to enhance better accuracy and reliability of system.

There is a vast scope of improvement in KNN classifier which has higher complexity due to which execution time is high for the analysing the system. So the system can be improved by using effective classifier to reduce the complexity.

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Effect of PUBG on Stress Levels in Youngsters

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Abstract: The epidemic rise in video gaming companies has led to the increase in players as well. Games have become the imperative part of people's life with the increase in advancement in technologies for emotion recognition in human beings. GSR easily captures the non-intrusive physiological signals which indicate the nerve response as a parameter of sweat gland function. It is used to estimate the affective rate of user's arousal level and stress. In this project, GSR is used to determine the effect of playing PUBG on stress levels of youngsters. In this, a participant played PUBG game in two different battlefields named "quick match" and "war" for 10 minutes with rate of 20 per second. Before starting this experiment, calm state of participant was recorded for 10 seconds at the rate of 20 per second. We have used GSR logger sensor NUL-217 which measures the conductivity of our skin, especially of our fingers. These sensors were attached to the non-preferred hand of the participant. While the experiment continued, graphs were obtained on Neulog software. Important thing was observed that with the increase in the obstacles, the frequency of arousal also increased.

KEYWORDS— Pubg, Nul-217, Gsr, Neulog Software, Battlefields, Arousal Level

I. INTRODUCTION

Gaming has become an important part of people's life. Playing games is considered as a popular activity throughout the life span. People play games to release their tension. By playing games, children learn to explore and to bond with their parents and peers. Additionally, the types of games people favor to play also controls their personal development. For example, adventurous games can help people to practice the skills or to act in the roles of who they want to be in existence, memory games can brush up their mental skills and word games can improve their communication skills.

Despite the fact that game playing in general are seen to be a beneficial activity, but the addiction of online video gaming have severe impact on people's mental health and social life. Researchers are increasingly recognizing that people play games to such an extent that it intrudes with their work, family, sleep, study, social life and hobbies. In such cases, gaming is not a beneficial activity but causes damage. Such players are neither able to enjoy the game nor they are able to change their gaming behavior.

This project introduces the basics of sensing emotions by using the sensor named GSR which detects the physiological signals of the player. The main goal of video gaming companies is to provide a real life scenario to the players. The market of PUBG is huge and number of users is rising. PUBG is much admired game among youth. But playing games like PUBG for longer period of time is harmful. In this experiment, stress level of a player is determined with the help of GSR sensor that senses the change in arousal of the player.

II. REVIEW OF LITERATURE

To check the stress level among youngsters while playing PUBG can be determined by GSR sensor. GSR is a simple module that is used to capture the physiological signals by changing the arousal level of the participant as a parameter of sweat gland function.

- **Maria V.V et al. [2012]** explained that the risk ofcardiac problem increases with stress. Due to this reason, there is a need to control different emotional situations so as to protect the person from suffering which can lead him in a dangerous situation. The author designed stress sensor based

on GSR controlled by zigbee. To check the performance of device, 16 adults including 8 men and 8 women were used who completed the test that requires certain degree of efforts such as deep breathing or mathematical operations. The data was sent through zigbee module and corresponding algorithm was used to determine the level of stress according to different tests [1].

- **Deger A. et al. [2017]** discuss the emotionplays a fundamental role in human life. Developing algorithms for computers to recognize the emotions is a broadly studied area. In this paper, GSR is used to recognize the emotions using time domain, wavelet and Empirical Mode Decomposition based features. K-nearest neighbor, decision tree, random forest and support vector machine algorithm is used to study the relationship between physiological signals with arousal level and valence. The author has achieved an accuracy rate of 81.81% and 89.29% for arousal and valence respectively [2].

- Yong D. [2018] mainly aimed at studying the operational model of PUBG in which human beings in the game are regarded as intelligent robots. Different situations were realized between the various factors. In this, the author found out the trend of safety area and random coverage circle of safety area and then to push it to the tie of jumping from parachute and then to push it to the time of jumping from parachute and the parachute jumping place. The game model was built according to the analysis among the distance between two sides in which players were running and attacking each other. After that, through the measure of KDA for the game and individual scores, winners were recognized.

- Zhuqing X. et al. [2018] conducted a survey in which 119 validate questionnaire were collected via questionnaire method to explore the influence of game loyalty. The results displayed that both the social experience of consumer and game design of operator promotes their loyalty. In this paper, social experience has an effect on game loyalty and trust has on the influence of the game design. Addition to this, gender plays an important role in which if women have trust on their teammates and game operation then they will have more loyalty on game. Moreover, women have more influence compared to mean on this aspect.

- **Anurag Sharma et al., [2018]** investigated therelationship between Android based game intervention called SOCH FaceID to the face identification skills in the children with autism spectrum disorder (ASD). SOCH FaceID offers the participants to practice face identification and memory enhancement skills. SOCH FaceID includes three games. The study shows that the face identification ability of the participants increases if they practice with face matching and remembers faces in SOCH FaceID. The results showed that the memory skills and face identifications skills of the Research Scholars improved who received game intervention.

- **M.Dagdee et al [2019]** discussed the rise of PUBG (Player Unknown's Battlegrounds) game among children's and along with this author also discussed various marketing strategies which are applied behinds its success. The PUBG game is released in December 2017 and it has attained massive success all over the world in short time span. Moreover, PUBG is the world's fifth-most selling video game all over the world. The main objective of this research is to understand the process which makes PUBG success in a short period of time along with examining the marketing strategies used by the PUBG Corporation for its success. The Research Methodology which is used in this research is Research Questions and Research objective. The author has done Qualitative data analysis process for PUBG game. In the end, author has concluded that the main reason for rapid rise and success for PUBG video game is the implementation of various marketing strategies by the developers, social media and live streaming. This marketing strategy not only enabled developers to overcome the limited financial resources but also earned them viral success and fame.

- **Z. Xu et al [2019]** discussed the study on various influence factors of college Research Scholar's loyalty in PUBG game. In this author has done survey for collection of data and validated 119 questionnaires with use of questionnaires methodology for exploring the influence of PUBG game loyalty among Research Scholars. The result which was analyzed by author is that the operator game design and consumer social experience are two main things that promoting

PUBG game loyalty. However, it is also analyzed that Trust factor has also some intermediary effect on the PUBG game influence of social experience and game design on PUBG loyalty. Along with this, it is also analyzed that the gender also plays an important role in the relationship between loyalty and trust such as more the trust of women in teammates the more their loyalty on the PUBG game. At the end of the research it is concluded that in PUBG game women have a stronger influence as compared to the men.

- **M. Mamun et al [2019]** discussed thePsychosocial Impact of Extreme Gaming on Indian PUBG Gamers. It is analyzed that online video gaming is one of the selected leisure time activity by youth. The author has stated that the use of video gaming has some positive benefits which include educational, medical, cognitive, therapeutic and health. However, author has also stated that the use of extreme gaming or addictive gaming has some various negative impacts such as no dedicated studies, Exam failure, running away from home, Hospitalization, Drinking acid instead of water by mistake, Suicide attempt, Suicide, Death, and Death by train. It is also analyzed that currently there are 100 million users have downloaded the PUBG mobile from Google play store and it has 30 million daily active users. The research methodology used by author in this research is market search survey in which author has conducted survey among 1047 Indian gamers. It is analyzed that the PUBG is most played game in India about 62% as compared to other games like Free Fire (21%) and Fortnite (8%).

III. GALVANIC SKIN RESPONSE

When we are exposed to emotionally loaded images, videos, events, or other kinds of stimuli weather its positive or negative, our skin gives a lot of information on how we feel. Whenever we are emotionally aroused i.e. happy, sad, stressed, nervous, fearful or surprised, the electrical conductivity of our skin changes. Galvanic Skin Response (GSR) is one of the most delicate measures for emotion arousal. GSR also referred to as Electro dermal Activity (EDA) or Skin Conductance (SC). To know how GSR works, we need to have a look on the physiological

characteristics of the skin, which is the largest organ of human body.

- Skin acts as a protective barrier which separates our body from the environment and protects our body organs from the environments impacts such as temperature variations, radiations, chemical agents, pressure etcetera.
- Our body temperature is controlled by the skin by regulating emission of sweat, goose bumps and peripheral blood circulation.
- Skin is an extensive network of nerve cells which can detect any change in the environment on the activity of the receptors for temperature, pain and pressure.

Our body contains millions of sweat glands whose density varies across the body. Sweat glands are being highest on cheeks and forehead, fingers and palms and as well as on the sole of feet. Whenever the sweat glands are triggered and becomes active, they secret moisture through the skin pores. Variation in the balance of the positive and negative ions of the secreted fluid results in the flow of electrical current more readily which results in the measurable changes in the skin conductance. When the skin conductance increases, the skin resistance decreases. The emotional experience triggers the change in the arousal level which ultimately increases the sweat secretion and our heart beat increases and our hands become sweaty.

Fig 1: Basic Emotions

A. USE OF GSR SENSOR

Use either SI (MKS) or CGS as primary units. (SI units are strongly encouraged.) English units may be used as secondary units (in parentheses). **This applies to papers in data storage.** Forexample, write "15 Gb/cm^2 (100 Gb/in^2)." An

exception is when English units are used as identifiers in trade, such as "3½-in disk drive." Avoid combining SI and CGS units, such as current in amperes and magnetic field in oersteds. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity in an equation.

The SI unit for magnetic field strength H is A/m. However, if you wish to use units of T, either refer to magnetic flux density B or magnetic field strength symbolized as $\mu_0 H$. Use the center dot to separate compound units, e.g., "A·m^2."

With minimum preparation time skin conductivity is recorded by placing two electrodes on the fingers of preferred hand. Generally, GSR sensors have a 1cm ² measurement sites which is made up of Ag/AgCl which is placed in the patch sticker or on straps. The logic behind GSR is easy:

i. Place the two electrodes on the emotionally sensitive locations of the body which can be either fingers of non-preferred hand of soul of the feet. Generally, placing the electrodes on the fingers is more preferable.

ii. Apply a low constant voltage.

iii. Measure the voltage difference between two electrodes.

iv. Report the affiliated skin conductance.

Although GSR can be acquired with sampling rates up to 2000Hz, low sampling rates are sufficient. High sampling rates are essential if the same device gathers GSR and other physiological parameters such as heart rate, brain signals etcetera.

Fig 2: GSR Sensor Attached to Non-preferable Hand

IV. PUBG

PUBG stands for Player Unknown's Battlegrounds which was released on 23rd March, 2017. It is online multiplayer battle game developed and published by PUBG Corporation. It is currently much admired game especially among youngsters. It is considered as one of the best-selling and frequently played video game s of all the time.

In PUBG, players can play in two different modes i.e. **arcade mode** and **classic mode**.

a. In **arcade mode**, there are distinct modes available to play i.e. small war, sniper training etcetera.

b. In **classic mode**, player can choose any map of his/her choice from three different maps to play. The names of the maps are Shanhok, Miramar and Erangel. In classic mode, 100 players can play the game and the mission is of 30 minutes only. When the mission is completed, the player is awarded with **Chicken dinner and othermedals**. If the player dies in a short time,he will get **too soon medal**.

c. There are surplus of guns, clothes, health kits, bandages granites and many more which are utilized by the players to play the game.

During the fight, the players takes parachute from an airborne machine to reach the island of 8X8 kilometers, 6X6 kilometers and 4X4 kilometers in size. The player requires to quickly determining the best time to eject and parachute on the ground and then continue spreading when they reach the island. After that players search for an offensive weapons so that they can defense against the enemy weapons and continues to survive till the last alive.
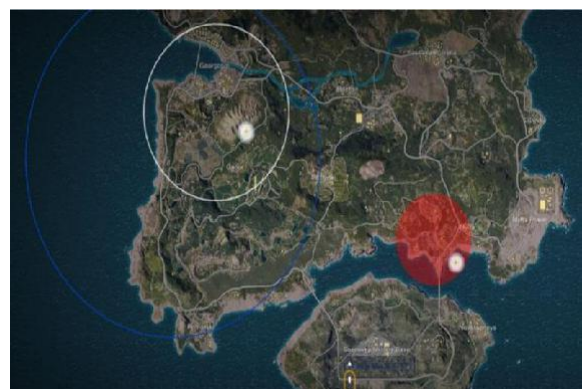
Fig 3: PUBG MAP [4]

V. STUDY

Participants played a video game called PUBG which is most popular game among youngsters. For this experiment some participants were average

game players and some of the participants were considered as expert in the video game.

A.) PROCEURE

Participants were tested individually and their stress level in calm state was evaluated. The purpose of this study is to evaluate different media by using GSR measurement. Finger electrodes were placed on their two fingers of the non-dominant hand which was left hand for each subject. The participants were between the age of 18 to 24 who played video game for the experiment.

The GSR sensors were attached properly to the fingers and it was checked that the cables were not dangling loosely. After this, GSR was plugged directly to the laptop by the use of USB.

B.) TASKS AND MEASUREMENTS

The players played PUBG in two different modes i.e. Arcade mode and Classic mode. Both the modes were played for 10 minutes. In Arcade mode, once the player is being shot by the opponent or enemy, he will re-enter the same game. But in classic mode, once the participant is being shot by the enemy, he is out of the game.

The subjects were 6 participants ranging in age from 18-24 years. The subjects were average game player who played PUBG once or twice a day. The subject was informed about the experiment's aim. Skin conductance of the participants was recorded with GSR logger sensor NUL-217. To play the game, players used their mobile phones so that they will be comfortable while playing the game. The experiment was performed in a sound proof room. The readings were taken with the help of Neulog software on PC.

Fig 4: Sample rate of subject during game play

The objective data was collected for both gaming modes for all the players. We have used GSR to calculate the skin conductance of each participant. The experiment was carried out between 0-1-

microsimens. All the physiological data was recorded using the same software with same sampling rate i.e. 20 samples per second.

Initially, the calm state of the subjects was measured for 10 seconds.

Figure:5
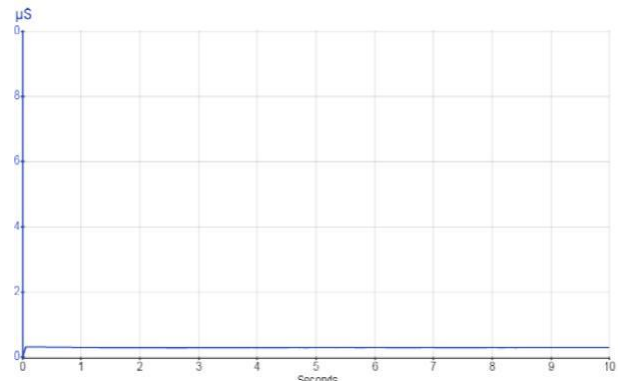
As each person has its own arousal level, the calm state of each person will be different. After that, each player played Arcade mode for 10 minutes which is followed by classic mode. The duration of participant playing the classic mode depends on whether the participant is being shot by the enemy or not.
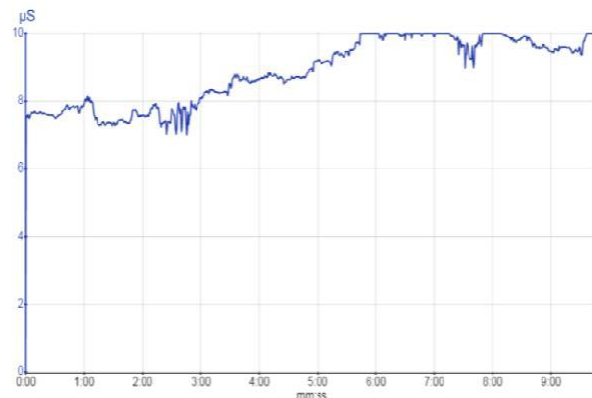
Figure:6

C.) DATA PREPROCESSING AND FEATURE EXTRACTION

As all the physiological information was recorded using Neulog Software, All of the data was recorded at a similar examining rate. Data from GSR sensor was plotted to check on the off chance that it was right. The GSR information was amazingly loud since it was put in the hand holding the controller, which was always moving and shaking while at the same time playing.
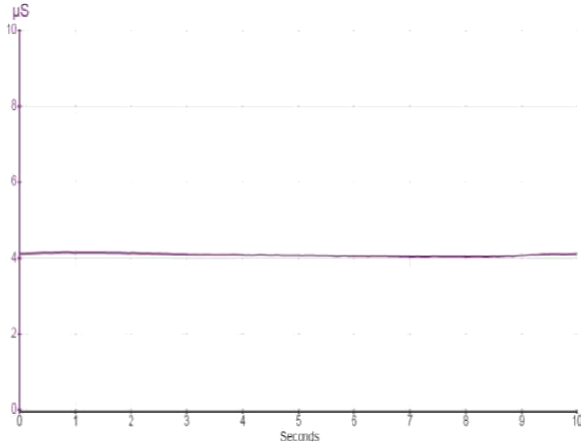
Fig 7: Graph obtained for Calm State

VI. RESULTS AND DISCUSSION

After game played we looked at the physiological signals and non-verbal behavior indicators in solo, play modes for co-located gaming. The significant correlations of HR between players during the solo mode demonstrate a clear arousal increase when playing. The strong correlation of the normalized mean HR in the solo mode shows that the arousal level in this mode is related. Basically two types of subjects were taken for the experiment in which some of the subjects are averaged player in PUBG and some of them were experienced as they were played daily in their routine.

The same game procedure was used to analyze GSR.

The result of 6 subjects showed that the arousal level of each participant is different. In our study, we measured that the arousal level of Research Scholars is different modes. The results shown in figure shows that the arousal level of participant is more in Classic mode as compared to Arcade mode. The figures given below are the comparison of arousal level of two subjects. Figure 1 is graphs obtained for a player A in different modes, who played PUBG after months and figure 2 is graphs obtained for a player B who plays PUBG on daily basis.

Fig 8: Player A Clam Mode

Fig 6(b): Player A Classic Mode
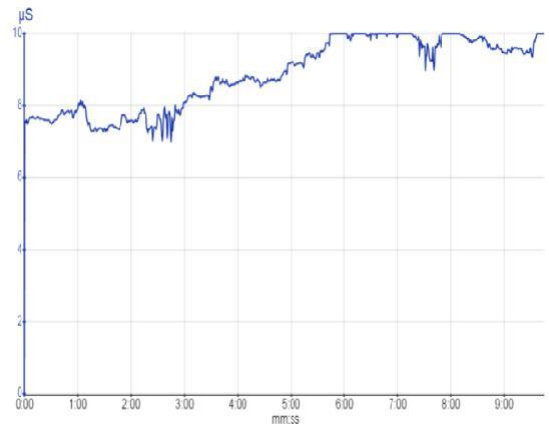
Fig 6(c): Player A Arcade Mode

The arousal level of player A for calm mode is between 0.3-0.2 µS whereas for the Classic mode, it is between 7.5-9.9 µS and for Arcade Mode it is between 0.2-7.7 µS. The figures shown below are the arousal level of player B who plays PUBG regularly.
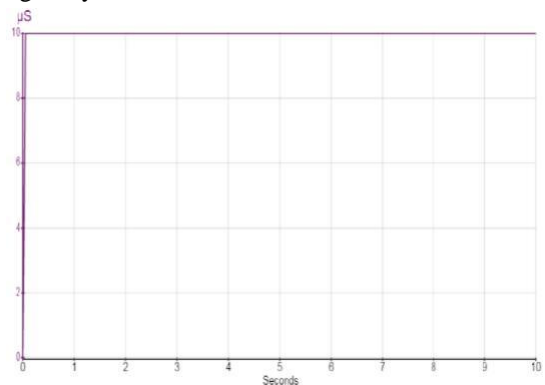
Fig 9: Player B Calm Mode
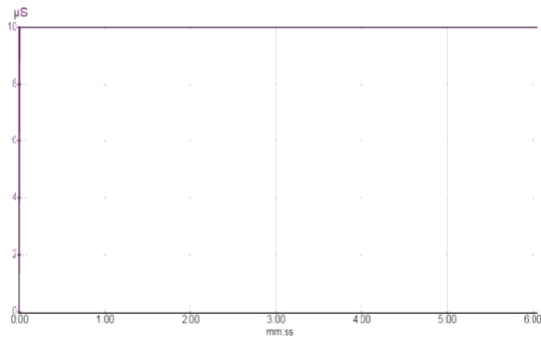
Fig 10: Player B Classic Mode
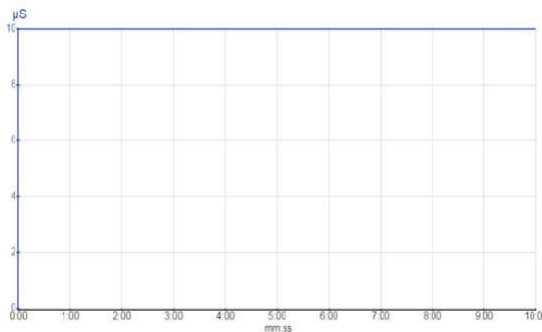
Fig 11 : Player B Arcade Mode

The arousal level of Player B for calm mode is 9.99µS, for Classic Mode it is 9.99µS and for Arcade Mode it is again 9.99µS. By comparing the data acquired for two subjects, we can clearly see that the player A who rarely plays PUBG has lower arousal level as compared to the Player B who played PUBG regularly.

VII. CONCLUSION& FUTURE SCOPE

GSR easily captures the non-intrusive physiological signals which indicate the nerve response as a parameter of sweat gland function. It is used to evaluate the affective stress level of a person and its arousal level. As the arousal level increases, the sweat glands secret more sweat whose conductance is measurable with GSR sensor. This study shows that we can depict the stress level among youngsters while playing PUBG and its effects on their mental health. In PUBG, as the obstacles increases, there is increase in the arousal level of the person and hence frequency increases. By proper placement of electrodes on the fingers, we can obtain a good quality of signal.

In this paper, we have physiological signals as an indicator of calm state and Arcade and Classic mode. There is a significant difference between calm state and two modes. In Arcade and Classic

mode, there is significant rise in the arousal level as compared to calm state. All the data is recorded by GSR. However the data should be recorded carefully as GSR data can be affected by fluctuations cause by dangling wires or other appliances.

The approach to identify the arousal and valance level only from GSR is a challenging task. The study can be extended by using ECG in which heart rate variability (HRV), respiration temperature, respiration interval can be taken in order to attain more efficiency and to study the impact of different modes on subjects' heart rate.

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Comparison & Performance Evaluation of Several Types of ECG Compression Techniques

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Abstract - ECG compression reduced the storage to develop a telecardiology system for diagnosis & analysis of cardiac. In this paper ECG signal compression is based on the different compression techniques such as Discrete Cosine Transform (DCT), DCT2 & DCT3 , Fast Fourier Transform (FFT), Fast Fourier Transform (FFT2), Discrete Cosine Transform (DCT), Chirp Z Transform (CZT) & Complex cepstral analysis After the compression of ECG signal we compare each technique one by one. These techniques are tested from ECG Signal with different data obtained from MIT-BIH arrhythmia database. The Experimental results show that the FFT signal compression is better in the terms of CR, PRD, QS and SNR.

Keywords —Electrocardiogram. ECG Compression, Compression Ratio, Discrete cosine transform, Fast FourierTransform, Discrete Cosine Transform.

I. INTRODUCTION

The electrocardiogram is a graphical recording and representation of electrical signal which is produced from the heart. Electrocardiogram (ECG) is valuable method that is utilized as a demonstrative tool for cardiovascular maladies [1]. ECG signal is generally utilized as a crucial method for the identification and diagnosis of heart issues in the world. ECG is the record of changes that occur in bioelectric potential with relevance time on the grounds that the human heart pulsates unfailingly. It gives significant information with respect to the reasonable parts of circulatory system.[2] Since ECG is the most regularly recorded signal for the patient checking and assessment process, it is critical to be dependably and rapidly identify the cardiovascular issue. ECG can be recorded effectively with the assistance of surface terminals on the appendages or chest. It is viewed as an representative signal of heart physiology, helpful in diagnosing cardiovascular arrhythmia [3]. Arrhythmia is a typical term for any heart beat that varies from ordinary heart rhythm [4]. ECG graphical demonstrates the electrical movement of the heart for the human. ECG signal has been likewise utilized in transmission for observing. For transmission of enormous ECG signal, it is fundamental to compress or decrease the size of signal.

II. HUMAN HEART ANATOMY

Heart might be a solid organ that pumps blood to the total body through circulatory frameworks. It gets the polluted and deoxygenated blood through the veins and siphons it out to the lungs for filtration. Heart is situated inside the thoracic cavity medial to the lungs and back to the bosom bone[5]. Fig. 1 shows the blood multidimensional language of the human heart. The left and right atria are inside the higher assembly of the heart though left and right ventricles are in lower chamber of the guts [6].
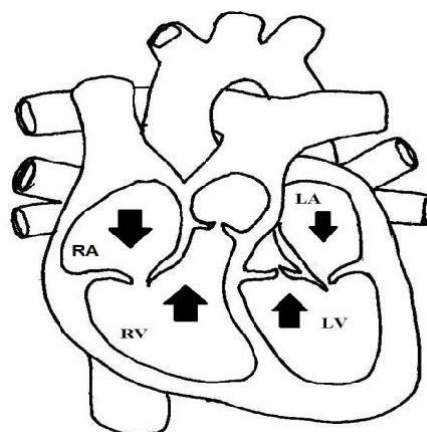
Figure 1 - Structure of Human Heart

III. ELECTROCARDIOGRAM SIGNAL

Cardiography is the recording of electrical manifestation of the contracted activity of the heart in our body. The rhythm of the center (Heart) is

calculable simply as beats per minute (bpm) by numeration the promptly recognizable wave. Any disorder within the regular rhythmic activity of the center or variation within the morphological pattern is termed as heart condition. the everyday ECG signal is illustrated in Fig. 2. ECG signal consists of P wave, QRS complicated, T wave and U wave that contains the helpful data concerning character of malady afflicting the heart [7]. The human vascular system consists of heart, lungs and arteries at the side of veins. One oscillation of graph signal consists of the P wave QRS at the side of T waves. P wave represents depolarization and

therefore the QRS represents chamber depolarization. T wave represents fast repolarization of the ventricles. The QRS is that the most important half within the graph thanks to its high amplitude compared to P and T waves. In today's world despite vital in heart condition remains a significant concern and is one among the common causes of death in patients. Given the importance of this issue, today, in advanced societies, attention is increasingly paid to medical instrument systems. The task of these systems is to receive a patient's heart signal and send it to the hospital for a fast assessment of the patient's condition. An cardiogram is a crucial parameter that measures patient health and reports if there's a failure.
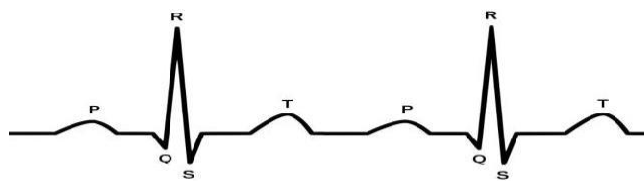
Figure 2 – Mechanism of ECG Signal

IV. ECG COMPRESSION

Electrocardiogram (ECG) compression reduced the storage needs to develop a lot of economical telecardiology system for analysis of the signal and diagnosing. The ECG compression while not loss of diagnostic info relies on terribly actual fact that consecutive samples of the digitized ECG carry redundant info that may be removed with very less computing effort. The non-invasive extraction of physiological and clinical info hidden in medicine signals is a very important and engaging field of analysis. The graph of ECG may be a non- stationary signal containing info regarding the physiological state of the heart. In ECG compression data are analyzed and compressed in time domain directly[8]. Discrete cosine transform (DCT) [9] is commonly for ECG signal compression [10][11]. In medical science data compression plays its application in many fields. ECG is one of the best parameter that shows human's health and also reports abnormalities

in ECG signal. In the past years, several research techniques developed for compression of the ECG signal. Thus, the need for ECG compression techniques is great importance now days. ECG compression methods are classified as two types that's are lossless and lossy. [12] In the case of lossless method, compressed signal is reconstructed in exact form of original signal but in lossy method; compressed signal is reconstructed with some error in a ECG signal. So there are following methods. [13]

- **Direct Time-Domain Techniques**

- **Transform-Domain Techniques**

- **Parameter Extraction Techniques**

We used transform domain technique for ECG signal compression. Because this technique is based on ECG compression which are performed by the application of linear orthogonal transformation to ECG samples.

The algorithm for ECG signal compression is shown in fig 3. Firstly ECG signal is loaded in the system & sampling of signal has been done. After the sampling of signal main compression technique is applied to ECG signal. Filtering is used to remove unwanted data from ECG signal. After that Huffman coding is applied for lossless compression data. For the decompression of signal the inverse Huffman coding is apply. The final step obtained from inverse of used ECG compression techniques & resultant ECG signal display.
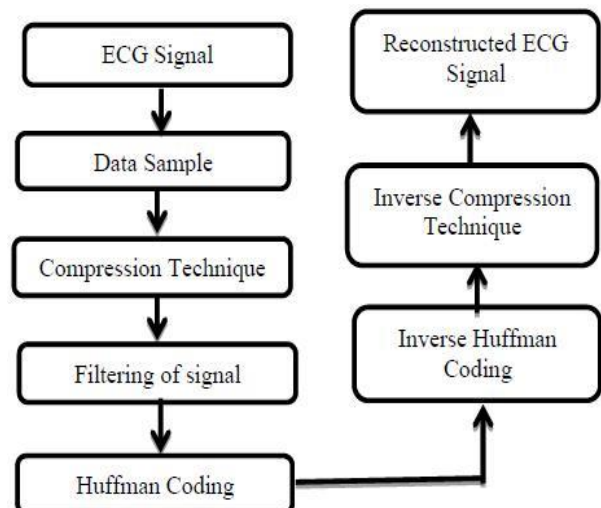
Figure 3 - Block Diagram of ECG compression

V. PERFORMANCE EVALUATION

The Performance Evaluation of an ECG compression technique that be justify by its

compression efficiency of signal and error criterion of the signal. These parameters shows the ability of compression technique to reconstruct the ECG signal and to preserve the relevant information of ECG signal. To verify reconstruction of the signal quality following parameters are used [14][15].

A. Compression Ratio (CR)

Compression Ratio is defined as the ratio of the original ECG signal size and compressed signal size. The CR provides information about of compression algorithm that removes the redundant data from a given signal. Higher the CR leads to the less number of bits required to store or transmits the ECG data. CR can be defined as

$$CR = \frac{B_0}{B_C}$$

Where, *B0* is the total number of bits required to represent original signal and *Bc* total number of bits required to represent compressed data of the signal.

B. Percent root mean square difference (PRD)

It measures the degree of distortion of signal between the reconstructed signal and original. PRD is defined as follows.

$$PRD = \sqrt{\frac{\sum_{i=1}^{n}(x_i - x_i^r)^2}{\sum_{i=1}^{n} x_i^2}} \times 100$$

C. Quality score (QS)

Quality score is the ratio of CR and PRD. QS is very important Performance Evaluation parameter that is used to examine the best compression method of ECG analysis. QS is defined as follows.

$$QS = \frac{CR}{PRD}$$

D. Root Mean Square Error (RMS)

Root mean square error measures the distortion with the sample size of signal. it is defined as follows.

$$RMS = \sqrt{\frac{\sum_{i=1}^{n}(x_i - x_i^r)^2}{N - 1}}$$

E. Signal to Noise Ratio (SNR)

Signal to noise measures the noise in decibel (DB) scale. A very some noise in a signal is introduced due to compression & decompression of signal. it is defined as follows.

$$SNR = 10 \times \log\left(\frac{\sum_{I=1}^{N}(x_i - x)^2}{\sum_{i=1}^{N}(x_i - x_i^r)}\right)$$

VI. COMPRESSION METHODS

Compression methods plays a very important role for the compression of ECG signal. In this paper, 8 compression technique are used to calculate compression ratio (CS) & other useful parameters. These compression techniques are follows.

A. Chirp Z Transform

The chirp Z-transform (CZT) is a technique of the discrete Fourier transform (DFT). DFT samples the Z plane the unit circle at uniformly-spaced points , it samples spiral arcs in the Z-plane, corresponding to straight lines in the S plane.

$$X_k = \sum_{n=0}^{N-1} x(n) z_k^{-n}$$

B. Complex cepstral analysis

Complex cepstral analysis is also known as CCPS technique. This technique is very basic & nonlinear signal processing technique used in ECG compression. It has many applications in areas such as speech and image processing.

C. Discrete Cosine Transform

The Discrete Cosine transform (DCT) has been widely used in ECG compression. It has energy compression and good correlation relation for ECG data. It describes the reduction power, in which the main signal can be reconstructed with just some coefficients It has limited sequence of a cosine function that oscillates at different frequencies. It is like a DFT that converts the any signal from the spatial domain to the frequency domain. It compressed can be restored to a limited number of DCT coefficients. It has discrete signal f (u),=0, 1, …, N-1 is defined as follows DCT constraints have greater distortion within the reconstruction signal. Where u = 0 ,1 2, 3, 4…N-1

$$f(U) = w(u) \sum_{x=0}^{N-1} f(u) \cos\left(pi(2U+1)x/2N\right)$$

D. Discrete Cosine Transform 2 (DCT2)

DCT is most commonly used in ECG compression technique . DCT2 also referred to DCT technique. DCT2 transform is equivalent to DFT of their real input values. It states the boundary condition in which x_n is even to n= -1/2 & even around to n=N-1/2; x_k is also even to k=0 & odd around its K=N. Where u = 0 ,1 2, 3, 4…N-1

$$x_k = \sum_{n=0}^{N-1} x_n\left(pi/N\left(n + \frac{1}{2}\right)k\right)$$

E. Discrete Cosine Transform 3 (DCT3)

DCT3 is known as the inverse of DCT2 that leads to scale factor. It is also referred as the inverse DCT. In this some authors divide the term x_0 with $\sqrt{2}$ &n then multiply the matrix with scale factor. We can say they DCT2 & DCT3 are transposes of one another so that makes the orthogonal matrix for DCT3. But DCT3 breaks the correspondence with DFT of half output. It states the boundary condition in which n=N; x_k is even to k=-1/2 & odd around its K=N-1/2.

$$x_k = \frac{1}{2} x_0 + \sum_{n=0}^{N-1} x_n\left(\frac{pi}{N}n\left(k + \frac{1}{2}\right)\right)$$

F. Discrete Sine transform

The Discrete Sine transform (DST) is known as Fourier transform. It is similar to a Discrete Fourier transform (DFT) & also known as orthogonal, but its parameters are occurs using a realistic matrix of data. As we know a discrete sinusoidal transform (DSTs) is expression of a signal based on the sum with domains and frequencies. That DST works in a limited number of discrete dots. The main difference between DST and DFT is that they uses only sinusoidal functions, while Fourier uses both the sinus and the cousin. However, this difference leads to result of a deeper distinction: DST has different boundary conditions.

Where u = 0 ,1 2, 3, 4…N-1

$$x_k = \sum_{n=0}^{N-1} x_n \sin\left(\frac{pi}{N+1}(n+1)(K+1)\right)$$

G. Fast Fourier Transform (FFT)

Fast Fourier Transform (FFT) or the Discrete Fourier Transform (DFT) is used to identify the sequence data & often used to identify peaks in various signals. In FFT the main frequency domain conversion is performed from the time domain by using the Fast Fourier Transform Algorithm (FFT). FFT techniques may believe that gives accurate results for the data. By using it we can obtain the frequency of the given signal domain.

Where u = 0 ,1 2, 3, 4…N-1

$$x(k) = \sum_{n=0}^{N-1} x(n) e^{-j2Pink/N}$$

H. Fast Fourier Transform 2 (FFT2)

FFT2 is two dimensional discrete fourier transform. It mainly returned the value of x that computed with FFT. FFT is also known as 2D (two-dimensional) fast fourier transform.

VII. RESULTS AND DISCUSSION

For the performance of ECG compression all 8 techniques are applied with 5 data collected from MIT-BIH database. In this paper MIT-BIH arrhythmia database are used. By using the performance parameters such as CR, PRD, QS, RMS & SNR. We are mainly focus on Compression ratio (CS) for ECG signal. For the algorithm of ECG signal, Firstly, we taken the raw ECG signal from MIT-BIH arrhythmia database. The procedure algorithm for ECG data compression as shown in block diagram 3. Secondly, we calculated the time & frequency samples from ECG signal by using all eight techniques. Then we apply the main compression (such as CZT, DCT etc) technique. Then we check coefficients before & after compression. Then increment the condition according to their signal data samples. Higher data samples can adjust to zero size. It reduces the

unwanted data ECG data. After we calculate inverse compression (such as CZT, DCT etc) technique and plot the result & calculated all performance parameters.

The compression ratio of FFT is achieved more if we compared to others compression technique. The procedure of DCT compression is same as that of figure 5. We follow the same procedure as shown in figure no.4.
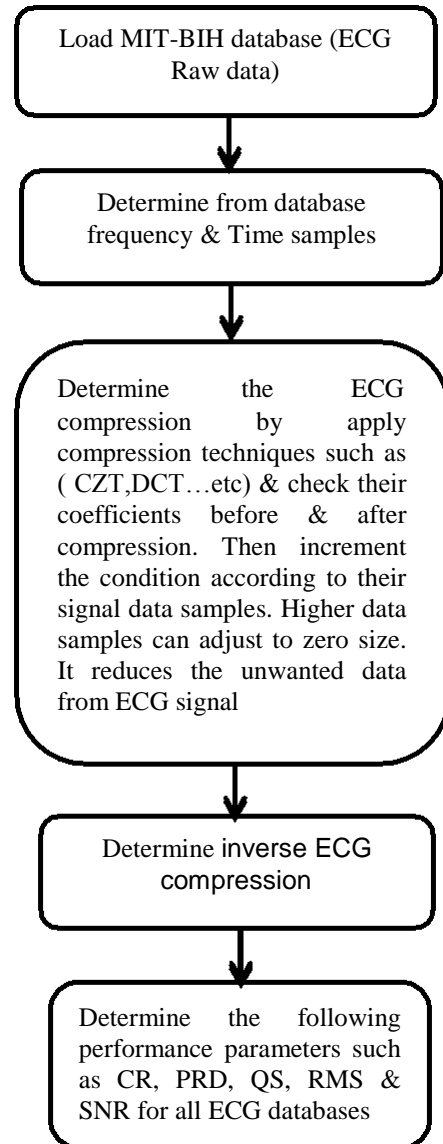
Figure 4 -Block Diagram Procedure of ECG Compression

The resultant signal of DCT compression as shown in fig 5.In figure 5 the above image shows the original ECG signal & that ECG signal compressed using DCT. The compressed signal of ECG as shown in figure 5. This shows the signal has no unwanted signal & redundant terms has been removed. In a given result P,Q,R,S & T waves can clearly see. The peaks of R wave is high as shown in fig 5.

If we compare database 202 it also shown that FFT pressed as compared to DCT as shown in figure 5. Same records taken of DCT & FFT for compression the pecks (R wave) of DCT compress are rough (according to graph). Mathematical result Shows that DCT signal of ECG is less compressed is same in ECG signal. Graphically it is shown that

If we compare DCT compression result with FFT compression. We can easily see FFT compression result is far better than DCT compression result. The procedure of FFT signal is same as shown in block diagram 3. The signal of FFT compression is more compressed as compared to DCT as shown in figure 5. Same records taken of DCT & FFT for

compression is same in ECG signal. Graphically it is shown that the pecks (R wave) of DCT compress are rough (according to graph). mathematical result Shows that DCT signal of ECG is less compressed as compared to FFT signal compression. If we compare database which we have taken from MIT-BIH. The resultant compress value of DCT for database 201 is 93.11 Which is not greater value than if we compare it with FFT Compression. The resultant compress value of FFT for 201 Database is 96.75 which is more compressed value as if we Compare it with DCT compression. If we compare database 202 it also shown that FFT signal compression is more.
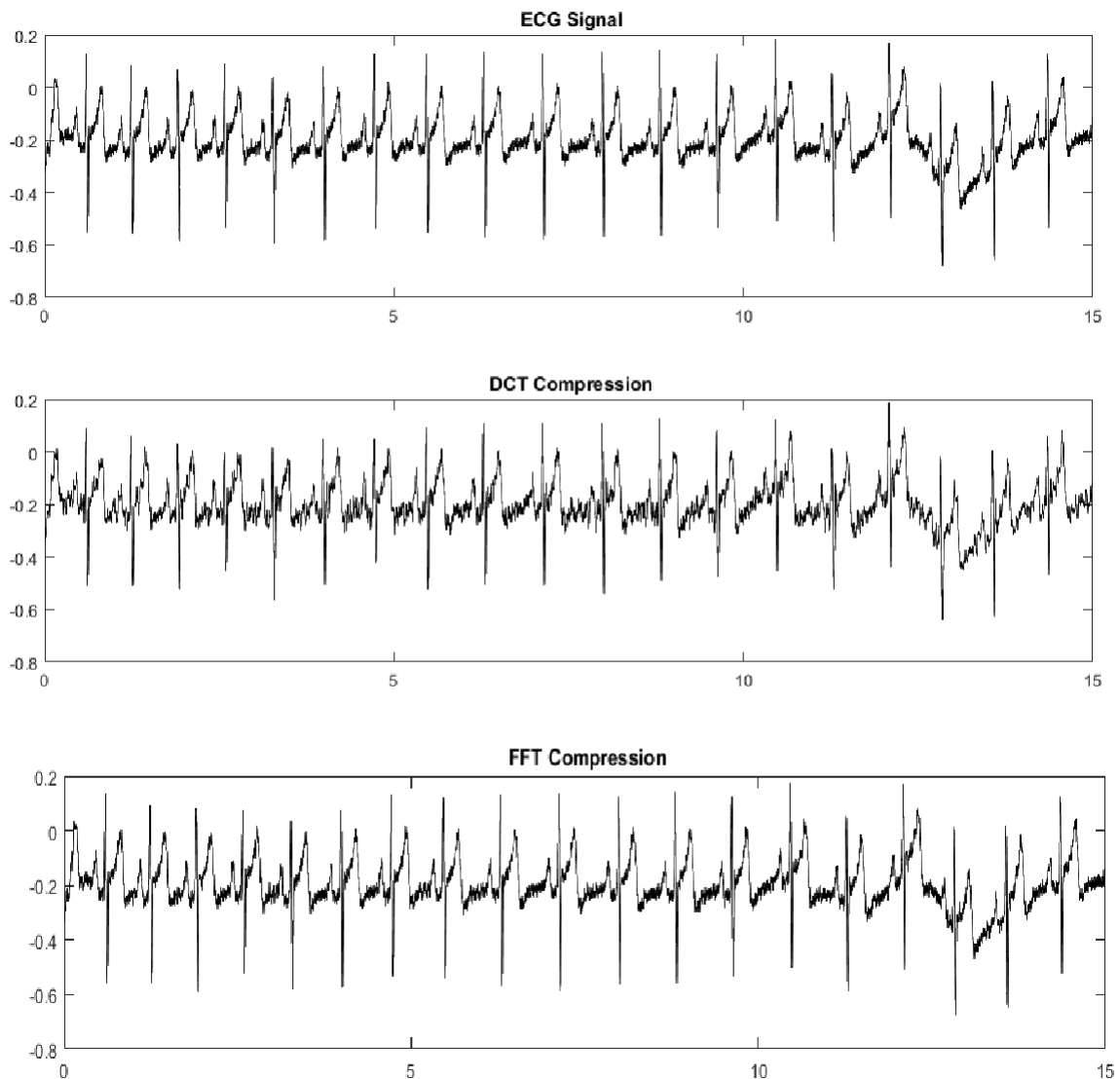
Figure 5 - DCT & FFT Compression

Here is the resultant mathematical table of DCT signal compression . All the databases used same for all the tables.

Table 1 - DCT Performance parameters

Data	CR	PRD	SNR	QS	RMS
201	89.11	7.40	52.00	12.03	1.20
202	89.25	9.77	46.38	9.11	0.99
205	96.41	4.04	64.13	23.83	1.18
207	89.16	4.59	61.56	19.38	1.27
208	91.08	5.40	58.32	16.32	1.14

From Table 1 it is shown that the compression ratio (CS) for database name 202 is more as compared to others databases showed in the table. Percent root mean square difference (PRD) is less for database 205. Next table, no. 2 showed the

Table .2 - DCT2 performance parameters

Data	CR	PRD	SNR	QS	RMS
201	93.11	13.93	39.21	6.71	2.27
202	93.46	20.69	31.67	4.41	2.09
205	89.16	6.38	54.67	15.59	1.87
207	92.61	7.59	51.78	2.18	2.11
208	92.88	9.03	48.02	10.39	1.90

From Table 2 it is shown that the compression ratio

(CS) for database name 205 is more as compared to others databases showed in the table. Percent root mean square difference (PRD) is less for database 207. Next table, 3 showed the DCT3 performance of signal.

Table 3 - DCT3 performance parameters

Data	CR	PRD	SNR	QS	RMS
201	81.66	115.20	-	0.70	18.85
202	32.36	278.56	-	0.063	37.37
205	79.43	100	-	1	29.30
207	29.33	168.32	-	0.17	46.79
208	23.76	217.47	-	0.04	45.96

From Table 3 it is shown that the compression ratio (CS) for database name 201 is more as compared to others databases showed in the table. Percent root mean square difference (PRD) is less for database 205.

The performance of DCT,DCT2 & DCT3 are different for all databases. It states that DCT has better than DCT2 & DCT3. Next table 4 showed the FFT performance of signal.

Table 4 - FFT Performance parameters

Data	CR	PRD	SNR	QS	RMS
201	96.75	29.99	23.14	3.22	4.88
202	96.36	42.19	15.29	2.28	4.27
205	98.16	7.67	51.67	13.59	2.21
207	95.13	15.71	36.76	6.05	4.36
208	94.91	8.31	35.98	5.81	3.44

From Table 4 it is shown that the compression ratio (CS) for database name 205 is more as compared to others databases showed in the table. Percent root mean square difference (PRD) is less for database 205. Next table, no. 5 showed the FFT2 performance of signal.

Table 5 - FFT2 performance parameters

Data	CR	PRD	SNR	QS	RMS
201	76.13	10.30	45.53	7.46	1.66
202	81.61	12.73	41.05	6.40	1.29
205	85.35	2.60	72.92	32.68	0.76
207	74.08	3.93	64.67	18.81	1.09
208	77.25	14.31	38.66	5.39	3.02

From Table 5 it is shown that the compression ratio (CS) for database name 205 is more as compared to others databases showed in the table. Percent root mean square difference (PRD) is less for database 207. Next table, 6 showed the DST performance of signal.

Table 6 - DST performance parameters

Data	CR	PRD	SNR	QS	RMS
201	95.83	22.32	29.47	4.29	3.63
202	96.26	35.34	19.46	2.27	3.58
205	98.05	9.88	46.17	9.96	2.89
207	94.72	12.02	42.21	7.87	3.33
208	95.19	14.19	38.84	6.70	3.00

From Table 6 it is shown that the compression ratio (CS) for database name 205 is more as compared to others databases showed in the table. Percent root mean square difference (PRD) is less for database 205. Next table, 7 showed the CZT performance of signal.

Table 7 CZT- performance parameters

Data	CR	PRD	SNR	QS	RMS
201	68.39	-	-	-	-
202	67.16	-	-	-	-
205	78.25	-	-	-	-
207	53.65	-	-	-	-
208	21.06	-	-	-	-

Table 8 - CCPS performance parameters

Data	CR	PRD	SNR	QS	RMS
201	53.16	79.15	-	0.67	12.97
202	52.30	163.40	46.98	0.32	16.23
205	54.25	17.38	34.68	3.11	5.09
207	48.69	43.35	14.69	1.26	12.01
208	65..83	114.65	-	0.65	24.90

From Table 7 it is shown that the compression ratio (CS) for database name 205 is more as compared to others databases showed in the table. Next table 8 showed the Complex cepstral analysis performance of signal.

From Table 8 it is shown that the compression ratio (CS) for database name 208 is more as compared to others databases showed in the table. Percent root mean square difference (PRD) is less for database 207.
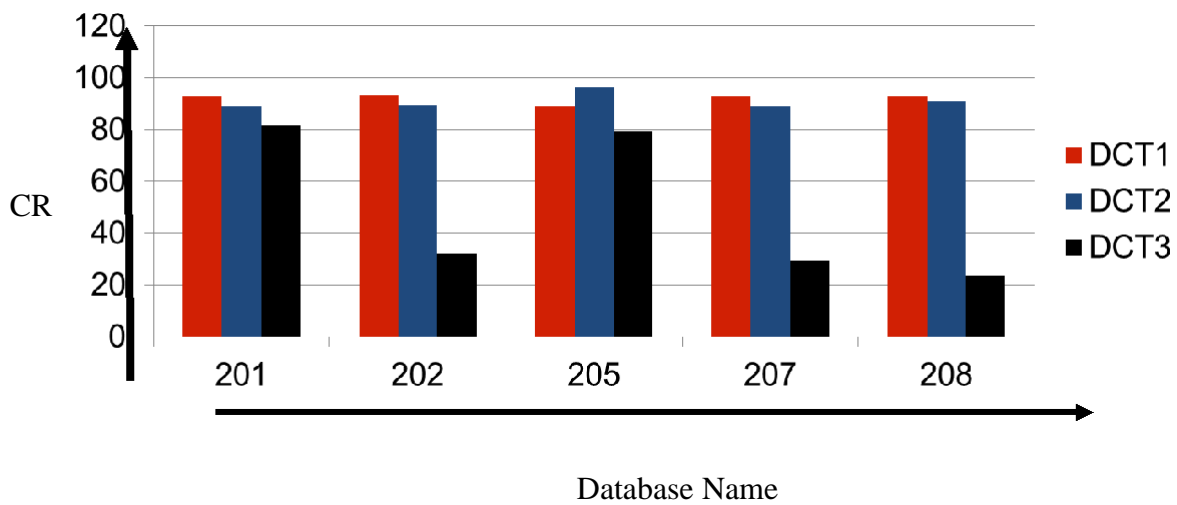
Figure 7 – Comparison of DCT1, DCT2,DCT3

Here in figure 7, we compare the DCT,DCT2 & DCT3. It states that DCT3 compression is less as compared to DCT & DCT2. The compression ratio of DCT2 & DCT3 approx. same.

The FFT has a high compression ratio as compared to FFT2. Figure 9 shows the comparison of all eight technique.
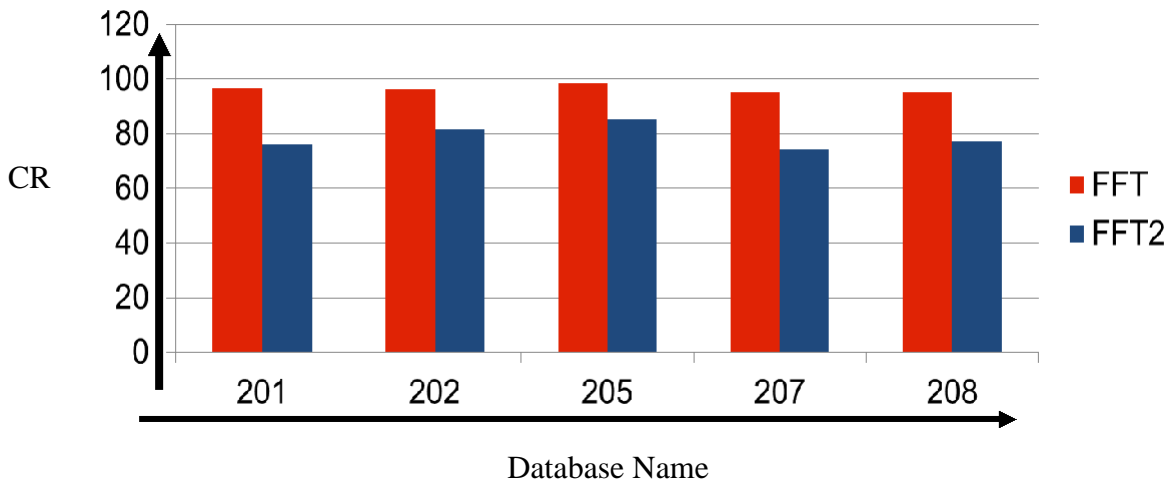
Figure 8 – Compression ratio analysis of FFT and FFT2
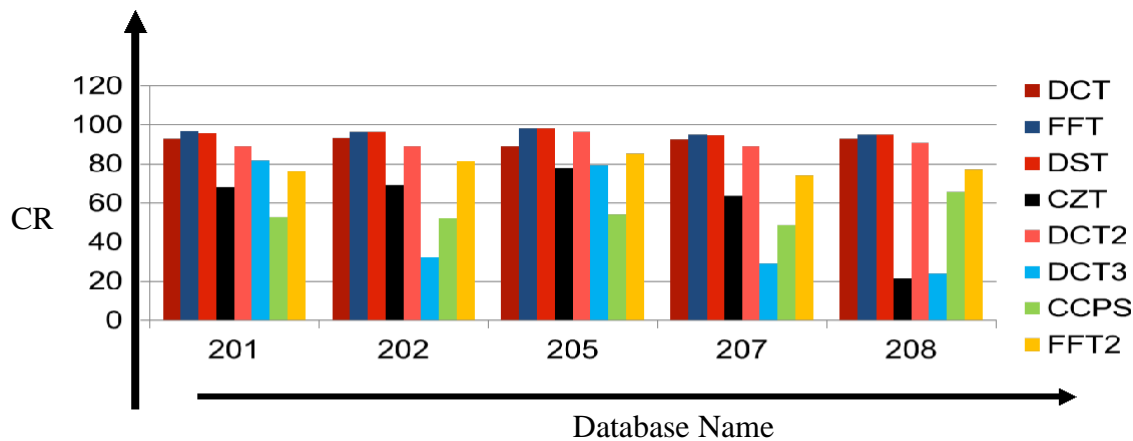
Figure 9 – CR graph of various compression methods
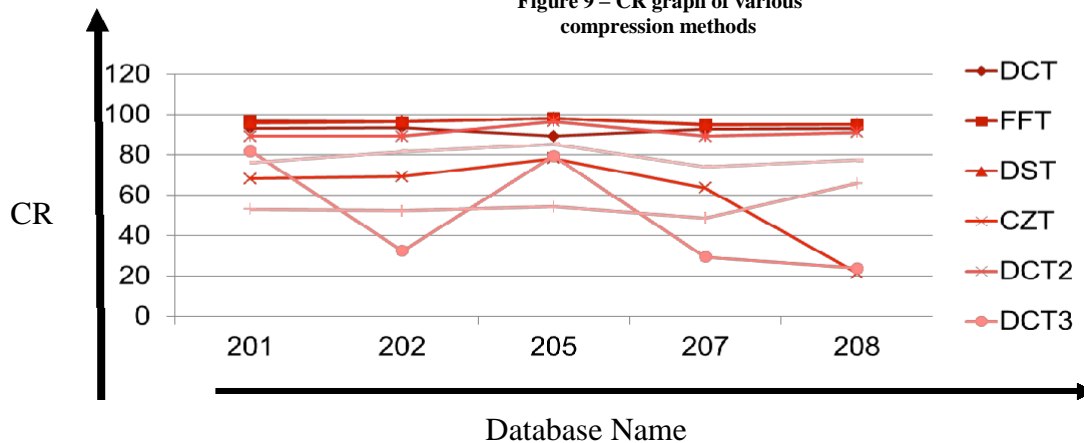
Figure 10 – Analysis of CR

VIII. CONCLUSION

In this paper, a detailed experimental analysis is presented on the basis of performance of several categories of ECG compression technique. From the result & discussion, it is clearly states that FFT signal compression is high as compared to other compression techniques. All the database is taken from MIT-BIH arrhythmia. We calculate performance parameters such as CS,PRD,RMS,QS & SNR. High compression ratio is achieved with the database 205 of 98.16 with the help of FFT signal compression. While other compression ratio are not properly obtained useful compression result. A less PRD states that less distortion of reconstructed signal from original ECG signal, But in future performance compression techniques can be reduce the value of PRD. Less PRD is introduced with database 205 of 2.60 with the help of FFT2 signal compression.

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Illuminating Surgical Keratoscope and Hierarchical Fuzzy Expert System for the Detection of Glaucoma and Cataract

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Abstract: Glaucoma and Cataract are eye diseases with common symptoms like, high pressure on eye, damage of optic nerves and sometimes loss of eyesight. Blindness occurs when left untreated that affects peripheral vision. Early diagnosis of glaucoma requires regular checkups which is too expensive and time consuming. This work proposes Hierarchical Fuzzy based decision constructed to overcome glaucoma and cataract at initial stage and a low cost Surgical Illuminating Keratoscope that was allocated to overcome the problems of irregular curvature of cornea, cataract surgeries and Penetrating keratoplasty. Hierarchical Fuzzy rule-based helps the medical practitioners to give accurate results by considering patients symptoms. The entire test performed on Hierarchical Fuzzy system and the usage viability of Keratoscope was done in presence of ophthalmologist, who further found these systems as precise and useful by comparing accuracy, sensitivity and specificity which results 97%, 98% and 96% respectively. This technique is efficient and having low computational cost.

Keywords: Glaucoma, Cataract, Hierarchical Fuzzy expert system, Graphical User Interface, Surgical Illuminating Keratoscope, Cornea.

I. INTRODUCTION

The therapeutic examination of any ailment is a big issue in today's world that needs engineering methods to access data. With new advances in medicinal engineering and other control frameworks that have been gained by the utilization of artificial intelligence Strategies [1]. This man made technology has made a vibrant exploration that includes artificial neural networks, genetic algorithms and Hierarchical Fuzzy logic. All these strategies are likely to give important data starting from one to other type and manage life threatening issues. The most accessible type of strategy that gives assistance and help to medical specialists in recognizing disease is the enhancement of the medical detection of result sustainment system [1].

The fundamental cause of glaucoma is the invariable failure of retinal Nerve fiber strata for the reason that of the expansion in the intra ocular weight inside the eyes. The capacity of these retinal nerve filaments is the change of perceived image in the form of signals to the brain, where these signs are perceived as object. Damage to these nerve filaments creates spots and these blind spots prompts to visual impairment [2]. Glaucoma is an infection this is hard to recognize in premature phase. There are quite a few ways to detect Glaucoma, as a example, some system are

Tonometry, Opthalmoscopy, Pachymetry etc. But these systems are expensive, tedious and needs High Skills [2]. Glaucoma will be: Open angle and Close angle Glaucoma. Open-angle glaucoma includes a wide purpose amongst IRIS and cornea which further referred to as wide angle glaucoma. And this is the reason experts needs more precise and less costly system to detect glaucoma in its early stage.

Cataract is directly related to lens. When clumps of protein are present on a lens then lens cannot able to pass the incoming light from itself. This causes blurriness in the front of a human eye. This process is reversible.

The effective use of the Hierarchical Fuzzy common sense has been applied for numerous applications. The most useful lies within the technique that analysts will display dubious, complex shape into simple human reasonable shape by method for using human information and acing as Hierarchical Fuzzy managing statute as set of etymological components [4]. The present paper brought up a pro structure by utilizing making use of Hierarchical Fuzzy framework to recognize Glaucoma and Cataract from its embraced aspect results. The precise pondering is settled by using understanding actualities set a report having 6 specific patterns. By using logical expert information Hierarchical Fuzzy guidelines are made

that can be made as a wellspring of determination making. The medicinal business using the field of man-made brainpower has productively moved from logical research focus to genuine projects. In this segment, laying out and upholding ramifications for examination of Glaucoma and Cataract by utilizing Hierarchical Fuzzy impedance system are intentional. In the wake of surveying the degree of accuracy, might be accomplished from clinical center records set. Using eight amounts of information parameters (signs) Hierarchical Fuzzy obstruction structures is made. The Hierarchical Fuzzy guideline based absolutely structure utilizes therapeutic expert certainties for knowing patient's pointers and conveys exceptional inclinations as with regards to norms are made.
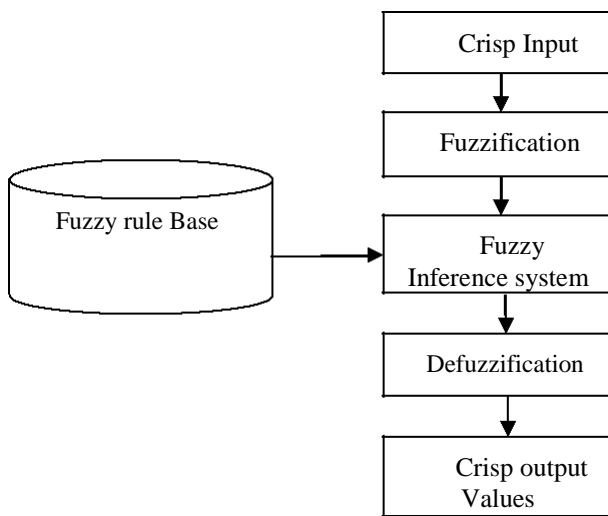
Figure 1 Hierarchical Fuzzy Expert System [5]

In the diagnosis of glaucoma eight parameters have been considered among which cornea is the one which is expensive to detect, that's why Surgical Illuminating Keratoscope is used which is a hardware device that solves the problem of irregular curvature of cornea and lens and is also cost effective. This is accurate method for the diagnosis and management of Corneal Refractive errors, Corneal Relaxing Incisions [6].

Figure 2 Surgical Illuminating Keratoscope [6]

A Surgical Illuminating Keratoscope is deployed to spot Astigmatism, which is the prime cause for an imperfect warp of the cornea. It is the unambiguous and encompassing dome jacketing the eye's iris and pupil or in the outline of the eye lens. In general, the cornea and lens is swish and additionally curved uniformly in all directions, serving to focus light rays piercingly onto the retina at the rear of eye [6]. Corneal astigmatism is that the state wherever cornea has an uneven form. When lens is unshapely lenticular astigmatisms is formed. As a result of any type of astigmatism, myopic and hypermetropic visualization are blurred or unclear.

With the IOL in position diminish or toggle off the coaxial illumination, permitting the reflections of the IOL to turn out to be visible. The facing reflections of the variety of the cornea come into view with greater brightness. Any astigmatism handy might be related to the steepest segment (the shorter cross segment of the speckled mires) along with your surgical pre-marks. Reflections from the IOL may be seen bigger, dimmer and rather

numerous in color [6].
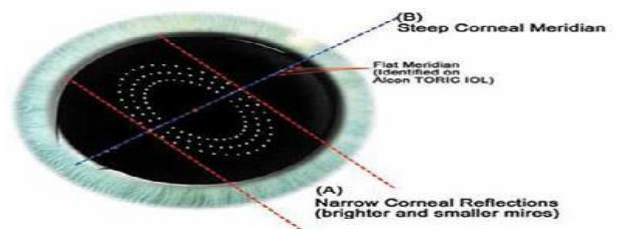
Figure 3 Astigmatic Corneal Reflection
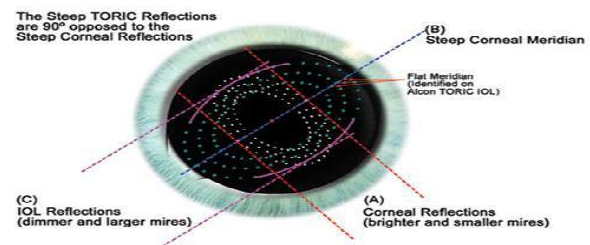
Figure 4 Toric IOL Reflection [6]

The slender corneal reflections shown in the image will reorient with sharp meridian marks (B). In this procedure ask the patient to concentrate on blinking LED and the scope has to be in 90 degree angle as that of patient's visual axis which further gives an accurate results.

II. RELATED WORK

There is a variety of heuristic work done that illustrates the actuation and mold of medical proficient schema.

1. Illuminating Surgical Keratoscope

Wang J. et al. (1988) proposed Qualitative method Photo keratoscopy to evaluate corneal

shape. The 2-Dknowledge on the Keratoscope figure is inadequate to rebuild 3-D corneal surface unambiguously. The assumptions for calculation cause errors. Author ended that the algorithmic rule by account a group of non-linear equations to portray the geometric and optical relationships additional accurately. The set of equations can be interpreted numerically by Newton- Raphson method. Testing on two ellipsoid models (e=0.5 and e=0.75), the maximum errors (at the outermost ring) were8 reduced from about 8% (e=0.5) and 12% (e=0.75) using current method to less than 2% using new method [7]. Vijfvinkel G et al. (1988) proposed qualitative keratometer which provides direct information concerning the whole shape of cornea. Any light source from the outside produces corneal placid reflections originating in the inner wall of the device [8].Corbett M et al. (1994) proposed the aim of topography and figure out the growth of topographic techniques from keratometry, via photokeratoscopy to videokeratoscopy and further differentiates the pros and cons of this method. The author comes to an end with accurate reconstruction of central cornea that was obtained by the two-step profile method which compared the diameters of individual Keratoscope mires reflected from the cornea with those from calibration spheres [9].Carvalho L et al. (1999) proposed quantitative theory on surgical keratometer which is computer based to measure central region (3-4mm) of corneal surface. For this procedure a fibre optic of high density is illuminated on a ring shape pattern also called as placid disc is assigned on cornea. Than the reflected images are taken on a device called charge coupled camera which lies on the top of Zeus's microscope. Thus, gets an accurate result for corneal shape with 0.05mm Mean deviation for radius of curvature, 0.24 diopter for power and for cylinder it's 5 degree [10].

2. Glaucoma

Ulieru M. et al. (2000) proposed a neuro-Hierarchical Fuzzy expert system for diagnosis and early detection of Glaucoma. Authors introduced a Hierarchical Fuzzy IF-THEN rule which helps to classify three different kinds of glaucoma (Pigmentary glaucoma, narrow angle, Open angle glaucoma) and also provide information about the clinical examination. Authors come to a conclusion that the defined neuro-Hierarchical Fuzzy decrease the health risks and Needless procedure which decrease the cost of diagnosis [11]. Varachiu N. et al. (2002) offered Computational intelligence strategies (including three algorithms Hierarchical Fuzzy logic, neural networks and genetic) to build up an intelligent system for designation and prediction of glaucoma. And then these rules are compared with clinical outcomes. Thus concludes

the defined Hierarchical Fuzzy rules are near agreement with clinical results [12]. Inoue N. Et al. (2005) projected method's discriminatory analyses and threshold processing to calculate the amount of territory of optic disk (OD) and circle cup zone (named C/D ratio) and surveyed this methodology workings nicely, except there are some complexity that veins within the optic circle is nowhere to be decided. Researchers constructing up any other method through the use of coordinating to deal with this trouble. Author assumed that new device are viable to examine the patient state of affairs for glaucoma [13].Cheng J. Et al. (2010) projected a radiant configuration for the assessment of RetCam pix for personalized close to/open characteristic taxonomy. Author deployed ideas i.E. Aspect recognition and arc recognition to painting open attitude and near attitude glaucoma. Further they have retrospected the clinical catalog and effects [14]. Xu Y. Et al. (2012) and accustomed Image processing and analyzing essentially primarily based machine that modified into expected to frontier and classify Anterior Chamber Angle (ACA), in view of multi-scale HOG highlights [15]. Krishnan M et al. (2012) put forth an original Intuitionist Hierarchical Fuzzy Set (lFS) premise based method deployed to slice the optic disc in retinal fundus images. Author sliced the optic disc by means of Otsu, Gradient Vector Flow (GVF) snake and A-IFSH based segmentation to pick the finest schema. The method has been evaluated on 100 images including 30 healthy, 39 glaucomatous and 31 DR images. The proposed IFS segmentation method obtained the F -score of 0.92 and93.4% precision as compared to the work of other two segmentation Methods [16]. Padmanaban K (2013) presented Hierarchical Fuzzy c mean clustering method which is deployed to spot the optic disc in color fundus image. Author separate green channel from the RGB illustration and used median filter to denoise the image along with ROI extraction. Authors concluded that this Proposed system increases efficiency to locate optic disc [17]. Elshazly H et al. (2014) presents the predicament of before time recognition of diseasecalled primary open angle glaucoma (POAG).Author conducted a test in which he assembles classifier by integrating principle component analysis with rotation forest tree (ROT). Three classifieds are namely decision tree (DT), Hierarchical Fuzzy logic and neural network (NN).At the end he concluded that ROT got high classification precision in most of the test and thus gets accurate results and early detection of glaucoma [18]. Agarwal A. Et al. (2015) brought adaptive thresholding method which mixes photograph highlights like imply, variance and fashionable deviation to the vicinity of optic circle and optic disc from the fundus image. Later they

differentiate the consequences scientific database and this framework gives promising results with 90% accuracy [19]. Aloudat M. Et al. (2015) brought a Haar clear out to rule out the open and closed angled glaucoma at the beginning by means of knowing the thickness of fluid in cornea. Author compares the end result with the Patients of the Jordanian Governmental health center (Al Ameera Basma Hospital). The sufferers have been of age institution ranging among years old, and all of them had imaginative and prescient illnesses [20]. Haveesh G. Et al. (2015) proposed structures explicitly Hierarchical Fuzzy classifier and picture processing to distinguish glaucoma. The primary cause of this method is to determine CDR after which arranging glaucoma based totally on calculating CDR.

The precept of this study is to perform retinal fungus picture for magnification which is must to deal with the cup to disk ratio of picture by making use of online facts base and handling the sickness from its signs the usage of Hierarchical Fuzzy classifier in MATLAB [21]. Lamani D. Et al. (2015) added several parameters together with central cornea thickness, neuro retinal thickness, intraocular stress etc to look at glaucoma by means of using scientific equipments like perimetry, pachymetry, tonometry and so forth [22]. Kumar B. Et al. (2016) delivered a photo processing approach to hit upon glaucoma. The scientist used specific strategies inclusive of PCA, HOS and mixing textures and compared their effects to look for accuracy. The outcome of this approach comes with 86% success out of two hundred actual photographs for two segment category with SVM [23]. John A etal. (2017) proposed Hierarchical Fuzzy professional device (FIS) to diagnose Glaucoma from everyday and Glaucomatous eye. The cease result located out 88% accuracy with the aid of contrasting Hierarchical Fuzzy outcomes and medical [24].

III. Proposed System

This segment embraces the loom embrace in constructing the wide-spectrum Hierarchical Fuzzy constitution for end construction framework. The Hierarchical Fuzzy skeleton is a composition that's reliant upon Hierarchical Fuzzy set proposition; it alternatives up a fuzzified description of patient's modern-day nation and induces Hierarchical Fuzzy association. With a specific aim to parent out Hierarchical Fuzzy construal to fullest i.E. To bring about outstanding interpretability and the capability to embody generality could be very momentous. Generalization includes that fitness to state thenation-hobby as opaque as attainable. Generalization policies allow nicely-constructed

rule base, spark off point of reference and awesome Hierarchical Fuzzy interpretability. A Hierarchical Fuzzy reliant assessment guide technique reap in series and information in thought of IF-ELSE strategy to cartoon Hierarchical Fuzzy inference. Therefore, a Hierarchical Fuzzy grasp framework permits an simple passage for putting in an correct arrangement with useful resource from an indistinct location. The regarded Hierarchical Fuzzy set almost about club work characterizes the statistics approbation to its exact membership and it have to be positioned in variety of (0, 1). A Hierarchical Fuzzy set has no cotemporary advantage and has a Hierarchical Fuzzy intermediate. The quadrilateral membership plot is a chore having four variables a, b, c, d in which a and d denote ft of quad with courting degree 0 and b and c be a symbol of shoulders of trapezoidal with degree 1.

IV. Methodology

Figure four.1 represent the designing of the professional gadget by using the usage of using eight enter variables i.E. Intraocular stress (IOP), Cup to disc ratio (CDR), Rim to disc ratio (RDR), discipline of Vision, Corneal thickness, Angle, visible Acuity, Lens period be used. These inputs are used to deduce the fitness rating of character. After choosing the input variables uninterrupted stair is to fuzzify the factors i.E. We have to institute the Hierarchical Fuzzy sets for every and every giving variable and the ensuing variance of the belonging to every Hierarchical Fuzzy set. Hierarchical Fuzzy rule-base permits specialists acquaintance to imitate on signs and symptoms of persevering with after which helps the rules advanced to provide a near accurate end. On-line prime hospital therapy signs assessment implies mentioning of those signs and symptoms and signs and symptoms which can be important for the evaluation and stop of sickness. Figure 4.1 correspond to the technique for the proposed gadget.Hierarchical Fuzzy Inference System (FIS) and Graphical User Interface (GUI) are very powerful tools provided by MATLAB to propose a Hierarchical Fuzzy verdict structure. The training part with reference to Hierarchical Fuzzy inference system is done by the FIS editor, which is another strong tool provided by MATLAB.

There is a straightforward and logical illustration in figure 4.2 that correspond to the denomination of all contribution (8 input parameter values) on the left hand side and output on the right hand side. So far, the quantity of inputs could also be restricted by the existing memory of your machine.
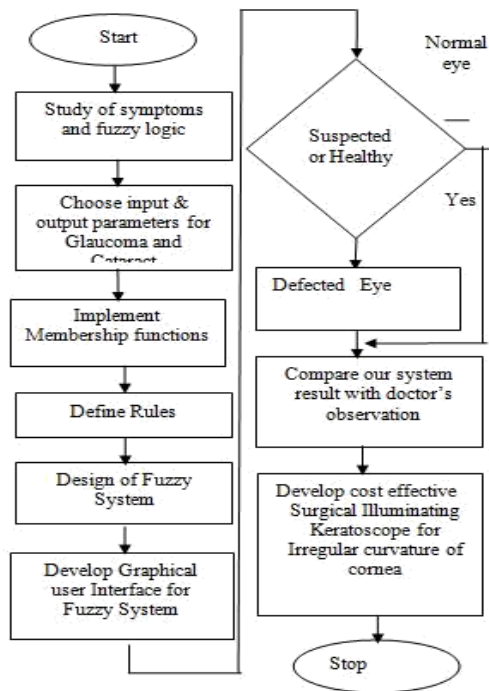
Figure.5 Methodology to Implement Proposed System

A) Input Variables

Eight input variables are used for designing this expert system which include Intraocular pressure (IOP), Cup to disc ratio (CDR), Rim to disc ratio (RDR), Visual field, corneal Thickness, Visual Acuity, Lens Size and Angle. These inputs are used to predict the health status of a person. We have to determine the Hierarchical Fuzzy sets for every input variable and the corresponding range of the belonging to each Hierarchical Fuzzy set.
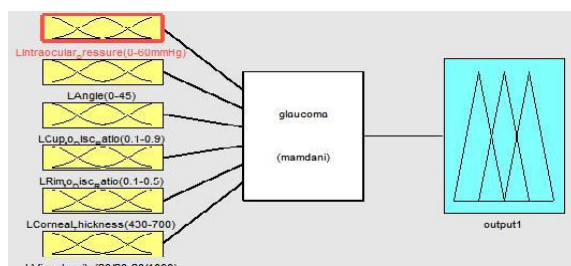
Figure 6. FIS Editor with 8 inputs & 1 output

B) Membership Function

All association functions are associated with each variable. The relationship functions of parameters are revealed below portrays the unambiguous outline of the membership functions. The membership function is used to edit rules and be confirmation for all the relationship functions for

the integrated Hierarchical Fuzzy inference system, jointly cooperating input & output parameters.
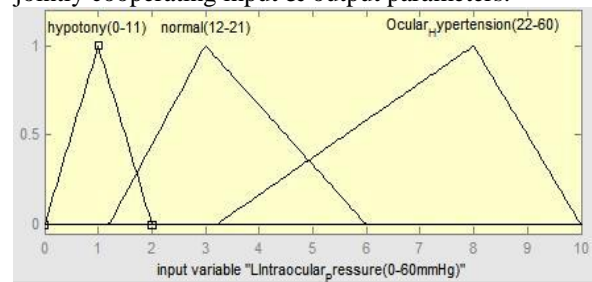
Figure 7. Membership function plots for Intraocular Pressure
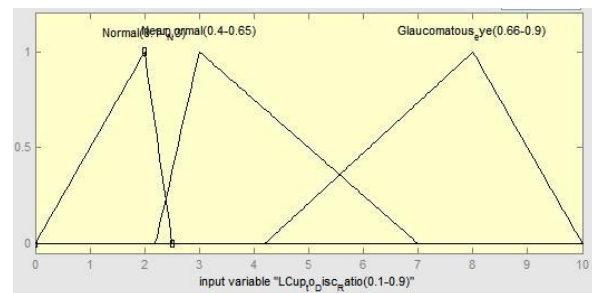
Figure 8 Membership function plots for Cup to disc ratio

It is the manner of the unification of the rules. The membership functions of the entire rules previously antecedently clipped at some stage in rule evaluation are in use and unified to one Hierarchical Fuzzy set. In progression a quantity of clipped subsequent relationship functions are represented conjointly to one Hierarchical Fuzzy set for each production variable. The inference methodology used is the Mamdani inference method. Table1. Shows the Ranges of Membership function parameters for the input variables.

Table 1. Ranges of Membership function parameters for the Input ariables

Sr.No.	Input variables	Membership Functions	Ranges
1	Intraocular pressure	Hypotony	[0 1 2]
		Normal	[1.2 3 6]
		Ocular hypertension	[3.2 8 10]
2	Angle	Extremely Narrow	[0 1 1.8]
		Narrow	[1.2 2 6]
		Wide open angle	[2.2 8 10]
3	Cup to disc ratio	Normal	[0 2 2.5]
		Near Normal	[2.2 3 7]
		Glaucomatous eye	[4.2 8 10]
4	Rim to disc ratio	Normal	[0 2 5]
		High Glaucomatous	[2.2 6 7]
		Severe Glaucomatous	[6.2 8 10]
5	Corneal thickness	Thick	[0 3 3.8]
		Average	[3.2 4 7]
		Very Thin	[4.2 8 10]
6	Visual Acuity	Normal	[0 3 5]
		Moderate Low Vision	[3.2 6 8]
		Severe Low Vision	[6.2 9 10]

C) Output

The proposed Hierarchical Fuzzy inference system (FIS) provides following outputs for the detection of Glaucoma and Cataract:

1. Normal eye (0-3)

2. Glaucomatous eye and Cataract (3.1-5.3) Mild

3. Glaucomatous eye and Cataract (5.4-7.6) Moderate

4. Glaucomatous eye and Cataract (7.7-10) Severe
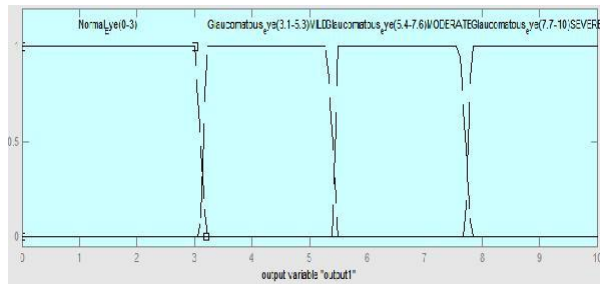
Figure 9 Membership Plot for Output

D) RULE EDITOR

Describing the appearance of the structure is called fact list which can be edited by rule editor. Rule editor comprises of a huge editable text field for displaying and writing rules. In toting up, rule editor has a range of well-known landmarked constant as those inside the FIS (Hierarchical Fuzzy Inference system) editor and, together with the menu bar and also the status line membership function Editor.

Rules = M^i [23]
M = Membership functions
I = Input parameters

Figure 10 Rule Editor

E) Fuzzification and Defuzzification

The next segment of Hierarchical Fuzzy expert system is the Fuzzification. It is the technique of mapping a crisp evaluation of an input to relationship degrees in a number of Hierarchical Fuzzy linguistic multivariate. Defuzzification is the converse course of action of Fuzzification. Thus crisp inference output is known by the Defuzzification method later than estimating its input significance.

V. EXPERIMENTAL RESULTS

A) Rule Viewer

Rule observer is used to analyze the Hierarchical Fuzzy inference system. Work out this observation as an indicative to verify, for example, the unit membership function appearance implicate the results. The rule viewer unveils the information of the absolute Hierarchical Fuzzy inference method. In accumulation, menu bar and status line are intimate items. Specific input value can be inputted in the text field situated at lower right location. In the lower right, there is a text field where you can enter a specific input value. Figure 5.1 rule viewer of the projected organization is displayed. It shows the result of whole Hierarchical Fuzzy system. At left plane at the crest, we get = 5.95 (defuzzified values) which means the person is normal.
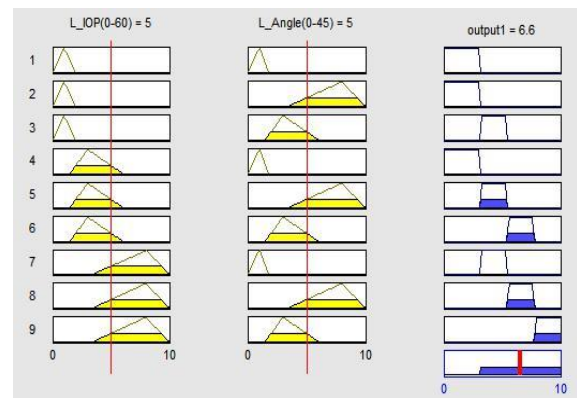
Figure 11 Rule Viewer

B) Surface Viewer

To evaluate the reliance of 1 of the outputs on 1 or 2 of the inputs Surface viewer is used, for the Hierarchical Fuzzy inference system (FIS) it spawns and devises an output surface plot. From 2 input variables and one production variable of a FIS It engender a 3-d surface. Figure 5.2 shows the surface plot of disease between two symptoms angle and intraocular pressure. Graph shows that when the range of angle is between 0 to 10 and intraocular pressure is between 0 to 10 then there is a disease will be recognized. Input is represented

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by blue color and output is represented by yellow color.
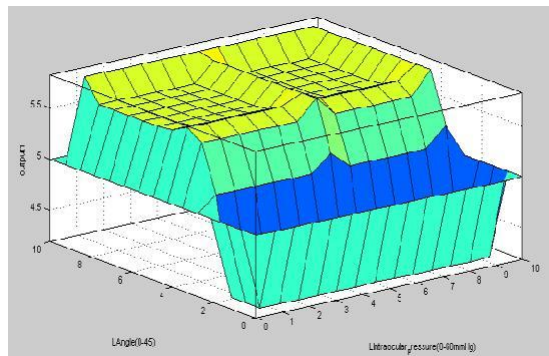
Figure 12. 3-D Surface View b/w IOP and Angle

C) Graphical User Interface

MATLAB Graphical User Interface is the frontier information from the MATLAB graphic objects formed for human-computer interface. GUIDE by design spawns 2 forms of MATLAB archive; one is on behalf of MATLAB edge figures and a supplementary is for M-file, habituation accumulates the authority operation of the MATLAB program. The M-file transport code to initialize the GUI and embrace a support in favor of the graphical user interface click-backs, the routines that achieve once a user interacts with a GUI element. By means of the M-file editor, you can add code to the click-backs to achieve the functions you wish. Figure 13,14,15 show the GUI for the anticipated system.

Figure 13 Glaucoma Detection GUI with Input Parameters

Figure 14. Glaucoma Evaluation Result
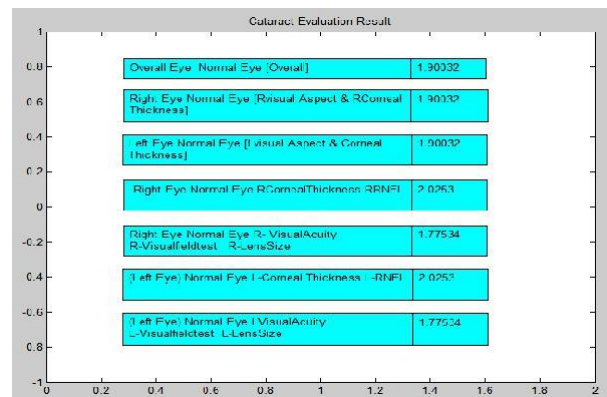
Figure 15 Cataract Evaluation Result

The projected method represents recognition of normal eye and glaucomatous eye by using the parameters (IOP, CDR, RDR, Angle, Field of Vision, Visual Acuity, Lens Size and Corneal Thickness).In Hierarchical Fuzzy inference system (FIS) there are 117 rules that are defined among which 100 rules were selected randomly. Among 100 rules 50 rules are of normal patient and 50 rules are of glaucomatous patient, and then the outcome are compared with the ophthalmologist. The result shows that 97 rules are similar as that of ophthalmologist results. Thus, accuracy of the system comes 97% [25].

$$\text{Overall Accuracy} = \frac{\text{No. of correct Patients}}{\text{Total No. of Patients}} \times 100 \qquad (1)$$

$$= \frac{97}{100} \times 100 = 97\%$$

Sensitivity is defined as the ratio of True Positives to the sum of True Positives and False Negatives. True Positives is the case when a glaucomatous image is classified as glaucoma and False Negatives is the case when a glaucomatous image is classified as non-glaucoma [25].

$$Sensitivity = \frac{True\ Positive(TP)}{True\ Positive(TP) + False\ Negative(FN)} \quad (2)$$

$$= \frac{49}{49 + 1} = 0.98 = 98\%$$

Specificity is defined ratio of True Negative to the sum of True Negative and False Positives. True Negative is the case when a non-glaucomatous image is classified as non-glaucoma and False Positives is the case when non-glaucomatous image is classified as glaucoma [25].

$$Specificity = \frac{True\ Negative\ (TN)}{True\ Negative\ (TN) + False\ Positive(FP)}$$

$$= \frac{48}{48 + 2} = 0.96 = 96\%$$

D) Hardware Implementation

A Keratoscope is designed to provide unique centration with a flashing fixation target and 3 concentric earrings of illuminating LED's. These LED's are arranged at every 10 degrees. Keratoscope is geared up with a hegemony switch that sways the awareness of illumination. This hegemony button is intended to securely maintain the surgical Keratoscope. Clockwise rotary movement of this switch switches at the device, giving preliminary illumination of the LED fixation goal. The vivid orange flashing LED is deployed for any procedure that aids the surgical treatment. Then the affected person is asked to fixate on a goal. When the switch is rotated extra in the clockwise course the total ring mild array starts offevolved to illuminate at its lowest stage. With persevered rotation the array will acquire full brightness. In Figure 16 the illuminating scientific device Keratoscope is established upon the goal lens of surgical microscope with the as it should be sized mounting ring measuring 48 mm. These rings are accessible in a variety of sizes and they are 48mm, 65mm, 70mm, and 82mm.We have set our target on the corneal reflection at standard surgical microscope functioning distance of 175mm. Hence, the microscopic image of the eye beneath surgical illuminating. The Keratoscope is represented in Figure 17 in which it shows bright light in the form of circle without any irregularity which results that the patient is normal.

Figure 16. Examination of Cornea using Surgical Illuminating Keratoscope
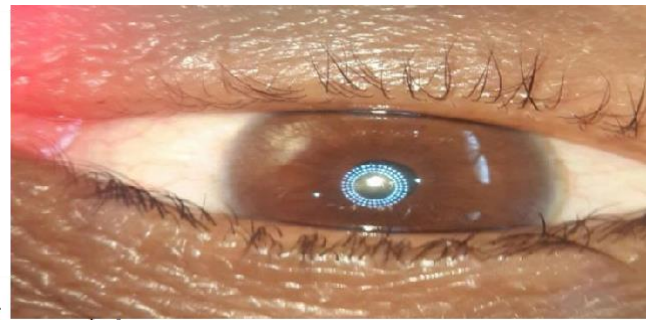
Figure 17 Reflection Image of Surgical Illuminating Keratoscope

VI. CONCLUSION

Glaucoma and Cataract are most wide-ranging disease at present, so in the early on identification is exceptionally important to keep individuals experiencing Glaucoma and Cataract. The highest loyalty choice is the early finding which gives doctors to detect the Normal eye, Cataract eye, Glaucomatous eye and also surgical Keratoscope which is low cost and effective solution to detect uneven curvature of cornea. In this research, we've got exhibited a Hierarchical Fuzzy shape on selection supportive network for the prognosis of Glaucoma. The prediction of the Normal eye, Cataract eye and Glaucomatous eye is done by way of the proposed Hierarchical Fuzzy interference framework.

The proposed gadget can administer exceptional resources of enter which may be a ways superior to address susceptibility at some stage in investigating period. The results are compared with scientific dataset of 100 patients; the device gives promising consequences over 97% accuracy. This present framework can be prolonged by expanding number of inputs. The surgical Keratoscope designed and build has proven to be very effective and useful not only for Superspeciality hospitals but also to small scale eye clinics as it is cost effective and also serves the purpose for which it is build Therefore, This Technology will have a Great Impact in Future.

Significance Statements

This study discovers the serene, quicker and cost effective way to identify glaucoma. It is valuable for the civilization as it is possible to detect glaucoma with only two of the eight examinations on hand. The patient can decide on for more examination for best clarity if the first two give you an idea about normal eye according to our

Hierarchical Fuzzy expert system (FIS).The of severity levels of glaucoma also represented by this system i.e.

1. Normal eye
2. Glaucomatous eye, Cataract eye (Mild)
3. Glaucomatous eye, Cataract eye (Moderate)
4. Glaucomatous eye, Cataract eye (Severe)

This research will help the researcher to uncover the serious faster discovery of glaucoma that is usually takes some time to get detected because the 8 checks are pricey. This investigation involves 8 parameters i.e. Tonometry, Ophalmoscopy, Pachymetry, Gonioscopy, Perimetry. Previous researchers used a most of two parameters. Easier, quicker and cheaper recognition of glaucoma can be arrived by utilizing the projected Hierarchical Fuzzy interference framework.

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An Efficient Fault Tolerant and Load Balancing Approach for Cloud Computing.

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Abstract- With the coming of best in class apparatuses and rise of new advancements causes the distributed computing to gain a superior situation in the commercial center. Distributed computing is performing superior to the next customary figuring. Adaptation to internal failure is the capacity of the planned framework to play out its usefulness even within the sight of disappointments. Building up a dependable and exceptionally accessible design with the capacity of enduring different disappointments is the difficult undertaking. A high accessibility and solid approach alongside the design is proposed. Node determination paradigm utilized in this paper helps the sellers of the distributed computing to expand its usefulness within the sight of numerous disappointments. The presentation and reenactment results show that the proposed methodology takes O (N2) time unpredictability within the sight of disappointments and assign the assets to its expected clients proficiently. The principle highlight of the created methodology is that while enduring the node disappointment and correspondence disappointment, load adjusting deals with the measure of remaining burden between the servers/nodes.

Keywords: Cloud Computing, Failures, Fault Tolerance, Load Balancing.

I. INTRODUCTION

While trying to pick up dependability and aggressive edge, IT foundation are constantly attempting to diminish framework and registering cost and regulatory expense. This has constrained the acknowledgment of new advances. Distributed computing is one of the advances that have gotten significant consideration and turning into a developing pattern for huge scale registering framework expected to offer the extraordinary degree of dependability to its customers.

A Cloud processing condition (CCE) comprises of independent figuring modules that interconnected with other utilizing messages [2]. Dispersed figuring is a system of PCs, each achieving a bit of a general employment to accomplish a computational outcome a lot speedier than a solitary PC. By and large action is represented by oneself coordinated nodes, middleware engineering, for example, Service Oriented Architecture (SOA), Common Request Broker Architecture (CORBA) which permits the correspondence between the nodes/servers specifically appropriated figuring condition [9]. Structuring appropriated distributed computing condition is more testing than planning incorporated frameworks for a few reasons, for example, Physical splitting and utilization of the heterogeneous as well as homogeneous frameworks darken between processor correspondence, the executives of assets, synchronization of collaborating exercises, and preservation of consistency among numerous duplicates of data [6]. The necessity for profoundly programming unwavering quality and accessibility is consistently expanding in different areas, for example, modern control, media transmission, fund, book-reservation. Distributed computing is a developing innovation that pulls in Information Communication Technology (ICT) specialist co-ops offering open doors for online appropriation of administrations. It offers registering as an utility, sharing assets of adaptable server farms. The distributed computing likewise produces the idea of green registering whereby a customer need not be care about the CPU cooling, server cooling arranging, programming stacks. Fault resistance is the one of the significant exhibition measurements in the distributed computing foundation. Adaptation to non-critical failure is the capacity of a system to complete its tasks even in the presence of failures.

Related Work:[8] Focused on the issue of crashdisappointment in the appropriated R-trees foundation, helps in actualizing range inquiries and substance based separating, in distributed computing. The creators exhibited a deficiency tolerant methodology which abuses replication of

non-leaf nodes in disseminated R-tree. Initially, they improve the availability without changing the R-tree structure. Second, through a broad reenactment they demonstrated that the created methodology definitely diminished the expense of both message traffic and adjustment time. Replication conspire builds the intelligent closeness. Conveyed tree structures, diagram, rings whose network is likewise crash touchy should be considered.

[1] Proposed an improved equalization diminish calculation (BAR) for taking care of machine disappointments in distributed computing condition. The proposed calculation plays out its expected usefulness as utilized in essential reinforcement approach. The improved calculation viably lessens the activity consummation time adequately when disappointment exists.

[7] Developed a Resilient, Fault-tolerant and High-productive worldwide replication calculation (RFH) for the conveyed distributed storage frameworks. They utilize the calculation to experience with streak swarm issue. The proposed calculation performs superior to the next existing calculations.

[3]Developed engineering for actualizing the intermediary dependent on checking the information and replication the board in distributed computing. Their work is likewise worried about expanding dependability, accessibility, wellbeing and security in Grids and electronic frameworks. The design explicitly managed adaptation to non-critical failure and expands the reliability in the cloud framework. Dynamic and inactive techniques used to actualize an idealistic convention. Intermediary to deal with administration calls and thoroughly depending on administration replication procedures, they viably manage the unpredictability and overhead issues. The specialists didn't utilize the component for shortcoming forecast and shirking.

[4] Focused on the Linearzability as the rightness measure for imitated administrations. Issues like Dependability, unwavering quality and accessibility in the conveyed frameworks are referenced in this paper. This paper is essentially an instructional exercise on adaptation to non-critical failure by replication in the disseminated cloud based frameworks. Two principle classes of replication procedures: Primary-reinforcement replication and dynamic replication are utilized to accomplish the adaptation to non-critical failure. Gathering correspondence is utilized as the foundation which gives satisfactory multicast natives to actualize either essential reinforcement replication, or dynamic replication. Accomplish adaptation to internal failure.

[10] Discussed the Low Latency Fault Tolerance (LLFT) middleware with the pioneer/devotee replication approach for appropriated applications. The LLFT middleware comprises of low Latency Messaging Protocol and a Virtual Determinizer structure. The enrollment convention gives a quick reconfigurable and recuperation administration when imitation gets broken and when copy joins or leaves a gathering. The proposed system keeps up solid reproduction consistency, offers application straightforwardness and accomplishes low start to finish inactivity for disseminated applications sent inside a distributed computing or server farm condition.

[5] Raised the prerequisite for adaptation to internal failure to accomplish dependability for constant registering on cloud framework. To adapt to this necessity, an adaptation to non-critical failure model for ongoing distributed computing is proposed. The framework gives both the forward and in reverse recuperation instrument, yet primary spotlight is on forward recuperation component. The primary substance of the proposed strategy is the versatile conduct of the unwavering quality loads alloted to each preparing node and nodes are added and expelled by the dependability loads. Likelihood of disappointment is less and fundamental bit of leeway of this methodology doesn't experience the ill effects of the domino impact. Check pointing component is utilized toward the end.

[6] Prototyped a deferral tolerant adaptation to non-critical failure calculation that viably lessens execution time and adjusts disappointments while limiting the issue revelation and recuperation overhead in the cloud. This is finished by isolating the work among the servers gathered two by two with the end goal that each pair will take a shot at its parts from inverse bearings. This enables every server to proceed with its work without counseling with the customers or different servers. Thiscalculation limits the coordination and synchronization endeavors expected to execute the deficiency disclosure and dealing with disappointments.

II. Experimental Setup

In this paper, theory on the natural assorted variety crosswise over distributed computing condition is had and tells the effect on nodes framework in the disseminated distributed computing condition. for at first, arrange test system (NS-2) is utilized to mimic the exhibition of the frameworks associated in a conveyed distributed computing condition. The nodes are made and connected together and dynamic directing convention which is an inbuilt element give by the NS-2. The nodes are arrangement, portrayed as vertex. The essential obligation of the nodes is to give the assets to the client/customer through the focal daemon node.
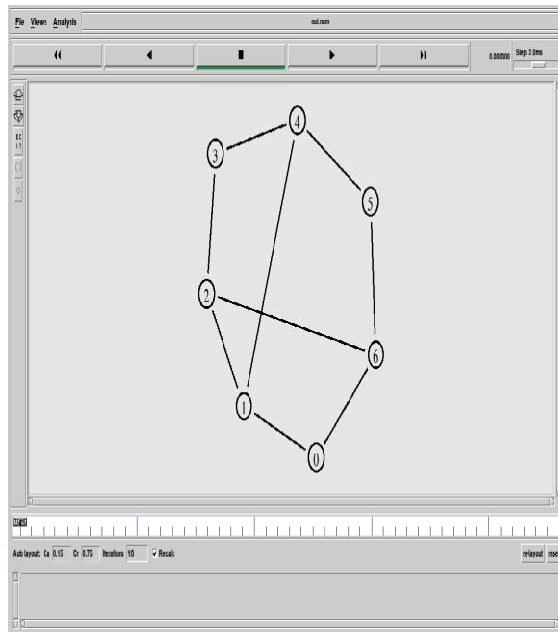
Fig 1 Connection of nodes in NS-2

In Fig 1, the nodes are connected bi- directionally using network simulator NS-2 version 10.4 on Ubuntu operating system. The nodes are depicted as Nodes, i.e. {0, 1, 2, 3, 4, 5, and 6} and the connections between the nodes are made. Arc represents the communication edges between the participating nodes. the list of connections are $\{0 \rightarrow 1, 1 \rightarrow 2, 2 \rightarrow 3, 3 \rightarrow 4, 0 \rightarrow 6, 6 \rightarrow 5, 5 \rightarrow 4, 6 \rightarrow 2$ and $1 \rightarrow 4\}$. Node 4 supervised the overall the communications exist between all nodes. It acted as a central daemon which notifies the fault occurrence at particular location whereby nodes are connected to other nodes.
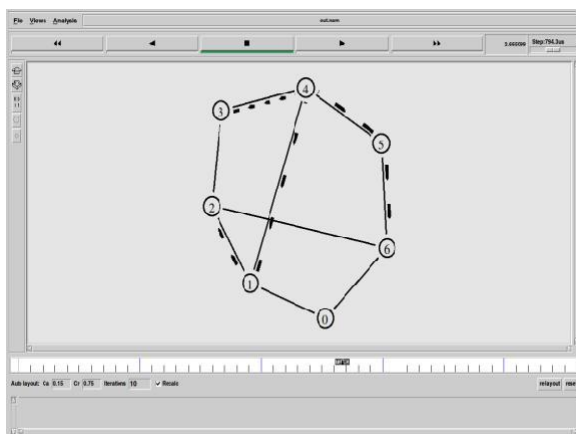
Fig 2 Node 4 sending the acknowledgment

In this methodology the replication approach is less considered in light of the fact that the measure of time required to repeat the assets may change contingent on the client's prerequisite. So neighbor nodes associated with the nodes (which have correspondence disappointment) enable that node to move their information parcels on to their working correspondence way.The central domain

sends the acknowledgment to all the participated nodes except node 0.

The central daemon (Node 4) sends an acknowledgment to check the aliveness of the nodes, i.e. whether they are working or not. The connected nodes respond with a message which contains information of aliveness. The nodes in the network may stop working either due to the system crash failure or communication link failure. The proposedapproach so effectively deals with the both kind of failures at same time. The nodes connected in such a way that communicates with each other to share the amount of load of other nodes.

Node 4 sends acknowledgment to the entire working node in two forms: pull acknowledgment forwarding and push acknowledgment forward.
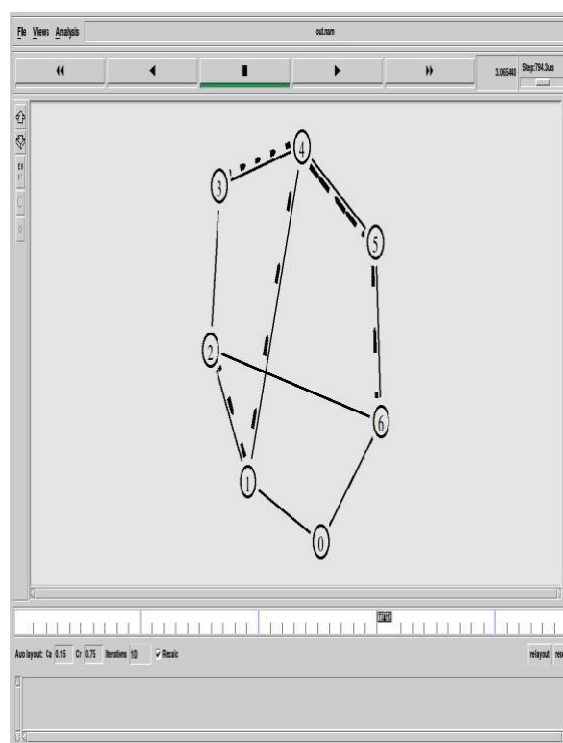
Fig 3 Node 4 (Central daemon) receiving the messages

This procedure rehash in a fixed interim of time, if any of the node doesn't react back because of the affirmation create by the Node 4 (Central daemon), at that point Node 4 expect that a disappointment condition has happened. A disappointment could be a node crash disappointment, correspondence disappointment, application disappointment, framework programming disappointment, etc. Disappointment of the Hard Disc (HDD) is one of the significant issues in the disappointment of the server. Different factors influencing the presentation of the servers in the distributed computing are; disappointment of Reduced Array of Inexpensive circles (RAID), other memory modules and substitution of the segments. The whole distributed computing condition stops its

working because of the topology uprooting, arrange disappointment, and so on. In this proposed work, crash disappointment, correspondence connects disappointment taken into account. The main advantage of the proposed approach is that more than one failure are tolerated meanwhile load balancing manages the amount of load.
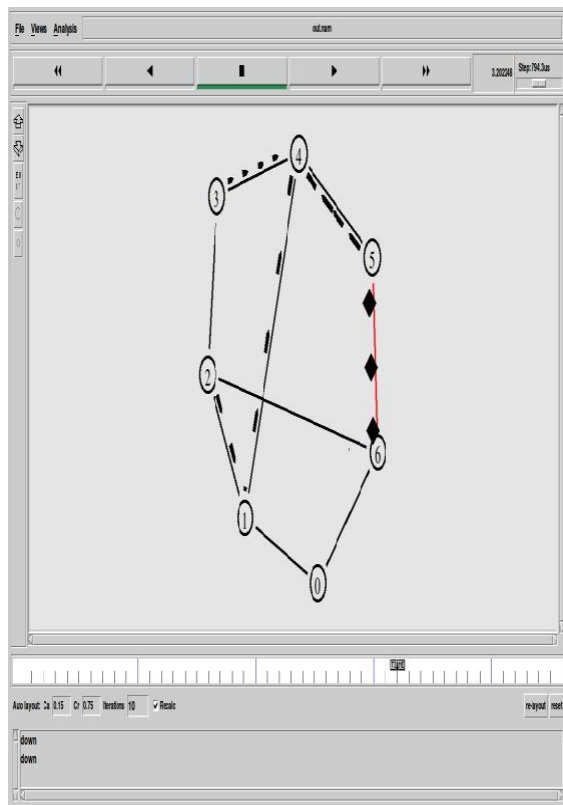
Fig 4 Failure of Link

In fig 2, the communication link between the Node 6 and Node 5 breakdown. The Node 5 carries the data packets of the node 6 through its communication path connected to Node or node 4. The node 0 is assigned as neighborhood node which requires the assets. The focal daemon assigns the assets to nearby node, for example node 0. A level of deliberation is made by the focal daemon node, for example node 4, which sends the assets to the neighborhood node whereby the nearby node have not information about which node is sending the necessary information assets to it. The computational time intricacy devoured by the general methodology is exceptionally less contrasted with different methodologies. The essential focal point of the methodology is enduring various disappointments with less computational time.
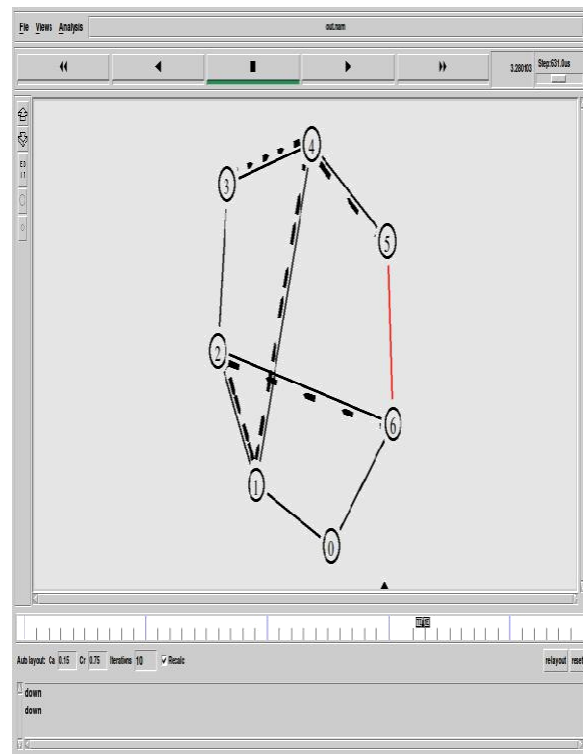
Fig 5 Sending data packets on alternate path.

In fig 5, the node 2 acquiring the data packets of node and node 1 sending the data packets to the central daemon.
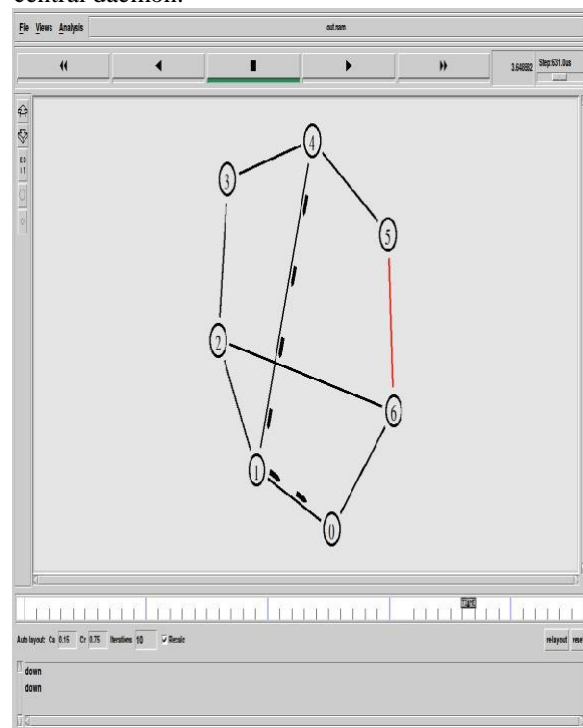
Fig 6 Node 4 sending data packets to node 0.

In fig 6, the central daemon sending the required data to the local node, i.e. node 0.

III. SIMULATION ANALYSIS
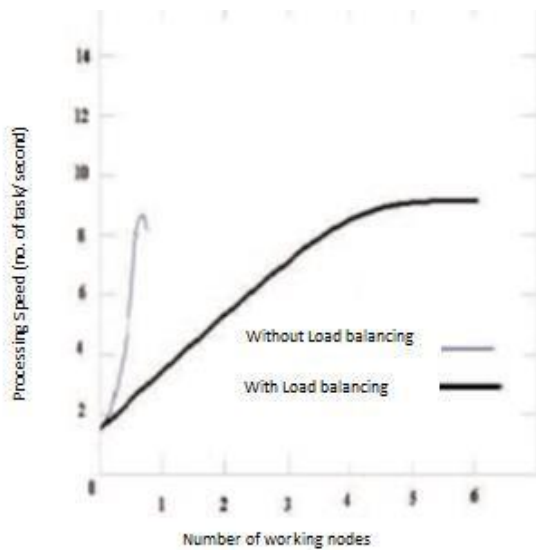
Fig. 7 Load Management

As appeared in fig 7, the heap adjusting by all the partaking nodes increment if disappointment happens. Right off the bat the focal daemon sends the affirmation to all the imparting nodes to assign the assets required by focal node, for example node 0. In the event that any of the node doesn't react back to the affirmation created by node 4, it expect that a disappointment has been happened and supplant that bombed node to other working or free node. In this work, when correspondence interface bombed between the node 6 and node 5, the working node 2 enables the node 6 to sends its information parcels to it. At last the node 1 sends the information parcels of node 2 and node 6 to the focal daemon (node 4)and at long last the focal daemon node 4 sends the necessary information bundles to the neighborhood node, for example node 0.As the number disappointment rises more summon of the nodes changes. In fig 7, the bend with load adjusting fluctuates in light of the association of the nodes.

IV. CONCLUSION

This examination paper is shrouded the disappointments exist in the distributed computing condition. To endure the correspondence disappointment and the hub disappointment, a trial arrangement is performed. The principle bit of leeway of the proposed methodology is to adapt to the disappointments in the interim burden the executives procedure deals with the stacking of the information parcels of the bombed hub and move it to the sound hubs. The exhibition of the whole plan increment as the quantity of hubs plays out the undertaking together. The time intricacy of the whole approach is O (N2). For future work the versatility issue needs to apply to give better execution to the cloud customers.

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Survey of Fog Computing

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ABSTRACT: The IoT (Internet of Things) is that it is to interconnect billions of heterogeneous objects these are not merely smart but equipped with sensors and processing power- also connected and able to share the information they generate. IoT is different from the traditional Internet because it diminishes the need of humans, to the point that in many cases they are removed from equation: Machines input, communicate, analyzes and acts upon the information. Several of these IoT applications have real-time requirements and must rely on those architectures which are specifically designed to manage "Big Streams" of data. "The Cloud" is the natural collection environment for sensed data retrieved by IoT nodes due to its scalability, robustness and cost effectiveness. But the newfound capability of "Fog Architecture" helps IoT enables enterprises to handle big streams of data toward the edge of a network. As compared to traditional cloud architecture This study aims at presenting a broad introduction to fog computing, architecture, various applications, data security challenges and opportunities that it brings to its researchers.

Keywords: Fog Computing, Cloud Computing, Internet of Things, Latency services

I. INTRODUCTION

Fog Computing, an extension of Cloud Computing services, has been introduced to bring the provision of services closer to end- users means allow computational needs to be fulfilled closer to the source of data to decrease the latency and network congestion. It is a decentralized computing infrastructure that utilizes one or more IoT devices or edge devices to collaboratively perform services such as communication, control, storage and data management, etc.

The challenges suffered by cloud computing such as large end- to-end delay, traffic congestion, processing of huge amount of data and communication cost are now being resolved by fog computing. Fog computing reduce the burden of data centers. This term "Fog Computing" was initiated by Cisco to extend the term cloud to edge.

II. CURRENT MARKET STUDY: A INITIATIVETOWARDS FOG COMPUTING

OpenFog is a consortium of high tech companies working towards creating an open architecture for networks. The term fog is "fog is a cloud close to ground". In another definition which is given by

OpenFog consortium the fog computing is "a system level horizontal architecture that distributes resources and services of computing, storage, control and networking anywhere, anytime along the continuum from cloud to things.

Features of Fog Computing:
- Heterogeneity
- Support real-time applications
- Wireless access anytime, anywhere
- Capacity to handle huge amount of data
- Low latency services
- Location awareness
- Geo-graphically distributed environment/decentralization
- End-user mobility

fog computing to enable interoperability, scalability, security, autonomy, reliability, availability, serviceability, agility, hierarchy and programmability. It is being promoted bydifferent companies such as intelligent edge by Intel.

Table: 1 value

Value		
Value	Centralized	Spatially Distributed
Value	High	Low
Value	Global	Local
Value	Large Size	Small Size
Value	Limited support to device mobility	Full support to device Mobility
Value	No	Yes
Value	High Communication Latency and service Deployment	Low Communication Latency and service Deployment
Value	Limited support to device heterogeneity	Full support to device Heterogeneity
Value	Support to computing intensive- delay tolerant analytics	Support to real time Applications
Value	Operated and maintained by experts	No or less human Interaction
Value	High inter-application Isolation	Low inter-application Isolation

most layer of architecture. This h ability to handle large volume of data, robust computing resource This layer receives data summaries from various fog nodes a performs global analysis on the data submitted by fog nodes a data from other sources to improve business insight in IoTs.
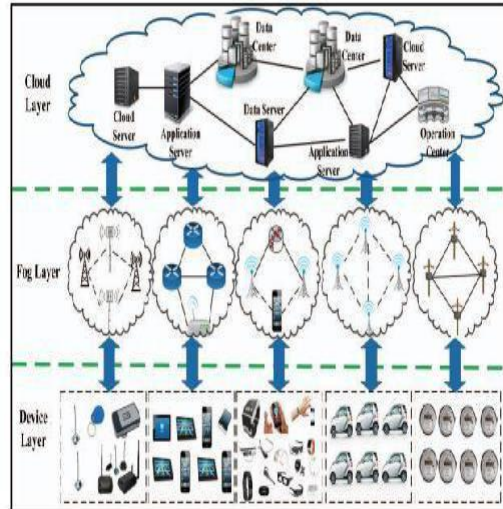
Fig1 : Technology enabler for Fog Computing

III. ARCHITECTURE OF FOG COMPUTING

Fog computing architecture can be divided into three layers: Clo layer, Fog Layer and Device Layer. This three-tier architecture one of the basic and widely used architecture in this fog computing

Tier 1-Device Layer: This is at the bottom ofarchitecture. consists of IoT devices equipped with sensors, smart handhe devices (e.g. smart phones, smart cards, tablets, smart vehicles a smart watches, etc) and other smart wearable devices. These e devices are also termed as Terminal Nodes (TNs) and are equipp with Global Positioning System (GPS).

Tier 2-Fog Layer: This is also known as fogcomputing layer. T fog nodes of this layer are comprised of devices such as route bridges, switches, gateways, base stations and other access poin These nodes always share computational and storage facilities wi each other (e.g. industrial controllers, embedded servers, mobi phones and video surveillance cameras).

Tier 3-Cloud Layer: This layer includes thecloud servers or clo data centers. This is the top

Figure-2

IV. APPLICATIONS OF FOG COMPUTING

Smart Living: The services which comes underthis smart living are Remote Control Appliances: by switching on and off these remote control appliances we can avoid accidents and save energy, Weather: It displays outdoor weather conditions such as humidity, temperature, pressure, wind speed and rain levels Smart Home Appliances: Smart Refrigerators with LCD screen telling what's inside, food that's about to expire, things you need to buy, etc. Washing machines are allowing you to monitor the laundry remotely.

Safety Monitoring: cameras, and home safety systems making people feel safe in their daily life at home, Intrusion Detection Systems: Detection of window and door openings and violations to prevent intruders, Energy and Water Use: Energy and water supply consumption monitoring to obtain advice on how to save cost and resources. Fog computing addresses this security, data encryption and distributed analytics requirements.

- **Smart Cities: Structural Health**: Monitoringof vibrations and material conditions in buildings, bridges and historical monuments, **Lightning**: intelligent and weather adaptive lighting in street lights, **Safety**: Digital video monitoring, fire control management, public announcement systems, **Transportation:** Smart Roads and Intelligent High-ways with warning messages and diversions according to climate conditions and unexpected events like accidents or traffic jams, **Smart Parking**: Real-time monitoring of parkingspaces availability **Waste Management**: Detection of waste levels in bins to optimize the trash collection routes. Garbage cans and recycle bins with RFID tags allow the sanitation staff to see when garbage has been put out. Deploying a fog computing architecture allows for fog nodes to provide local processing and storage.

- **Smart Industrial wireless sensor networks: Explosive and Hazardous Gases:** Detection ofgas levels and leakages in industrial environments, surroundings of chemical factories and inside mines to ensure workers and goods safety, **Maintenance and repair:** Early predictions onequipment damage and service maintenance can be automatically scheduled ahead of an actual part failure by installing sensors inside equipment to monitor and send reports.

- **Smart Healthcare: Patients Surveillance:** Monitoring of conditions of patients inside hospitals and in old people's home, **MedicalFridges:** Control of conditions inside freezersstoring vaccines, medicines and organic elements, **Fall Detection:** Assistance for kids, elderly ordisabled people living independent, **Dental:** Bluetooth connected toothbrush with Smartphone app analyzes the brushing uses and gives information on the brushing habits.

- SMARTAGRICULTURE: Green Houses: Control micro- climate conditions to maximize the

production of fruits and vegetables and its quality, Compost: Control of humidity and temperature levels to prevent fungus and other microbialcontaminants, Animal Farming/Tracking: Location and identification of animals grazing in open pastures or location in big stables, Study of ventilation and air quality in farms and detection of harmful gases from excrements, field Monitoring: Reducing spoilage and crop waste with better monitoring and management of the agriculture fields, including better control of fertilizing, electricity and watering.

Smart Grids: Smart grid is another applicationwhere fog computing is been used. Based on demand for energy, its obtain ability and low cost, these smart devices can switch to other energies like solar and winds. The edging process the data collected by fog collectors and generates a control command to the actuators. The filtered data are consumed locally and the balance to the higher tiers for visualization, real-time reports, and transactional analyticshandle a large number of heterogeneous things that also belongs to different platforms as well. Interoperability should be considered by both IoT devices manufacturers and application developers of fog computing to ensure the delivery of various services to customers regardless of the specifications of the hardware platform they use.

- **Privacy and Security:** Fog computing lies on thecomputational power of distributed nodes for reducing the total pressure of the data center. In fog computing, privacy preservation is more challenging due to heterogeneity in IoT, it is not easy to guarantee the security and privacy of end user's data (like credit card information, bank account details, etc.).So new challenges identified for privacy, trust and reliability are-1) Information must be of trust and quality based 2) security of exchange of data over the network.

- **Cost versus usability:** For adoption of IoT intoday's era, the cost of its devices used for sensing, tracking and control mechanisms, must be inexpensive in the coming years.

Data Management Services: Due to connectionof billions or trillions of smart devices, data management is also crucial aspect in terms of Internet of Things as the data gathered by these devices is larger in quantity and is of dynamic

nature. So software applications of fog computing must have the ability to handle such kind of data.

V. OPEN RESEARCH CHALLENGES AND FUTURE DIRECTIONS

- **Reliability:** IoT networks are expected to providereliable and secure services to the end users. Reliability means to ensure that all information and services of IoT will be available on time and with accuracy. So its aim is to increase the success rate of IoT services availability over the fog computing. In order to have reliable IoT services, the ongoing communication must be reliable, because for example if there will be unreliable perception, data gathering, processing, and transmission of data then it will leads to long time delays, loss of important data and this eventually leads to wrong decisions.

- **Interoperability:** Interoperability means systems should be able to "talk the same language" of protocols and different encodings. So great challenge for the fog computing due to the need to

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- **Device level Energy Issues:** As the communication between these IoT devices is most energy consuming so to interconnect things of Internet in an interoperable way over the fog, energy constraints must be in mind.

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A Systematic Review on Technologies Implemented in Big Data Environment.

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Abstract- Big Data has demonstrated the incredible potential in improving, deciding, spotting business inclines in different fields, for example, fabricating, money, Information Technology. This paper gives a multi-disciplinary diagram of the examination issues in huge information and its methods, apparatuses and system identified with the protection, information stockpiling the executives, system and vitality utilization, adaptation to internal failure and information perceptions. Other than this, result difficulties and openings accessible in this huge information stage have made.

Keywords- Big data privacy, data storage management, network and energy consumption management.

I INTRODUCTION

The term of enormous information basically used to portray huge, heterogeneous, and unstructured computerized content that is hard to process utilizing customary administration instruments and procedures. The development of enormous information fundamentally expanding the administrative, strategic and operational capacities of an association quickly in the terms of information handling, data recovery, protection and security and above all basic leadership by means of cutting edge huge information's instrument and methods. The constant reception of Big Data Systems (BDS) are quickly giving different points of interest, for example, (a) putting away immense measure of information (regarding Petabyte (1015), Exabyte (1018), and Zettabyte (1021), (b) structure (content based information) and unstructured information (pictures, sound, video and so on.), (c) information can be store for a significant stretch of time, (d) causes the chiefs to look for unexpected information expectations all through the datasets to improve judgment to develop in the commercial center [3]. Contradicted to huge favorable circumstances by the enormous information, there are as yet various execution block subjects (for example Individual data spillage, information

stockpiles' security issue, organizes dormancy, etc) in enormous information that powers the administrative specialists to consider whether to embrace the huge information stage or to keep on working with the current databases. In this paper, an audit of writing on security procedures, information handling and the board approaches alongside their inadequacy has been appeared.

II PROBLEM DEFINITION

The primary goal of this paper is plot different inconveniences, difficulties and chances of enormous information as far as protection, security, information representation, information handling and the board and system and vitality the board distinguished during the examination of accessible writing on huge information.

III LITERATURE REVIEW

As indicated by [Pardip Kumar and Sahu] sum up examine approach is embraced. We start with the investigation of presumed scholastic diary databases (Springer, Taylor and Francis, Google Scholar, IEEE, Science Direct) identified with enormous information protection approaches, structures and methods for information stockpiling and quality administration, adaptation to non-

critical failure and perception procedures. To reach at the particular end, gathered research papers are sifted utilizing unique investigation. In the last stage, deliberately picked writing has contemplated and portrayed in a table structure.

TABLE I
Approaches for privacy, data management, network and energy consumption management, Fault tolerance and Visualization

Sr. No.	Author Name	Approach(s)	Advantages	Disadvantages
		Big data Privacy approaches		
01.	Rongxing Lu et. al [26]	V Privacy- Preserving aggregation (Based homomorphic encryption technique.) V De- identification privacy preserving technique.	VI It can protect character privateness in the stages of massive information collecting and storing. VII De- identification could make statistics analytics and facts mining greater effective and flexible.	VIII Since aggregation is motive-precise, one- motive aggregated statistics usually cannot be used for different purposes. X Its inflexibility prevents jogging complex data mining to take advantage of new knowledge. X Insufficient for big Information analytics.
03.	Houyem Heni [16]	A methodological framework which uses data fragmentation combined with a data encryption applied in big data.	Overcome the threads and information leakage in massive data environment, in particular for NOSQL databases.	Manually filtering the irrelevant records purchaser Greater computational time.
04	Xuyun zhang, chang liu. [47]	Flexible, scalable, dynamical and cost effective privacy-preserving framework is proposed which is based on map reduce on cloud.	The privateness- retaining framework handles the dynamical update of facts sets as well as to preserve the privacy of necessities of such records sets. • Improves the privateness of the disparate information units placed at multiple storage locations.	Proposed framework Nevertheless wishes vast investigation To improve the privacy of statistics units.
05	Shiyuan Wang. [41]	Information dispersion algorithm (IDA) for data confidentiality in storage systems. Column- access- via- proxy operations for data confidentiality in query accesses between clients and server. B+- tree index for efficient query processing.	They deal with the attacks that concentrate on to compromised facts confidentiality without compromising integrity. Denial- of- Service assaults. Achieves the realistic exchange- off among the security and overall performance.	• They did now not cope with the inner attacks including From malicious partners. • Network latency issues become worse the general performance.
06.	Kashinath Sarjapur [33]	Frequency distribution block (FDB) and Quasi- identifier distribution block (QIDB) anonymization methods.	Overcomes record linkage, probabilistic assaults and attribute linkage of patient touchy or personal records.	• Unable to store and aid unstructured statistics.
07.	Chin Lin	Differential privacy protection scheme for big data in body sensor network (BSN) is proposed. Dynamic noise threshold.	• Reduces the danger of privateness publicity whilst ensuring the facts availability and accuracy. • Noisy and outlier records is without trouble detected and eliminated from the pattern information units.	No theoretical evaluation Is provided to apply Differential privacy for massive Touchy facts in frame sensor networks (BSN).
08.	Dawei jiang1 [19]	• E*pic,* an extensible and scalable system is proposed. • Map reduce and relational data processing models are implemented.	Avoid I/O overheads. Easily parallelize the big data units on to working nodes and handles the multi-based records.	• Both the epic and Hadoop enjoy 2X slowdown when node failure occurs.
09.	Prokopios	A privacy preserving	Increase privateness of the digital services	• Unable to empower citizen's To

	Drogkaris [12]	methodology with salted hashing techniques.	and e- governance. The proposed transformation also can be applied directly to other information, information and attributes of the personal identifiers. Scalable to large allotted surroundings and big statistics sets.	retain control over their private statistics whilst the use of the advanced governmental Electronic services.
10	Lei Xu and Chunxiao Jiang []	Secure and reliable framework called Rampart is developed.	Eliminate the privacy risk in data preparation. Reconstruction and modification approaches of rampart framework protect sensitive information from unwanted discovery by data mining algorithms.	• Data provenance method based on gametheory requires more research to work reliably.
11	Zhao [49]	Intrusion detection system, named IDnS is developed. Reputation engine based on big data is built which include approximately 400 million DNS queries.	Effectively and efficiently detect Advanced Persistence Threat (APT) malware infections based on malicious DNS and traffic analysis. Reduce the volume of network traffic and improves the sustainability of the network.	Sometimes the proposed model cannot judge whether a host is infected or not. For a large and high sped network, it is hard to record all inbound and outbound traffic. Not good at detecting malware infections that do not rely on domains, such as Trojan use IP address directly to locate the command and control server.
Big data management approaches				
12	Huiju wang. [42]	TAMP: (Transform, aggregation, merge and post preprocessing) model is developed.	Multi-dimensional data updating problem is minimized. The join free approach is scalable, efficient and stable despite of the large number of table involved.	Network latency increased due to the multiple queries. Computational and query processing time increase.
13	Sanyal [34]	A conceptual framework is proposed which includes capturing data, organizing data, analyzing data and values & decision modules.	Reduces the problem of data processing of huge amount of data. Proposed model provide reliable and efficient solutions through data capturing, organizing data, analyzing data and finally helps the decision makers to make better decisions.	NA
14	Sandhu [32]	Framework for scheduling big data applications over geographical distributed cloud data centers is projected.	Reduces data extraction cost as well as provide query results timely.	Higher resource utilization rate. Unable to manage workload among data centers and virtual clusters. Not suitable for media stream applications.
15.	Jie pan [29]	Implement MapReduce model to parallelizethe calculations for special type of multi-dimensional data analysis query, namely multiple group-by queries.	Intermediate data transfer reduction, by mappers and combiners, decreases the communication cost.	Size of intermediate data increases significantly. A small of cost is increased as number of worker node increases in the MapReduce model.
16.	Merino [27]	Model to improve the data quality in big data is proposed.	Easily classify the data whether it is relevant to its intended user or not.	Disadvantage of proposed model is that it partially clean or filter the data.
17.	Dhouha jemal [18]	Model for OLAP process is developed.	Minimize the Input/ Output resource contention in terms of data manipulation, read and write operations throughout the	Varying number on nodes in a cluster And unbalanced workload deteriorates the overall performance of the model.
18.	Emad Elsebakhi [13]	Newton Raphson- likelihood optimization as a new large-scale learning classifier is proposed for big biomedical	Overcome the challenge of long- execution time while accessing the patients' health related data. Have best correct data classification rate.	Provide less predictions within multi- dimensional data.

				data sets.	
19	chao [9]	Framework for big data enterprise information processing network is developed.	Provide valuable information for supply chain decision making. Respond to customers queries in minimal and fast time. Enhance the capabilities of mining, warehousing and extracting modules.	NA
20.	Muhammad bilal [9]	Graph based data storage technique is implemented to store and process voluminous data.	Visualization tool helps the decision makers to make relevant/ irrelevant decision throughout the decision process.	User's private information leaked by data processing module.
21.	Noufa Al-Najran [3]	Data classification based framework is developed.	Helps the data analyst to categorize structured and unstructured data within the data sets. Noise and irrelevant data is easily eliminated.	Private information is exposed during data processing of data sets.
22	Dua' al hajjar (4)	Quality assessment based framework is Proposed to improve the quality of data sets.	Quality metrics such as efficiency, performance and flexibility helps to analyze the quality and reliability of data sets.	NA
23.	Ahmed absi [2]	Data reduction Techniqu e is Adopte d to optimize the performance of big data.	Assists in memory overhead reduction. Reduces the overall computation taken by the mappers and reducers.	Only suitable for medium scale geographically data sets.
24.	Lopez [25]	Chi- FRBCS (Fuzzy Rule Based Classification System) for imbalanced data present in the big data sets.	Structured and unstructured data is easily classified with minimal processing time.	Unable to handle and classify imbalanced data when scale to large distributed environment.
25.	Yi zhang [48]	K- Mean clustering algorithm.	Helps to identify knowledge pertaining to research and academia.	Performance is worst when sets scale to large data.
26.	Hui Li	Develop a complete churn analysis model include; Churn prediction model Information prediction model Negative inter- subscriber influence model.	Telecom operators easily analyze churn behaviors of telecom subscribers. The prediction model helps the telecom operators to retain existing and to attract new subscribers by offering the better service and quality.	Distributed cloud infrastructure incurs high cost.
Network and energy efficient approaches
27	Eleni, Stai	Hyperbolic data analysis (HDA) for network/ networked data analytics. Rigel and HyperMap data embedding technique.	Assume and identify the missing network links and social network analysis metrics (network links). Provides optimal advertisement strategy and targeting for marketing purposes.	Did not perform well in decentralized big network data.
28	D. Zeng (24 copy)	Computation- efficient heuristic algorithm is implemented.	Virtual machine placement policy manages the workload effectively within data centers. Data is processed at a large scale.	Higher Intercommunication traffic and communication cost.
29.	Yingjie xia (23)	A big data traffic data processing Framework is proposed using Hbase to analyze the data of intelligent monitoring and recording system (IMRS) is proposed.	Solves the big data storage and analysis problem vehicle behavior based big data sets. Increase the data query speed and computing efficiency. Cluster size can be expanded within the data centers according the requirements so as to improve the concurrent capacity and processing speed.	For meet these requirements still it is difficult for the programmer to design an analysis algorithm. The extra consumption Of storage space required by the proposed framework is Very high.
30	Liang Shi (21)	Path aware selection method is implemented.	Maintain the topology of characteristic in data centers. Effectively detect faulty links in the communication network. Less number of path selections makes the network topology reliable.	Computational time Increases while selecting the suitable path for data transmission.
31.	Mohammed	Hybrid electrical and optical	Decreases the cost of cooling system from	Initial setup/ installation cost for

	naimur Rahman (18)	network architecture for big data is advanced.	49.575 to 27% of total cost. Scalability and fault tolerance features of developed model are very high.	cooling Procedure and optical interconnections are very high.
32.	Moises- Quezada- naquid (17)	RS- pooling strategy which divides the overall storage devices into disjoint subsets or pools and then fault tolerance is applied to these subsets. Replication technique is employed in case of any storage device failure.	Approach is very beneficial for the organization which faces vendor- lock in problem in big data as well as cloud environment.	Renting storage resources increases the overall operational cost.
33.	Francesco Palmieri (15)		The proposed unified model allows better utilization of the network and reduces the communication overhead within big data.	Service disruption and increase in computational power hinders the performance of projected model.
34.	Hamid kchaou (13)	Framework for distributed workload handling in big data and for cloud is implemented. Vast data sources from cloud and web are stored in a distributed fault tolerant databases and processed through a programming model.	Vast amount of data sets are easily managed.	Information leakage is still unresolved. Performance is very slow when scale to A large scale environment.
35.	Jaoume ferrarons (11)	A unified benchmark approach aiming to assess all the performance parameters involved in cloud based big data application system is proposed.	Existing parallel framework's performance can be easily obtained.	Did not include security and workload measures.
36	Jerzy balicki [7]	Meta-heuristic search technique is applied.	Deal with communication failure in big data cluster grids. Continue to work even in the presence of communication link failure.	They did not employ automatic repair and recovery of faulty nodes.
37.	T. Baker [7]	GreenDi (Green Director): Network- based routing algorithm acts as a bridge between intended users and most energy efficient paths.	Helps to select more energy efficient path to access, retrieve and process the data. Works even in the presence of node failures.	Huge amount of computation time is consumed to select the best optimal energy efficient path.
38.	Mohamed aboulela [1]	Multi- domain hierarchical scheduling process is created. Shortest path algorithm handles more complex data intensive applications in big data platform.	Improve link utilization within datacenters. Application completion time is greatly reduced.	The algorithm use in their research Work suffer from longer scheduling time. Unable to recover distributed resources in case of failure.
39.	Dawei Sun [38]	Energy efficient and critical path scheduling algorithm is applied.	Maintains the tradeoff between increased energy efficiency and decrease response time effectively in big data environment.	NA
40	Xuan Liu[1]* (scalability wala paper)	Meta- MapReduce (MMR) algorithm	Resolves the problem of iterations in Hadoop. Error rates of MMR are smaller. The speed performance of MMR proves that MapReduce improves the computation complexity substantially on big datasets. MMR reduces computational complexity.	• The proposed algorithm did not perform accurately well in parallelized environment to increase efficiency.
41.	Sankari subbiah (-2)	Hit rate geographical location analysis algorithm (HIRAGLAA)	Manage the geographically distributed big data infrastructure. Minimize the energy consumption of storage devices. Load balancing and fault tolerance features make the infrastructure more reliable.	NA
	Data Visualization approaches in big data			

| 42 | Baobin Li1 | Parallel Coordinates, virtualization technique, is applied on Cyber Psychology model in big data. | Gives the direct visual relationship of data which help improving analyzing data. This visualization technique easily categorizes the normal and abnormal behavior (mental illness) of Research Scholars while accessing micro blog via network access. | • Noisy data samples rose because no preprocessing Filtering mechanism and data Mining technique is used. |
| 43. | Sun-Yuan Kung [21] | Discriminant component analysis (DCA), a supervised principal component analysis (PCA), visualization Tool is proposed. | • Individual data can be highly compressed before being uploaded to the clouds. • Achieves privacy, data compression, visualization in collaborative learning environment. | The proposed visualization tool did not address the emerging issue on internet privacy. |

In table 1, rundown of approaches, their points inte est and inconveniences is spoken to. The aftereffect ofwriting survey exhibited a lot of procedures/syste ms/techniques for protection, information the board, system and vitality the executives, Fault resilience a nd represent. From table 1, further unique analysis may be made to pick out inside the previous knowledge gap and to suggest a few areas for destiny research work.

TABLE II Challenges in Big Data Platform

Sr. No.	Challenges in Big Data
1	Security troubles are the major subject in massive information. One of the crucial security issues at the enter a part of the massive records is to make sure that the sensors will now not be compromised with the aid of attacks.
2	Security trouble on the communiqué among the large records and other external device is likewise foremost challenge.
3	Dealing with protection issues at the analysis a part of big records is also a tough project.
4	To pick out the Advanced Persistent (APTs) safety troubles through the disparate structures is a critical undertaking.
5	Leakage of private statistics by using the records analytics techniques to other human beings after the massive statistics evaluation technique is a challenging assignment.
6	To cope with affirmation of a document (COF) and studying contents of files (LCF) safety assaults in huge statistics a most important essential challenge.
7	How to get the tradeoff between statistics privacy and reproducible research is the most important mission in massive facts.
8	Different convergence speeds of the equal records mining algorithms main to the problem of synchronization.
9	How to mitigate the impact of noise, outliers, incomplete and inconsistent information in big information storage is becoming an open difficulty. The integration of different statistics sources is a well timed problem. Data integration is faced with many challenges, consisting of extraordinary statistics patterns and a huge quantity of redundant facts.
10	Manually cleansing facts in large records is taken into consideration as the main challenge inside the arena of big information due to the increasing extent, speed and type of data.
11	Challenge is to develop a filtering mechanism to maintain the beneficial records in big data.
12	Deciding the place wherein to save the massive statistics is some other challenging venture.
13	To locate the basis reason failure of dispensed compute nodes, databases middleware is a really hard system.
14	Storing and evaluating massive volume of log based totally records for illness evaluation, trying out, detecting safety breaches is elevating issue.
15	Collecting the log fie from remote location becomes a challenging due to network bandwidth caps and fragile networks.
16	The increase of log repository within the huge information systems is becoming a essential situation for the records analysts.
17	Existing worm duplicate strategies may reveal patron's sensitive facts while screw ups arise inside the massive statistics structures.
18	Operations over encrypted information are usually complex and time ingesting, at the same time as large facts is excessive extent and desires us to mine new understanding in an affordable time frame, running operations over encrypted facts is inefficient in big records analytics.
19	Hadoop should combine with actual time big facts series & transmission and provide quicker processing past the batch processing.
20	Hadoop provides a concise user programming interface, even as hiding the complex execution. In a few senses, this simplicity causes poor performance. So extra superior interface similar to DBMS should be implemented from single angle.
21	In big dimensionality, scalability poses as the key project to many present nation- of- art methods.
22	Computational intelligence and statistics mining in huge facts can't cope with massive size of datasets elegantly and regularly scored miserably.
23	Achieving actual- time evaluation and prediction on massive dimensionality in huge facts is a new venture of computational intelligence on transportable systems.
24	Big records switch entails large records generation, acquisition, ameliorations inside the spatial domain. Big facts transfer normally incurs high prices, which is a bottleneck for huge records computing. And enhancing the transfer performance of large facts is a key aspect to enhance massive data computing.

information visualization and fault tolerance, challenges and possibilities) to research the contemporary fame massive facts. After that, result has been calculated thru reading to be had techniques on big data offerings furnished by them and provided in graph 1.

The examine of table 2 indicates the presence of diverse challenges of massive statistics techniques diagnosed for the duration of evaluate of relevant literature. According to the literature evaluate protection, privateers, coping with massive amount of records units, prediction analysis, scalability and locating root purpose failure in big facts are the primary demanding situations in massive records. Furthermore, this know-how may be in addition exploited to layout new techniques or tactics, frameworks for the minimization of demanding situations and maximization of opportunities of massive statistics platform. Conclusion, open research issues, and future directions

In the beyond few a long time, facts has been produced in massive quantities by means of big records linked devices and packages. Continuous advancement in the computational power and the development inside the current technologies are the main reason for the statistics growth. In this paper, we've studied privacy, information control, community and power intake control, Fault tolerance and visualization in big records platform. A complete survey of strategies/ frameworks/ strategies along with (a) gain, (b) hazards is explored in this paper. The information provided on this paper can be in addition exploited to layout and model new mechanisms or techniques within the cloud. The outlined research gaps will be helpful for the researchers who are motivated to work in the field of big data.

IV FUTURE DIRECTIONS

1) Different kind of big data approaches, framework has been developed to provide various services like workload management of big data sets, providing security and privacy measures to stored data, but there is a stringent requirement on big data privacy preservation and management.

2) Developing an approach for security and privacy of big data platform with other systems such as cloud computing is a critical task.

3) Problems related to manually cleansing the data sets for data processing phase in big data poses a research issues. So there is a need to develop self-programmed data filtering technique to eliminate noisy, outlier and irrelevant data within the data sets.

4) Scalability issue of the existing big data approaches in terms of data management, privacy and security, resource optimization and data extraction by different data mining algorithms is rapid growing challenge which needs to be tackle.

5) There is a need to develop a machine learning systems and to define in-built gestures in research for general and more specific (medical) purposes.

From the review of literature, authors identified few research gaps in context to different areas such as privacy, data management, network and energy management, data visualization, fault tolerance, challenges and opportunities. These research areas can be explored as future work. For this, more analytical studies are required for developing a suitable solution either in the form of framework.

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Application of Bacteriocins of Lactobacillus Brevisas Biomedicine Against Dental Cavities

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Abstract: World Health Organization (W.H.O.) has pointed that despite of great improvements in the oral health of population in several countries; dental caries still persists and has become a global problem. The oral health care demands are beyond the capacities of the health care systems in most low and middle income countries. Therefore, it was thought to explore the natural ways by which the problems of dental caries can be prevented in a cost-effective manner. The inhibition of caries causing organisms can be done by naturally occurring substances like bacteriocins found in lactic acid bacteria. In the present study, prevention of dental caries by utilization of bacteriocins from *Lactobacillus brevis* has been done by incorporating bacteriocin in toothpaste. The bacteriocin producing five strains of *Lactobacillus brevis* isolated from curd were used for the production of bacteriocin.Out of five bacteriocin producers, the strain LB11(1) showed maximum percentage of MIC. The bacteriocin activity was optimized using different media, pH and temperature. The partial purification of the bacteriocin was done using ammonium sulphate precipitation and centrifugal filteration which obtained the molecular weight of the purified bacteriocin as 3 kDa, while yield obtained was 100 per cent. The purified bacteriocin was then incorporated in the toothpaste to check the effect of inhibition on caries causing organisms (*Streptococcusmutans* and *Streptococcus sobrinus* isolated from dental cavities). It was confirmed that the bacteriocininduced toothpaste can be applied to prevent dental caries directly by the consumer and in a cost effective manner.

Keywords —Bacteriocins, lactic acid bacteria, Streptococcus mutans, Streptococcus sobrinus, Lactobacillus brevis, dental caries

I. INTRODUCTION

Dental caries is the most common disease occurring in all age groups, which is preventable and is the major cause of oral pain and tooth loss [1]. Children suffering with tooth decay, also suffer with improper growth and development which severely affects their health. India is a diverse country with different ethnic, geographic and cultural diversity. Therefore, it is quite expected to have different disease patterns in various regions or states of the country [2]. According to the report of World Health Organization, a large number of clinical treatments for dental caries have been developed with improved technologiesin most of the countries of the world, but still the disease of dental caries has become a global burden. The oral health care demands are beyond the capacities of the health care systems in most low and middle income countries [3]. Keeping in view of the above data, it was thought to explore the natural ways by which the problems of dental caries can be prevented in a cost-effective manner. It was found that a few studies have set the path through use of natural bacteriocins against inhibition of caries causing organisms. Bacteriocins are potent protein toxins produced by virtually every bacterial and archeal species [4] which can be applied to prevent dental cavities. Bacteriocins have a fast acting mechanism and they work even at extremely low concentrations. They form pores in the target membrane of bacteria, thus inhibiting the cell-wall biosynthesis, [5].

II. METHODOLOGY

A. Review Stage Isolation and screening of bacteriocins from the strains of Lactobacillus brevis:

Isolation of bacteriocin- The five strains ofLactobacillus brevis[LB11(1), LB13(3), LB13(4), LB13(5), LB14(3)] isolated from curd were grown in De Man Rogosa and Sharpe (MRS) broth for 24 h at 24°C. Cells were removed by centrifugation at 12,000 rpm for 5 min in 1.5 ml sterilized Eppendorftubes [6].

Determination of anti-bacterial activity-This supernatant (crude bacteriocin) was employed for determining the antibacterial activity. The indicator organisms used were- ten strains of Streptococcus mutans[SM10(a), SM13(a), SM14(a), SM22(a), SM23(a), SM28(a), SM29(a), SM33(a), SM35(a), SM36(a)] and four strains of Streptococcus sobrinus [SS19(b), SS23(b), SS24(b), SS36(b)] (dental caries causing organisms).

Minimum Inhibitory Concentration (MIC) of the Crude Bacteriocin-Minimum inhibitory concentrations (MICs) are defined as the lowest concentration of an antimicrobial that will inhibit the visible growth of a microorganism after overnight incubation [7]. Spot on lawn assay was done against the fresh indicator cultures grown at 24 h at optimum conditions. Different concentrations (as given in the Table 1) of the crude bacteriocin solution was put as drop on each plate of the isolate.

Table: 1 . Different Concentrations

S.No.	Concentration	CFCs	Distilled Water
1.	2x	100μl	100μl
2.	4x	100μl	300μl
3.	6x	100μl	500μl
4.	8x	100μl	700μl
5.	10x	100μl	900μl
6.	15x	100μl x (6)	50μl
7.	20x	100μl x (6)	100μl
8.	30x	100μl x (6)	200μl
9.	40x	100μl x (6)	300μl
10.	50x	50μl x (6)	450μl
11.	100x	100μl x (11)	100μl
12.	200x	100μl x (12)	100μl

Growth Curve of Bacteriocin Producing Strain- To determine the growth curve of bacteriocin producing strain, the method as described by the [9] was followed. The selected bacteriocin producing cultures- LB11(1) was inoculated in sterilized De Man Rogosa and Sharpe (MRS) broth and incubated at 37°C. Optical density (O.D.) of the bacterial growth was measured at 600 nm after 2, 4, 6, 8 10, 24, 30 and 36 h of incubation. Medium-De

Man Rogosa and Sharpe (MRS) and M-17 flasks inoculated with the cultures were incubated at 42°C.

- Initial pH-De Man Rogosa and Sharpe (MRS) broth adjusted to various initial pH values (5.0, 6.0 and 7.0) was inoculated with the cultures and incubated at 42°C.
- Temperature- De Man Rogosa and Sharpe (MRS) broth inoculated with the producer strain was incubated at 37°C, 42°C and 50°C.

In all the above experiments, the sampleswere drawn at 0, 8, 16, 24 and 36 h intervals and tested for pH andbacteriocin activity units. The results obtained were represented in theform of table and graphs. The statistical analysis for the parameter pH for all the conditions were statistically analyzed using ANOVA- single factor.

Protein Estimation-Protein content of the samples was estimated by the method of the [10-12] using bovine serum albumin (BSA) as the standard. The concentrations of the test solution were noted under absorbance at 600 nm which were analyzed by graphical representation. The amount of protein was calculated as-

mg protein/ml= mg(protein) (Dilution)/ Reagent (ml)

B. Partial purification of the bacteriocin

Ammonium Sulfate Precipitation-The procedure as described by the [13] was followed. To 100 ml of supernatant, 37.32 g of ammonium sulfate was added slowly with constant stirring at 4- 5°C to achieve 60 per cent saturation and stirring continued for another 4 h at 5-7°C. The mixture was then kept overnight in refrigerator at 0°C. It was then centrifuged at 13,000 rpm for 20 min and the precipitates were dissolved in 0.1N phosphate buffer (pH 6.8). This partially purified bacteriocin was further subjected to purification by centrifugal filters.

Centrifugal Filters-The bacteriocin solution obtained, was further purified using 3kDa MWCO (molecular weight cut off) centrifugal filter. The method as described by the [14] was used with some modifications. 0.5 ml of partially purified bacteriocin was added in two filters of 3kDa each in sterilized conditions. These were centrifuged at 13,000 rpm for 10 min. The purified sample was recovered in another sterile Eppendorff tubes. The specific activity and yield of the bacteriocin were

calculated from the protein content and activity units of the samples. The Bacteriocin yield (%) was calculated as- Weight of sample before filtration x 100/ Volume of sample used for filtration.

Enzyme Sensitivity- To know the sensitivity of the bacteriocin against enzyme, the proteolytic enzyme used was Protease. 5 ml of bacteriocin was treated with enzyme (1 mg/ml) at pH 7.0. Incubation was done at 37°C for 24 h. It was then heated at 100°C for 3- 5 min to denature the enzyme. This was then assayed by agar well-diffusion method for determining the antimicrobial activity. The standard method as described by the [15] was followed.

C. Incorporation of bacteriocin in toothpaste

The purified bacteriocin was incorporated in toothpaste (standard composition is mentioned in the Table 2, given by the Moharamzadeh, 2017) to determine the effect of these substituted products on caries causing organisms. Taken 1g/1ml of toothpaste in four different sterile tubes and incorporated with different concentrations of bacteriocin- 0.05 ml, 0.1 ml, 0.5 ml and 1 ml. Agar well assay was used to know the bacteriocin activity while being incorporated in the products. 50 µl of the incorporated bacteriocin were filled in agar wells on the solidified mat of indicator organism. These were incubated at 37°C for 24 h to observe for the presence or absence of zone. A control sample of To othpaste without bacteriocin was also kept along for testing.

Table 2. Standard Composition of Toothpaste

Constituents	Quantity
Abrasives- aluminium hydroxide, calcium hydrogen phosphates, calcium carbonate, silica and hydroxyapatite	50.0 %
Detergents- Sodium lauryl sulfate (SLS)	0.5-2.0 %
Antibacterial agents- Triclosan or zinc chloride	30.0 %
Sodium fluoride	1450 Ppm
Water	20- 40%
Flavourants- spearmint, peppermint and wintergreen	1000 Ppm

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III. RESULT AND DISCUSSION

I. Isolation and screening of bacteriocins from the strains of Lactobacillus brevis:

Anti-microbial assay against Streptococcus mutans and Streptococcus sobrinus-The five strains of Lactobacillus brevis were used against the indicator organisms- nine strains of Streptococcus mutans and five strains of Streptococcus sobrinus to determine the antibacterial activity. All the five strains of Lactobacillus brevis showed zones of inhibition against six isolated strains of Streptococcus mutans and Streptococcus sobrinus species. Thisis represented in the Figure 1. The statistical analysisofthe diameter of zone of inhibition were statistically analyzed using ANOVA. This showed that the maximum percentage of inhibition is shown by the isolate LB11(1)- 26% against the isolates of Streptococcus mutans and Streptococcus sobrinus. All the values were average of three trials. The p-value within the isolates is 1.71E-09 and showed no significant difference at p ≤ 0.05. In the Figure 2, the graphical representation of the zone of inhibition has been presented showing the maximum inhibition by the isolate LB11(1) against the Streptococcal isolates.

The maximum inhibition shown by the strain LB11(1) may be due to the presence of optimal growth conditions for bacteriocin production.
The study by the [16], had also shown similar results as the diameter zones are included between 2 to 10 mm and the biggest clear zones were recorded by the extracts of Pediococcuspentosaceus NRC AM1 and Pediococcuspentosaceus NRC AM4 with Escherichia coli 0157:H7, but the lowest clear zones were obtained with the extracts of Lactobacillus brevis NRC AM2 and Lactobacillus plantarum NRC AM7 against Pseudomonas aeruginosa.
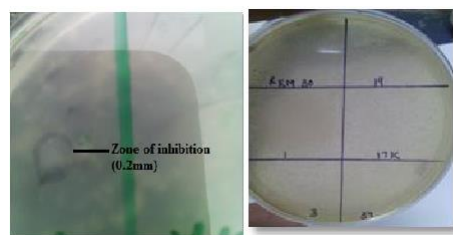
Fig. 1 Anti-bacterial activity of the Strains against Streptococcal species
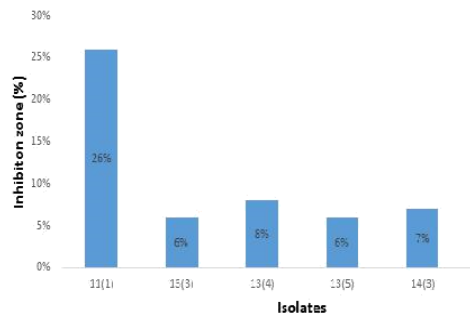
Fig. 2. Percentage of Inhibition by Strains

Minimum Inhibitory Concentration (MIC) of the Crude Bacteriocin-To determine the lowest concentration of an antimicrobial (bacteriocin), the Minimum Inhibitory Concentration (MIC) of the crude bacteriocin was determined by spot-on-lawn assay [18]. MIC was calculated as - AU/ml= 200 x MIC.The minimum inhibitory concentration was 0.02 µl as shown by the strain LB11(1) with maximum antimicrobial activity of 10,000 AU/ml against the Streptococcal strain of SM28(a). The dilution of culture supernatant to 50X dilution did not show any zone of inhibition. The diameter of zone of inhibition obtained for all the strains was 0.1mm. The MIC of the crude bacteriocin were statistically analyzed using ANOVA-single factor. This represented the minimum inhibitory concentration as percentage and the maximum percentage of MIC is shown by bacteriocin producing strain LB11(1)- 2% against the isolates of Streptococcus mutans and Streptococcus sobrinus. All the values were average of three trials. The p-value within the strains is 0.002 and did not show any significant difference at p ≤ 0.05.

The presence of optimal conditions required for the maximum activity of bacteriocin for the strain LB11(1) favored this strain to produce maximum percentage of inhibition at the minimum concentration.

In a study by the [17], similar results were shown- MIC of various isolates of lactic acid bacteria producing bacteriocins isolated from fermented milk was determined. The MIC (µl) observed was as follows- Lactococcus spp.- 0.05, Lactococcus spp.- 0.6, Leuconostoc- 0.2, Pediococcus(4 different strains)- 0.6, 0.5, 0.5 and 0.05.Growth Curve-To obtain the optimum growth conditions of the bacteriocin producing strain, a growth curve of

isolated lactic acid bacterial strain LB11(1) in MRS broth was plotted against time of incubation and optical density (O.D.) at 600 nm which was incubated at 37°C for 36 h. It was observed that the maximum bacteriocin was produced at 24 h and production remained stable till 30 h. After reaching 36 h, the bacteriocin production started to decline and pH of MRS broth decreased from 5.97 to 3.6 (Figure 3).

During 48 h of growth, pH of MRS broth decreased from 5.8 to approximately 3.6.
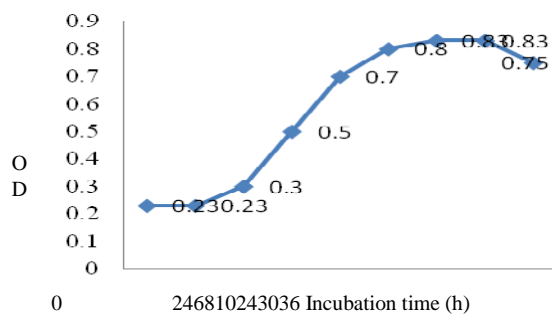
Fig. 3 Growth Curve

Optimization of Conditions for Maximum Production of Bacteriocin-

• Influence of Culture Medium on Bacteriocin Production-The optimization of conditions for different media was done using De Man Rogosa and Sharpe (MRS) and M-17 media.A gradual decrease in the initial pH of the growth media (MRS and M17) was observed with increase in incubation period varying from 0-36 h. The bacteriocin production was observed maximum in MRS media at 24 h at pH 5.9 against the Streptococcal strain SM28(a) (Figure 4(a)).Statistical analysis: The optimization of conditions for different media for pH were statistically analyzed using ANOVA- single factor. The p-value within the strains for MRS media is 5.87E-15 and did not show any significant difference at p ≤ 0.05. Similarly, the p-value within the strains for M-17 media is 2.56E-12 and did not show any significant difference at p ≤ 0.05.

• In a study by the [20], the activity of the bacteriocin produced from Lactobacillusbrevisisolated from curd, was evaluated againstthree bacterial species in MRS media supplemented with various nitrogen and carbon sources. MRS media supplemented with soy bean

meal recorded maximum anti-bacterial activity against the tested bacterial strains which is in support to the present study.

- Influence of Initial pH on Bacteriocin Production-The optimization of conditions for initial pH was done using pH 5.0, 6.0 and 7.0. De Man Rogosa and Sharpe (MRS) broth was adjusted to various initial pH values (5.0, 6.0 and 7.0) and inoculated with the cultures and incubated at 42°C. A gradual decrease in the initial pH range of 5.0, 6.0 and 7.0 was observed in the growth media at incubation period varying from 0-36 h. The bacteriocin activity was observed at 24 h and it showed decrease in the activity at 36 h in the pH of 5.0, 6.0 and 7.0. The bacteriocin production was shown to be maximum at pH 5.8 at 24 h against the Streptococcal strain SM28(a) (Figure 4(b)). Statistical analysis: The statistical analysis of the strains for comparison of the parameter pH was done using ANOVA-single factor. The p-value within the strains at pH 5.0 is 1.64E-06 and did not show any significant difference at $p \leq 0.05$. At pH 6.0, the p-value within the strains is 4.78E-13 and did not show any significant difference at $p \leq 0.05$. For pH 7.0, the p-value within the strains is 1.84E-10 and did not show any significant difference at $p \leq 0.05$.

- In a study, the bacteriocin strains of Lactobacillus species isolated from dairyproducts, showed that all the strains were grown well at pH 4, 6 and 8 but only strains of Pediococcuspentosaceus NRCAM1, Lactobacillus brevis NRCAM2 and Pediococcuspent osaceus NRCAM4 were also grown at pH 2.0 [16] which is in support to the present study.

- Influence of Incubation Temperature on Bacteriocin Production-The optimization of conditions has been done using different temperatures- 37°C, 42°C and 50°C. De Man Rogosa and Sharpe (MRS) broth inoculated with the culture was incubated at 37°C, 42°C and 50°C. It was observed that with gradual rise in incubation period from 0 to 36 h, there was a gradual decrease in the initial pH. The rise in the incubation period from 0 to 36 h, at 37°C, there was maximum bacteriocin activity at 24 h which gradually decreased at 36 h of incubation. Whereas, at 42°C and 50°C, there has been consistent decrease in the activity of bacteriocin. The maximum activity of bacteriocin was shown at

37°C and pH 5.9 for 24 h against theStreptococcal strain SM28.

Statistical analysis: Statistical analysis of theisolates for the parameter pH at different temperatures was performed. For temperature 37°C, the p-value within the strains is 3E-15 and did not show any significant difference at $p \leq 0.05$. At temperature 42°C, the p-value within the strains is 2.4E-14 and did not show any significant difference at $p \leq 0.05$. Also, for temperature 50°C, the p-value within the strains is 5.41E-15 and did not show any significant difference at $p \leq 0.05$.

In a study, the bacteriocin strains of *Lactobacillus* species isolated from dairy products including the strains of *Lactobacillus brevis*NRCAM2 showed the growth at 30°C and 37°C. On the other hand, strains of *Lactobacillus brevis*NRCAM2, *Lactococcuslactis*sub sp. *lactis*NRCAM3 and *Lactobacillus pentosaceus*NRCAM5 were not ableto grow at temperature 45°C. On the other hand, the species of *Lactobacillus plantarum* and *Lactobacillus rhamnosus* can grow at 45°C [16]which is in support to the present study.
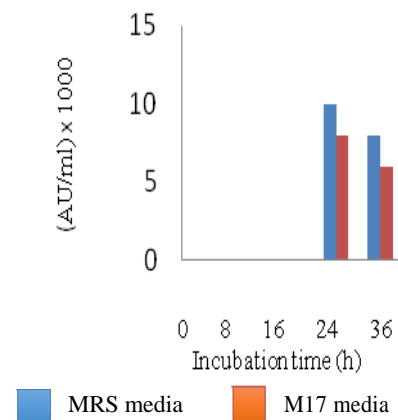
Figure: 4
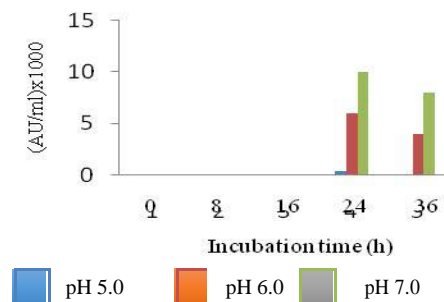
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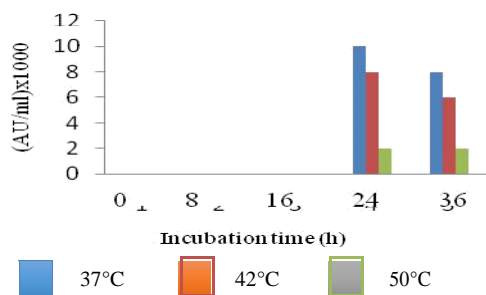
Fig.6 Influence of different conditions

II. Partial purification of the bacteriocin

The partial purification of the bacteriocin was done by using ammonium sulphate precipitation. The partially purified bacteriocin was passed through centrifugal filter of 3 kDa. After purification, the specific activity of the purified bacteriocin was determined by spot-on-lawn assay against the isolated strains of *Streptococcus mutans* and *Streptococcus sobrinus*. The activity units of thebacteriocin LB11(1) was 20,000 AU/ml against the isolated strain of *Streptococcus sobrinus*-SS19(b). The diameter of the zone of inhibition was 0.2 mm. The molecular weight cut-off of the purified bacteriocin after centrifugal filteration was 3kDa and the bacteriocin yield obtained was 100%.

A study by [19], showed similar results: the molecular weight of the bacteriocin of *Lactobacillus brevis* isolated from Jiaoke (naturalfermented cream in China) was approximately 3.8 kDa according to tricine SDS-PAGE which is in support of the present study.
Protein Estimation of the Crude and Partially Purified Bacteriocin-The total protein content of the crude and purified bacteriocin of the strain LB11(1) was determined by the method described by the Lowry *et al*, 1951. The total protein content in crude bacteriocin was calculated as 1.0 mg/ml and that of purified bacteriocin was 0.2 mg/ml.

In a study by the [21], similar results were obtained which showed that the purified bacteriocin produced from the lactic acid bacteria had protein content of 0.21 mg/ml
Enzyme Sensitivity of Bacteriocin-To determinethe proteinaceous nature of the bacteriocin, the bacteriocin of the strain LB11(1) was treated with the enzyme- protease. It was observed that the bacteriocin had lost its inhibitory activity upon treatment with the proteolytic enzyme. The enzyme protease had cleaved the bacteriocin and this bacteriocin could not show its antimicrobial action

against the indicator organism. This confirmed the proteinaceous nature of the bacteriocin. The bacteriocin like substance produced by *Lactobacillus brevis* B23 showed no antimicrobialactivity or it was unstable after heat treatment with all the proteolytic enzymes (protease and trypsin). The completely inactivated inhibitory activity indicated that it was proteinaceous in nature [22] which is in support of the present study.

III. Incorporation of bacteriocin in toothpaste

Agar well assay was performed on solidified mat of indicator organism. The diluted concentrations for 100X and 200X of 50 µl toothpaste was poured into the wells of the medium and incubated at 37°C for 24 h. After incubation, these were observed for the presence or absence of zones. The zone of diameter at concentration of 100X for the control sample of toothpastewas 0.6 mm and the toothpaste with bacteriocin was 1.01 mm (average of three trials), while at concentration of 200X, the control sample of toothpaste was 0.8 mm and for the toothpaste with bacteriocin was 1.21 mm (average of three trials) (Figure 5).

Statistical analysis: Statistical analysis of the zoneof diameter for the bacteriocin induced toothpaste at concentration 100X and 200X, was performed using ANOVA-single factor. The p-value within the isolates is 8.16E-05and did not show any significant difference at $p \leq 0.05$. The comparison of zone of diameter for bacteriocin induced inhibition by toothpaste and control sample is shown in the Figure 6.
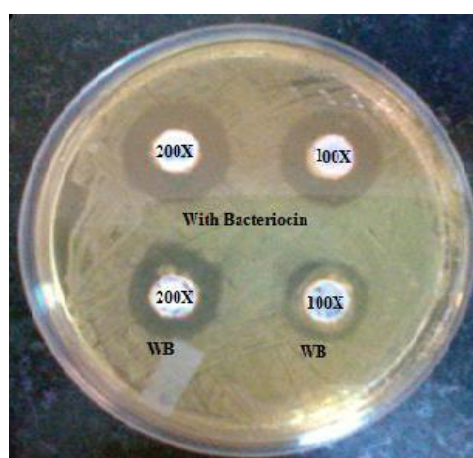
**WB: Without Bacteriocin Fig. 7 Increase in Inhibition of Bacteriocin Induced Toothpaste against Indicator
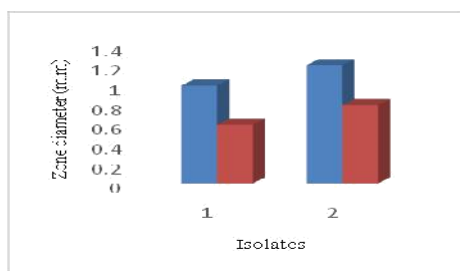
Fig. 8 Zone of Diameter for Inhibition by Toothpaste

IV. CONCLUSION

The five strains of Lactobacillus brevis isolated from curd, were used for the production of bacteriocins. The crude bacteriocins obtained were applied to test the antimicrobial activity against the isolated Streptococcal species of dental cavities. All the five strains showed antimicrobial activity against the six indicator organisms of Streptococcal species. This indicated the presence of natural inhibiting substance called bacteriocin within the isolated Lactobacillus brevis strains. It was found that the minimum inhibitory concentration was obtained by the bacteriocin of the strain LB11(1)-0.02 µl with maximum antimicrobial activity of 10,000 AU/ml against the Streptococcal strain of SM28(a) and LB11(1) was regarded as the best bacteriocin producing strain as the optimal conditions for its growth were suitable.The statistical analysis revealed De Man Rogosa and Sharpe (MRS) to be superior to M-17 media at 24 h at pH 5.9 against the Streptococcal strain SM28(a). This is because the MRS media contains all essential nutrients which is required for the bacteriocin production whereas there is absence of such nutrients in M-17 medium. The bacteriocin can be considered heat labile as the activity was decreased at the temperatures 42°C and 50°C. In all the conditions, there was a gradual decrease in the initial pH with gradual rise in incubation period from 0 to 36 h. This is due to the loss of activity due to nutrient limiting factor after 24 h or the bacteriocin is degraded by the enzymes. It was concluded that the bacteriocin producing strain LB11(1) showed maximum antimicrobial activity at 37°C for 24 h between pH 6.0-7.0. The molecular weight cut-off of the purified bacteriocin after centrifugal filteration was 3kDa and the bacteriocin yield obtained was 100%. The total protein content in crude bacteriocin- 1.0 mg/ml and that of purified bacteriocin- 0.2 mg/ml. The proteinaceous nature of the bacteriocin was also confirmed by the application of enzyme protease. Thus, bacteriocins

from Lactobacillus brevis can help in enhancing the prevention of dental caries as a biomedicine. This can be achieved by inoculating the bacteriocin in toothpaste as it can be applied directly by the consumers and patients of dental caries in an easy and cost-effective manner.

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Intelligent Manhole Management System

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Abstract: - World is heading towards smarter ways, smart cities are emerging very fast all over the world. Many parameters are considered for the smart cities such as internet connectivity, clean water, transportation & electricity. Cities and countries neglect water, sewer and manhole systems at their peril & smart city starts eight feet below the ground and goes up from there. The underground drainage system is considered to be a vital module of urban infrastructure. It is considered to be city's lifeline. Since there are manual drainage management systems hence effective cleaning and working of an underground system majorly in various big cities is quite difficult for the government personnel and also it is nearly impossible to locate a manhole having a problem. Underground Drainage system comprises of complex network of sewerage system, gas pipeline, water pipeline, and manholes. The prototype project being discussed in this research has various functions which are used for preservation and monitoring of underground drainage systems. It provides a system which is able to monitor the water level, toxic gases and most importantly open covers. The system is also capable of detecting hazardous gases in the closed chamber of specific manholes. All this data is sent to the concerned personnel on their dedicated devices which can be accessed from all across the globe. The implementation of this project will be very useful to the society.

Keywords: — Automated Monitoring System, IOT, Sensors, Smart city, Smart manhole cover, Smart protection.

I. INTRODUCTION

A well supervised man-hole managing is a sign of good city. Now-a-days man-holes are the main problem in the cities .All the man-holes are not in secure position. Most of the man-holes are in damaged condition. Because of the damaged man-holes, there are chances of occurrence of accidents in the road. These damaged man-holes are threat to personal safety. This prototype is designed to decline the chances of accident by preventing open man-hole in major cities. The sensors are used to detect open manholes and then the information will be sent to the authority of the corporation department and the councilor of the area where the manhole is present. The control and the management is done through IOT. The implementation of this project will be very useful to the society. The smart world is the new trend where everything is controlled by the things, not by human beings. The world which is getting urbanized requires well maintained surrounding. Smart cities are forming in order to make people comfortable. That comfortness includes in maintaining our environment clean. Maintaining cleanliness in your living place is the great lifeline for the smart city. The drainage system which is laid underground is the base of well-maintained smart city. In order to manage these systems, many holes in the pavement are made, they are called as manholes. Open

Manholes are not included in good management of the smart city. Implementation of new system should undergo well management so that it works properly. Manholes should be properly closed in order to decrease the accidents. Road accidents, hazardous gas emission, people or animals falling inside the manholes `and environmental pollution are frequently occur as a result of manhole cover displacement, loss, and damage by threatening lives and safety. The rate of accidents due to insecure manhole coverage is high. Obviously, this is an objection over the concept of the smart cities. The person of corporation office has to go directly and check the manholes or the municipal office. It helps the authorities to take action corresponding management through mobile devices based on the collected information. World is heading towards smarter ways, smart cities are emerging very fast all over the world. Many parameters are considered for the smart cities such as water, transportation, electricity, communication, underground system; etc. The waste water is

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disposed underground. Water pipelines are placed below the ground. This underground systems needs to be maintained in order to maintain the dignity of the smart cities. Nowadays manhole management is more important because mismanagement of manholes leads to many accidents. It is very important to have a secure manhole management system in smart cities because the rate of accidents due to insecure manhole coverage is high. Municipal Corporation is the official authorities to maintain the manhole cover functions. Manual maintenance will be difficult in real-time execution, thus we are proposing a management system. The main idea behind developing this system is to maintain the manhole covers from damaging. It is the IoT based manhole cover system. This system consists of three sensors and an interface where notification gets to the municipal office. Implementation of this system will help in the betterment of the smart cities.

The main objectives of this proposed system are:
1. Detection of open/displaced manholes.
2. Detection of water/sewer overflows.
3. Detection of hazardous gases

By implementing the intelligent manhole cover system is obtain an effective low-cost and flexible solution for condition monitoring and infrastructure management in the city.

II. Significance of the Study

Uncovered manholes killed 167 persons and injured five in 2015 and this data gets more severe numbers in recent years. Open, exposed 'trenches, 'Gutters ' and pits took an even heavier toll--as many as 730 fell into them during the year. While 663 died, 65 suffered injuries. In the previous year, 195 persons died by falling into open manholes, while 780 died on account of accidental fall into open pits, says National Crime Records Bureau data.

Behind each of these tragic deaths is a tale of callous indifference exhibited by the municipal authorities to the safety of the citizens and to the duty of care entrusted to them. If concerned officials had done their job and closed the death traps on roads and, so many lives would not have ended. Sewers come up with countless number of dangers for those who work in them. Venomous gases resulting from cleaning is witnessed in areas of the sewer, rising to levels that create brutal risks

to those inhaling them. Remarking to the concern when a person is working in sewer is the "sewer gas" present. This gas is a compound resulted from various organic and inorganic materials, the levels of which can fluctuate to a great extent. The most abundant gas, hydrogen sulphide, is the result of the breakdown of human waste in the absence of oxygen. It is very difficult to judge where this gas may be present without prior testing of oxygen levels inside sewer. Hydrogen sulphide toxicity directs towards danger to people working in the sewer. This toxic gas comes up with adverse effects on the human body by attacking person's mental state. Excessive inhalation of the gas can cause disorientation, or even unconsciousness. This gas is untraceable manually to a sewer worker which leaves them at risk of losing consciousness before realizing the danger they are in. These symptoms could add a delay in attempts by the worker to exit the sewer. Nausea and hallucination may occur, causing disorientation. This effect is increases the potential danger to skin and eye.

Sewer blockages leading to the overflow are very common all across the globe. The sewer lines get frequently choked leading to their blockage and overflow which results in sanitation problems and creates health hazard for citizens. Detection of blockage point is difficult and a major problem in maintaining the sewer system. The current methods of detection are based on manual visual inspection.

III. Related Work

The Internet of Things is nothing but "A network of Internet connected objects that are capable to collect and exchange data."It is commonly abbreviated as IOT. In a simple way to put it, we have "things" that sense and collect data and send it to internet which is later accessible from anywhere from the globe.

Cloud computing is taking all over the technical world. Cloud computing has been the most dominant computing model. It involves computing, storage, and network management in the cloud environment. One of the greatest advantages of cloud computing is the ability to deliver computing power and storage, because of the vast resources of the clouds, which can satisfy the needs of resource-constrained end-user devices. It combines the IoT and cloud computing. It executes data at the edge of the network, which has the potential to provide a

better response time, battery life, bandwidth cost, data safety, and privacy.

Based on the above two parts, the manhole cover with the attached sensors and the network that combines the IoT and Internet, the server can obtain the data from manhole covers. However, it is important to respond the abnormal condition immediately when receiving alarm information from a manhole cover. If a manhole cover is left open by someone, the sensors in the manhole cover makes it possible for the server to obtain dynamic information about its present values like toxic gases, water/sewer overflow and open manhole as well. Moreover, every manhole is dedicatedly assigned with the number so that the management system must respond in real time to the dynamic location information to make things easier.

IV. FLOW CHART
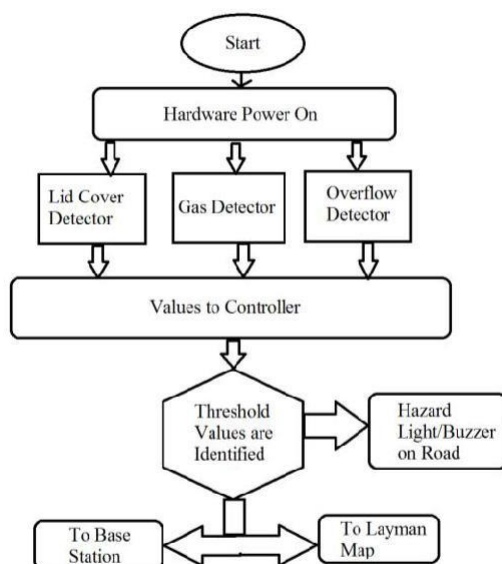
Fig. 1 Flow Chart

V. PROPOSED SYSTEM

The proposed architecture of IMMS consists of the following:

1. Three sensors and Node Mcu are attached to the manhole covers all over the city. They will sense the changes happening according to their functionality, through the Node Mcu data will be communicated to the municipal office.

2. We have a web interface for the online notification. The sensed data pops up in the web page as the warning. The municipal officer can take action after receiving the warning.

3. We have embedded Hazard lights and buzzer as well which will let people know about danger. This will be a precautionary measure which will make people aware until a concerned person come and resolves the issue.

4. Same hazards will be depicted automatically on real time layman map which will act as a extra layer ultimately leading to 100% promptness towards hazard.

The data or the warning will be shown in the mobile device and the web interface. This easily helps the officials to locate which manhole is having the problem and could take appropriate steps. The main architecture of the proposed system is shown in the figure 2.
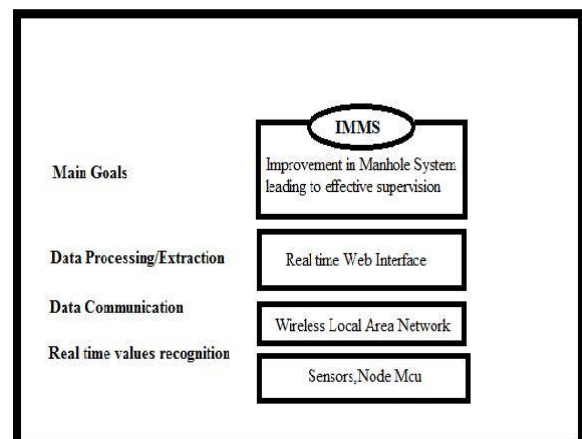
Fig. 2 Architecture of the proposed system

It includes the main goal where monitoring the manholes are done efficiently. The three steps are as follows:

1. Technology used for the recognition purpose. Sensors are used to sense the change and inform the same.

2. Data transmission through network using wifi for the warning which pops up in the web interface.

3. Information processing will be done by the municipal officials. They will search the data and take actions against the problem.

A. Manhole attached to the sensors

Manhole cover lid and wall of the manhole are attached with the required sensors, which are later connected to node mcu which we have used for the writing and uploading the backend code for the proper functionality of the sensors. Same Node mcu is connected to the network which is then responsible for transmission of values to the firebase.

1. *Node MCU:* It is an open source internet of things platform. It typically includes firmware which can run on the ESP-8266 Wi-Fi system on chip module from Espressif Systems, and the hardware is completely based on the ESP12 module. The term "Node MCU" typically refers to the permanent software rather than a development kit. Lua scripting language is being used in this type of firmware.

Fig. 3 Node MCU

2. *Gas Sensors:* A gas sensor is a device thatdetects the presence of gases in an area, often as a part of safety system. This apparatus is used to detect a gas leak or other emissions which can later interface with a control system so a process can be automatically proceed accordingly. Gas sensor is used to detect toxic gases in the manhole chamber.

Fig. 4 Gas Sensor

3. *Water Level Sensors:* As the nameprescribes this sensor is used to detect the level of the water. Such substances include liquids, slurries,. Such measurements can be used to determine the amount of materials within a closed container or the flow of water in the open channels. Measurements of water level can be done inside any confined chamber. This is also used to check for overflows.

Fig. 5 Water Level Sensors

4. *IR Sensor:* An infrared sensor circuit is oneof the fundamental and accepted sensor module in an electronic device. This sensor is parallel to human's visionary senses, which can be used to detect obstacles and it is very widely used in our day to day life for real time applications.

Fig 6 IR Sensor

B. Mode of notification

1. *WEB INTERFACE*

Online notification in the web interface. Web interface is the interaction between the user and software running on the web server. The user interface can be the web page which could be easily downloaded and rendered. It is the programming connection between the Application interface and the web servers. Using Wi-Fi connection the warning pops up in the web interface.

> In the web interface usage the user or the municipal officer should be login to the interface using their email account. Then they can monitor online by getting the warnings. They will take the action against the problem according to the warning they got.

> The web interface is shown in the figure 8. It is having a home page, dashboard and a logout button. When they are not monitoring online they can logout the web page.
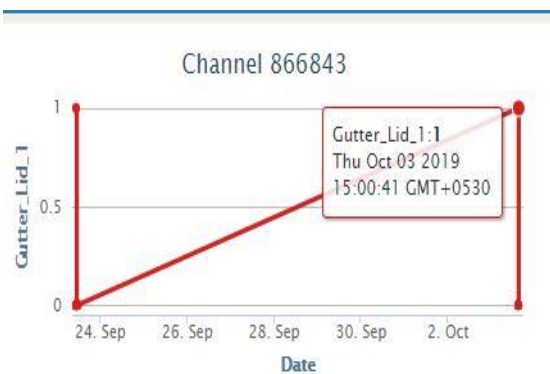
Figure 7

Figure 8

Figure 9

2. *Layman Map*

Real time layman map is provided in the system to make this system full proof. This map will depict the real time parameter values of gutters/manholes. Even if single value of any parameter goes high it will raise alert by glowing the led of the concerned manhole on the map making it more simple and easy for person to understand which will ultimately lead to almost zero or no chance of human negligence.

VI. METHODOLOGY

Smart cities are the places where we get maximum population. The urban area management issues are: Population, Pollution, Poverty, Security and mobility. To maintain the base of the smart cities that are underground systems, they should be managed properly. The proposed IoT-based IMMS should be implemented in the manholes to manage the drainage system efficiently.
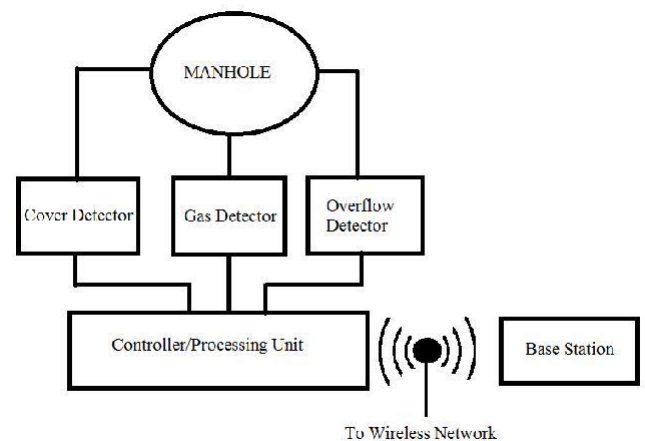
Figure 10

Every manhole cover in the system has three states:

1. Sensors (gas sensor, water overflow sensor and cover detector)
2. Arduino board.
3. Online notification (web interface)

Sensors: The manhole is attached with the sensors(gas sensors, water overflow sensor and cover detector) each of the sensors will detect the issues in the manhole. Gas sensor detects the hazardous gases emitted inside the manhole. Overflow sensor identifies if the water level is above the threshold

level. Cover detector i.e., IR sensor identifies the manhole cover or the manhole lid is tilted or displaced and notifies to the municipal office.

Notifications: Node MCU is used to take the input from sensors and convert it into output. We have connected a wifi to the node mcu so that data can be sent to the municipal officer's screen. The online messages will be sent using wifi to the web interface. The municipal officer should login to the web page and check the notifications. Moreover live indication of problem in manhole will be indicated on real time map.

Our proposed system will be dealing with the management of manhole in cities. Features are as follows:

1. The data can be analyzed anywhere at any time using mobile phone and internet.
2. The open manhole cover can be found very easily and accidents can be avoided.
3. It is a real-time monitoring system.
4. Compact design.

Advantages of the Project

The proposed system will be a good management system for the smart cities to analyze the manholes related data. This monitoring will be 24x7 which makes it more effective. This will help in reducing accidents thus the proposed system will prove to be advancement in safety protection

VII. CONCLUSION

Manhole monitoring is a challenging problem. It explains various problems like open manhole cover, toxic gases, and sewage overflow. This project features real time update on the internet which leads to superior flow of maintenance and regularity in manhole checks thus avoiding the hazards. Various parameters like toxic gases, flow and level of water are being monitored and updated on the internet using the Internet of Things. This enables concerned person to take necessary action accordingly the hazard.

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Technology Transfer- Bridging Society and Technology

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Abstract-Our Society is changing. The part which information and communication technology (ICT) play in our general public is developing quickly and then the total populace is maturing. ICT has empowered social networking sites, which are regularly focused towards more youthful individuals and is in this manner less appropriate for seniors who get them dislodged over and over through a plan look into arranged investigation, we will investigate the speculations of non- traditional computing to discover elective methods for utilizing innovation to better address the issues of seniors. We have found bridging technologies to be a promising domain that could help address the life- changing consequences of population ageing. In this thesis, authors will develop an efficient method which will help the seniors to make a use of technologies such as social networking sites (SNS) in a traditional way. Another motto of my research will be to improve the learning abilities of children with ongoing technologies in real world and academic carrier.

Keywords- Bridging technologies, unicomp and unavoidable innovations, Social Networking Sites (SNS), children or teenagers and seniors.

I. INTRODUCTION

The far reaching appropriation of data and interchanges innovation, moreover known as ICT, is changing our general public (Saunders, 2004). ITU (International Media transmission Union), a United Nations body, reports an expansion of Web clients from 400 million of every 2000 to a gauge of 3.2 billion of every 2015 [4]. The effect of ICT is crossing all areas of society, from budgetary to wellbeing, training and social union [2] making it a fundamental part of any present day society (Dolata, 2013). One essential mainstay of the ICT transformation is the ascent of Social Network Sites, otherwise called SNS. SNS assume a noteworthy part in supporting social connections and have turned into a necessary piece of the regular life of its clients (Boyd and Ellison, 2007; Sundar, Oeldorf-Hirsch, Nussbaum and Behr, 2011). Regardless of being viewed as a staple in day by day correspondence (Sundar et al., 2011), current SNS are especially intended for the capacities of more youthful individuals making the locales less reasonable for different gatherings, for example, senior clients (Goswami, Köbler, Leimeister and Krcmar, 2010). Seniors as a gathering still battle with the selection of ICT and SNS making them unfit to profit by its social impacts by taking part in them, for example, trade

of data and more grounded social bonds (Saunders, 2004; Hope, Schwaba and Piper, 2014).
The quickly changing correspondence scene has a tendency to uproot the more seasoned era, barring them from a critical wellspring of socialization, and will keep on doing so for the people to come (Hope et al., 2014). With a specific end goal to confront the results of a quickly changing correspondence scene, better approaches for moving toward the plan of ICT are being called for (Hope et al., 2014; Coelho and Duarte, 2016). Spanning advancements takes into account better approaches for addressing the requirements of various eras, who each favor diverse communication styles and client interfaces. Connecting advances can be intended to represent age-related needs, social practices and inclinations to build prosperity of seniors by bringing down the obstruction of PC communication (Hope et al., 2014; Coelho and Duarte, 2016).This is turning into an inexorably critical societal issue as the world's populace is maturing [1], causing and expanded monetary weight on the help frameworks for seniors [3]. Not just because of a diminished death rate yet likewise because of a decrease in richness [1; 2]. This is a pattern without any indications of moderating down [2]. It is assessed that by 2050 individuals beyond 60 years old will make up over 21.1% of the total populace,

surpassing the quantity of kids for the first run through ever in present day history [1; 2]. As indicated by the World Health Organization [2] endeavors should be made to fortify the social capacities of seniors and to enable them to confront the difficulties that accompany maturing. This incorporates engaging seniors to adjust to the social challenges they are probably going to confront as they become more seasoned [2]. Sadly present general wellbeing ways to deal with address populace maturing have obviously been demonstrated insufficient [2].

In Northern Europe 90% of all seniors live freely [1]. In spite of the fact that autonomous living is as of now basic practice among seniors a free method for living is probably going to wind up plainly significantly more typical later on [1]. In any case positive this may appear, it turns into an issue when those unfit to live autonomously is left no other decision. Because of the proceeded with financial weight on emotionally supportive networks an ever increasing number of seniors should confront the difficulties of maturing autonomously [1]. Autonomous living can't just be unsafe for the physical prosperity, yet in addition impeding to the emotional wellness of seniors (Steptoe, Shankar, Demakakos and Wardle, 2012). Social detachment is a noteworthy and common medical issue inside the senior group (Nicholson, 2012; Steptoe et al., 2012). The repercussions of social detachment can be severe to the point that it adversely impacts, not just the prosperity of seniors, yet in addition their general future (Steptoe et al., 2012).

Studies demonstrate that examination on other options to the customary PC; supporting seniors needing to get to ICTs are being called for (Coelho and Duarte, 2016; Hope et al., 2014; Jaschinski and Allouch, 2015; Van House, 2015; Dahl, Farshchian, Kofod-Petersen, Bøthun, Holbø and Reitan, 2013). Past research inside the area of universal processing, unavoidable figuring, quiet innovation, encompassing knowledge and surrounding helped living has examined comparative settings and difficulties. Universal and unavoidable processing mean to upgrade PC use by making PCs open through the physical condition while seeming imperceptible to the client, taking into consideration regular collaboration and a brought down hindrance of utilization (Weiser, 1993). Quiet innovation endeavors to make

innovation, which is frequently viewed as upsetting by seniors (Lindley, Harper, and Sellen, 2009), additionally quieting by seeing how it snatches our consideration and moves all through our outskirts (Weiser and Brown, 1997; Jafarinaimi, Forlizzi, Hurst and Zimmerman, 2005). Surrounding knowledge gives a advanced condition that proactively, however sensibly, underpins individuals, in an encompassing and inconspicuous way (Augusto and Shapiro, 2007). Surrounding helped living reaches out to concentrate especially on helping those with intellectual and physical incapacities, in their day by day lives (Jaschinski and Allouch, 2015).

II. KNOWLEDGE GAP

Through a design research oriented study, we explored the theories of non-traditional computing to find alternative ways of using technology to better meet the needs of seniors. We have found bridging technologies to be a promising domain that could help address the life-changing consequences of population ageing.Drawing from each of these points of view we mean to better see how a crossing over innovation can be intended to address the issues of seniors. This examination means to investigate how current SNS can be made all the more effectively open to a developing senior populace through the accompanying exploration question: By what means can spanning advancements be intended to empower seniors to communicate with informal community destinations? This investigation expects to investigate the setting of seniors, innovation and informal organization destinations or sites.

Objective: All the more particularly we intend to develop a set of design principles to help the design of bridging technologies.

III. LITERATURE REVIEW

A writing study will directed to investigate, outline characterize focal ideas for the investigation. These ideas will incorporate spanning innovation, surrounding knowledge, encompassing help living, universal registering, unavoidable processing, quiet innovation, interpersonal organization locales, social detachment and senior aged users. The writing will utilize as a part of this examination will be recover via hunting down associate inspected articles in the field of ICT, HCI, Public Health and

IS through the Halmstad University School Library Summon look administration and Google Scholar.

As advances inside the communication landscapes are being supplanted by the most recent buildup, conventional based innovations are supplanted with current period of advances. (Expectation et al., 2014). Take for instance the development of simple to computerized, corded telephones to cell phones, and now, the advancement inside the advanced moving from messages to informal organization destinations. Regularly being gone for the more youthful era, it is less demanding for them to keep up just taking little strides to embrace the most recent innovation, though the seniors may battle to keep up. Receiving new innovations can be troublesome for anybody. The senior group particularly communicates a dread of sitting idle and vitality on drawing in with new advancing advances (Van House, 2015).

2) Using both unavoidable innovations, The Ambient Wood Project intended to empower youngsters to widen and associate their understandings, reflections, and theories in both certifiable and classroom settings (Rogers, Price, Randell, Fraser, Weal and Fitzpatrick, 2005). Installing Wi-Fi and sensor based advancements in nature components as trees and alike the venture pushed a case of condition plan, unavoidable and pervasive to the client. The earth could interface with an assortment of portable and independent computational gadgets conveyed by the youngsters. By detecting the nearness of clients without express client contribution, and additionally displaying computerized data through the handheld gadgets (PDAs) or shrouded remote speakers suiting communication models were utilized. The open air universal e-learning condition, called for simply enough consideration permitting the youngsters' learning background to effortlessly rise above between the physical and advanced world (Rogers et al., 2005).

3) Facebook, a typical SNS, are a standout amongst the most prominent sites on the planet (Lazer et al., 2009). Studies have demonstrated that the utilization of Facebook is related with an expansion of the social capital of its clients (Lazer et al., 2009). SNS have been found to enable those experiencing a noteworthy life to change, for example, secondary school understudies moving to

school keeping up social capital (Cummings, Lee and Kraut, 2006). Seniors going into retirement confront comparative life changes having their companions, colleagues, previous collaborators and companions broadly appropriated topographically and spread out finished the diverse developments of their lives (Van House, 2015). In spite of the fact that SNS could bolster seniors in keeping up their social capital, current SNS are especially focused towards more youthful individuals and are blocked off for seniors (Van House, 2015).

(IMPORTANCE OF STUDY)

Through a design research oriented study, we explored the theories of non-traditional computing to find alternative ways of using technology to better meet the needs of seniors. We have found bridging technologies to be a promising domain that could help address the life-changing consequences of population ageing.

IV. METHOD

We started this investigation with a writing study took after by a restudy where client input was gathered. We at that point utilized the consequences of the writing study and the restudy to make standards that would manage us in our prototyping. We at that point assessed the standards through the model, which filled in as a reason for our investigation. Therestudy comprised of two workshops. The principal workshop was enlivened bythe Da Vinci approach. We utilized three stages to trigger the creative ability, set up situations and present situations. The approach enabled us to open up the outline process for client input and to offer help to acknowledge dreams and future application regions (Ihlström Eriksson, Svensson and Åkesson, 2005). The workshop urged clients to envision future arrangements and situations (Bødker, Grønback, and Kyng, 1993). Amid the 3 hour session we took notes and additionally sound and video recordings the workshop. Members were educated of the expected utilize and the motivation behind the gathered material as indicated by the rules of Vetenskapsrådet (2002). The workshop began with a visioning stage utilizing triggers. Triggers amid the visioning stage indicated cases and idea recordings planned to start the creative energy of the workshop members, giving them an idea of future conceivable outcomes. We demonstrated a video gathering on Vimeo called

Future Homes [6]. The video indicated future innovations inserted in homes with elective communication styles as motions and discourse. The triggers were utilized as a beginning point for a talk. The members were solicited to take notes from what they discovered intriguing amid the video. These notes filled in as a reason for the exchange that took after. In the wake of talking about the distinctive advanced situations, we presented the members to the situation building stage. The situation stage is intended to help the members imagine future situations that for this situation tackles their ordinary issues (Go and Carroll, 2004). We had arranged an illustration situation keeping in mind the end goal to help the members to see how a situation is developed. The situation was broken into five unmistakable pieces. Who, when, where, what and ultimately an general depiction of their thought. Situations push

workshop members to structure their thoughts into necessities, setting and prerequisites (Ihlström et al., 2005). The eight members were part into two gatherings, four members in each gathering, and were told to think of situations of their own. Amid the situation building stage we went about as help when the members had questions with respect to the development of their situations. Requesting that the members exhibit their situations is a path for them to pass on an experience without bounds utilization of their thoughts (Benyon, Turner and Turner, 2005). In this manner we finished the workshop with a short introduction from each of the two gatherings. They were urged to understand their situations by utilizing low-fi strategies, for example, paper models or basically sanctioning a circumstance. One of the bunches read their situation and the other gathering reenacted their situation as a short play.
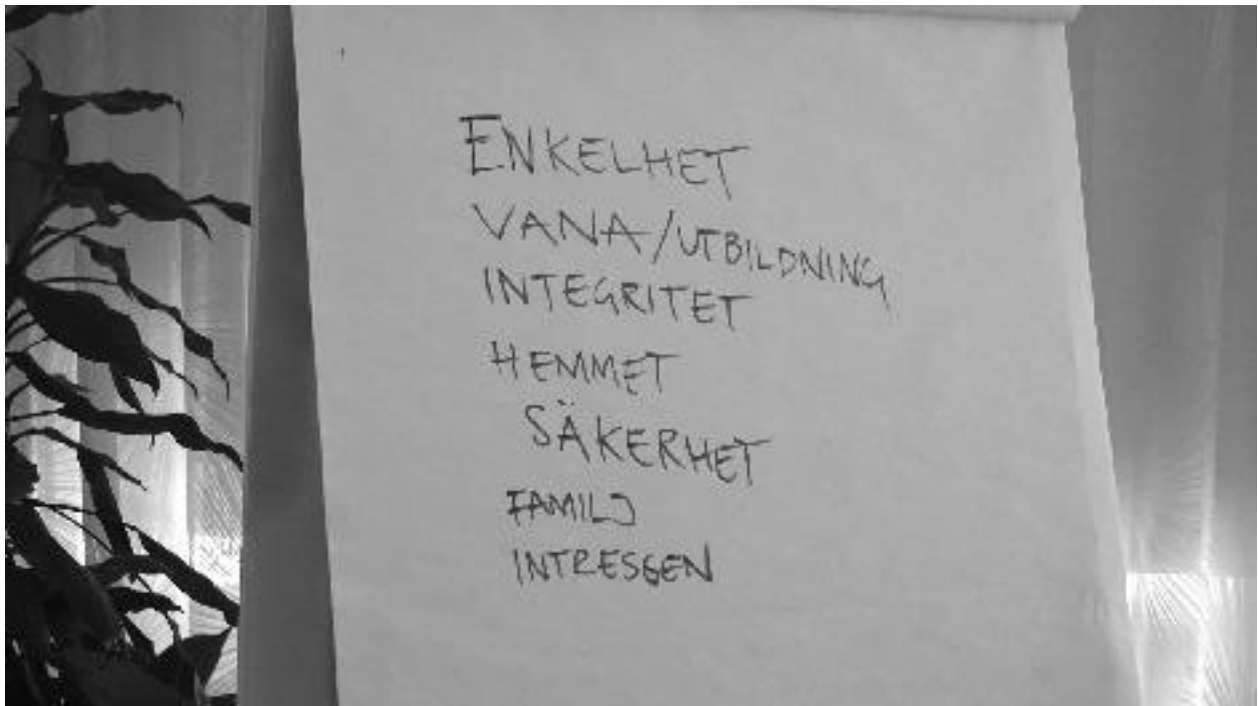
Figure1: Workshop Summary

We ended the workshop by writing down what the participants thought summarized the topics of discussion.

Workshop 1 Preparations

As the main workshop brought about the member's general contemplations of innovation we chose a moment workshop was required, additionally investigating the discoveries from the

main workshop. Expanding on the key subjects of talk from the primary workshop we developed a situation. The distinctive points of talk, for example, uprightness, the home and distinctive methods for collaborating with innovation through ordinary items, together with the introduced situations were turned into the building pieces of our situation. The accompanying is a case of how the building squares were arranged.
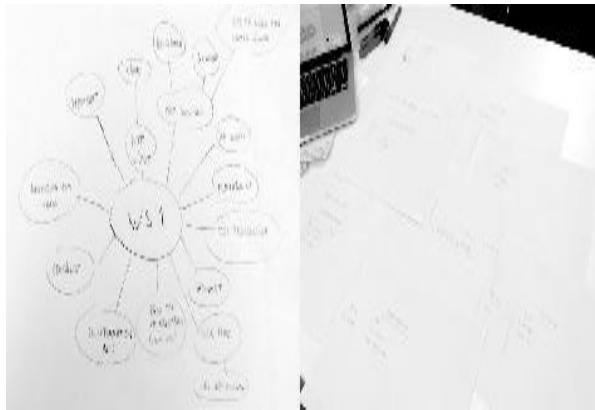
Figure 2-Sorting finding into themes

The situation was planned around the idea of an increased regular protest; for this situation a book. The situation happens in the client's home condition. The book would get the client's consideration, a method for talking about the tranquility of our proposed ancient rarity, when there's new movement on the client's SNS account. The book is then grabbed and the client starts

turning the pages similarly as they would with a customary book. Along these lines we could talk about the communication styles of a proposed crossing over innovation. Once the book is open, the TV is naturally be turned on, showing the photos or profile pictures from the informal organization.

V. DATA SELECTION

Male and Female candidates of age 60-75 has selected along with the experience of using Social networking sites and other technologies. The situation was planned around the idea of an increased regular protest; for this situation a book. T.

TABLE I. Design Principles

Principle	Description
The Principal of Perceived Control	The client itself must direct the terms of which a SNS can achieve the client. It additionally needs a physical nearness so as to feel controllable by the client.
The Principle of Calmness	A crossing over innovation antique should show some level of intangibility keeping in mind the end goal to feel nonintrusive to the client

VI. IMPLEMENTATION OF DESIGN PRINCIPLES

The following table describes how the design principles were embodied in this work plan.

TABLE II. Design Complications

Principle	Design Implication
The Principle of Perceived Control	As a tangible object the prototype is available in the user's physical environment. This enables the user to see and feel the prototype, making them feel in control.
The Principle of Calmness	The model does not call for consideration in a prominent way. Utilizing a photo outline and a radio as the essential methods for acquiring data the protest stays cool and inconspicuous to the client.

VII. PREStudy RESULTS

The workshop members communicated how innovation frequently controls them, instead of a different way. They depicted how innovation endeavors to get their consideration when they don't need it to and how every association comes with a noteworthy danger of demolishing the gadget or Stalling out. They esteem the input human offers of having physical controls to interface with. "Where's the truth? The things you can touch. The entire world is being revamped with innovation. Where's our place in this? Are you expected to just utilize your cerebrum? Quit utilizing your feet and arms completely?"

In one of the situations being played out one of the members went about as a robot endeavoring to help a senior experiencing dementia to work out.

The robot acted in an indifferent route, without any sentiments or elements of a human parental figure. The members were not able consider innovation to be something that could give support and solace. They depicted the eventual fate of innovation as something that would control them as opposed to the inverse.

VIII. PRINCIPLE OF CALMNESS

The members esteemed the smoothness of simple innovation. While talking about the component of worry in innovation members communicated how not having the capacity to get the telephone in time or just not perceiving that some person is attempting to contact them is seen as distressing. Sound signs, for example, cell phone notices, are thought to be excessively distressing, and even ineffectual in getting their consideration. "Signs are for the most part not a smart thought, imagine a scenario in which I don't hear or see them. I am scared that I am not going to make it in time before the other individual hangs up." My first response to this [the trigger video] is that the greater part of it is bound to the home condition. I surmise that is sure. It is tragic how today there's dependably somebody with a telephone in their grasp, messaging or talking. Individuals don't look into, they stroll into each other on the grounds that the telephone is so critical."

IX. RESULTS

The model essentially had no controls; the radio be that as it may, had on/off, volume also, tuning. A few members at first felt as if the absence of controls made the model feel excessively constrained, expecting it would give more capacities. For illustration, participants discussed video calls as a conceivable extra to the model to make it more important. Selected participants In this examination we have contributed with a gathering of plan rule that can be utilized to better guide the plan of connecting innovations with regards to seniors. These can be additionally investigated since we concentrated on a particular client gathering, setting and administration to connect. All together for our general public to legitimately meet the difficulties of populace maturing and the people that it influence

requested a method for having the capacity to stop what's more, control the rate of which the pictures moved. Others, for example, aged 75 participant, expressly requested a method for killing the gadget on or. Control of what substance to demonstrate was likewise requested by the members. They felt that they must be capable channel the substance that is being shown through the model. Participant said he "should have the capacity to expel sources." At the point when all the more unequivocally asked whether they thought the models highlights and capacities would bolster seniors who are experiencing difficulty embracing innovation, participants thought of the absence of usefulness as a key perspective. "They [seniors] are frightful of They additionally go ahead to portray how the present youth invest excessively energy in their telephones separated from reality. Being on your telephone is not thought to be a demonstration of socialization yet rather the inverse. Being on your telephone is considered discourteous and impolite when you are in the organization of others. "

X. SUGGESTION AND FUTURE WORK

In this examination we have contributed with a gathering of plan rule that can be utilized to better guide the plan of connecting innovations with regards to seniors. These can be additionally investigated since we concentrated on a particular client gathering, setting and administration to connect. All together for our general public to legitimately meet the difficulties of populace maturing and the people that it influences.

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A Simulation Driven Design Approach to Lightweight Magnesium-Based Materials While Improving/Maintaining Strength to Weight Ratios

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Abstract: Simulations act as valuable tools to design a product for a particular application. When it comes to light weighting a product the common approach is to use the lightest possible material for such purposes. But when Boeing introduced the revolutionary micro-lattice structure using nickel (density = 8.9 gm/cm^3) where close to 99% of the material was air, they initiated a new design approach. Yet, one design aspect that needed to be addressed for its use inside aircrafts was the rigidity of the micro-lattice. While micro-lattices have good energy absorption properties under impact, their use is restricted with the extent of deformation they tend to undergo. While rigidity can be provided by structural columns, beams and frames, there exists a possibility to light weight these structural components. With the inspiration that human bones are strong because they are hollow, this study focusses on light weighting Magnesium based materials, the lightest structural material, by introducing controlled defects while improving/maintaining its strength to weight ratios. Using simulations, an optimal hole diameter has been achieved for an 8mm cylindrical sample. Experimental validations were also conducted. Further simulations indicate how pragmatic drilling can help achieve even higher strength to weight ratios in magnesium-based materials.

Scale validation of Customer's Satisfaction level Regarding Bank Support, Customer Knowledge and Information Regarding Internet Banking

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Abstract: With the advancement in the field of information and communication technology, the introductions of online services now have an edge over the traditional services provided in the banking sector. The study was conducted to find out scale validation of Customer's Satisfaction level regarding Bank Support, Customer Knowledge and Information regarding Internet Banking . Data was collected from 400 customers who are using internet banking. A structured questionnaire was designed to obtain the necessary information matching with the objectives of the study. The statements incorporated in the questionnaire were based on variables obtained in literature survey and expert opinion obtained through personal interview. The data was collected from three major cities of Punjab. The research shows that majority of the individuals are aware about various banking services which is being render by different banks. Discriminant analysis was used.   .

Keywords: Bank support, customer satisfaction, knowledge and information.

I.   INTRODUCTION

Technological advances have eliminated time-consuming repetitive tasks, reducing human errors and broad access to banking related services. Telephone banking permits to carry on non-cash transactions which was earlier not possible without a personal visit to bank (Prendergrast and Marr, 1994). Person to person basis technology provides customer satisfaction which would otherwise increase the cost. Customers can perform their tasks at a time and in a convenient ambience which is possible with the advent of technology. Technology, as more broadly stated, includes the different types of work done by the majority of public agencies and the agenda designed with the intention to respond to state of affairs and occurrences of processes to achieve the results in a mandatory procedure. Also, it does not only include machines and equipment only, but also programs and operations agency (Gortner et al., 1989). Using today's technology offers dramatic and lasting improvements in organizational performance enhancement (Holzer and Callanhan, 1998; Morton, 1991; Daven Port, 1993; Hammer and Champy, 1993). E-Banking involves grouping of banking services with the technological services.

It is provision of banking services through an electronic channel. The services are used by the customers through the use of computer (Kaur, 2017)

II.   REVIEW OF LITERATURE

- **Leblanc (1990)** found that principle buyer inspiration for utilizing ATMs was its availability advantages. The customers slanted to be to a great degree taught. They imagined that this innovation improved quality, introduced minute security hazard and mollified their requirement for unobtrusive and quick exchanges. However non-customers favored interrelating with human tellers and saw ATM utilization to be mind boggling and dangerous.

- Munusamy et. al (2010) conducted a study in Malaysia in order to examine the impact of delivery service quality on the satisfaction of customers of banking sector.. The research tried to measure the level of customer satisfaction with the help of service quality in this sector. The findings indicate that the assurance as a dimension of service quality does not have any significant impact on the

satisfaction of the customers. Also, reliability does not have any significant impact whereas tangibles were found to be significant. Empathy and responsiveness also don't have any significant impact on the customer satisfaction

- Mumuni Moro Wandaogou & Pambiin Jalulah (2011) directed a study to assess consumer loyalty with Internet Banking quality in Ghana Commercial Bank (GCB) and Merchant Bank of Ghana (MBG). The study was a cross-sectional case study that included the utilization of self-regulated organized poll to gather essential information from the customers of the two banks. It was found that consumer loyalty with Internet Banking nature of the two is fundamentally distinctive, with customers of MBG altogether fulfilled than those of GCB.

- Waheed (2013) conducted a study to measuare the role of satisfaction, Security and risk in internet banking which directly affect the business of banking industry. He studied 250 customers and their result showed that the affect of the role of satisfaction, risk and security is significant and affect the bank policy.

III.   RESEARCH DESIGN

The study was limited to two public sector banks namely State Bank of India (SBI) and Punjab National Bank (PNB). The study also included two private sector banks namely ICICI bank and HDFC bank. In addition to this, the scope of the study was limited to these banks that were operating within the Punjab region. The target population for the present study consists of customers of State Bank of India (SBI), Punjab National Bank (PNB), ICICI bank and HDFC bankTherefore, a sample of 400 customers from these four banks which were operating in Jalandhar, Amritsar and Ludhiana city.

IV.   DATA COLLECTION

Both primary and secondary data was used for collection of data. Data is collected from different resources, which determines the knowledge and information regarding internet banking.

V.   OBJECTIVES OF STUDY

The main aim of this study was to measure scale validation of Customer's Satisfaction level of the
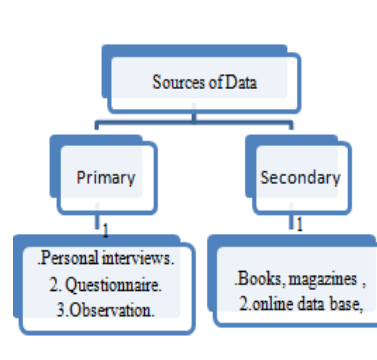
Figure: 1 Objectives Model

Pertaining to Bank Support, Customer Knowledge and Information Related to Internet BankingIt is a slow process and pest control staff involved may not be efficiently deployed resulting in poor utilisation of manpower.

A.   CONSTRUCT VALIDITY
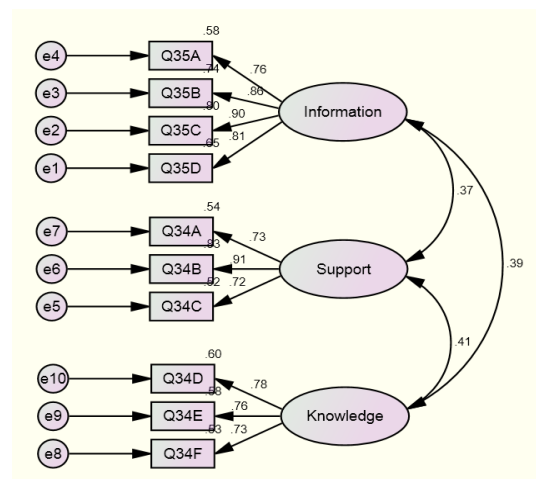
Figure 2: Measurement Model Customer's Satisfaction

Through discriminant validity and convergent validity (Hair et al., 2006) Convergent validity was assessed with the procedure prescribed by Hair et al., 2010, which suggest that Composite Reliability (CR) should be greater than Average Variance Extracted (AVE) and AVE should be greater than or closer to 0.5. The table below show that Composite Reliability is greater than AVE and all the values of AVE is closer to 0.5. Therefore, in concert, it is evident from these facts that scale shows a strong evidence of convergent validity. Discriminant validity was assessed by the procedure prescribed by Hair et al. (2010), which

suggest that Maximum Shared Variance (MSV) should be less than that of Average Shared Variance (ASV) and ASV should be less than AVE. The table below depicts those values of MSV for each construct is less than values of ASV further values of ASV for each construct are less than that of AVE values. This indicates that scale shows substantial evidence of discriminant validity.

Table 1: Convergent and Discriminant Measurement Model

	CR	AVE	MSV	ASV	Support	Information	Knowledge
Support	0.833	0.628	0.171	0.155	0.793		
Information	0.900	0.692	0.154	0.147	0.373	0.832	
Knowledge	0.800	0.572	0.171	0.163	0.414	0.393	0.756

Table 2: Descriptive Analysis of Customer's Satisfaction level pertaining to Bank Support, Customer Knowledge and Information Related to Internet Banking

	N	Minimum	Maximum	Mean	Std. Deviation
Bank's Support	400	1	5	2.78	0.74
Knowledge	400	1	5	2.81	0.82
Information	400	1	5	2.22	0.77
Valid N	400				

Table 3: Mean and SD of Satisfaction Level Related to Bank's Support on the basis of Bank Type and City

City	Mean Bank			Std. Deviation Bank		
	Public	Private	Total	Public	Private	Total
Jalandhar	2.91	2.90	2.91	0.75	0.88	0.79
Amritsar	2.74	2.60	2.66	0.85	0.59	0.72
Ludhiana	2.83	2.79	2.81	0.62	0.79	0.72
Total	2.83	2.73	2.78	0.74	0.74	0.74
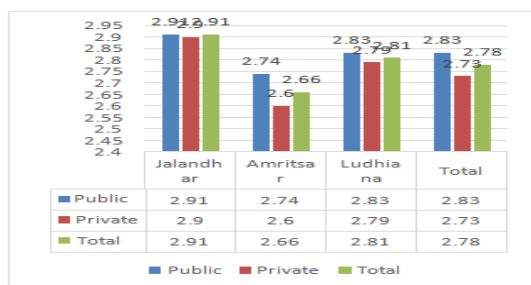
Figure: 3 Graph

Table 4: Mean and SD of Level of Customer's Knowledge Related to Online Banking on the basis of Bank Type and City

City	Mean Bank			Std. Deviation Bank		
	Public	Private	Total	Public	Private	Total
Jalandhar	2.99	2.69	2.90	0.75	0.92	0.81
Amritsar	2.77	2.64	2.70	0.81	0.81	0.81
Ludhiana	2.84	2.84	2.84	0.85	0.83	0.83
Total	2.87	2.74	2.81	0.80	0.83	0.82
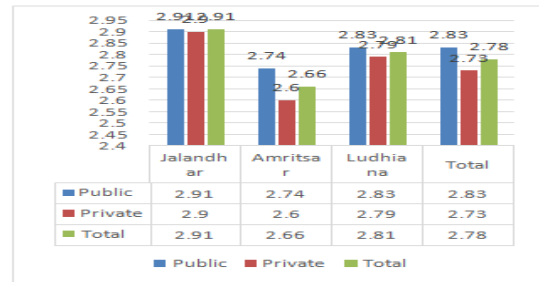
Figure: 4 Graphs

Table 5: Mean and SD of Level of Information Related to Online Banking on the basis of Bank Type and City

City	Mean Bank			Std. Deviation Bank		
	Public	Private	Total	Public	Private	Total
Jalandhar	2.21	2.20	2.21	0.73	0.79	0.74
Amritsar	2.31	2.05	2.16	0.71	0.67	0.69
Ludhiana	2.35	2.24	2.29	0.85	0.83	0.84
Total	2.29	2.16	2.22	0.77	0.76	0.77
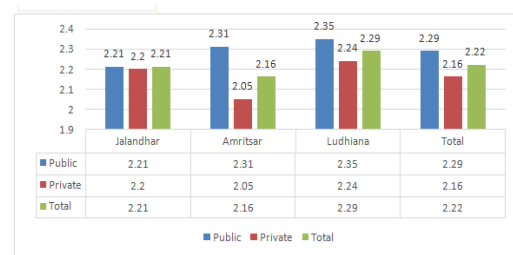
Figure: 5

VII. CONCLUSION

In the end it can be concluded that majority of the individuals are aware about various banking services which is being render by different banks. Further, in order to have more satisfying customers banks need to have a more user friendly website or mobile application so that more and more people can use the internet banking with ease. Apart from this, results also manifested that the knowledge of the customers regarding different banking services should be increased. This can be done by arranging an expert lecture, free workshops or various seminars.

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The Relationship between Agricultural Sector and Nigerias Economic Growth (1986-2018)

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ABSTRACT- The study determines the impact of the agricultural sector on Nigeria's economic growth during the 1986-2018 periods. To achieve this objective, annual time series data on Nigeria's GDP per capita, agricultural value added and other key variables determining economic growth were generated and used for the empirical estimating of the impact of the agricultural sector on growth. Test were carried out to test for unit roots in the time series collected for the study. The results revealed that all the variables are non-stationary at level but stationary at first difference. The results of the correlation analysis on Nigerian economic performance and the agricultural sector show a strong positive relationship between the two variables. This suggests positive impact of developments in the agricultural sector on Nigeria's economic growth.

KEY WORDS: AGRICULTURE, ECONOMIC GROWTH

I. INTRODUCTION

To achieve accelerated level of growth and development, developing countries need to attain the simultaneous development of all the major sectors of the economy. The linkages between agricultural and industrial sectors are such that the development of one sector is critical to the sustained development of the other sector. Often the rapid growth and development of the industrial sector is viewed as the most effective way to achieve the rapid and sustained economic growth required to achieve the development objectives of developing countries. The industrial sector with its higher productivity is viewed as an engine of growth of the economy, whose sustained growth is required to achieve accelerated pace of economic growth, which in turn is critical to poverty reduction and improvement in prosperity. However, this sustained industrial development has been found to heavily rely on the continuous expansion of the primary sector which is led by the agricultural sector (Ogunsanya, Jelilov and Ozden, 2017).The agricultural sector development has been generally found to be the prerequisite for long term industrial and overall economic development of nations. This assertion is strongly supported by the experience of the now developed countries of North America, Western Europe and Japan. The economic development of these countries signifies

a transition from the dominance of agriculture to industrial sector and now service sector. The industrialization process of these economies have been fueled by the continuous supply of productive inputs, usuallyreferred to as visible goods (which include consumption goods, intermediate goods and investment goods) and invisible goods (which include cheaper wages for continued industrial and service sectors expansion, providing market for industrial products etc.) (Ogunsanya, Jelilov and Ozden, 2017).

The importance of agriculture in the economies of sub-Saharan African countries cannot be overemphasized. With agriculture accounting for about 65 percent of the region's employment and 75 percent of its domestic trade, significant progress in reducing hunger and poverty across the region depends on the development and transformation of the agriculture sector. Transforming agriculture from a largely subsistence enterprise to a profitable commercial venture is both a prerequisite and a driving force for accelerated development and sustainable economic growth in sub-Saharan Africa (World Bank, 2014).

This study is aimed at investigating the impact of the Nigeria's agricultural sector on the country's economic growth covering the period 1986-2016.

This period qualify as the period where the country's policy rhetoric and efforts to diversify from the predominance of oil to the improved role of the agricultural and sectors in economic growth and development were most considerate..

II. LITERATURE REVIEW

Agriculture is still the most important productive activity in Nigeria. It provides employment to about 70% of the workforce. In the first quarter of 2016, agriculture contributed 23% of the Nigeria's Gross Domestic Product (GDP). It is a major source of raw materials for the agro-based industries and it generates the most foreign exchange revenue of any other sector with the sole exception of oil. It contributes about 75% of the country's non-oil foreign exchange earnings over the years (National Bureau of Statistics, 2016).

As in many other African countries, agriculture in Nigeria is largely focused on food crops for the domestic market, given the Nigerian population estimated at 184 million people in 2016. In spite of this reality, Nigeria remains a net importer of food, for many reasons. First of all, the majority of the agriculture-focused operations in the country are small-scale, with limited innovation regarding inputs, harvesting, processing, distribution, and access to markets. The vast majority of people engaged in agriculture operate at the subsistence level, are uneducated and have limited access to training. Moreover, over 95% of the country's exports are dominated by petroleum and related products, which has shifted focus away from agriculture. As a result, until recently, there has been severe underinvestment in agriculture by the public and private sectors, civil society and bilateral and multilateral agencies. This has been intensified by weak, un-enforced, poorly implemented and often conflicting policies at all levels of the country (Ogunsanya, Jelilov and Ozden, 2017).

The potential of the agriculture sector in Nigeria is huge. The country has a substantial base to build upon: its natural assets including land (39.6 million hectares of arable land, of which about 60% is under cultivation), climate and rainfall, its coastal areas, its history as an agrarian economy. Today, Nigeria is one of the world's largest producers of cassava, cashews, tubers (sweet potato, yams), fruits (mango, papaya) and grains (millet, sorghum and sesame) Yusuf, S. A. (2014). In addition, the country's population represents a large domestic market that can support and sustain local production and processing. Nigeria also plays a key role in West Africa and there are tremendous opportunities to access regional markets. Unfortunately, there is limited collaboration across regional value chains; there is greater collaboration between the West African countries and their former colonisers or the United States, than with their neighbours. This point was emphasized by Otedola and Otunmu (2013) who pointed out that the importance of agriculture to the Nigerian economy is evident in the nation's natural endowments in production factors – extensive arable land, water, human resources, and capital. They asserted that exploring the nation's productive advantage in this sector is the fastest way to stimulate growth in the economy. Research on this issue is therefore important to help inform policy decisions regarding resource allocation in agricultural growth and development to achieve rapid economic growth.

A. Empirical Literature Review

The literature is replete with studies that analyze the agriculture sector of the Nigerian economy. This section attempts an apt overview of previous empirical studies assessing the performance of the agricultural sector in previous years and on the relationship between agricultural development and economic growth in order to provide a compelling context for subsequent discussions on the theme. A vast amount of literature exists on the connection between agricultural development indicators and economic growth in both the developed and developing countries alike with varying emanated empirical outcomes generated ranging from positive, negative and /or at best mixed. Many of these studies provide enough evidence of a positive relationship between agriculture sector investment and GDP growth.

The agriculture sector has been the mainstay of the economy since independence and despite several bottlenecks; it remains a resilient sustainer of the populace. In the 1960s, Nigeria was the world's largest exporter of groundnut, the second largest exporter of cocoa and palm produce and an important exporter of rubber, cotton (Sekunmade, 2009). More recently, agriculture employs about two-thirds of Nigeria's labour force, contributes

significantly to the GDP and provides a large proportion of non-oil earnings (Lawal, W.A., 2011).

The sector has several untapped potential for growth and development in the availability of land, water, labour and its large internal markets. It is estimated that about 84 million hectares of Nigeria's total land area has potential for agriculture; however, only about 40% of this is under cultivation (FMARD, 2012). Productivity in the cultivated lands is also low due to small farm holdings and primitive farming methods. Nigeria has therefore become heavily dependent on food imports. In addition to diverse and rich vegetation that can support heavy livestock population, it also has potential for irrigation with a surface and underground water of about 267.7 billion cubic meters and 57.9 billion cubic meters respectively (Chauvin, Mulangu and Porto, 2012; Lipton 2012). Nigeria's large and growing population provides a potential for a vibrant internal market for increased agricultural productivity.

In spite of these opportunities, the state of agriculture in Nigeria remains poor and largely underdeveloped. The sector continues to rely on primitive methods to sustain a growing population without efforts to add value. This has reflected negatively on the productivity of the sector, its contributions to economic growth as well as its ability to perform its traditional role of food production among others. This state of the sector has been blamed on oil glut and its consequences on several occasions (Falola&Haton, 2008). In 1960, petroleum contributed 0.6% to GDP while agriculture''s contribution stood at 67%. However by 1974, shares of petroleum had increased to 45.5% almost doubling that of agriculture which had decreased to 23.4% (Yakub, 2008). It should be clarified that this pattern was not an outcome of increased productivity in the non-agricultural sectors as expected of the industrialization process (Christaensen& Demery, 2007); rather it was the result of low productivity due to negligence of the agriculture sector.

Eboh and others (2006) showed that agricultural sector performance and poverty trend are somewhat associated. Negative annual average agricultural growth from 1981-85 was accompanied by increase in poverty from 28% in 1980 to 43% in 1985. Conversely, from 1986-90, the country recorded

higher annual average agricultural growth (6.7% per annum) and poverty reduced from 43% in 1985 to 34% in 1992. Again, a decline in annual average agricultural growth (2.4% per annum) from 1990-1996 was accompanied by increased poverty from 34% to 65.6% in 1996.

Olajide et al. (2012) in his studies of agricultural resources and economic growth in Nigeria also discovered a positive causality between GDP and agricultural output, where he used Ordinary Least Squares (OLS) econometrics techniques, precisely between 1970 and 2010. From his studies, it was revealed that agricultural sector accounted for about 35 percent of the variation in GDP. Even though the agricultural sector suffered a high level of setback, immediately after which oil was discovered in commercial quantity. He recommends that government should make available infrastructural facilities such as constant power supply, pliable road, opening of feeder roads to rural farmers and access to financial support with small payback return.

The empirical study carried out by Ebere et al. (2012) on the impact of government spending on agriculture and economic growth, using the Ordinary Least Squares (OLS) econometrics technique on a time series data covering over 30 years between 1980 and 2012.

Going through the empirical analysis of Okoro (2011) where he investigated the contribution of agricultural sector on the Nigerian economy, using panel data for a period of over twenty years, precisely between the year 1986 and 2007. Okoro(2011) discovered a positive relationship between agricultural sector and economic growth in GDP as dependent variable, while foreign direct investment (FDI) and domestic savings (DS) were the explanatory variables. From his findings, FDI and domestic savings were able to explain 81 percent of the variation in the economic growth, quite a robust model. He recommended, better improvement of the Nigerian agricultural sector, and that the government and Central Bank of Nigeria (CBN) should have accessible and low-interest rate loan plan for farmers and also strengthen the research institutions for noble findings. Oji-Okoro (2011) employed multivariate framework to examine the contribution of agriculture, domestic savings, government expenditure and FDI on Nigeria's GDP growth.

They found that agriculture contribute positively to the country's GDP growth during the 1986-2007 period. The study also found that 81% of the variation in the dependent variable GDP, is explained by the variables included in the model.

According to Lawal (2011) in his study, where he analyzed government expenditure on agricultural sector contribution to growth (GDP) and subsequent development, for a period of 30 years between 1970 and 2007. His study was in affirmation with Okoro (2011) where it was revealed that a direct relationship exists between the agricultural sector and economic growth. Ukeji (2003) who also conducted a research on the relationship between the variables in question also agreed with (Lawal. 2011; Okoro, 2011) revel the existence of a positive relationship between gross domestic product and the agricultural sector. Ukeji (2003) x-rays that in the 1960's agriculture accounted for over 65-70 percent of the total gross domestic product.

Nevertheless, there has been a nose dive to 48 percent in the 1970"s and still decline to overwhelm 19 percent in the 1990"s this outcome is explained by the oil boom. Some studies have revealed positive influence of agricultural production activities as represented by agricultural output on the growth of GDP or GDP per capita, while others have discovered negative influence running from agriculture to economic growth. However, these conflicting findings may be the result of procedural differences and different sample periods and sample observations used for the analysis. This study employs relatively better analytical framework and estimation techniques to evaluate the impact of agriculture on Nigeria's economic growth

B. Theoretical Framework

According to Agenor and Montiel (1996), Robert Solow (1956) was the first economist to develop a model that represents the neoclassical theory of economic growth incorporating this idea. Later on, his model was further developed by Trever Swan (1956). The latest model was then renamed as the Solow-Swan model (1956). The neoclassical growth theory is best represented by this model. The Solow-Swan model was built up on aggregate constant return to scale production function that combines labor and capital (with diminishing marginal returns) in the production of a composite good (Solow,1957). Production is distributed between savings and consumption on the basis of the Keynesian saving rule. Savings are assumed to be a fixed fraction of output, and technology improves at an exogenous rate. If savings are equal to the level of investment, then the economy is said to be in the steady state. The convergence process towards the steady state is ensured by the assumption of decreasing productivity of capital. The model had attempted to solve the stability problem of full-employment steady state by assuming a neoclassical production function that allows for flexible coefficients of production (Salvadori, 2003). Without technological progress, Heijdra and Ploeg (2006) suggest that Solow-Swan model would imply that countries with similar production technologies as well as comparable saving and population growth rates should converge to similar steady state levels of output.

This convergence property-known as Absolute Convergence Hypothesis- means that poor countries starting with a relatively low standard of living and a lower capital-labor ratio should grow faster during the transition as they catch up with the rich countries, but ultimately both groups arrive at the same level of per capita income (Agenor and Montiel, 1996). Later on, other economists developed an alternative hypothesis that states rich countries grow faster than poor countries.

This hypothesis is known as Conditional Convergence Hypothesis. Ramsey (1965) had also developed a model that further explains the neoclassical theory of economic growth by making the saving rate of households endogenous. This replaced the ad hoc saving/consumption function by forward looking theory based on utility maximization. The Ramsey model yields very similar growth predictions as the Solow-Swan does.

However, unlike the Solow-Swan model, it features the Ricardian equivalence that the particular method used to finance government spending does not matter in affecting consumption, investment and output or in short government debt and tax have equivalent impact on macroeconomic variables and rules out over-saving (Heijdra and Ploeg, 2006).

C.Endogenous growth theories

Unlike the traditional growth theories which view economic growth as a result of exogenous factors, Paul Romer, Robert E. Lucas and Robert J. Barro independently came up with a new type of growth theory which endogenizes technology in the eve of 1990s. This theory is known as Endogenous Growth Theory. The recent literature highlights the existence of a variety of channels through which steady state growth may emerge endogenously. The new growth theory stressed the importance of innovation, human capital accumulation, the development of new technologies and financial intermediation as important determinants of economic growth. In other words, N. G. Mankiw, David Romer, and David Weil (1992) modified the neoclassical model by adding human capital as another input into the production of national income. This opens another avenue for policy to affect wealth, as policies that increase educational investments will also make a country permanently richer and will temporarily raise its growth rate in the transition period to the new equilibrium.

III. MATERIAL AND METHODS

This study uses secondary data to evaluate the impact of agricultural sector on economic growth in Nigeria covering the period 1986 – 2018. The study uses the annual time series data on Nigeria's GDP per capita, gross capital formation, active labour force, agricultural output and trade openness covering the period from 1986 to 2018 for the analysis. This period is adopted to take into consideration the major agricultural development programs implemented to promote economic growth through increased economic performance of the agricultural sector. The time series data used for the analysis in this study was collected from the World Bank's World Development Indicators database. The data was collected in its natural form as expressed in US dollars and percentages forms. The data collected in natural forms in millions US dollars were first converted into natural logarithm form.

A.Model Specification

Economic performance will be estimated using the natural logarithm of gross domestic product per capita (GDPPC) as a measure of economic growth. This study follows the neo-classical enhanced Solow growth model, which was first proven by Mankiw, Romer, and Weil (1992).

For the analysis of the economic growth factors, academician and empirical researchers have commonly used the Cobb-Douglas production function model to determine the effect of several indicators on economic growth (Demetriades and Law, 2006).

$$X_{it} = K_{it}^{\varphi}(A_{it}L_{it})^{1-\varphi} \qquad (1)$$

Where, X_{it} is the output, K_{it} is the capital L_{it} is the labour force; meanwhile, A_{it} is the level of technology and efficiency, country and time are denoted by i and t respectively.Oyinbo and Grace (2014), Victor (2015) and Ogunsanya, Jelilov and Ozden (2017) among others, include the agricultural output variable in their empirical model to examine the impact of the agricultural sector on economic growth. Hence this study extends equation (1) by including agricultural output as part of the explanatory variables.

A.Techniques of Data Analysis

Several data analysis techniques will be employed to estimate the model developed in this study. These analytical techniques require some modification of the initial model in order to produce reliable and accurate estimations. They include the unit root tests, the Ordinary Least Squares (OLS) and the Pearson Correlation Coefficient to estimate of the relationship between the agricultural sector and Nigeria's economic growth performance during the sampled period. Several post estimation techniques will be used to assess the significance of the estimation techniques used.

II. Unit Root Tests

The application of unit root tests in the OLS estimation procedure is necessary in order to avoid spurious regression. This is because applying the OLS on nonstationary time series will generate biased, inefficient and inconsistent estimates. The unit root test was carried out using Augmented Dickey Fuller (ADF) unit root test and Phillips-Perron(PP) unit root test. Based on these tests, weestimate the model in first difference form over the entire sample period. Variables expressed in numerical values are expressed in logs, so that first differences represent percentage changes. The test is conducted by adding the lagged values of the

dependent variables ΔX_t as given in equation (1) below:

$$\Delta X_t = \beta_0 + \beta_1 t + \delta X_{t-1}$$
$$+ \sum_{i=1}^{k} \propto_i \Delta X_{t-1}$$
$$+ \varepsilon_t \ldots \ldots \ldots \ldots \ldots (2)$$

Where: ε_t is a pure white noise error term and $\Delta X_{t-1} = (X_{t-1} - X_{t-2})$, $\Delta X_{t-2} = (X_{t-2} - X_{t-3})$, and so on, and t is the time or trend variable while k is the lag length, and X in our case represents lgdppc, capf lnlab, lnago and opn, as the case may be. The null hypothesis is that $\delta = 0$; that is; there is unit-root. Thus, the time series is non-stationary. The alternative hypothesis is that δ is less than zero, that is, the time series is stationary.

III. *Ordinary Least Square*

In this study, the OLS estimation technique was used to examine the causal impact of the agricultural output, capital formation, active labour force and trade openness on GDP per capita. Trade openness is used to capture the impact of international trade on per capita GDP growth in the Nigerian economy over the study period.The relationship between the agricultural sector and the Nigeria's economic growth performance is assessed using Pearson's correlation analysis of the values of the two variables during the study period.

IV. RESULTS AND DISCUSSION OF FINDINGS

It is well-known fact that time series data are subjected to the high rate of skewness. This is due to the existence of many outliers along the trend line. From the table of descriptive statistics, Jarque-Bera test of normality is used to see whether the data is normally distributed. The null hypothesis in the normality test assumes that the series are normally distributed. Likewise, the mean based coefficients of skewness and kurtosis are applied to check the symmetric nature of the variables. From the Table 1, it is clearly seen that the series are normally distributed. This is because the mean coefficients of the Jarque-Bera statistics show that the series are normally distributed. Table 2 presents the correlation coefficient of the four independent variables. It is observed that all the variables have significance relationship.

A. *Source: Researcher's computation*

After descriptive statistic, the next step is to determine the method suitable for achieving the stated objectives, in doing so we have to first find out the order of integration of the variables under study.

Table 1: Descriptive Statistics

	GDPPC	CAPITAL	LABOUR	AGO	OPNS
Mean	7.456242	31.76885	17.49095	24.53962	35.34480
Median	7.352149	30.15634	17.48994	24.45372	36.54016
Maximum	7.848970	54.95059	17.89235	25.46212	53.27796
Minimum	7.194434	14.90391	17.10184	23.68024	9.135846
Std. Dev.	0.241926	13.09007	0.236623	0.623791	10.62704
Skewness	0.427959	0.183940	0.033906	0.114243	0.449884
Kurtosis	1.548821	1.745411	1.831029	1.385872	2.783667
Jarque-Bera	3.784688	2.279107	1.828122	3.543486	1.141841
Probability	0.150718	0.319962	0.400893	0.170036	0.565005
Sum	238.5997	1016.603	559.7103	785.2677	1131.033
Sum Sq. Dev	1.814367	5311.847	1.735705	12.06259	3500.951
Observations	32	32	32	32	32

For this purpose, the analysis applied two most popular unit root tests, namely ADF and Phillip Perron. Table 3 below indicates that ADF and Phillip Perron unit root tests of the data series at the level are not stationary. However, all the data series become stationary at first difference. Thus, the variables under the study are integrated at I (1). The results as reported in Table 4 indicate that all the variables are integrated at I (1). The result is consistent with the ADF and Phillip Perron unit root tests. lngdppc, cap%, lnlabour, lnago and opns respectively.

Table 2: Unit Root Tests of Stationarity

	ADF				PP			
	Level		1st Diff.		Level		1st Diff.	
	t stats	p values	t stats	p values	t stats	p values	t stats	p values
Lgdppc	-0.482961	0.8812	-3.606483	0.0117	-0.272006	0.9182	-3.606483	0.0117
Capital	-1.309398	0.6125	-5.792126	0.0000	-1.682885	0.4297	-8.508806	0.0000
Ln labour	1.648874	1.0000	-3.906039	0.0243	1.026542	0.9998	-3.991075	0.0201
Lnago	0.008058	0.9523	-5.392843	0.0001	0.006495	0.9522	-5.392694	0.0001
Opns	-3.411270	0.0182	-6.962122	0.0000	-3.411270	0.0182	-7.661313	0.0000

Source: Researcher's computation

Table 3: Agricultural and Economic Growth

Dependent Variable: D(GDPPC)				
Method: Least Squares				
Coefficient	Std. Error	t-Statistic		Prob.
D(CAPITAL)	-0.001679	0.001820	-0.922412	0.3648
D(LABOUR)	0.004539	0.125258	-3.277537	0.0030
D(AGO)	0.162285	0.046627	3.480505	0.0018
OPNS	0.001287	0.000607	2.119482	0.0438
C	3.169564	1.092337	2.901636	0.0075
R-squared	0.377164	Mean dependent var		0.019157
Adjusted R-squared	0.281343	S.D. dependent var		0.037234
S.E. of regression	0.031565	Akaike info criterion		-3.926873
Sum squared resid	0.025904	Schwarz criterion		-3.695585
Log likelihood	65.86654	Hannan-Quinn criter.		-3.851479
F-statistic	3.936129	Durbin-Watson stat		1.916933
Prob(F-statistic)	0.012530			

Source: Researcher's computation

Table 4 shows the results of the estimation of the impact of agricultural industry on Nigeria's economic growth during the 1986 – 2017 period. Some of the explanatory variables including labour agricultural output and openness were found to have positive influence on the dependent variable or GDP per capita.

The variable of interest agricultural output has produced positive impact on Nigeria's economic growth during the period. The results indicate that a 1% increase in agricultural output increased Nigeria's GDP by 0.16% during the period. Openness which is projected to have positive impact on Nigeria's GDP is found to have positive but very weak impact on economic growth during the 1986 - 2017 periods. However, the ultimate measure of the statistical significance of the parameter estimates indicate that the impact of the explanatory variables with the exception of capital formation output were found to be statistically significant.

Agricultural output was found to have statistically significant positive impact on per capita GDP growth during the study period. Therefore we can confidently assert that we have found evidence that the agricultural industry has had a significant impact on Nigeria's per capita GDP growth during the period. All the other explanatory variables included in the model except capital were also found to have positive and statistically significant impact of per capital GDP growth

Relationship between Agriculture and Economic Performance
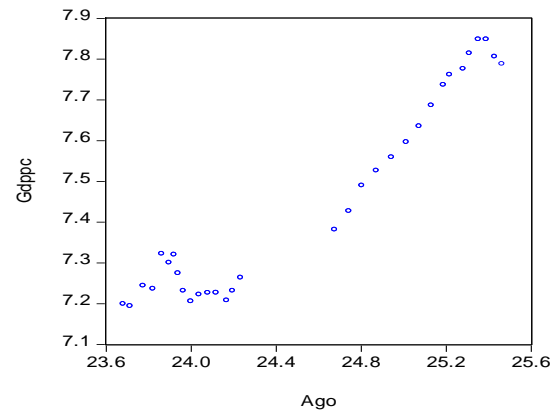
Figure 1: Correlation between GDPPC & Agricultural Output

The above scatter plot shows the correlation between GDP per capita representing economic performance and agricultural output which represent the Nigeria's agricultural sector. The resulting coordinates suggest positive association between the two variables.

Table 4: Result of Correlation

Variable	AGO	GDPPC
AGO	1	0.957829
GDPPC	0.957829	1

The result of the correlation analysis reveals strong positive linear relationship between the values of GDP per capita and those of agricultural output during the study period. The correlation coefficient is 0.9578 which represent strong positive linear relationship between the variables. Thus we can conclude the relationship between Nigeria's economic performance and the performance of its agricultural has been positive and strong during the study period. These suggest that the performance of the agriculture is very important to the general performance of the Nigerian economy.

Post-estimation Tests

The measure of Goodness of fit, the R^2

The major of the statistical significance of the model, the adjusted R^2 is approximately 0.28, which means the model is capable of explaining only 28% of the variation in the dependent variable.

The F – Statistics

The F – statistics measures the joint significance of the explanatory variables – gross capital formation, labour, agricultural output and openness in explaining variation in the dependent variable, Nigeria's per capita GDP growth. The results shows an F statistic of 3.94 with the corresponding p-value of 0.01 and this is empower us to reject the null hypothesis and conclude that the explanatory variables are jointly significant in explaining changes in the dependent variable.

Breusch-Godfrey Serial Correlation LM Test

This test measures whether the residuals are serially correlated. The null hypothesis state that the residuals are not serially correlated while the alternative hypothesis state that the residual values are serially correlated. The results of the Breusch-Godfrey Serial Correlation LM Test are presented below.

Table: 5

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	1.268836	Prob. F(2,24)	0.2994
Obs*R-squared	2.964383	Prob. Chi-Square(2)	0.2271

Source: Researcher's computation

From the above table, F statistic is 1.2688 and the corresponding p-value is 0.2994. This result empower us to accept the null hypothesis and conclude that there is no serial correlation of the residuals and thereby lending more credibility to our findings and conclusions from the study.

Heteroskedasticity Tests

This test is carried out to determine whether the assumption of homoscedasticity is violated in the data and analysis. The null hypothesis state that the variance of residuals is homoscedastic while the alternative hypothesis state that the variance of residuals is heteroscedastic. The result is shown below.

Source: Researcher's computation

The F – statistics from the table is 0.7033 and the corresponding p-value is 0.5968. This result empowers us to accept the null hypothesis and conclude that the variance of the residuals satisfies the assumption of homoscedasticity and this lead further credibility to our findings.

Table: 6

V. DISCUSSION

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.703349	Prob. F(4,26)	0.5968
Obs*R-squared	3.026901	Prob. Chi-Square(4)	0.5533
Scaled explained SS	2.355748	Prob. Chi-Square(4)	0.6706

The result from this study has provided evidence on the significance of the agricultural sector on Nigeria's economic growth. It has also revealed the proximate determinants of economic growth including capital formation and labour have had no significant impact on Nigeria's economic growth during the study period.This study has added to the bulk of empirical evidence on the significance of the agricultural sector to economic growth and development. It is recommended that the Nigerian government promotes increased investment in the Nigeria's agricultural sector so that the country can enjoy increased economic activities and the associated improvement in the societal welfare.

VI. CONCLUSION

An understanding of the nexus of agricultural production and economic growth in Nigeria with a view to reaching conclusion on the policy implication of agricultural development is the main objective of this research work. Using time series data on the index of agricultural production, real gross domestic product per capita, gross capital formation, active workforce and openness of the economy, the Ordinary Least Squares method was employed to analyse the data leading to the key finding of the study. It was established that agricultural production has positive impact on economic growth in Nigeria and there is a positive relationship between economic performance and Nigeria's agricultural sector.

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Relationship Between Workplace Flexibility, Job Satisfaction and Organizational Commitment of the Employee in the BPO Sector

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Abstract- The purpose of the study is to examine whether if there is any significant relationship between workplace flexibility, Job Satisfaction and Organizational Commitment among the BPO"s employees. The study had included 60 employees in different BPO's. Snowball sampling technique was used for the collection of the data. Pearson Moment Correlation method was used to do the analysis to see whether if there is any significant relationship between Workplace flexibility, Job Satisfaction and Organizational Commitment. It was found out that there is a positive or a significant relationship between Workplace flexibility, Job Satisfaction and Organizational Commitment. So, the greater or the more flexibility the employees has, the more likely he is to be satisfied and committed to his job.
Keywords: Workplace Flexibility, Job Satisfaction, Organizational Commitment, BPO's.

I. INTRODUCTION

The workplace was once seen as a separate domain from home and family, a separation that was largely defined by gender roles. However, recent decades have seen the increasing participation of women in the paid workforce, changes in the structure of families, and an increase in dual-career families. The challenge faced by families and the wider community is to ensure that an appropriate balance is achieved between work and family responsibilities.Every organization has their own workplace strategy, who they will hire and how they manage, assess and reward employees. The question is whether the strategies are effective, because only then will they lead to improved employee engagement, job retention, job satisfaction and employee wellbeing—all of which contribute positively to the company's bottom line. Research from Families and Work Institute's 2002 National Study of the Changing Workforce (NSCW) demonstrates that a critical element of workplace effectiveness is flexibility.

1. exit and re-enter the workforce and to increaseand decrease their workload or pace.
2. Culture of Flexibility reflects whether supervisors are knowledgeable about flexible.

Workplace flexibility includes flexible schedules and role flexibility. Workplace flexibility could also be categorized into the flexible work arrangements, leave time, both paid and unpaid, and exits and re-entry into a workplace. Italso includescreating a schedule that meets the needs of the organization and meanwhile allowing the employee to have passion and more interests in his/ her workand enable a work life balance. Today business/organization environment is at a fast pace, turbulent, and unpredictable because of the changing trends in technology, competition, and so on. The employee has to fit in to the organization and should be able to meet the expectations of the organizations in several ways. Comparing today's organizations to organizations in the past, there has been found that there is an increasing amount of stress and workload, and people are demanding more of flexibility or part time work to have better adjustment and in order to work more efficiently and effectively. Even some companies haveused it as a tool for improving recruitment and retention, and for responding to employee diversity

Several studies suggest that work flexibility can offer many benefits to both employers and employees, including improved job satisfaction, reduced absenteeism, greater commitment, and

reduced turnover. According to the Boston College Center for Work & Family study of six large companies, 70% of managers and 87% of employees reported that working a flexible arrangement had a positive or very positive impact on productivity; 65% of managers and 87% of employees reported that a flexible work arrangement had a positive or very positive impact on the quality of work; and 76% of managers and 80% of employees indicated that flexible work arrangements had positive effects on retention.

Where flexible working is genuinely available to all employees within an organization, it is perceived as more acceptable than limiting to a group of employees. This is irrespective of whether or not organizational policy says that flexible working is available for all. The gap between the rhetoric of policy and the reality of the types of employees who actually take up flexible working can be indicative of the culture of the organization. Often 'flexibility for all' translated into a large of majority of parents of young children (particularly mothers) working in flexible ways. This reinforces stereotypical views ofwhat it means to be a flexible worker. There was nothingunusual identified in the barriers to a genuine flexible workingculture: managerial resistance; a lack of role models, especially senior men; an unwillingness to 'go against the grain'; well-founded suspicions that career prospects would be harmed; an over-complicated application procedure.

Flexible working can also help you to reduce absenteeism and increase productivity, employee commitment and loyalty.

Flexibility will probablyincrease during future decades and will be one important feature of work and organizations in the times ahead.

II. RATIONAL OF THE STUDY

In India, the BPO Sector has a very high attrition rate as compared to the other Business Units. Also BPO's have a potential for flexible working such as options for Shifts (Day and Night) and also it providesoptions for employees to work from home if adequate technical support is provided. However many BPO's in India don't provide these flexible working options.So thisstudy will help in understanding if the flexible working hours will increase the level of satisfaction and commitment of the people working in the BPO sector in the Indian Context.Thus the results of this research will also help in reducing or controllingof the attrition

rate and will increase the retention of the employees in the organization.

III. OPRATIONAL DEFINITION

Workplace Flexibility: According to the National Study of Employers (2012) workplace flexibility includes different factors such as flex time and flex place, choices in managing time, reduced time, caregiving leaves, time off, flex careers and culture of flexibility.

Job Satisfaction:Locke, 1976 defines job satisfaction as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences"

Organizational Commitment: According to Meyer and Alien (1994) organization commitment is "a psychological state that (a) characterizes the employees' relationships with the organization and (b) has implications for the decisions to continue membership in the organizations.

IV. PROBLEM STATEMENT

To find out if there is a relationship between workplace flexibility, Job satisfaction and commitment of the employees working in the BPO Sectors in Bangalore.

V. OBJECTIVES

1. To examine is there is a relationship between Workplace flexibility and Job satisfaction.
2. To examine is there is a relationship between Workplace flexibility and Organizational Commitment of the employee.

VI. REVIEW OF LITRATURE

A study was done on 54 full time employees with permanent contracts in local and multinational companies. Additionally, Pinto (2011) used two questionnaires to map demographic information as gender, age and caring responsibilities as well as the availability and use of flexible working arrangements. All the data were collected using an online survey platform and all answers were anonymous, voluntary and confidential. The sample was characterized by a majority of female employees, an average age around 30 years, with participant's ages ranging from 22 to 53 years old. And also more than a quarter of the participants were responsible of child care and more than a tenth of taking care of an adult. The results show that the availability of flexible working arrangements is related to higher levels of job

satisfaction and lower level of turnover. And also it is found out that gender and caring responsibilities were not linked with the use of flexible working arrangements. And however age showed a relationship with the use of flexible working arrangements, with older employees reporting more frequently the use of flexible working arrangements.

Blair-Loy, Wharton (2004) has done a study on how academics, policy makers, and human resource professionals advocate flexibility policies as a way to help employees balance work and family and to promote a more committed workforce for employers. And the analysis of the study on individual-level and work group–level factors that contribute to workers' feeling constrained from using a corporation's generous official flexibility policies reveals that those with the heaviest job demands and least supportive work groups are most likely to feel unable to use these policies. And the sense of constraint is associated with lower organizational commitment. ontheir findings suggest contradictions in the high-commitment model of employment as it has been applied to managers and professionals in the rapidly changing, competitive financial services industry.

Fisher (2010)investigated how flexible work arrangements are designed and implemented and how workplace culture and structure shape these activities or behavior of the employees. The author used a qualitative, grounded theory approach to conduct a case study of a large Midwestern U.S. workplace with a diverse hierarchyof jobs. Spatial analysis and semi-structured face-to-face interviews with both managers and non-managers in salary and hourly positions were used to gather data. The findings has shown that providing flexibility in the workplace can greatly affect corporate organizations' approaches to flexibilityin ways that may not even be directly associated with flexible work arrangements in the minds of organizational members. Based on her findings, she has also presented several hypotheses as a means of contributing to the research agenda on flexible work arrangements in corporate settings. Hypothesis:

1) There is no significant difference in the level of job satisfaction of the
2) There is no significant difference in the level of organizational commitment of

employees with and without flexible work options.

VII. RESEARCH DESIGN

A correlational research design will be used to find out the relationship between workplace flexibility, level of satisfaction and commitment of the employee. And the sample will include 30 males and 30 females in various employees working in BPO sector's in Bangalore.

VIII. SAMPLING

The sampling method that should be adopted is the Snowball Sampling technique among the various BPO's in Bangalore

IX. TOOLS

The flexibility Scale developed by the National Study of Employer 2012. This scale consists of four subtopics such as flextime and flex place, choice in managing times, caregiving, leaves, time-off, and flex careers. As this scale has not yet standardized in the Indian population. So it will be given to 5 or 6 experts for the face validity and content validity.

2 Job Satisfaction Scale developed by Dr. Amar Singh and Dr. A.T Sharma

3.Organizational Commitment Scale developed by Dr. Anukool M. Hyde and Mrs. Rishu Roy

X. DESIGN ANALYSIS

Pearson Correlation method should be used to find out if there any significance relationship between Workplace Flexibility, Job Satisfaction and commitment of the employee.

Table:1

		Sum of Squares	df	Mean Square	F	Sig.
Or commitment	Between Groups	1203.756	2	601.878	3.930	.025
	Within Groups	9036.712	59	153.165		
	Total	10240.468	61			
Job satisfaction	Between Groups	4487.377	2	2243.688	29.180	.000
	Within Groups	4536.559	59	76.891		
	Total	9023.935	61			

XI. ETHICAL CONSIDERATION

•Data collected will be anonymous.

•Confidentiality will be maintained at the utmost level
•Participation will be voluntary and no coercion of any sort will be used.
•Data will be used only for research purposes.
•No information will be published without the permission of the Company.

XII.   RESULT AND DISCUSSION

The aim of the study is to find out is there any significant relationship between Workplace flexibility, Job Satisfaction and Organizational Commitment among the employees in the BPO sector in Bangalore. The BPO's Sector in India has a very high attrition rate as compared to the other Business Units. The BPO's have also this choice for the employees to work for in the day shift or night shift, and also the options for voice and non-voice process. However many BPO's employees in India have a very tight schedule and sometimes don't even have the time for themselves too. So this study will help in understanding if the flexible working hours will increase the level of satisfaction and commitment of the people working in the BPO sector in the Indian Context. So this study will enlighten us about the importance of the flexible working options and schedules and how it relates to the satisfaction and commitment of the employees.

Descriptive statistics of Job Satisfaction and Organizational Commitment

Table 1 represents the descriptive analysis of the data obtained for Job Satisfaction and organizational Commitment. It indicates the range or spread of the scores across the two variables with the minimum value of 45 and the maximum value of 98 for job satisfaction and minimum value for 83 and maximum of 137 for job satisfaction.

Table 2 represents the analysis done on the basis of anova. It was found that the mean squares for Organizational Commitment across varying levels of workplace flexibility were608.878 and the mean squares within the group were found to be 153.165. Mean squares are estimate of variance across group. It is also significant at .025 levels, showing that there is asignificant difference in the organizational commitment based on the varying levels of workplace flexibility.For job satisfaction, it was found that the mean square for between group and within groups was 2243.688 and 76.891. And it is found that the f value was significant at

.000 level and showing that there is a very significant difference between Job Satisfaction based on the varying levels of Workplace flexibility.

Correlations coefficient between Job Satisfaction and Organizational Commitment

**. Correlation is significant at the 0.01 level (2-tailed).

The hypothesis of the study stated that there is no relationship between Workplace Flexibility, Job Satisfaction and Organizational Commitment. Spearman's correlation was used to calculate the correlation coefficient of workplace flexibility, Job Satisfaction and Organizational Commitment.

Table: 2

	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic
Job satisfaction	45	98	70.03	12.163
Org commitment	83	137	112.37	12.957
Valid N (listwise)				

According to Table 3, a positive significant correlation was found at 0.01 levels between Workplace flexibility, Job Satisfaction and Organizational Commitment. It indicates that a more flexible work option and schedules the employee has, the higher chance is to increase the level of satisfaction and commitment to his job. Thus the hypothesis is being rejected as there was a significant correlation between workplace flexibility, Job satisfaction and organizational Commitment. As from the previous studies, we can see that flexibility has a positive relationship with job satisfaction Hanglberger (2010).Warsi, Fatima and Sahibzada (2009) also found the positive relationship between Organizational Commitment and its Determinants among Private Sector Employees of Pakistan.

Table: 3

		Job satisfaction	Organizational commitment
Job satisfaction	Pearson Correlation	1	.478**
	Sig. (2-tailed)		.000
	N	62	62
Org commitment	Pearson Correlation	.478**	1
	Sig. (2-tailed)	.000	
	N	62	62

As the sample size consists of 60 employees among the BPO's employees in Bangalore. The researcher used Snowball sampling technique to distribute and collect the data. The population who has responds as 'Yes' which is53.33%, said that the organization which they work for has provided them the flexibility and as compared to the other groups they have the higher scores in Job Satisfaction and Organizational Commitment scale. Then 11.29% of the respondents have said that their respective organization has provided them some amount or they provide workplace flexibility only for sometimes. This does not make any much difference in the scores in Job Satisfaction and Organizational Commitment Scales. It might be due to the perception and attitude of the employee towards their level of flexibility. But the respondents who have higher flexibility tend to have more scores in Job Satisfaction and Organizational Commitment too. The other groups, which comprised of 35.48% of the sample population, said that, they do not receive or have any kind of flexibility, from the results it could also be seen that they are likely to be less satisfied and less committed to their respective organization or to their job. But among of the 35.48% of the sample who said 'NO', a small proportion of them are still tend to be very satisfied and committed no matter how less or no flexibility is provided to them.As the table depicted that the workplace flexibility has a positive correlation with the Job Satisfaction and Organizational Commitment among the BPO employees in Bangalore. From the results, it could be stated that the higher the flexibility in the organization, the employees tend to be more satisfied and committed to their respective organization or job. As from the responses and the results, it was found that most of the employee who responded to the questionnaire depicted that, their respective organization has provided them flexible work schedules and timing which make them more satisfied and happy with their jobs. As stated by some of the respondents, it also reduce their level of stress as they could choose their work timings and even most of them stated that they have the options to work from home temporarily. This has makes their work a more lot easier and then can saves a lot of their time and energy.

So to conclude, it is found that there is a positive relationship between Workplace Flexibility, Job Satisfaction and Organizational Commitment among those who are working in the BPO Sector in Bangalore. It could also be seen that the higher the flexibility the organization provided to the employee, the employees tend to be more satisfied and committed to their organization or to their work.

XIII.   SUMMARY AND CONCLUSION

This study was aimed to study the relationship between Workplace Flexibility, Job Satisfaction and Organizational Commitment. And also to examine that is there is a relationship between Workplace flexibility and Job satisfaction and also between Workplace flexibility and Organizational Commitment.

According to the National Study of Employers (2012) workplace flexibility includes different factors such as flex time and flex place, choices in managing time, reduced time, caregiving leaves, time off, flex careers and culture of flexibility. Workplace flexibility mainly refers to when, where and how people are working. It is really important for creating and effective and efficient organization. It is really important for all the employees, including the managers, employers and for the organization. According to Locke, (1976), job satisfaction is defined as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences". Organizational Commitment has been defined by Meyer and Alien (1994), they state that organization commitment is "a psychological state that (a) characterizes the employees' relationships with the organization and (b) has implications for the decisions to continue membership in the organizations. The hypothesis of the study was to find out that there is a significance relationship between Workplace Flexibility, Job Satisfaction and Organizational Commitment. A sample size of 62 employees in the BPO sector in Bangalore were administered the flexibility

questionnaire, Job Satisfaction Scale (by Dr. Amar Singh and Dr. A.T Sharma) and Organizational Commitment Scale (Dr. Anukool M. Hyde and Mrs. Rishu Roy).

The major finding of the study was that there was a significant relationship between Workplace Flexibility, Job Satisfaction and Organizational Commitment among the BPO employees in Bangalore. PearsonsCorrelation method has been used to find out that there is a significance relationship among the variables.

Findings of the study:

1. There is a significant correlation between Workplace Flexibility, Job Satisfaction and Organizational Commitment which rejected the hypothesis of the study.

2. Job satisfaction is significantly higher among the employees in the BPO Sector in Bangalore who have flexible working options.

3. Organizational Commitment is significantly higher among the employees in BPO Sector in Bangalore who have flexible working options

Limitations of the study:

1. The finding of this study is limited to a small sample and cannot be generalized to a larger population.

2. This particular study is confined to only on the BPO's in Bangalore hence it did not capture the essence of the whole industry.

3. Finding out that the employees in the BPO's in Bangalore has flexibility, it doesn't mean that all the employees in Bangalore have a flexible work schedules too. It also differs from one BPO to another.

Scope for further research:

1. The sample size can be increased to more than 100 with considering the demographic variables of the employees.

2. Same research can be conducted on the other sector.

3. A comparative study among the gender could be done.

4. A comparative study among different sectors.

5. A comparative study among the singled and married employees.

XIV. CONCLUSION

As there is a correlation between Workplace flexibility, Job Satisfaction and Organizational Commitment, It indicates that employee who has more access to work flexibility are likely to be more satisfied and committed to their job or organization as found from the study. To conclude, employees in the BPO sector in Bangalore who has the accessibility to flexibility are more satisfied and committed

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A Review on Impact of GST on Micro, Small and Medium Enterprises (MSMES)

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ABSTRACT:- The Goods and Services Tax (GST) is an indirect tax that was introduced in markets and industries in India on 1 July 2017 and implemented and enforced across India, with many cascading taxes levied by both the central and state governments. It is true that the Government of India says that GST means "great step towards change", Step "Great step of transparency in India" and it is also true that someone gives "birth" while another person nurtures it. Does'. It is a long overdue problem to streamline all specific types of slanted taxes and implement a "single taxation" system. As the name indicates, GST can be levied on a variety of items and offerings each. GST is a tax that is to be paid on the supply and supply of products and offerings. Any person or anyone, who is presenting or offering goods and services, is liable to GST. We are now looking at how this tax reform changes the dynamics of our economy industry and business for micro, small and medium enterprises. In the midst of a challenging environment, India's Small and Medium Enterprises (SMEs) have experienced many highs and lows over the years. The Indian economy is expected to combine and emerge as one of the leading economies in the world and is expected to become a $ 5 trillion economy by 2025, with major impetus to strengthen the backbone of our economy — the SME sector Used to be. This paper includes knowing the impact of GST and MSME and GST and MSME.
Key words--GST, MSMEs and GSTN

I.INTRODUCTION

The Goods and Services Tax (GST) is an indirect tax such as sales tax and value-added tax, introduced in India on 1 July 2017 and applicable across India, replacing the double taxation imposed by the central and state governments. It was officially introduced as the Constitution (One Hundred and First Amendment) Act 2017 after the passage of the Constitution's 122nd Amendment Act Bill. GST is governed and run by a GST Council and headed by the Finance Minister of India. Under GST, product and services square measure taxed at the subsequent rates, 0%, 5%, 12%, 18% and 28%. There is a market-specific rate of 0.25% on rough and hard precious and semi-precious stones and 3% on gold. In addition, the use of 22% or other rates on top of the 28% GST applies to some lesser items such as aerated drinks, luxury cars and tobacco products. The GST replaced a series of indirect taxes with an integrated taxation system and has therefore set the stage for dramatically transforming the country's $ 2 trillion economy. The single unit GST (Goods and Services Tax) is substituted and levied on several prior taxes and levies which included: Central Excise, Service Tax, Additional Customs Duty, Surcharge, State-level Price Tax and Octroi. Other levies that were applicable to inter-state transport of goods have also been completely abolished in the GST regime. GST is levied on all money transactions that are made and carried out such as sales, transfers, purchases, barter, leasing, or imports of goods and / or services in the market. India adopted and implemented the dual GST model, which means that taxation is administered by both governments presented by the central and state governments. Transactions made within a single unit of state governments are levied with central GST (CGST) by both the central government and state governments by the state GST (SGST). For inter-state transactions and imported and goods or services, a unified GST (IGST) is levied by the central government. GST is a consumption-based tax / destination-based tax, therefore, taxes are collected and paid to the state where the goods or services are consumed and do not absorb the state in which they are produced. The IGST complicates tax collection and bundling for state governments, which prevents them from depositing tax directly or directly from the central

government. Under the already developed system, a state would have to contract and deal with only one government to collect and consolidate tax revenue. According to the government, the Digital Internet Media website on GST, "Goods and Services Tax" Network (GSTN) is a non-profit making no harm to create a website / platform for all concerned and related parties related to GST is proposed. To joint and collaborate stakeholders, government and tax payers on a single portal. When up and running, the Internet website portal should be accessible and enable the central government to allow it to track every transaction or display at its end while taxpayers are advertised digitally Is done so that it has the ability to connect. However, its efficacy and efficiency are yet to be further tested. GSTN has a well-known certified and authorized capital of 10 crores (US $ 1.6 million), of which the Central Government of India holds 24.5 per cent shares, while the State Government has 24.5 per cent and the balance and private banking firms to run effectively.

II. ACCORDING TO SMALL, TINY AND MEDIUM ENTERPRISES DEVELOPMENT (MSMED) ACT 2006

The MSMED Act was notified and announced in 2006 to address policy issues affecting MSMEs as well as coverage and investment limits of the sector. The Act seeks to facilitate the development of these enterprises as well as increase their competitiveness. It provides the first-statutory framework for the recognition of the concept of enterprise which constitutes both manufacturing and service entities. It first defines medium enterprises and seeks to integrate and combine the three levels of these enterprises, namely, micro, small and medium.

The Act provides for a statutory (by law) consultation process at the national level with a balanced representation of all classes of stakeholders, particularly the three categories of enterprises and a wide range of advisory functions. Foundation of specific funds that are appropriate incentives, sophisticated construction, development and rapid increase in competitiveness of these business ventures, notification of schemes / programs for this purpose, progressive and improved credit policies and practices, government procurement for products and services Micro and small enterprises shown for preference, problems of delayed payment to micro and small enterprises

Some of the other features of the Act are the more effective mechanisms for mitigation and assurance of a plan by these enterprises to close the business.

Objectives
1. To Know the GST and MSMEs
2. To Study the Impact of GST on MSMEs

III. RESEARCH METHODOLOGY

The present study relies on secondary data. Secondary data was collected from micro, small and medium enterprises of the Government of India and also searched edited books and websites.

IV. GST AND MSMES

The growing formalization of the Indian economy, particularly through digitization, is an advance advance that will enhance the business model of micro, small and medium enterprises (MSMEs) based on twin arbitrage of labor and cash transactions. India's paradigm shift. . The Goods and Services Tax (GST) regime in July will increase their compliance costs and snatch most of them into indirect tax traps for the first time.

Sharp practices
So far, unorganized MSMEs have grown faster than organized peers due to lower cost structures, cost structures due to tax avoidance, and non-payment of social security benefits (such as provident funds and gratuity) to employees and excise (If the turnover is less than Rs.1.5 crore). Some MSMEs understand the employee base or set up multiple ventures to avoid tax limitations. Such rapid practices helped them to price products and services competitively over the past few decades and maintain operating margins at organized player levels. The vicissitudes caused by the effects of GST are many. For manufacturers, the reduction in the GST exemption limit from 1.5 crore to 20 lakh means that tens of thousands of unorganized MSMEs will soon be taxed. And digital transaction trails created by double authentication of invoices under GST will strengthen tax compliance. Additionally, lower tax burden under GST will reduce the cost of raw materials and logistics.

Different for services
For the services sector, however, the tax burden will increase. Therefore, organized players with the ability to keep their value-line, or pass on any increase in the cost of customers, will be able to

maintain or improve profit margins. We believe that demonetization market will improve operational efficiencies, especially with the wider reach of MSMEs. Then, there was demonetization. MSMEs were expected to register top-annual growth of 14 to 16 percent in the last fiscal year. However, the impact of demonetization in the second half has been severe and they would have closed the year with just 6 to 8 per cent growth. But as the effect of demonetization fades, growth will pick up in the current fiscal year. A Glance in Outlook: Positive for Light Engineering: Crisil-rated Light Engineering MSMEs saw a 15 percent compound annual growth rate in the topl ne between 2014 and 2016. per cent in FY15 to 8 per cent in 2016. GST will have a slight negative impact due to increase in tax rates. During crisis negotiations with customers, some of them expressed concern that a unified market would create more competition with a large number of unorganized players in an already crowded and price-sensitive sector. Organized players working in branded apparel are expected to fare well though. causing just one setback. GST is expected to give a boost to this segment due to lower tax incidence. The government, emphasizing on Make in India, will also continue to invest, which will help the sector to maintain growth momentum. Positive for electrical appliances: Sales of companies rated by CRISIL grew nearly 23 percent faster than 2015 in FY16. In 2015 the region will benefit from lower freight costs and tax rates. Although growth is expected to be strong this financial year, especially cheaper imports from China, is a challenge. Neutral to pharmaceuticals: Sales at companies rated by CRISIL grew 11 percent in FY16 compared to 15 percent in 2015. Privatization had limited impact as the government

development commission, MSME

Under the various promotional and development activities taken up as part of the planning schemes, the number of MSMEs reported to have benefited during November 2017 was 4,985 compared to 3,139 during the same period of the previous year. In November 2017, 20,114 persons were trained as compared to 9,351 persons in November 2016. In the cases of approved proposals, there are 15,920 during November 15,920. The following statement is noted under various schemes:

a simplified tax structure and an integrated

allowed the restricted use of restricted Rs 500 and 1, 000 currency notes to purchase medicines. We do not consider any significant difference in tax rates under GST. This fiscal too, we expect similar growth. Neutrals for auto components: Between 2014 and 2016, sales of unorganized auto component manufacturers by Crisil grew 14 percent year-over-year compared to 7 percent for their organized peers. However, demonetization led to a short-term decline in sales of original equipment manufacturers (OEMs), or vehicle manufacturers. This fiscal, OEM sales are expected to be normal. Organized players will be benefited and will record moderate growth, emphasizing digitization and lower tax rates under GST. Most unorganized players catering to the non-OEM replacement market will be forced to move into the organized domain. Marginal Negative for Textiles: Sales growth in the textile-related MSME segment had already fallen from 15

Table 1. The present ceiling on investment for enterprises classified as micro, small and medium enterprises is as follows:

Classification	Manufacturing Enterprises*. (Investment ceiling in Plant & Machinery)	Service Enterprises** (Investment ceiling in equipment)
Micro	Rs. 2.5 million / Rs. 25 lakh	Rs. 1 million / Rs. 10 lakh
Small	Rs.50 million / Rs. 5 crore	Rs. 20 million / Rs 2 crore
Medium/Moderate	Rs 100 million / Rs 10 crore	Rs. 50 million / Rs 5 crore

GST rates to be much different from the current indirect tax rates. Crisil expects overall growth and player margins to decline this fiscal. Monthly and financial performance of

V. IMPACT OF GST ON MSME

Currently, the total tax collection in India is around 14.5 lakh crore, of which 34% is indirect tax. Indirect taxes include service tax, stump duty, customs duty, VAT etc. It refers to the gathering of tax indirectly by the govt. of Bharat. In most developing countries, the share of indirect tax is higher than direct tax. However, indirect tax share in developed countries is very low. Therefore, the new implementation of GSTwill help the government to get a better grip on taxpayers. It should be able to develop the entire tax system. Small and Medium Enterprises (SMEs) have been

considered the primary growth drivers of the Indian economy for decades. This is further clarified by the fact that today we have around 3 million SMEs in paymentrefunds and returns will now be done only through online portals and as such SMEs should not worry about negotiating with department officials to fulfill these compliance, which are currently Tax is considered a headache. Governance. Below we've provided a high level impact analysis of GST on tiny and medium businesses in Bharat.

Table:2

Compliance Procedure	Positives	Negatives
Registration	Online registration will ensure timely receipt of certificate of Registration And minimal bureaucracy interface	Not all the SMEs have technical expertise to deal with online systems, thus most of them will need intermediaries to obtain registration for them. This will add to their registration cost.
Payment	Electronic Compliance will bring transparency and will also reduce the compliance cost.	Since funds are required to be maintained in the form of electronic credit ledger with the tax department, it may result in liquidity crunch.
Refund	Electronic refund procedures will fast track the process and enhance liquidity for SMEs	Refunds can be claimed only after filing of relevant returns. Also it depends on the compliances done by the supplier and his rating.
Returns	All returns are required to be filed electronically and input tax credit and tax liability adjustment will happen automatically on the basis of these returns	Minimum of thirty-seven returns are required to be filed by every registered taxpayer during a financial year. Thus SMEs will have to deploy additional resources and eventual cost of compliance will increase

GST will help in easing the process of starting a business in India. Earlier, every business in India was required to obtain VAT registration, which varies from state to state, and the rules and laws are different. Thus it was a very confusing process. However, businesses under GST will only have to register for GST which will have a centralized process similar to service tax. Currently, for any business, it is mandatory to pay VAT if the annual turnover is more than 5 lakhs in some states and 10 lakhs in some other states. This difference in different states causes confusion. Under GST, a business doesn't have to be compelled to register or collect GST if the annual turnover i

s ten hundred thousand. This applies to every state. This will allow many small businesses, which have a turnover between 5 lakh - 10 lakh to avoid applying for GST returns. Due to low complexity, GST allows small and medium businesses in India to do it easily. The gap between services and goods will be eliminated, and this will make compliance easier.India, contributing about 50% to industrial production and 42% of India's total exports. For a developing country like Bharat and its demographic diversity, SME has emerged as a major employment generating sector and has provided balanced growth across sectors. Let us see what effect GST will have on small and medium enterprises. All compliance procedures under GST - registration, Direct impact of GST on tiny and medium

VI. CONCLUSION

Many policy interventions with technology and innovation will continue to play an important role in creating a business-friendly environment for SMEs. There is no doubt that the purpose of GST isincrease the taxpayer base, which will mainly take the SMEs Under its ambit and place the burden of compliance and associated costs on them. But in the long run, GST will make these SMEs more competitive with large enterprises and a level playing field between them. In fact, recently the government has constituted a special committee to look after the issues facing the MSME sector in GST. It is urged by the industry to continuously throw light on the above issues and get relief before the arrival of GST China, the Philippines and East Pakistan

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A Study on Extent and Management of Crop Residue in Punjab State

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Abstract- Agricultural crop residue burning is a common environmental hazard observed in northern India. It has a significant potential health risk for the rural population due to respirable suspended particulate matter (RSPM).Burning of farm waste causes severe pollution of land and water on local as well as regional scales. It results in the emission of smoke which if added to the gases present in the air like methane, nitrogen oxide and ammonia, can cause severe atmospheric pollution. Burning of crop residue also contributes indirectly to the increased ozone pollution. The study puts forth literature on various aspects of residue generated on the field, chemical composition of the residue, volume of pollution caused by residue burning, adverse impact of burning on human and animal health and various ways of crop stubble management. among various efforts made by Punjab government to protect environment from pollution, one of the major steps is to stop crop residue burning as still Punjab is not free from this menace. If the residue from the crops is managed scientifically and used as a conventional source of energy it will go a long way to save the fossil fuel, coal, wood, precious foreign exchange, create additional employment, Besides, this will also add to the income of farmers from the by-product generated. Thus, for efficient management of the crop residues, there is a need to create awareness among the farming communities about the importance and efficient utilization of this valuable natural resource.
Keywords: Conventional source of energy, Crop Residue, Environment hazard, Fossil fuel, RSPM.

I.INTRODUCTION

In Punjab, INDIA it is common to burn crop residue as disposal of crop residue has turned out to be a huge problem. Burning of crop residue not only pollutes environment but it also results in loss of appreciable amount of plant essential nutrient. Punjab made a commendable progress in the production of food grains in the post-green revolution period. Food grain production underwent a big jump from 3.16 million tonnes in 1960–1961 to 31692 tonnes in 2017–2018. The growth story of Punjab agriculture was accompanied by its negative environmental concerns like ground water exploitation and stubble burning etc. The use of combined harvesters leaves behind a large amount of crop residue to be burnt in the open fields. The combined harvester spreads the crop residue in the fields which is difficult to collect. It is widely perceived that farmers find it the easiest and the most economical way of getting rid of the crop stubble through burning it. Thus, burning has emerged as the standard method of crop residue/stubble management in the combine harvested rice-wheat cropping system that is practised on a broad scale in the state of Punjab in northwest India. Every year almost 15 million tonnes of paddy straw are generated in Punjab. Of this, according to various estimates, on an average, almost 7–8 million tonnes of rice residue are set on fire in open fields. Crop residue burning results in extensive impacts both on and off farm, e.g., losses in soil nutrients, soil organic matter, production and productivity, air quality, biodiversity, and water and energy efficiency and on human and animal health.

Fig.1. In-situ burning of crop residue

II.OBJECTIVES OF THE STUDY

The main objectives of the present study are:

- To study the extent of crop residue in PUNJAB State.

- To review the significance of various crop residue management policies and practices PUNJAB.

III.RESEARCH METHODOLOGY

The present study is focused on analyzing the extent of and practices for management of crop residue in Punjab State. The study considers secondary data which have been extracted from various journals, articles, surveys, official websites, newspaper sand books etc

IV.EXTENT OF CROP RESIDUE IN PUNJAB STATE

Punjab, situated in northwest India between 29°30¢– 32°32²N and 73°55¢–76°50²E, occupies 50,362 sq. km, i.e. 1.54% of India's total geographical area. Punjab, located between the Indus and Ganges rivers, is largely an alluvial plain irrigated by canals. Its arid southern border edges the Thar or Great Indian Desert. The Shivalik Ranges rise majestically in the north. Four rivers, i.e. Ravi, Beas, Satluj and Ghaggar flow across the State in the southwest direction. Several small seasonal tributaries branch out from these rivers. At present, over 84% of the total geographical area of the State stands cultivated. Only about 28,000 ha land is classified as cultivable waste. The State looks like a vast farmstead with only 16% of its geographical area under cities, towns, villages, rivers, canals, roads, buildings, wastes, forests, etc. Thus, there is little scope for horizontal expansion of crop cultivation. Vertically, the intensity of cropping is over 186%. The major crops in the State are wheat, maize (corn), rice, pulses (legumes), sugarcane, cotton, exotic vegetables. Average annual rainfall of the State is 462.8 mm and over 70% of the annual rainfall occurs during the monsoon season, i.e. from July to September.

In Punjab, almost 80 per cent of the rice crop is harvested using combine harvesters, which leaves behind large amounts of rice residue - almost 19.7 million metric tons of paddy straw on average, of which almost 15.4 million metric tons are set on fire in open fields (Punjab Government 2017).
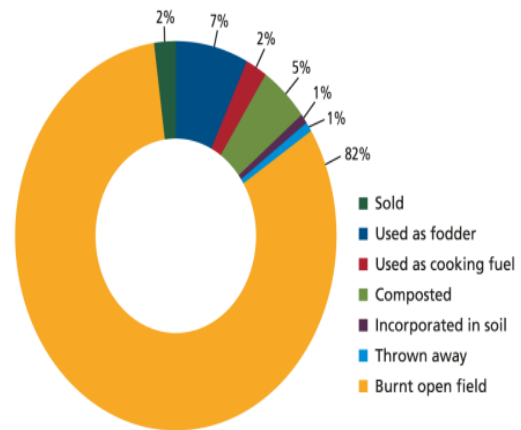
Figure: 2
A. DIFFERENT TYPES OF CROP RESIDUES

There are two types of agriculturalcrop residues. Field residues are materials left in an agricultural field or orchard after the crop has been harvested. These residues include stalks and stubble (stems), leaves, and seed pods. The residue can be ploughed directly into the ground, or burned first. Good management of field residues can increase efficiency of irrigation and control of erosion. Process residues are materials left after the crop is processed into a usable resource. These residues include husks, seeds, bagasse, molasses and roots. They can be used as animal fodder and soil amendment, fertilizers and in manufacturing.

B. STATE WISE GENERATION OF CROP RESIDUE

Traditionally crop residues have numerous competing uses such as animal feed, fodder, fuel, roof thatching, packaging and composting. Cereal residues are mainly used as cattle feed. Rice straw and husk is used as domestic fuel or in boilers for parboiling rice in states like West Bengal. The uses for various residues are different in different states. Farmers use residue either themselves or sell it to other landless households or intermediaries, who in turn sell the residues to industries. The remaining residues are left unused or burned in field. In states like Punjab and Haryana where crop residues are not used as cattle feed, large amount crop straw is burned in field. Sugarcane tops in most of the areas is either used for feeding of dairy animals or burned in field for ratoon crop. Residues of groundnut are burned as fuel in brick kilns and lime kilns. Cotton, chilli, pulses and oilseeds residues are mainly used as fuel for household needs. Coconut shell, stalks of rapeseed and mustard, pigeon pea and jute and mesta, and sun flower are used as domestic fuel.

Coconut generates about 3 Mt of husk annually and about 1.2 Mt is utilized for making coir and 1 Mt burned as fuel.

The following picture shows the state wise generation of crop residue in India:

Maximum crop residue in Punjab state is generated from cereal crops i.e. approx 46 Mt., followed by residue of fiber crops, oilseeds crops and sugarcane i.e. 9 mt., 0.08 mt., 2 mt. respectively.

If all this left over crop residue burnt by stubble burning(i.e. approx 52 mt). , it could have serious implications on environment and social life.

Table: 1 Source: Ministry of new and Renewable energy.

States	Crop residue generated (Mt/yr)			
	Cereal crops	Fiber crops	Oilseed crops	Sugarcane
Andhra Pradesh	33.07	16.07	2.50	5.80
Arunanchal Pradesh	0.56	0.00	0.06	0.01
Assam	8.15	2.01	0.29	0.41
Bihar	19.87	3.27	0.20	1.87
Chhattisgarh	8.87	0.01	0.11	0.01
Goa	0.24	0.00	0.01	0.02
Gujarat	8.18	28.62	5.06	5.85
Haryana	24.73	7.58	2.15	1.93
Himachal Pradesh	1.95	0.00	0.01	0.02
Jammu & Kashmir	2.76	0.00	0.11	0.00
Jharkhand	7.34	0.00	0.09	0.13
Karnataka	11.73	3.55	0.81	8.80
Kerela	1.14	0.01	0.00	0.10
Madhya Pradesh	16.05	3.51	2.13	1.12
Maharashtra	8.75	19.51	0.57	22.87
Manipur	0.78	0.00	0.00	0.01
Meghalaya	0.44	0.13	0.01	0.00
Mizoram	0.10	0.00	0.00	0.01
Nagaland	0.89	0.01	0.06	0.07
Orissa	13.38	0.56	0.16	0.24
Punjab	45.58	9.32	0.08	1.76
Rajasthan	22.19	2.96	9.26	0.15
Sikkim	0.14	0.00	0.01	0.00
Tamil Nadu	11.69	0.78	1.56	12.37
Tripura	1.22	0.02	0.00	0.02
Uttar Pradesh	72.02	0.04	2.49	41.13
Uttarakhand	2.40	0.00	0.03	2.11
West Bengal	37.26	24.43	0.95	0.62
A & N Islands	0.04	0.00	0.00	0.00
D & N Haveli	0.05	0.00	0.00	0.00
Delhi	0.17	0.00	0.00	0.00
Daman & Diu	0.01	0.00	0.00	0.00
Pondicherry	0.10	0.00	0.00	0.06
All India	361.85	122.37	28.72	107.50

V.NASA SATELLITE IMAGES SHOW STUBBLE BURNING IN PUNJAB

The Indian state of Punjab has two growing seasons—one from May to September and another from November to April. Prior to the planting season is time for farmers to clear their fields and they do that by burning the fields to clear them. Stubble burning is a relatively new phenomenon. Historically, farmers harvested and plowed fields manually, tilling plant debris back into the soil. When mechanized harvesting using combines became popular in the 1980s, burning became common because the machines leave stalks that are about one-foot tall. Burning the stalks is the quickest and cheapest way to clear them.

Satellites began to detect large numbers of active fires in mid-October. Normally extensive agricultural burning lasts for about three weeks. Although most of the haze appears to originate from the agricultural fires, other factors such as urban and industrial smog may also be contributing.

The fires release several types of particles and gases into the atmosphere, including smog-forming carbon monoxide, and nitrogen dioxide. Haze that forms over the Punjab rarely stays there. While the fires burn, smoke often blankets much of the Indo-Gangetic Plain, exposing millions of people in the densely populated plain to elevated levels of air pollution.

Every year, Punjab rice farms collectively burn about 7 to 8 million metric tons of leftover plant debris in October and November.
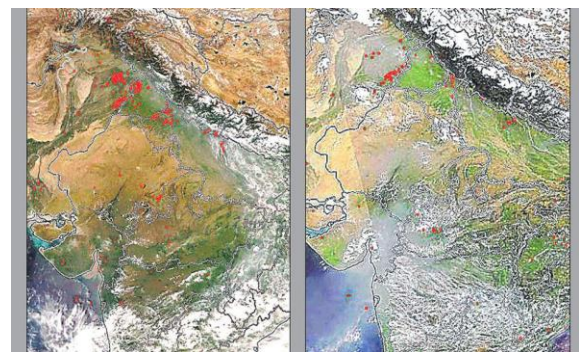
Figure:3 Source: NASA image courtesy

A combination of satellite images by Nasa from October 3, 2017 (left) and October 3, 2018 show fewer red spots signifying farm fires in northern India.

"Crop burning in 2018 lesser than previous year, claims govt"

The Union government on January 3 claimed that paddy residue burning over North Indian states had significantly reduced in 2018 when compared to the previous year. It took credit for the decrease, attributing it to Central schemes for management of paddy stubble.

"Through the various efforts under the Central Sector Scheme on 'Promotion of Agricultural Mechanisation for In-Situ Management of Crop Residue in the states of Punjab, Haryana, Uttar Pradesh and the National Capital Territory of Delhi' the satellite data indicates that paddy residue

burning events have reduced by 29.5 per cent, 24.5 per cent and 11.0 per cent in Haryana, Uttar Pradesh and Punjab respectively, when compared with the paddy residue burning events in the year 2017," a government statement read.

The total outgo from Central funds for the Central Sector Scheme on 'Promotion of Agricultural Mechanization for In-Situ Management of Crop Residue in the states of Punjab, Haryana, Uttar Pradesh and NCT of Delhi' has been to the tune of Rs 1,151.80 crore (Rs 591.65 crore in 2018-19 and Rs 560.15 crore in 2019-20).

During 2018-19, funds amounting to Rs 269.38 crore, Rs 137.84 crore and Rs 148.60 crore have been released to the governments of Punjab, Haryana and Uttar Pradesh respectively for distribution of in-situ crop residue management machinery to the farmers on subsidy, establishment of custom hiring centres of in-situ crop residue management machinery and undertaking information, education and communication activities for creating awareness among farmers.

Besides, the Union Ministry of Power had brought out a policy for biomass utilisation in power generation through co-firing in pulverised coal fired boilers in November 2017. As per the policy, all fluidised bed and pulverised coal units (coal-based thermal power plants) except those having ball and tube mill, of power generating utilities, public or private, located in India, are to use a 5-10 per cent blend of biomass pellets made, primarily of agro residue along with coal after assessing the technical feasibility namely safety aspects. In line with the policy Central Electricity Authority (CEA) had issued an advisory to all concerned state governments, power plant utilities, power equipment manufacturers and other stakeholders to promote use of biomass pellets.

In a meeting held on November 15, 2018, the ministry decided that the states of Haryana and Punjab would issue bids for all coal-based thermal power plants to use a minimum 5 per cent of biomass pellets and up to 10 per cent to be co-fired with coal.
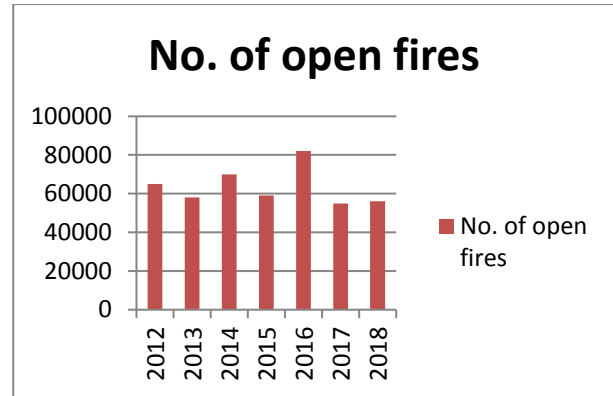
Figure:4 Historical trend of aggregate open fires in Punjab during paddy burning season (Oct-Nov) Source: NASA NRT VIIRS 375 m *open fires from any burning detected by the satellite

VI.REASONS FOR CROP RESIDUE BURNING IN PUNJAB

Major reasons for stubble burning in Punjab are:

➢ In Indo Gangetic Plains, the wheat straw is preferred for dry fodder than Paddy straw
➢ Highly mechanized farming practices in harvesting operations
➢ Govt. policy on cultivation of paddy Labor shortages and higher wages during harvesting due to MNREGA
➢ Uncertainty of weather Farmers consider it as a soil fertility enhancement and pest control measures.
➢ Poor storage facility for the straw
➢ Higher transportation cost
➢ Lack of awareness among farmers about other economic use

VII.IMPACTS OF CROP RESIDUE BURNING

Burning of agricultural biomass residue, or Crop Residue Burning (CRB) has been identified as a major health hazard. In addition to causing exposure to extremely high levels of Particulate Matter concentration to people in the immediate vicinity, it is also a major regional source of pollution, contributing between 12 and 60 per cent of PM concentrations as per various source apportionment studies. In addition, it causes loss of vital components such as nitrogen, phosphorus, sulphur and potassium from the topsoil layer, making the land less fertile and unviable for agriculture in the long run. About 25% of nitrogen, 25% phosphorus, 50% of sulphur and 75% of

potassium uptake by cereal crops are retained in residues, making them valuable sources of nutrients.
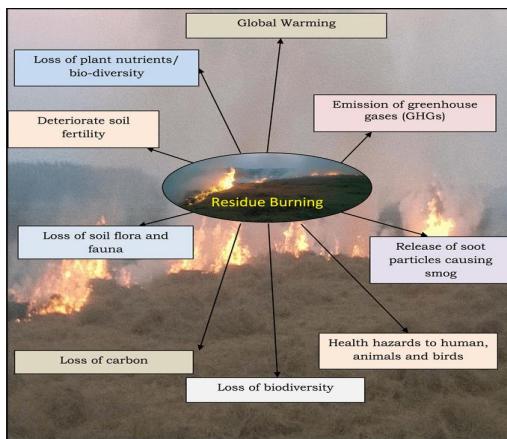
Figure: 5

a). **Economic impact**

Crop residue is not a waste but rather a useful natural resource. About 25 % of nitrogen (N) and phosphorus (P), 50 % of sulphur (S) and 75 % of potassium (K) uptake by cereal crops are retained in crop residues, making them valuable nutrient sources. Sidhu et al. (2007) estimated the quantity of nutrients available in rice. According to his study, the paddy straw has 39 kg/ha N, 6 kg/ha P, 140 kg/ ha K and 11 kg/ha S.Sidhu and Beri (2005) shared their experience with managing rice residues in intensive rice-wheat cropping system in Punjab. According to them, theapproximate amount of the nutrients present in the straw, which was burnt in 2003–2004 were 106, 65 and 237 thousand tonnes respectively of N, P2O5 and K2O in addition to secondary and micronutrients. The removal of the paddy stalk that remains on the field is a labour-intensive process. With labour being unavailable and the time window for preparing the field for wheat cultivation being limited, the options that the farmer has are either investing in expensive and rarely used agricultural implements, or burning the residue right on the field. Of the two, the latter is both cheaper and requires less effort.

b). **Social impact –Health impact**

Burning of crop stubble has severe adverse impacts especially for those people suffering from respiratory disease, cardiovascular disease. Pregnant women and small children are also likely to suffer from the smoke produced due to stubble burning. Inhaling of fine particulate matter of less than PM2.5 µg triggers asthma and can even aggravate symptoms of bronchial attack. According to Singh et al. (2008), more than 60 % of the population in Punjab live in the rice growing areas and is exposed to air pollution due to burning of rice stubbles. As per the same study, medical records of the civil hospital of Jira, in the rice-wheat belt showed a 10 % increase in the number of patients within 20–25 days of the burning period every season.

c). **Climate Change Impact**

Agricultural crop residue burning contribute towards the emission of greenhouse gases (CO2, N2O, CH4), air pollutants (CO, NH3, NOx, SO2, NMHC, volatile organic compounds), particulates matter and smoke having direct influence on global warming. Furthermore, it depletes the soil of its organic matter, major nutrients and reduces microbial biomass in soil that ultimately impairs the efficacy of organic matter application in the next cropping season. It is estimated that burning of one tonne of rice straw accounts for loss of 5.5 kg of nitrogen, 2.3 kg of phosphorus, 25 kg of potassium and 1.2 kg of sulphur. The heat generated elevates the temperature of soil and thus, killing fungi, pests, reptiles and the like that are otherwise beneficial for the crops. (The Times of India, May, 10, 2015). So concentration of GHGs in the region lead to rise in temperature or local warming which ultimately affect the various climatic parameter in the region.
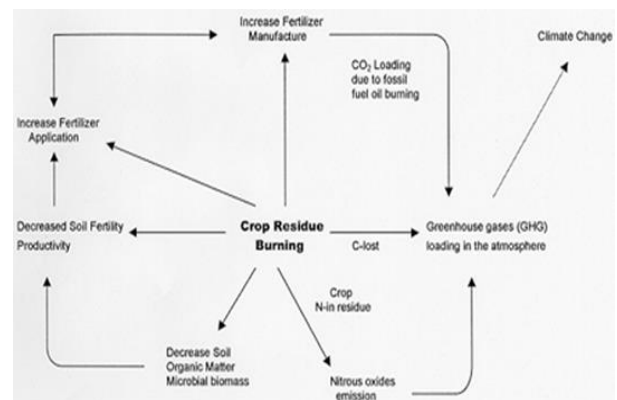
Figur: 6

d). **Air Pollution**

Pollution from agricultural activities also adversely affects the state's environment. The state produces

about 20 million tons of rice straw, and 17 million tons of wheat straw every year, a part of which (about 81% of rice straw and 48% of wheat straw) is burnt in the fields to make way for the next crop. Besides leading to loss of soil fertility, it causes severe air pollution especially during the months of March-April and October-November. The smoke also impairs visibility which can cause road accidents. Though LPG is the main source of domestic fuel in urban areas, however, cow dung cakes and wood are still used in rural areas and slums. Further, due to high per capita income and adoption of modern life style, use of air conditioners and refrigerators in the state is increasing rapidly. This contributes to air pollution by ozone depleting substances. Further, since the state faces acute power shortage problem, use of diesel/kerosene gen-sets in domestic and commercial sector is rampant.

VIII.MANAGEMENT OF CROP RESIDUE

The open field burning of straw after combine harvesting is a common practice in the state in order to ensure early preparation of fields for the next crop. Apart form affecting the soil fertility burning of agricultural residue is now recognized as an important source of air pollution in rural areas. It leads to emission of large amounts of suspended particulate matter besides gases like CH_4, CO, N_2O, NO_X, SO_2 and hydrocarbons. Punjab produces around 20 million tons of rice straw and 17 million tons of wheat straw annually. The wheat straw to an extent used for cattle feed, whereas paddy straw is not preferred for the purpose due to presence of silica content. More than 80% of paddy straw and almost 50% wheat straw produced in the state is being burnt in fields every year. The burning of straw leads to loss of precious nutrients as nearly 25% nitrogen & phosphorus, 50% Sulfur and 75% of potassium uptake from soil are retained in the crop residues. It has been estimated that burning of 1 tonne of paddy straw accounts for loss of 5.5 kg nitrogen, 2.3 kg phosphorus and 1.2 kg sulfur, besides organic carbon. Further, heat generated by paddy straw burning penetrates into the soil, leading to loss of moisture and useful microbes, thus, adversely affecting soil properties. High cost of collection and lack of economically viable options to utilize the straw, are identified as major factors, compelling the farmers to burn it.

In terms of efforts being made to reduce crop residue burning, the following approaches have been used by various state and central administrations and regulatory bodies so far:

A. IN SITU INCORPORATION

Though the crop stubble has various alternate uses but the area which is harvested by using combine harvester is left behind with scattered residues which farmers find difficult to remove from the fields. After combine harvesting farmers are left with only two alternatives, either in-situ incorporation of the remains of crop stubble or open burning in the field. Farmers don't prefer in-situ incorporation as the stubble takes time to decompose in the soil that may adversely affect the wheat productivity because of time loss in sowing. As per the Department of Agriculture of the Punjab government, less than 1 % of the farmers incorporate crop stubble because of more tillage operations required in the case of incorporation than of post burning.

B. Alternative Uses of Crop Stubble

The crop stubble produced during the harvesting of rice and wheat crops can be used for various alternative uses if it is not burnt. These include use of crop stubble as fodder for animals, use of crop stubble for the generation of electricity, use as input in the paper/pulp industry etc. The use of rice residue as fodder for animals is relatively low in Punjab as compared to the wheat stubble. This is because the rice residue is high in silica content which in turn is not good for animal health. However, very often the crop stubble is treated with urea before it is fed to the animals.

C. Banning Crop Residue Burning

Crop residue burning was notified as an offence under the Air Act of 1981, the Code of Criminal Procedure, 1973 and various appropriate Acts. In addition, a penalty is being imposed on any offending farmer. Village and block-level administrative officials are being used for enforcement.

D. Detection and prevention

A combination of remote sensing technology—use of satellite imagery—and a team comprising local officials–Sub-Divisional Magistrates, Tehsildars, Block Development Officers, Patwaris and village-level workers—is being used to detect occurrences of crop residue burning in real-time and to prevent them from taking place.

E. Establishment of a market place for crop residue burning

Efforts are being made to increase the avenues for the alternate usage of paddy straw and other crop residue. For instance, paddy straw has a considerable calorific value, making it suitable for use as a fuel in biomass-based power plants. Similarly, it can be utilised for the preparation of bio-fuels, organic fertilisers and in paper and cardboard making industries. The strategy, broadly, is to assign a real economic and commercial value to the agricultural residue and making burning it an economic loss to the farmer.

F. Outreach and public awareness campaigns

There are ongoing efforts to highlight the health effects of crop residue burning. It produces extremely high levels of toxic particulates, which affect the health of the people in the direct vicinity of the burning. In addition, efforts are also being made through kisan camps, trainings and workshops, apart from campaigns through various print media, televised shows and radio jingles, in informing farmers about the alternative usage of crop residue.

G. Subsidy on agri-implements:

The state governments, in collaboration with the Centre, has rolled out schemes for providing subsidy on mechanical implements that help tillage of soil, so that the crop residue can be retained in the soil, adding to its fertility, or alternately, collection of crop residue for putting it to commercial usage. However, the high cost of these implements means that in spite of subsidies, only a small number of farmers have access to these implements at the moment.POLICY MANDATESeveral mandates have been taken so far to address the paddy residue problem.

The National Policy for Management of Crop Residue, 2014 (NPMCR) was prepared by the Ministry of Agriculture and Farmers' Welfare, Government of India. The NPMCR lists policies to reduce the incidence rate of paddy residue burning. The document listed interventions such as 'use of satellite based remote sensing technologies to monitor crop residue management' and 'development of appropriate and cost-effective farm machinery to facilitate collection, volume reduction, transportation and application of residues',etc.20 Although these interventions have been enforced to some extent, these have not eliminated the burning incidence.

The National Green Tribunal, 2015 (NGT) provides many directives. One imposes a fine, in the form of environmental compensation,on farmers who burn crop waste. Small farmers with a landholding of less than 2 acres (0.81 hectares) pay environmental compensation of INR 2,500 per incident; those with a landholding of more than 2 acres but less than 5 acres (2.02 hectares) pay INR 5,000 per incident; and farmers with a landholding of more than 5 acres pay INR 15,000 per incident.21 However, CEEW research and interviews with farmers suggest that none of this has reduced fire counts; farmers continue to burn residue. The financial condition of farmers, especially of small landholders, is such that they can afford neither expensive agricultural implements nor expensive labour; paying the fine cheaper.

The Environment Pollution (Control and Prevention) Authority (EPCA), set up by the Prime Minister's Office, coordinates with state governments (Punjab, Haryana, and Uttar Pradesh) to review the status of problems and implementation of solutions.

The Sustainable Alternative Towards Affordable Transportation (SATAT) initiative was launched by the Ministry of Petroleum and Natural Gas on 1 October 2018. The SATAT aims to setup compressed biogas (CBG) production plants and make CBG available in the market for use in automotive fuels. Compressed biogas can be produced from various biomass/ waste sources, including agricultural residue, municipal solid waste, sugarcane press mud, distillery spent wash, cattle dung, and sewage treatment plant waste.

Through the initiative, the government aims to 'boost availability of more affordable transport fuels, better use of agricultural residue, cattle dung and municipal solid waste, as well as to provide an additional revenue source to farmers.

 A new central sector scheme, 'Promotion of Agricultural Mechanization for In-Situ Management of Crop Residue in the States of Punjab, Haryana, Uttar Pradesh and NCT of Delhi', was approved in 2018 to 'address air pollution and to subsidize machinery required for in-situ management of crop residue' for the period from 2018-19 to 2019-20.23 A provision of INR 1,151.80 crore has been made under this scheme, of which Punjab will receive INR 695 crore. The scheme is implemented to promote the 'usage equipment and machines for in-situ management of crop residue'. It has three major components:

 1. establish farm machinery banks or CHCs of in situ crop residue management machinery;

 2. procure agricultural machinery and equipment for in situ crop residue management; and

 3. conduct information, education, and communication (IEC) programmes through demonstrations, trainings, advertisement, and publicity to raise awareness on in situ crop residue management.

IX. THE HAPPY SEEDER MACHINE- A SOLUTION TO STUBBLE BURNING

The Punjab government has drawn up ambitious plans to reduce paddy straw burning, which at present is to the extent of about 80 per cent in the state and causes high environmental pollution and also burns organic matter worth Rs 250 crore annually.

To tackle the problem, the state government has decided to distribute 200 'happy seeders' machines that sow wheat among standing rice stubble among Primary Agriculture Cooperatives Societies (PACS) in the state. The machine would be distributed in the state through Punjab State Farmers Commission.

Speaking to Business Standard, Punjab State Farmers Commission consultant, P S Rangi, said,

"The commission has decided to give 80 machines free of cost and the remaining 120 machines at a 50 per cent subsidy to the PACS, with the grants received from the state agriculture department."

According to estimates by the PSFC, organic matter-nitrogenous fertilisers worth Rs 250 crore annually is lost by burning of Paddy straw.

Happy Seeder is a tractor-powered machine that cuts and lifts rice straw, sows wheat into the bare soil, and deposits the straw over the sown area as mulch. It is attached to a 45-50 horse power (hp) tractor and works with a spreader called the Super Straw Management System (Super SMS). The machine cuts slits in the field, about 4-5 centimetre (cm) deep and drops the seeds for the next crop.24 Using Happy Seeder has potential agronomic benefits. The mulch suppresses weeds, reducing soil evaporation and the need for control measures (Sidhu et al. 2007, 2008).25 Other advantages of using Happy Seeder, include improved soil health, and enhanced nutrient use efficiency (by 10-15 per cent) and water savings (up to 1.45 million litre per hectare) through reduced evaporation and elimination of pre-sowing irrigation. In the conventional approach (of burning straw), it takes about 10 days to prepare the fields; using Happy Seeder, the farmer can mulch and seed the next crop in three or four days.

Figure:7 Happy Seeder is more economical than conventional farm equipment

X.Conclusion / Suggestions

material, denying the soil an opportunity to enhance its organic matter and incorporate important chemicals such as nitrogen and phosphorus, as well as, loss of useful micro flora and fauna. The off-field impacts are related to human health due to general air quality degradation resulting in aggravation of respiratory (like cough, asthma, bronchitis), eye and skin diseases. Fine particles also can aggravate chronic heart and lung diseases and have been linked to premature deaths in people already suffering from these diseases. It is thus essential to mitigate impacts due to the burning of agricultural waste in the open fields and its consequent effects on soil, ambient air and living organisms.

The following key recommendations could be made to address the paddy residue burning problem.

- ➢ Make paddy residue management technologies available
- ➢ Promote short-duration rice varieties
- ➢ Raise farmer awareness
- ➢ Monitor fire counts and rural air quality
- ➢ Give farmers incentives to move away from the rice-wheat cultivation cycle
- ➢ Set up mechanisms to collect paddy residue
- ➢ Use paddy residue to produce biofuels
- ➢ Strengthen MSP operations

Crop residue burning is one among the major issues in Punjab. The on-field impact of burning includes removal of a large portion of the organic

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The Importance of Foreign Language in Business Environment

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Abstract: -The foreign language as a prime communication medium plays a vital role in most of the international business environment. This paper represents the examination study of importance of foreign language in international business organizations, investigation of managerial point of view towards the use of foreign language, the issues of use of foreign language in communication with clients, methods of increasing abilities of employees related to use of foreign language. A survey has been conducted for face-to-face interviews through qualitative approach. The results of face-to-face interviews depicted that the use of foreign languages as communication medium plays significant roles in multinational organizations and import/export companies. According to the various managers of different organizations, the use foreign languages are very much crucial to their businesses environments, mainly while communicating with foreign customers and international suppliers. Many companies face enormous problems in term of using in appropriate foreign languages because of varieties of national and international customers. The companies invite many proficient trainers to assist their employees to build up the skills in foreign languages, especially in pronunciations, vocabulary, listening, writing, reading and speaking.

Keywords: Business Environment, Importance of foreign language, Methodology, Research findings.

I. INTRODUCTION

Language is a fundamental implement that is used to converse with natives and people around the globe in every day and working lives (Sanstead, 2001; Adejimola, 2008). The structure of language mainly consists of meaningful words, those are the collective forms of connected units (mainly called sentences) (Hagoort & Van Berkum, 2007; Van Berkum, 2008). The different forms of sentences are appropriately joined together to create useful information that can be utilize to share ideas among people (Lieberman, 2008). The verbal communication through appropriate language is an essential part of working environment, in many cases where the foreign language is required for verbal communication; sometime the linguistic skill does not work sufficiently (Cantoni, 1998; Geneva 2002; Hulstrand, 2008). In business environment, for internal/external communication the foreign language plays a crucial role (Marchan et al., 1997; Marschan, Piekkari et al., 1999; Davies, 2000, Leslie & Russel, 2006). Foreign language helps to get good job and to understand the other different cultures. Foreign language with superior communication level has its impact in the globalization (Cole, 1988). Now days, for better world wide competition, the utmost aspect is the

capacity having the significant verbal communication on the basis of a clearer, quicker and wider modes (Schorr, 2005).

Considering the part of foreign language will be helpful in light of the fact that it helps to understand the discussions, interchanges and exchanges ideas among professionals and remote customers. Experts can run organizations more easily with the utilization of foreign language so that overseas clients will experience more ease while sharing ideas related to international business (Peh, 2005). In business environment all the aspects of understanding language like pronunciations, vocabulary, speaking, listening, reading and writing are crucial(Stewart, 1973). The majority of foreign language used in the business is purely dependent upon the verities of the clients, type and the nature of the business involved. The mode of language which is essential and the level to which it can be understood is a vital skill of managers. It is not only advantageous for employees but also for clients, those can also anticipate benefits fromthe use of familiar language in form of product and services. For example, with the productive communication through foreign language, clients get what they request in the shops. On the other hand, inappropriate use of the foreign language communication, the clients might

experience befuddling issues or don't get what they request for. This seems to be a small issue; however, it can be quite high-risk, if it happens on the regular basis. The correct use of language enhances the customers' satisfaction, which results in high competitiveness in the marketplace. For better competitiveness, one should have capacity to handle the varieties of customers through appropriate use of language (Crystal, 1989).

II. WHAT IS BUSINESS

Business is the activity of earning money by producing, buying and selling of products, goods and services (Walter, 2004). Business consists of various benefits, losses, profits and market shares. Friedman (1994) concluded that business is a profit-making venture, occupation and product operated to obtain revenue by supplying varieties of products and service. As mentioned by Thills (2001), there are broad classes of profession areas that exist in business market, for example, management of business, business in finance, Human Resource, advertisement, dealings, and various enterprises. It includes economies since it can procure income from both national and overseas(Mendonca, 2003). Business is generally categorized into three major groups i.e.an individual Proprietorship, joint venture or partnership and corporation. Business having an individual proprietorship is the traditional structure of trade organization operated by a single individual. It is quite easy to deal with and manage as compare to business having partnerships and involvement of various corporations (Coleman, 2004; Mauro, 2008). Business through partnerships is having various persons involved in the trade. They distribute the profits and losses of the overall business among them in which they have invested. Business has the third category i.e. corporation. In the business category the ownership is categorized into share holders, national and international investors. This type of business category is a separate legal body (Iwai, 2001).

III. IMPORTANCE OF FOREIGN LANGUAGE

Now a day, the majority of the various businesses trades have expanded overseas. Most of the investors invest in other countries just to increase their business revenues and market competitiveness. So, the use of foreign language in their organizations is essential to attract foreign customers (Cook, 2007; Pine, 2006).The achievement of business environment will rely on the excellence of flow of information through

foreign language with the clients and various competitors and the market. The use of foreign language has following importance.

IV. IMPORTANCE OF FOREIGN LANGUAGE IN INTERNAL COMMUNICATION

Individuals who work in an association need to converse with one another to make others recognize what they need. Sometime they share their ideas and try to understand the others people(Cong, 2007). Foreign language can be a way to enable them to understand one another. If there is lack of communication between the employees in an association, there are probably going to be issues for working process. Communication can be an approach to develop a decent connection between representatives inside an association. The use of foreign language has its importance in maintaining good relationships among colleagues in internal/external communication. Both internal and external communications are important, if the working of internal communication is efficient then it is possible that the external communication is also efficient (Grunig 1992).

V. IMPORTANCE OF FOREIGN LANGUAGE IN EXTERNAL COMMUNICATION

The use of foreign language as external communication medium includes face-to-face verbal communication with the clients (Samova & Porter, 2004). These shows how significant are language tasks in external communication that can pick up benefits for associations. An association will get more clients from the messages and activities that express what the association really is. The use of foreign language covers numerous things to clients and increases more extensive network. Similarly as internal communication system that conveys information flows from top to bottom management(Thill, 2005).

VI. PORTANCE OF FOREIGN LANGUAGE IN CUSTOMER' SATISFACTION

The importance uses of foreign language in business organization and consumer loyalty are both related in business. Consumer loyalty relies upon what and how the clients gain from the association after a communication. Both verbal and non-verbal types of communications are

considerable in such manner. Relational abilities will be utilized as an initial step to achieve clients and make them happy with the association's contributions. The more that client is fulfilled, the more the association additions focal points. The importance of use of foreign language assumes a significant job in making clients feel great about purchasing items or administrations (Runnakit,2007).The organization needs to utilize positive and inviting language to show comprehension and care for their clients. The importance of foreign language is tuning in to clients carefully to recognize what they need or need from the association is significant, on the grounds that it makes the organization staff realizes how to cause them to fulfill. Subsequently, the organization can offer them some type of advancement and for items that are legitimately identified with their needs. Besides, the organization should demonstrate a similar degree of consideration and consideration in taking care of their clients just as the first run through the organization staff meets the clients.

VII.METHODOLOGY

The main intentions of this examination is to investigate the jobs of foreign language in business environment, to explore administrative points of view concerning the jobs of foreign language, to consider the issues of foreign language utilization in communication with clients and to find methods of building up workers' foreign language capacity in business environment. The examination study is based on the face-to-face interviews through qualitative approach with the test sample of 20 managers. These managers were related to the different companies, organizations and departments with different forms of business. These managers are as follow 5managers from Tour Company, 5managers from hotels, 5managers from import/export Company, 5managers from jewelry store. They were selected on arandom basis within the region of Jalandhar city.A team of 10 Research Scholars were chosen for this task. The aim of the study is to investigate the importance offoreign language in business environment, to examine the manager point of view related to the use of foreign language in their business, to investigate the troubles of foreign language practice in communication with clients, to find out the methods for increasing the abilities of employees concerning the use of foreign language. The set of guidelines of interview were in English language, which was formed as an investigation tool by there

search team. These guidelines were categorized into two main partsi.e. personnel details and main objectives of the study respectively. The first part consists of individual information (Gender, education, working experience, business type etc.) The second one is related to questions associated with the aim of this study. A beforehand formal letters requesting to conduct an interview were also prepared. All the appointments were made about one week in advance with the managers. All the guidelines related to the Interview were sent to managers by e-mail to provide appropriate time to the respondents to prepare for answers. Most of the Interviews were completed in the premises of the company's offices. Some of them were conducted in coffee shops, restaurants, hotels and elsewhere. The time range for the each interview was approximately half an hour. There are also some limitations related to this study i.e. the diverse range of business respondents and the range of the time was limited. This can be improved by adding more broad business categories or industrial units.

VIII.   RESEARCH FINDINGS

The findings of this research is categorized into three sections: (1) The perspectives of managers relating to the importance of foreign language (2) The issues related to use of foreign language in communicating with clients(3) The methods of increasing abilities of employees to use foreign language.

IX.   THE PERSPECTIVES OF MANAGERS RELATING TO THE IMPORTANCE OF FOREIGN LANGUAGE

From the meetings with managers of various companies, it ended up clear that it is important to use the foreign language in business environment. The different types of organizations wherein foreign language assume an important job specifically are in import/export industries concerning agricultural and horticultural items e.g.(rubber, rice, tropical-natural products, crops, jewelry and companies having seafood products). Most of them said that most of the time they prefer to use foreign language while dealing with their foreign clients through telephonic conversation, through e-mails and sometime through fax machines. Moreover, that foreign language utilization is the back bone of their business development and expansion in worldwide. They also expressed that to accomplish the objective in their business; they are required to satisfy their

customers not only on the basis of good service but also by communicating in their native languages. This makes a special bonding between the customers and the managers of the companies so that the same customers will visit again and again.

X. THE ISSUES RELATED TO USE OF FOREIGN LANGUAGE IN COMMUNICATING WITH CLIENTS

The managers found that a few issues happened as a result of difference between various clients. Not every remote client can convey in foreign language, regardless of whether it is English. Many could talk just their own language, regardless of whether it is Italian, French, Russian, or Danish. They couldn't communicate in English great and sent in requests in awful English as far as punctuation and spelling are concerned. These circumstances frequently happen in transportation companies. The issue for the organization was to figure the significance from the setting from off base sentences and to utilize clear and simple English that those clients may probably get it. In such cases, the issue concerning the requirement for the user to accustomed themselves to recognize and reply to the order appropriately, just as different types of collaboration. Clearly, the issues originated from the two senders and recipients who needed information in foreign language. In this circumstance, it was demonstrated that senders may need learning in English so they can utilize it regularly.

Specially in case of hotels, the customer did not know any Russian, Italian, French or Danish thus they didn't have an idea how to react to the clients, or didn't know to write message in English, due to lack of knowledge about the foreign language. In this case, the managers understood that they can't blame their clients' language speaking capability just because it is not their duty to communicate well in a foreign language. The companies those faced the same problems, now understands that they must know about the various foreign languages so that they can communicate with foreign customers in their native languages.

XI. THE METHODS OF INCREASING ABILITIES OF EMPLOYEES TO USE FOREIGN LANGUAGE

Others study included the method of developing representatives' foreign language capacity or abilities preparing for organization staff. The sources understood that English isn't just significant however is vital for administrating business. They likewise expressed that associations should welcome proficient trainer to assist their representatives and employees to improve English aptitudes in vocabulary and discussion. The training of all the aspects of understanding of foreign languages is important, so that employees can speak, write, listen and read well enough to communicate with foreign clients frequently. The managers are emphasizing that the organization should consider this seriously and provide training support for the development of language skill. The trainers provide well language training so that employees can understand the foreign language and can respond correctly so the communicators avoid making mistakes, since these can create issues and delay business dealings.

XII. CONCLUSION AND FUTURE SCOPE

This examination study has concerned with the importance of use of foreign language in business environment, which is purely dependent on managers points of view and the perspectives. This examination demonstrated how foreign language aptitudes are superior for the organization. True to form, the appropriate responses from managers in various business organizations to the inquiry concerning the significance of foreign language usage were almost similar. They all said that foreign language was helpful to everybody in speaking with others and to working out different issues. The use of foreign language is quite significant in collaborating and communicating with different nations and remote clients. The companies those are doing a business in tourism. They need to use English language very fluently, for transportation organizations those are involved with foreign travelers, for those organizations the use of foreign languages definitely play significant role. A good communication skill while using foreign language is essential for the companies having jewelry business so that they can communicate with their foreign customers optimally. This results in excellent and first-class impression while dealings with international clients for productive business. Moreover, it will be good to understand for communicating with foreign clients in languages other than English, such as Chinese, Dutch, Japanese, Thai, or Russian etc. Most of the clients from international organizations anticipate the organizations those are interested to carry out trade whose goods and services they will

utilize to be capable to recognizing and understanding their native language. The most excellent method is to recognize those nations with which the trade or business is involved and prioritize the appropriate language skills, they are using. The language is the connection to other nations and a communication medium for The negotiation and concessions become easier if there is healthy relationship and the differences in cultures are minimized through communication. To recapitulate the things in depth, this study represents the importance of use of foreign language as the prime tool while communicating with international clients, companies and suppliers. This study also depicts that it is a significant observable fact in business environment, so in near future; it should be further studied scientifically.

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Blue Economy: Potential for India

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Abstract: In the case of international trade, Oceans are an essential source for export and import. First, over 80% of world trade is conducted via the seas; maritime transport is the base of international trade and, by extension, the global economy. The six priority pillars for the IORA Secretariat in the blue economy are Fisheries and Aquaculture, Renewable Ocean Energy, Seaports and Shipping, Offshore Hydrocarbons and oceanic Minerals, Marine Biotechnology, Analysis and Growth, Tourism. The main aim of this paper is to throw light of the status of Blue Economy in India. This paper emphasized the status of Fisheries and Aquaculture, Renewable Ocean Energy, Seaports and Shipping, Offshore Hydrocarbons and oceanic Minerals only.

Keywords —**Fisheries, Aquaculture, Renewable Ocean Energy, Seaports and Shipping, Offshore Hydrocarbons.**

I. INTRODUCTION

In the case of international trade, Oceans are an essential source for export and import. First, over 80% of world trade is conducted via the seas; maritime transport is the base of international trade and, by extension, the global economy. The aim of the blue economy primarily is recognizing the oceans as the latest milestones of economic development – essentially as a strategy to explore the ocean's potential as a source of resources, livelihood, and services.

There are two main elements of this "economic development model" which warrant further elaboration. The first is that of sustainable development. Blue economy considers the sustainable utilization of oceanic resources to be significant, albeit as a secondary priority Gamage (2016).

The 'Blue Economy' is an emerging area that can be a rich source for inclusive development and sustainable development. The blue economy comprises various activities like renewable marine energy, fisheries, maritime transport, tourism, climate change, and waste management. The concept of the Blue Economy has been derived from the United Nations Conference on Sustainable Development held in Rio de Janeiro in 2012.

Blue economy considers the sustainable utilization of oceanic resources to be significant, albeit as a secondary priority Gamage (2016).
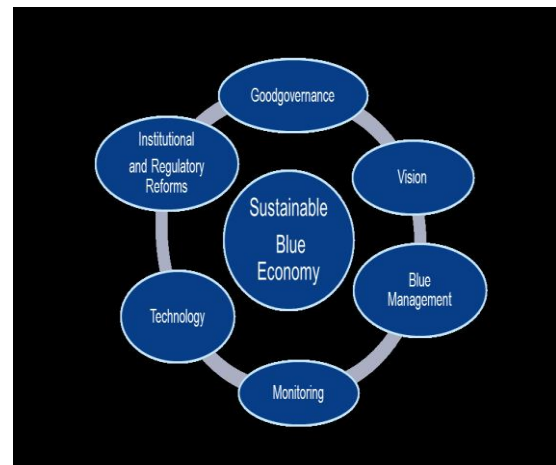
Figure: 1 Stakeholders of Blue Economy

Figure 1.1 shows that the main stakeholders of the Blue Economy are; Good Governance over the things, Vision and Technology, Blue Management, Observation, Institutional reforms for regulation.
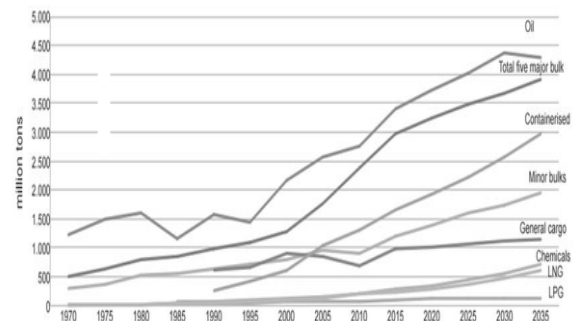
Figure 2: Growth in seaborne trade 1970-2035

The economy is the most active driver of developments in the maritime economy, along with

the population. Although the long-term scenario for worldwide economic development and the OECD area as an entire remains modest, GDP per capita is expected to rise extensively over the next few decades. More than triple could be the Global freight trade, by 2050. Around 90% of international freight is carried by the ocean, the impetus to the shipping business and ports will be substantial OECD (2016).

Table 1 Growth and Prospects for Ocean Industries

Prospects for Modest Growth	Capture Fisheries
	Offshore oil and gas extraction
Prospects for high long term Growth	Shipping
	Shipbuilding
	Offshore wind
	Marine aquaculture
	Tourism
	Surveillance and safety
Long Term Potential but not yet at commercial scale	Ocena renewable energy
	Marine Biotechnology
	Deep-sea mining
	Carbon capture and storage

Source: OECD (2016)

The worth of the global economy based on the oceans is expected between USD 3-6 trillion/year and more than 3 billion people depend upon the oceans for their livelihoods.
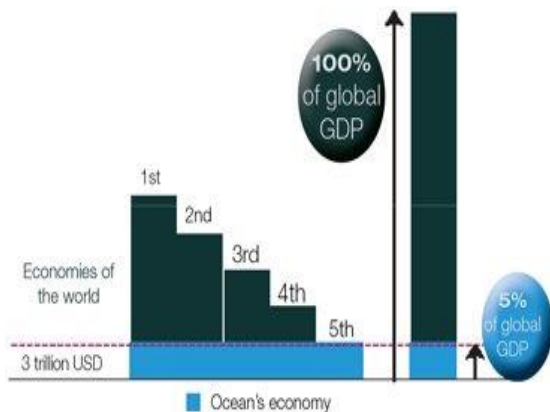
Figure 3: Ocean's economy

Source:unctad.org

Global seaborne trade gained momentum in 2017, with volumes expanding by 4.0 percent. It was the best development in the past five years. In the year 2017, goods were loaded worldwide were about 10.7 billion tons; 1.5 billion tons more than in 2012. Only the consignment of dry cargo increased by 1.2 billion tons; the overall remaining 305 million tons were

increased by crude oil, petroleum and gas products. By far the leading trading area was Asia. In the year 2017 on Asian seaports, the goods of 4.4 billion tons were packed, and the goods of 6.5 billion tons were unpacked. Half of these amounts were registered by other continents. Less than 200 million tons of volumes of goods were delivered to Oceania which was particularly small (unctad.org).

The blue economy is coming up as a field of opportunities that enhances or provides economic activity by the means of the ocean. Opportunities also exist to 'monetize' the worth of extremely effective coastal carbon stocks such as mangroves and seagrasses into carbon finance markets, or 'blue carbon.' Worldwide, aquaculture has been growing at a compounded rate of almost 9% since 1980, and now supplies nearly half of the world's consumed fish protein. However, much of it remains unsustainable in terms of pollution and impacts on species diversity, making this a critical Blue Economy opportunity to introduce more sustainable practices, such as integrated multi-trophic aquaculture. With support from GEF and UNDP, the IMO and the global shipping sector are taking pro-active steps to minimize the sector's contribution to climate change through improved energy efficiency, which can, in turn, enhance the sector's profitability, a true Blue Economy approach (undp.org).The purpose of the Blue Economy is to provide opportunities for employment within the Indian .Ocean region's maritime economic activities. Renewable Ocean Energy, Seaports and Shipping, Offshore Hydrocarbons and oceanic Minerals, Marine Biotechnology, Analysis and Growth, Tourism.
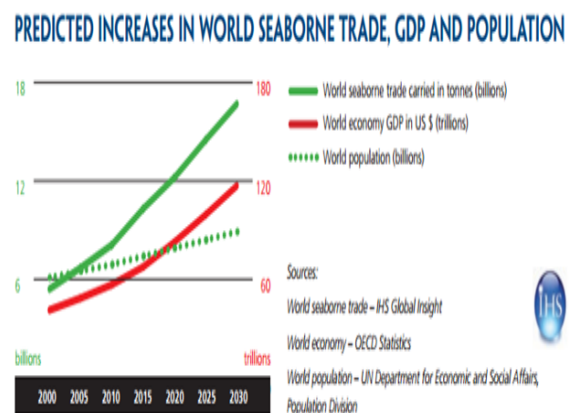
Fig: 4 Predications of World Seabborne Trade, GDP and Population

Ocean data Clusters and Small Island Developing States & LDC Programmes are cross-cutting priorities. Source: fao.org The blue economy aims to start sustainable development of sea resource, analysis and development, reserve assessment of oceanic assets, marine aquaculture, lengthy line fishing and biotechnology and human aid improvement, amongst others.Source: ics-shipping.orgCouncil of Ministers' meeting recommended six priority pillars for the IORA Secretariat in the blue economy are Fisheries and Aquaculture,During 2012–2013, marine product exports reached a record in which the ways above the ground of Rs 18,857 crores. Exports combined to 928216 tonnes worth at Rs. 18 856.25 crores and the US $ 3 511.67 million. Match up to the preceding 12 months, seafood exports witnessed a boom of 7.69 % in capacity, 13.62 % in INR and 0.1 % development in US$ income, in that order. Throughout 2012–2013, frozen shrimp from the way of life sector persisted to be the most critical export fee component accounting for a share of 51.36 % of the overall US$ income. Shrimp exports increased with the support of 20.89 %, 18.73 % and 3.57 % in capacity, INR and US$ fee, correspondingly.

Table: 2 Fisheries and Aquaculture

Year	Brackish water(Qty)	Freshwater(Qty)	Marine(Qty)
2001	102 930	2 015 656	1500
2002	114 970	2 072 219	1 600
2003	115 884	2 197 087	2 800
2004	125 589	2 669 047	4 050
2005	147 805	2 814 173	5 400
2006	206 535	2 962 768	11 560
2007	141 467	2 960 729	10 044
2008	263 970	3 567 898	19 189
2009	224 789	3 547 249	19 882
2010	119 407	3 648 355	18 017
2011	304 008	3 355 060	14 014
2012	348 664	3 847 909	12 905
2013	381 100	4 155 507	14 100
2014	467 059	4 408 741	14 200
2015	590 758	4 656 642	12 600
2016	611 269	5 076 131	12 600
2017	739 161	5 427 839	13 000

There was pointy call unit fee recognition of frozen shrimp at 14.33 percentages. Fish is the first essential export object in terms of value, accounted for a share of approximately 37.06 % in amount and 17.60 % in US$ earnings.

Table :3 Main institutions involved in aquaculture studies and education in India.

Sl.No .	Infrastructure Component	No.'s / capacity
1	Registered Exporters	1 060
2	Processing Plants	456
3	Total Installed Capacity (MT/day)	18 495
4	Frozen Storages	551
5	Frozen Storage Capacity (MT)	212 854
6	Pre-processing centres	614
7	Pre- processing capacity (MT/day)	11 483
8	EU approved Processing plants	262

Frozen objects have revealed a high-quality boom in amount (27.27 %), rupee price (51.27 %) and US$ (35.91 %).The unit cost-consciousness additionally increased by using 6.84 %. South-east Asia is the biggest consumer of Indian marine products with a share of 23.12 % in terms of US$ price cognizance. The European Union was the second leading marketplace with a proportion of 22.14 percentage accompanied with the aid of the USA of America (21.30 %), Japan (10.62 %), China (7.68 %), Middle East (5.97 %) and other international locations by way of 9.23 %.

The fisheries region gives nationwide profits, sells overseas, meals and dietetic protection and service production. As consistent with the approximate of the Central Statistical Organization, of the Government of India, the worth of GDP from fisheries segment at present-day charges all through 2011–2012 turned into Rs 65 541 crores, that's 4.47 in keeping with cent of the overall GDP of agriculture and allied sectors. Fish contributes considerably to the home provisions protection of India which has in line with capita consumption of more than 6.00 kg in step with annum. With freshwater aquaculture being a home hobby in numerous elements of the country, except including to the dietary safety it also facilitates bringing extra income to rural households. The community of 429 FFDAs has introduced approximately 8.05 lakh ha of water underneath the cutting-edge fish way of life operations gaining extra or much less 13, 86 lakh beneficiaries. The fast development of the arena has generated vast service possibilities for expert, specialized and semi-skilled employees for exceptional assist activities such as building and the supervision of farms, hatcheries, feed mills,

processing devices and so forth. It has been estimated that more than 300 000 jobs have been produced in the brackish moist sector without help in the main and underneath areas for shrimp tradition.

II. Ocean Energy

The earth's surface is covered up with 70 % oceans and constitutes a large quantity of power inside the shape of wave, tidal, marine contemporary and thermal gradient. India has a shoreline with estuaries and gulfs. MNRE is looking for the improvement of the latest machinery and helps in finding out diverse alternatives to help its deployment. Mainly many types of technologies are presently pre-R&D. Fundamental R&D is taking care of the Ministry of Earth Sciences. MNRE supports and shows the tasks of demonstrated technology and is accepting by way of the professional group constituted by way of MNRE.

III. Tidal Energy

Tides are produced by a combination of forces exerted by the gravitational pull of the sun, moon which revolves around the earth. The Gulf of Cambay and the Gulf of Kachchh are the best places on the west coast where exceptional tidal variety is 12 m and 9 m. The Ganges Delta within the Sunderbans in West Bengal has the right locations for small scale tidal development. The most tidal range in Sunderbans is approximately 5 m with a median tidal variety of 2.97 m. The well-known monetary tidal strength in India is 8000-9000 MW and about 7000 MW within the Gulf of Cambay and is approximately 1300 MW within the Gulf of Kachchh and is below 100 MW in Sunderbans. (eai.in)

IV. Wave power

Ocean wave is confined immediately from ground waves or strain fluctuations underneath the floor. Wave energy converts the movement of the waves into mechanical power in which lump may be used to generate strength. However, less extensive energy was available in northern and southern latitudes. In 1982, the Ocean Engineering Centre, Indian Institute of Technology, Madras started to research and development activities for exploring wave strength. It estimated that the annual wave power is among 5 MW to 15 MW consistent with a meter. However, sensible and reasonable capability is probable to be less substantial.
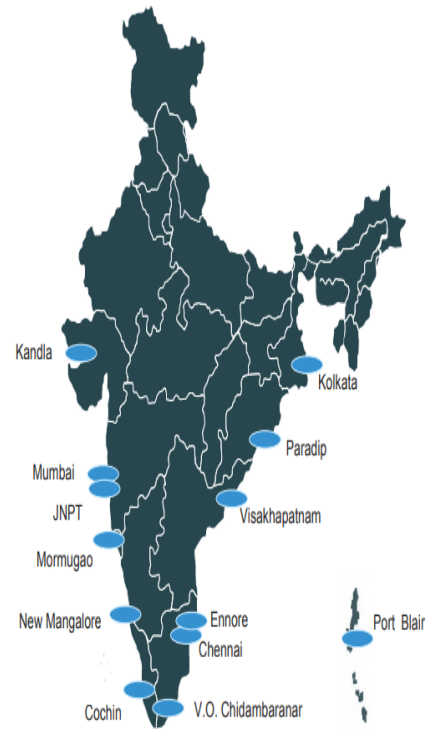
Fig 5 Major Ports in India

V. Ocean Thermal Energy

The main purpose of Ocean Thermal Energy Conversion (OTEC) is to transform solar strength into usable power.

Ocean Thermal Energy Conversion structures use the ocean's natural thermal gradient due to the fact the sea's layers have specific temperatures to produce an electricity-generating cycle. As high because the temperature among the balmy surface water and the bloodless profound water differs by about 20°C (36°F). In India, OTEC has an ability mounted ability of **180,000 MW.**

VI. Sea Ports and Shipping

Out of 12 predominant ports in the U S A; 6 are on the Eastern coast and six on the Western coast. Major ports are under the jurisdiction of the Government of India. India has about 205 non-primary ports, out of which 68 are dealt with cargos in 2017-18.

Source: ibef.org
Ports in India deal with around 95 percent of the global extent of the country.
The variety of exchange activities and personal participation is increased in port infrastructure in India. India has 12 main ports, out of which six new

mega ports are going to be developed within the country. The Maritime Agenda 2010-20 has a 2020 goal of 330 MT of port capacity. In FY19, the main ports in India handled 699.05 million tonnes of shipment site for visitors, implying a CAGR of 2.74 2.90 steps with cent year after year to 699.05 million tonnes and for FY20T (up to August 2019) stood at 293.80 million tonnes.

1)   Sedimentary Basins in India

India has 26 sedimentary basins that cover a place of 3.14 million sq. km. with aerial Extension of approximately 1.84 million sq. Km. These basins are categorized into 4 groups such as

Table: 4 Categories of Indian sedimentary basins

Type of basins	Area (Sq. KM)	Hydrocarbons Prospectivity	Basins/ Region
Category I (7 Basins)	518500	Established commercial production	Cambay, Assam Shelf, Mumbai offshore, Krishna Godavari, Cauvery, Assam Arakan Fold Belt and Rajasthan
Category II (3 Basins)	164000	Known accumulation of hydrocarbons but no commercial production as yet	Kutch, Mahanadi-NEC & Andaman-Nicobar
Category III (6 Basins)	641000	Indicated hydrocarbon shows that are considered geologically prospective.	Himalayan Foreland, Ganga, Vindhyan, Saurashtra, Kerala-KonkanLakshadweep & Bengal
Category IV (10 basins)	461200	Uncertain potential which may be prospective by analogy with similar basins in the world.	Karewa, Spiti-Zanskar, Satpura-South RewaDamodar, Narmada, Decan Syneclise, Bhima-Kaladgi, Cuddapah, PranhitaGodavari, Bastar, Chhattisgarh
Deepwater	1350000		East & west cost from 400 m water depth to EEZ
Total	3134700	-	

2)   Hydrocarbon Resources

The foretold conventional hydrocarbon sources in 15 sedimentary basins and deepwater regions of the nation are of 28.1 billion tonnes. Basin-sensible information is defined as follows:

Table : 5 Estimated Hydrocarbon Resources in India

BASIN	OFFSHORE (MMT)	ON LAND (MMT)	TOTAL (MMT)
MUMBAI	9190	-	9190
ASSAM-ARAKAN FOLD BELT	-	1860	1860
CAMBAY	-	2050	2050
UPPER ASSAM	-	3180	3180
KRISHNA-GODAVARI	555	575	1130
CAUVERY	270	430	700
RAJASTHAN	-	380	380
KUTCH	550	210	760
ANDAMAN-NICOBAR	180	-	180
KERALA-KONKAN	660	-	660
SAURASHTRA OFFSHORE	280	-	280
GANGA VALLEY	-	230	230
BAENGAL	30	160	190
HIMALAYAN FORELAND	-	150	150
MAHANADI	100	45	145
DEEP WATER	7000	-	7000
TOTAL	18815	9270	28085

3)   On 1.4.2014, hydrocarbon quantity of 11,543 million tonnes of oil and oil gas may be established through exploration via OIL, ONGC and Private/JV firms. So, about 59% of sources are below "yet to discover category". Out of 11,543 MMT of oil and oil comparable gas of In-location volumes, the closing reserves which gave approximately 4199 MMT of oil and oil equivalent fuel because of the establishment.

VII.   CONCLUSION

The earth's surface is covered up with 70 % oceans and constitutes a large quantity of power inside the shape of wave, tidal, marine contemporary and thermal gradient. Ports in India deal with around 95 percent of the global extent of the country. The variety of exchange activities and personal

participation is increased in port infrastructure in India. India has 12 main ports, out of which six new mega ports are going to be developed within the country. The Maritime Agenda 2010-20 has a 2020 goal of 330 MT of port capacity. The fast development of the fish and acuqaculture has generated vast service possibilities for expert, specialized and semi-skilled employees for exceptional assist activities such as building and the supervision of farms, hatcheries, feed mills, processing devices and so forth. It has been estimated that more than 300 000 jobs have been produced in the brackish moist sector without help in the main and underneath areas for shrimp tradition. In last the paper suggests that there is ample amount of scope for the development of Blue economy in India. India has a huge potential as far as Fish and aquaculture is concerned.

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To Analyze Perceived value towards Electronic Service Quality and its Impact on Customer Satisfaction: A study of E-Banking Customers Conducted in Jalandhar (India) Region

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Abstract: This paper explores perceived service quality in a online retail bank setting in Jalandhar (India) and its influence on customer satisfaction. The purpose of this research is to understand the impact of variables of e-banking on customer satisfaction. Five service quality dimensions namely Security, Responsiveness, Navigation, Customer Service, and Quality of Content were chosen based on the SERVQUAL model and the literature review. These variables have been tested in e-banking to explore the relationship between service quality and the customer satisfaction. The data were gathered through survey interview by a structured questionnaire with 100 customers. The study shows that these factors are the important service quality dimensions for customer satisfaction in e-banking. The study also explores that Security, Responsiveness and Navigation have more contribution to satisfy the customers of e-banking in Jalandhar. The results from regression analysis suggest that these three dimensions of service quality influence customer satisfaction at a large. The information provided by this research can be used when designing marketing strategies to improve customer satisfaction in retail banking.

KEYWORDS: Banking, Customer Satisfaction, Electronics, Perceived Value, Service Quality

I. INTRODUCTION

Retail banking sector in India is characterized by increased competition. Intensified rivalry among banks has led them to think seriously about how to compete effectively. In the past, banks largely pursued undifferentiated marketing that was aimed at a broad spectrum of customers rather than particular segments. Making a full range of services available to all customers and development of the one-stop financial centre was an attractive strategy. Cross-selling seemed to be more important than service differentiation. As a result, particular benefits from getting a service from one rather than another bank were not apparent to customers. Moreover, extending the range of services offered is of itself not a powerful means of differentiation because competitors can easily copy a new service introduced. This is due to

intangibility of services which means, consequently, that there are no patents and innovations can have short life-cycles. Therefore, a distinction between banks will be drawn not through the service-mix, i.e. the assortment of services offered, but principally through the quality of service, which is difficult to imitate, however, it is vital for creating a long-term relationship with customers. Under existing severe competitive conditions customer satisfaction and retention became critical for retail banks.

Growth of Electronic banking in a country depends on many factors, such as success of internet access, new online banking features, household growth of internet usage, legal and regulatory framework. E-banking can offer speedier, quicker and dependable services to the customers for which they may be relatively satisfied than that of manual system of banking. E-banking system not only generates

latest viable return, it can get its better dealings with customers. The rationale of this research is to recognize the impact of variables of e-banking on customer pleasure in India.

The Internet banking has opened a new avenue to exploit to make a distinction between banks and deliver a superior service compared to competitors. It involves the use of the Internet by consumers to get in touch with their banks and check their accounts and carry out banking transactions. The migration to Internet banking has greatly influenced the distribution policies of banks and the mode of interaction with the banking and service experience for consumers. Thus, retention and attraction of consumers are largely determined by the quality of services delivered.

The aim of this research is to study the impact of the quality of online banking services on customer's intention to revisit the banking site and to maintain a lasting relationship with it. It is twofold. From a theoretical viewpoint, this research enriched the few studies that have explored the concept of perceived quality of online services. From a managerial point of view, it points to the bankers the importance of promoting satisfaction through better online service quality.

II. Literature Review

A. Service quality

In the service literature service quality is interpreted as perceived quality which means a customer's judgment about a service. The authors of SERVQUAL which has been extensively used in assessing service quality of different service providers including banks suggested that "Quality evaluations are not made solely on the outcome of a service; they also involve evaluations of the process of service delivery" (Parasuraman et al., 1985, p.42). Within the SERVQUAL model, service quality is defined as the gap between customer perceptions of what happened during the service transaction and his expectations of how the service transaction should have been performed. SERVQUAL refers to five dimensions of quality:

• Reliability (delivering the promised outputs at the stated level).

• Responsiveness (providing prompt service and help to customers; the reaction speed plays a vital role here).

B. E-SQ

More recently, interest in service quality has shifted to reflect current developments in e-commerce that emphasize the e-service quality. E-service quality can be described as overall customer evaluations and judgments regarding the excellence and the quality of e-service delivery in the virtual marketplace (Santos, 2003). Online transaction is a complex process that can be divided into various sub-processes such as navigation, information searching, negotiation, online payment, delivery, and after-sales service. Thus, e-service quality contains multi-components, which reflects two attributes in its measurement – system attribute and service attribute. System attribute stresses technological elements, such as efficiency, speed, and security. On the other hand, e-service quality is not solely an evaluative outcome of a system, but the essence of service quality is customer service such as order delivery and after-sales service. Table I shows the e-service quality measurement in prior studies.

Table: 1

Wolfinbarger and Gilly (2003)	Website quality and customer's service quality of e-retailer	Fulfilment/reliability, website design, privacy/security, customer service
Zeithaml et al. (2000) e-SQ	E-service quality of B2C commerce	Information availability and content, ease of use or usability, privacy/security, graphic style, reliability/fulfilment
Wolfinbarger and Gilly (2003) eTailQ	E-service quality of B2C commerce	Efficiency, system availability, fulfilment, privacy, responsiveness, compensation, contact

The lack of consensus concerning the nature or the scope of e-service quality dimensions results in different approaches and outcomes as well as the existence of research gaps. Therefore, the literature on e-service quality calls for its more complete and comprehensive understanding, conceptualization.

C. Perceived Value

Zeithaml (1998) conceptualized service value as a consumer's overall assessment of the utility of a service based on perceptions of what is received and what is given. Value represents a trade-off between give and get components. The "get"

components (benefit) of perceived value include intrinsic attributes (e.g. how the purchase makes one feel) and extrinsic attributes (e.g. reputation of the product/service), while the "give" components (sacrifice) of perceived value include monetary prices and nonmonetary cost (e.g. time, energy, effort). Lee and Overby (2004) identified two types of online shopping values utilitarian value and experiential value. Utilitarian value is defined as an overall assessment of functional benefits incorporating the four dimensions- *price saving, service, time saving, and merchandise selection*. Utilitarian value is relevant for task-specific use of online shopping, e.g. purchase deliberation. Experiential value is defined as an overall representation of experiential benefits from *entertainment, escapism, visual appeal, and interactivity* involved with online shopping activities. Utilitarian value is relevant for acquiring affective and social stimulation.

D. *Customer Satisfaction*

Customer satisfaction is the customer's assessment of a service in terms of whether that service has met the customer's needs and expectations (Zeithaml et al., 2006). A number of studies have reported that satisfaction is positively correlated with service quality and is a significant mediator of service quality and behavioral consequences (Cronin et al., 2000; Tam, 2004; Yu et al., 2006; Chang et al., 2009).

Service quality is found to be a strong predictor of customer satisfaction (Cronin and Taylor, 1992; Cronin et al., 2000; Dabholkar et al., 2000;). Research in different industries have investigated the relationship between service quality (its dimensions) and customer satisfaction – telecommunications (Woo and Fock, 1999); restaurants (Gilbert et al., 2004); hospitals (Andaleeb, 1998); hotel services (Voss et al., 1998); travel agencies (Bitner, 1990); internet services (Kim and Lim, 2001; Van Riel et al., 2001); multiple industries (Bitner et al., 2000). In traditional retail banking service quality dimensions of relational performance, core performance and features performance were found to be significant predictors of customer satisfaction. Various studies have been conducted in similar

area, where in banking service quality dimensions have been tested as predictors of customer satisfaction.

E. *Service quality, Perceived Value and Customer Satisfaction*

The relationship between expectation, perceived service quality and customers satisfaction have been investigated in a number of researches (Zeithaml, et al, 1988). They found that, there is very strong relationship between quality of service and customer satisfaction (Parasuraman et al, 1985; 1988;). Increase in service quality of the banks can satisfy and develop attitudinal loyalty which ultimately retains valued customers. The higher level of perceived service quality results in increased customer satisfaction. When perceived service quality is less than expected service quality customer will be dissatisfied. According to Cronin and Taylor (1992) satisfaction super ordinate to quality-that quality is one of the service dimensions factored in to customer satisfaction judgment.

III. Research Questions

After a careful understanding of the literature presented above the following research questions and hypothesis were identified to be verified through primary research for the concerned study:

1. What are the most influential online service quality dimensions that are associated with a high level of customers' perception towards e-banking?
2. Is there any positive relationship between the level of customers' perceived overall service quality and their satisfaction in e-banking?

IV. Research Design

The research is basically primary in nature. The data was collected through a well structured 5-point itemized Likert scale which was administered through face to face interaction with the customers who have used e-banking services at least once in the recent past. A sample of 100 respondents was selected through Systematic Random Sampling technique in which every third customer coming out a branch of a selected bank was asked to fill the questionnaire (after found eligible to fill the same).

Table: 2
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942[a]	.887	.881	.173

Predictors: (Constant), Customer Service Perception, Privacy Perception, Responsiveness Perception, Navigation Perception, Content Perception

V.   Data Analysis and Interpretation

The results of the data analysis obtained through SPSS are presented below. The First question pertaining to identifying the most important Service Quality

Dimension relating to e-banking services was answered with the help of Mean scores computed of the responses given by respondents as shown in Table 1 below. It was found that Responsiveness of the portal in clearing the transactions/ generating receipts etc with a mean score of 4.85 with minimum Std. deviation is the most important parameter for assessing the e-service quality followed by

Security of the details of the customers at the virtual space with a mean value of 3.97 and consequently Navigation of the website i.e. user friendliness in transiting from one page to the other is at no. three with a mean score of 3.73 and consequently Quality of Content with mean score of 3.47 and Customer Support Service with score of 3.41 are at fourth and fifth places.

The first research questions can be answered like that: Security, Responsiveness and Navigation are the main important dimensions that determine the Service Quality of e-banking Portals the most. The results of the Regression model are presented in Table 2 & 3 below. As shown in table 2 & 3 the regression model is a good fit with the value of R=0.942 and R2= 0.887 and p value of 0.000 as available from ANOVA table which shows that model

is statistically significant at 5% level of significance with a F value of 147. 878.In order to find the answer to second research question we need to look at the Linear

Regression Model developed with Customer Satisfaction as dependent variable and Privacy,

The results of the Regression model are presented in Table 2 & 3 below. As shown in table 2 & 3 the regression model is a good fit with the value of R=0.942 and R2= 0.887 and p value of 0.000 as available from ANOVA table which shows that model is statistically significant at 5% level of significance with a F value of 147. 878.In order to find the answer to second research question we need to look at the Linear Regression Model developed with Customer Satisfaction as dependent variable and Privacy, Navigation, Content, Responsiveness and Customer Service as dependent variables as shown in Table 4 below. It is clear from the table that Privacy, Responsiveness, and Navigation are important factors for determining the Customer satisfaction from the service quality of e-banking portals which were found to be significant at 5% level of significance whereas Customer Service shows a very small association with overall customer satisfaction and Quality of Content dimension of service quality was not supported as a source of customer satisfaction.

From the above discussion it can be concluded that Privacy, Responsiveness and Navigation are the main parameters of the e-Service Quality which were rated the most influential in determining the overall Customer Satisfaction from the e-banking portals used by the customers in Jalandhar region of Punjab (India).

Table :3 Descriptive Statistics- Mean Scores

	N	Minimum	Maximum	Mean	Std.Deviation
Security.Per.	100	3	5	3.97	.359
Navigation Per.	100	2	5	3.73	1.109
Content_Per.	100	2	5	3.47	.979
Resp._Per.	100	4	5	4.85	.171
Cust.Ser._Per.	100	2	5	3.41	.965
Valid N (listwise)	100				

Table 4 ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.180	5	4.436	147.878	.000^a
	Residual	2.820	94	.030		
	Total	25.000	99			

Table 5 Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.743	.456		12.586	.000
	Privacy Perception	.576	.045	.469	12.789	.000
	Navigation Perception	.170	.048	.168	3.576	.001
	Content Perception	.037	.029	.060	1.282	.203
	Responsiveness Perception	.851	.038	.826	22.596	.000
	Customer Service Perception	-132	.041	.129	3.218	.002

Table:6

Scale Items (For Measuring most important Service Quality Dimensions)	Scale (1 to5) **Likert Scale** 1- Least Important 2- Somewhat Important, 3- Neither imp. nor unimp. 4 Important 5 Very Important
I consider the Security of my personal details while using e- banking services of this bank to be_____.	1 2 3 4 5
For me the user friendliness in transition from one page to the other is _____.	1 2 3 4 5
I give _____ to the quality of content available on the website that provides me the features of products or processes in details.	1 2 3 4 5
For me the availability of graphics and design is _____ while doing e-banking transactions.	1 2 3 4 5
I consider the responsiveness of the system in clearing the transactions and generating receipts to be _____.	1 2 3 4 5
For me the availability of 24 hrs. customer service is _____	1 2 3 4 5

Table 7
Measurement ScalesImportant Dimensions of e-SQ   Perceived e- Service Quality

Scale Items (For Measuring perceived Service Quality of e-banking services)	Scale (1 to5) **Likert Scale** 1- Very Disagree 2- Disagree 3- Neither agree nor disagree 4- Agree 5- Very agree
My bank ensures my privacy and security while dealing with the e-banking services offered by my bank.	◯1 ◯2 ◯3 ◯4 ◯5 ◯ ◯
My bank offered a pleasant experience while navigating the e-banking portal.	◯1 ◯2 ◯3 ◯4 ◯5 ◯ ◯
Quality content is available on the portal that provides me the features of products/services in detail.	◯1 ◯2 ◯3 ◯4 ◯5 ◯ ◯
The well designed graphics are used in my bank's e-banking portal.	◯1 ◯2 ◯3 ◯4 ◯5 ◯ ◯
My e-portal of my bank is quite responsive in clearing the transactions and generating receipts.	◯1 ◯2 ◯3 ◯4 ◯5 ◯ ◯
Customer service for using e-banking services is available 24 hrs.	◯1 ◯2 ◯3 ◯4 ◯5 ◯ ◯

Table: 8 Customer Satisfaction

Scale Items (For Measuring Customer Satisfaction of e-banking services)	Scale
I am _____ with the performance of my banks e-banking services.	◯V. disatisfied ◯Dissatisfied ◯Neither Sat. nor Dis. ◯Satisfied

VI.   CONCLUSION

From the above discussion it can be concluded that Privacy, Responsiveness and Navigation are the main parameters of the e-Service Quality which were rated the most influential in determining the overall Customer Satisfaction from the e-banking portals used by the customers in Jalandhar region of Punjab (India).

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Trade Performance of Bimstec Countries Since 1997

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Abstract- The study compares the trade performance for BIMSTEC nations since 1997 using the panel co-integration approach and t-statistics. The purpose of this study is to assess the empirical relationship between trade performances. Secondly, analyse the relationship between economic growth and exports using time series data fromthe period 1997–2015. Economic integration within regional trading blocs adds the significant value to increase economic growth, trade, investment, etc. BIMSTEC was proposed with the object to merge the Thailand's "Look West" policy and ASEAN with the "Look East"policy of India and South Asia. To achieve the objective of study, econometric techniques panel unit root, panel co-integration and granger causality model has been used. The Study suggested that for making BIMSTEC a "vibrant regional entity", there are needs to revitalize coastal shipping preparations and inter-modal transport, practices for easy flow of goods and services.
Keywords: BIMSTEC, GDP-Export, Panel Co-integration, Unit root, Granger causality

I.INTRODUCTION

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is an international organization linking a cluster of nations in South Asia and South East Asia. These are: India, Thailand, Bangladesh, Myanmar, Sri Lanka, Bhutan and Nepal. The Bay of Bengal is a bay that forms the north-eastern part of the India's oceanic. It resembles a triangle in form bordered by India, Sri Lanka, Bhutan, Bangladesh, Myanmar, Thailand, Malaysia and Indonesia. In 1990s these countries determined to get engaged in a regional corporation with a view to attain superior economies of scale in production, achieve specialism, boost competitiveness, expand export basket and make exploit of their under-utilized economic impending in terms of human being, technological and natural resources with lesser potential of back-sliding. On 6 June 1997, a new sub-regional alliance was created in Bangkok and given the name BIST-EC (Bangladesh, India, Sri Lanka, and Thailand Economic Cooperation). Myanmar present at the foundational June gathering as an spectator and connected the organization as a complete member at a Special Ministerial conference held in Bangkok on 22 December 1997, upon which the name of the alliance was changed to BIMSTEC. BIMSTEC was initiative with the objective to merge the 'Look West'

policy of Thailand and ASEAN with the 'Look East' policy of India and South Asia.

BIMSTEC was set up in 1997 as an expression of the convergence of economic interests coming out of India's Look East policy and Thailand's Look West policy.The Bay of Bengal representing one fifth of the world's population, including nearly a third of its poorest members, the bloc's member states are demographically young, politically evolving and ethnically diverse. The inter-regional grouping BIMSTEC aimed to serve as a bridge between the five SAARC countries and two ASEAN countries. BIMSTEC's objectives stretch from creation of economic and social prosperity based on equality, to enhancement of mutual benefits in economic, social and technological aspects. They also involve intra-regional assistance in the form of training, research and development as well as beneficial cooperation in the areas of agriculture, industry, expansion of trade and investment, improvement in communication and transport, for the purpose of improving living standards and cooperation with other international organizations. The formation of BIMSTEC can be attributed to two things. One is the failure of SAARC to form a vibrant regional forum for trade and economic cooperation. Secondly, ongoing process of liberalization in South Asian economies is desperate to discover new markets in the ASEAN region as a substitute of SAARC, whose scope is limited due to

non-economic factor that is unlikely to change in the near future. There is another factor, which may be cited for the formation of this bloc is the Thailand's desire to establish strong foothold on the Indian subcontinent because of increasing competition it has been facing in the ASEAN markets. Though BIMSTEC comes into existence very recently, its formation can be traced back till mid-1960s, when both India and Sri Lanka were invited to join ASEAN but was rejected by both the countries. In 1981, Sri Lanka made an unsuccessful attempt to join ASEAN, and India and Pakistan obtained Dialogue Partner status in 1993. The approach of South Asian countries to establish link and enhance economic cooperation shows their intension to strengthen economic relations with the ASEAN countries (Kelegama,2000). BIMSTEC may be used as conduit for South Asian countries to establish and develop a good relationship with the ASEAN countries. To compare the trade performance of BIMSTEC nations t-statistics has been used and to analyse the relationship between economic growth and exports panel approach has been used. For this purpose secondary data since 1997 has been used from various authentic sources. These are UNCTAD, UNCOMTRADE, World Bank, Trade Map, World Trade Organization (WTO), and BIMSTEC.org etc.

II.OVERVIEW OF BIMSTEC ECONOMIES

Economic performance will depend heavily on the domestic security and political scenario, and developments in the global economy. Domestic factors played a more important role, such as the security situation in Nepal, tensions between India and Pakistan and progress on peace talks in Sri Lanka. The main aim of BIMSTEC is to fully utilize the existing potential of member nations for promoting economic cooperation in the areas of investment, industry, technology, human resource development, agriculture and infrastructure. BIMSTEC provides an opportunity to optimize complementarities in trade, investment and production between South and South-East Asian countries. The similarities among the member states extend to a common historical past, their developing status and cultural bonds. BIMSTEC brings together 1.5 billion people, 21 per cent of the world population, and a combined GDP of over US$ 2.5 trillion. The BIMSTEC nations contain both Developing Nations and Least Developing Countries

(LDC's). Therefore, they are characterized by higher tariff barriers on their imports, viz-a-viz their developed counterparts. It was anticipated that the special treatment has been permit the nations to increase improved access in each other market the 'enabling clause' provision would give them the requisite safeguard to protect the responsive domestic sectors on the other. lower the level of transaction costs, which presently put a downward pressure on the intra-regional trade dimensions (Bhattacharya, 2007). The integration of BIMSTEC is one of the most important regional integration process developed among developing countries. It consists of heterogeneous group of countries with wide socio-economic development. The description provided by

Table 1: Demographic and Macroeconomic Indicators of BIMSTEC economies

Parameter/ Country	Year	India	Bangladesh	Bhutan	Myanmar	Nepal	Sri Lanka	Thailand
% share of Population above 15-65 years	2015	66	66	68	67	62	66	72
GCI Index ranking	2015	55	107	105	131	100	68	32
Life Expectancy (Years)	2015	61	63	58	61	60	70	70
Adult Literacy (15-24)	2015	89.66	83.20	92.04	96.33	89.95	98.77	98.64
Growth Rate of GDP in Current Prices (in %)	1997	4.0	4.5	5.4	5.7	5.0	6.4	-2.8
	2015	7.6	6.6	3.3	7.0	3.4	4.8	2.8
Per Capita in Current Prices (in US $)	1997	47477.48	325.4765	418933.7	9332.566	5097.386	15457.5	145444.1
	2015	138103.7	1770.005	1856518	59441.95	1820231	58258.3	370693.7
HDI rank	2015	130	142	132	148	145	73	93
HDI Values	2015	0.609	0.507	0.605	0.536	0.548	0.757	0.726
GDP (US $ Billions)	2015	2,090.71	205.71	2.21	66.98	21.35	82.09	395.28
Gini Index	2015	33.9	32.1	38.1	N/A	32.8	36.4	39.4
Per Capita GDP (US $)	1997	434.73	402.89	667.84	155.89	244.087	882.95	2475.10
	2015	1688.38	1265.71	2836.80	1268.68	751.12	3767.58	5426.30

Source: World development Report (2015), International Monetary Fund, World Economic Outlook (2015), UNESCO, UNDP

gives some statistics on GDP growth rates, per capita incomes and demography for the BIMSTEC countries. Assessment of Table 1 clearly indicates that the in 2015 growth rate has been in double digits for all the countries along with a two to three times increase in the per capita incomes. However, among BIMSTEC countries, India is biggest nation in terms of land area, and Bhutan is the smallest one. India having 1st rank in population among the BIMSTEC countries, lowest population country is Bhutan in a region. As shown in the table, these countries have a fairly young population with only Thailand having 10 per cent of its population above the age of 65. Almost all the member nations of BIMSTEC have

been performing fairly well to make their population literate. Literacy rate in countries like Thailand, Myanmar, Sri Lanka and Bhutan were more than 90 per cent.

The share of agriculture in GDP can be used as an indicator to overview the economic situation of BIMSTEC countries. Agriculture plays a critical role in the entire life of a given economy. Agriculture is the stamina of economic system of a given country. In addition to providing food and raw material, agriculture also provides employment opportunities to very large percentage of population. Agricultural products like sugar, tea, rice, spices, tobacco, coffee etc. constitute the major items of exports of countries that rely on agriculture. The growth of agricultural sector contributes to marketable surplus. Many people engage in manufacturing, mining as well as other non-agricultural sector as the nation develops. Construction of irrigation schemes, drainage system as well as other such activities in the agricultural sector is important as it provides larger employment opportunities.

Table 2: Share of Agriculture in GDP of member nations of BIMSTEC (in per cent)

Year	India	Bangladesh	Bhutan	Myanmar	Nepal	Sri Lanka	Thailand
1997	25.88	25.78	31.20	58.93	41.43	21.87	9.45
1998	25.79	25.45	29.53	59.05	39.91	21.11	10.78
1999	24.65	26.18	27.27	59.91	41.29	20.67	9.39
2000	23.12	25.51	27.39	57.24	40.82	19.90	9.02
2001	23.00	24.10	26.13	57.07	37.20	20.05	9.13
2002	20.75	22.73	26.34	54.53	38.09	14.28	9.43
2003	20.77	21.75	25.19	50.62	37.07	13.23	10.41
2004	19.03	21.04	24.92	48.35	36.67	12.54	10.31
2005	18.81	20.14	23.18	47.29	35.86	11.82	10.27
2006	18.29	19.61	22.14	46.86	34.13	11.34	10.77
2007	18.26	19.24	19.23	46.81	33.07	11.68	10.68
2008	17.78	19.01	18.98	45.68	32.22	13.38	11.56
2009	17.72	18.73	18.75	44.78	33.16	12.69	11.46
2010	17.74	18.59	17.50	43.28	36.53	12.81	12.39
2011	17.22	18.29	15.94	42.94	31.75	12.09	12.36
2012	17.50	17.11	17.00	42.23	36.53	11.00	12.31
2013	18.21	16.30	17.10	43.72	36.10	10.81	12.02
2014	17.37	16.97	17.09	37.19	35.91	9.67	11.89
2015	17.40	16.11	17.72	33.70	34.32	8.61	10.55

Source: World Bank

Table 2 illustrated the share of agriculture in GDP of BIMSTEC nations. In 1997 the share of agriculture in GDP was 25.88 per cent in India. Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka, and Thailand's share of agriculture in GDP was 25.78 per cent, 31.20 per cent, 58.93 per cent, 41.43 per cent, 21.87 per cent and 9.45 per cent respectively in 1997. The share of agriculture in GDP has increased from 1997 to 1998 in India. In 1998 except Myanmar the share of agriculture in GDP in other BIMSTEC countries has decreased. In 1999 the share of agriculture in GDP was 24.65 per cent in India. Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka and Thailand's share of agriculture in GDP was 26.18 per cent, 27.27 per cent, 59.91 per cent, 41.29 per cent, 20.67 per cent and 10.78 per cent respectively in 1999. The share of agriculture in GDP has decreased from 1999 to 2000 in India. In 2000 only Bhutan has seen an increase in the share of agriculture in GDP. In 2003 the share of agriculture in GDP was 20.77 per cent in India. Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka and Thailand's share of agriculture in GDP was 21.75 per cent, 25.19 per cent, 50.62 per cent, 37.07 per cent, 13.23 per cent and 10.41 per cent respectively in 2003.In 2006 the share of agriculture in GDP was 18.29 per cent in India.In 2006, Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka and Thailand's share of agriculture in GDP was 19.61 per cent, 22.14 per cent, 46.86 per cent, 34.13 per cent, 11.34 per cent and 10.77 per cent respectively. In 2009 the share of agriculture in GDP was 17.72 per cent in India. Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka, Thailand the share of agriculture in GDP was 18.73 per cent, 18.75 per cent, 44.78 per cent, 33.16 per cent, 12.69 per cent, and 11.46 per cent respectively in 2009. In 2011 the share of agriculture in GDP was 17.22 per cent in India. Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka, Thailand the share of agriculture in GDP was 18.29 per cent, 15.94 per cent, 42.94 per cent, 31.75 per cent, 12.09 per cent and 12.36 per cent respectively in 2011. In 2013 minor fluctuations were seen in agriculture share in GDP of all nations. The agriculture increased from 17.50 per cent to 18.21 per cent for India in 2013. But in case of Bangladesh, Nepal and Thailand, the share of agriculture decreased. Whereas Bhutan, Myanmar and Sri Lanka noticed increment in share of agriculture share in GDP.During 2015, highest agricultural growth was noticed in Nepal followed by Myanmar i.e. 34.32 per cent and 33.70

per cent respectively, and lowest growth in Sri Lanka that was 8.61 per cent.

The progress of a country's is to great extent is measured by its industrial development. A growing industrial sector is crucial to greater economic development and takes in a number of areas as a country develops. In particular, industries can make significant contribution to achieve social and economic objectives such as labour absorption, income distribution, rural development, poverty eradication and balanced economic growth.

Source: World Bank

Table 3 examined the share of industry sector in the GDP of BIMSTEC nations. In 1997 the share of industry in GDP was 26.41 per cent in India. Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka and Thailand Share of industry in GDP was 25.14 per cent, 33.78 per cent, 10.17 per cent, 22.86 per cent, 26.89 per cent and 40.16 per cent respectively in 1997. In 1998 India's share of industry in GDP has decreased marginally. Except Sri Lanka other BIMSTEC countries share of Industry in GDP have decreased in 1998. In 2000 the share of industry in GDP was 26.11 per cent in India. The share of industry in GDP for other BIMSTEC countries was almost similar as compare to the 1999. In 2002, the share of industry in GDP have increased in India, Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka, and Thailand from 2001. In 2003, except India and Bangladesh, other BIMSTEC countries share of industry in GDP hasincreased from 2002. In 2004 except Bhutan and Bangladesh other BIMSTEC countries share of industry in GDP has increased from 2003. In 2005 except Bangladesh other BIMSTEC countries share of industry in GDP has increased from 2004. In 2006 the share of industry in GDP in Myanmar, Nepal, Thailand has decreased from 2005.In 2007 the share of industry in GDP in Myanmar, Nepal, Thailand has decreased from 2006.In 2008 the share of industry in GDP in Bangladesh, Nepal, has increased from 2007 while in other BIMSTEC countries the share of industry in GDP has decreased from 2007. Bangladesh and Sri Lanka have also experienced a growth in the share of industry in GDP in 2009. The share of industry in GDP has decreased in 2009 for the remaining BIMSTEC countries. In 2011 the share of industry in GDP was 26.40 per cent in India. In Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka and Thailand

the Share of industry in GDP was 28.20 per cent, 43.91 per cent, 20.67 per cent, 15.33 per cent, 29.90 per cent and 41.15 per centrespectively in 2011. In 2013, the share of industry in GDP for all the BIMSTEC nations was increased as shown in the table. During 2015, share of industry in GDP was highest by Bhutan and lowest in Nepal i.e. 42.29 per cent and 15.69 per cent respectively. Thailand's increasingly diversified manufacturing sector is the largest contributor to growth. Industries registering rapid increases in production have included computers and electronics, furniture, wood products, canned food, toys, plastic products, gems, and jewelry. High technology products such as integrated circuits and parts, hard disc drives, electrical appliances, vehicles, and vehicle parts are now leading Thailand's growth in exports. The reason for low share of industry in GDP of Myanmar was lack of electricity. The consumption of electricity in Myanmar is one of lowest in the world i.e. 20 times less than the world.

Table 3: Share of Service sector in GDP of BIMSTEC countries (in per cent)

Year	India	Bangladesh	Bhutan	Myanmar	Nepal	Sri Lanka	Thailand
1997	26.41	25.14	33.78	10.17	22.86	26.89	40.16
1998	25.74	25.81	32.90	9.85	22.49	27.54	39.63
1999	25.37	25.15	35.64	8.99	21.80	27.28	40.93
2000	26.11	25.28	35.99	9.69	22.13	27.28	41.99
2001	25.17	25.94	37.90	10.58	17.79	26.80	42.14
2002	26.23	26.41	38.60	13.00	18.09	28.01	42.43
2003	26.04	26.26	39.36	14.25	18.14	28.42	43.63
2004	27.92	26.60	37.74	16.20	17.85	28.61	43.39
2005	28.13	27.22	37.28	18.20	17.69	30.18	43.96
2006	28.84	27.90	38.98	17.35	17.19	30.64	44.34
2007	29.03	28.37	45.37	19.87	17.09	29.91	44.73
2008	28.28	28.51	44.47	19.34	17.33	29.37	44.05
2009	27.56	28.65	43.17	16.73	16.27	29.67	43.33
2010	27.11	28.45	44.55	18.86	15.63	29.42	44.65
2011	26.40	28.20	43.91	20.67	15.33	29.90	41.15
2012	26.20	26.71	44.30	19.56	15.51	31.50	43.61
2013	27.81	27.62	44.60	20.21	15.70	32.51	42.51
2014	28.31	26.54	42.11	21.34	15.54	31.21	40.54
2015	30.00	27.66	42.29	22.59	15.69	30.65	36.91

The service sector is becoming increasingly important in the economies of developed and developing countries. For the manufacturing sector,

the service sector, especially knowledge-intensive and business services, is being increasingly recognized as important levers for growth and development of the economy

Source: World Bank

Table 4 defined the share of service sector, value added percentage of GDP for all the members nation of BIMSTEC. In 1997 the share of service sector in GDP was 25.88 per cent in India. For Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka, Thailand the share of service sector in GDP was 49.07 per cent, 35.01 per cent, 30.90 per cent, 35.70 per cent, 51.23 per cent, 50.39 per cent. In 1998 the share of service sector in GDP has increased from 1997 to 1998 for India. Except Bangladesh and Thailand other BIMSTEC countries the share of service sector in GDP has increased in 1998. In 2000 except Bhutan and Thailand other BIMSTEC countries the share of service sector in GDP has increased as shown in above table. The share of others countries except Bhutan, Nepal and Thailand has increased in 2002 from previous year. In 2004 only India has seen a decrease in the share of service sector in GDP i.e. 53.05 per cent from 53.18 per cent. In 2005, again share of service sector in GDP of India was increased i.e. 53.06 per cent. For Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka, Thailand the share of service sector in GDP was 52.63 per cent, 39.53 per cent, 35.88 per cent 46.44 per cent, 57.99 per cent, 45.77 per cent respectively. In 2011 the share ofservice sector in GDP for India was 56.37 per cent. For other members nations of BIMSTEC such as Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka and Thailand, the share of service sector was 53.51 per cent, 40.15 per cent, 39.95 per cent, 52.92 per cent, 58.00 per cent and 46.48 per cent respectively. In 2013 expect Sri Lanka, GDP. The share of GDP was India (57.00 per cent), Bangladesh (56.12 per cent), Bhutan (38.30 per cent), Myanmar (40.83 per cent), Nepal (49.20 per cent), Sri Lanka (56.80 per cent) and Thailand (45.50 per cent). In 2015, highest share in service sector noticed in Sri Lanka (60.61 per cent) followed by Bangladesh .

III. COMPARATIVE ANALYSIS OF TRADE PERFORMANCE FOR BIMSTEC COUNTRIES

Growth dynamism of a country or a region can be judge from the size of its international trade earnings.

It is widely accepted that open economies grow faster compared to closed ones. The globalization movement, which accelerated especially in the 1980s, enforced this situation to come into view more clearly.

T-Test of Significance: To calculate the trade performance of BIMSTEC region, the following null hypotheses has been framed. The objective behind this, to test the significance of growth for trade in pre and post formation of BIMSTEC bloc.

The test statistic is-

$$t = \frac{\overline{x}_d - \mu_o}{\frac{s_d}{\sqrt{n}}}$$

H₁ : There is no significant difference in the export performance during pre and post formation of BIMSTEC bloc.

H₂ : There is no significant difference in the import performance during pre and post formation of BIMSTEC bloc.

H₃ : There is no significant difference in the CAGR during pre and post formation of BIMSTEC bloc.

To test the above null hypothesis, the t-statistics has been calculated for exports, imports and CAGR for three phases i.e. pre formation period from 1980 to 1997, second phase for post formation period i.e. from 1998 to 2015 and the third phase for overall. For CAGR and concluded that there is a significant difference in CAGR during pre and post formation of BIMSTEC bloc. Since 1997, after the formation of bloc the trade among BIMSTEC nations has grown nearly 22 times. India as leading player contributing more as compare to other member nations of bloc in overall trade after the formation of bloc. From 1980 to 2015, India share in Bangladesh trade as member of BIMSTEC was 2.22 per cent, for Bhutan India contributing 0.14 per cent, for Myanmar, Nepal, Sri Lanka and Thailand it was 0.52 per cent, 1.61 per cent, 2.33 per cent and 2.43 per cent respectively. In BIMSTEC region, still resources are remain unsophisticated that become the hindrance for the growth of trade in the bloc.

IV. THE EMPIRICAL RELATIONSHIP BETWEEN EXPORT AND GDP AMONG BIMSTEC COUNTRIES

BIMSTEC has a potential to enhance the trade between member countries by taking benefit of their geographical position in the region of the Bay of Bengal and the Eastern coast of the Indian Ocean. Economic integration within regional trading blocs adds the significant value to increase economic growth, trade, investment etc. India is the biggest economy in terms of its macroeconomic indicators while Bhutan is the smallest in the bloc among all the member nations. In between these two, only Thailand can be noticed as a dominant nation in the group. The member states collectively having a combined GDP of US$ 1.7 trillion in nominal terms and US$ 4.2 trillion in purchasing power parity (PPP) terms. And account for approximately 1/5 of the world's population, occupy 3.64 per cent of surface area. The BIMSTEC is characterized by momentous heterogeneity of income among the member countries as all nations are at diverse levels of development (Batra, 2010).

Granger Causality model is based on the following hypotheses for testing the causality and co-integration between GDP and export for BIMSTEC nations. (i) Whether there is bi-directional causality between GDP growth and export for BIMSTEC nations.(ii) Whether there is unidirectional causality between the two variables, (iii) whether there is no causality between GDP and export for BIMSTEC nations.(iv) whether there exists a long run relationship between GDP and EXPORT for BIMSTEC nations.

V. MODEL SPECIFICATION

GDP=f (Export)   **… (1)**

Where,   GDP = Gross Domestic Product of BIMSTEC nations

                Export = Export of BIMSTEC nations

The relationship between GDP and EXPORT for BIMSTEC nations is expressed with the help of following model:

GDP$_t$= a+b$_t$Export+ε$_t$ ... (2)

The model is based on the assumption other variables then export remains constant.

GDP is Gross Domestic Product of the BIMSTEC nations, Export is the for BIMSTEC nations.at a particular time period t respectively. While ε$_t$ is the error term; a and b represent the slope and coefficient of regression. The coefficient of regression, b specify how a unit change in the independent variable (export) affects the dependent variable (Gross Domestic Product). The error, ε$_t$, is incorporated in the equation to cater for other factors that may influence GDP. The validity or strength of the Ordinary Least Squares method depends on the accuracy of assumptions. In this study, the Gauss-Markov assumptions are used and they include; that the dependent and independent variables (GDP and Export) are linearly co-related, the estimators (a, b) are unbiased with an expected value of zero i.e., E (ε$_t$) = 0, which implies that on average the errors cancel out each other. The procedure involves specifying the dependent and independent variables; in this case, GDP is the dependent variable while Export the independent variable. In addition, whereas the Ordinary Least Squares (OLS) regression analysis can establish the dependence of either GDP on EXPORT or not.

Panel Tests

In order to examine the possibility of panel co-integration, it is first necessary to determine the existence of unit roots in the data series. For this study we have chosen the Im, Pesaran and Shin (IPS), which is based on the well-known Dickey-Fuller procedure. Im, Pesaran and Shin (IPS) proposed a test for the presence of unit roots in panels that combines information from the time series dimension with that from the cross section dimension. Since the IPS test has been found to havesuperior test power by researchers in economics to examine long-run relationships in panel data, to fulfil the purpose of study IPS employed procedure in present study. IPS begins by specifying a separate ADF regression for each cross-section with individual effects and no time trend-

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j=1}^{p_i} \beta_{ij}\Delta y_{i,t-j} + \varepsilon_{it} \quad …(3)$$

where $i = 1, \ldots, N$ and $t = 1, \ldots, T$

IPS use separate unit root tests for the N cross-section units. The test is based on ADF statistics

averaged across groups. After estimating the separate ADF regressions, the average of the *t*-statistics for p_1 from the individual ADF regressions, $t_{iT_i}(p_i)$

$$\bar{t}_{NT} = \frac{1}{N}\sum_{i=1}^{N} t_{iT}(p_i\beta_i) \qquad \dots (4)$$

The $\bar{t}$ is standardized to show that the standardized $\bar{t}$ statistic converges to the standard normal distribution as N and $T \longrightarrow \infty$. IPS (1997) showed that *t-bar* ($\bar{t}$) test has better performance when N and T are small. The study suggested a cross-sectionally degraded version of both test used for the errors in different regressions that comprise a common time-specific factor.

Panel Co-integration Tests

Panel co-integration test used to check for the existence of a long-run co-integration among FDI and the independent variables using panel co-integration tests suggested by Pedroni (1999 and 2004) based on Engle-Granger co-integration tests. In present study seven panel co-integrations has been used developed by Pedroni in 1999, since test determines the appropriateness and applied to estimated residuals from a co-integration regression after normalizing the panel statistics with correction terms. The estimation of residual from the hypothesized long-run regression given as-

$$y_{i,t} = \alpha_i + \delta_i t + \beta_{1i}x_{1i,t} + \beta_{2i}x_{2i,t} + \dots + \beta_{Mi}x_{Mi,t} + e_{i,t} \qquad \dots (5)$$

for t = 1....T, i = 1....N, m = 1... M

where, *T* is the no. of observations over time, *N* no. of cross-sectional units in the panel, and *M* no. of regressors. In equation, α_i is intercept value or fixed effects parameter which varies across individual cross-sectional units. $\delta_i t$ is slope coefficients and member specific time effects. Pedroni (1999 and 2004) also proposed the heterogeneous panel and heterogeneous group mean statistics to examine the panel co-integration.The statistics calculate the group mean of the individual time series statistics. The asymptotical distribution of all five statistics. It can be written by-

$$\frac{X_{N,T} \quad \mu\sqrt{N}}{\sqrt{v}} \Rightarrow N(0,1) \cdots (6)$$

where, $X_{N,T}$ is the test statistics and μ and v are the mean and variance of each test respectively.

Under the Alternative Hypothesis (H1), panel *v* statistics deviates to positive infinity. Thus, it is a one sided test were large no. of positive values reject the null of no co-integration. The rest statistics deviate to negative infinity that means the large negative values reject the null.

Table: 4

Parameter/ Country	Year	India	Bangladesh	Bhutan	Myanmar	Nepal	Sri Lanka	Thailand
% share of Population above 15-65 years	2015	66	66	68	67	62	66	72
GCI Index ranking	2015	55	107	105	131	100	68	32
Life Expectancy (Years)	2015	61	63	58	61	60	70	70
Adult Literacy (15-24)	2015	89.66	83.20	92.04	96.33	89.95	98.77	98.64
Growth Rate of GDP in Current Prices (in %)	1997	4.0	4.5	5.4	5.7	5.0	6.4	-2.8
	2015	7.6	6.6	3.3	7.0	3.4	4.8	2.8
Per Capita in Current Prices (in US $)	1997	47477.48	325.4765	418933.7	9332.566	5097.386	15457.5	145444.1
	2015	138103.7	1770.005	1856518	59441.95	18202.31	58258.3	370693.7
HDI rank	2015	130	142	132	148	145	73	93
HDI Values	2015	0.609	0.507	0.605	0.536	0.548	0.757	0.726
GDP (US $ Billions)	2015	2,090.71	205.71	2.21	66.98	21.35	82.09	395.28
Gini Index	2015	33.9	32.1	38.1	N/A	32.8	36.4	39.4
Per Capita GDP (US $)	1997	434.73	402.83	667.84	155.89	244.087	882.95	2475.10
	2015	1688.38	1265.71	2836.80	1268.68	751.12	3767.58	5426.30

Granger Causality test: Causality is a type of statistical reaction theory which is generally using in the construction of forecasting models. Previously, Granger (1969) and Sim (1972) were the ones who dignified the application of causality in economics. Granger Causality test is a procedure for decisive whether one time series is important in forecasting another (Granger. 1969). The standard Granger Causality test (Granger, 1988) seek to establish whether past values of a variable helps to forecast changes in another variable.

To investigate the causality among GDP and exports on the one hand and exports and GDP on the other, and simple Granger causality test by estimate the bivariate autoregressive processes for GDP and exports. The purpose of is to test the Export Lead Growth (ELG) hypothesis for BIMSTEC and an additional is export lead to increase GDP. (Mehrara and Firouzjaee, 2011).To assess causation direction between exports and GDP, Granger test involves estimation of following regressions equations: If causality runs from EXPORT to GDP, the equation is:

$$GDP = \sum_{i=1}^{n} a_i X_{t-i} + \sum_{j=1}^{n} \beta_j Exports_{t-j} + \in 1t \qquad . (7)$$

If causality runs from GDP to EXPORT, the equation is:

$$\text{Exports} = \sum_{i=1}^{n} \gamma iXt - i + \sum_{j=1}^{n} \partial jGDPt - j + \in 2t \quad \textbf{(8)}$$

Where,

GDP_t and $EXPORT_t$ represent Gross Domestic Product and export respectively, ε_{it} is uncorrelated stationary random process, and subscript t denotes the time period.

VI. EMPIRICAL RESULTS

The model estimated with panel data for seven BIMSTEC countries. It includes Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand. To explore the dynamics of the association among export and economic growth between BIMSTEC with data for the period, 1997 to 2015 and this include the 17 observations. The two main variables are real GDP and real Export. Both the variables economic growth rate (GDP) and exports measured in US $ million. Study scrutinize the long time and causal dynamic associations among the level of export and GDP. The methodology used in study is the Unit Root Analysis, Co-integration and Granger Causality technique.

Table 5: Panel Unit Root Test – Im, Pesaran and Shin (IPS)

Variables	Level	First difference	Second difference
Log_GDP	-0.8060	-3.5297	-5.5063
Log_Exports	-1.5572	-2.1370	-7.5250
Im, Pesaran and Shin W-stat	0.36335	-1.96709	-7.05029
T-bar critical values *			
1% level	-3.857386		
5% level	-3.040391		
10% level	-2.660551		

H_0 : Unit root (individual unit root process)

Table 5 depicts the results of the IPS panel unit root test at level with intercept indicating that all variables are in the constant level with intercept of the panel unit root regression. These results clearly revealed that the null hypothesis of a panel unit root in the level of the series cannot be rejected at various lag

lengths. Generally it has been observed that the null hypothesis for panel unit root is rejected in all series at level form and various lag lengths. The test values concluded that most of the variables attain stationary at level with intercept by applying the IPS test. The results of the panel unit root tests confirm that the variables are non-stationary at level. Table also shows the results of the tests at first difference and second difference for IPS test with intercept. From the test values, series of the null hypothesis for unit root test is rejected at 95 percent critical value (1 percent level and 10 per cent). Hence, based on IPS test, there strong evidence that all the series are integrated of orders one. The results revealed that the panel unit root support the hypothesis for all variables from 1997 to 2015. At most of the 1 percent significance level, the results found that all tests statistics with intercept significantly confirm that all variables strongly reject the unit root null and concluded that series of Log_GDP and Log_Exports has stationarity.

Table 6: Co-integration test- Pedroni (Engle-Granger based)

Variables	tau-statistic	Prob.*	z-statistic	Prob.*
Log_GDP	-1.239225	0.8495	-5.811685	0.6136
Log_Exports	-0.963284	0.9096	-4.821390	0.7129

H_0 : Series are not co-integrated

Table 7 depicts the results for Pedroni co-integration based on Engle-Granger test for all the variables.

The test investigate that whether long-run steady state or co-integration exist among the variables or not. Coiteux and Olivier (2000) examined that the panel co-integration tests have much higher testing power than conventional co-integration test.

Null hypothesis is rejected at 5 per cent level of significance, which explains that there is long run relationship exist between GDP and Exports between GDP and Exports. Both leads to economic developments of the region.

Table 7: Granger causality test between Log_Exports and Log_GDP

Null Hypothesis:	Obs	F-Statistic	Prob.
LOG_EXPORTS does not Granger Cause LOG_GDP	17	4.24555	0.0403
LOG_GDP does not Granger Cause LOG_EXPORTS	–	4.62955	0.0323

VII. CONCLUSION

BIMSTEC nations are prosperous in resources, but they remain underdeveloped and disengaged from Asia's development story. Although the member nations of BIMSTEC are linked by regional cooperative process, and remained on the margins of Asian market integration. The high potential of mutual trade with rest of the world has remained unexploited for various hurdles such as lack of shipping and road connectivity. For making BIMSTEC a "vibrant regional entity", there are needs to revitalize coastal shipping preparations and inter-modal transport, practices that had flourished in the past, for easy flow of goods and services. Now requirement of time is that member nations to stress on encouraging investment for operating actions for economic development and to build capability in the sectors of comparative advantage such as tourism, hydropower, agriculture and others to attain the greater goals and objectives.

The econometrics technique was used to test the causality among Log_GDP and Log_Exports. To test for unit roots of the variables, Panel Unit Root Test had been utilized. The null hypothesis of a panel unit root in the level of the series cannot be rejected at various lag lengths. Generally it has been observed that the null hypothesis for panel unit root is rejected in all series at level form and various lag lengths. From the test values, series of the null hypothesis for unit root test is rejected at 95 percent critical value (1 percent level and 10 per cent). Hence, based on IPS test, there strong evidence that all the series are integrated of orders one. The results revealed that the panel unit root support the hypothesis for all variables from 1997 to 2015. At most of the 1 percent significance level, the results found that all tests statistics with intercept significantly confirm that all variables strongly reject the unit root null and concluded that series of Log_GDP and Log_Exports has stationarity.

Table 7 explicated that there is Bi-directional causality between both the variables. Null hypothesis rejected in both the cases since the F-statistic values greater than 4 and having lag length of 1 to 4. So, the null hypothesis is rejected in both case and concluded that LOG_EXPORTS Granger Cause LOG_GDP. In second case, the null hypothesis is also reject and concluded that Log_GDP granger cause to Log_Exports. There is long run relationship exist

The test investigate that whether long-run steady state or co-integration exist among the variables or not. Coiteux and Olivier (2000) examined that the panel co-integration tests have much higher testing power than conventional co-integration test. Null hypothesis is rejected at 5 per cent level of significance, which explains that there is long run relationship exist between GDP and Exportsover the period 1997 to 2015. Granger causality was applied to test the causal association among Export and Economic Growth. The results explained the facts of bi-directional causality between GDP and export among BIMSTEC bloc. In nutshell, this study provided support for growth-led export and growth led exports for BIMSTEC region. The main challenges faced by BIMSTEC now a day India is leading performer in BIMSTEC, on behalf of more than two-thirds of its constituency. Conversation about BIMSTEC in the Indian strategic society has also been limited, brief and fairly periodic in nature. As a consequence, the cluster has stayed on marginal to integrative conversation in South and Southeast Asia. Another is structural constraints, in the form of limited state capabilities of the bulk of its member nations, have also foiled the development of the cluster. Major of the BIMSTEC nations is technology lacking and deficiency in the resources to invest in growth and infrastructure projects, with Bangladesh, Bhutan, Myanmar and Nepal along with the world's least developed nations (LDC's).

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A Study of Perception of Youth Towards Khalsa Aid International

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Abstract: Khalsa Aid International is an international non-profit aid and relief organisation which provides selfless service to the victims of disasters, wars and other tragic events around the world. Khalsa Aid International has attracted a lot of attention in recent years due to their commendable work. This research focuses on the behavioral study of youth towards Khalsa Aid International and their work. It stresses upon their effectiveness, efficiency, reliability, transparency etc. in comparison with other welfare organizations (Statutory Organizations and Voluntary Organizations) and also includes the brief information about the Projects, Initiatives and Awards & Achievements of the Khalsa Aid International.

Keywords — Effectiveness,Initiatives, Reliability, Statutory, Transparency.

I.INTRODUCTION

Khalsa Aid International is an UK-based humanitarian relief charity (Registered Charity Number – 1163294) based on the Sikh principle of "Selfless Service and Universal love" and "Recognizing the whole Human Race as One". Khalsa Aid International provides support and relief assistance to the victims of disasters, wars and other tragic events all around the world with the help of their volunteers.

A. Foundation

Khalsa Aid was founded by Ravinder Singh (aka Ravi Singh), who was struck by the plight of refugees in Kosovo in 1999. Mr. Ravinder Singh when got to know about the Kosovan Refugees and about a small group who were organising an aid convoy to Albania, the Sikh ideology of "Sarbhat Da Bhala" came to his mind, which means 'well- being of all', recognizing the humanity in us all and reaching out to those in need, regardless of race, religion, borders etc. and after that the Khalsa Aid came into existence in 1999. That year was also marked as the 300th birth anniversary of the Khalsa – an opportunity for the community to reflect the core teachings of their faith.

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reaching out to those in need, regardless of race, religion, borders etc. and after that the Khalsa Aid came into existence in 1999. That year was also marked as the 300th birth anniversary,

Fig.1 Founder of Khalsa Aid

Projects, Initiatives And Awards & Achievements

Due to the growth in operations and support for Khalsa Aid, the trustees of the charity decided to develop the Khalsa Aid to a Charitable Incorporated Organisation to expand its operations overseas and Khalsa Aid became Khalsa Aid International on 5th December, 2016. Since 1999, Khalsa Aid has been able to provide crucial aid to millions of people all around the world. The Khalsa Aid has introduced two long term projects and several emergency relief projects in disaster areas and civil conflict zones around the world in last two decades.

- Long Term Projects
  i. Langar Aid - (Focus on ending hunger

worldwide).

ii. Focus Punjab - (Focus on tackling the problem of poverty, illiteracy and drugs in Punjab).

- Emergency Relief Projects

i. Turkey Earthquake (Aug. 1999)
ii. Orissa Cyclone (Dec. 1999).
iii. Gujarat Earthquake (Jan. 2001).
iv. Congo/Rwanda – Volcanic Eruption (Jan. 2002).
v. Kabul Refugee Aid (Jul.2003).
vi. Andaman Islands: Tsunami (Dec. 2004).
vii. Pakistan Earthquake (Mar. 2005).
viii. Indonesia Tsunami (Mar. 2006).
ix. Bangladesh Cyclone 2007 (May 2007).
x. Punjab Floods 2007 (Aug. 2007).
xi. Cambodia Orphan Children (Aug. 2009).
xii. Haiti Earthquake 2010 (Jun. 2010).
xiii. Libya & Syria (Mar. 2011).
xiv. Famine Relief, Kenya (May 2011).
xv. Uttarakhand Floods (Jun 2013).
xvi. Muzaffarnagar Riots (Sep. 2013).
xvii. Philippines Typhoon (Dec. 2013).
xviii. UK Floods – 2014 (Jan. 2014).
xix. Lebanon: Refugee Support (Apr. 2014).
xx. **Sudanese Refugee** Camp, Uganda (May 2014).
xxi. Bosnia Floods (May 2014)
xxii. Floods in Jammu and Kashmir, India (Sep. 2014).
xxiii. Vishakhapatnam Cyclone (Oct. 2014).
xxiv. Australia: Cyclone Marcia (Feb. 2015).
xxv. Nepal Earthquake (Apr. 2015).
xxvi. Yemen Civil War (Jul. 2015).
xxvii. UK Floods 2015 (Dec. 2015).
xxviii. Greece: Refugee Crisis (May 2016).
xxix. Project Dignity: Essential Clothing for Yezidi Women, ex-slaves of ISIS.
xxx. Syrian Refugee Emergency Relief (Jan. 2017).
enfell Tower (London) Fire (Jun 2017).
xxxi. Kerala Flood Relief (Aug. 2018).
xxxii. Indonesia Earthquake and Tsunami Relief (Oct. 2018).
xxxiii. Punjab Floods 2019 (Jul. 2019).

B. Initiatives

i. PURE – Punjab Unprivileged Rural Empowerment (2009).
ii. The Forgotten Yazidi Women of Iraq (2018).
iii. Pad the Path (2019).
iv. Planting Memories (2019).
v. Khalsa Aid helps Iraqi Village open

school doors again before Christmas.
vi. Become Blood and Organ Donor (2019).
vii. Pop up Shelters for Flood affected people (2019) and many more...

C. Awards and Achievements

i. Khalsa Aid was awarded with 'Mother Teresa Award for Social Justice 2017.
ii. Ravinder Singh was presented with "The Award of Excellence and Achievement in your Chosen Vocation".
iii. Project Langar Aid Team was awarded with the "Queens Award for Community Service".
iv. Ravinder Singh was presented with the "International Sensation" Award in Darpan Magazine's Extraordinary Achievement Awards, 2017 and many more...

II.LITERATURE REVIEW

According to Lehigh Valley Community Foundation – "A Charitable Organization is a kind of institute or a business that falls under the category of NPO or Non-Profit Organization. It can be run privately as well as publicly. This type of organization is often called a Foundation or Charity. It can be based on educational, religious or even based on public interest activities. The law and regulations of the charity is dependent on the country or the region where it has been established and operated."In International Journal of Quality & Reliability Management 26 (1), 5-22, 2009;Jos Van Lwaarden, Ton Van Der Wiele, Roger Williams, Claire Moxham defined the Charity as – "Charities are defined as organizations involved in health, international aid, well-being, and nature and environment."

Lord William Beveridge, a British Economist defined a Voluntary Social Welfare Organization as – "A Voluntary Organization, properly speaking, is an organization which whether its workers paid or unpaid, is initiated and governed by its own members without the external control."

Voluntary Social Welfare Organization in Goa: A Sociological study' – Sawardekar and Asha V defined a Statutory Welfare organization as- "The Statutory Organizations are started by Government. They derive their support from taxes, and they are administered according to specific provisions of law, generally by government employees."

Varinder Singh & Ishfaq Majid – Ph.D. Scholars in the School of Education, Central University of

Gujarat, wrote about Khalsa Aid's operations in India in an article 'Khalsa Aid: A Journey of Serving the Mankind'. In their article they wrote - "Khalsa Aid International is popularly known for its humanitarian relief charity and Aid in India from 2001 to 2019.

III.OBJECTIVES OF THE STUDY

i. To compare the Khalsa Aid International with other welfare organizations
ii. To study the extent of inclination of youth towards Khalsa Aid International

IV.RESEARCH METHODOLOGY

Research Methodology refers to the specific procedures or techniques used to identify, select, process and analyze information about a topic. The type of research done in this study is qualitative as well as quantitative research.

A. *Research esign*

A research design is a pattern or an outline of a research project's workings. It is a series of advanced decisions when taken together comprise a master plan for the conduct of the survey. The information received through the questionnaires
is analyzed, interpreted and it forms the basis for major conclusion of the study. For this study, both types of sources are used:

i. Primary Source: Questionnaire Survey.
ii. Secondary Sources: The Secondary Sources include the published and unpublished data. The secondary sources used for this research are:
   • Various journals, newspapers, published research papers, unpublished work etc.
   • Internet sites are visited which provide wide range of information.

B. *Sample Design & Method Used*

The main sample group of the survey includes various persons of Jalandhar City and surrounding rural areas. In order to accomplish the goal, both direct and indirect information was gathered. While preparing questionnaire, objectives of the study were kept in mind.

C. Sample Size

The sample size for this study consists 100 persons of the Jalandhar City and its outskirts.

Data Analysis and interpretation

D. Gender of the Respondents
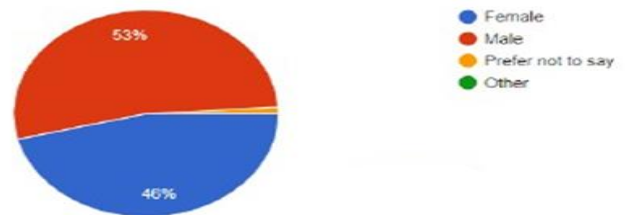
Fig.2 Gender of the Respondents

The Figure1 shows the percentage of the male and female respondents of this survey. As the chart indicates that 53% respondents are males and 46% respondents are female and the remaining 1% didn't disclose their gender

E. *Age of the Respondents*
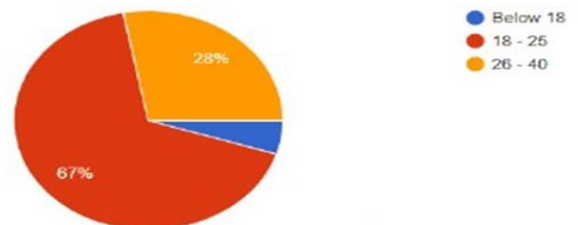
Fig.3 Age of the Respondents

The Figure2 depicts that 5% of the respondents of this study lies in the age group of Below 18 years, 67% in 18-25 years, 28% in 26-40 years respectively which signifies most of the respondents are youngsters.

F. *Education Level of the Respondents*
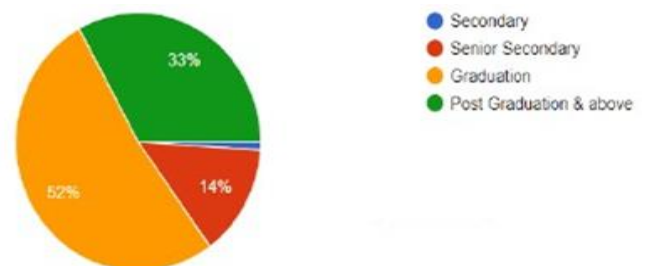
Fig.4 Education Level of the Respondents

The Figure3 reflects that the majority part of the sample is Graduate i.e. 52%. On the other hand, the percentage of the Post- Graduates is 33%, Senior Secondary Education is 14% and Secondary Education is only 1%.

G.   Employment Status of the Respondents
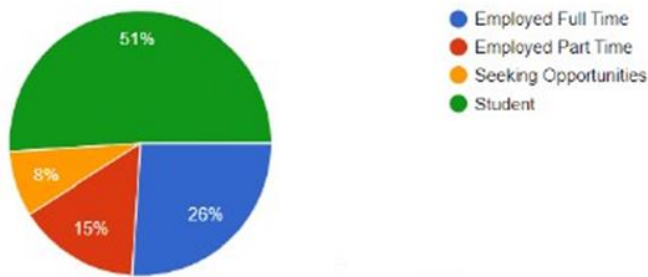
Fig.5 Employment Status of the Respondents

Figure4 represents that the majority of the respondents i.e. 51% are Research Scholars, 26% of sample population works Full -Time and 18% works Part-time and the remaining 8% respondents are seeking for Job Opportunities.

H.   Residential   Area   of   the Respondents

Both the rural and urban areas of the Jalandhar City are covered in the study.
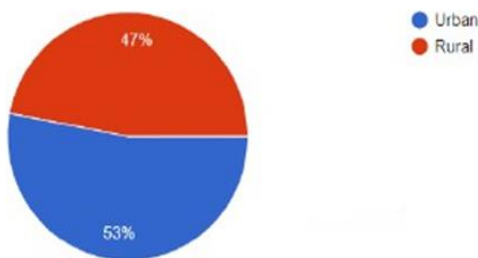
Fig.6 Residential Area of the Respondents

Figure5 shows 57% respondents belong to urban area of the region and rest belong to the rural area.

I.   Participation of Respondents in Welfare Activities
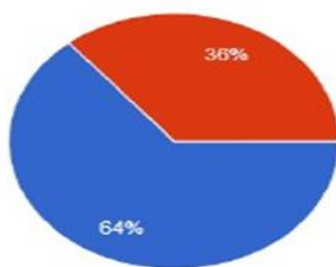
Fig.7 Participation of Respondents in Welfare Activities

The Figure6 shows that the 64% of the sample population of the study participates and donates in welfare activities and rest has not donated or participated in such activities yet.

J.   Awareness   of   respondents regarding Khalsa Aid International
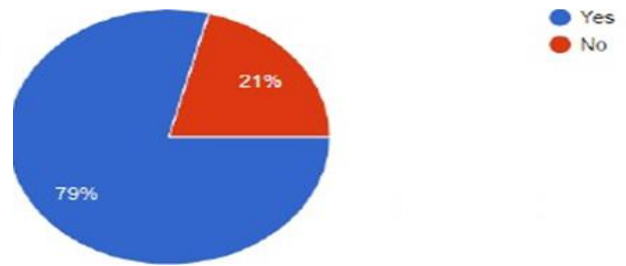
Fig.8 Awareness of Respondents Regarding Khalsa Aid International

Figure7 represents 79% of the respondents are aware and have heard about Khalsa Aid International and its projects & initiatives and the remaining 21% respondents are not aware and have not heard about the same. Comparisons of the data:-

The following are the figures and interpretation of the data which would be the basis for comparing Khalsa Aid International with other welfare organizations. Other Welfare Organizations may include Statutory Organizations and Voluntary Organization which are associated with humanitarian relief operations. The parameters are studied by using rating points from 0-5. The x-axis represents the rating points and y-axis represents the responses of the sample population.

K.   EFFECTIVENESS

This parameter is used to study the effectiveness of Khalsa Aid International in its operations as well as with the other welfare organizations.
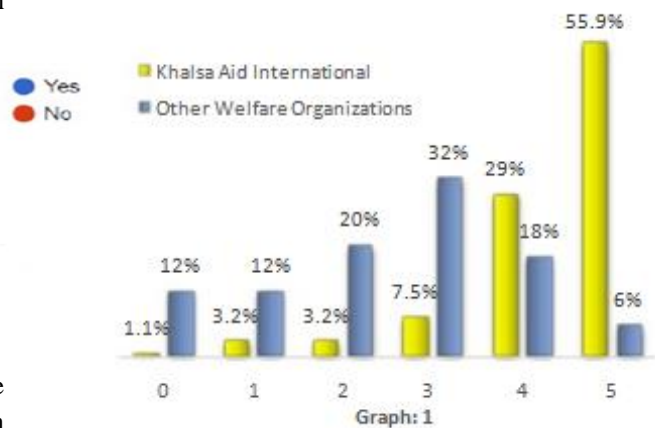
Fig.9 Effectiveness of Khalsa Aid International with the Other Welfare Organizations

• Khalsa Aid International

The graph1 shows that the 1.1% of respondents gave 0 points, 3.2% of respondents gave 1 point, 3.2% of respondents gave 2 point, 7.5% of respondents gave 3 points, 29% of respondents gave 4 points and 55.9% of respondents gave 5 points to Khalsa Aid

International for its effectiveness in its operations.

- Other Welfare Organizations

The graph1 also shows that the 12% of the respondents gave 0 points, 12% of respondents gave 1 point, 20% of respondents gave 2 points, 32% of respondents gave 3 points, 18% of respondents gave 4 points and 6% of respondents gave 5 points to other welfare organizations for their effectiveness.

L. EFFICIENCY

This parameter is used to study the efficiency of Khalsa Aid International in its operations as well as to compare it with the other welfare organizations.
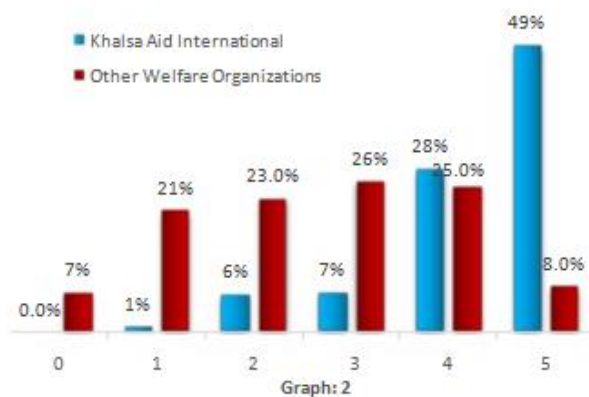
Fig.10 Efficiency of Khalsa Aid International with the Other Welfare Organizations

- Khalsa Aid International

The graph2 shows that 0% of respondents gave 0 points, 1% of respondents gave 1 point, 6% of respondents gave 2 points, 7% of respondents gave 3 points, 28% of respondents gave 4 points and 49% of respondents gave 5 points to Khalsa Aid International for its efficiency.

- Other Welfare Organizations

The graph2 shows that 7% of respondents gave 0 points, 21% of respondents gave 1 point, 23% of respondents gave 2 points, 26% of respondents gave 3 points, 25% of respondents gave 4 points and 8% of respondents gave 5 points to other welfare organizations for their efficiency.

M. RELIABILITY

This parameter is used to study the trustworthiness of Khalsa Aid International and other welfare organizations amongst the youth with the help of ratings.

Fig.11 Reliability of Khalsa Aid International with the Other Welfare Organizations

- Khalsa Aid International

The graph3 shows that 0% of respondents gave 0 points, 3.2% of respondents gave 1 point, 3.2% of respondents gave 2 points, 8.6% of respondents gave 3 points, 23.7% of respondents gave 4 points and 61.3% of respondents gave 5 points to Khalsa Aid International for its reliability.

- Other Welfare Organizations

The graph3 shows that 14% of respondents gave 0 points, 17% of respondents gave 1 point, 16% of respondents gave 2 points, 20% of respondents gave 3 points, 20% of respondents gave 4 points and 13% of respondents gave 5 points to other welfare organizations for their reliability.

N. TRANSPARENCY

This parameter is used to study the opinion of people regarding the transparency of various welfare organizations in terms of financial operations.

Fig.12 Transparency of Khalsa Aid International with the Other Welfare Organizations

- Khalsa Aid International

The graph4 shows that 0% of respondents gave 0 points, 1.1% of respondents gave 1 point, 8.5% of respondents gave 2 points, 14.9% of respondents gave 3 points, 20.2% of respondents gave 4 points and 55.3% of respondents gave 5 points to Khalsa Aid International for its transparency.

- Other Welfare Organizations

The graph4 shows that 12% of respondents gave 0 points, 20% of respondents gave 1 point, 24% of respondents gave 2 points, 23% of respondents gave 3 points, 13% of respondents gave 4 points and 8% of respondents gave 5 points to other welfare organizations for their transparency.

O.   ADOPTION OF INNOVATIONS

This parameter is used to study the dynamicity of the organizations to adopt the innovations in their operations.
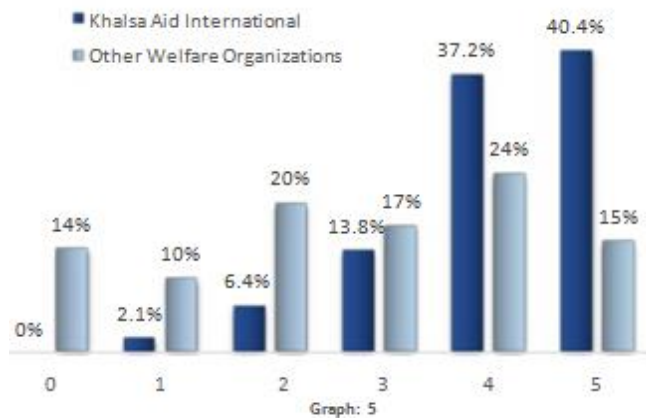
Fig.13 Adoption the Innovations of Khalsa Aid International with the Other Welfare organizations

- Khalsa Aid International

The graph5 shows that 0% of respondents gave 0 points, 2.1% of respondents gave 1 point, 6.4% of respondents gave 2 points, 13.8% of respondents gave 3 points, 37.2% of respondents gave 4 points and 40.4% of respondents gave 5 points to Khalsa Aid International.

- Other Welfare Organizations

The graph5 shows that 14% of respondents gave 0 points, 10% of respondents gave 1 point, 20% of respondents gave 2 points, 17% of respondents gave 3 points, 24% of respondents gave 4 points and 15% of respondents gave 5 points to other welfare organizations.

P.   WILLINGNESS

**V.This parameter is used to study the willingness of the respondents towards contributing or joining Khalsa Aid International. About 89% of respondents are minded to contribute or join Khalsa Aid**

ix.operations when compared to other similar organizations.

x.Khalsa Aid International adopts more innovative approaches according to the survey.

xi.Near about 90% of the respondents are willing to

International and only 11% have refused to contribute or join Khalsa Aid International.
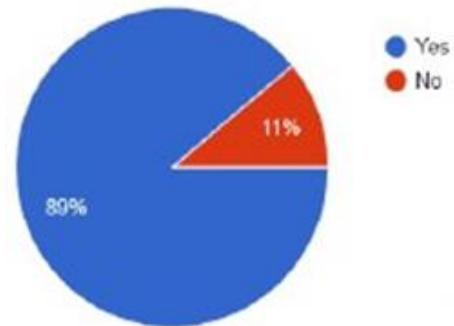
Fig.14 Willingness of the Respondents

A.   FINDINGS

i.67% of the respondents belong to the age group of 18-25 years, forming the basis for deriving the conclusion of the study.

ii.More than half of the respondents belong to the urban areas and 47% of respondents belong to north-western outskirts of the Jalandhar City.

iii.64% of the sample population participates in welfare activities which means majority of the people of the region are concerned for the welfare of society and are keen to serve the society.

iv.Near about 80% of the respondents are familiar with Khalsa Aid International and its operations.

v.Most of the people believe that Khalsa Aid International is much effective in completion of its tasks and objectives and the extent to which targeted problems are solved in comparison to other welfare organizations.

vi.About half of the sample believes that Khalsa Aid International is quite efficient in fulfilling their objectives of serving society

vii.More than 60% of the sample considers Khalsa Aid International much trustworthy than other organizations. They find Khalsa Aid International honest and unimpeachable.

viii.People find Khalsa Aid International much transparent and apparent in terms of financial

join Khalsa Aid International which signifies that youth is very much inclined towards Khalsa Aid International.

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VI.CONCLUSION

The main objective of Khalsa Aid International to providing relief to persons in need, hardships or distress as the results of disasters or social and economic circumstances is being achieved in such an effective manner that it has been successful in inculcating the values and concern about society's well-being amongst youth. According to the study, it can be concluded that most of the people are inclined towards Khalsa Aid International as they find it much effective, efficient, reliable and transparent in comparison to other welfare organizations. Youth is ready to voluntarily join Khalsa Aid International.

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Role and Effectiveness of Teaching Pedagogies: A Case Study of Selected Educational Institutions in Punjab

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Abstract- Quality human resource is the demand of the market. It is an education which moulds an aspirant to the desired product. The level of competition among the Research Scholars has also increased many folds and stress has become a buzzword among the children. The learner's of today that is an epitome of tomorrow, are not getting the quality education and are not taught of the right pedagogy. The Research Scholars are imputed only with theoretical knowledge or a less practical exposure is conferred to them. An effective teaching pedagogy is required for the Research Scholars by which they would be able to understand the lesson. It is observed that Research Scholars are more adhere in learning text books and their capability is checked only on the basis of their marks. There are limited techniques of evaluation which do not identify learner's level of attainment and thus result in frustration and disgrace among Research Scholars. Also e-learning in the form of e-journals, e-assignments, guest lecturers through video conferences also taken into consideration by the universities. The aim of the research is to identify an effective pedagogy to be preferred by the Research Scholars.For the study purpose three institutions namely CT group of institutions, Lovely professional university and Lyallpur khalsa college, all belonging to Punjab has been taken in to consideration. The reason behind selecting the said institutions is that these institutions have Research Scholars not only from different parts of India but abroad also.

Keywords: pedagogy, e-learning, practicum ,innovation ,e-journals.

I. INTRODUCTION

Teaching is an art. It needs lots and lots of efforts to educate the Research Scholars. Someone have beautifully quoted that this world is fully dark without teachers. The duty of teacher is not only to teach but to make the Research Scholar understand what he or she is teaching. The impact of teaching can be analyzed only by using the right pedagogy. Traditional classroom teaching, is still dominating in most of India and same is applicable to the education institutes of Punjab too. The education system of Punjab has witness a good growth in the recent years. Most of the schools and colleges have started adopting the latest pedagogies. A right pedagogy can be helpful in molding the Research Scholars in the desired shape and strengths as per the demands of industry. Tracing education system in Japan and

America, we can see their education system is fully practical oriented and seeing the same in the case of India it is theory oriented. The theory based education needs to be forwarded to Research Scholars in the best way. In this research work, the effectiveness of every pedagogy was measured to finalize the best pedagogy preferred by the Research Scholars. Interviewing the teachers, we came to learn that practical subject oriented teacher wants to go for traditional teaching methods as latest teaching pedagogy do not serve their problems .Education is modifications of behavior and our behavior can be modified only through the right education and right education is achieved only with right pedagogy. Teacher must know the use of right pedagogy at the right time.

For instance, in order to teach dance, if the teacher used black board in spite of audio visual it will not serve the purpose. Teacher must evaluate themselves the effectiveness of various teaching pedagogy before delivering a particular lesson. Learning is an interactive and collaborative process. Research Scholars learn better when they are active and engaged.
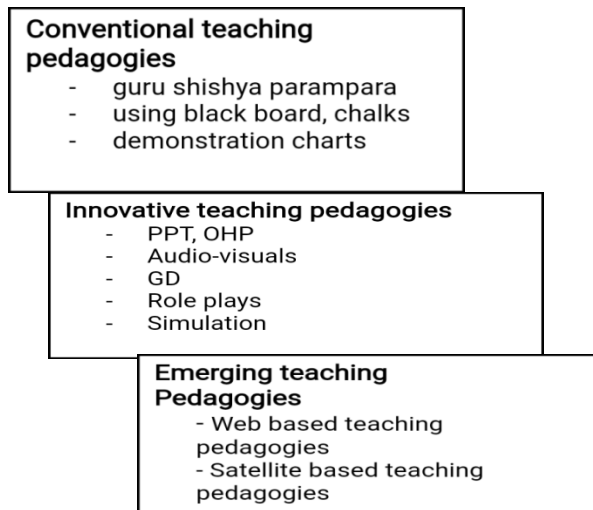
Figure 1: Different teaching pedagogies

Where as the conventional teaching pedagogies cover the traditional class room teaching methods including black board, chalks, demonstration charts, models, etc. The ancient education system involving guru, shishya, gurukul is one of the oldest teaching pedagogy. Under this system, the classes were conducted in the open, outdoor, in the lap of nature, say under the tree only. The Nalanda University of India was one of the oldest university systems of education in the world. With the technological advancements, new teaching pedagogies have emerged and have been successfully adopted in the education system of the country. These include Power point presentations, the use of over head projectors, audio-visuals, group discussion, role plays, etc. The internet and satellite technology has given an entire new dimension to the discipline of teaching pedagogy. EDUSAT is the first Indian satellite built exclusively to serve the education sector. It is already being implemented in the education institutes of Haryana.

II.   LITERATURE REVIEW

The revamping of teacher's education curricula has become the need of the hour. The orientation has to be towards a visible shift from information based to experience based and from traditional instruction domination to a constructivist orientation. The theory courses have no clear articulation with practical work and ground realities. The method courses are routine and are distanced from actual class room situations.

Table 1: Comparative study of teaching pedagogies with judgemental elements

S.no.	Teaching pedagogies Judgemental Elements	Conventional teaching pedagogies	Innovative teaching pedagogies	Emerging teaching pedagogies
1.	Cost	Cheap	Expensive (OHP, PPT & Video Conf.)	More expensive
2.	Accessibility	Easily accessible	Needs time for installation and operations	Initially time consuming
3.	Reliability	Continuous teaching possible	Technical problems may arise due to power failure etc. (PPT, OHP, and Video Conf.)	Connectivity problems may occur
4.	Feedback	Immediate	Immediate	Feedback delays
5.	Physical presence of teacher	Essential Table 1: Comparative study of teaching pedagogies with	Essential	May not be required in e-learning and satellite based lessons

Pradeep Aggarwal, 2010). Teaching using class room involves using levels of the Research Scholars on Understanding the pedagogy of the Research Scholars in a particular skills. differentiated instructions as well as supervision to meet the needs of all Research Scholars in the class room. In the space of approximately one hundred and thirty years we have moved from the industrial age through the scientific age to the technological information age and the knowledge economy. With regards to pedagogy, this dramatic shift has placed traditional approaches to teaching and learning directly in the darkest shadow-cast by an illuminating, vibrant, new vision involving a collaborative and interactive community of learners in an increasing globalized world. Both real and virtual (Jeong-Bae son, Shirley o'nell). It is not possible to teach something that you have not mastered thoroughly through your own training and investigation (Marienne Uszler). Quotations are \useful tools for providing supporting evidence for your claims but you should not rely on quotations to do the job of argumentation for you. You need to judgemental elements make your point yourself and then use the quote to support your argument, and not the other way around (Clive Opie, 2005).

III. RESEARCH METHODOLOGY

Primary data was collected thorough a questionnaire and a survey was undertaken to support it. Also interview of the faculty was also taken. Secondary data was also collected through books, Journals, etc.

IV. DATA COLLECTING PROCEDURE

In order to obtain the effectiveness of various teaching pedagogies, a questionnaire survey was chosen. It comprised of 11 questions, related to the different teaching pedagogies, and the respondents were asked to tick the right option from the 5 point likert scale ranging from 1 with "most effective", 2 with "effective", 3 with "no opinion", 4 with "some what effective" and 5 with "least effective". Survey was conducted in the third week of October, 2010. A total of 120 Research Scholars of graduation and post graduation stream were selected randomly from 3 colleges and institutes in Punjab for this study. In order to find out the most commonly adopted teaching pedagogy by the faculty, a personal interview method was adopted, in which they were asked to rank the most commonly used pedagogies. A total of about 50 faculties belonging of different .

pedagogy also involves assessing the educational .
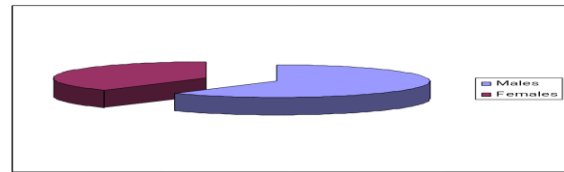
Figure: 2: Gender demographics of respondents
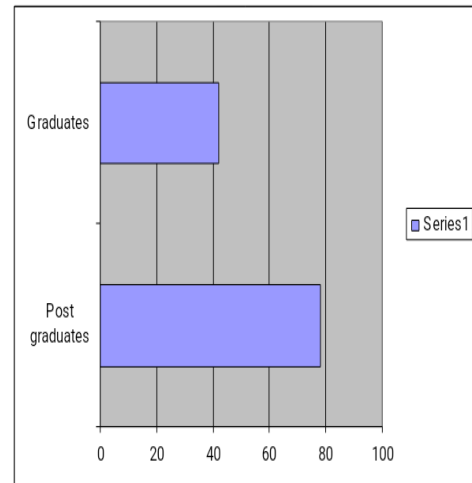
Figure 3: Education qualification of respondents

Figure 2 and figure 3 displays the gender demographics and education qualification of respondents.

I. Analysis and Results
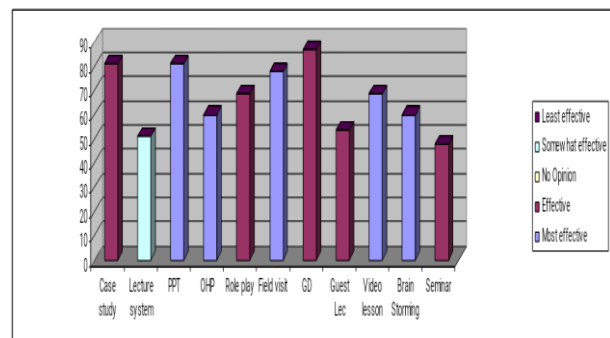
igure 4: Effectiveness of various teaching pedagogies
Source: Primary Data

● Based on the figure 4, it can be summarized that, most effective teaching pedagogy as perceived by the Research Scholars are PPT, Field visit, OHP, video lessons and brain storming, while GD, with the highest mode

value, is the effective teaching pedagogy. Case study, guest lectures and seminar based pedagogy are also effective. Interestingly, it was observed that, traditional lecture system involving black board, chalk, etc. was some what effective.
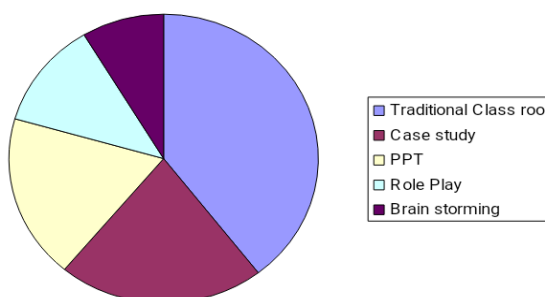
Figure 5: Source: Primary data

- The figure 5 is based on the interview of the faculty reveals that 86 % of the Faculty uses the traditional class room teaching pedagogy as the most common teaching pedagogy, while 47 % Faculty uses case study as a most commonly adopted teaching pedagogy. 40 % of the Faculty uses PPT as most commonly used teaching pedagogy, 26 % of the Faculty uses role plays and 19 % of the Faculty uses brain storming as most commonly adopted teaching pedagogy.
- The interview conducted with the Faculty highlighted that the numerical based subjects like maths, accountancy, finance, economics, computers, etc. can be taught better by using traditional class room pedagogy.

- From the study it has been found that the teachers in CT group of institutions adopt mostly traditional teaching methods, Lyallpur Khalsa college faculty is using both traditional based and seminar based teaching and Lovely professional university teachers are most of the time using power point presentations, etc. as teaching pedagogy.
- Through the course of study, it is analyzed that the choice of pedagogy also depends on the type of subject taught like geography, management, IT, etc. based subjects need a more visible mode of learning. It is analyzed that maximum faculty respondents still prefer traditional class room teaching.

V. ISSUES RELATED WITH TEACHING PEDAGOGIES

The conventional teaching pedagogies like use of black board lack thrill in the class room, are somewhat time consuming, may affect health of teacher as most of them use chalks, the graphical representation takes a lot of time, etc.

In contrast, new innovative teaching pedagogies also have some issues associated with them. Most of them depend on electronic technology like power point presentations, which may face technical failures during its operation. This may also result in data loss. Another thought of concern is its high installation cost and future maintenance. Also, if teachers use the innovative pedagogy regularly, it may loose its appeal and may become monotonous. As the technology is changing very fast and new pedagogies are emerging, it is difficult for the teachers to adopt new pedagogies. The continuous use of technological based pedagogies like power point presentations, which is completely dependent on personal computers and laptop may affect our health as some institutions have made it compulsory for the faculty to use these modern teaching aids.

VI. SUGGESTIONS AND RECOMMENDATIONS

- Before adopting a new pedagogy, the effectiveness of that particular pedagogy should be evaluated in advance by the concerned teacher among the faculty say by brainstorming etc.
- The selection of teaching pedagogies can also make a contribution towards the sustainable environmental approach. As use of pedagogies like OHP, PPT, consume lots of energy. The use of such pedagogies should be kept at limit.
- Teacher must understand the psychology of the Research Scholars before making the selection of teaching pedagogy.
- Faculty development programs should be made compulsory for the faculty as these provide a platform for the faculty to exchange ideas and discussions. It will be beneficial for them from teaching pedagogies point of view also.
- From the research work, it was analysed that Research Scholars get monotonous with same styles of teaching, so creative

pedagogies should be offered to the Research Scholars from time to time.

- It has been observed that when coege management takes feed back from the Research Scholars regarding the study, the pedagogy effectiveness criteria is not taken into consideration. It should also be included in the feedback criteria.

- The apex bodies in the field of education in India should come forward with financial aid, so that institutes can avail .

VII. CONCLUSION

From our study it has been found that most of the teachers adhere to the traditional teaching practices. As they feel it more easy and comfortable in adopting simple teaching methods. From the Research Scholar's point of view, it has been found that they find innovative teaching pedagogies like PPT, field visit, role plays, group discussion, simulations, etc. not just more appealing and interesting but also very effective. The new pedagogies have also been able to lower the stress level of Research Scholars at the same time it has increased the class room attendance. Now the time has arrived that the teachers should change their approach with time and should adopt the new teaching methods, so that the study can be made more motivating, innovative and engaging.

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Survey on the Prospect and Challenges of Tourism Industry in India

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Abstract: The travel and tourism industry has emerged as one of the largest and fastest growing sectors in the world. Its contribution to the global Gross Domestic Product and employment has increased significantly. The Indian tourism industry has emerged as one of the key drivers of growth among the services sector in India. Tourism in India is a sun rise industry, an employment generator, a significant source of foreign exchange for the country and an economic activity that helps local and host communities. Rising income levels and changing lifestyles, development of diverse tourism offerings and policy and regulatory support by the government are playing a pivotal role in shaping the travel and tourism sector in India. This study is undertaken to examine the progress made by tourism Industry within the span of 2009 to 2019. However, this study brings out some of the challenges faced by the sector of tourism such as lack of good quality.

Key words: Foreign exchange, inclusive growth, Skill development

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I. INTRODUCTION

The travel and tourism industry has emerged as one of the largest and fastest growing economic sectors globally. According to the UNWTO (2013), tourism's total contribution to worldwide GDP is estimated at 9 per cent. Tourism exports in 2012 amounted to USD 1.3 trillion accounting for 6 per cent of the world's exports. New tourist destinations, especially those in the emerging markets have started gaining prominence with traditional markets reaching maturity. Asia Pacific recorded the highest growth in the number of international tourist arrivals in 2012 at 7 per cent followed by Africa at 6 per cent. Increasingly, travel and tourism is emerging as an important category of services exports worldwide.

The word "tour" is derived from the Latin word 'tornare' and the Greek word 'tornos,' meaning 'a lathe or circle; the movement around a central point or axis.' This meaning changed in modern English

to represent 'one's turn.' In developing countries like India tourism has become one of the major sectors of the economy, contributing to a large proportion of the National Income and generating huge employment opportunities. It has become the fastest growing service industry in the country with great potentials for its further expansion and

diversification. However, there are pros and cons involved with the development of tourism industry in the country. Let us discuss the development as well as the negative and positive impacts of tourism industry in India. Tourism in India has grown in leaps and bounds over the years, with each region of India contributing something to its splendor and exuberance As per the Travel and Tourism competitiveness Report 2009 by the World Economic Forum, India is ranked 11th in the Asia Pacific region and 62nd overall, moving up three places on the list of the world's attractive destinations. The India travel and tourism industry ranked 5th in the long- term [10- year] growth and is expected to be the second largest employer in the world by 2019.

The travel and tourism sector holds strategic importance in the Indian economy providing several socio economic benefits. Provision of employment, income and foreign exchange, development or expansion of other industries such as agriculture, construction, handicrafts etc. are some of the important economic benefits provided by the tourism sector. In addition, investments in infrastructural facilities such as transportation, accommodation and other tourism related services lead to an overall development of infrastructure in the economy. According to the World Economic Forum's Travel and Tourism Competitiveness Report 2013, India ranks 11th in the Asia pacific region and 65th globally out of 140 economies

ranked on travel and tourism Competitiveness Index. India has been witnessing steady growth in its travel and tourism sector over the past few years. Total tourist visits have increased at a rate of 16.3 per cent per annum from 577 million tourists in 2008 to 1057 million tourists in 2012. The travel and tourism sector directly contributed INR 1920 billion to India's GDP in 2012 reflecting a growth CAGR of 14 per cent since 2007. This is forecasted to grow at a CAGR of 12 per cent from the estimated INR 2222 billion in the year 2013 to INR 6818 billion by 2023. The travel and tourism sector supported 25 million jobs in 2012 directly related to the tourism sector. Constituting 4.9 per cent of the total employment in the country in 2012, this is expected to amount to 31 million jobs by 2023. Capital investment in the travel and tourism sector in 2012 was estimated at INR 1761.4 billion amounting to approximately 6.2 per cent of total investment in the Indian economy. It is expected to increase by 14.2 per cent in 2013, and witness further annual growth rate of 10.5 per cent by 2023 amounting to INR 5459 billion.

In fact India has a rich source in tourism sector to influence GDP, employment, image, foreign investments, new projects and the like to make our position comfortable in globally. Challenges in Tourism industry Tourism industry in India is growing and it has vast potential for generating employment and earning large amount of foreign exchange besides giving a fillip to the country's overall economic and social development. But much more remains to be done.

II. LITERATURE REVIEW

Venkatesh., M.,& P Stanley. (2016) Impact of Tourism in India: reveals thatThe potential and performance of India's tourism industry needs to gauge in terms of its socio- economic magnitudes. It also examines the impact of India's economic growth on tourism, Contributors to economic growth, Role of Tourism industry in India's GDP, Foreign versus Domestic Tourists. Tourism is one of the fastest growing service industries in the country with great potentials for its further expansion and diversification. Tourism industry plays a major role in any country's economic development. It helps significantly to the country for creating the employment opportunities to the large number of people. Moreover, it is also one of the important engines to attract more foreign exchanges with its potential. We need to concentrate to have liberal policies, relaxation in taxes, comprehensive package and so on to influence tourist and foreign investment. There is also a need to increase the government's role to make India flourishing in tourism and established in the global market. India has rich source in tourism for the establishment of the brand. Of course India has been launched the Incredible India to make tourism better.

Aynalem., S., &Birhanu., K., &Tesefay., S (2016) Employment Opportunities & Challenges in Tourism & Hospitality Sectors : This article described that tourism is one of the main economic engines for nations with total contribution of 9.5% to global GDP and 8.9% of total employment in 2013. Tourism can only flourish if the industry can employ qualified staff or sustainable workforce which is the heart for excellent and prompt service delivery system. Thus, this review made to give summarized information about challenges and opportunities of tourism and hospitality employment. Narrative review was used where selected and related articles, reports and studies of the topic are compared and summarized. Tourism and hospitality creates diversified employment opportunities in different sectors like accommodation, food and beverage establishments, transportation services, travel agencies, tour operation companies, natural and cultural attractions sites. The challenges are poor pay and working conditions, sexual harassment, discrimination, unequal treatment, low education and training, undemocratic and rigid corporate culture, seasonality and political instability which drastically reduce the number of visitors which in turn brings high employees' turn over. Concerned stakeholders including, academicians, policy makers and business owners of tourism and hospitality shall take actions to bring sustainable work force for the development tourism and hospitality sectors.

Raju N., T., (April 2016) Prospects and emerging challenges of tourism industry in India : states that hospitality Industry and travel & tourism industry is closely inter-linked. Hospitality sector plays a key role in the total economic growth of the country. Along with the speedy industrial growth and advancement of tourism, Hospitality sector in India has achieved new heights today. Foreign travellers are showing new interest in our country, which has led to an unprecedented growth in the hospitality sector. Tourism is not merely an activity for pastime and entertainment. It is an enriching and energizing activity. For a developing country like India which is on the path of modern economic growth through structural transformation of the economy. The value-added effect of tourism is increasing. Sustainable tourism has vast scope in India by convergence of landscapes with finance scapes, techno scapes, Mediasscapes and icescapes. In the vibrant tourism industry, there is now an almost assured channel of financial flow to the country. With its forward and backward linkages with a host of sectors like transport, hospitality, education, health, banking etc. India is all set to reap full potential of this vibrant sector. At the Post globalization and under GATS many changes and

challenges are confronted by the tourism industry in India. New issues and emerging challenges of tourism industry in India are liberalization and tourism, social and political concerns, low-cost carriers outperform competition, growth drivers, increased tourist movement, economic growth, changing consumer dynamics and ease of finance, Indian tourism on a roll etc., A protocol to amend the memorandum of understanding (MoU) between ASEAN and India to strengthen tourism cooperation was also signed.

III. OBJECTIVES OF THE STUDY

1. To examine on the prospect of Indian tourism market between the year 2009-2019
2. To identify the emerging challenges face by the industry.

IV. FINDINGS

Prospects of India tourism industry 2009-2019:
India is gifted with massive diversity in culture, geography, and art which pull in a colossal measure of voyagers to the nation. Different new forms of tourism that are being introduced in recent years are also helping to build up the country's tourism industry. Medical tourism, eco-tourism, adventure tourism, and cruise tourism have also gained a lot of popularity and attention among foreigners now and have the potential for high growth in the near future. The Himalayas are the greatest assets of India in adventure tourism. Tourism industry for India is a beautifully prospering and promising field. Taking sufficient measures to confront the difficulties presented and further enhancing the prospects can guarantee unlimited chances and development of the nation.

- **Generating Income and Employment:** Tourism in India has emerged as an instrument of income and employment generation, poverty alleviation and sustainable human development. It contributes 6.23% to the national GDP and 8.78% of the total employment in India. Almost 20 million people are now working in the India's tourism industry.
- **Source of Foreign Exchange Earnings:** Tourism is an important source of foreign exchange earnings in India. This has favourable impact on the balance of payment of the country. The tourism industry in India generated about US$100 billion in 2008 and that increased to US$275.5 billion by 2018 at a 9.4% annual growth rate.
- **Preservation of National Heritage and Environment:** Tourism helps preserve several places which are of historical importance by declaring them as heritage sites. For instance, the Taj Mahal, the Qutab Minar, Ajanta and Ellora temples, etc, would have been decayed and destroyed had it not been for the efforts taken by Tourism Department to preserve them. Likewise, tourism also helps in conserving the natural habitats of many endangered species.
- **Developing Infrastructure:** Tourism tends to encourage the development of multiple-use infrastructure that benefits the host community, including various means of transports, health care facilities, and sports centers, in addition to the hotels and high-end restaurants that cater to foreign visitors. The development of infrastructure has in turn induced the development of other directly productive activities.
- **Promoting Peace and Stability:** Honey and Gilpin (2009) suggests that the tourism industry can also help promote peace and stability in developing country like India by providing jobs, generating income, diversifying the economy, protecting the environment, and promoting cross-cultural awareness. However, key challenges like adoption of regulatory frameworks, mechanisms to reduce crime and corruption, etc, must be addressed if peace-enhancing benefits from this industry are to be realized.

Emerging challenges faced by tourism industry in India 2009-2019:
- **Undesirable Social and Cultural Change:** Tourism sometimes led to the destruction of the social fabric of a community. The more tourists coming into a place, the more the perceived risk of that place losing its identity. A good example is Goa. From the late 60's to the early 80's when the Hippy culture was at its height, Goa was a haven for such hippies. Here they came in thousands and changed the whole culture of the state leading to a rise in the use of drugs, prostitution and human trafficking. This had a ripple effect on the country.
- **Increase Tension and Hostility:** Tourism can increase tension, hostility, and suspicion between the tourists and the local communities when there is no respect and understanding for each other's culture and way of life. This may

further lead to violence and other crimes committed against the tourists. The recent crime committed against Russian tourist in Goa is a case in point.

- **Creating a sense of antipathy:**Tourism brought little benefits to the local community. In most all-inclusive package tours more than 80% of travelers' fees go to the airlines, hotels and other international companies, not to local businessmen and workers. Moreover, large hotel chain restaurants often import food to satisfy foreign visitors and rarely employ local staff for senior management positions, preventing local farmers and workers from reaping the benefit of their presence. This has often created a sense of antipathy towards the tourists and the government.

- **Adverse Effects on Environment and Ecology:** One of the most important adverse effects of tourism on the environment is increased pressure on the carrying capacity of the ecosystem in each tourist locality. Increased transport and construction activities led to large scale deforestation and destabilization of natural landforms, while increased tourist flow led to increase in solid waste dumping as well as depletion of water and fuel resources. Flow of tourists to ecologically sensitive areas resulted in destruction of rare and endangered species due to trampling, killing, disturbance of breeding habitats. Noise pollution from vehicles and public address systems, water pollution, vehicular emissions, untreated sewage, etc. also have direct effects on bio-diversity, ambient environment and general profile of tourist spots.

- **Lack of proper infrastructure:** An entrenched framework of infrastructure which includes proper transportation facilities, health facilities, stable, and uninterrupted connectivity and other human resources are mandatory for stable tourism. India positioned 112nd in the ICT readiness component and 104th rank in the health and hygiene components of the WEF's Travel and Tourism Competitiveness Index, 2017. This basically mirrors the poor quality infrastructure our nation has. One of the significant reasons for this is the improper allocation of financial resources for the tourism sector. If we look at the 2017-18 budget we can see that only 1840

crore was allocated for a prospering and promising sector like tourism

- . Insufficient promotion and marketing:Great promotion and enough marketing push are excessively indispensable for a nation's travel industry improvement. Be that as it may, in India, the financial backing allotted to help and advance the travel industry is moderately less contrasted with other tourist destinations. At present India needs a colossal move from the conventional marketing techniques that are still being followed to a much modern approach.Taxation:High taxes on the entire industry including the airline facilities, hotels, and tour operators are highly expensive. This is the one main reason why India loses to other less expensive countries when it comes to tourism. For instance, consider the price of air tickets. It varies in all the 29 states.

V. CONCLUSIONS

Today's world, tourism and hospitality Industry are the fastest growing sectorhighly to the economy of the country. It improves payments as well as income creation along with employment generations. Recent data from various researchers shows that tourism and travel industry created over 276 million jobs generating 9.8% GDP. Due to this improvement and development a developing and developed countries like India give major attention to creation of quality employees in tourism industries to contribute more to the sector which helped in the country's development.

Based on the review from various journals tourism and hospitality industries created many jobs opportunities all around the world in different areas like hotels, food and beverage, fast food outlets, pubs, nightclubs, airport, rental cars, travel agencies, ships, boat, cruises, land transport , etc. Cultural and natural destinations such as museum, national parks, festivals,carnivals, conferences, trade shows, exhibitions, galleries, theatres are also developed and renovated to serve the tourist better in order to generate more tourists and income of the country and citizens of India.

We all know that when there is an improvement and development it goes hand in hand with challenges such as unfair treatment among men and women employees, untrained workforce, poor working conditions, safely and security problems, several harassment, low salary, depletion of natural and cultural heritage (monuments), socio- cultural related issues etc. Therefore, it is crucial to know how to balance both the prospects / progress and the challenges in order to keep the Industry exist for a long run. The Government should take certain

measures in order to sustain the Industry to flourish for a longer period of time.

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Show Rooming and Web Rooming: Consumer Preferences and Futuristic Approach

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Abstract: This research paper brings two buzzwords in lime light Show Rooming and Web Rooming , which are not new but still more research is required in this aspect. Earlier it was said that the customers are the king of market but in this era it would not be wrong to say that it is the customer, who is the creator as well as destructor of the market. Generation Z is more smart, more active, more creative and they all are well connected to each other as they have strong social networks through Face book, Instagram, Whatsapp, Twitter etc. which has joined them digitally and unconditionally. Each and every person is using mobile and they all access internet so easily and quickly. Due to which their consumption has become unique and unlimited. Marketers need to develop such a strategy to understand the customers so that they can easily anticipate their moves. This research paper aims to understand the terms of Show Rooming and Web Rooming, through customers prospective in a better way. Customer will make their mind for a purchase intention only when they are completely satisfied. In this paper, an effort is made to compare both shopping formats to find which has a brighter future

Keywords — Show rooming, Web rooming

I.INTRODUCTION

Consumer Behavior is a broad field of study which seems to be simple but it is equally difficult to understand as marketing managers are always eager to know more about the consumers. "Consumer behavior" has been defined as "the behavior that consumers display in searching for acquiring, using, evaluating, and disposing of products, services, and ideas which they expect will satisfy their needs" (Schiffman and Kanuk). According to recent marketing theories, consumer behavior is not only influenced by family, friends, advertising, and role models but also by consumer's mood, emotions and their situation. Consumer in today's era is smarter, more intelligent and more connected, than ever before. As the commerce is becoming digital, customers are empowered to explore quickly, research anything and make their own purchase decisions. They are well equipped with smart phones or Tablets, through which they can shop any time, any where and when ever they feel convenient. Each and every consumer is different and special in the way he shops or in the way he makes decisions. The Heterogeneity among consumers makes them unique and difficult task for marketers to understand their minds. Customer's satisfaction is the only "Mantra" to achieve success in the market, as it is said that consumer is the "King of Market".

"Web Rooming" is the most recent buzzword of the retail sector. Show rooming and Web rooming are not unknown terms; in fact both the terms are opposites of each other. In each process, the customers at the end buy the product according to his comfort and preferences only. Show rooming is made for the ultimate "Deal Seekers" who will visit a physical store, have a conversation, with a sale person, touch and feel the product, give it a trial and then finally order them on their smart phone screen at the lowest price.

Web rooming is a pre purchase research done by customers to gain more information and knowledge of the market. Conducting research online but deciding to purchase in-store (Philips, 2013) where customers can touch feel and observe the products, before buying them is termed as Web Rooming which is exactly reverse to the later term, show rooming. The main objective of research study is to compare Show Rooming and Web Rooming and to find out which is most preferred or favorable format of shopping and to find out which format (Show Rooming and Web Rooming) has bright future.

II.LITERATURE REVIEW

Kolemainen and Tatja (2018) the study is based on all such drivers as well as motivations which exist behind the SHOWROOMING behavior of a customer. The goal of the study is to find all such factors to know the intentions of the customers before deciding a shopping format. After analyzing it has been revealed that when customers visit showroom, they find information online regarding prices, product attractiveness, different offers and deals available. Electronics, Clothes, Cosmetics and shoes are highly showing roomed products which is mainly popular among younger people.

Gensler et al. (2017) has investigated the empirical impact of channel related factors on the consumer decisions to engage in competitive Show rooming and the survey gave the output that customer perception and perception of larger price dispersion on line is positively associated with show rooming.

On line search costs, greater availability in store sales personnel, consumers time pressure all are negatively associated with show rooming.

Klein and Schmitz (2016) found that although cross-format patronage has become a common phenomenon in markets for Fast Moving Consumer Goods (FMCG), research on consumers' specific cross-format combinations are limited. They studied those shopping patterns by focusing on retail format utilization. A qualitative pre-study demonstrated consumers' patronizing combinations of typical retail formats in FMCG with main-format usage and provides underlying differences in consumers' perceived shopping utility for cross-format selection, which results from their utilized main-format. Our quantitative study reveals three clusters with main-format dominance, that is, mainly supermarket, discount store, and hypermarket shopper's complementarily utilizing fill-in formats to a much lesser extent. Whereas we found high inter-format loyalty in each consumer group, intra-format loyalty significantly varies between clusters. ANOVA and post hoc-tests concerning perceived shopping utility dimensions show that consumers' perceived acquisition utility rather than perceived transaction costs significantly differs between consumer group. On line search costs, greater availability in store sales personnel, consumers time pressure all are negatively associated with show rooming.

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Luceri and Latusi (2016) studies to investigate thecross-format shopping behavior in the apparel sector. The purpose of the study was to relate the number of store formats patronized to a set of consumer characteristics under a unifying theoretical framework emphasizing cost-benefit analysis. The research involved questionnaire telephone surveys from a sample of 1,722 apparel shoppers in a European region. Among shoppers' socio-demographic characteristics, age, gender, employment status and citizenship were found to have an impact on multi-store format patronage patterns for apparel purchases. Moreover, the store format preference and the sale proneness proved to be additional determinants of cross-format mobility. The findings provide retail managers with valuable insights for effective marketing strategies aimed to exploit customer loyalty potential. the study quoted that despite consumers' regular use of various alternative store formats for apparel purchases, literature on the determinants of cross-format mobility is scarce. Addressing the inter-type cross-shopping behavior of consumers from a cost-benefit viewpoint, this study makes a new contribution in the area of customer loyalty and the complementarily and substitutability of store formats. **Linden(2015)** searched the different marketing tools currently employed by retailers, importance of mobile marketing and general trends affecting it. Qualitative

research methods and three semi structured interviews were used to prove the authenticity of the study conducted. With the mobile marketing, marketers are able to target the market, in a better way and according to current market expectations video marketing on mobile will increase within few years..

III.RESEARCH METHODOLOGY

The sample has been taken from three cities of Punjab, namely Amritsar, Ludhiana and Jalandhar. 340 customers between the age group of 18 to 35 were surveyed, out of which 68% are females, 32.% are males. This often leads to confusion because equations do not balance dimensionally. If you must use mixed units, clearly state the units for each quantity in an equation. List of tools which are followings:

The most common and appropriate way is selected to gather data i.e. questionnaire method which carried 19 questions. In addition, an open ended question was also asked from the people regarding their suggestions to understand them better.

IV.RESULTS AND DISCUSSIONS
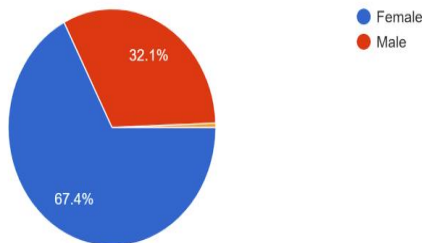
Fig 1: represents 340 respondents 68% are females and 32% are males.
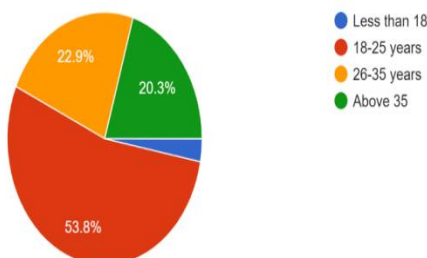
Fig 2: Age wise distribution of respondents

Fig 1 depicts that 53.8% are between the age group of 18-25 years; around 23% are 26-35 years and above 35 are 20.3%.
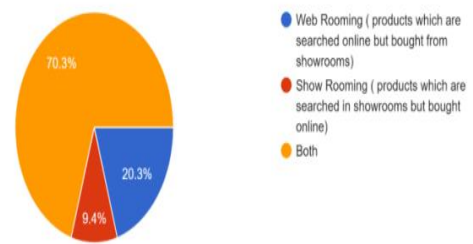
Fig 3: represents that 70.3% respondents prefer both formats of shopping i.e. Show

Rooming as well as Web Rooming. Ratio of 20.3% respondents is in favor of Web Rooming but ratio of online shoppers is just 9.4%.
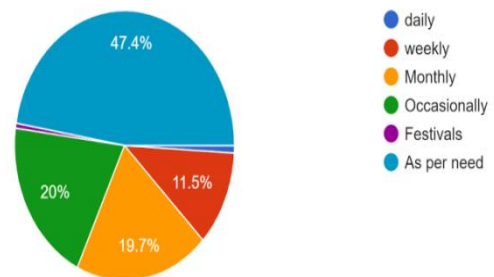
Fig 4 reveals that the frequency of shopping, 47.4% shops only as per need and on the other side 20% shops occasionally,19.7%monthly and just 11.5% prefer to shop weekly.
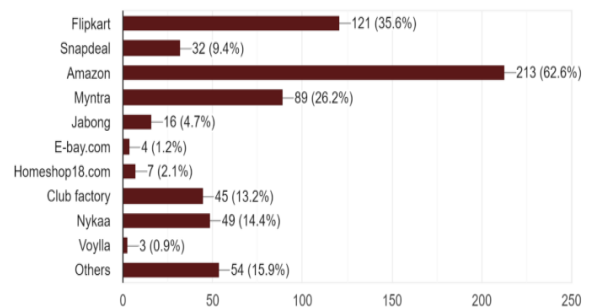
Fig: 5 Preferences regarding Apps for shopping

Fig 1.5 explains that Amazon is the first choice as it has maximum number of users i.e. 62.6%, rest apps like Flip kart 35.6%, Myntra 26.2%, club factory and Nykaa have almost same users but Voylla has least followers.
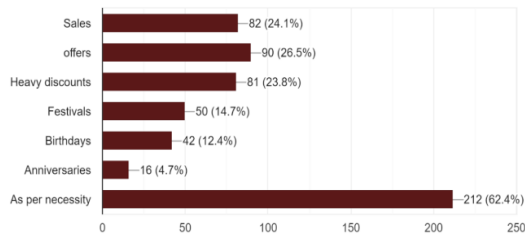
Fig: 6 Preference of Shopping during different occasions

Fig 1.6 explains that 62.4% shop only as per necessity, 26.5% prefer to buy during offers only, 23.8% during heavy discounts and just 14.7% on festivals and 12.4% on birthdays.
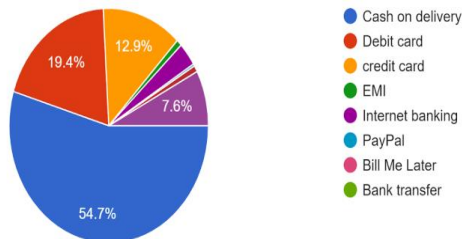
Fig 7 Mode of Payment during Shopping Online

Obtained results regarding mode of payment showed that 54.7% prefers to use COD i.e. cash on delivery, as against others who prefer online payments like 19.4% use debit cards,12.9% are in favor of credit cards and around 7.6% use internet banking.
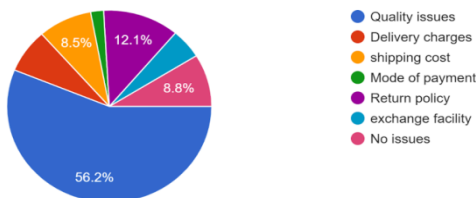
Fig: 8 Main challenges faced while shopping online

Although the popularity of shopping apps are increasing day by day but still there are certain loopholes in this format, as per this survey 56.2% respondents are facing the biggest issue regarding the quality of products, 12.1% are not satisfied with the return policy, there are a lot of other issues like delivery charges, shipping cost, exchange of goods, mode of payment which are faced by the customers.
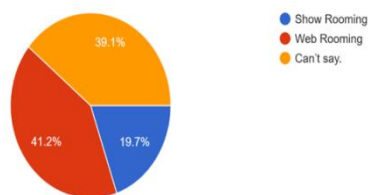
Fig: 9 Main challenges faced while shopping online
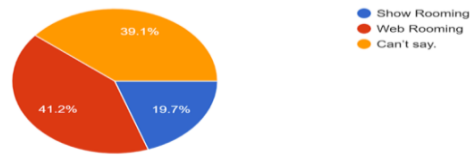
Fig: 10 Main challenges

After conducting the survey and analyzing so many parameters, it has been found that both shopping formats are in trend among the customers, both have certain advantages as well as disadvantages. Customers always prefer to buy as per their comfort only and from where they get the best offer and dealings. From the above Pie Chart, majority of respondents i.e. 41.2% are in favor of web rooming, 39.1% says that they are not sure that which format will have bright future, 19.7% says that show rooming will be in trend in coming days.

V. Conclusion

The survey revealed that both shopping formats are preferable by the shoppers but still the ratio of web roomers are more as compared to show roomers which means customers feel more satisfied to shop from showrooms after surfing and investigating products through internet. Maximum number of customers shop only as per their requirement. "Amazon" is the first choice of customers, in spite of lots of mode of payment methods customers still prefer C.O.D. as per survey, and the major issue is of the quality of products which the customers are facing.

VI. Limitations

The study is based on the survey of only three cities, so it has revealed the shopping patron of only 340 customers moreover convenience sampling method was used which too has certain limitations. The biased behavior of the respondents towards a particular aspect is non removable from the study. A very limited research has been done on this aspect, especially on the Indian Customers.

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Comparative Analysis of Job Satisfaction Among Male and Female Faculty Members Working in Private Management Colleges in Jalandhar Region of Punjab

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Abstract: Generally job satisfaction is related with number of employee's variables such as turnover, absence, age, occupation and size of the organization in which he works. The degree of satisfaction of job is largely depends on satisfaction of employee variables. According to Garton (1976), employee's satisfaction and morale are attitudinal variables that reflect positive or negative feelings about particular persons or situations, satisfaction when applied to work context of teaching seems to refer to the extent to which a teacher can meet individual, personal and professional needs as an employees. In this paper the author used gender as the main variable in comparing the Job satisfaction of the faculty members working in selected private management colleges in Jalandhar district of Punjab with respect to Leadership style, Co-workers, cooperation, Salary, Promotion, Job security, Size of the organization, Relationship with superior, Personal Growth, Research Environment, Stress. The primary data with the help of a questionnaire was collected from the faculty members of KCL-IMT, APJIMT, LSB, SSIMT, CTIMT. The sample size for the survey taken was 70. Convenience and snowball sampling was used while choosing the sample. The data was analyzed by applying ANOVA to compare the difference in the satisfaction level with respect to Gender as the independent variable. On analyzing the data the researchers came to the conclusion that there is no significant difference in the satisfaction level of teachers with Gender as the main predictor variable.

Keywords: Job satisfaction, Teachers, Private Management Colleges, ANOVA

I.   INTRODUCTION

A.   *Importance of Job Satisfaction*

Human life has become very complex and completed in now-a-days. In modern society the needs and requirements of the people are ever increasing and ever changing. When the people are ever increasing and ever changing, when the people's needs are not fulfilled they become dissatisfied. Dissatisfied people are likely to contribute very little for any purpose. Job satisfaction of workers /employees is very important for the industry to function successfully. Apart from managerial and technical aspects,

employers can be considered as backbone of any industrial development. To utilize their contribution they should be provided with good working conditions to boost their job satisfaction. Any business can achieve success and peace only when the problem of satisfaction and dissatisfaction of workers are felt understood and solved with them scientific investigation serves the purpose to solve the human problems in the industry.

B.   *Job Satisfaction :*

Job satisfaction is a general attitude towards one's job: the difference between the amount of reward workers receive and the amount they believe they should receive.

Job satisfaction is the amount of pleasure or contentment associated with a job. If you like your job intensely, you will experience high job satisfaction. If you dislike your job intensely, you will experience job dissatisfaction

C.   *Factors of Job Satisfaction:*

Pay: Pay is instrumental in fulfilling so many needs. Money facilities the obtaining of food, shelter, and clothing and provides the means to enjoy valued leisure interest outside of work. More over, pay can serve as symbol of achievement and a source of recognition. Employees often see pay as a reflection of organization. Fringe benefits have not been found to have strong influence on job satisfaction as direct wages.

The work itself: Along with pay, the content of the work itself plays a very major role in determining

how satisfied employees are with their jobs. By and large, workers want jobs that are challenging; they do want to be doing mindless jobs day after day. The two most important aspect of the work itself that influence job satisfaction are variety and control over work methods and work place. In general, job with a moderate amount of variety produce the most job satisfaction.

Promotion: Promotional opportunities have a moderate impact on job satisfaction. A promotion to a higher level in an organization typically involves positive changes. Supervision, job content and pay. Jobs that are at the higher level of an organization usually provide workers with more freedom, more challenging work assignments and high salary.

The work group: Having friendly and co-operative co-workers is a modest source of job satisfaction to individual employees. The working groups also serve as a social support system of employees. People often used their co-workers as sounding board for their problem of as a source of comfort.

Working condition: The employees desire good working condition because they lead to greater physical comfort. The working conditions are important to employees because they can influence life outside of work. If people are require to work long hours and / or overtime, they will have very little felt for their families, friends and recreation outside work.

Supervision: Employee centered or consideration supervisors who establish a supportive The other dimension of supervisory style influence participation in decision making, employee who participates in decision that affect their job, display a much higher level of satisfaction with supervisor and the overall work situation.

II. LITERATURE REVIEW

The Indian Education Commission (1964-66) states that 'nothing is more important than providing teacher's best professional preparation and creating satisfactory conditions of work in which they carefully effective.' Sand Frankiewiz (1979) found a positive relationship between job satisfaction and effective teacher behaviour. In the light of the above the theoretical framework of teacher job satisfaction may be considered as one of the important factors, which can enhance teaching competency.

There are also different theories that describe the concept of job satisfaction. Like Life discrepancy theory by Locke (1969) and equity theory by Mowday (1992). According to discrepancy theory the difference between the actual outcome and excepted outcome tells us about the satisfaction level of the employee (Lawler, 1973). If the actual outcome is greater than the excepted one, the employees would more satisfy with their work and vice versa. According to equity theory employees compare their input/output with the other individuals. If the ratio of one employee equal to the other, the individual would more pleased with his/her job. Equity has been associated with satisfaction and inequity with dissatisfaction.

Lawler (1973) defines that job satisfaction is one-dimensional. Employs are either happy or unhappy with their work. But other scholar Smith, Kendall and Hulin (1969) says that job satisfaction is multidimensional, Employ may be more satisfied or less with the factors that affect their jobs i.e. Someone may be more satisfied with his pay but less satisfied with the supervisor or the promotion opportunities.

Edwin Locke's (1976) classic definition of job satisfaction has been widely cited in the literature. Locke defines job satisfaction as "a pleasurable or positive emotional state resulting from an appraisal of one's job or job experiences" (p. 1300). Similarly, Hackman & Oldham (1975) provide an implicit definition of job satisfaction as one's affective reactions to his/her job in their Job Characteristics Model. Both definitions are essentially the same, indicating that job satisfaction is one's "emotional reactions" to one's job.

Linda Evans (1997, 2002) addressed the issue of job satisfaction conceptualization in a qualitative study designed to assess the morale and job satisfaction of teachers. Her reasoning was not to establish a link between satisfaction and retention but to respond to an earlier study that questioned the applicability of Herzberg's motivational hygiene theory in education. In her study, she asked teachers what factors they were s*atisfied by*, what factors they were *satisfied with*, and what factors they were *dissatisfied with*. Evans' main focus was upon satisfaction factors and she discovered that there is a difference between factors the teachers were *satisfied by* and those they were *satisfied with*. She defined the former, *satisfied by*, as factors the teachers found to be fulfilling or

motivating. The latter, *satisfied with,* were factors the teachers found to be acceptable, but not fulfilling. In a similar manner as Herzberg's extrinsic factors, the *satisfied with* factors could lead to dissatisfaction if removed but were by no means a factor of fulfillment. Evans later referred to her *satisfied by/satisfied with* dichotomy as *job fulfillment* and *job Contentment.*

As teachers perform very momentous role in the improvement and grooming of their Research Scholars, so job satisfaction is also extremely vital for teachers to execute their duty well. The responsibility of a teacher is not only to provide new understanding to the Research Scholars but also train the Research Scholars for their future life (Siddique, Malik, Abbass, 2002). When the teachers will be satisfied with the job they can perform better. They can deliver their lectures more effectively and enhance the capabilities of Research Scholars with more devotion. Trabue (1993) suggested that profound satisfaction is the actual return of a teacher and if a teacher is satisfied in all dimensions he/she can turn up to the public expectations (Siddiqueetal,2002)

There is a wide range of literature is available on the factors which affect the satisfaction level of the workforce. As suggested by one researcher main elements in work satisfaction are: the work itself, salary, promotion, recognition and co-workers. Smith et al. (1969) also described in their t"job satisfaction index" these factors .Fringe benefits, job security, working condition are some other factors that affect the satisfaction intensity of the teachers along with the above factors (Santhepparaj & Alam,2005).

Ronit (2001) studied 'The Influence of Leadership Style on Teacher Job Satisfaction'. This study disclosed the effects of principals' leadership style (transformational or transactional), principals' decision-making strategy (autocratic versus participative), and teachers' occupation perceptions on teacher satisfaction from the job. More specifically, it attempts to find out how much of the variation in teachers' job satisfaction can be attributed to their perceptions of their occupation, as compared to their perceptions about their principals' leadership style and decision-making strategy.

E Chung-Lim Ho and Wing-Tung Au of Chinese University of Hong Kong (2006) studied 'an u Teaching Satisfaction Scale' to measure Job Satisfaction of Teachers in China. In the present study proposes a teaching satisfaction measure and examines the validity of its scores. The measure is based on the Life Satisfaction Scale (LSS). Scores on the five-item Teaching Satisfaction Scale (TSS) were validated on a sample of 202 primary and secondary school teachers and favorable psychometric properties were found. As hypothesized, teaching satisfaction as measured by the TSS correlated positively with self-esteem but negatively with psychological distress and teaching stress. The TSS scores had good incremental validity for psychological distress and teaching stress beyond earlier Job Satisfaction Scales.

III. OBJECTIVES & HYPOTHESIS

A. *Primary Objective:*

To compare the job satisfaction level among the Male and Female faculty members of private management colleges in Jalandhar region of Punjab with respect to Co-workers, team work, Salary, Promotion, Job security, Size of the organization, Research Environment, Stress, Work load, Research Scholars Response.

B. *Hypothesis:*

H_{01}- There is no significant difference in the satisfaction level of male and female employees w.r.t co-worker's attitude

H_{02}- : There is no significant difference in the satisfaction level of male and female employees w.r.t Teamwork.

H_{03}- There is no significant difference in the satisfactions level of male and female faculty members w.r.t. Salary.

H_{04}- There is no significant difference in the satisfactions level of male and female faculty members w.r.t. Promotions.

H_{05}- There is no significant difference in the satisfaction level of male and female employees w.r.t job security.

H_{06}-There is no significant difference in the satisfaction level of male and female employees w.r.t Size of the organization

H_{07}-There is no significant difference in the satisfaction level of male and female employees w.r.t research environment

H_{08}- There is no significant difference in the satisfaction level of male and female employees w.r.t Stress

IV. RESEARCH DESIGN

The primary data with the help of a questionnaire was collected from the faculty members of KCL-IMT, APJIMT, LSB, SSIMT, CTIMT. The sample size for the survey taken was 70 (35 Males & 35 Females). Convenience and snowball sampling was used while choosing the sample. The data was analyzed by applying ANOVA to compare the difference in the satisfaction level with respect to Gender as the independent variable.

V. DATA ANALYSIS & INTERPRETATION

The ANOVA was applied on the responses obtained from the respondents through a five point Likert scale consisting the questions related to parameters set in the objectives and hypothesis. The SPSS was used for calculating the ANOVA values.

The following results were obtained:

H_{01}- There is no significant difference in the satisfaction level of male and female employees w.r.t co-worker's attitude

Interpretation: As the calculated p value .642 > 0.05 So, the Null hypothesis is accepted. It means there is no significant difference in satisfaction level towards *co worker's behavior* among males and females faculty members.(Table 1)

Table1:Between-Subjects Factors

Gen	Value Label	N
1	male	35
2	female	35

Table1: Tests of Between-Subjects Effects

Dependent Variable: Coworker behaviour a. R Squared = .003 (Adjusted R Squared = -.011)

Interpretation: As the calculated p value .258 > 0.05 so, the Null hypothesis is accepted. It means there is no significant difference in satisfaction level towards *teamwork* among males and females faculty members. (Table 2)

Table2: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	.418ᵃ	1	.418	1.299	.258
Intercept	1175.389	1	1175.389	3.653E3	.000
Gender	.418	1	.418	1.299	.258
Error	21.882	68	.322		
Total	1199.000	70			
Corrected Total	22.300	69			

H_{03}- There is no significant difference in the satisfactions level of male and female faculty members w.r.t. Salary.

Interpretation: As the calculated p value .446 > 0.05 so, the Null hypothesis is accepted. It means there is no significant difference in satisfaction level towards *salary* among males and females faculty members. (Table 3)

Table 3: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	.236ᵃ	1	.236	.589	.446
Intercept	863.322	1	863.322	2.154E3	.000
Gender	.236	1	.236	.589	.446
Error	27.250	68	.401		
Total	892.000	70			
Corrected Total	27.486	69			

H_{04}- There is no significant difference in the satisfactions level of male and female faculty members w.r.t. Promotions.

Interpretation: As the calculated p value .524 > 0.05 so, the Null hypothesis is accepted. It means there is no significant difference in satisfaction level towards *promotions* among males and females faculty members. (Table 4)

Table 4: Tests of Between-Subjects Effects

Dependent Variable: Promotions

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	.236ᵃ	1	.236	.589	.446
Intercept	863.322	1	863.322	2.154E3	.000
Gender	.236	1	.236	.589	.446
Error	27.250	68	.401		
Total	892.000	70			
Corrected Total	27.486	69			

a. R Squared = .006 (Adjusted R Squared = -.009)

H_{05}- There is no significant difference in the satisfaction level of male and female employees w.r.t job security

Interpretation: As the calculated p value .116 > 0.05 so, the Null hypothesis is accepted. It means there is no significant difference in satisfaction level towards *job security* among males and females faculty members. (Table 5)

Table 5: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1.483ᵃ	1	1.483	2.528	.116
Intercept	829.883	1	829.883	1.415E3	.000
Gender	1.483	1	1.483	2.528	.116
Error	39.889	68	.587		
Total	878.000	70			
Corrected Total	41.371	69			

H_{06}-There is no significant difference in the satisfaction level of male and female employees w.r.t Size of the organization

Interpretation: As the calculated p value .700 > 0.05 so, the Null hypothesis is accepted. It means there is no significant difference in satisfaction level towards *size of organization* among males and females faculty members. (Table 6)

Table6: Tests of Between-Subjects Effects
Dependent Variable: Size of organization

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	.053ᵃ	1	.053	.150	.700
Intercept	970.795	1	970.795	2.775E3	.000
Gender	.053	1	.053	.150	.700
Error	23.790	68	.350		
Total	997.000	70			
Corrected Total	23.843	69			

a. R Squared = .002 (Adjusted R Squared = -.012)

H_{07}-There is no significant difference in the satisfaction level of male and female employees w.r.t research environment

Interpretation: As the calculated p value .010 < 0.05 so, the Null hypothesis is rejected. It means there is a significant difference in satisfaction level towards *research environment* among males and females faculty members. (Table 7)

Table7: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3.007ᵃ	1	3.007	7.092	.010
Intercept	1052.150	1	1052.150	2.481E3	.000
Gender	3.007	1	3.007	7.092	.010
Error	28.835	68	.424		
Total	1081.000	70			
Corrected Total	31.843	69			

Dependent Variable: Research environment
a. R Squared = .094 (Adjusted R Squared = .081)

H_{08}- There is no significant difference in the satisfaction level of male and female employees w.r.t Stress

Interpretation: As the calculated p value .824 > 0.05 so, the Null hypothesis is accepted. It means there is no significant difference in satisfaction level towards *stress* among males and females faculty members. (Table 8)

Table8: Tests of Between-Subjects Effects
Dependent Variable: Stress

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.023ᵃ	1	.023	.050	.824
Intercept	766.880	1	766.880	1.679E3	.000
Gender	.023	1	.023	.050	.824
Error	31.063	68	.457		
Total	800.000	70			
Corrected Total	31.086	69			

a. R Squared = .001 (Adjusted R Squared = -.014)

VI. CONCLUSION

From the above discussion it has been found that there is no significant difference in the satisfaction

level of male and female faculty members w,r.t. Co-workers attitude, teamwork, salary, promotions, stress, job security, size of the organization, which means that males and females are equally satisfied. But there exists a significant difference in the satisfaction level towards research orientation by the institutes. There exists a variation in the responses of faculty members. So this gives us a point of further discussion which can further be explored separately for future research.

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Achievement Motivation in Relation to Academic Achievement of Secondary School Students

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Abstract- **This study attempts to find correlation between Achievement Motivation and Academic Achievement of secondary school Students. It tries to measure a Student's motivation and relate it to the achievement in academics. If the Students have high motivation, then they will score high. Similarly, if the Students are not motivated, or afraid that they will not be able to achieve high in academics. This study hopes to identify those motivation choices. The issues of motivation of Students in education and the impact on academic performance are considered as an important aspect of effective learning. However, a learner's reaction to education determines the extent to which he or she will go in education. The impact of motivation on education of a child cannobe undermined. That is why Hall (1989) believes that there is a need to motivate pupils so as to arouse and sustain their interest in learning. Motivation raises question on why people behave in the way they do it".**

Key Words: Achievement Motivation, Academic Achievement, Motive, Drive

I.INTRODUCTION

In today's world, achievement is considered to be a key factor for personal and social progress. In the present competitive world everybody desires for a high level of achievement. Today's modern society expects everyone to be a high achiever. The willingness of the Students to actively participate in the academic process is defined as motivation. Motivation is generally defined as internal condition that stimulates, direct and maintains behavior. There is a strong relationship between learning and motivation. Motivation is the inner state of mind that generates a drives until the need is achieved. According to Tucker (2002) motivation is an academic engagement that leads to Students' cognitive, emotional and behavioral aspect of education. The motivation that produces a desire for better success or achievement is called achievement motivation.

Achievement motivation is ones' willingness to perform well and succeed. Such willingness can be materialized in ambition; the excitement that goes together with competence, Student's tendency tobecome independent, confront challenges, ability to resolve them, and showing the boldness to take medium risk assignments rather than low level or extreme ones. Researchers seek to promote the internal motives of Students towards studying. Once such mission is accomplished;

teachers and parents will no longer seek external motives to encourage Students to take part in learning activities. There are different interpretations formotivation. In the discipline of education motivation is a tridimensional phenomenon consisting of individuals belief's in ability in carrying out a specific task, reasons and goals of the individuals in doing the task and the emotional response concerning carrying out the task (Hassanzadegh and Amuee 2001). Psychologists have noted that motivation should be taken into account in education because of its effective relationship with new learning, abilities, strategies and behaviours (Shahraray 2007) and they have presented motivation for academic achievement as one of the preliminary constructs for defining such type of motivation. Motivation for academic achievement is attributed to behaviours which lead to learning and achievement (Masaali 2007). In other words, motivation for academic achievement is such a pervasive inclination towards doing a task successfully in a particular context and assessing the performance spontaneously. The bulk of behaviours indicating the academic motivation involve insisting on doing difficult assignments, hard working or effort into learning to reach mastery and choosing assignments which need great efforts (Abedi 2008).

II.STATEMENT OF THE PROBLEM

The problem has been stated as follows:-
Achievement Motivation in relation to Academic Achievement of secondary school Students
Operational definition of Variables
Achievement Motivation
Achievement motivation for the present study refers to the scores obtained by the sample subjects on achievement motivation (n-ach) scale by V.P.Bhargava (2011).
Academic Achievement
Academic achievement for the present investigation consisted of the aggregate marks secured by the sample subjects in the half yearly exams of IX class.

III.DELIMITATIONS OF THE PROBLEM

The problem was delimited to following areas:-
- The study was restricted to secondary schools of Jalandhar city.
- The study was restricted to co-education secondary schools of Jalandhar city.
- The study was restricted to IX class Students.

IV. OBJECTIVES

1. To study the level of achievement motivation among secondary school Students.
2. To study the level of academic achievement among secondary school Students.
3. To investigate significant differencein achievement motivation among secondary school Students in relation to gender.
4. To investigate significant difference in self-concept among secondary school Students in relation to gender.
5. To find out the significant relationship between achievement motivation and academic achievement among secondary school Students.

IV.HYPOTHESES

H0 1. There exists no significant difference in achievement motivation among secondary school Students in relation to gender.
H0 2. There exists no significant difference in academic achievement among secondary school Students in relation to gender.
H0 3.There exist no significant relationship between achievement motivation and academic achievement among secondary school Students.

V.DESIGN OF THE STUDY

Descriptive survey method was employed to investigate the present study. The data was collected from co-education secondary schools of Jalandhar city.

VI.SAMPLE

The sample of study consists of 200 Students. 100 girls and 100 boys was selected as sample from IX class of secondary schools of Jalndhar city. .Random sampling technique was employed to select the sample.

VII.TOOLS

Achievement Motive test (n-ach), V.P.Bhargava (2011).Academic achievement was measured by the marks achieved by Students in their midterm exams.

VIII.STATISTICAL TECHNIQUES

1. Descriptive statistics such as Mean and Standard Deviation to ascertain the nature of distribution of scores on the variables.
2. t-test to find out the significance of difference between means of different groups.
3. Correlation to find out the significant relationship between achievement motivation and academic achievement.

IX.CONCLUSIONS

1. It was found that majority of Students scored between 284-309, on the variable of academic achievement. Only 1-1 Students scored between 534-559 & 809-834 respectively. The minimum score of academic achievement is 108 and maximum score.
2. It was found that majority of Students scored between 22-26 on the variable of Achievement Motivation. Only 3 Students scored between 37-41.
3. It was concluded that the boys have mean score 26.01 with the S.D of 3.49 whereas the girls have mean score of 25.22 with S.D 4.49. It shows a little difference between scores of the boys and girls on the achievement motivation.
4. On the basis of calculations done, it was concluded that boys have a mean score of 301.25 with S.D of 113.47 whereas the girls have a mean score 400.29 with S.D 129.63.It shows that the mean scores of

girls are higher than the mean scores of boys on academic achievement.

5. There is no significant difference in achievement motivation between the boys (M=26.01) and girls (M=25.22) of secondary schools. The study shows a little difference between the mean scores of boys and girls of secondary school on achievement motivation.

6. There is significant difference in academic achievement among secondary school Students in relation to gender. The girls of secondary school have higher academic achievement than the boys of secondary schools.

7. The study indicates that achievement motivation is significantly related to academic achievement among secondary school Students.

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Changing Concept of Education in Global Era

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Abstract- Today's modern and dynamic society is integrally based on high technologies which develop at a very fast pace, requiring a contemporary profile of adaptability and flexibility based on reliable skills and competences. Through this paper the investigator is concerned with the recent advancement in the field of Education. The earlier system, where the field of education came forward to adopt new technologies. These technologies are very helpful to provide education in remote areas as well as metro cities. With the help of advancement technologies the shape of traditional classroom has changed in the modern and hi-tech classroom. In recently, institutions adopt Gandhi's view on value based education. That such an education would be based on action, problem solving, and practical activities rather than mere book learning is also perfectly valid. The internet, mobile computing, social networks and many other advances in human communications have become essential to promote and boost education, technology and industry.

Keywords - Dynamic, contemporary, progressive, psychomotor, cognitive, curricula, E-learning, digital literacy.

I. INTRODUCTION

Education in the general sense is a form of learning in which the knowledge, skills, and habits of a group of people are transferred from one to next through teaching, training, or research. Education frequently takes place under the guidance of others, but may also be autodidactic. An experience that has a formative effect on the way one thinks, feel, or acts may considered educational. It has been argue that high rates of education are essential for countries to be able to achieve high level of economic growth. Education is continuous and dynamic process. According to the Latin author, "the mid-wife brings forth, and nurse brings up, the tutor trains and the master teaches". It means that education does not merely mean the acquisition of knowledge or experience but it means the development of habits, attitudes and skills which help a man to lead a full and worthwhile life. Also Mahatma Gandhi emphasized basic education which based on the values. Value based education is highly needed in our modern society because our lives have become more miserable. The realization of value based education has become quite strong in fast few decades on a global level. Now-a-days, negative forces like selfishness, hatred, terrorism, individualism, violence, intolerance etc. have become main problems in the world for example, 26/11/2008; the Mumbai attacks were a group of terrorist attacks in different locations of Mumbai and 9/11/2001, the terroristic attacks on Twin Tower, World Trade Center and Pentagon buildings of the USA.

The Phenomenon such as family breakdown, increasing of negative attitude and spread of health hazards like drugs and HIV/AIDS seem to be escalating worldwide, which have now terrified humanity. "If there is nobility in heart, there will be beauty in character, if there is beauty in character, there will be harmony at home, if there is harmony at home there will be order in the nation, if there is order in the nation, there will peace in the world" thus says a Chinese Proverb. It is fact that creating a peaceful world is possible and to cherish the purpose of undergoing education. So we need to create a special environment in institutions that transform value based education in Students. "Science without humanity, Commerce without morality and Education without character is useless and dangerous" says Sri Satya Sai Baba in his essential features in Indian education, pointing out the co-existing relation of education and character. In short, from the Indian point of view, profound education means perfection in the character, because character is deeply connected to education. As a man undergoes natural change in his physique, he must ensure that there is simultaneous mental development for which he needed morally stimulating faculties. Thus the foundation of a systematic value based and progressive education is laid for him. Scope for this teachers should update their knowledge and interact

meaningfully with Research Scholars and contribute their mite fir the proper growth and dissemination of ethical values so that they may feel that their real objective to perform well in their professionalism.

II. FORMS OF EDUCATION

Every person has received the education before birth to till end of his life at many forms. These forms of education helps to develop all domain in human being like Sensory motor, Psychomotor and cognitive motor. The form education gives Physical, Social, Economic, Political, Moral, Religious aspect of life. Basically two forms of education like formal education are class room based, provided by trained teachers. Informal education happens outside the class room, in after school programs, community based organizations, museums, libraries or at home.

III. VEDIC EDUCATION SYSTEM

Traditional Indian education boasts of the Vedas, the Puranas, the Ayurveda, the Arthasashtra, and many more and is a marvel of the Indian intellect. In the system of(ancient Indian system of dispersing knowledge) the adolescent boys stayed in the house of the teacher (guru) to gain knowledge over a stipulated time-period. Education was based on the intimate relationship between teacher and pupil. The relationship was inaugurated by a religious ceremony called Upanayana. The school was a natural formation, not artificial constituted. The Brahmacharya (celibacy) state was observed till a certain age while women and lower caste people had no access to education in the Middle Ages. The reform movement spread by the Sufi, Bhakti, Jain and Buddhist religions reduced the pain of the oppressed segments of the society and educational reforms gained eminence in the nineteenth century.

IV. PRESENT SCENARIO OF EDUCATION SYSTEM

The present educational system of India is an implantation of British rulers in 20th century by recommendations of Macaulay. It has western style and content. On the view of Macaulay English education should be imported in place of traditional Indian learning because oriental culture was defective and unholy. He wished to create a class if Indians who were Indian in colour and blood but English in taste and affiliation. In 1835, the Alphinstone college (Bombay) and the Calcutta medical college were established. The British government did not recognize the traditional structures and so they have declined. But Wood's Dispatch of 1854 laid the foundation of present system of education in India. Before the advent of British in India, education system was private one. With the introduction of Wood's Dispatch known as Magna Carta of Indian education, the whole scenario changed. The main purpose of it was to prepare Indian Clerks for running local administration. Under it the means of school educations were the vernacular languages while the higher education was granted in English only. British government started giving funds to indigenous schools in need of help and thus slowly some of the schools became government-aided.

Contemplating on the new system which was introduced Mahatma Gandhi expressed his anguish in following words, "I say without fear of my figures being challenged successfully, that today India is more illiterate than it was fifty or a hundred years ago, and so is Burma, because the British administrators, when they came to India, instead of taking hold of things as they were, began to root them out. They scratched the soil and began to look at the root, and left the root like that, and the beautiful tree perished. The village schools were not good enough for the British administrator, so he came out with his program. Every school must have so much paraphernalia, building, and so forth. Well, there were no such schools at all. There are statistics left by a British administrator which show that, in places where they have carried out a survey, ancient schools have gone by the board, because there was no recognition for these schools, and the schools established after the European pattern were too expensive for the people, and therefore they could not possibly overtake the thing. I defy anybody to fulfill a program of compulsory primary education of these masses inside of a century. This very poor country of mine is ill able to sustain such an expensive method of education. Our state would revive the old village schoolmaster and dot every village with a school both for boys and girls. "After independence, education for all was the mission of the government. The unhealthy practice of discriminations was removed by the 86th Constitutional Amendments and education has been made compulsory for the age group 6 to 14. The significant gap between the rate of urban and rural literacy is being bridged and the UGC was set up in the year 1953 to regulate the processes of educational development in the country. Indeed the National Policy on Education (NPE-86) urged that the gap between the formal education system and India's rich and varied cultural traditions should be bridged through an enrichment of the curricula and making education a forceful tool for the cultivation of

social and moral values. As a follow -up, a broad based scheme of assistance by the union ministry of Human Resource Development (MHRD) to the voluntary agencies and institutions engaged in strengthening culture, art and values and carrying out innovative programmes in education stressing on noble ideals was implemented in 1988-89. The ministry decided to review this scheme in 1990 in order to make it more purposeful and thus a revised scheme wad approved with two broad components:-

- Strengthening cultural and value education inputs in the school and non-formal education system.
- Beefing up the in-service training of art, craft, music and dance teachers. The amount earmarked for this purpose was given to several voluntary organizations apart from regular established institutions.

However, the efforts of upgrading the standards of Indian Education are not meeting with success, due to hurdles in accessibility, poverty and other factors. Due to widespread poverty the government of India is not able to achieve higher success in the implemented projects. The 11th 5- year plan alleviates the importance of development in the education sector and primary education as well as higher education is given equal importance in this plan.

V. EDUCATION SYSTEM OF INDIA

Till the recent past it was believed that premier education is not available in India, but the current development in the educational sector has led to the belief that quality education is indeed available in India. Research done in the past has highlighted loopholes in the curriculum and methodologies but these criticisms had acted upon and amendments were made. These included changes in the syllabus, introduction of new courses and dynamic methodologies. Modern infrastructures and teachers with adequate training are facilitating cutting-edge delivery of content; connected E-learning (called C-learning) is in vogue and today, India is attracting Research Scholars from South Africa, China, Canada, France, Germany, Canada, Australia, UK and USA.

This unbelievable progress in the educational scenario also includes low costs of tuitions as compared to the western countries. The basic divisions in the academics include primary, secondary, senior secondary and higher education. Elementary education is till standard 8 while

secondary and higher secondary education consists two years each. Graduation is between three to five years depending on the course after which there is an option for post-graduation (a two-year course) and research.

Education system in India divided into stages.

Pre- Primary - It consists of children of 3-5 years of age studying in nursery, lower kindergarten and upper kindergarten. At this stage Student is given knowledge about school life and is taught to read and write some basic words.

Primary - It includes the age group of children of 6-11 years studying in classes from first to fifth.

Middle - It consists of children studying in classes from sixth to eighth.

Secondary - it includes Students studying in classes ninth and tenth.

Higher Secondary - Includes Students studying in eleventh and twelfth classes.

Undergraduate - Here, a Student goes through higher education, which is completed in college. This course may vary according to the subject pursued by the Student. For medical Student this stage is of four and a half years plus one year of compulsory internship, while a simple graduate degree can be attained in three years.

Post Graduation - After completing graduation a Student may opt for post graduation to further add to his qualifications.

Currently, there are 17000 plus colleges, around 20 universities (central), 217 universities (state), and many deemed universities as well as national institutions. The national institutions of international fame are the IIT's and the IIM's. The Indian School of Business (ISB) in Hyderabad holds a global rank of 15 in the field of management education.

VI. INNOVATION IN EDUCATION FOR DEVELOPMENT

The challenge of closing the ever-widening gap between the haves and have-nots may rest with the willingness of the education community to view education from a new perspective and to innovate. This may include making use of affordable and accessible technologies to expand access to education. It may also require other innovative process or service strategies that do not rely on technology. It may require a shift in focus, to target educational and training programs to align more closely with what people identify as their most urgent needs.

Providing education in new and unconventional ways is only one of a number of solutions, but it is through

innovation that we can meet the challenges of improved efficiencies, lower costs, increasing accessibility, and greater success in achieving development goals through education.

VII. RECENT ADVANCEMENTS IN THE FIELD OF EDUCATION

In the present scenario, the field of education is very vast comparing to the ancient and the 20th century. Present period is called **21st century skills** which means to broad set knowledge, skills, work habits and character traits that are believed by educators, school reforms, college professors, employees and other to be critically important to success in today's world. Generally speaking, 21st century skills can be applied in all academic subject areas and in all educational, career and civic setting throughout a Student's life. The educators must create a curriculum that will help Students connect with the world and understand the issues that our world faces. Schools in 21st century will become nerve centers a place for teachers and Students to connect with those around them and their community.

The skills have been grouped into three main areas:

i. Learning and innovation skills
- Critical thinking
- Problem solving
- Communication and collaboration
- Creativity and innovation

ii. Digital literacy skills
- Information literacy
- Media literacy
- Information and communication technologies literacy

iii Career and life skills
- Flexibility and adaptability
- Initiative and self direction
- Social and cross-cultural interaction Productivity and accountability

According to the topic of Paper the investigator is concerned with the Recent Advancement in the field of education. In the digital era education is an investment into the future of the economy and the state. Our quality of life and our economy 10, 15, or 50 years from now depends on how well our youngsters are learning today. To achieve this, following advancement has in the field of education recently:-

VIII. TECHNOLOGY IN EDUCATION

Advances in the technology are very helpful in transforming the way people are educate. The technological progress of humans has a positive impact of education. The technological progress of humans has a positive impact of education. Technological change has given shape to education but with the addition of digital revolution. Many colleges and universities have started offering distance learning programs before the discovery of internet where these programs were difficult to find at that time. Due to this reason, many people who lived in villages and towns lack access to these universities and colleges. There is no doubt that technology has greatly involved in our daily lives and mainly when we are talking about education field. Education has been widely affected by the integration of technologies as it is a fast way to reach mass number of Students.Changes in traditional classroomWith the help of various kinds of technologies the shape of traditional classroom has changed in the modern and hi-tech classroom. Some technologies are:-

- **Computer in classroom:-** It is considered that having computer in the classroom is asset for teachers as well as for Students. The teachers can use computer to demonstrate new lessons, new material can be presented, illustration of using new programs and showing new websites. At present time, each and every child knows how to operate computer and can easily navigate their way through a website.

- **Interactive White Board:-** This device provides touch control of computer applications which enhances the experience in a classroom by showing different things on the computer screen. Apart from visual learning, it is interactive so that the Students can draw, manipulate and write images on the white board.

- **Use Smart Classroom:-** Smart classroom is an artificial intelligent room which can automatically reconfigure itself and its resources totally based on the profiles of user group. Tedious task can be automated at the start of a lecture that allows the teacher and the Students to focus on the learning process. The learning methods and practice are evolving and improving from an educational perspective. It involves organizing a group of Students in order to complete a project or for solving problems.

- **Digital games:** The field of educational games is growing considerably from last few years where it is provided as tools for classroom and provides positive feedback that includes higher motivation for Students.

IX. CREATIVE REVOLUTION

Education has been undergoing a creative revolution during the past and teaching methods have changed and so has the teacher pupil relationship. Generally the methods have moved from a predominantly teacher-directed, teacher controlled approach to a teacher pupil interactive system in which discovery learning is considered an integral part of the process. The children learn through integrative sensory modalities, combining creative approaches with curricular content and the integration is so strong that there are numerous association to help the children retain and relate what they have learned.

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To Study the Downfall in Indian Automobile Industry with Special Reference to Four Wheelers

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Abstract - The automobile industry is undergoing a tremendous change during the first and second qtar of 2019. The auto industry contributes 7.5 percent of India's GDP and a whopping 49% of manufacturing GDP with a large economic multiplier impact. According to industrial body SIAM the industry directly employs eight million people in manufacturing and services sector. the industry woes started around Sep-oct 2018 when a confluence of disparate events halted the steady growth it had witnessed over the previous few years .The alarming crises in the auto industry was downplayed by contrasting it with buoyant . The study attempted to analyse the automobile sector which covers a huge share in Indian market as well as in contribution to GDP.

Keywords: Crisis, Economic multiplier impact, GDP, SAIM (The Society of Indian Automobiles Manufactures)

I. INTRODUCTION

The Indian automobile industry ranks fourth in the world with 4.2 million (excluding two wheeler) an increase of 9.5% year on year. It is seventh largest manufacturer of commercial vehicles. in 2018 the two wheeler vehicle sector dominates the market due the growth of middle class and the young population . In addition companies growing interest in the rural markets has allowed the growing this sector at a faster rate India is prominent exporter of automobiles.

Indian automobile industry suffered from worst sales in the 19 years as due to the floods in some states of India such as the Kerala, Orissa etc which is also an reason for the decline In the sales of the automobile industry as per the data released by the SIAM (society of automobile manufacturers) it is a worst sales performance since the 35% in December 2000

Petrol and diesel prices are the major reason for the downfall in the automobile sector central government did nothing to control the petrol and diesel prices due to which the owing vechicles also started to travel wby the public transport there were major changes in the country ban on notes with the help of demonitization started the shivering fall of the economy and also the increase in the insurance rates of vechiles , introduction of GST started derailing the industry .

Disbursements by the non banking financial institutions has affected the sales of the automobile sector NBFC are responsible for the 30% of problem in automobile sector .NBFC were the major financers for them who do not approach banks for getting the loan

Now a days due to the easy aviability of the second hand / pre-owned cars in the market on the websites such as true value, cars24 etc the customers are buying the pre-owned cars much more as compared to the new cars because the pre-owned cars are the less costlier and second hand cars seller are also giving the various offers such as the free service, warranty on the car

As in the next year Bharat Stage 6 emissions are to be launched by the government of India and the most of the customers are waiting for the BS6 emissions firstly to be implemented and then buy the cars which is also reason for the customers not buying the cars and there is lot of confusion among the bharat stage 6 emissions.

II. REASONS BEHIND AUTOMOBILE INDUSTRY SLOWDOWN

- **Harder to Get Loans now a days.**
- Confusion among BS6 emission standards.
- Uncertainty of diesel in Bharat Stage 6 era.
- The OLA / UBER factor.
- Metro cities are too crowded.
- To many back to back changes in the automobile industry.
- The electrification equation.

III. OBJECTIVES OF THE STUDY

- To discuss about the slowdown in Indian automobile industry.
- To study about the preferences of automobile consumers.

IV. REVIEW OF LITERATURE

PC Magazine observed that "a 2012 car could have a system originally designed in 2006 and put into production in 2008 when that model first hit the streets." In 2012, Tata Motors announced it will invest around $6 billion on developing Futuristic Infantry Combat Vehicles in collaboration with DRDO.

Mr. Jawahar Lal Wadhwa, Independent Automotive Professional (2013), Within next years, the automotive industry would begin to change to alternative sources of energy, especially to electric systems, hydrogen cells and hybrid usage. USA is currently leading the research and lots of prototype vehicles are already under trials. This may bring in revival of American car industry, which is under distress. China is faster than any economy to absorb or copy this technology.

Mr. Gaurav Pareek, Finance Expert (2013), "As we all know that we have the money to spend in bulk but do not spend. So companies should provide the petrol services with fixed liter for the years as like as free service which will be good for attracting more consumers.

Mr. Ashish Jain, Sales Professional (2013) "Automobile companies should focus on uncovered area Such as Rural Area because and to do New R&D in Engine development which will give more millage, which is the need of the growing population and they can also control on cost and offer good pricing of their product and attract more consumers" "The Indian automobile industry which is growing rapidly, is in themselves to real-life applications", said **Dr. Vijayakanthan Damodaran**, Engineering Group Manager (Vehicle Performance**), General Motors Technic Bangalore (2012)**

Max Samuel Ellenbongen 2016 In today society the perception is that foreign automobiles are superior then the domestic automobiles.

Dr Navjyot raval 2019 the present government took an enormourous step to terminate Rs 500 and Rs 1000 notes will prompt effect on 8 November 2016 proceed was aimed to control the fake currency circulation black money and terror financing in the country India has the highest level of currency in circulation at nearly 13% of GDP the act of demonetization is expected to have marketed impact on various sectors.

M chitra economic growth is accelerated by industrialization which is turning factor for rapid economic development of any country .the increased production of consumer goods and capital goods and services resulted the increasing standard of living specifically in in accessing development of transport service automobile sector has made a tremendous change in the life style of human being particularly in mobility.

Shailesh ransariya global crises has had a negative effect on India Share market , real estate IT and industrial sector leading to increased layoff automobile industry unemployment etc. in India as in many other countries the auto industry is one of the largest industries it is the key sectors of Indian economy.

V. RESEARCH METHODOLOGY

The research design is a series of advanced decisions when taken together comprise a master plan or model for the conduct of survey. It provides a framework of plan for study which guides the collection, measurement, analysis and interpretation of the data. The information received through the questionnaire is analyzed, interpreted and form the basis of major conclusion of research paper.

For the present project, both types of sources are used:

- ❖ **Primary Source:** Questionnaire Survey.
- ❖ **Secondary Source:** The secondary sources include the published data. The published sources are used for this project are:
- Various journals, newspapers, magazines etc. to cover a wide range of information

VI. SAMPLE DESIGN, SIZE AND METHOD USED

The main sample group of the survey includes various persons of Punjab. In order to accomplish the goal, both direct and indirect information was gathered. While preparing questionnaire, objectives of the study were kept in mind. Special care was taken to ensure that questions do not lack clarity and simplicity.Sample SizeThe sample size for this study consisted of 100 persons comprising of 55 males , 44 females and one not answered

VII.   DATA ANALYSIS AND INTRPRETATION

Age Group?

This pie chart shows that out of the 100 respondents there were 73% of respondents belonging to the age group of the 18 to 30, 14%respondents belonging to the age group of 10 to 17, 10% of respondents were belonging to the age group of 30 to 40 and 3% of the respondents were belonging to age group of 40 and above
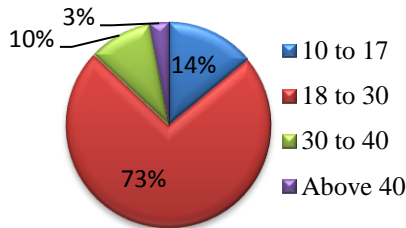
Figure1

- **Are you using any car, motorcycle or any other automobile?**
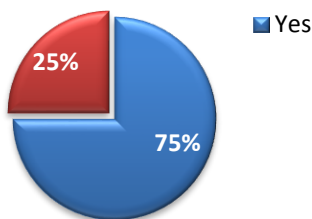
Figure2

 This pie chart shows that out of the 100 respondents 75% are using car or motorcycle or any other kind of automobile and 25% are not using any kind of automobile.

What will you prefer for travelling?
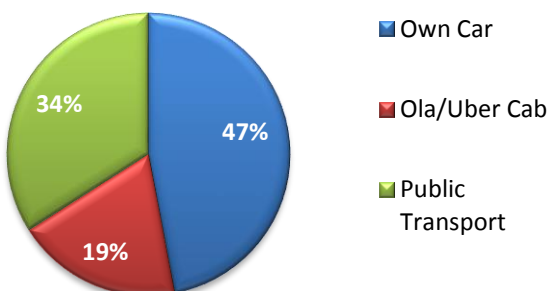
Figure3

This figure shows that out of the 100 respondents there were 47% respondents prefer to travel by their

own car and there are 53% of respondents who will prefer to travel in OLA/UBER cab or the public transport

- **Do you know about the Bharat Stage 6?**

This pie chart shows that out of the 100 respondents there were 52% people knows about the BS6 .
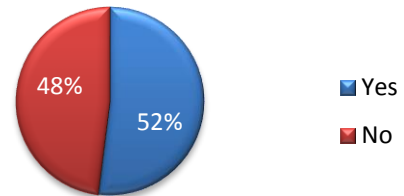
Figure 4
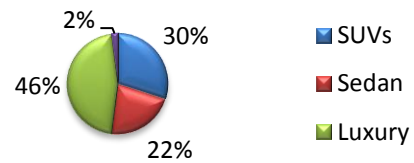
Figure 5

- **Is BS6 is the reason for customer not buying cars?**

This pie chart shows that out of the 100 respondents 50% are saying BS6 is the reason for customer not buying the cars , 44% are saying that bharat stage 6 is not the reason for customers not buying the cars and 6% did not responded.

- **Are you waiting for BS6 to come and then buy the cars?**
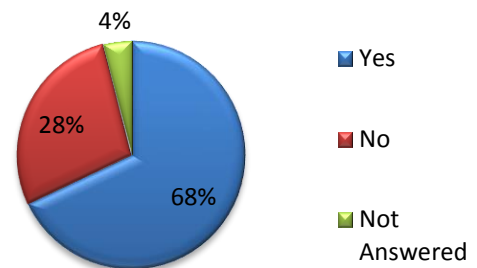
Figure:6

This pie chart shows that out of the 100 respondents 55% are waiting for BS6 to come and then buy cars

,36% are not waiting for BS6 to come and then buy cars and 9% have not answered
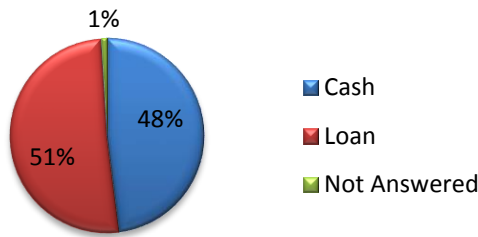
Figure :7

- **Which cars now a day's consumer wants?**

This pie chart shows that out of the 100 respondents 30% are I the favor of the SUVs, 46 % are preferring the sedan cars, 46% of Respondents are preferring the luxury cars and 25 didn't answered.

- **Will you prefer car on loan or on cash?**

This pie chart shows that out of the 100 respondents 51% of people will prefer car on loan and 48% of people will prefer car on cash and 1% did not responded
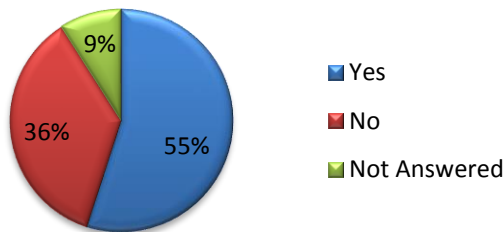
Figure 8

- **Are loans easily available in the market?**
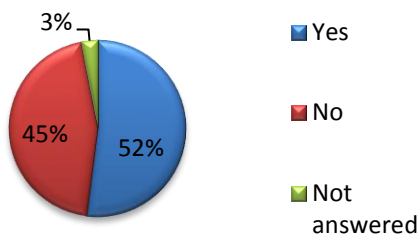
Figure 9

This pie chart shows that out of the 100 respondents there were 52% who are saying loans are easily

available in the market, 45% are saying loans are o easily available in the market and 3% have not answered.

Has GST and demonetization has also impacted the sales of the cars?

This pie chart shows that out of the 100 respondents 82% are saying that GST and demonetization has affected the sales of the cars , 15% are saying it has not impacted and 3% has not responded.

- **Which car will you prefer from the following?**

This pie chart shows that out of the 100 respondents there were 64% who are preferring the pre-owned cars and 34% who prefer to buy the new car and 2% did not responded

Waiting for attractive deals in BS6?

This pie chart shows that out of the 100 respondents
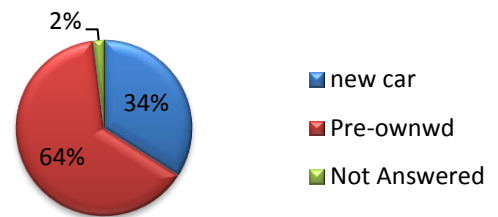
Figure10

68% are waiting for attractive deals in the bharat stage 6, 28% are not waiting or attractive deals in BS6 and 4 have not responded

VIII.   FINDINGS OF THE STUDY

- As in April 2020 it is expected that bharat stage 6 fuel will be brought to India so the population is waiting for the attractive offers in the bharat stage 6.
- People are also waiting for the new features in bharat stage 6.
- Due to recent changes in the economy such as the demonetization and the GST which has affected the liquidity position of the people which has also led to decrease in the sales of the cars
- Due to the NBFC crises now a day's its harder to get loans in the market especially in the rural area and rural area has huge share in the profits of automobile sector.
- Now a day's car is not being categorized as the luxury item.

- The preference of the consumers now a day is towards the luxury cars such as Audi, MG hector, Mercedes etc.
- The people travel less by their own car and travel more in OLA/UBER taxi and public transport which is more economical.

IX. CONCLUSION

The sales of cars has declined due to the factors such as the bharat stage 6 which is to be implemented in the April 2020 and customers are waiting for the attractive deals and offers in it .also the recent changes as implementation of GST and the demonetization done by central government has also impacted the sales of the cars and now a day's customers are preferring to travel by public transport or the ola/uber taxi as it is more economical as well as more convenient for the person who wants to travel.

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Perception and Impact of Web Series on Indian Audience

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ABSTRACT- Web series are the new trend and emerging industry of the decade. People are preferring web series and online content over TV shows & serials and the popularity of web series is rising in India at a very rapid pace. There are many reasons for this shift which are focused in this research. The major reasons include convenience, wide and cheap availability of internet facilities and over-the-top media service provider's presenting unique content. Web series also have many positive and negative impacts on all the aspects of our economy especially the youth and their mind set. This study focuses on that impact and people's perception on web series and what is its future in India.

Keywords: Web series, OTT services, sampling

I.INTRODUCTION

Big industries lead to the formation of sub industries. As television industry sprouted out of film industry, the industry of web series is born by the television industry. This new storm of online content is taking over phones and TV screens all over the world and taking down the television industry due to the reason that in web series the production costs, the celebrity TV stars and the high media cost is not incurred as in television. Web series is basically a combination of internet and televised programming. Web series is nothing but a form of television program being broadcasted online. The biggest advantage of watching online content is that people can watch it as per their convenience whenever, wherever and however they want. They no longer have to schedule their routines according to the broadcasting time of their favourite television show or serial. They can just go home and watch it without any advertisements disturbing or interfering in between. Moreover the teenagers who were not very involved in watching TV shows or serials are now engaged in watching them online because they feel more excited and related to the content. They can choose the content to be watched as per their choice from the wide variety. People were tired of watching repetitive drama of daily soaps, where web series came to their rescue. Watching web series also provides alone time and personal space to the masses. The biggest advantage of web series over TV serials or shows is its different, unique and attractive content which is bifurcated according to the different genres for all age groups. This web industry is also leading in providing employment opportunities to many struggling actors who could not make their way into big film industries or television industry as well as they are increasing opportunities for supporting staff. With the help of web series, writers and producers get the freedom to raise their voice for modern concepts like homosexuality and show the With the help of web series, writers and producers get the freedom to raise their voice for modern concepts like homosexuality and show the bitter truth of our society.But web series can also affect people negatively. The reports have shown that web series leads to binge watching habits among teenagers and adults.

It also can lead to internet addiction disorder and can influence their lives in a bad manner. Web series' censorship is also an important matter about which the parents are concerned.

It also can lead to internet addiction disorder and can influence their lives in a bad manner. Web series' censorship is also an important matter about which the parents are concerned. The promotion of performance language, nudity and substance abuse is no strange tale for teenagers and youth. Also, the biggest drawback of the web series is the all the content is accessible by anyone regardless of the age, which ultimately damages the cultural beliefs of society. There are so many over-the-top media service providers in India, available for web series. They are :

National OTT(over the top) media platforms doing business in India

Table 1

I.	Addatimes	III.	Hoichoi	IV.	Spuul
V.	Airtel Xstream	VI.	Hotstar	VII.	Sun NXT
I.	ALTBalaji	X.	Jio Cinema	X.	TVF
XI.	Arre	XII.	Jio TV	III.	Vodafone Play
IV.	BIGFlix	XV.	Lyca TV	XVI.	Voot
II.	Box TV	II.	MX Player	X.	FlizMovies
X.	DittoTV	I.	ShemarooMe	XXII.	ZEE5
I.	Eros Now	IV.	Sony Liv	V.	WinterSun

International OTT(over the top) media platforms doing business in India

Table 2

1.	Amazon Prime Video	2.	HOOQ	3.	Netflix
4.	Viu	5.	Vuclip	6.	YuppTV
7.	Smart Multiplex				

II. Indians preferring national OTT service providers over international

The data statistics on unique applications installs in India during quarter 1 of 2017-18, the most installed application was Hotstar followed by sonyliv, jio cienema and voot giving neck to neck competition to each other. The basic reasons found were availability of both t.v. serial/shows and web series. The basic reasons found were firstly the availability of both the TV serials/shows and web series along with sporting events and local content; secondly however affordable the OTT service providers make it, the price Indians pay for their entertainment is very material to them. Thus, platforms like hotstar, Sony LIV and voot not only focuses on their originals and web series but also broadcast the repeats of TV serials/shows. Also, they are free of cost for the people who do not want premium membership and are satisfied with limited content. The national OTT platforms have made their strategies according to the needs and habits of Indian people which make them more popular and more widely used application for entertainment purposes. This figure 1 represents the information presented above.
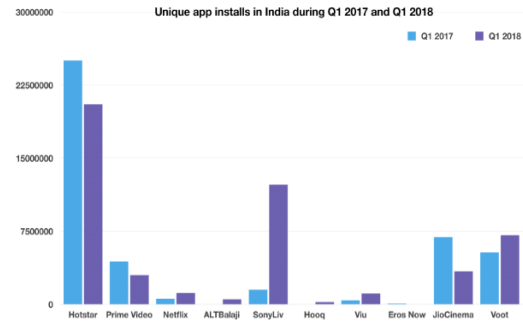
Figure 1
Source: CNBC [5]

III. Future of online steaming/web series in India

Analysts projected that India's streaming market is increasing and will continue to increase at a very rapid pace including both the subscription supported and advertisement supported streaming. This is due to the reasons that people are getting more and more aware of web series and online broadcasted content. Also the OTT media service providers are making it cheaper than TV cables to increase their customer base. The wide coverage of content is their biggest strength. Thus, web series have a great future in India as well as all over the world. Hence, figure 2 shows the projection of India's video steaming market sizes of future.
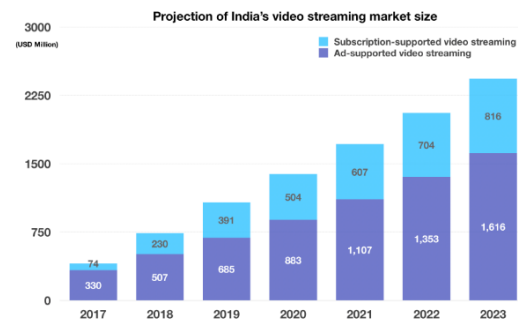
Figure 2
Source: CNBC [5]

IV. OBJECTIVES OF THE STUDY

1. To analyse the awareness of web series among people.
2. To analyse the perception and impact of web series.

V. RESEARCH QUESTIONS
1) Email address
2) Name
3) Gender
4) Age
5) Occupation

6) Do you watch web series?
7) Where do you categorize yourself in watching habits?
8) Do you like web series better than T.V. serials?
9) Do you think there should be censorship in web series?
10) When you watch web series?
11) How much time do you spend on watching the web series in one time on average per day?
12) Do you think web series leads to binge watching habits?
13) How often do you binge watch web series?
14) What do you think is the reason of such high popularity of web series in India?
15) Do you think the invention of t.v. marked an end of the radio era; web series would also mark an end towards t.v.?
16) Do you the promotion of web series can lead to internet addiction disorder?
17) Do you think web series can bring better influence towards homosexuality, sex education, women empowerment?
18) How do you think web series influence the India culture and society?
19) What do you think is the impact of web series on
   a) Teenagers?
   b) Employment opportunities?
   c) Working population?
   d) Over all?

VI. RESEARCH METHODOLOGY

Research design:

The research design is basically a master plan of the study. It comprises of the procedures and methods used for the major functions for conducting a study like collection, measurement, analysation and interpretation of the data. It provides a framework for the research. The information received through the questionnaire is analyzed, interpreted and form the basis of major conclusion of research paper.

For the present project, both types of sources are used:

❖ **Primary Source:** The primary source used in this research is QUESTIONNAIRE SURVEY. Questionnaire is basically a set of questions with given options for conducting statistical study. 160 respondents were

questioned about their perception and impact of web series.

❖ **Secondary Source:** Newspapers, magazines and various internet sites were used for the research.Sample Design, Size and Method Used.The main sample group of the survey includes various persons of Jalandhar City and Kapurthala district. The sampling technique used for conducting this study was random sampling. The Jalandhar and Kapurthala regions were selected but the selection of respondents was done randomly. In order to accomplish the goal, both direct and indirect information was gathered. While preparing questionnaire, objectives of the study were kept in mind. Special care was taken to ensure that questions do not lack clarity and simplicity. Sample Size:-The sample size for this study consisted of 160 persons comprising of males and females.

VII. SAMPLE INTERPRETATION AND ANALYSIS
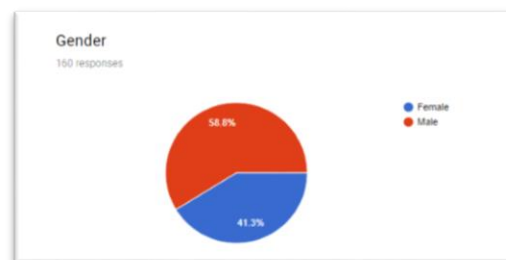
Figure 3

A) **Interpretation:** The above figure shows that out of 160 respondents, approximately 59% were males and 41% were females.
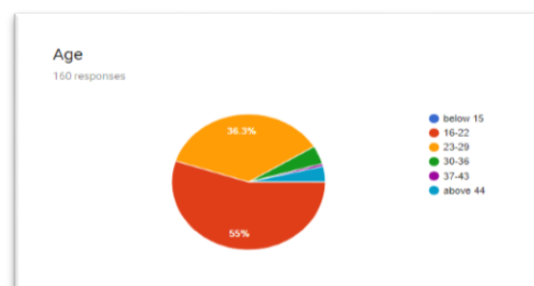
Figure 4

B) **Interpretation:** The figure represents that the majority respondents, 55% were the age of (16-22), followed by the age group of (23-29) representing 36 % and rest 9% was equally divided into the (30-above 44) groups.
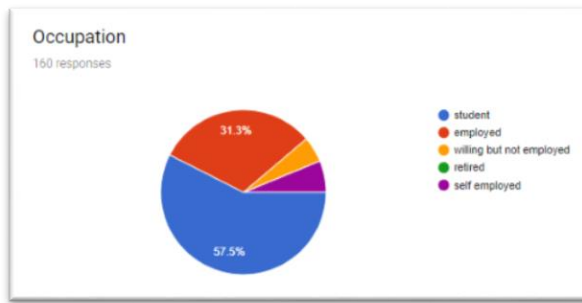
Figure 5

C) __Interpretation:__ The analysis was majority responded by Students with 57%, employed people with 32%,then 10% divided equally between not employed people and self employed ones.

Figure 6

D) __Interpretation:__ The figure represents that from 160 respondents only 16% of people do not watch any kind of web series where as 84% people were into watching web series on various platforms.

Figure 7

E) __Interpretation:__ The figure 10 shows that 60% people prefer watching both t.v. serials and online content where as 35% of people are attracted only to online content.

Figure 8

F) __Interpretation:__ The diagram clearly shows that 91% of people like web series over t.v. serials with only 9% people saying that web series are that much preferable to them.
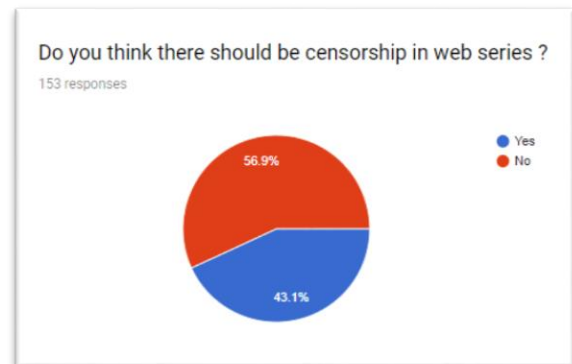
Figure 9

G) __Interpretation:__ Surprisingly the 57% people do not want any kind of censorship over the web series, where as 43% strongly disagree saying the web series or online content should be strongly monitored.

Figure 10

H) __Interpretation:__ The above figure shows that 87% of people watch the web series anytime they like, may it be morning, afternoon or even night i.e., no specific rules. But some people (12%) watch them only in the night time of the whole day.
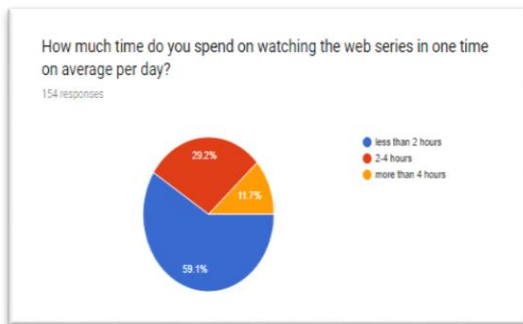
Figure 11

I)   **Interpretation:** The normal average time spent on watching web series per day was computed less than 2 hours by 59% where as 2-4 hours were spent by 29%. Only 12% spent more than 4 hours per day over watching the web series according the survey.

Figure 12

J)   **Interpretation:** Accordingto the above figure, 83% people agree to the point that web series leads to binge watching because of availability of unlimited content and various other reasons. But 18% says they do agree that web series would lead to binge watching habits.

Figure 13

K)   **Interpretation:** Approximately,41% people binge watch on weekends followed by 37% people who binge watch on holidays where as,22% said that they binge watch everyday.

Figure 14

L)   **Interpretation:** the 35% believes that all the reasons like cheap internet schemes, convenience, content, all are the reason of such high popularity of web series in India. The high preference to different content with 21% and freedom of convenience to watch it anytime, anyplace was 17% beside various factors.

Figure 15

M)   **Interpretation:** 60 % of people said that the invention of t.v. have marked an end of the radio era and that web series would also mark an end towards t.v. but 40% do not agree to that statement.

Figure 16

N)   **Interpretation:** The quota of 88% people strongly believes that the improvements in the society are continuously aided by web series where 12% of people still defy that.
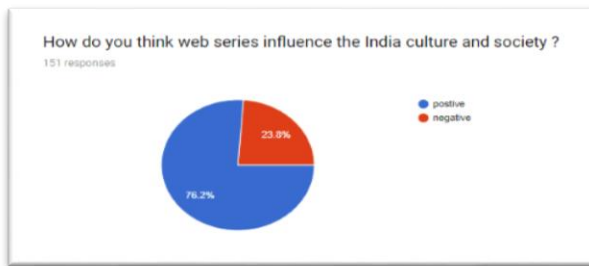
Figure 17

O)   **Interpretation:** The analysis shows that the influence of the web series have an positive impact over the Indian culture and society with 76% of people where as, 24% people still believe its not good.
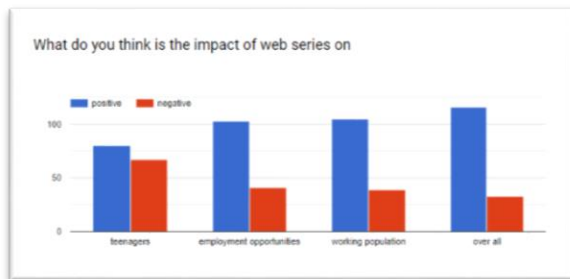
Figure 18

P)   **Interpretation:** The figure 23 represents the impact of web series on various people. The alarming percentage of negative impact was recorded under teenager with 41% and over all it was positively influencing the various fields, say employment opportunities and working population with stats of 72%.

VIII.   MAJOR FINDINGS OF THE STUDY

- More than 80% of people are engaged in watching web series
- Approximately 60% people categorised themselves as customers of both TV serials and online content.
- More than 90% people like web series better than TV serials
- Approximately 57% people argued that there should be no censorship in web series.
- 87% people watch web series in in their free time regardless of day or night
- Approximately 60% people spend less than 2 hours on average per day watching the web series
- Also 82.5% persons think that web series leads to binge watching habits.

- 78% people confessed that day binge watch the web series on weekends and holiday.
- The reason of high popularity of web series in India is not very clear but includes cheap internet schemes ,new/different content, convenience and define TV serials boring.
- 61.4 % people believe that web series would mark and end of TV serials
- 88.2% respondents think that web series can bring better influence towards homosexuality, sex education and women empowerment
- Also 76.2 percent of respondents have a thinking that web series impact the Indian culture and society in a positive way.
- Majority respondents think that the overall impact of web series is positive on teenagers employment opportunities and working population.

IX.   LIMITATIONS OF THE STUDY

Besides its major findings and benefits, present study suffer from various limitations also:

- Lack of personal contact with the respondents
- Lack of proper understanding among some people
- Limited area
- Requirement of further investigation for greater depth of research

X.   CONCLUSION

Web series and online video streaming is the revolutionary change brought in our society. They are becoming more and more popular over the time due to the convenience, cheap internet schemes and different content they offer to the public. Though web series is accused of damaging the culture and beliefs of Indian society and leading to internet addiction disorder, its pros weigh much more than its cons. Besides it's strong language and showing nudity, they present whole new India with broad thinking and open mindedness. Introduced as a source of entertainment for people, web series is now more like a weapon in the hands of writers and producers to show the public whatever they like

and whatever they think should be known by them. Its negative impact can be curtailed by putting some age restrictions on adult and objectionable content and keeping a check on watching habits. They have also opened the gates for talented struggling actors and widen the scope of employment opportunities in India. Overall introduction of web series have marked the beginning of a new era.

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An Analysis of E-Waste: Case of India

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Abstract- **In modern era, the sustainable development has emerged as a major area of concern. Pollution is the major threat in most of the developed and developing economies. The development is the cause of pollution and is also responsible for environmental degradation. The environment provide three main services to the society, first it provides the basic raw materials and inputs that support economic activity. Secondly environment acts as a sink which absorbs and recycle the human waste. Thirdly environment act as a shield that protect the humanity from unwanted rays. The main objective of this paper is to throw some light on problems related with e-waste.**
Keywords: Environment, Management, Sustainable Development, e-waste

I.INTRODUCTION

Electronic Waste – or e-waste – is the term used to describe old, end-of-life electronic appliances such as computers, laptops, TVs, DVD players, mobile phones, mp3 players etc. which have been disposed of by their original users. While there is no generally accepted definition of e-waste, in most cases, e-waste comprises of relatively expensive and essentially durable products used for data processing, telecommunications or entertainment in private households and businesses. (Punjab Pollution Control Board)

Electrical and electronic waste (e-waste) is one of the fastest growing waste streams in the world. According to the Global E-Waste Monitor 2017, India generates about 2 million tonnes (MT) of e-waste annually and ranks fifth among e-waste producing countries, after the US, China, Japan and Germany. In 2016-17, India treated only 0.036 MT of its e-waste. (downtoearth.org.in). In India, only a small quantity of e-waste is recycled, due to high rate of refurbishment and reuse of electronic products. At present most of e-waste generated in the country is recycled in the informal sector having small capacities and poor processing technologies contributing significantly to the pollution load and environmental degradation. Some of the e-waste recyclers are engaged in dismantling e-waste for export.There is shortage of proper e-waste recycling facilities in India to do end-to-end recycling.

Sixty-five cities in India generate more than 60% of the total e-waste generated in India. Ten states generate 70% of the total e-waste generated in India. Maharashtra ranks first followed by Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab in the list of e-waste generating states in India.

India is ranked 5th in the world among top e-waste producing countries-USA, China, Japan and Germany. "The large increase (in total e-waste generation of the world) was mainly attributed to India," said the report. An ASSOCHAM-KPMG study, *Electronic Waste Management in India* identified computer equipment account for almost 70 per cent of e-waste, followed by telecommunication equipment-phones (12 per cent), electrical equipment (8 per cent) and medical equipment (7 per cent) with remaining from household e-waste.(downtoearth.org.in)

Electronic waste or e-waste includes used T.Vs, computers, mobile phones, electronic devices, etc. With increase in production and use of electronic goods, the generation of e-waste is also increasing. Though the IT industry has had a positive effect on the economy, however, it also has an ecological backlash. Computer waste is one of the most significant e-waste with respect to the rate at which it is being generated. In addition, its recycling is a complex process which involves many hazardous materials.

Table 4.1 shows the toxic elements of a computer which, when dumped without proper treatment/recycling, could be a major source of toxic pollution and a threat to our lives and the natural environment. (Report: **Punjab State Council for Science & Technology, Chandigarh, 2007**)

Table 1.1 Toxic elements of a computer
Table 1 Components of PCs Toxic constituents

Hazardous materials	Percentage
Silica	24.9%
Plastic	23%
Iron	20.5%
Aluminium	14.2%
Copper	7%
Lead	6.3%
Zinc	2.2%
Tin	1.0%
Others(including cadmium, chromium, antimony and beryllium)	Less than 0.1%

Source: **Electronic Industries Alliance**

Table 1.1 explains the toxic elements of a computer which, when dumped without proper treatment/recycling, could be a major source of toxic pollution and a threat to our lives and the natural environment. (Report: **Punjab State Council for Science & Technology, Chandigarh)**

Table: 2 E-Waste / WEEE Generation in Top Ten States

S.No	States	WEEE (tonnes)	Percentage (%)
1	Maharashtra	20270.59	18.49
2	Tamil Nadu	13486.24	12.30
3	Andhra Pradesh	12780.33	11.66
4	Uttar Pradesh	10381.11	9.47
5	West Bengal	10059.36	9.18
6	Delhi	9729.15	8.87
7	Karnataka	9118.74	8.32
8	Gujarat	8994.33	8.20
9	Madhya Pradesh	7800.62	7.11
10	Punjab	6958.46	6.35

Source:e-waste is one of the most critical waste issues emerging globally, due to its increasing quantities and toxic constituents like lead, mercury, cadmium and BFRs. The backyard recycling operations in India has been a major talking point around the world because of the environmental pollution and toxic exposures. India has been one of the favourite dumping destinations for E-waste for over a decade now, fact which has been so widely reported in media. Recyclers in developed countries from the west, mainly Europe and US have found it very lucrative to pass the burden of handling this waste to countries like India and seriously impacting environment and human health. Volumes of waste being dumped continue to show a rising trend, as materials available on the ground shows. It could very well be that the earlier estimates of 50,000 MT per annum have already doubled and will increase further. This flow of highly toxic waste has been one of the major concerns concerning E-waste management in India. (toxicslink.org)

Almost 80 per cent of e-waste workers in India suffer from respiratory ailments due to improper standards and nearly 500,000 children are engaged in e-waste collection without adequate protection and safeguards.

The digital India imitative increased the efficiency and productivity gains but at the same time also increased the e waste. For example, Data centres, are one the largest contributors to global warming, contributing a similar amount to global greenhouse emissions as the aviation industry. (chathamhouse.org)

Case Studies

To address the mounting problem of electronic waste or e-waste, the waste pickers' cooperative of the city, Swach, has decided to start a special drive for its collection. Called 'V collect – U donate – Together we recycle', the project involves setting up mobile waste collection centres at different locations in Aundh and nearby areas on specific dates. This sort of a system previously existed for flea markets and specialty stores, but had never been used for e-waste collection. These pop-up kiosks will be stationed at prominent locations, making it convenient for residents to drop off not just e-waste but also old clothes, toys, books and household items among others that they wish to discard. This will then be recycled and reused. (indianexpress.com)

Although not directly involved in e-waste, UNFCCC has been active as part of the E-waste from Toxic to Green initiative. Through the initiative, waste pickers in India have been trained to collect electronic waste, such as computers and mobile phones, for safe disposal and recycling. The initiative aims to make waste pickers more resilient to poverty by providing green jobs that increase their incomes and protect them from the risks of exposure to toxins and heavy metals.(unemg.org)

Nokia launched its "Planet Ke Rakhwale" take-back and recycling campaign in September, 2009, which extended to 28 cities across India. The campaign was launched at the national level in January, 2010. An intensive media campaign was undertaken on TV, radio and print, featuring the megastar Shahrukh Khan. The campaign aimed to inspire young minds to spread the recycling message. For every handset dropped in the recycle bin, Nokia promised to plant a tree and also offered a surprise gift. But this campaign received only a lukewarm response in the beginning because unlike other take-back schemes it was not giving the consumers any fiscal incentive in return for their discarded phones.

CONCLUSION

The economy is witnessing the major issues related with environmental pollution. Electronic waste (e-waste) is one of the fastest growing waste streams in the world. The need of the hour is to think about the consequences of e-waste and problems associated with it. Now days the economies in the world are dependent on technology. The advance technology provides efficiency and ease of doing the tasks but at the same time it creates hurdles for sustainable development. The reason behind this is that it is very difficult to manage the e waste due to lack of knowledge, overutilization of advance technology, economic growth, and Demonstration Effect i.e. Ratchet Effect etc.

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Contemporary Literary Adaptations in Bollywood

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ABSTRACT- The historical backdrop of movies demonstrates that writing and film are tied in a solid, or what is by all accounts, an unbreakable bond. Both have been respected basically as methods of articulation. This incredible limit of narrating or portrayal by both these expressions – writing and film – has truth to be told, kept them indistinguishable. Since the approach of movies (generally named as 'film' or then again 'movies' or 'motion pictures') over a century back, producers have acquired widely from artistic sources, for example, books, plays, accounts, and accounts, deciphering words on a page to pictures on a screen (in the period of Quiet Films) and in the long run to pictures and sound in motion picture houses (in the structure of Talkie Films). The numerous incredible works of books have been transformed into extraordinary movies which have won Universal honours like Oscar. In India additionally, especially in Bollywood, truly a number of Indian books have been made into incredible movies.

Keywords: film, cinema,

I.INTRODUCTION

Film adaptations are the exchange of a composed work to a film. This composed work could be a novel, play, short story, epic and so on it could likewise be a work of true to life, collection of memoirs and even different movies. Adaptations are ordinarily an interpretation into a distinctive medium that communicates by utilizing an alternate gathering of strategies and utilizing creative agreement pursued by the elements associated with the moving work of writing to the screen.

The expression "adaptations" was first used to portray a specific method of interpretation sometime before it was applied to film thinks about, it tends to be guessed that the ever prolonged routine with regards to interpretation contemplates, crossing from Plato to Derrida, offers a steady base for the development of a film adaptations hypothesis.

An interpreter utilizes a simple language as per his taste. Similarly a film director changes the language of the first content. Macbeth, for instance, was composed in English by William Shakespeare; however, when it was

adjusted by various movie directors of the world they changed its language to their individual culture. In mechanical terms, the language of interpretation is verbal however the language of adjustment is pictorial. A film executive changes the composed scene into a genuine one. The words get changed into pictures.

II.LITERATURE REVIEW

Abraham, TT (2002) in his research "Novel into film a case for adaptations" concluded that adaptations are helpful in increasing the demand and popularity of novels. Copying or taking the same story never compromise with the original thing. They always have some unique point. Even if many adaptations are successful there are many critics who may still doubt the appeal of practice of adaptations.

Biswas, Siddhartha (2010) in their research "Harold Pinters screenplays strategies of adaptation" concluded that adaptation and translation is having a relation and there is no difference. Film is taken as translation of text when we talk of adaptation. Even the adapted ones don't have the same place as original ones.

Dhvani Joshi (2015) In her research "Cinematic Adaptations of Literary texts" found that adaptation is a worldwide or universal process. Filmmakers have chosen novels to make movies in other languages that people from all over world can enjoy artistic piece. Novels and movies both are made to give creative appeal to readers and viewers but how they take this, totally depend on them.

D'souza, Wilma (2011) In "G B Shaws Pygmalion as a verbal text and three visual texts an analysis in comparison" found that film is successful only if it is able to carry the meaning exactly. Otherwise people will always take adaptation as inferior to the original work. Adaptation is not always the exact thing but include some changes that take it to higher level. If the film is adaptation of play then there are changes

like fil don't include so much of drama but theatre is more focused on language and hence on that of drama.

Patel SwagatKunjaban (2015) In research "Books in motion a study of the adaptations of four Indian novels into films" found that movie 3 Idiots is more broadened work as adapted from Five Point Someone. Film is hit because of very good dances and songs. Susanna's Seven Husbands is just of 59 pages and movie 7 KhoonMaaf is about 2 hours and 15 minutes. Reading text can take around 1 hour 30 minutes. The expansion of movie is just because of creativity of adaptation done by the filmmaker that make it a big hit.

Pawar, Girish D (2013) In "A Narratological Study of Harry Potter Novels Seven Types of Narrative" concluded that Harry Potter was a success just because of artistic work done despite of doing so much marketing. Otherwise people never look at bad product for so long. They can left the work when they found that boring or not qualitative.

Ray, Pradipta (2011) In "Shakespeare on screen appropriation retroaction and intertextual dynamics in selected Shakespearean plays as films" concluded that adaptation of Shakespeare film is a progressive adaptation. Carefully Constructed movies can give you a good package, popularity and publicity like "High School" which is more predictable teen Shakespeare's movie and having more package.

Ritu Mohan (2015) In research "Literature and cinema theory and practice literature on celluloid an analysis through comparative study of selected film adaptations of Macbeth" concluded that it is the responsibility of filmmaker to make the written piece more creative, powerful and credible. What is seen and what is shown is the combine work and combine efforts of both writer and filmmaker. No one can do this alone. Even more technology is required to form a movie from novel.

Rizwana Sultana K (2017) In "*Filming the texts the politics of horror in selected texts and films.*" concluded thatfilm adaptation is a newthe new form of adaptation which open up a new sense of sensibility and a turning point to the culture. Even adaptation of horror literature is there to give viewers a visual of horror experience. It gives a more power to expression. Earlier horror was about the vampire or monster but now horror is about the devil within the humans.

Sunman Kaur (2015) In her research "Literary Text and its Theatrical and cinematic Adaptations" concluded that while adaptation we need to ignore analysis analytical thinking approach. Literary adaptations have their own identity which consist of creativity and have some difference that makes them different and popular too.

III.OBJECTIVES OF THE STUDY

- To analyse the impact of literary adaptations in Indian Cinema.

- To examine the role of adaptations in cinema from past three decades.

IV.METHODOLOGY

The present study is focused onanalysing the impact of literary adaptations in Indian cinema from past three decades. The study considers secondary data which have been extracted from various official websites, journals, articles, books and newspapers etc.

❖ INDIAN CINEMA FROM 1990 TO 2000

1990 - 2000. Another layout for Bollywood musical romance films which characterized was shaped in 1990s. This decade denoted the entrance of new entertainers in art and liberal movies, some of which were commercially successful. Referred to "New Bollywood" since the 1990s, contemporary Bollywood is connected to monetary advancement in India during this decade.

Total 265 Bollywood movies were released from the year 1999 to 2000. Some movies were marked as blockbusters during this period and the rest of the movies in the list were either flops or average grossers, but are considered as classics today.

Movies like **Hum Aapke Hain Kaun** (1994), **Dilwale Dulhania Le Jayenge** (1995), **Raja Hindustani** (1996), **Dil To Pagal Hai** (1997), and **KuchKuchHota Hai** (1998), introduced a new generation of popular actors, including the Three Khans: Aamir, Shah Rukh, and Salman, who have starred in most of the top ten highest-grossing Bollywood films.

Out of 265 movies, some movies took inspiration from Hollywood movies and some were a part of adaptations from novels.

❖ SCREEN ADAPTATIONS DURING 1990 To 2000

Screen adaptions into films was very common in Indian cinema before 1990's but during this decade, out of 265 films only 4 films were inspired from novels.

Screen adaptations during this decade
- **Suraj Ka SatvanGhode (1992)** was a Hindi movie directed by ShyamBenegal in 1992. It is based on the novel The Sun's Seventh Horse by Dharmavir Bharati. It has won the 1993 National Film Award for Best Feature Film in Hindi.
- **Tere Mere Sapne (1996)** is a Hindi romantic drama film directed by Joy Augustine in 1996. The plot of the film is extensively like Twain's The Prince and the Pauper.

- **ChaarAdhyay (1997)** a 1997 Indian Bengali language dramatization movie composed and directed by Kumar Shahani. It depends on Rabindranath Tagore's last novel ChaarAdhyay.

- **Earth (1998)** is a 1998 Indian period romance drama movie directed by Deepa Mehta. It depends on BapsiSidhwa's epic novel, Cracking India.

❖ INDIAN CINEMA FROM 2000 TO 2010

The 2000s saw expanded Bollywood acknowledgment worldwide because of developing (and succeeding) NRI and Desi people group abroad. The development of the Indian economy and interest for quality stimulation in this period drove the nation's film industry higher than ever underway qualities, cinematography and screenwriting just as specialized advances in territories, for example, enhancements and animation. Some of the biggest production houses, among them Yash Raj Films and Dharma Productions were the makers of new present-day films. Some famous movies of the decade were **KahoNaa..Pyaar Hai** (2000)**, Gadar: Ek Prem Katha** (2001), **Lagaan**(2001), **Koi... Mil Gaya** (2003), **Kal Ho Naa Ho** (2003), **Veer-Zaara** (2004), **Parineeta** (2005)**Rang De Basanti** (2006), **Lage RahoMunna Bhai** (2006), **Dhoom 2** (2006), **Krrish** (2006) and **Jab We Met** (2007), among others, showing the rise of new movie stars.

Total 1070 Bollywood movies were released from the year 2000 to 2010. The number of blockbusters during this decade increased and the audience saw a huge change in Bollywood film style by the mid of this decade.

Out of 1070 films, literary adaptation was done in 18 films.

Screen adaptations during this decade

- **Devdas (2002)**is a 2002 Indian romantic drama film directed by Sanjay Leela Bhansali and adapted Sarat Chandra Chattopadhyay's epic novel Devdas.
- **Pinjar (2003)** is a 2003 Indian period dramatization movie directed by Chandraprakash Dwivedi. The film is about Hindu-Muslim issues during the segment of India. The film depends on a Punjabi novel Pinjar, written by Amrita Pritam.
- **Chokher Bali (2003)**a 2003 drama film dependent on the novel Chokher Bali by Rabindranath Tagore. It was directed by Rituparno Ghosh and stars Aishwarya Rai as Binodini and Raima Sen as Ashalata. It additionally won the National Film Award for Best Feature Film in Bengali.

- **Maqbool (2003)**is a 2003 Indian crime drama film directed by Vishal Bhardwaj and starring Pankaj Kapur, Irrfan Khan, Tabu and MasumehMakhija in an adaptation of the play Macbeth by Shakespeare.

- **Bride and Prejudice (2004)**Bride and Prejudice is a 2004 romantic drama film directed by Gurinder Chadha. The screenplay by Chadha and Paul MayedaBerges is a Bollywood-style adaptation of Pride and Prejudice by Jane Austen.

- **Parineeta (2005)** a 2005 Indian musical romantic drama film adaptation of the 1914 Bengali novella, Parineeta by Sarat Chandra Chattopadhyay.

- **The Blue Umbrella (2005)**is a 2005 Indian drama film dependent on the novel The Blue Umbrella (1980) by Ruskin Bond. It was directed by Vishal Bhardwaj and featured Shreya Sharma and Pankaj Kapur in lead jobs.

- **Sarkar (2005)** is a 2005 indian political crime thriller film directed by Ram Gopal Verma. This movie was the remake of Hollywood movie Godfather which was a screen adaptation of novel Godfather by Mario Puzo

- **The Namesake (2006)**The Namesake is a 2006 English-language dramatization movie directed by Mira Nair and written by SooniTaraporevala dependent on the novel The Namesake by Jhumpa Lahiri. It stars Tabu, Irrfan Khan, Kal Penn, and Sahira Nair.

- **UmraoJaan (2006)**is a Bollywood film based on the Urdu novel UmraoJaan Ada. Aishwarya Rai star in the lead role along with Abhishek Bachchan, Shabana Azmi, Sunil Shetty, Divya Dutta, Himani Shivpuri and Kulbhushan Kharbanda in supporting roles. The film is directed by J. P. Dutta in 2006.

- **Omkara (2006)**itis a 2006 Indian crime drama film adapted from Shakespeare's Othello, co-written and directed by Vishal Bhardwaj.

- **Saawariya (2007)**2007 Indian romance film produced and directed by Sanjay Leela Bhansali, based on Fyodor Dostoevsky's short story "White Nights".

- **Gandhi My Father (2007)**An Indian biographical drama film by Feroz Abbas Khan. It was produced by Bollywood actor Anil Kapoor and released in 2007. The movie is based upon the biography of Harilal Gandhi, titled Harilal Gandhi: A Life by ChandulalBhagubhaiDalal.

- **Hello (2008)**a 2008 Indian Hindi thriller film directed by Atul Agnihotri, The film is based on Chetan Bhagat's novel, One Night @ the Call Center.

- **Dev D (2009)**is an Indian romantic black comedy-drama film released in 2009. Written and directed by Anurag Kashyap, it is a

contemporary adaptation of Chattopadhyay's classic Bengali novel Devdas.

- **Aisha (2010)**is a 2010 Indian romantic comedy-drama film directed by Rajshree Ojha, starring Sonam Kapoor and Abhay Deol in the lead roles. It is an adaptation of Jane Austen's 1815 novel Emma.

- **Rajneeti (2010)**is a 2010 Indian political thriller film co-written, directed and produced by Prakash Jha. This one movie is a mishmash of two pieces of literature; Mario Puzo's "The Godfather" and our very own Vedvyasa Sanskrit epic "Mahabharat".

❖ INDIAN CINEMA FROM 2010 TO PRESENT

During the 2010s, the industry saw established stars, for example, Salman Khan, Akshay Kumar and Shahrukh Khan making huge spending plan masala movies like **Dabangg 2** (2012), **EkTha Tiger** (2012), **Rowdy Rathore** (2012), **Chennai Express** (2013), **Kick** (2014) and **Happy New Year** (2014) in more youthful on-screen characters. Despite of the fact that the movies were frequently not praised by critics, but they were commercially successful. A portion of the movies featuring Aamir Khan has been credited with rethinking and modernizing the masala film with a particular brand of socially cognizant cinema.

Most stars from the 2000s proceeded with fruitful vocations into the following decade, and the 2010s saw another age of well-known entertainers in various movies. Among new shows, female-cantered movies, for example, The **Dirty Picture** (2011), **Kahaani** (2012), **Queen** (2014) and **Raazi** (2018),began increasing wide money related achievement.

Total 951 Bollywood movies were released from the year 2011 till present. The number of blockbusters during this decade increased and the audience witness a new contemporary era of Bollywood with different styled movies.

Out of 951 films, literary adaptation was done in 12 films. And upcoming projects like Zoya Factor (2019), Dil Bechara(2019), Bioscopewala (2019) etc will be witness soon by the audience.

Screen adaptations during this decade

- **7 KhoonMaaf (2011)**is a 2011 Indian black comedy film directed, co-written and co-produced by Vishal Bhardwaj.7 KhoonMaaf is an adaptation of the short story Susanna's Seven Husbands by Ruskin Bond. After Bhardwaj saw the possibility of a script in the short story, he requested Bond to develop the story for a film adaptation. Bond expanded his four-page short story into an 80-page novella.

- **Kai Po Che! (2013)**is a 2013 Indian buddy drama film directed by Abhishek Kapoor based on Chetan Bhagat's novel The 3 Mistakes of My Life.

- **Lootera (2013)**is a 2013 Indian historical romance film directed by VikramadityaMotwane and partly based on author O. Henry's 1907 short story The Last Leaf.

- **2 States (2014)** is a 2014 Indian romantic comedy film co-written and directed by Abhishek Varman based on the 2009 novel 2 States: The Story of My Marriage written by Chetan Bhagat. It is produced by Karan Johar and Sajid Nadiadwala.

- **Haider (2014)** is a 2014 Indian drama film written, produced and directed by Vishal Bhardwaj. The film is both a modern-day adaptation of William Shakespeare's tragedy Hamlet and an adaptation of Basharat Peer's memoir Curfewed Night.

- **Bajirao Mastani(2015)**based on the Marathi novel Raau by Nagnath S. Inamdar, Bajirao Mastani narrates the story of the Maratha Peshwa Bajirao released in 2015 an Indian epic historical romance film directed by Sanjay Leela Bhansali.

- **Fitoor (2016)**is a 2016 Indian romantic drama film directed by Abhishek Kapoor, produced by Siddharth Roy Kapur, based on Charles Dickens' novel Great Expectations.

- **Half Girlfriend (2017)**Half Girlfriend is an Indian Hindi-language romantic drama film based on the novel of a similar name composed by Chetan Bhagat. The movie is directed by Mohit Suri and stars Arjun Kapoor and Shraddha Kapoor.

- **Padmaavat (2018)**is a 2018 Indian Hindi-language epic period drama movie directed by Sanjay Leela Bhansali. Based on the epic poem Padmavat by Malik Muhammad Jayasi.

- **Raazi(2018)**Raazi is a 2018 Indian Hindi-language spy thriller film directed by Meghna Gulzar. It is an adaptation of Harinder Sikka's 2008 novel Calling Sehmat.

- **Thugs of Hindostan (2018)** It is a 2018 Indian Hindi-language epic action-adventure film written and directed by Vijay Krishna Acharya. It based on Confessions of a Thug an English novel written by
- Philip Meadows Taylor in 1839.

- **The Accidental Prime Minister(2018)**The Accidental Prime Minister is a 2019 Indian biographical drama movie directed by Vijay Ratnakar Gutte and composed by Mayank

Tewari, in view of the 2014 journal of a similar name by Sanjaya Baru.

V.IMPACT OF LITERARY ADAPTATIONS ON AUDIENCE

➢ Adaptations give a new perspective to the literary things.
➢ It offers a wide opening to more advancement in literary piece by adding more technology like screenplay, different views, camera shots, angles.
➢ It gives a new opportunity to under-rated writers, whose work is liked more by audience in a form of screen adaptations.
➢ It also provides an opportunity to mix the traditionally written literary culture into a more contemporary form.
➢ A film medium, in this way, also gives a good opportunity to a good director to present an alternative viewpoint to his viewers from what the novelist, short story writer or playwright formerly did.

VI.CONCLUSION

An epic or a short story chose by an executive for shooting offers a test to him to make the author's work in any event as amazing, as tenable, as prominent as engaging on film as it as of now is in its unique artistic structure. The film medium, thusly, gives a decent chance to a decent executive to exhibit an elective perspective to his watchers from what the author, short story, essayist or writer some time ago did. There could anyway be a period slip by between when the story was composed and when the film is being made. There can be financial political changes occurring in the genuine around. Neither the author nor the movie producer can do his 'work' in separation with these changes. These circumstances and conditions power the author and the producer to 'see' and 'show' inside a specific casing.

The film, truth be told, is a bigger bit of work than a novel in light of the fact that a film utilizes the mechanical instruments to bring the story alive on screen and make a living atmosphere helped by sound, light, music, altering, discourse, outfit and so forth. It, in this way, confines the extent of the watcher to practice his inventive and imaginative forces, not at all like what the novel does to itperuse. A film adjustment, at its absolute best, isn't lesser work of innovativeness than the first book.

Obviously writing communicates reality, yet film communicates this reality in actuality. When it is acknowledged the view that film and writing have their autonomous presence, with their individual control and rationale and translating of significations and undertones at that point there would not be an issue in moving toward the two media in right point of view. At that point contention like what is unique and auxiliary, how far the film adaptations have been consistent with the first work or/regardless of

whether done equity to it – all this becomes repetitive. The contribution of the two creators in utilizing their particular media in communicating their musings most adequately turns into the point of convergence for an imperative dialog. A film adaptation therefore should be studied as a hybrid product resulting from the blending of two or more authors, cultures and audience, since it is, by nature, a dynamic and interactive process. The successful adaptation performs the process of its transit, makes explicit the way in which the literary work is passed through the filmmaker's imagination, the new cultural context, and the technology of the medium, to emerge as a full–fledged, autonomous retelling of the tale. If one wants to better understand film adaptation, he/she should recognize it as a separate sub–genre of cinema that fulfills specific characteristics of aesthetics shared by translation.

Film adaptations also make recognize under–appreciated writers. The emerging writers can get recognition easily if their works are adapted well. For example, Three Idiots(2010) which is considered among some of the most entertaining as well as meaningful films in Bollywood, directed by Rajkumar Hirani, was adapted from the Chetan Bhagat's novel Five Point Someone. After the success of this film many directors revealed their desires to make a film on his novels. For Example: **Raazi** is a 2018 Indian Hindi-language spy thriller film directed by Meghna Gulzar. It is an adaptation of **Harinder Sikka's** 2008 novel **Calling Sehmat**. After the movie a mass audience came to know about the bravery and scarifies of Sehmat made for our country.

In the act of adapting choices are made focused on various angles involving sort harmonies, political commitment, and individual just as urban history. These decisions are made in a creative just as a life-changing structure. philosophical, cultural, ordered, ethnic, emotional, and stylish. Film scholars who guarantee that the film is totally self-governing workmanship don't typically deny, but instead, deprecate the significance of the film's associations with writing. Their contention is two–crease. To start with, they characterize the film As the craft of film and characterize writing as the specialty of printed verbal language, and present differentiation of film and print. Second, they balance the film with the literature
.

The contemporary movements in film adjustments of Shakespeare are tenaciously prophetically calamitous essentially. They more than once pursue the dichotomous feeling of 'earliness' and 'result' inborn in a prophetically calamitous grant. In the wake of surveying the connection between Shakespeare's plays and their contemporary screen forms, an extreme takeoff from twentieth-century apportionments of Shakespeare is found. Those allocations regularly (if not constantly) will, in general, be 'dedicated' or 'near' their source writings.

At present it is no longer reasonable to limit Shakespeare's plays within prevailing geographical and cultural and academic canons; instead, other archetypes that support exchange must be established. The archetypes, those assist to uncover existing imbalances of location, time and space, and stand as testament to the proper valences of a universal Shakespearean societal integrity. Only after that perhaps the prevalent explorations regarding fidelity and authorship in Shakespeare scholarship and interpretations can be defied.

For Example, Indian film director, screenwriter, producer, music composer, and playback singer Vishal Bhardwaj garnered critical acclaim and several accolades for writing and directing the Indian adaptations of three tragedies by William Shakespeare: Maqbool (2003) from Macbeth, Omkara (2006) from Othello, and Haider (2014) from Hamlet.

All these show how contemporary adaptations of literature are a part of Indian cinema from decades and will continue like this only.

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Economic Empowerment of Ladies by Joining Self Help Groups- A Study of Punjab State

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Abstract: Self-help Group is homogeneous affinity groups with the common aim of enhancing their economic conditions. Some researchers said that Self Help Groups are a group of poor village people formed with at least 5 members. Generally, SHG comprises of 15-20 members having similar economic conditions and aspirations. The research paper has examined the income level of women members of SHGs in Punjab after joining SHGs by using statistical tool T-test and found that there is significant difference in income, expenditure and saving levels of respondents after joining SHGs.

Keywords: SHGs, Women Empowerment, Income, Expenditures, Savings and Borrowing Pattern

I.INTRODUCTION

Self-help Group is homogeneous affinity groups with the common aim of enhancing their economic conditions. Some researchers said that Self Help Groups are a group of poor village people formed with at least 5 members. Generally, SHG comprises of 15-20 members having similar economic conditions and aspirations. There are no strict rules in SHGs, even though they framed smooth rules so that they conduct the SHGs meetings and the collection of money regularly. The credit is provided for both consumption and other productive purposes. SHGs also play an important role in lending loans at a reasonable rate of interest. All the decisions of SHGs are taken by members of the group collectively.

Background: SHGs are brain child of Grameen Bank of Bangladesh, which was founded by Prof. Mohammed Yunus. SHGs were formed in 1975. National Bank for Agricultural and Rural Development (NABARD) started the SHGs in India in 1986-87, but the real effort was taken after the linkage of SHGs with Banks in 1991-92. In Punjab, the concept of SHGs was started in 1999 (Harper et.al 2005). District Fatehgarh Sahib of Punjab is having maximum number of SHGs. The role of NABARD is significant in this district. Most of the SHGs are indulged in the activities like cutting, sewing, embroidery, and dairy farming etc. (fatehgarhsahib.gov.in/selfhelp.htm).

- **Women Empowerment:** A woman is said to be empowered when proper education, health, social status, and earnings are readily available to her.

- Awareness about the available opportunities and a symbiotic approach would generate ample score for sustainable development of women. Women empowerment is influenced by factors like such as education, income, job, property right, technical skills, and self-decision making. The welfare governments all over the world consider the importance of women empowerment. By this process, the overall social development is ensured.

II.REVIEWOF LITERATURE

Kaur & Singh (2014) examined the impact of micro financing schemes on members of SHGs of Fatehgarh Sahib district in Punjab and found the positive impact of these schemes on reducing the poverty. The study also examined to what extent scheme is proved to be helpful in raising the income of the members of the SHGs.

Sharma (2014) investigated Microfinance through SHGs and the empowerment of women taking a case study of some selected SHGs of Sikkim, analyzed the status of respondents before joining and after joining the SHGs and found that income of the respondents has been increased after joining SHGs and their role in decision making has also been increased.

Geethanjali & Prabhakar (2013) analyzed the economic development of women after joining SHGs, taking a case study of YSR District of Andhra Pardesh and found that living standards of women has been improved and women became more aware about their rights. They become more saving conscious, organized, confident and strength full. SHGs played significant and entrepreneurship after joining the groups.

Sarumathi & Mohan (2011) studied the role of Micro finance in women's empowerment taking the study in Pondicherry region observed that Microfinance has brought self confidence, awareness of child education, awareness of environmental issues, economic & social empowerment after joining SHGs in women respondents, as 92% of respondents reported that poverty has been reduced by participating in Micro credit programs, concluded that after joining SHGs there is appreciable improvement in the income of the respondents.

Mahajan & Bansal (2010) investigated the impact of microfinance on poverty, employment & women empowerment in rural Punjab. The study examined the success of microfinance programme in diversified rural areas. The study revealed the social, economical, psychological and political empowerment of the women through this programme.

Randhawa & Mann (2005) stated that income related activities organised by the SHGs and also studied their problems and their impact on the empowerment of the women members of the SHGs. The study found that SHGs helped in empowering the women members by indulging them in various income generating activities like khes making, embroidery, knitting, tailoring and detergent making etc.

III.   RESEARCH METHODOLOGY

Objective of the study:

To examine the income level of women members of SHGs in Punjab.H: There is a significant difference in the income, expenditure, savings and borrowing pattern of women participating in the SHGs of Punjab state after joining the SHGs.

Data collection: The data is collected from primary source by filling the questionnaire from 100 women members of SHGs of Punjab. The data collected from the primary sources has been tabulated and analyzed. After the tabulation process, various statistical techniques like mean and t-test have been applied on collected data to reach meaningful conclusions.

Analysis and interpretation:

1. **Monthly income of the respondent**

Table 1: Distribution of Respondents on Monthly Income Before and After Joining SHGs in Punjab

onthly income	Before joining SHGs	After joining SHGs
a) less than 2000	40%	30%
b) 2000-4000	20%	30%
c) 4000-6000	10%	15%
d) above 6000	30%	25%

Table 1, represents the percentage of respondents in Punjab on the basis of their monthly income. At income level less than 2000 and above 6000, the percentage of respondents decrease after joining SHGs but in others income levels, the percentage of respondents are increased after joining SHGs.

2. Monthly expenditure of the respondents

Table 2: Distribution of Respondents on Monthly Expenditure Before and After Joining SHGs in Punjab

Monthly expenditure	Before joining SHGs	After joining SHGs
a) less than 2000	30%	20%
b) 2000-4000	40%	30%
c) 4000-6000	20%	40%
d) above 6000	10%	10%

Table 2, depicts the distribution of respondents on the basis of monthly expenditure in Punjab. The percentage of respondents after joining SHGs is decreased in the scale less than 2000 and 2000-4000. In the scale 4000-6000, the percentage of respondents is increased after joining SHGs. At last, in monthly expenditure above 6000, the percentage of respondents is similar before and after joining SHGs.

3. Monthly savings of the respondents

Table 3: Distribution of Respondents on Monthly Savings Before and After Joining SHGs in Punjab

Monthly savings	Before joining SHGs	After joining SHGs
a) up to 100	20%	10%
b) 100-300	25%	30%
c) 300-500	15%	15%
d) above 500	40%	45%

Table 3, represents the distribution of respondents in Punjab on the basis of monthly savings. The savings up to 100, the percentage of respondents is decreased after joining SHGs. On the other hand, respondents are increased at savings scale 100-300 and above 500 after joining SHGs. The savings 300-500, respondents are same in both cases.

4.   **Mode of savings of the respondents**

Table 4: Distribution of Respondents on Mode of Savings Before and After Joining

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Mode of savings	Before joining SHGs	After joining SHGs
a) SHGs	20%	25%
b) post office	15%	20%
c) banks	20%	10%
d) insurance	15%	15%
e) others	30%	30%

Table 4, depicts the distribution of Respondents on the basis of mode of Savings Before and After Joining SHGs in Punjab. It is seen that the respondents use SHGs and post office as modes of savings more after joining SHGs. In case of banks, the percentage of respondents decreases after joining SHGs and in case of others and insurance, respondents remain same.

5. Borrowings of the respondents

Table 5: Distribution of Respondents based on Borrowings of respondent before and After Joining SHGs in Punjab

Borrowings of respondent	Before joining SHGs	After joining SHGs
Less than 10000	30%	35%
10000-25000	30%	20%
25000-50000	20%	35%
50000-100000	20%	10%

Table 5 represents the distribution of Respondents based on the Borrowings of respondent before and after joining SHGs in Punjab. There is a rise in the borrowings at scale less than 10000 whereas in 10000-25000, the percentage of respondents decreases after joining SHGs. In 25000-50000 and in 50000-100000, percentage of respondents rises and falls respectively after joining SHGs.

6. Housing types of the respondents

Table 6: Distribution of Respondents based on Housing Types Before and After Joining SHGs in Punjab

Housing Type	Rented	Owned	Kutcha	Pucca
Before joining SHGs	20%	30%	30%	20%
After joining SHGs	10%	40%	20%	30%

Table 6, represents the distribution of Respondents on Housing Details before and after joining SHGs in Punjab. The percentage of Owned and Pucca houses of the respondents has increased after joining the SHGs. in Punjab. Health and Sanitation Facilities have increased after joining SHGs. Medical facilities have also declined whereas drinking water facilities remained unchanged before and after joining SHGs.

The percentage of Rented and Kutcha houses of the respondents has decreased after joining SHGs.

7. Basic amenities of the respondents

Table 7: Distribution of Respondents based on Basic Amenities Before and After Joining SHGs in Punjab

Factors	Before Joining SHGs	After Joining SHGs
Health Facilities	30%	40%
Medical Facilities	30%	10%
Sanitation Facilities	30%	40%
Drinking Water Facilities	10%	10%

Table 7, presents the distribution of Respondents on the basis of basic Amenities before and after joining SHGs

T-Test

In T-test Analysis

A1: Monthly income (Before and After)

A2: Monthly expenditures (Before and After)

A3: Monthly savings (Before and After)

A4: Mode of savings (Before and After)

A5: Borrowings of the respondent (Before and After)

A6: Housing Types

A7: Basic Amenities (Before and After)

H: There is a significant difference in the income, expenditure, savings and borrowing pattern of women participating in the SHGs of Punjab state before and after joining the SHGs

Table 8: Values of T-test, P- value, Mean Difference and 95% Confidence Interval of the lower Difference.

Variables	T-Test	P-Value	Mean Difference	95% Confidence Interval Of The Lower Difference
Monthly Income	14	0.0017	29	25
Monthly Expenditures	7	0.00133	15	11
Monthly Savings	4	0.0026	4	2
Mode Of Savings	19	0	40	36
Borrowings Of The Respondent	9	0	9	7
Housing Types	12	0.0034	8	6
Basic Amenities	9	0.0056	12	7

Table 8shows the value of one sample T- test for finding the relationship between them. In this table, T test performs for showing the relationship between the variables A1, A2, A3, A4, A5, A6 and A7. These variables present the relations before and after joining the SHGs.The sample test presents the experimental result of SHGs where t-test A1 14%, A2 7%, A3 4%, A4 19%, A5 9%, A6 12% and A7 9%. Mean difference A1 29%, A2 15%, A3 4%, A4 40% a A5 9%, A6 8% and A7 12% same in 95% Confidence Interval of the lower Difference in SHGs. In table 8, 2- tailed significant value shows the significant of the hypothesis. Its value indicates the P-value take 99% confidence, which less than $P<=0.01$ shows that the null hypothesis will reject and define hypothesis accept. There is a mean difference which is effective in all the factors. "There is a significant difference in the income, expenditure, savings and borrowing pattern of women participating in Punjab state's SHGs before and after joining the SHGs".

VIII.CONCLUSION AND SUGGESTIONS:

The outcomes demonstratethat there is a positive effect of SHGs on women empowerment. SHGs give a golden opportunity to the Punjabstate's women to upgrade their capabilities. The conducted study gives an idea about the awareness of women in the field of SHGs. After joining SHGs there is addition in the income of the individual. There is a vast development in state of mind of women due to various work and jobs assigned to them.As income increases, it is obvious to increase in expenditure whether it is daily or monthly. There is a huge difference in the income, household expenditure or own expenditure before and after joining of SHGs.As the result represents the saving of individual households, the amount of saving is increased in Punjab. With the increment in earnings, they have raised their mode of saving, but naturally, there is increase in their expenditure accordingly. The housing types are also changed; they have moved to pucca and owned houses after joining SHGs. They have also got basic amenities like health, sanitation and drinking facilities after joining SHGsThe followings suggestions should take into consideration:Training facilities should be provided to the women so that they

can learn the things and do the work accordingly.Motivations should be given to them, so that they prefer to do work in a group rather than individually.Initiative should be taken to make the groups workable so that membership of the groups.

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Cost and Income Structure Viability of Regional Rural Banks: A Case of Indian Punjab

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Abstract: Regional Rural Banks have been in existence for around three decades in the Indian financial scene. Inception of regional rural banks (RRBs) can be seen as a unique experiment as well as experience in improving the efficacy of rural credit delivery mechanism in India.The results arrived at through the analysis of the secondary data have been discussed in this chapter. This chapter has been divided into two sections. First section includes trends in different performance indicators such as deposits, loan & advances, business, credit deposit ratio, profit and productivity of RRBs, Financial viability of RRBs in terms cost and income structure in providing the financial products under various schemes of rural development and Second section includes break-even analysis of deposits, advances, business and credit-deposit ratio for achieving the optimum level of profit.

Keywords — Break- Even Analysis, RRBs, Credit- Deposit Ratio, Economic Viability.

I. INTRODUCTION

Regional Rural Banks have been in existence for around three decades in the Indian financial scene. Inception of regional rural banks (RRBs) can be seen as a unique experiment as well as experience in improving the efficacy of rural credit delivery mechanism in India. With joint share holding by Central Government, the concerned State Government and the sponsoring bank, an effort was made to integrate commercial banking within the broad policy thrust towards social banking keeping in view the local peculiarities. The genesis of the RRBs can be traced to the need for a stronger institutional arrangement for providing rural credit. The Narsimham committee conceptualized the creation of RRBs in 1975 as a new set of regionally oriented rural banks, which would combine the local feel and familiarity of rural problems characteristic of cooperatives with the professionalism and large resource base of commercial banks. Subsequently, the RRBs were set up through the promulgation of RRB Act of 1976. Their equity is held by the Central Government, concerned State Government and the Sponsor Bank in the proportion of 50:15:35. RRBs were supposed to evolve as specialised rural financial institutions for developing the rural economy by providing credit to small and marginal farmers, agricultural labourers, artisans and small entrepreneurs.

A rural bank is a primary Banking institution set up to serve a compact group of villages generally working as a co-operative or as subsidiary Bank of a commercial Bank, functioning or set in a rural area for the purpose of providing Banking and credit facilities in that area .

The main purpose of the rural Bank is to provide Banking and credit facilities to the rural people. They are supposed to be a nucleus of rural development programme in view of their relatively low cost structure, local ethos and professional management. They are government owned, regionally based and rurally oriented Banks endeavouring to supplement the existing rural credit institutional system.

Regional rural banks play a very important role in agricultural credit. Credit is needed both by the distribution channel as well as by the farmers. The distribution channel needs it to finance the fertilizer business and farmers need it for meeting various needs for agricultural production including purchasing fertilizers. Regional Rural Banks also play a very important role in disbursement of medium term and long term credit needed by the farmers' for purchasing agricultural equipments viz. tractors, installation of tube wells and land development works etc. The farmers will not be able to adopt the modern agricultural practices unless they are supported by a system which ensures adequate and timely availability of credit on reasonable terms and conditions.

II. Research Methodology

In order to have a conceptualized view of the financial and social viability of RRBs in Punjab; a set of 40 Customers per branch (total 320) from the selected branches of Punjab Gramin Bank (four), Malwa Gramin Bank (two) and Sutlej Gramin Bank (two) in the state of Punjab were considered for data collection. So, a sample of 320 customers of the selected branches of the Banks was considered for analyzing their perception towards the social

performance of RRBs in Punjab. Further a set of three Bank Officials per branch (total 120) from the selected branches of Punjab Gramin Bank (twenty), Malwa Gramin Bank (ten) and Sutlej Gramin Bank (ten) in the state of Punjab were considered for data collection. So, a sample of 120 Bank Officials of the selected branches of the Banks were interviewed. Both primary and secondary methods will be used for collection of data.

A. DEPOSITS, LOANS & ADVANCES, BUSINESS, CREDIT-DEPOSIT RATIO AND PROFIT

The trends in deposits, loans & advances, business, credit-deposit ratio and profit of RRBs have been worked out in terms of compound annual growth rates covering a period of 2005-06 to 2016-17. This was done through application.

i. Punjab Gramin Bank

a. *Deposits, Loans & Advances, Credit-Deposits Ratio and Profit*

The trend in deposits, loans & advances, business, credit-deposit ratio and profit in Punjab Gramin Bank are shown in Table 4.1.1.1 It can be seen that the deposits were of the order of Rs. 940.10 crore in 2005-06, which consistently increased to Rs. 2631.17 crore in 2011-12 and further to Rs. 6029.00 crore in 2016-17. The deposits depicted a significantly increasing trend from 2005-06 to 2016-17 at the growth rate of 18.35 percent compounded annually. Similarly, the outstanding loans & advances by Punjab Gramin Bank were found to be Rs. 444.00 crore in 2005-06, which increased to Rs. 1847.98 crore in 2011-12 and further to Rs. 4115.00 crore in 2016-17. The advances also exhibited a significantly increasing trend throughout the period of the study at the growth rate of 22.92 percent compounded annually. In case of volume of business of Punjab Gramin Bank, it is obvious from the data given in Table .1, the increase was found to be significant as indicated by the compound growth rate of 20.06 percent per annum.

Table: 1

Year	Deposits	Loans & Advances	Business	CD Ratio	Profit
2005-06	940.10	444.00	1384.10	47.23	13.59
2006-07	1083.00	557.14	1640.14	51.44	30.22
2007-08	1284.84	720.54	2005.38	56.08	35.10
2008-09	1562.05	917.52	2479.57	58.74	50.08
2009-10	1869.30	1214.29	3083.59	64.96	55.46
2010-11	2250.00	1473.51	3723.51	65.49	60.05
2011-12	2631.17	1847.98	4479.15	70.23	31.53
2012-13	3081.03	2174.47	5255.50	70.58	66.69
2013-14	3505.00	2597.00	6102.00	74.09	68.88
2014-15	4185.00	3101.00	7286.00	74.10	77.50
2015-16	5003.00	3740.00	8743.00	74.76	90.88
2016-17	6029.00	4115.00	10144.00	68.25	102.29
Average	2785.29	1908.54	4696.83	64.66	56.86
C.V.	58.50	65.57	61.31	14.35	46.36
C.G.R.	18.35	22.92	20.06	3.86	14.67
t-value	88.17**	28.97**	55.87**	6.33**	5.11**

As far as credit-deposit ratio is concerned, it also depicted a significantly increasing trend in Punjab Gramin Bank from 2005-06 to 2016-17. The proportion of credit in the deposits came to be 47.23 percent in 2005-06, which increased to 74.76 percent in 2015-16 and decreased to 68.25 percent in the next year.

The credit-deposit ratio registered a very significantly growth at the rate of 3.86 percent compounded annually.

The ratio above 50 percent indicated that the major focus of Punjab Gramin Bank remained on credit disbursement to poor.

Bank profit was recorded at Rs. 13.59 in 2005-06, which increased to Rs. 60.05 crore in 2010-11 and then decreased to Rs. 31.53 crore in the next year. After this, it consistently increased to Rs. 102.29 crore in 2016-17.

The profit of the bank increased significantly at the growth rate of 14.67 percent compounded annually. Overall,

Punjab Gramin Bank registered an encouraging trend in deposits, advances, business, credit-deposit ratio and profit.

b. *Productivity per Branch and Per Employee*

The productivity of Punjab Gramin Bank was worked out in terms of per branch productivity and per employee productivity. The results have been presented in Table 2.

Table 2: Productivity of Punjab Gramin Bank, 2005-06 to 2016-17 ('000 Rs.)

Year	Productivity	
	Per Branch	Per employee
2005-06	93520	25584
2006-07	110821	31063
2007-08	130171	38344
2008-09	159972	47684
2009-10	195164	54193
2010-11	209326	57235
2011-12	227362	60940
2012-13	241078	64485
2013-14	254256	72044
2014-15	276001	75742
2015-16	319093	81863
2016-17	360996	98104

Average	214813.33	58940.08
C.V.	38.31	36.22
C.G.R.	12.10	11.42
t-value	14.72**	12.42**

It is clear from the data that per branch productivity increased significantly from Rs. 93520 thousands in 2005-06 to Rs. 360996 thousands in 2016-17 at the rate of 12.10 percent compounded annually.

B. Malwa Gramin Bank

a. Deposits, advances, Business, Credit-Deposits Ratio and Profit

The trend in deposits, outstanding loans and advances, business, credit-deposit ratio and profit in Malwa Gramin Bank are shown in Table 4.1.2.1 The deposits were of the order of Rs. 191.56 crore in 2005-06, which increased to Rs. 649.66 crore in 2011-12 and further to Rs. 1364.81 crore in 2016-17. The deposits registered a significant growth at the rate of 18.60 percent compounded annually.Similar was the trend in case of advances of Malwa Gramin Bank. The loans of the bank were found to be Rs. 149.09 crore in 2005-06, which increased to Rs. 581.40 crore in 2011-12 and further to Rs. 1290.49 crore in 2016-17. The increase in advances was found to be significant at the compound growth rate of 20.97 percent per annum. The trend in advances was directly correlated with the trend in deposits, as the advances important part of

Table: 3

Year	Deposits	Loans & Advances	Business	CD Ratio	Profit
2005-06	191.56	149.09	340.65	77.83	8.36
2006-07	239.75	210.00	449.75	87.59	10.04
2007-08	314.29	276.03	590.32	87.83	11.28
2008-09	429.97	342.04	772.01	79.55	12.78
2009-10	511.73	410.44	922.17	80.21	12.86
2010-11	563.84	471.62	1035.46	83.64	13.44
2011-12	649.66	581.40	1231.06	89.49	14.03
2012-13	752.31	722.89	1475.20	96.09	19.64
2013-14	879.81	864.55	1744.36	98.27	21.02
2014-15	1013.47	1033.05	2046.52	101.93	22.40
2015-16	1151.32	1101.67	2252.99	95.69	27.06
2016-17	1364.81	1290.49	2655.30	94.55	25.87
Average	671.88	621.11	1292.98	89.39	16.57
C.V.	55.29	60.93	57.94	8.93	38.27
C.G.R.	18.60	20.97	19.71	1.99	11.04
t-value	19.50**	23.32**	22.31**	4.07**	15.11**

Deposits and advances directly impact the business, also depict the similar trend as was observed in case of deposits and advances. The business increased significantly from Rs. 340.65 crore in 2005-06 to Rs. 2655.30 crore in 2016-17 at the rate of 19.71 percent compounded annually. As far as credit-deposit ratio is concerned, it depicted a significantly increasing trend in Malwa Gramin Bank from 2005-06 to 2016-17. The proportion of credit in the deposits came to be 77.83 percent in 2005-06, which increased to 95.69 percent in 2015-16 and decreased to 94.55 percent in 2016-17. The credit-deposit ratio registered a significant growth at the rate of 1.99 percent compounded annually. The ratio remained above 75 percent, which indicated that the major focus of Malwa Gramin Bank remained on cred The profit of Malwa Gramin Bank was found to be Rs. 8.36 crore in 2005-06, which increased to Rs. 25.87 crore in 2016-17 after meeting some ups and downs. The profit also exhibited an increasing trend at the rate of 11.04 percent compounded annually. The trend in profit was directly correlated with the trend in advances and deposits, as the deposits and advances are both the source of profit.

b. Productivity per Branch and Per Employee

The productivity of Malwa Gramin Bank was worked out in terms of per branch productivity and per employee productivity. The results have been presented in Table 4.1.2.2.

Table 4.: Productivity of Malwa Gramin Bank, 2005-06 to 2016-17 ('000 Rs.)

Year	Productivity	
	Per Branch	Per employee
2005-06	83087	26823
2006-07	109695	35694
2007-08	143980	41572
2008-09	151377	41958
2009-10	180816	51807
2010-11	195368	46020
2011-12	219834	57797
2012-13	237936	60212
2013-14	256525	61206
2014-15	272869	63164
2015-16	283493	63940
2016-17	308756	70620
Average	203644.67	51734.42
C.V.	35.25	25.70
C.G.R.	11.46	7.77
t-value	11.12**	8.40**

It is clear from the data that per branch productivity increased significantly from Rs. 83070 thousands in 2005-06 to Rs. 308756 thousands in 2016-17 at the rate of 11.46 percent compounded annually. Similarly, per employee productivity increased significantly from Rs. 26823 thousands in 2005-06 to Rs. 70620 thousands in 2016-17 at the rate of 7.77 percent compounded annually.

c. Sutlej Gramin Bank

i. Deposits, Advances, Business, Credit-Deposits Ratio and Profit

The trend in deposits, outstanding loans and advances, business, credit-deposit ratio and profit in Sutlej Gramin Bank are shown in Table 4.1.3.1. It is clear from Table 4.1.3.1 that the deposits were of the order of Rs. 84.16 crore in 2005-06, which increased to Rs. 238.21 crore in 2011-12 and further to Rs. 491.49 crore in 2016-17. The deposits registered a significant growth at the rate of 16.02 percent compounded annually.

Similar was the trend in case of outstanding loans and advances of Sutlej Gramin Bank. The loans and advances of the bank were found to be Rs. 65.69 crore in 2005-06, which increased to Rs. 190.96 crore in 2011-12 and further to Rs. 445.02 rore in 2016-17.

The increase in loans and advances was found to be significant at the compound growth rate of 20.26 percent per annum. **Table: 5**

Year	Deposits	Loans & Advances	Business	CD Ratio	Profit
2005-06	84.16	65.69	149.86	78.08	1.80
2006-07	100.67	72.01	172.68	71.53	1.24
2007-08	131.34	81.80	213.14	62.48	1.10
2008-09	165.62	95.87	261.49	58.07	1.22
2009-10	195.48	116.53	312.01	59.63	2.37
2010-11	221.72	157.82	379.53	71.18	2.38
2011-12	238.21	190.96	429.18	80.16	3.80
2012-13	264.73	203.56	468.29	76.89	2.24
2013-14	306.46	260.33	566.79	84.95	3.63
2014-15	328.21	332.45	660.66	101.29	7.95
2015-16	408.48	383.14	791.62	93.80	1.65
2016-17	491.49	445.02	936.51	90.72	-2.41
Average	244.71	200.43	445.15	77.40	2.25
C.V.	50.43	64.32	56.45	17.71	105.96
C.G.R.	16.02	20.26	17.86	3.65	-17.56
t-value	19.14**	3.20**	44.05**	3.25*	1.46

The business increased significantly from Rs. 149.86 , crore in 2005-06 to Rs. 936.51 crore in 2016-17 at the rate of 17.86 percent compounded annually. As far as credit-deposit ratio is concerned, it depicted a significantly increasing trend in Sutlej Gramin Bank

from 2005-06 to 2016-17. The proportion of credit in the deposits came to be 78.08 in 2005-06, which decreased to 58.07 percent in 2008-09 and increased to 80.16 percent in 2011-12. Then it reached 90.72 percent in 2016-17 after touching the peak of 101.29 percent in 2014-15. The credit-deposit ratio registered a significant growth at the rate of 3.65 percent compounded annually. The profit of Sutlej Gramin Bank was found to be Rs. 1.80 crore in 2005-06, which decreased to Rs. 1.22 crore in 08-09. But pity of the situation was the profit turned into loss of Rs. 2.41 crore in 2016-17. These heavy fluctuations turned the growth rate of 2.25 percent to be non-significant. Hence, profit could not depict any definite trend in Sutlej Gramin Bank.

c. Productivity per Branch and Per Employee

The productivity of Sutlej Gramin Bank was worked out in terms of per branch productivity and per employee productivity. The results have been presented in Table 4.1.3.2.

Table: 6 Productivity of Sutlej Gramin Bank, 2005-06 to 2016-17 ('000 Rs.)

Year	Productivity	
	Per Branch	Per employee
2005-06	68116	22366
2006-07	78489	27409
2007-08	85254	23400
2008-09	87165	32687
2009-10	104189	39070
2010-11	126512	46856
2011-12	138484	40488
2012-13	151189	49335
2013-14	182835	49286
2014-15	194313	62326
2015-16	208321	53488
2016-17	234129	64145
Average	138249.67	42571.33
C.V.	40.57	33.25
C.G.R.	12.25	9.93
t-value	28.78**	8.97**

It is clear from the data that per branch productivity increased significantly from Rs. 68116 thousands in 2005-06 to Rs. 124129 thousands in 2016-17 at the rate of 12.25 percent compounded annually. Similarly, per employee productivity increased

significantly from Rs. 22366 thousands in 2005-06 to Rs. 64145 thousands in 2016-17 at the rate of 8.97 percent compounded annually.

Economic Viability of RRBs: Costs and Margins Structure and Break-Even Analysis

d. Economic Viability of RRBs: Costs and Margins Structure

e. Punjab Gramin Bank

(a) Economic Viability of RRBs: Costs and Margins Structure

The RRBs gives credit to different sectors and social groups in rural Punjab. For this they have to raise funds in terms of deposits and borrowings, on which they expend interest, while on credit they earn interest. From investments they earn dividend and for recovery of loans they bear recovery cost. Keeping all these in view, an attempt has been made to assess the financial viability of RRBs in providing the financial products to different sections of rural society.

The costs and margin structure of Punjab Gramin Bank has been presented. The data given in Table 4.2.1.1(a) showed that the working funds were of the order of Rs. 1100.69 crore, while financial returns were Rs. 83.76 crore against financial cost of Rs. 33.68 crore, resulting in financial margin of Rs. 49.75 crore in 2005-06. The income from miscellaneous sources was Rs. 5.94 crore. The transaction cost and risk cost came to be Rs.20.36 crore and Rs. 3.30 crore respectively. In this way, the net margin worked at Rs. 32.03 crore, which came to be 38.24 percent of financial returns in 2005-06. The net margin was only 2.91 percent of the working funds.

The working funds increased from Rs. 1100.69 crore in 2005-06 to Rs. 7455.92 crore in 2016-17. The financial returns ranged between Rs. 83.76 crore in 2005-06 to Rs. 615.11 crore in 2016-18, while the financial cost was Rs. 33.68 crore in 2005-06, which increased to Rs. 413.06 crore in 2016-17. Therefore, the financial margin was as low as Rs. 49.75 crore in 2005-06 and as high as Rs. 202.06 crore in 2016-17.

The transaction cost increased from Rs. 20.36 crore in 2005-06 to Rs. 111.84 crore in 2016-17. The risk cost remained only between Rs. 3.30 crore in 2005-06 to Rs. 24.60 crore in 2016-17. Thus the net margin was Rs. 32.03 crore in 2005-06, which decreased to Rs. 31.94 crore in 2011-12 and increased to Rs. 151.36 crore in 2016-17. The net margin increased to 32.80 percent in the next year. It again decreased to 9.98 percent in 2011-12, which increased to 17.65 percent in 2012-13 and decreased to 14.60 percent in 2015-16. It registered an increase to the level of 24.61 percent of financial returns in 2016-17. However, the net margin stood only at 2.91 percent of the working funds in 2005-06, which decreased to 0.86 percent in 2011-12 and increased to 1.59 percent in the next year. Ultimately, the net margin was 2.03 percent of the working funds in 2016.17.

Therefore, Punjab Gramin Bank remained financial viable throughout the period of the study. However, the years of 2005-06 to 2009-10 depicted the best trend of financial viability.

(b) Pattern of Costs and Margins in Punjab Gramin Bank

The pattern of different costs and margins as percent of working funds was worked out and presented below.

Table 4.2.1.1(b) showed that in Punjab Gramin Bank, financial returns ranged between 7.61 percent in 2005-06 to 9.01 percent in 2012-13, while financial cost existed from 3.06 percent in 2005-06 to 6.34 percent in 2014-15. Financial margin was lowest to the tune of 2.58 percent in 2014-15 and the highest of the order of 4.52 percent in 2005-06, while miscellaneous income was lowest to the tune of 0.15 percent in 2011-12 to 1.14 percent in 2016-17. The transaction cost existed from 1.33 percent in 2013-14 to 1.86 percent in 2011-12 and the risk cost from 0.07 percent in 2010-11 to 0.35 percent in 2006-07. Ultimately, the net margin ranged between 0.86 percent in 2011-12 to 2.91 percent in 2005-06.

f.   Malwa Gramin Bank

(a) Economic Viability of RRBs: Costs and Margins Structure

The costs and margin structure of Malwa Gramin Bank. Table 4.2.1.2(a) showed that the working funds were of the order of Rs. 229.94 crore, while financial returns were Rs. 19.15 crore against financial cost of Rs. 7.73 crore, resulting in financial margin of Rs. 11.43 crore in 2005-06. The income from miscellaneous sources was Rs. 0.60 crore. The transaction cost and risk cost came to be Rs. 4.62 crore and Rs. -0.99 crore respectively. In this way, the net margin worked at Rs. 8.39 crore, which came to be 43.82 percent of financial returns in 2005-06. The net margin was only 3.65 percent of the working funds.

The working funds increased from Rs. 229.94 crore in 2005-06 to Rs. 2003.01 crore in 2016-17. The financial returns ranged between Rs. 19.15 crore in 2005-06 to Rs. 170.86 crore in 2016-18, while the financial cost was Rs. 7.73 crore in 2005-06, which increased to Rs. 112.97 crore in 2016-17. Therefore, the financial margin was as low as Rs. 11.43 crore in 2005-06 and as high as Rs. 57.89 crore in 2016-17.

The transaction cost increased from Rs. 4.62 crore in 2005-06 to Rs. 33.85 crore in 2016-17. The risk cost remained negative in 2005-06 but remained between Rs. 0.31 crore in 2006-07 to Rs. 6.41 crore in 2016-17. Thus the net margin was Rs. 8.39 crore in 2005-06, which increased to Rs. 25.84 crore in 2016-17. The net margin as percentage of financial returns worked at 43.82 percent in 2005-06, which decreased

to 15.12 percent in 2016-17 However, the net margin stood only at 3.65 percent of the working funds in 2005-06, which decreased to 1.29 percent in 2016-17. Therefore, Malwa Gramin Bank remained financial viable throughout the period of the study. However, viability pattern go on diluting year after year.

(b) Pattern of Costs and Margins in Malwa Gramin Bank

The pattern of different costs and margins as percent of working funds was worked out and presented in Table 4.2.1.2(b)

The data given in Table 4.2.1.2(b) showed that in Malwa Gramin Bank, financial returns ranged between 8.31 percent in 2010-11 to 10.07 percent in 2013-14, while financial cost existed from 3.35 percent in 2006-07 to 7.14 percent in 2013-14. Financial margin was lowest to the tune of 2.87 percent in 2015-16 and the highest of the order of 5.20 percent in 2006-07, while miscellaneous income was lowest to the tune of 0.26 percent in 2005-06 to 0.56 percent in 2007-08. The transaction cost existed from 1.25 percent in 2009-10 to 2.01 percent in 2005-06 and the risk cost from -0.43 percent in 2005-06 to 0.32 percent in 2016-17. Ultimately, the net margin ranged between 1.29 percent in 2016-17 to 3.65 percent in 2005-06.

g. Sutlej Gramin Bank

(a) Economic Viability of RRBs: Costs and Margins Structure

The costs and margin structure of Sutlej Gramin Bank has been presented in Table 4.2.1.3(a). The data given in Table 4.2.1.3(a) showed that the working funds were of the order of Rs. 102.34 crore, while financial returns were Rs. 7.86 crore against financial cost of Rs. 3.75 crore, resulting in financial margin of Rs. 4.11 crore in 2005-06. The income from miscellaneous sources was Rs. 0.30 crore. The transaction cost and risk cost came to be Rs. 2.28 crore and Rs. 0.11 crore respectively. In this way, the net margin worked at Rs. 2.02 crore, which came to be 25.65 percent of financial returns in 2005-06. The net margin was only 1.97 percent of the working funds.

The working funds increased from Rs. 102.34 crore in 2005-06 to Rs. 668.30 crore in 2016-17. The financial returns ranged between Rs. 7.86 crore in 2005-06 to Rs. 61.75 crore in 2016-17, while the financial cost was Rs. 3.75 crore in 2005-06, which increased to Rs. 46.25 crore in 2016-17. Therefore, the financial margin was as low as Rs. 4.11 crore in 2005-06 and as high as Rs. 18.56 crore in 2015-16.

The transaction cost increased from Rs. 2.28 crore in 2005-06 to Rs. 17.91 crore in 2016-17. The risk cost increased from Rs. 0.11 in 2005-06 to Rs. 3.27 crore in 2016-17. Thus the net margin was Rs. 2.02 crore in 2005-06, which decreased to Rs. 1.62 crore in 2015-16 and turned to be negative to the tune of Rs. -2.47 crore

in 2016-17. The net margin as percentage of financial returns worked at 25.65 percent in 2005-06, which decreased to 2.60 percent in 2015-16 and negative to the tune of -4.00 percent in 2016-17. However, the net margin stood only at 1.97 percent of the working funds in 2005-06, which turned to be negative to the tune of -0.37 percent decreased to 1.29 percent in 2016-17. Therefore, Sutlej Gramin Bank remained financial viable throughout the period of the study. However, viability pattern go on deteriorating year after year and negative in the terminal year of the study. The bank management should check and curtail this deteriorating trend in the economic viability.

(b) Pattern of Costs and Margins in Sutlej Gramin Bank

The pattern of different costs and margins as percent of working funds was worked out and presented in Table 4.2.1.3(b)

The data given in Table 4.2.1.3(b) showed that in Sutlej Gramin Bank, financial returns ranged between 7.68 percent in 2005-06 to 9.99 percent in 2015-16, while financial cost existed from 3.66 percent in 2005-06 to 6.96 percent in 2015-16. Financial margin was lowest to the tune of 2.32 percent in 2016-17 and the highest of the order of 4.14 percent in 2006-07, while miscellaneous income was lowest to the tune of 0.29 percent in 2005-06 to 0.75 percent in 2010-11. The transaction cost existed from 2.01 percent in 2014-15 to 3.00 percent in 2015-16 and the risk cost from 0.01 percent in 2012-13 to 0.49 percent in 2016-17. Ultimately, the net margin ranged between -0.37 percent in 2016-17 to 1.97 percent in 2005-06.

Hypothesis-1 The RRBs are economically viable.

The analysis indicated that Punjab Gramin Bank and Malwa Gramin Bank remained economically viable throughout the period of the study, while Sutlej Gramin Bank turned to be economically unviable in the end year of the study.

Therefore, hypothesis-1 that 'the RRBs are economically viable' was majorly accepted by the study.

h. Break-Even Analysis of Deposits, Advances, Business and Credit-Deposit Ratio

The break-even analysis of deposits, advances, business and credit-deposit ratio was performed to determine the level of these parameters, minimum required needed to achieve the positive level of profit. This was done in the linear form of regression analysis.

i. Punjab Gramin Bank

The break-even analysis of deposits, advances, business and credit-deposit ratio in Punjab Gramin Bank has been shown in Table 4.2.2.1.

Table 7: Break-even analysis for Punjab gramin Bank
(Y=Profit)

Factor	Deposits	Advance	Business	CD Ratio
Constant	15.572	26.386	20.047	25.096
Regression coefficient	0.015	0.017	0.008	0.531
t-value	7.23**	5.19**	6.34**	1.33
R-Square	0.839	0.730	0.801	0.149
F-ratio	52.27**	26.98**	40.23**	1.76
Break-Even	-1038.13	-1552.12	-2505.88	-47.26
Average	2785.29	1908.54	4696.83	64.66
Average-BEP	3823.42	3460.66	7202.71	111.92

The analysis given in Table 7 indicated that in case of deposits, the magnitude of R^2 came to be 0.839, which was highly significant as conveyed by the F-ratio of 52.27. This revealed that as high as 83.9 percent of the variation in profit of the bank could be explained by its deposits. This indicated that profit was intimately linked with the deposits of the bank. The regression coefficient of deposits was 0.015, which showed that an increase of one unit in deposits would lead to an increase of 0.015 units in profit.

The break-even point of deposits worked at Rs. -1038.13 crore. The Punjab Gramin Bank had been earning an average profit of Rs. 58.86 crore with average deposits of Rs. 2785.29 crore. The break-even point of deposits (-1038.13) indicated that the bank had Rs. 3823.42 crore of deposits over and above the break-even point. Hence the bank would act financially viable in the future too.

In case of advances, the magnitude of R^2 came to be 0.730, which was highly significant as conveyed by the F-ratio of 26.98. This revealed that as high as 73.0 percent of the variation in profit of the bank could be explained by its advances. This indicated that profit was closely related with the advances of the bank. The regression coefficient of advances was 0.017, which showed that an increase of one unit in advances would lead to an increase of 0.017 units in profit. The break-even point of advances worked at Rs. -1552.12 crore. The Punjab Gramin Bank had been earning an average profit of Rs. 58.86 crore with average advances of Rs. 1908.54 crore. The break-even point of advances (-1552.12) indicated that the bank had Rs. 3460.66 crore advances over and above the break-even point. Hence the bank would act financially viable in the future too.

In case of business, the magnitude of R^2 came to be 0.801, which was highly significant as conveyed by the

F-ratio of 40.23. This revealed that as high as 80.1 percent of the variation in profit of the bank could be explained by its business. This indicated that business and profit were directly linked with each other.

The regression coefficient of business was 0.008, which showed that an increase of one unit in business would lead to an increase of 0.008 units in profit. The break-even point of business worked at Rs. -2505.88 crore. The Punjab Gramin Bank had been earning an average profit of Rs. 58.86 crore with average business of Rs. 4696.83 crore. The break-even point of business (-2505.88) indicated that the bank had Rs. 7202.71 crore of business over and above the break-even point and hence the bank would act financially viable in the future too.

In case of credit-deposit ratio, the magnitude of R^2 came to be 0.149, which was non-significant as conveyed by the F-ratio of 1.76. This revealed that only 14.9 percent of the variation in profit of the bank could be explained by its credit-deposit ratio. The regression coefficient of credit-deposit ratio was 0.531, again non-significant. The break-even point of credit-deposit ratio worked at Rs. -47.26 crore. The Punjab Gramin Bank had been earning an average profit of Rs. 58.86 crore with average credit-deposit ratio of Rs. 64.66 crore. The break-even point of credit-deposit ratio (-47.26) indicated that the bank had 111.92 ratio over and above the break-even point and hence the bank would act as financially viable in future too.

j. Malwa Gramin Bank

The break-even analysis of deposits, advances, business and credit-deposit ratio has been given in Table 4.2.2.2.

Table : 8 Break-even analysis for Malwa Gramin Bank
(Y=Profit)

Factor	Deposits	Advance	Business	CD Ratio
Constant	833.762	879.632	855.964	-775.430
Regression coefficient	0.685	0.671	0.340	23.269
t-value	6.23**	5.95**	6.11**	2.67*
R-Square	0.795	0.780	0.789	0.416
F-ratio	38.77**	35.35**	37.37**	7.11*
Break-Even	-1217.17	-1310.93	-2517.54	33.32
Average	671.88	621.11	1292.98	88.39
Average-BEP	1889.05	1932.04	3810.52	55.07

The analysis given in Table 4.2.2.2 indicated that in case of deposits, the magnitude of R^2 came to be 0.795, which was highly significant as conveyed by the F-ratio of 38.77. This revealed that as high as

79.5 percent of the variation in profit of the bank could be explained by its deposits. This indicated that profit was intimately linked with the deposits of the bank. The regression coefficient of deposits was 0.685, which showed that an increase of one unit in deposits would lead to an increase of 0.685 units in profit. The break-even point of deposits worked at Rs. -1217.17 crore. The Malwa Gramin Bank had been earning an average profit of Rs. 16.57 crore with average deposits of Rs. 671.88 lacs. The break-even point of deposits (-1217.17) indicated that the bank had Rs.1889.05 crore of deposits over and above of the break-even point. Hence the bank would remain finally viable in the future too.

In case of advances, the magnitude of R^2 came to be 0.780, which was highly significant as conveyed by the F-ratio of 35.35. This revealed that as high as 78.0 percent of the variation in profit of the bank could be explained by its advances. This indicated that profit was closely related with the advances of the bank.

The regression coefficient of advances was 0.671, which showed that an increase of one unit in advances would lead to an increase of 0.671 units in profit. The break-even point of advances worked at Rs. -1310.93 crore. The Malwa Gramin Bank had been earning an average profit of Rs. 16.57 crore with average advances of Rs. 621.11 lacs. The break-even point of advances (-1310.93) indicated that the bank had Rs. 1932.04 crore of advances over and above the break-even point and hence the bank would remain financially viable in the future too.

In case of business, the magnitude of R^2 came to be 0.789, which was highly significant as conveyed by the F-ratio of 37.37. This revealed that as high as 78.9 percent of the variation in profit of the bank could be explained by its business. This indicated that business and profit were directly linked with each other. The regression coefficient of business was 0.340, which showed that an increase of one unit in business would lead to an increase of 0.340 units in profit. The break-even point of business worked at Rs. -2517.53 crore. The Malwa Gramin Bank had been earning an average profit of Rs. 16.57 lacs with average business of Rs. 1292.98 crore. The break-even point of business (-2517.54) indicated that the bank had Rs. 3810.52 crore of business over and above the break-even point and hence the bank would remain financially viable in the future too.

In case of credit-deposit ratio, the magnitude of R^2 came to be 0.416, which was significant as conveyed by the F-ratio of 7.11. This revealed that 41.6 percent of the variation in profit of the bank could be explained by its credit-deposit ratio. The regression coefficient of credit-deposit ratio was 23.267, again significant. This indicated that an increase of one unit in the credit-deposit ratio would lead to an increase of 23.27 units in the profit of the bank.

The break-even point of credit-deposit ratio worked at Rs. 33.32 crore. The Malwa Gramin Bank had been earning an average profit of Rs. 16.57 crore with average credit-deposit ratio of Rs. 88.39 crore. The break-even point of credit-deposit ratio (33.32) indicated that the bank enjoyed 55.07 of ratio over and above the break-even ratio. This indicated that the bank would retain its financially viable position in the future too.

4.2.2.3 Sutlej Gramin Bank

The break-even analysis of deposits, advances, business and credit-deposit ratio in Sulej Gramin Bank has been given in Table

Table: 9

Factor	Deposits	Advances	Business	CD Ratio
Constant	5.071	4.679	4.851	0.224
Regression coefficient	-0.002	-0.00006	-0.0004	0.057
t-value	0.27	0.01	0.14	1.11
R-Square	0.008	0.000	0.002	0.109
F-ratio	0.07	0.00	0.02	1.22
Break-Even Point	2535.50	77983.33	12127.50	-3.93
Average	244.71	200.43	445.15	77.40
Existing-BEP	-2290.79	-77782.90	-11682.35	81.33

The analysis given in Table 4.2.2.3 clearly indicated that in case of deposits, advances, business and credit-deposit ratio, the magnitude of regression model does not allow us to proceed for working out break-even points of these performance indicators for profit. The management of Sutlej Gramin Bank should take this situation very seriously and take remedial measures to resolve the contradiction of profit with deposits, advances, business and credit-deposit ratio.

III. CONCLUSION

Punjab Gramin Bank registered an encouraging trend in deposits, advances, business, credit-deposit ratio and profit. The major focus of Malwa GraminR^2 came only to be 0.008, 0.000, 0.002 and 0.109 respectively. All the R^2 values were negligible and non-significant. This indicated that deposits, advances, business and credit-deposit ratio could not explain profit of the RRB. This means that neither deposits nor advances and neither business nor credit-deposit ratio was in significant relationship with the profit. Therefore, the Bank remained on credit disbursement to the rural poor. Sutlej Gramin Bank remained financial viable throughout the period of the study. However, viability pattern go on deteriorating year after year and negative in the terminal year of the study.

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Research Review on Shipbob Proprietary System in E-commerce

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Abstract-A developing and creating writing regarding this matter has been distributed especially since the late 1970s. An endeavor is made to make significant inferences with respect to advantages and A survey of late writing is exhibited identifying with general Just-in-Time (JIT) theory, its stockpile puts together and with respect to the formalized and scientific models. JIT has turned into a subject of a lot of intrigue and some little contention lately and has pulled in light of a legitimate concern for some significant assembling associations in the West just as in Japan where it was initially pertinence to Western assembling industry.
KEYWORDS: - Industry, Japan, Just in time, Model, Toyota

I. INTRODUCTION

The in the nick of time (JIT) stock framework is an administration procedure that adjusts crude material requests from providers legitimately with creation plans. Organizations utilize this stock methodology to build productivity and abatement squander by getting merchandise just as they need them for the creation procedure, which diminishes stock expenses. This technique expects makers to conjecture request precisely.The JIT stock framework appears differently in relation to simply on the off chance that systems, wherein makers hold adequate inventories to have enough item to assimilate most extreme market request.[1]The significant contrasts between JIT assembling and customary assembling are as per the following

a) Some Key takeaways are

The in the nick of time (JIT) stock framework is an administration procedure that limits stock and builds productivity. Without a moment to spare (JIT) fabricating is otherwise called the Toyota Production System (TPS) in light of the fact that the vehicle producer Toyota embraced the framework during the 1970s.Kanban is a booking framework frequently utilized related to JIT to stay away from overcapacity of work in procedure. The accomplishment of the JIT generation procedure depends on relentless creation, top notch workmanship, no machine breakdowns, and solid providers.[2]

b) Case Study

Celebrated for its JIT stock framework, Toyota Motor Corporation requests parts just when it gets new vehicle orders. In spite of the fact that the organization introduced this technique during the 1970s, it took 15 years to consummate it. The terms short-cycle producing, utilized by Motorola, and nonstop stream fabricating, utilized by IBM, is synonymous with the JIT framework. Unfortunately, Toyota's JIT stock framework about made the organization go to a sudden stop in February 1997, after a fire at Japanese-claimed car parts provider Aisin destroyed its ability to deliver P-valves for Toyota's vehicles. Since Aisin is the sole provider of this part, its weeks-since quite a while ago shut down made Toyota stop creation for a few days. This caused a gradually expanding influence, where other Toyota parts providers in like manner needed to incidentally close down in light of the fact that the automaker had no requirement for their parts during that time span. Therefore, this fire cost Toyota 160 billion yen in income.

II. OBJECTIVES OF TOYOTA PRODUCTION SYSTEM:

(I) Zero stock.
(ii) Zero breakdowns.
(iii) 100% on time conveyance administration.
(iv) Elimination of non-esteem included exercises.
(v) Zero imperfections.

III. LITERATURE REVIEW

In [1] authors explained the experience of actualizing the JIT in an Indian car organization. The investigation has discovered the 'representative association' as a basic component for actualizing the JIT, while enormous speculations are not discovered basic. Finally, it is reasoned that usage of JIT isn't so troublesome in India. Its usage could be an incredible open door for Indian businesses because of its wide range of advantages.

In [2] they well expressed that India may give a brilliant contextual investigation to decide, if JIT practices actualized in Indian businesses. Be that as it may, JIT usage without understanding the reasonable system can't bring about durable upgrades. Also, this examination recommended that JIT ought to be actualized in two phases. First phase of JIT execution incorporates arrangement decrease, part size decrease, little machines, quality, format, support stock decrease and adaptable workforce. These systems are fundamental for full JIT to work in light of the fact that these emphasis on four primary components of JIT that can be accomplished in present moment. These are: straightforwardness, stream quality, and quick arrangement and lays the establishment for preceding onward the more troublesome strategies like Kanban, JIT buying, Buffer stock expulsion, multifunctional specialist, pull planning, implemented improvement and perceivaility.

In [3] they well examined the directed a Delphi concentrate to evaluate the appropriateness or trouble of executing JIT components in Indian setting. The outcomes have demonstrated that quality circles and great correspondence are not hard to execute having a rating of 30and above on a 40 point scale. Top the executives frame of mind, multifunctional laborers, long haul connection transport with seller and backing from worker's organization have high appraising, which shows that JIT usage in India isn't an unthinkable assignment. The examination has likewise worried on concentrating more on jab burden, diminished set up time, Kanban framework, and nature of approaching material.

[4] highlighted investigated the particular social changes required in JIT condition and furthermore detailed their quality in Indian enterprises. They have expressed that trust; area, obligation, advancement, inspiration, authority, long haul relationship and regard for people imprint work culture required in JIT condition. It is basic for businesses to attempt cognizant and purposeful endeavors to Change the work culture for effective execution of JIT. These progressions require top administration responsibility and laborer cooperation in basic leadership, and monstrous instruction and preparing to the individuals concerned.

[5] Described endeavored audit on the cutting edge of JIT and its potential implications in the acquiring and assembling framework. It has been brought up that JIT from a framework point of view necessitates that providers and assembling capacities must be working together with configuration, arranging, and without a moment to spare Approach – It's Application in Indian Industries control. JIT must be seen as a coupling power coupling every one of the exercises, from approaching crude material to the completed merchandise

In [6] authors have led a study of 31 Indian enterprises to examine the significance of the credits relating to JIT acquiring and provider assessment criteria. The studied organizations have given incredible significance to certain properties, for example, high caliber, common trust, participated relationship, on time conveyances provider assessment, stable generation plan, dependable system of providers, diminished conveyance time, long haul contract and constant improvement. The examination has too demonstrated the extent of JIT as70 on-scale (0-100), which is anticipated better contrasted with before considers.

In [7] they have uncovered the relevance of JIT in Indian ventures. They have moreover looked into the writing identified with utilizations of JIT in various divisions of assembling and recognize the different prerequisites should be satisfied include: leveled and stable last get together timetable, change in design, multi-talented workforce and preparing for laborers.

In [8] authors have given a review of changes actualized in apring fabricating office. These progressions were made as a component of a proceeding with usage of a JIT producing framework. This examination has demonstrated how assembling request and control frameworks change in request to make a framework which can respond promptly as indicated by change in client's needs.

In [9] he has led review of 43 Indian enterprises and proposed that TQM and merchant advancement endeavors must pre-surrender the dispatch of major JIT programs. It has been discovered that car industry in India has made

critical upgrades in zones, for example, multi-skilling of workforce, absolute preventive upkeep (TPM) and JIT buying. These variables comprise the essential necessities for fruitful JIT execution in any firm. Provider advancement, worker inclusion, and top the executives' duty is unmistakably recorded as basic achievement variables. Preparing, team arrangement, re-format, and pilot study are demonstrated as among the initial five stages taken in JIT usage.

In [10] authors have directed a contextual investigation in JIT usage of an Indian tractor get together Industry. Records of organization have demonstrated that noteworthy advantages are accomplished by improvement in quality and profitability, and decrease in stock, material development, space, labor, work-in-procedure, and lead-time. The key strides in JIT usage were broad preparing of workers on pull ideas; recognizable proof of key execution parameters; new design dependent on U-molded cells; institutionalization of activities; and upkeep plan for each machine, housekeeping, visual control, also, multi-expertise preparing.

In [11] they have led a study on JIT rehearses in India, 34 assembling firms were incorporated into study. The aftereffect of this study bolstered the idea that JIT can possibly increment the operational productivity, quality and hierarchical adequacy of Indian enterprises while some essential components are marginally hard to actualize existing creation arrangement of ventures. Having assessed the prior examinations on JIP approach, the businesses are exceptionally profited with this idea by method for taking out unreasonable speculation on stock, convenient stockpile of required sources of info, diminished wastage, decreased inactive time of laborers, and so forth.

Along these lines, to pick up the advantages of JIT, Indian enterprises must be happy to alter their way of thinking of the executives, operational strategies and frameworks. To harvest these additions coming up next are the means to be taken by the Indian business associations during the days to Come.

IV. USAGE OF JIT IN INDIAN INDUSTRIES:-

JIT isn't new to the present situation of industrialization. This innovation isn't restricted to a specific nation yet because of its huge capability of advantage it has a boundless application through the world. Numerous ventures have received it and others are going to execute it for their endurance in the quick rivalry at each phase in every territory. The execution of the JIT in organizations will rely upon numerous factors. The usage of JIT should be done in association with all divisions.

• Top administration must acknowledge thought of the JIT.

• Employees ought to comprehend essentialness of the JIT idea.

• The last advance is trying and control for effective presence and creating of the JIT framework there must be ceaseless control. Without control, things can away from the correct course.

• The input circles additionally exist and they are significant for the entire procedure.

V. OBJECTIVES OF STUDY

- To examine the JIT present impacts.
- To inspect the effect of JIT on industries.
- Implementation of ship bob system in e-commerce.

VI. METHODOLOGY

The present examination is centered around breaking down the effect of JIT on enterprises .The investigation considers auxiliary information which have been extricated from different authority sites, diaries, articles, books and papers and so on..

VII. LIMITATIONS OF TOYOTA PRODUCTION SYSTEM

Regardless of the greatness of the first points of interest, there are additionally a few disservices related with in the nick of time stock, which are:

i. A provider that doesn't convey merchandise to the organization precisely on schedule and in the right sums could genuinely affect the creation procedure.

ii. A cataclysmic event could meddle with the progression of merchandise to the organization from providers, which could end generation nearly on the double.

iii. A venture ought to be made in data innovation to interface the PC frameworks of the organization and its providers, with the goal that they can arrange the conveyance of parts and materials.

iv. An organization will be unable to promptly meet the prerequisites of a huge and sudden request, since it has few or no loads of completed merchandise.

They concluded that Indian work is generally uneducated, ailing in inspiration and increasingly worried about fiscal advantages and employer stability than bearer progress and improvement of their potential. Trade guilds and their reluctances are likewise troublesome for executing the JIT. On this issue, a few scientists expressed that Japanese preparing models are not exceptionally fruitful in India. Subsequently, some particular time bound preparing projects ought to be composed for Indian workforce after cautiously concentrating their standards of conduct, individual characteristics, demeanors and social qualities. This turns into another zone for look into.

A. THE SEVEN WASTES OF LEAN MANU FACTURING

Overproduction : The most genuine of the squanders, overproduction can cause every other sort of squanders and results in overabundance stock. Stocking Depending, obviously, on the item being referred to, overproduction can have intense natural impacts. More crude materials than would normally be appropriate are devoured; the item may ruin or wind up out of date, which necessitates that it be hurled; and, if the item includes risky materials, more unsafe materials than should be expected are squandered, bringing about additional discharges, additional expenses of waste transfer, conceivable laborer introduction, and potential ecological issues coming about because of the waste itself.

Stock : Stock waste alludes to the waste delivered by natural stock. This incorporates the misuse of capacity, the misuse of capital tied up in natural stock, the misuse of shipping the stock, the compartments used to hold stock, the lighting of the extra room, and so forth. Additionally, having abundance stock can shroud the first squanders of creating said stock.The ecological effects of stock waste are bundling, weakening or harm to work-in-process, extra materials to supplant harmed or out of date stock, and the vitality to light—just as either warmth or cool—stock space.

Movement: Inefficient movement is the majority of the movement, regardless of whether by an individual or a machine that could be limited. On the off chance that overabundance movement is utilized to include esteem that could have been included by less, than that edge of movement is squandered. Movement could allude to anything from a laborer twisting around to lift something up on the production line floor to extra mileage on

machines, bringing about capital devaluation that must be supplanted.There are numerous natural expenses from abundance movement. One evident one is the unnecessary misuse of materials used to supplant worn machines; another could be the wellbeing assets for overburdened representatives, who probably won't have required them if movement had been limited.

Imperfections: Imperfections allude to an item going amiss from the guidelines of its plan or from the client's desire. Inadequate items must be supplanted; they require administrative work and human work to process it; they may conceivably lose clients; the assets put into the deficient item are squandered in light of the fact that the item isn't utilized. In addition, a blemished item infers squander at different levels that may have prompted the deformity in any case; making a progressively proficient generation framework lessens imperfections and builds the assets expected to address them in any case.Ecological expenses of deformities are the crude materials expended, the imperfect pieces of the item requiring transfer or reusing (which squanders different assets engaged with repurposing it), and the additional room required and expanded vitality utilize associated with managing the imperfections.

Over-preparing: Over-preparing alludes to any part of the procedure of assembling that is superfluous. Painting a zone that will never be seen or including highlights that won't be utilized are instances of over-preparing. Basically, it alludes to including more an incentive than the client requires.The natural effect includes the abundance of parts, work, and crude materials expended underway. Time, vitality, and emanations are squandered when they are utilized to create something that is superfluous in an item; improvement and proficiency diminish these squanders and advantage the organization and the earth.

Pausing: Holding up alludes to sat around idly in view of eased back or ended creation in one stage of the generation chain while a past advance is finished. To take the exemplary model, the generation line, in the event that one undertaking along the chain takes longer than another, than whenever the worker accountable for the following assignment spends holding up is squandered. The undertaking that takes additional time must be made increasingly proficient, different representatives must be employed to help, or the

work process must be better organized or planned for request to compensate for this sat around idly. The natural effect originates from the squandered work and vitality from lighting, warming, or cooling during the holding up period. Also, material can be ruined, and segments could be harmed as a result of a wasteful work process.

Transport: Transport is moving materials starting with one position then onto the next. The vehicle itself enhances the item, so limiting these expenses is fundamental. This implies having one plant nearer to another in the generation chain, or limiting the expenses of transportation utilizing increasingly effective strategies. Assets and time are utilized in dealing with material, utilizing staff to work transportation, preparing, actualize wellbeing safeguards, and utilizing additional room. Transport can likewise cause the misuse of pausing, as one piece of the creation chain must trust that material will show up. Natural expenses to holding up incorporate gas outflows, transportation bundling utilized, conceivable harm to the item in transit, just overall host of different squanders including moving perilous materials.

VIII. SUGGESTIONS TO IMPLEMENT JIT IN INDUSTRIES

There are sure prerequisites to be satisfied for fruitful usage of JIT:
  i. Balance out and Level of Master Production Schedule (MPS): endeavors to utilize all work focuses through consistent day by day creation. Additionally request vacillation ought not to be fluctuating the generation level; it ought to rather be met by stock.
  ii. Cutting down the arrangement time: arrangement time ought to be brought down to a base. Executing SMED would prompt least stock.
  iii. Cutting down the parcel size: This guarantees creation of littler parts however as this would expand the recurrence of conveyance, coordination with providers is to be kept up.
  iv. Cutting down the lead time: Getting workstations closer and depending on cell fabricating subsequently, decreasing no of occupations pausing and better synchronization between procedures can help diminish lead time. Likewise providers area and auspicious is important.
    a) Preventive Maintenance: to diminish inert time and keep away from breakdowns. Any reason for log jams and stoppages

ought to be recorded and investigated ahead of time.
  b) Adaptable Workforce: Workers should now have the option to play out numerous undertakings and ought to be adaptable while being able to take on various jobs and receive new obligations every now and then.
  c) Guaranteeing Supplier quality and Zero Defect: There should be no deficient things in light of the fact that there are no security stocks now. Each laborer ought to do his/her work impeccably and guarantee total quality to the following level.
  d) Taught Shop Floor Control: The tasks ought to be unclogged. There should be exact timings and amount for generation and arrival of request.
  e) Misuse of Over-Production
  f) Misuse of Waiting
  g) Misuse of Transportation
  h) Misuse of Processing Itself
  i) Misuse of Stocks
  j) Misuse of Motion
  k) Misuse of Making Defective Products
  l) Concentrating on Value Addition: Process Delays, longer work-in-progress, crude material transportation delays, inventories, unnecessary preparing time – all increase the value of the item. The focal point of JIT is to maintain a strategic distance from such issues and increase the value of the creation procedure.
  m) Generation of Quality Goods: Internal Inspection is done at each phase by the specialist themselves, guaranteeing no deformities in the item before being passed onto the following level. Each stage assumes responsibility for nature of its finished result.
  n) Zero Set-up time: a diminished set-up time prompts increasingly advanced creation. To dodge stock and keep part sizes suitable, the set-up time must be decreased. This prompts development in structure and procedures too.
  o) Zero Inventories: Zero Inventories has decreased the throughput and improved process durations. Machines no more run full ability to decrease the hourly expenses. Likewise immense space reserve funds are acknowledged as there are no necessities of distribution centers any longer.
  p) Decrease of Manufacturing Costs: This can be best done by setting up a decent compatibility

between boss and representative to create cost sharing arrangements.

q) "First Time Right". Getting the item made with no imperfections and of required quality can prompt higher investment funds. This can be accomplished by improving specialist aptitude level and mechanization of the procedures.

IX. E-COMMERCE SECTION

Stock administration for your web based business can get somewhat confused. Requests come flying in, items should be delivered out, and it very well may be trying to monitor what you have all through stock.

Consumer loyalty is colossally imperative to your business, so ensuring requests are satisfied on time should be a top need. You need an answer that holds the majority of your stock within proper limits and guarantees you recharge in time.

Enter Just in Time (JIT) stock, a training that limits stock and abundance item, so your business just has what is required close by.

While assembling organizations like Toyota have invested a great deal of energy and cash on consummating this procedure, it isn't generally as effectively repeated for internet business organizations.

a) What is Just in Time (JIT) stock?

JIT is a strategy for inventory network the board that is intended to cut costs, increment proficiency, and reduction squander by accepting products when they are required. It adequately means having enough stock accessible to fulfill client need yet close to simply enough, so you have to store the rest of rapidly from that point.

While executing JIT stock for a web based business can be troublesome, the uplifting news is ShipBob offers the following best arrangement – ensuring warehousing expenses and dispatching expenses are as low as could be allowed.

b. OFFER 2– DAY SHIPPING WITH AN ADVANCED INTERNET BUSINESS SATISFACTION SUPPLIER

ShipBob enables you to maintain your online business with satisfaction focuses close to your clients and the devices to keep up command over stock, requests, and shipments.

i) *Interface your store and send your items to us*Getting set up with ShipBob is direct. All

major online business stages and commercial centers are flawlessly coordinated with our innovation, so it just takes a few minutes to match up your store and import your items/SKUs. At that point, send us your stock.

ii) *We store your stock:*With ShipBob's system of satisfaction focuses in the biggest US urban areas, you approach an incredible geographic impression. We possess and work the majority of our satisfaction focuses and help you deliberately split and deal with your stock to diminish transportation expenses and time in travel.

iii) Your client puts in a request: ShipBob's innovation controls our system of satisfaction focuses the nation over. When a request is put on your store, it is naturally sent to the ShipBob satisfaction focus nearest to the client to be picked, stuffed, and sent to the customer.

iv) We send the request to your client — quick:For each request, ShipBob finds the quickest and most financially savvy alternative to get it conveyed to its transportation goal. When the request ships, following information is pushed back to your online store and sent to your clients so they remain on top of it at all times.

v) More tightly control:-
Web based business stores should control their production network the executives as much as they can to arrive at any kind of effectiveness with JIT. They have to stay over requests and stock so as to adequately control their generation procedure in accordance with JIT frameworks.

vi) A Greater requirement for information:-
Warehousing and stock estimating information is incredible on the off chance that you use it accurately. Since JIT is totally dependent on your past market interest, you'll need ongoing information to quantify your needs or future stock.

Utilizing an electronic information arrangement (EDI) would empower web based business stores to oversee stock, improve effectiveness, and control edges. EDI additionally enables stores to gather and transmit information precisely to improve estimating expectations. The arrangement will naturally arrange new stock to recharge stock levels once they hit a specific edge with

the spryness and speed expected to fulfill customer and retail needs.

Online business satisfaction suppliers like ShipBob likewise have innovation that helps organizations with reorder point recipes and constant stock levels crosswise over satisfaction areas and SKUs.

vi) Make your web based business store network JIT productive:-

So as to viably oversee crude materials and stock levels, solid provider connections and exact interest gauging are required. The following are a few different ways to make your web based business inventory network JIT productive.

vii) Cement your coordination's:-

Coordination has an immense influence in web based business stores and the capacity to reach online business JIT industry benchmarks. The JIT system can be applied to any region of business; however transportation is a major one that can be persistently improved with shorter and increasingly predictable travel times, better correspondence encompassing conveyances, and improved coordination.

viii) Have more than one provider:-

Having beyond what one provider can guarantee that you have enough stock if something turns out badly. A typical drawback to JIT is that if a stock can't be recharged rapidly enough, it can prompt colossal issues that influence the whole store network. To beat this, web based business stores can utilize various providers to guarantee they never bring about such issues.

ix) Redistribute satisfaction to a 3PL:-

ShipBob engages online business stores by giving satisfaction focuses that are close to their clients, devices that help to keep up authority over stock and requests, and exclusive stockroom the executives' innovation that powers its satisfaction organize. Re-appropriating satisfaction to a 3PL like ShipBob can assist you with overseeing your stock administration. See it in real life: Read about how Brummell conveyed on their vacation deals in the last-minute with assistance from ShipBob.

c. 3PL REQUEST SATISFACTION PROCESS:-

In case you're thinking about working with a 3PL organization or are new to redistributing

shipping, what goes on in a 3PL satisfaction focus may appear to be a black

box. In any case, the 3PL satisfaction procedure doesn't need to — and shouldn't — be a secret! So what precisely occurs at a 3PL distribution center once a client clicks "Submit request" on your online store.Getting:-

A 3PL can't ship orders without stock close by. The "getting" of stock in a 3PL distribution center alludes to the acknowledgment of approaching stock pursued by its stockpiling. Each 3PL has its very own procedures and limit with regards to getting and putting away stock.For instance, at Ship Bob, we expect customers to take care of out a Warehouse Receiving Order (WRO) with the goal that we know which items we will get and what number of units. This encourages us remain sorted out and convenient with getting, which means we can begin satisfying your requests all the more rapidly and proficiently.When we get your stock, we store your things in our satisfaction focuses. Each SKU has a different devoted stockpiling area, either on a rack, in a receptacle, or on a bed..Diverse 3PLs have distinctive stockpiling limits; not all 3PL stockroom space is made equivalent. It's critical to work with a 3PL that has all that could possibly be needed extra room for your present stock — as your product offering and request volume develop, your 3PL stockpiling must have the option to scale with you.Contingent upon your items, you may likewise require temperature-controlled stockpiling or refrigeration. Diverse 3PLs have various degrees of lodging accessible to address these issues.

i. Picking:-

At the point when a client submits a request, it's the ideal opportunity for the 3PL satisfaction procedure to start. (You may have heard the expression "pick-and-pack satisfaction" previously — this is the principal half of that.)

Some 3PLs expect you to physically transfer requests to their framework. Now and then, this includes spreadsheets including request subtleties, clients' delivery subtleties, and that's just the beginning. This can be a wasteful and complex approach to oversee orders.

Different 3PLs have refined innovation that coordinates straightforwardly with your web based business stage or commercial center. These 3PL satisfaction programming combinations bring orders, shipments, stock

following and stock levels, and all the more together in one spot to streamline and mechanize the satisfaction procedure.

This incorporates consequently driving clients' online requests to your 3PL when they're set.At the point when a request is sent to your 3PL, it is doled out to the picking group. The picking group gets a picking rundown of the things, amounts, and capacity areas at the office to gather the arranged items from their particular areas.

At the point when all things in a request have been picked, it's an ideal opportunity to get them safely stuffed for transportation. The pressing materials utilized will rely upon your 3PL's capacities, your image inclinations, and the things being dispatched.The most widely recognized standard pressing materials include:

  i. Unbranded boxes
 ii. Air pocket mailers
iii. Poly sacks
 iv. Pressing tape
  v. Air pocket wrap

Some 3PLs will charge for pressing materials as a different detail, while others incorporate them as a component of their satisfaction administrations. The 3PL will pick the best pressing materials to both secure your items and accomplish the most reduced down to earth dimensional weight.

Dimensional weight is a transportation evaluating strategy that considers bundle measurements to decide delivery rates. Utilizing the correct pressing materials can help keep coordination's costs low.

In the event that you need your image to radiate through your transportation, ensure you cooperate with a 3PL that enables you to utilize custom bundling, for example, custom boxes and embeds. Regularly, accepting a bundle is the first in-person experience a client has with your image, so marked bundling can establish a major connection.

The following stage is shipping your request. Most 3PLs will buy and print transportation names for your sake. Some 3PLs have favored transporter accomplices, while others look at transportation costs from an assortment of bearers. The last helps 3PLs offer customers the most reasonable evaluating feasible for the conveyance speed that every client picks.

Bearers, for example, DHL, USPS, and UPS get orders from 3PL distribution centers to deliver. The transporter and transportation speed for each request rely upon the 3PL's associations and strategies just as the ship choices offered by the customer and chose by the end client.

When the request ships, 3PLs with the coordinated innovation referenced above will consequently push following subtleties to dealers' online stores. The most effective method to get Affordable 2-Day Shipping Rates.

V Returns:-

A large number likewise offer return handling administrations. In the event that a client restores a request by transportation it back to your 3PL, your 3PL will process the arrival and restock or discard the thing relying upon their strategies and your inclinations. You can have your 3PL give return transportation names to your clients. This offers comfortfor both you and your clients; you won't need to deal with returns in-house, and clients can without much of a stretch track the status of their arrival request.

X. CONCLUSION

JIT is a progressive idea to stay aggressive. The colossal measure of cost and time reserve funds produced by effective execution of JIT alongside the exertion decrease brings about an at last smooth working of store network. Be that as it may, each idea has a flip-side to it. If there should be an occurrence of JIT, it's that the JIT practice of any two associations can't be same. Henceforth, firms need to recognize regions of progress as per their neighborhood limitations and make vital changes to their procedures to coordinate with the global guidelines and appreciate 100% advantages of the exertion that are placed into execution of JIT in their frameworks. And in e-commerce without a moment to spare stock frameworks can help online business stores lessen waste, space, and expenses. Be that as it may, your store will likewise should be as light-footed as could be expected under the circumstances and have the capacity of dealing with a shorter than normal creation cycle.

While JIT is ordinarily utilized with respect to stock administration, similar standards can be applied to different regions of the production network. Become familiar with how ShipBob can enable your business to oversee stock and convey arranges speedier.

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An Antecedents in to Customer Participation in Web Based B2CE-Markets by Indian Retailing Sector

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Abstract: The Present study makes an effort to explore the constructs crucial shopper participation in B2C E-markets. internet wanting turning into a straightforward route rather than the quality methodology for obtaining merchandise & services on the premise of their choices and specifications i.e. whereas not going from look to shop for. magnified internet Penetration, updated efforts to determine safety, quality of wanting in lives throughout a rush, and, obviously, many retailers to browse these are many variables that captivates extra purchasers to shop for on internet. this study reveals five factors that impact the patron Opportunities to shop for merchandise and administrations from internet wanting i.e. Budget, simple use, Compatibility, Hardware and package and Opportunities. Budget is that the first variable that spur the patron Opportunities to shop for merchandise through E-Markets. With the assistance of internet entrances, shopper can investigate the item, budgets, engaging offerings, simple installments mode and so forth of the items gave by the distinctive supplier effectively and will decide the things as needs be.

Keywords: E-Markets, B2C Markets, E-Markets

I.INTRODUCTION

E-markets are virtual outlets wherever a potential businessman will investigate a intermingled sack of things like attire, Accessories, Mobiles/Cell Phones, Cameras, Computers, Books, Magazines, Music CDs and DVDs, Electronic, Goods, Shoes, Furniture, Health Equipment's, Flowers, etc. Advertisers (Kotler prince, 2013) will lead on-line promoting by creating an electronic closeness on the web, "putting advertisements on line; participating in discussions, newsgroups, announcement sheets and internet networks; and utilizing email and web throwing. The extent of things which will be oversubscribed victimization that E Marketing is gigantic and covers things that are sold nowadays and people that aren't logical to supply another approach. It incorporates no matter may be depicted, is especially delineated and has quality to a minimum of one patrons. It joins accomplishment lofts and radio wires, batteries, bicycles, securities, books, articles of consumer goods, PCs, magnificence care things, etc and no matter else will move. The division has big radically from customary city fairs, street merchants to splendid strip malls and made shops, making from quality to

quality. Asian nation (ICRIER, 2010) is that the seventh-greatest retail exhibit on earth, and is needed to make at a CAGR of over thirteen until FY12. marketing (Kunz, 1997) could be a flow channel limit, wherever one affiliation buys things from providing corporations or makes things themselves, and subsequently offers these direct to customers. Associations like Reliance, Tata, Bharti, Adani Enterprise, are putting surprisingly within the impacting Indian retail territory. Also, totally different multinational associations have in like manner found out retail chains during a joint elbow grease with large Indian associations. The Indian retail fragment is uncommonly divided and therefore the untidy territory has around thirteen million shops that record for around 95-96% of the overall Indian retail trade (Duggal, 2002). As the world steps into the new thousand years , the IT modification that has initiated within the latest decade of the 20th century strengthened, usually in light weight of the advancement of net that has modified the planet into overall city, wherever individuals impart instantly with anybody in any little bit of this planet through clicking of mouse and sitting before a laptop connexion on internet (WWW), that have enabled the individual to accumulate such plenty of volume of knowledge during a year

that of a person living in nineteenth century will col lect within the totality of his years (Vijay, 2009). E-Markets (Kaplan and Sawhney, 2000) by morals are its type sceptered markets wherever patrons and shippers get along in business division house and exchange info distinctive with esteem, issue subtlet ies and terms of trade and part esteem creating phas e, (for instance, provide and raise structure) trade between the associations.

The business world is moving ANd it's reevaluating itself at an unmatched pace. In past internet has obtained another revolt every field nevertheless at n ow days it's one in every of the elemental wellsprin g of purchase about to nothing, medium and mamm oth affiliations once customers have their issue or organization through internet whether or not they are in work place or reception. Electronic marketing offers modification from cust omary physical top off structure to more and more elegant non-store courses of action prompts change in business nowadays. it'll be used as a basic plans to execute business with no issue. Electronic marketing can set another section for the business' enlargement. The present investigation work is to trouble points regulated within the new a mount. In any case, the read for this world ascent up out of AN unmatched cognizance of the style during which that the status for a business starts from the accumulated learning base, and what is more ability to enact and be a part of knowledge.

II. HYPOTHESIS OF THE STUDY

Shopper's expectation to buy on-line the info securing stage. The investigation joined 3 elementary factors that are likely to impact customers' aims for instance Accommodation attributes of searching channels, Product kind qualities and Perceived budget of the item. Monsuwe, Dellaert and Ruyter (2004) examine the comprehension lookper|ofcustomer|of purchaser} frames of mind toward E-Markets and their aim to the shop on the online. The investigation reasoned that purchasers' frame of mind toward net searching rely on the immediate impacts of applicable E-Markets highlights, for instance, usability and crazy measurements like pleasure. Kim and Lee (2004) contemplate targeting completely different variables relationship on-line hunt aim, for instance, utilitarian estimation of net knowledge look, decadent estimation of net knowledge obtain,

saw benefits of net searching, saw danger of net searching and web shopping data anticipated on-line inquiry aim nice.

Schimmel (2005) trust reasoned that communication and advertising endeavors were the foremost important inspirations, whereas on-line correspondences were the lead powerful. Rajamma and Neeley (2005) analyzed the impact of social introduction of the purchasers. The examination found that on-line customers are sure to be out customers and are likely to induce larger happiness from searching. Prasad and Aryasree (2009) investigated the determinants of client conduct, for instance, accommodation, shopper administration, trust, net store condition and web searching delight. Rao and Mehdi (2010) within the investigation investigated the conduct of net purchasers. They reasoned that security was the foremost important issue from on-line factor from online purchasers pursued by unwavering quality factor.

Davis (1993) trust discovered clients' mentalities with reference to net searching are relying upon the immediate impacts of pertinent E-Markets highlights. E-Markets highlights will be ordered into purchaser's read of helpful and utilitarian measurements, for instance, "usability" and "helpfulness", or into their impression of overzealous and indulgent measurements like "pleasure" Vijayasarathy and Jones (2000) found that apparent hazard wedged the 2 tendencies toward E-Markets and goal to buy on-line in accordance with completely different examinations. however, saw likelihood is alleged to diminish with net understanding (Miyazaki and Fernandez, 2001). Indeed, even Huang, Schrank and Dubinsky (2006) found on-line customers had lower seen hazard than non-customers. Unwavering quality could determine with the capability of the location to satisfy arranges effectively, convey straightaway, and keep individual knowledge secure (Parasuraman et al., 1988; Janda, Trocchia, and Gwinner, 2002; Kim and Lee, 20 02). attender and associates (1999, p. 33) contemplate found that net studies concur that the web world is moderately younger, increasingly educated, wealthier, despite the actual fact that the holes are step by step movement. Bhatnagar and associates (2000) provide proof that socioeconomics aren't applicable factors in determining that store to belittle or the number to pay, but individuals do can generally purchase various types of things or administrations

by means that of the web. For net purchasers, sex, standing} status, personal space, age, training, and relations pay were as typically as doable ascertained to be important indicators of net getting (Fram and Grady, 1997; Kunz, 1997; Mehta and Sivadas, 1995; grand Turk and Henrichs, 2000) grand Turk and Henrichs (2000) careful that the customer's readiness to and inclination for embrace the web as his or her searching medium was to boot by all odds known with pay, family size, and creativeness. In 2000, girls spoke to the most important on-line Christmas season customer (Rainne, 2002. As indicated by a report by the church bench center (2001), the number of women (58%) World Health Organization purchased on-line surpassed the quantity of men (42%) by Sixteen Personality Factor Questionnaire. Among the woman World Health Organization purchased, thirty seventh proclaimed obtaining a charge out of the expertise "a nice deal" contrasted with simply 17 November of male customers World Health Organization delighted within the experience "a ton". Akhter (2002) showed that more and more educated, younger, guys, and wealthier people as against less taught, additional seasoned, females, and fewer affluent are sure to utilize the web for purchasing. Administration quality depends very on the conduct of shoppers. later, if the online composition may empower customers to utilize effectively and quickly discover the info or purchase administration they have, purchasers would feel the administration brilliance of the sites (Dabholkar, 1996; Santos, 2003). Kumar, Smith, and Bannerjee (2004) named the most concerns influencing the benefit of use of a website interface are: language used, game arrange of information, utilization of analogies, size and differentiation of letters. Tatsuo Tanaka (1996), James Ho (1997) and sticker Stelzer (2001) ponder finished up the variables propulsion within the organizations to misuse the E-markets such New business openings , resolve correspondence boundaries rather improve the correspondence notably in E-markets .Similarly Jackson Michele (1997) and Stone and Han dynasty (1999) to boot examined the benefits of abusing E-markets and what is more it thought-about the problems such Low entrance level , Requiring pc ability , Payment Security issue and a few additional. Hann Jungpil et al (2001), Schoopmarkieke (2001), Grewal Rajdeep et al (2001) inferred that the dimension of support in E-markets depends upon Ability and inspiration. the

power is littered with age based mostly learning, toil based mostly learning and IT capacities. The second issue inspiration is wedged by productivity intention and credibleness thought processes. Gauzente Claire et al (2001), Ruth M. Guzley et al (2001), Kauffman J. Henry M. Robert et al. (2001) counseled the procedure empowering association to develop the points of interest to require half in and E-markets, for instance, enticing net distance, e-installment security , temporary conveyance of merchandise , safe aquatics , viable treatment of messages and acceptable EDI framework relying upon the association nature and size of market. Arora ShivaniANdChanderSubhash (2003) thought-about the thought of and E-markets and problems with planned of abusing e-advertises through an example size of three hundred s absence of installment security, absence of bit and feel, dread of hid budget, delayed conveyance, baffled requesting framework. It likewise wind up the variables propulsion in to require half in and E-markets, for instance, correspondence edges, moment conveyance and installment, large inclusion, another approach to sell electronically, out there 24X7 , cash saving benefits and a few additional.
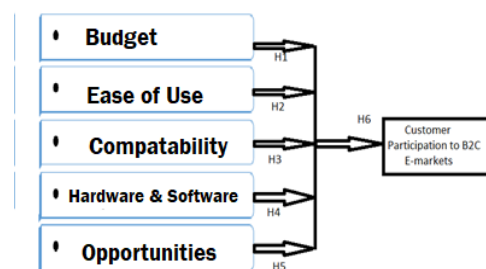

Figure: 1 Conceptual Model

III.METHODOLOGY

The fundamental goal of this examination is to evoke the variables touching the shoppers to partake in net authorised E-markets through e-shopping. To evoke theoretic finish the man of science analyzed the accessible writing as books,explore works, explore articles, reports of various boards of trustees/commissions. to think about the various variables associate example of five hundred shoppers from the 3 scene specifically Jalandhar, Amritsar, and Ludhiana organized in geographical region through a well-organized meeting set up.

So on examinations the elements touching the shopper support in E-Markets, heaps of twenty one articulations were structured supported the audit of

writing. These announcements focused on completely different elements inflicting shopper cooperation in B2C E-markets. The arrangement of those announcements has been displayed in table I.

The respondents were invited to demonstrate their dimension from concurrence with each announcement on a five-point Likert Scale running from 'Unequivocally Agree' to 'Firmly Disagree'.

These showed that partial correlations are low, indicating that true factors exist in the data.Cronbach's Alpha is calculated .863 which shows that data are reliable for Factor Analysis. The communalities of the variables range from 0.432 to 0.921whereas the factor loadings range from 0.498 to 0.962A factor loading represents the correlation between an original variable and its factor. The signs are interpreted just like any other correlation coefficients. On each factor, 'like signs' of factor loadings mean that the variables are positively related and 'opposite signs' mean that the variables are negatively related. The process of naming factors is quite subjective, though guidelines have been given by various authors. The names of the factors and the loadings are summarized in the table I.

IV. SUITABILITY OF DATA FOR FACTOR ANALYSIS

Table: 1

The five factor proposed model determined with the help of EFA is depicted in the Table I which is tested with the help of AMOS 18.0 to confirm to

Kaiser-Meyer-Oklin Measure of Sample Adequacy (KMO) is calculated. Overall, MSA is found to be 0.791 which supports that the sample is good enough for factor analysis. Bartlett's Test of Sphericity show statistically significant number of correlations in the variables. Anti-image Correlations are calculated.

Table: 2

Construct Item	Standard Item	t-value	R-Sq.
Budget	**Construct Load**		
X1	0.974733	22.39116	**0.8856**
X2	0.925683	14.7454	**0.5832**
X3	0.876532	18.74526	**0.6414**
X4	0.805434	23.60356	**0.7336**
X5	0.600738	18.15322	**0.7180**
Ease of use			
X6	0.922953	11.6428	**0.7005**
X7	0.976149	22.60253	**0.8740**
X8	0.923256	23.71824	**0.9381**
X9	0.881184	14.67683	**0.7005**
Compatibility			
X10	0.934381	12.74658	**0.5041**
X11	0.931246	11.59364	**0.6985**
X12	0.657576	23.61559	**0.9340**
X13	0.783488	18.6775	**0.7387**
H/w and s/w			
X14	0.987173	18.69389	**0.7394**
X15	0.926492	23.12469	**0.9146**
X16	0.876936	22.39116	**0.8856**
X17	0.764322	19.28622	
Opportunities			
X18	0.987072	18.74526	**0.7414**
X19	0.774002	23.60356	**0.9336**
X20	0.686602	19.82752	**0.8923**
X21	0.988285	18.28255	**0.6752**
Equations			
β1	0.409392	8.238005	
β2	0.269624	5.527299	
β3	0.120856	2.507021	
β4	0.136835	2.391627	
β5	0.069884	3.372529	

V. HYPOTHESIS SETTING

the five factors and to determine the estimated model exploring the various factors influencing customer decision. Which factor is more accountable and which is less depends upon the factor loading of that very factor.

Table 3: Statistics for Confirmatory Factor Analysis

Goodness of Fit Index(GFI)	0.932864
Adjusted GFI	0.886443
RMSEA	0.064827
Chi-Square	281.366
Bentler Bonnet Non normed Index	0.934988
Boolean Non normed Index	0.922649
Bentler Comparative Fit Index	0.866115

The exploratory study suggests that the first main factor is among the Constructs is 'Budget'. The loading values in respect of five variables X1,X2,X3,X4 and X5 obtained with the help of AMOS 18.0 The Model is duly obtained after the requisite modifications proves to be an acceptable model fit the data ($\chi2$ = 308.322, p< .001; GFI = 0.944; AGFI =0.964; CFI
= 0.966; TLI = 0.945; IFI = 0.965; NFI = 0.923 and RMSEA = 0.023) which indicates all the indicators loaded significantly on the latent constructs. The values of the fit indices indicate a reasonable fit of the measurement model with data. In short, the SEM model confirms to the five-factor structure of the variables influencing customer decisions to participate in E-markets.

Table:4

Hypothesis	Effect	Loading	Hypothesis Result
H1	Budget has insignificant effect on Customer Participation in B2C E-markets.	0.351948	Significant
H2	Ease of use has insignificant effect on Customer Participation in B2C E-markets.	0.351948	Significant
H3	Compatibility has insignificant effect on Customer Participation in B2C E-markets.	0.269624	Significant
H4	Hardware and software has insignificant effect on Customer Participation in B2C E-markets.	0.120856	Significant
H5	Opportunities has insignificant effect on Customer Participation in B2C E-markets.	0.136835	Significant

VI.SUMMARY, RECOMMENDATION AND CONCLUSION

The Present study attempts to explore the constructs determining customer participation in B2C E-markets. Internet shopping turning into a simple route rather than the conventional method for purchasing merchandise & services on the basis of their features and specifications i.e. without going from shop to shop. Augmented Internet Penetration, updated efforts to establish safety, suitability of shopping in lives in a hurry, and, obviously, many retailers to browse these are a couple variables which captivates more clients to shop on the web. The present study attempts to explore the five factors accountable customer participation in B2C E-markets rather the traditional type of markets. It investigates five

factors Budget, Ease of use, Compatibility, Hardware and software and Opportunities which influence .Budget is the main variable which spur the client Opportunities to purchase merchandise through E-Markets. With the assistance of web entrances, client can look at the item, budgets, alluring offerings, simple installments mode and so forth of the items gave by the distinctive supplier effectively and can pick the items as needs be. Also he can get to E-markets on 24X7 basis at whatever time anyplace sitting at home and tapping the mouse as opposed to moving to the outlets. The PC's improvement equipment, programming and web entrance has changed the world into worldwide town which has positively upgrade the open doors for the vender as well as for the potential clients.The study of E-markets will surely enable the retailers to attract the customer to accelerate the sales and thereby increasing the profits to a great extent.

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Impact of Social Media in Mutual Communication

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Abstract Social media has impacted almost all the aspects of our life but what it affected mostly is interpersonal communication. It is not uncommon to see that now days we don't have time for each other, what used to be the priority in any relationship, because of social media. It might had its origin with a positive thought that it will bring people together but now the amount of fascination people have for social media is has completely altered the purpose for which social media was actually created. The ease that technology and digitalization has provided to us is so much that we have almost assumed that there is no need to for a face to face interaction. When all you need to have is a cell phone and an internet connection and anybody even who is on the other part of the world is in front of you on your mobile screen. Mobile phones and the presence of various social media apps in them are the only way for people to connect to the outer wforld perhaps that's the reason why people now days are more concern about the low battery sign and poor network signal on their phone than anything else. There is a reason why I have describe "outer world" in this context as everybody is confined in their own world that is whole sole surrounded by technology and various digital devices that has reduced human touch in every aspect. This research paper will analyze the impact of social media and the way it has shaped our communication.

Keywords : Social Media, Methodology and objectives, Conclusion

I.INTRODUCTION

Gone are those days when life was not as fast paced as it is now. Nowadays people find it hard to spare time for in person meets ups which used to meant a lot for earlier generation. No wonder our older generations have more belongingness for each others as compared to present generation who are fully engulfed by technological devices that has made world a global village, in other words a small world. As the world has became a global village people are more interested in always being aware of what is happening around the world. Technology helps them in every aspect of it. People are always connected with the world, internet has made no place far away from you. Almost everything is just a click away. This digital revolution has made many things known to us as everything is available on the internet. There is no such topic in the world that is not available on the internet in its entirety. Hence people of nowadays are much more knowledgeable than the previous generations in terms of nitty-gritty of various topics. But what Present generation lack is that they have lost a human touch in their communication. They are more comfortable in wishing, greeting, celebrating, chatting online than doing all these things in person. Earlier people used to do all these things face to face and that was the reason why they were more in tune with each other. Because, they prefer interacting face to face and they didn't miss any aspect of communication whether it is verbal or non verbal. They see and they learn from the gesture, posture and facial expression of the speaker. That's how they use to have meaningful conversation. All this helps them to really feel the vibes of another person and connects them to the heart of their listener. But now we find it hard to communicate with other person if we are put into real face to face conversation. We prefer communicating online where there is no need to show ours and interpret others non verbal expressions. According to Paul Booth [1], social media certainly affects how we engage with one another across all venues and ages conference.

II.SOCIAL MEDIA

Social media has expanded its reach in our daily life quite faster than we thought it can. Social media will continue to influence our life in future also perhaps more profoundly than ever before. It's just that we will have to become a little wiser so as to be get less affected by its negative impacts. Now present generation has became totally dependent on these stimulations created by social media. Our

lifestyle has become very superficial as we only seek for sensational stuff and this is also what we are feed by social media in their recommendations. This might be the reason why we have lost the sense of belongingness with another. The fascination for social media is so intense that nowadays we hardly see anyone with any social media connectivity.

People are always busy in updating their status online or checking who else has liked their recent upload. On the other hand these social media platforms are also smart enough to get people hooked on to them. People felt so loved and desired whenever they receive a notification about their picture got liked by someone. By sending these notifications social media sites lures their users to spend more and more time surfing them. So these delightful notifications become responsible for the release of dopamine from your brain, which is a pleasure hormone. And thus you get addicted to social media and get trapped in this vicious circle.

III. METHODOLOGY & OBJECTIVES

The present research paper is an attempt to assess and highlight the growing influence of social media in the Communication process between individuals. Communication as we know is the backbone of any relationship among individual. It is an essential requirement for social integration among different communities as well as two individuals.

One of the most alarming side effects of social media is cyber bullying. For example cyber bullying is quite as same as real life bullying. Probably even worse than real life bullying. Because in real life bullying the one being bullied can remove himself from the environment. For example, a kid being bullied at school can escape the playground when he or she goes home each night. "However, cyber bullying is marked by its persistence," Bowman says. But in cyber bullying the bullying messages don't stay in a particular space it follows you even if one seems to leave the playground. Because internet is prevalent everywhere this becomes a haunting situation for the kid. Another concern lies in technology addiction, when an individual spend more time with their smart phone. One may begin to feel that this is all the world is. In this virtual reality created with the help of social media anyone can alter

one's real life personality and present oneself as one likes to. That is why the find it difficult to get offline and live in real world where they have no absolute control in presenting their self image to others what they can easily do online. Internet addiction is now considered as a mental illness marked byemotional shutdown, lack of concentration, and withdrawal symptoms. Because of the above mentioned situations.

However, many have argues that calling Internet usage as an "addiction" is an inaccurate portrayal. Social media was designed to connect people with people. It's a human to humanrelationship mediated by technology. If it is bringing some not desired results then it is not social media or technology to be blamed but the user of these technology himself.

Another potential negative consequence of social media is a lack of privacy. Is doesn't matter whether we have set privacy settings to extremely high or not, there is always a possibility of information leaking out. We must not also neglect the presence of hackers in this modern technological era. They can hack our social media account and do all kind of misdeed.

Of course, our communication system has developed to a huge extent than what they used to be before. Information can travel at a much faster pace. Sharing your videos and photos are much easier and faster. A video call can make you feel like you are almost there. Any place of the world is just a click away. Social media not only helped us to make a lot of new friends but also united long lost friends. It is easier to find anyone on social media whether a lost friend or someone you met somewhere but didn't asked for his/her contact information.

Before the social media era people didn't knew this many number of people as today. Their friend list was not as big as we see in anyone's facebook account today. People of post social media era may had a little less numbers of friends than now but that friendship was in the real sense. People were true and honest to the people they knew or had friendship with. Now one may have a long list of friends but they know in their heart there are just few friend they can really count upon. Rest of the friends in the list is just a number added in to the list.

No doubt social media allow us the opportunity to share opinions with a far wider audience. There is no possibility of your message getting filtered by any mediator as in the case of using television or print media where editor decides what to show. You can present its message directly to the people without speaking directly to them. Your message can get across to thousands or even millions of people uncensored.

Speaking about "getting you message across" those who have taken a lot of advantage of this digital and technological revolution is the people involved in marketing. Every business or company whether it is public or private have a online presence in all social media platforms like facebook, twitter, instagram etc. it is very cost effective for them to make their presence felt in a market where there is cut throat competition among various companies. Social media helps them in various ways to reach maximum number of people, build a positive image, stand out from their competitors, develop a strong public relation, understanding the needs of their target customer and delivering what customers want.

Advertising budget has reduced a lot due to social media as marketers don't have to rely only upon T.V and various other print media options. They can reach directly to their targeted audience or viewers and put their message across.

IV.CONCLUSION

We must understand that this phenomenon of social media is just about two decades old. It's only in last one decade that it has reached a pretty fast swing. Yet it is in its infancy stage keeping in mind the speed at which our technology is constantly evolving. In the years to come not only new social media portals will arise but existing social media platforms will also transform themselves into technically more advanced. So all we need to do is to accept this inevitable change that technology will bring and become smart enough to find a perfect balance between optimum use of technology and addiction of it. So that social media will never be able to replace the actual face to face conversations that entice various kinds of human emotions.

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Effect of Fym and Phosphorus Levels on Soil Fertility and Performance of Mung Bean (Vigna Radiata L.)

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Abstract: A field experiment was conducted during summer season 2017 at research farm of Dolphin (PG) College of Science and Agriculture, Chunni Kalan, Punjab to investigate the effect of FYM and phosphorus levels on soil fertility and performance of mung bean. The experiment was laid out in split plot design consisting of three replications and twelve treatments. The treatments consisting main plot of FYM viz. control, 5 t and 10 t ha^{-1} and sub plot of phosphorus viz. control, 20, 40 and 60 kg ha^{-1}. Mung bean var. SML 668 was sown on March 17, 2017 and harvested on May 18, 2017. FYM and phosphorus treated plots give positive result as compared to control plot in various growth, yield and yield attributes. The growth and yield parameters viz. plant height, number of branches plant^{-1}, dry matter accumulation, number of pods plant^{-1}, number of seeds pod^{-1}, seed yield and stover yield was recorded highest in F$_3$P$_4$ (FYM @ 10 t ha^{-1} and phosphorus @60 kg ha^{-1}) treatment as compared to the other treatments.

Keywords - Soil fertility, FYM, growth, yield, yield attributes, dry matter accumulation

I. INTRODUCTION

Grain legumes provide a protein-rich source of food which is essential part in the diet of people inhabiting in the tropics. Legumes are productive and protective agricultural food products and also contribute to maintenance and restoration of soil fertility by biologically fixing a large proportion of atmospheric nitrogen.

All over the world, particularly in the developing countries, it is being realized that we must strive for a sustainable agriculture which can feed their burgeoning populations not at the environmental cost exacted by present day intensive farming practices. Pulses are equally important for maintaining soil health and sustainability of different cropping systems. In India, total pulses are grown on 23.46 million ha area with a production of 19.27 million metric tons and an average productivity of 789 kg ha^{-1} (Directorate of economics and statistics, 2015).Mungbean [*Vigna radiata* (L.) Wilczek] is tolerant to drought and can be grown successfully on well drained loam to sandy loam soils in areas of erratic rainfall. Mungbean is an excellent source of protein (24.5%) with high quality lysine and tryptophan. It also has remarkable quantity of ascorbic acid and contains riboflavin and minerals when sprouted (Gopalan *et al.*, 2012). Total pulse area in India is 233.09 lakh hectare and the production are 171.91 lakh tones. It occupies 30.53 lakh hectare area and contributes 15.09 lakh tones in pulse production in thecountry (Anonymous, 2016). Total area of mungbean crop in Punjab was 0.42 lakh ha, production was 0.35 lakh tones and average yield was 845 kg ha^{-1} (Annual report 2016-17). FYM is rich in organic matter and is a good source of plant nutrients. It helps to buffer soils against rapid chemical changes. FYM also acts as a source of energy for the growth of soil microbes. Improvement in physical properties of soil, organic carbon and available nitrogen, phosphorus and potassium due to long term application of FYM and fertilizer has been well documented by Babulkar *etal*. (2000).Phosphorus is one of the important plant macronutrients, making up about 0.2% of a plant's dry weight (Machiavelli and Khurana

2013).Phosphorus greatly helps to improve root development which increases photosynthetic and more dry matter, improve flowering and ripening of fruit.

II. MATERIALS AND METHODS

A field experiment was conducted during summer season 2017 at research farm of Dolphin (PG) College of science and agriculture, Chunni kalan, District Fatehgarh Sahib Punjab. Geographically, itis situated at 30°39'9.79" N latitude and 76°33'30.25" E longitude with relief 281m above mean sea level. It contains sub-tropical, sub-humid climate with moderate rainfall (average rainfall 692mm) and minimum temperature of 13.3°C.

The soil of the experimental plot was alluvial soil which is alkaline in nature. It contains average electrical conductivity 0.68, pH 8.08, low organic carbon 0.44%, available nitrogen 389.88 kg ha^{-1}, available phosphorus 20.85 kg ha^{-1} and available potassium 218.95 kg ha^{-1}.

The experiment was laid out in split plot design with three replications and twelve treatments with net plot size 8.8 m^2 per plot. The experiment comprises levels of FYM in main plot (*viz.* control, 5 t and 10 t ha^{-1}), phosphorus in sub plots (*viz.* control, 20, 40 and 60 kg ha^{-1}) and their interaction. After preparation of field, sowing of seed of mungbean @ 20 kg ha^{-1} was done keeping 30 cm distance from row to row. The mungbean cv. 'SML 668' was sown on 17th march, 2017 and harvested on 18th may, 2017. Other cultural operations were done following recommendation and crop requirements.

III. RESULTS AND DISCUSSION

The data presented in table 1 revealed that growth parameters *viz.* plant height, dry matter, number of branches, total number of nodules and effective nodules in main plot (FYM) was found significantly maximum in FYM @10 t ha^{-1} treatment 53.55cm, 496.75 g, 4.89, 16.53 and 12.88, respectively whereas in sub-plots (phosphorus) growth parameters were found extreme in 60 kg P$_2$O$_5$ ha^{-1} treatment *i.e.* 51.59 cm, 491.13 g, 4.66, 15.78 and 12.36, respectively. The interactional effect of FYM and phosphorus was highest in FYM @10 t ha^{-1} + 60 kg P$_2$O$_5$ ha^{-1} treatment *i.e.* 54.80 cm, 503.11 g, 5.12, 17.03 and 13.78, respectively. This increments may be due

that the FYM contains both macro as well as micro- nutrients and some growth promoters which supply essential nutrients to the soil which ultimately gave positive effect in growth parameters (Ranpariya *etal*., 2017 and Ram *etal*., 2012).

The phosphorus play an essential role in the transfer and conversion of energy in the plant's metabolism reactions including biological energy transformation which ultimately increase better vegetation growth, flowering and fruiting (Sinha*et al.,* 2018; Khan *etal*., 2017 and Choudhary *et al*., 2015).

The combined application of FYM and phosphorus helps to improve better root growth, nodulation and root penetration which helps the plant to utilize more water and nutrients from deeper layers which helps to improve vegetative growth (Boru *etal*., 2017 and Omar, 2014).

The data depicted in table 2 revealed that the significant results were found in mungbean crop with respect to yield attributes viz. number of pods per plant, number of seeds per pod, seed yield and stover yield whereas the non-significant results were found in test weight and harvest index. The maximum yield was found in 10 t FYM ha^{-1} treatment and the minimum was in 60 kg P$_2$O$_5$ha^{-1} treatment. In phosphorus treated plots the significantly higher value was in P$_4$ treatment i.e. 60 kg P$_2$O$_5$ha^{-1} and lower was 0 kg P$_2$O$_5$ha^{-1} treatment. The phosphorus play an essential role in the transfer and conversion of energy in the plant's metabolism reactions including biological energy transformation which ultimately increase better vegetation growth, flowering and fruiting (Sinha*et al.,* 2018; Khan *etal*., 2017 and Choudhary *et al*., 2015).This increment on yield attributes of mungbean was due to the direct increase in growth attributes of crop. The significant result was found with respect to yield and yield attributes viz. number of pods per plant, number of seeds per pod, seed yield and stover yield in mungbean crop. The highest yield attributes found in 10 t FYM ha^{-1} + 60 kg P$_2$O$_5$ ha^{-1} treatment which were 16.65, 6.98, 1414.43 kg ha^{-1} and 5760.63 kg ha^{-1}, respectively. This is due to that increment in growth parameters which gave direct effect on yield attributes.

Table 1. Effect of FYM, phosphorus and their interaction on growth parameters

Treatments	Plant height (cm)		Total number of branches	Dry matter (g/m2)		
	30 DAS	Harvest		30 DAS	45 DAS	harvest
F1	8.65	46.52	4.06	34.87	177.59	479.27
F2	10.16	50.58	4.53	36.17	183.52	485.33
F3	11.29	53.55	4.89	37.80	189.61	496.75
P1	9.42	48.66	4.26	35.43	180.38	482.09
P2	9.87	49.70	4.48	35.95	182.88	486.15
P3	10.30	50.92	4.58	36.69	184.72	489.10
P4	10.54	51.59	4.66	37.06	186.29	491.13
F1P1	8.24	45.51	3.89	34.21	175.26	476.53
F1P2	8.53	46.10	4.03	34.75	177.36	478.92
F1P3	8.81	46.81	4.11	35.12	178.51	480.36
F1P4	9.02	47.65	4.22	35.41	179.21	481.27
F2P1	9.56	48.31	4.31	35.39	179.92	481.16
F2P2	9.95	49.89	4.55	35.98	182.85	484.17
F2P3	10.49	51.82	4.61	36.49	184.75	486.98
F2P4	10.64	52.31	4.65	36.83	186.55	489.02
F3P1	10.46	52.16	4.57	36.69	185.97	488.58
F3P2	11.13	53.10	4.85	37.12	188.44	495.36
F3P3	11.60	54.13	5.01	38.45	190.91	499.95
F3P4	11.95	54.80	5.12	38.93	193.11	503.11

Table 2. Effect of FYM, phosphorus and their interaction on yield parameters

Treatments	Pods per plant	Seeds per pod	Test weight (g)	Grain Yield (kg/ha)	Stover Yield (kg/ha)	Harvest Index (%)
F1	14.06	4.59	32.15	692.60	2514.09	21.79
F2	15.40	5.56	33.90	969.45	3575.73	21.51
F3	16.04	6.61	35.75	1267.07	4706.73	21.35
P1	14.52	5.18	33.22	845.60	2905.63	22.63
P2	15.14	5.49	33.74	950.64	3321.68	22.33
P3	15.37	5.73	34.16	1019.15	3740.91	21.42
P4	15.65	5.93	34.62	1090.10	4427.18	19.80
F1P1	13.69	4.12	31.45	590.76	1978.28	22.98
F1P2	13.91	4.52	31.98	670.02	2290.01	22.62
F1P3	14.18	4.77	32.41	730.77	2646.26	21.65
F1P4	14.47	4.93	32.76	778.83	3141.81	19.90
F2P1	14.75	5.21	33.19	850.17	2881.81	22.78
F2P2	15.44	5.46	33.65	945.56	3269.65	22.44
F2P3	15.59	5.68	34.11	1005.05	3772.33	21.04
F2P4	15.83	5.89	34.65	1077.04	4379.11	19.78
F3P1	15.12	6.21	35.01	1095.88	3856.81	22.14
F3P2	16.06	6.49	35.58	1236.33	4405.37	21.93
F3P3	16.33	6.75	35.97	1321.63	4804.12	21.58
F3P4	16.65	6.98	36.45	1414.43	5760.63	19.74

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