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Dr. Harsh Sadawarti | Dr. Jasdeep Kaur Dhami | Er. Anurag Sharma

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Current Trends in Engineering, Sciences & Management

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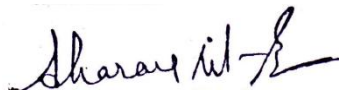
Message

Throughout its well endowed presence, **CT Group** has established an outstanding reputation at state, national and international level, with the establishment of 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 the **Chief Patron** of "**ICTESM-2019**", International Conference on **Current Trends in Engineering, Sciences and Management**, 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 1st International Conference by our CT University, Ludhiana 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
Chief Patron, ICTESM-2019

Message

It gives me immense pleasure to share that CT University is organizing its first International Conference on **"Current Trends in Engineering, Sciences and Management**" on **January 02, 2019 at Malaysia.** It is a matter of great satisfaction that **CT University** 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 students.

I congratulate Dr. Jasdeep Kaur Dhami, Director (Maqsudan Campus), Dr. Harsh Kumar Sadawarti, Vice Chancellor CT University, Mr. Anurag Sharma, Vice Principal CTITR, faculty and staff 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
Co-Patron, ICTESM-2019

Message

It is my great pleasure to welcome you to the International Conference on "Current Trends in Engineering Sciences and Management: ICTESM -2019, organized by **CT University on January 02, 2019 at Malaysia.** It has been a real honor and privilege to serve as the Co-Patron 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- 2019 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. Jasdeep Kaur Dhami and Er. Anurag Sharma for their valuable contribution in organizing this conference. We have received over 60 papers for oral and poster presentation. Special thanks to members of our Technical Program Committee for reviewing these papers and offered 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 in the 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 day 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 Kaula Lampur, Malaysia.

Mr. Harpreet Singh
Vice Chairman, CT Group
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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 International Conference on Current Trends in Engineering, Sciences and Management (ICTESM-2019).

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-2019. 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-2019 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 recognises 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-2019. We always aspire to get whole-hearted cooperation of all concerned towards this international event.

Dr Harsh Sadawarti
Vice Chancellor
CT University, Ludhiana, India
Conference Convener, ICTESM-2019

Convener(s) Message

The present volume of conference proceeding contains the written versions of most of the contributions presented during the "**International Conference on Current Trends in Engineering, Sciences and Management"**: **ICTESM-2019**, which was organized by **CT University, Ludhiana on January 02, 2019 at Malaysia**. 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 Etc.

We 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. Our special thanks to our colleague Ms. Anshu Sharma for her devoted assistance in the overall organization of the conference. We also express our sincere thanks to our publication committee for their help with proof reading of the contributed papers and preparing the proceedings volume. We also want to thanks Mr. Tarun Sharma and Mr. Nittan Arora for their support.

We offer our deep sense gratitude to S. Charanjit Singh Channi (Chief Patron), Mr. Manbir Singh (Co-Patron), Mr. Harpreet Singh (Co-Patron), Dr. Harsh Sadawarti (Conference Convener) CT Group of Institutions, Jalandhar for their support and encouragement.

Dr. Jasdeep Kaur Dhami, Er. Anurag Sharma
Conference Convener(s), ICTESM-2019

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Keynote Address

The first industrial revolution began on the 17th century which marked the very first time, manual work had been replaced by automation. The progress of these industrial revolution was seen as the turning point for industries to change the world. Impossible is the right word to describe the change between each of the industrial revolution. Hence, in the fourth Industrial Revolution, what was once thought to be out of this world, is now setting the standard in everything that we do in our daily lives. This is the epitome of revolution which is a very important change in the way that people do things.

The Digital Revolution is the best description to define Industrial Revolution 4.0(IR 4.0). Compared to the first three revolution which moved at a linear pace, the fourth one is moving rather exponentially, which is why it is already reaching its peak and the world is at the brink of Industrial Revolution 5.0. IR 4.0 is characterized by the Internet of Things because everything about it involves things being done online. The involvement of human in this progress is still needed but Artificial Intelligence seem to be the theme of the day. People all over the world benefited from this revolution as information and communication are at their fingertips.

The benefits of IR 4.0 include telecommunication which has no boundaries, online education system such as the Massive Open Online Courses (MOOC) and paperless banking which also benefits the environment. Nevertheless, there are several pitfalls of the changes that we face because of the revolution. For example, inequality amongst people living in the rural and urban area are increasing as the benefit of such revolution differs between the two society.

In Malaysia, the government is planning to embrace IR 4.0 using the best method possible in order to move forward. Compared to other developed nations, Malaysia seem to be falling behind in IR 4.0's acceptance but it is at our own steady pace. As the world is already looking at Industrial Revolution 5.0, Malaysian must adapt to this revolution rather exponentially or be left behind. In the end, its all about people and values which will define the next generation of the human society.

Professor Dr. FaridahHj Hassan (FCIM UK)
Vice Chairman
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Track-1

COMPUTER SCIENCE ENGINEERING/ ELECTRONICS AND COMMUNICATION ENGINEERING

Localization in Wireless Sensor Network Using PSO with Flip Ambiguity Mitigation

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Abstract: Location information of the sensor nodes play a critical role in most of the Wireless Sensor Network (WSN) applications. In this paper we have focused on accurate localization of nodes with effect of flip ambiguity that form the WSN. PSO (Particle Swarm Optimization) is a desirable technique for estimated location optimization because of its fast convergence and lesser computational requirements. A problem often encountered in localization using PSO is flip ambiguity. In this paper we propose a novel technique to reduce the effect of flip ambiguity. After localization, localizable target nodes having more than four anchor nodes in range are upgraded to pseudo anchor nodes. Further, the remaining localized target nodes are checked for flip ambiguity using anchor nodes in short range of communication. Once flip ambiguity is detected, it is reduced using one of these anchor nodes. Finally, we examine a set of properties by which evaluation of localization systems can be done.

Keywords—WSN, Localization, Flip Ambiguity, Particle Swarm Optimization (PSO)

I. INTRODUCTION

A wireless sensor network (WSN) is a collection of nodes that senses, processes and communicates relevant information. The sensor nodes are generally low cost, low power devices; that have ease of programmability and self-organizing capabilities. Due to the above-discussed advantages, WSN can be used for a wide variety of applications like ranging from military surveillance, healthcare monitoring, environmental, disaster relief, etc[1]. Most applications of WSN require the knowledge of the location of the sensor nodes. Manually recording and entering positions of each sensor node is impractical, where sensor nodes are randomly distributed in large numbers. Seemingly, another simple alternative is to collect data on the location of sensor nodes by means of GPS devices. This is also not a feasible option, both because of the high cost incurred in installing the nodes with GPS receivers and high power consumption of the GPS module that results in reducing the lifetime. Also using an additional module increases the size and weight of the node. Considering the drawbacks of aforesaid solutions, automated localization systems that can assign geographic coordinates to each node, were developed. Most of these schemes require inexpensive and easily available hardware, which have minimal energy requirements, and can scale to large networks. They achieve good accuracy even in the presence of irregularities and are capable of giving the solution in less computation time.

For localization a prior knowledge of position of a few nodes (called anchor nodes) is required and position of the remaining nodes (target nodes) is computed with the help of these anchor nodes. The localization techniques can be classified in different ways [3], based on range information (range based/range free), based on existence of anchor nodes (anchor based/anchor free), based on computation method (centralized/ distributed), based on mobility (static/dynamic), etc. In [2] it has been suggested that localization systems can be divided in three distinct components – estimating the distance/angle, computing the position and applying the localization algorithm. Distance/angle estimation can be done by using techniques like ToA (Time of Arrival), RSSI (Received Signal Strength Indicator) and Time Difference of Arrival (TDoA), etc. Methods like trilateration,

triangulation, centroid, etc. are used for position computation.

Localizing target nodes using above discussed methods results in high mean localization error. Recently, the prevalent strategy is the application of optimization algorithms to solve the localization problem. Classical optimization techniques are not suitable for localization in WSN because of its complexity. Evolutionary algorithms like SA (simulated annealing), BBO (Biogeography Based Optimization) and PSO (Particle Swarm Optimization) are becoming prevalent because of less computational requirement and provision of good results. A problem sometimes encountered in using these algorithms for WSNs is that of flip ambiguity. The main contribution of this paper is: It presents a novel technique to reduce the setback of flip ambiguity for localization using PSO for distributed localization system.

Section II presents an analysis of the related work, which has been done on optimization of obtained node Location of WSN using PSO algorithm. Section III describes the proposed protocol. Simulation results performed on matlab are reported in Section IV. Finally, in Section V conclusions are presented.

II. RELATED WORK

A detailed survey of issues in WSNs is available in [4]. Herein PSO and its suitability for applications in WSNs is discussed. In [5] it is proposed for PSO to be used for localization in WSN, as a stochastic global optimization tool, that minimizes the objective function, avoids being trapped in local minima, thus reducing the mean localization error significantly. The scenario assumed in [5] is centralized architecture for WSN. The applications of a variant of PSO called H-Best PSO (HPSO) and an evolutionary algorithm, Biogeography Based Optimization (BBO) algorithms are proposed in [6] for randomly deployed sensors (scenario presumed is distributed) to obtain optimal localization. This paper concluded that HPSO and BBO yields better performance in terms of faster and accurate localization as compared to traditional PSO. Experiment simulation, comparison and evaluation are conducted for node localization using six variants of PSO in [7]. It proposes two new variants PSO: Gauss Dynamic PSO and Logistic Dynamic PSO and concludes that these variants perform well for node localization problem. In [8] the problem of flip ambiguity is discussed and it is suggested that the localization problem can be solved by using a two objective evolutionary algorithm. During the evolutionary process it concurrently takes into account the localization accuracy and some topological constraints imposed by the network connectivity. This helps in further reducing the localization error. In literature [9] a distributed two-phase PSO algorithm is proposed to reduce flip-ambiguity. In the first phase search space is defined by bounding box method and in the second phase error due to flip-ambiguity is corrected. Simulation results indicate that this method localizes more unknown nodes with higher precision. In [12,13] location optimization for mobility based scenarios with single anchor node has been proposed using PSO, HPSO (hybrid PSO), BBO (Biogeography based optimization) and FA (Firefly Algorithm).

III. PARTICLE SWARM OPTIMIZATION

3.1 Basics of PSO and Its Application in Localization of WSN

PSO is a bio-inspired evolutionary technique facilitating global search. Eberhart and Kennedy [10], developed it based on the social behavior of a flock of birds where each individual learns from its own experience and the experience of its neighbors. In PSO a set of feasible solutions, called particles are deployed within the search space. Corresponding to each particle location, objective function is calculated. PSO could be used for minimization or maximization of an objective. For WSN localization application, PSO is used for minimization.

The particles are moved in the search space following the behavior of a flock of birds. Each particle moves towards the best position that it has encountered so far (pbest) and the best position obtained by the entire swarm (gbest).

In a D-dimensional search space, where the size of the swarm population is M, the position and the velocity of the kth particle can be represented as $X_k=[x_{k1}, x_{k2},\ldots,x_{kD}]$ and $V_k=[v_{k1}, v_{k2},\ldots,v_{kD}]$ respectively. $P_k=[p_{k1}, p_{k2},\ldots, p_{kD}]$ gives the best position ever visited by the k_{th} particle and the position vector of the best particle in the swarm is given by $B=[b_1, b_2,\ldots,b_D]$. In every iteration, l each

particle in the search space evolves according to equations

$$v_{kd}(l+1) = \omega v_{kd}(l) + c_1 r_1 (p_{kd} - x_{kd}(l)) + c_2 r_2 (b_d - x_{kd}(l)) \quad (1)$$

$$x_{kd}(l+1) = x_{kd}(l) + v_{kd}(l+1) \quad (2)$$

where d=1,2,…,D and k=1,2,…,M. ω is the inertial weight. Its value decides the speed of convergence. A small value results in an early convergence whereas larger values slows down the process of convergence. c_1 and c_2 are the cognitive and the social learning parameters, that determine the speed at which a particle accelerates towards its pbest and gbest respectively. r_1 and r_2 are uniform random numbers in the range [0,1]. Eberhart and Shi in [11] recommended a value of ω=0.7 and c1= c2=1.494 for fast convergence.

3.2 *Limitation of PSO for Location Optimization*

A phenomenon known as flip ambiguity (shown in Figure 1) is encountered in localization using PSO. If there are three or four near collinear anchor nodes in range of a given target node a point in the search space may exist that has minimum objective function, but is flipped along the line connecting the neighbor anchor nodes. In Figure 1 Target Node T_1 is localized using anchors A_1, A_2 and A_3. The anchor neighbors of T_1 are near collinear, hence even if the position of T_1 is obtained at T_1', as the objective function of the two positions is almost equal, it may lead to wrong localization of T_1 at T_1'.

3.3 Proposed Methodology to Remove Flip Ambiguity

An efficient method for localization in WSNs has been proposed in order to overcome the problem of flip ambiguity.

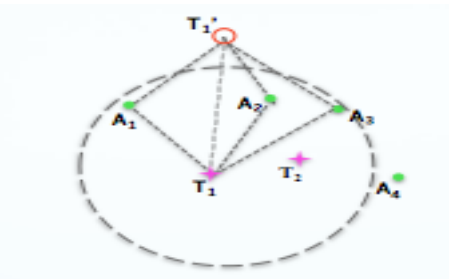

Figure 1 Problem of Flip Ambiguity

Algorithm of proposed protocol

- Deploy m anchor nodes and n target nodes in a given area
- Find the number of anchor nodes in communication range of a given target node. The distance between the target and the anchor is measured as

  $$d_i = \sqrt{(u - u_t)^2 + (v - v_t)^2} \quad (3)$$
- Due to environment consideration, the distance measurement is corrupted by additive white Gaussian noise ni and is given by

  $$\hat{d}_t = d_t + n_t \quad (4)$$

  (u,v) is the co-ordinate of the target node and (ut,vt) is the co-ordinate of the tth anchor node.
- If the number of anchor nodes in range are less than three then the target node cannot be localized.
- If the number of anchor nodes in range of target node are three or more than three then the target node can be localized.
- If the target is localizable, the centroid of the anchor nodes in range of the target is found.
- Particles are deployed around the centroid.
- PSO algorithm is applied to optimize the obtained node location and minimize the objective function:

  $$f(u,v) = \frac{1}{M}\sum_{t=1}^{M}\left(\sqrt{(u - u_t)^2 + (v - v_t)^2} - \hat{d}_t\right)^2 \quad (5)$$
- After all the localizable target nodes are localized, the targets having more than four anchor nodes in range are upgraded to the status of anchor nodes (pseudo anchor nodes).
- Targets with three and four anchor nodes in range are checked for flip ambiguity.
- This is done using short-range communication.
- Short-range anchor neighbors of the targets (having three or four anchor nodes in range) are obtained and its distance with the target is calculated using equations 3 and 4. Their distance with the localized position is also computed.
- If this distance is more than the distance considered for short range communication the target is assumed to be wrongly localized with flip ambiguity.
- Once the flip ambiguity is detected the nearest anchor neighbour of the target is

taken as reference to deploy particles for applying PSO algorithm.

- Target is re-localized correctly

IV. SIMULATION AND RESULTS

The WSN localization simulations were carried out in MATLAB. The number of target nodes was fixed to 100 in an area of 20 × 20 l unit. Population size of the swarm for PSO algorithm is fixed at 20. The number of maximum iteration is 100.

a) No. of Anchor Nodes: 5 to 20
b) Maximum Range of communication: 8 and 10
c) Gaussian Noise: 2 to 8

In Figures 1, 2 and 3 green dots represent anchor nodes, pink asterisk represent the target nodes and the red circles represent the estimated location of the corresponding target nodes. The yellow lines represent the error in localization that is the distance between the actual position and the estimated position of the target node. As can be seen in figure 2 (simulation result of localization using traditional PSO algorithm), the localization error is high due to flip ambiguity phenomenon. Figure 3 shows the simulation result of the proposed method in this paper. As can be seen in figure 3 the localization error due to flip ambiguity has been rectified.

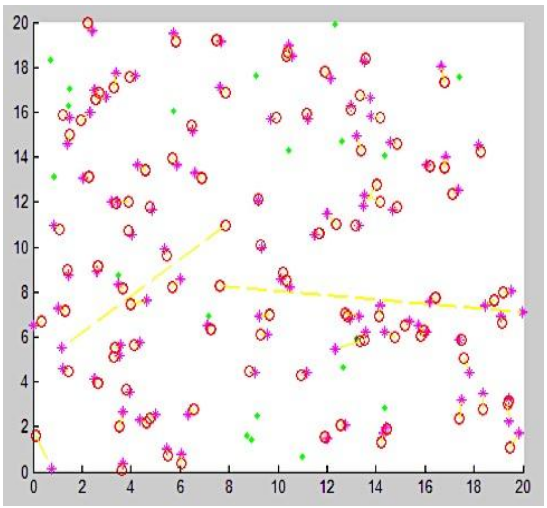

Figure 2 Simulation Scenario for localization in WSN using PSO

Gaussian noise is an important parameter for distance measurement, which in turn affects localization accuracy. In order to compare the three methods, i.e. location optimization using PSO without removing flip ambiguity, existing method in literature to remove flip ambiguity and the proposed method to remove flip ambiguity, the dependence of mean localization error on Gaussian noise variance is plotted in Fig. 4. It can be seen in the figure that the localization error increases with increase in added noise, but the performance of the proposed method is better as compared to the existing methods.

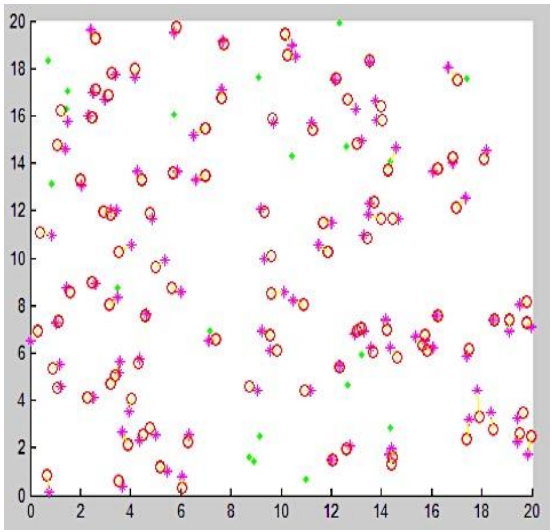

Figure 3 Simulation Scenario for Proposed Method to Remove Flip Ambiguity

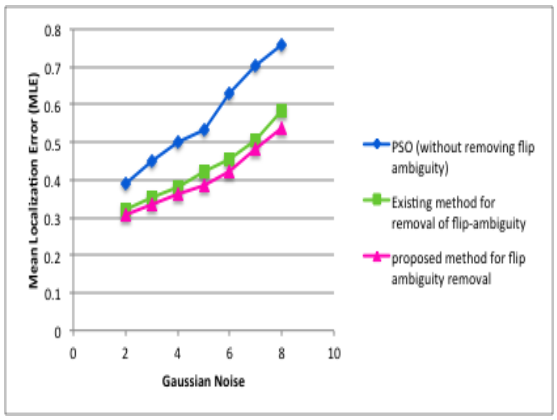

Figure 4 Mean Localization Error vs Gaussian Noise.

The number of Anchor nodes and the transmission range are other important parameters affecting the localization efficiency. The performance of localization algorithm (in terms of mean localization error) as a function of number of Anchor nodes, varying the transmission range is depicted in Fig. 5. The mean localization error decreases with increase in number of anchor nodes but after an extent there is no change in performance.

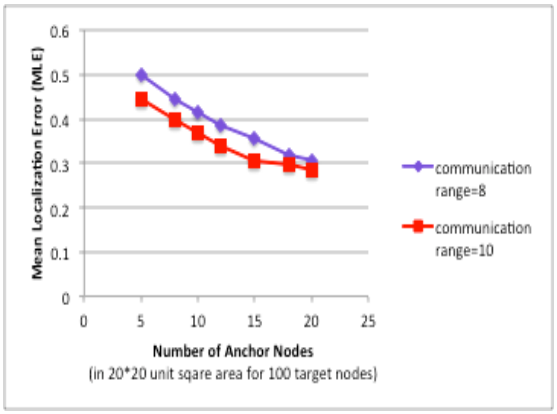

Figure 5 Mean Localization Error vs Number of Anchor Nodes.

V. CONCLUSION AND FUTURE WORK

In this paper a new technique is proposed and analysed to remove the problem of flip ambiguity arising duringlocalization using PSO. From the above results and discussions it can be concluded that the proposed method provides better localization performance in terms of localization accuracy as compared to the existing methods in literature. Since short-range communication is used in the improvement phase, the energy requirement for improving localization efficiency is also reduced. In future the energy requirement for localization for the methods discussed can be computed and compared with each other and the latest research works.

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A Low Cost Hardware and Fuzzy Expert System for the Detection of Glaucoma

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Abstract: Glaucoma is an eye disease with 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 fuzzy based decision constructed to overcome glaucoma 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. Fuzzy rule-based helps the medical practitioners to give accurate results by considering patients symptoms.The entire test performed on 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, Fuzzy expert system, Graphical User Interface (GUI), Surgical Illuminating Keratoscope, Cornea.

I. INTRODUCTION

The therapeutic examinationof anyailment 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 avibrantexploration that includes artificial neural networks, genetic algorithms and 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 resultsustainment system [1].

The fundamental cause of glaucoma is the invariablefailure of retinal Nerve fiber stratafor 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 filament creates spots and these blind spots prompts to visual impairment [2]. Glaucoma is an infection this is hard to recognize in prematurephase. There are quite a few ways to detect Glaucoma, as a example, some system are Tonometry, Ophalmoscopy, 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.

The productive use of the fuzzy logic has been utilized for various applications. The most useful lies within the approach that analysts will display dubious, complicated structure into uncomplicated human reasonable form by utilizing human knowledge and learning as fuzzy guiding principle as set of linguistic factors [4].The present papertalked about a specialist framework by making utilization of fuzzy system to differentiate Glaucoma from its recommended side effects. The accurate thinking is resolved by utilizing understanding information set a record having 6 unique traits. By utilizing medical expert information fuzzy rules are created that can be

created as a source of decision making. The medical business utilizing the field of man-made intelligence has effectively moved from clinical research center to real applications. In this part, outlining and implementing outcomes for investigation of Glaucoma by utilizing fuzzy interference framework are planned. In the wake of assessing the level of precision, will be achieved from medical center information set. Utilizing 6 quantities of input parameters (symptoms) fuzzy interference frameworks is created. The fuzzy rule based framework uses restorative expert information for knowing patient's indications and give a precise choice as per standards are made.

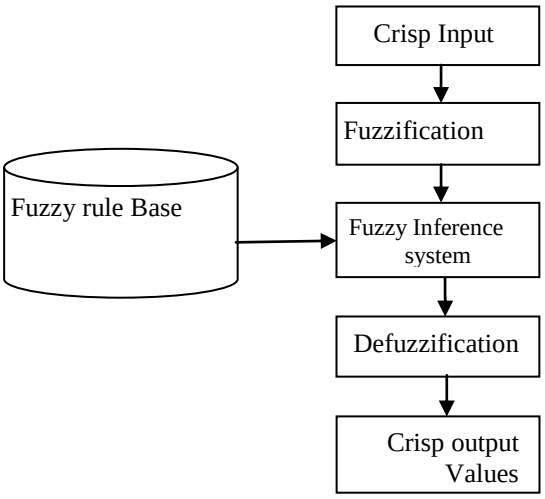

Figure 1(a). Fuzzy Expert System [5]

In the diagnosis of glaucoma six 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 problems 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 1(b). Surgical Illuminating Keratoscope [6]

A Surgical Illuminating Keratoscope is deployed to spotAstigmatism, 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 aresult of any type of astigmatism, myopic and hypermetropicvisualization are blurred or unclear.

With the IOL in positiondiminish or toggle off the coaxial illumination, permitting the reflections of the IOL to become visible. The facing reflections of the range of the cornea come into sight with enhanced brightness. Any astigmatism at hand will be associated with the steepest section (the shorter cross section of the speckled mires) with your surgical pre-marks. Reflections from the IOL will be visible bigger, dimmer and somewhat diverse in shade [6].

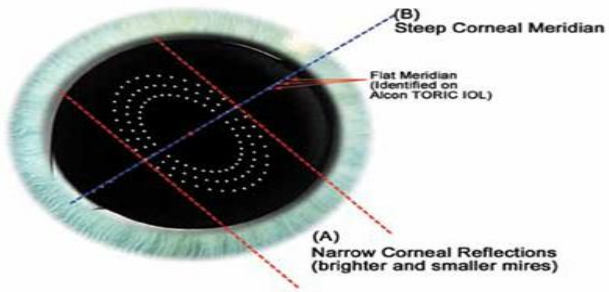

Figure 1(c). Astigmatic Corneal Reflection [6]

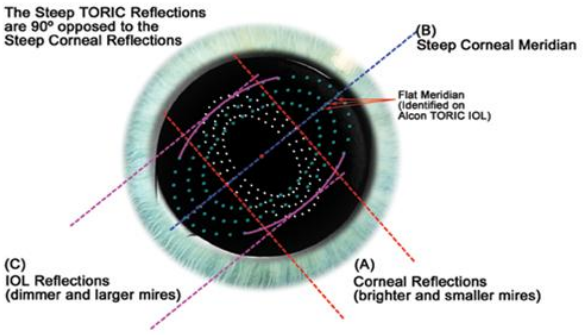

Figure 1(d). Toric IOL Reflection [6]

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 proficientschema.

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].Ulieru M. et al. (2000)proposed a neuro- fuzzy expert system for diagnosis and early detection of Glaucoma. Authors introduced a 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-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 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 fuzzy rules are near agreement with clinical results [12].Inoue N. et al. (2005**)** projected two approach'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 well, except there are some complexity that veins within the optic circle is nowhere to be found. Researchers build up another technique by using coordinating to handle this issue. Author assumed that new system are viable to look at the patient situation for glaucoma [13].Cheng J. et al. (2010) projected a radiantconfiguration for the assessment of RetCamimages for personalized close/open positiontaxonomy. Author deployed two conceptsi.e.edge recognition and arc recognition to portray open angle and close angle glaucoma. Further theyhaveretrospected the clinical catalog and outcomes [14]. Xu Y. et al. (2012) and accustomed Image processing and learning principally based system that was anticipated to frontier and classify Anterior Chamber Angle (ACA), in view of multi-scale HOG highlights [15]. Krishnan M et al. (2012) put forth anoriginalIntuitionist Fuzzy Set (lFS) premise based methoddeployed to slice the optic disc in retinal fundus images. Author sliceded the optic disc by means of Otsu, Gradient Vector Flow (GVF) snake and A-IFSH based segmentation to pick the finestschema. 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 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 timerecognition of disease called 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), 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) introduced adaptive thresholding technique which combines picture highlights like mean, variance and standard deviation to the region of optic circle and optic disc from the fundus picture. Later they differentiate the outcomes medical database and this framework gives promising outcomes with 90% accuracy [19]. Aloudat M. et al. (2015) introduced a Haar filter to rule out the open and closed angled glaucoma at first by knowing the thickness of fluid in cornea. Author compares the result with the Patients of the Jordanian Governmental hospital (Al AmeeraBasma Hospital). The suffererswere of age group ranging between years old, and all of them had visionailments [20]. Haveesh G. et al. (2015) proposed two systems explicitly fuzzy classifier and picture processing to differentiate glaucoma. The main purpose of this technique is to determine CDR and then arranging glaucoma based on calculating CDR. The principle of this study is to perform retinal fungus image for magnification which is must to deal with the cup to disk ratio of image by utilizing online data base and managing the disease from its symptoms using fuzzy classifier in MATLAB [21].Lamani D. et al. (2015) introduced several parameters such as central cornea thickness, neuro retinal thickness, intraocular pressure etc to study glaucoma by using clinical equipments like perimetry, pachymetry, tonometry etc[22]. Kumar B. et al. (2016) introduced a picture processing method to detect glaucoma. The scientist used different techniques such as PCA, HOS and combining textures and compared their results to look for accuracy. The outcome of this technique comes with 86% success out of 200 real pictures for two phase classification with SVM [23]. Ohri K. et al. (2016) introduced Fuzzy based inferenceengine to examine two different breast cancers that are malignant and benign. This paper juxtaposes the fuzzy outcomes with medical results presented [24]. John A et al. (2017) proposed fuzzy expert system (FIS) to diagnose Glaucoma from normal and Glaucomatous eye. The end result found out 88% accuracy by contrasting fuzzy outcomes and medical [25].

III. PROPOSED SYSTEM

This section embraces the loom embrace in building the broad-spectrum fuzzy constitution for conclusion construction framework. The fuzzy skeleton is a composition which is reliant upon fuzzy set proposition; it picks up a fuzzified description of patient's current state and induces fuzzy association. With a specific aim to figure out fuzzy construal to fullest i.e. to bring about distinguished interpretability and the aptitude to embrace generality is very momentous. Generalization involves that fitness to state the state-activity as opaque as practicable. Generalization rules permit well-built rule base, prompt point of reference and distinct fuzzy interpretability. A fuzzy reliant assessment support method achieve in sequence and understanding in conception of IF-ELSE strategy to sketch fuzzy inference. Therefore, a fuzzy master framework permits an uncomplicated passage for setting up an accurate arrangement with aid from an indistinct area. The known fuzzy set with reference to membership work characterizes the information approbation to its exact membership and it should be positioned in range of (0, 1). A fuzzy set has no cotemporary merit and has a fuzzy intermediate. The quadrilateral membership plot is a chore having 4 variables a, b, c, d where a and d denote feet of quad with relationship level 0 and b and c be a symbol of shoulders of trapezoidal with level 1.

IV. METHODOLOGY

Figure 4.1 represent the designing of the expert system by using six input variables i.e. Intraocular pressure (IOP), Cup to disc ratio (CDR), Rim to disc ratio (RDR), field of Vision, Corneal thickness, Angle be used. These inputs are used to deduce the health ranking of individual. After selecting the input variables uninterrupted stair is to fuzzify the factors i.e. we have to institute the fuzzy sets for each and every giving variable and the resultant variance of the belonging to each fuzzy set. Fuzzy rule-base permits experts acquaintance

to imitate on indications of continuing and then supports the rules developed to give a near accurate conclusion. On-line prime medical care symptoms evaluation implies citing of these symptoms that are fundamental for the analysis and conclusion of disease. Figure 4.1 correspond to the methodology for the proposed system.

Fuzzy Inference System (FIS) and Graphical User Interface (GUI) are very powerful tools provided by MATLAB to propose a Fuzzy verdict structure. The training part with reference to 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 (6 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.

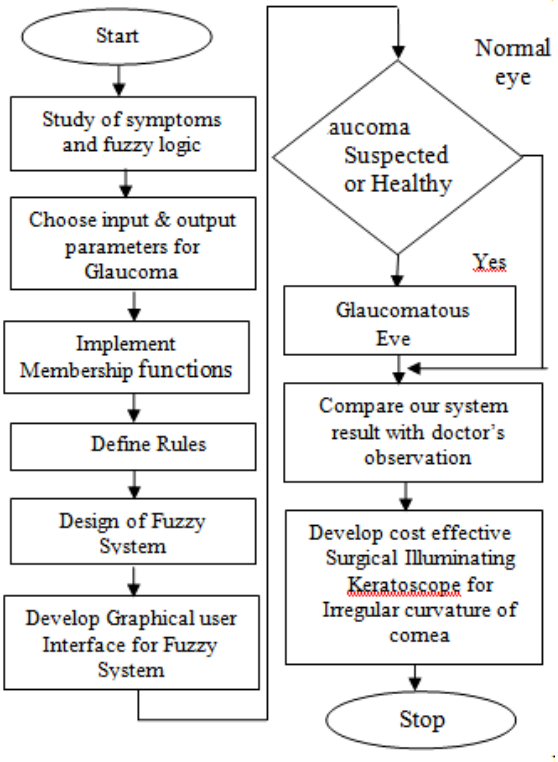

Figure.4.1. Methodology to Implement Proposed System

A) INPUT VARIABLES

Six 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 and Angle. These inputs are used to predict the health status of a person. We have to determine the fuzzy sets for every input variable and the corresponding range of the belonging to each fuzzy set.

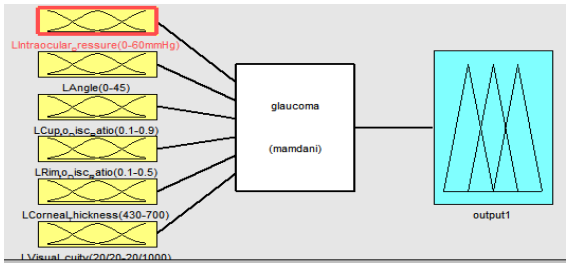

Figure 4.2. FIS Editor with 6 inputs & 1 output

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 fuzzy inference system, jointly cooperating input & output parameters.

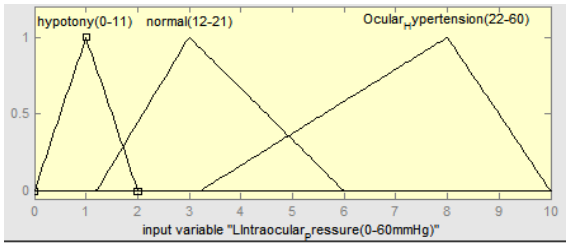

Figure 4.3(a). Membership function plots for Intraocular Pressure

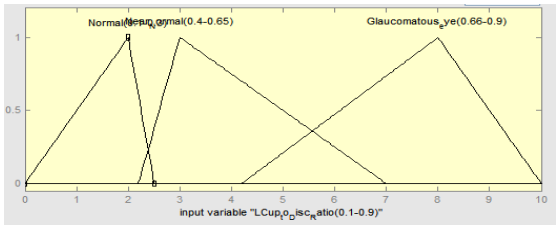

Figure 4.3(b). Membership function plots for Cup to disc ratio

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 fuzzy set. In progression a quantity of clipped subsequent relationship functions are represented conjointly to one 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 variables

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 fuzzy inference system (FIS) provides following outputs for the detection of Glaucoma:

1. Normal eye (0-3)
2. Glaucomatous eye (3.1-5.3) Mild
3. Glaucomatous eye (5.4-7.6) Moderate
4. Glaucomatous eye (7.7-10) Severe

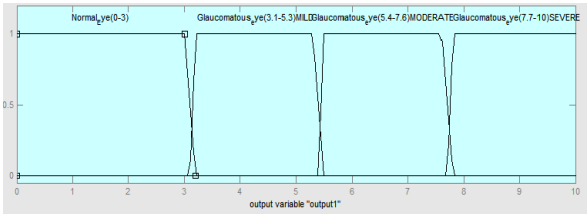

Figure 4.4. Membership Plot for Output

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 (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

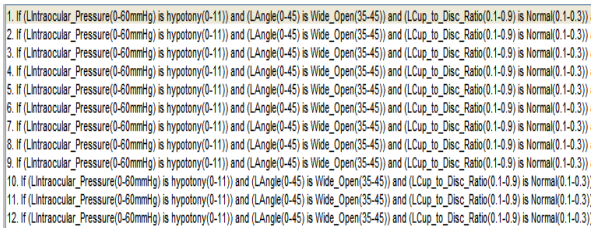

Figure 4.5. Rule Editor

E) FUZZIFICATION AND DEFUZZIFICATION

The next segment of 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 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 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 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 fuzzy system. At left plane at the crest, we get = 5.95 (defuzzified values) which means the person is normal.

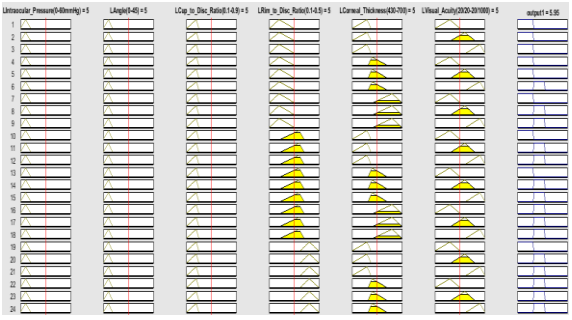

Figure 5.1. Rule Viewer

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 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. Figure5.2 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 by blue color and output is represented by yellow color.

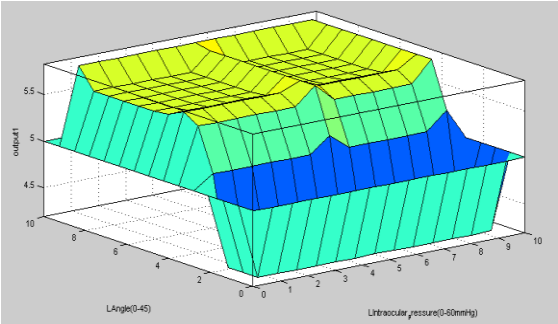

Figure 5.2.3-D Surface View b/w IOP and Angle

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 5.3(a), 5.3(b) and 5.3(c) show the GUI for the anticipated system.

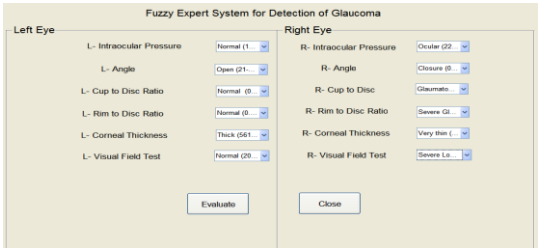

Figure 5.3(a). Glaucoma Detection GUI with Input Parameters

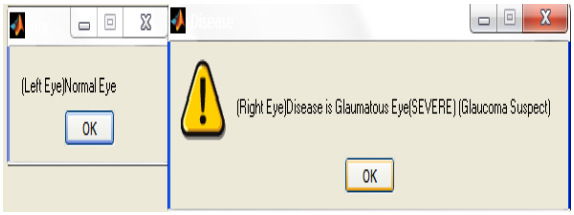

Figure 5.3(b). GUI showing Decision on Glaucoma according to Input Parameters

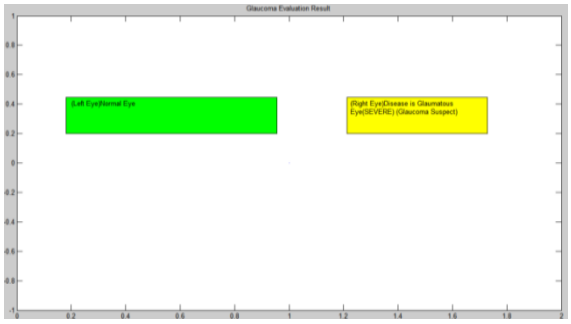

Figure 5.3(c). Glaucoma Detection for Both Eyes

The projected method represents recognition of normal eye and glaucomatous eye by using the parameters (IOP, CDR, RDR, Angle, Field of Vision, and Corneal Thickness).In fuzzy inference system (FIS) there are 729 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% [26].

$$\text{Accuracy} = \frac{\text{No. of correct Patients}}{\text{Total No. of Patients}} \text{x } 100 \quad (1)$$

$$= \frac{97}{100} \text{x } 100$$

$$= 97\%$$

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 [26].

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

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

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 [26].

$$\text{Specificity} = \frac{\text{True Negative (TN)}}{\text{True Negative (TN)} + \text{False Positive(FP)}} \quad (3)$$

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

D) *Hardware Implementation*

A Keratoscope is designed to provide precise centration with a flashing fixation target and three concentric rings of illuminating LED's. These LED's are arranged at every 10 degrees. Keratoscope is outfitted with a hegemony switch that sways the concentration of illumination. This hegemonybutton is intended to securely hold the surgical Keratoscope. Clockwise rotary motion of this switch switches on the device, givingpreliminary illumination of the LED fixation objective. The bright orange flashing LED is deployed for any process that aids the surgery. Then the patient is asked to fixate on a target. When the switch is rotated more in the clockwise direction the full ring light array begins to illuminate at its lowest level. With continued rotation the array will achieve full brightness. In Figure 5.4 the illuminating medical instrument Keratoscope is mounted upon the target lens of surgical microscope with the appropriately 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 5.5, in which it shows bright light in the form of circle without any irregularity which results that the patient is normal.

Figure 5.4. Examination of Cornea using Surgical Illuminating Keratoscope

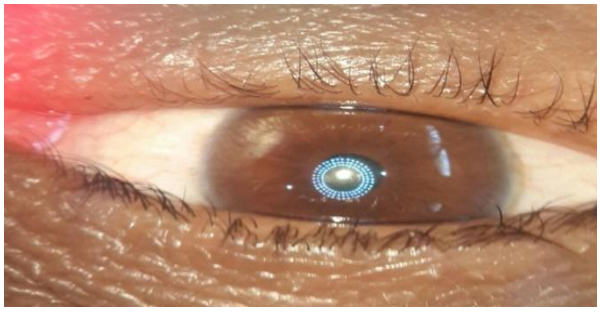

Figure 5.5. Reflection Image of Surgical Illuminating Keratoscope

VI. CONCLUSION

Glaucoma is most wide-ranging disease at present, so in the early on identification is exceptionally important to keep individuals experiencing Glaucoma. The highest loyalty choice is the early finding which gives doctors to detect the Normal eye and Glaucomatous eye and also surgical Keratoscopewhich is low cost and effective solution to detect uneven curvature of cornea. In this research, we have exhibited a fuzzy structure on decision supportive network for the diagnosis of Glaucoma. The prediction of the Normal eye and Glaucomatous eye is done by the proposed fuzzy interference framework.

The proposed system can administer different sources of input which can be far superior to handle susceptibility during investigating period. The results are compared with clinical dataset of 100 patients; the system gives promising results over 97% accuracy. This present framework can be extended 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.

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

1. Normal eye
2. Glaucomatous eye (Mild)
3. Glaucomatous eye (Moderate)
4. Glaucomatous 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 as the six tests are costly. This investigation involves six parameters i.e., Tonometry, Ophalmoscopy, Pachymetry, Gonioscopy, Perimetry. Previous researchers used a maximum of two parameters. Easier, quicker and cheaper recognition of glaucoma can be arrived by utilizing the projected fuzzy interference framework.

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Threats on the Security of Wireless Sensor Networks-A Review

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Abstract: Wireless Sensor Networks (WSN) have very wide of aperture of applications and it is becoming backbone of many uphill tasks which may also make it fatal for the humans to operate. Its minute sized nodes and faster than light communication over-powers all the other systems and makes them the topmost priority for the systemization of many applications requiring independence and energy efficiency. The emerging technology of WSNs has tremendous potential of getting deployed in situations which are critical such as battlefields and applications in commercial fields like buildings, traffic monitoring, habitat automation with smart behavior and several other areas. Although the vulnerability to attacks is apparent, the deployment of these nodes is inevitable. The system becomes highly profitable at a great extent when the sensing technology gets combined with processing power and wireless communication. A wide variety of attacks on the security are discussed in this paper.

Keywords—Wireless Sensor Networks, Network Security, Attacks on Security, Active and Passive Attacks, Wormhole Attack, Security Mechanisms,Design challenges in wireless sensor ne*twork*s.

I. INTRODUCTION

WIRELESS SENSOR NETWORKS (WSN) are rudimentarily application dependent. Being primarily designed for the attainment and examination of the real-time data of low level in the environment which is unfriendly for the human presence, they comprise of spatially shared and multifunctional nodes of sensors that are small in size as well as capable of doing short distance wireless communication. Designed to integrate non-similar properties, nodes can sense surrounding atmosphere and talk to other peer nodes in the vicinity of its respective neighborhood without any considerable hassle. This may be one of the several reasons, why they are the first preference among many, for the surveillance and monitoring required applications [1].

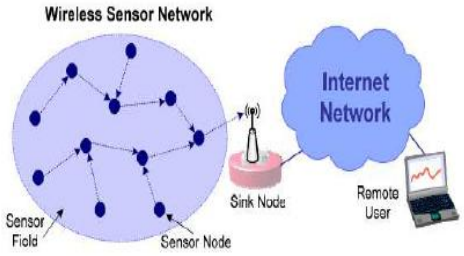

Figure 1Wireless Sensor Network [20]

Fields ranging from wildlife to smart buildings, forests to military, communications to industrial quality control, robotics to traffic management, and many others, are usually found to be relying on their usage as it brings greater variety of support mechanisms. Owing to being deployed majorly in the hostile surroundings with the ever-active opposition to the intelligence, security becomes a critical hurdle sometimes. In many applications, there is a constant presence of suppressing requirement of privacy and confidentiality of data and location to avoid any chance of network destruction.

As the nature of interactions is wireless, it only takes place in air and it is through radio frequencies which soars the potential of getting intercepted by someone unknown who may be based anywhere in the world. Thus, encryption becomes a must on the go and if not supported by a strong algorithm, then the security may be compromised. Preserved confidentiality, ensured integrity and maintained availability strengthens the backbone of the information systems.

The designing of any application depending upon

the stringently secure assurance involves the protection of the easily exposable casualties which may disclosed with authorization at the times of the disasters such as terrorist activities and hence, becomes a necessary key expectation. Apart from that, applications which play around threats related to chemical, biological or any environmental hostility, need to do monitoring and should be free from any network threatening blow. Total disregard for the signals may result if the alarms, designed for the safety, are notoriously played around with, to induce panic and chaos among the users of that particular applications [2]. What's more, in utilities which revolve around the care of public health and making the home smart and supportive, protection of privacy is vital which can be only nurtured if the access to the systems is so strict that only the patrons, who are authorized to command the entrance and exit to the system, are allowed to question and alter the ins and outs of the network when necessary [1].

This paper mainly encompasses the classification of the security attacks which may bring wrath to the well-being of any WSN. Following some goals of the security, the threats are discussed in detail.

II. PERSPECTIVE OF SECURITY FOR SENSOR NETWORKS

WSNs also have the capability of being a part of any ad-hoc network and there are some goals of security which needs to be fulfilled by the network nodes in order to assure the optimistic conduct and rule out any possibility of fault tolerance. The goals are categorized as either primary or secondary [3]. The first three of the following are the primary ones and

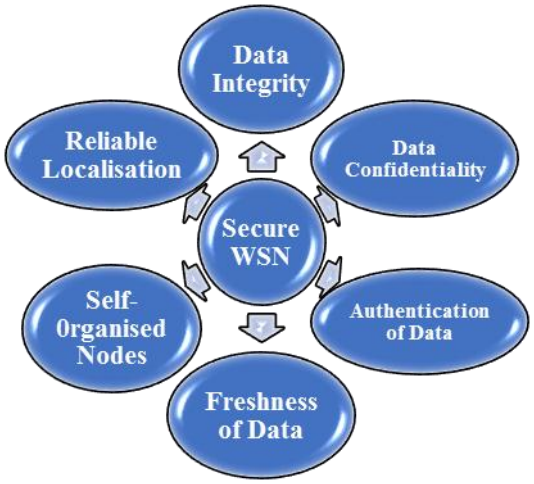

Figure 2 Security of WSN

the other three are the secondary ones.

A. *Confidentiality of Data*

The encapsulation of the data in a secure manner to disable any passive attacker from getting to know about the whereabouts of the communication going on between two parties by any means is the confidentiality which is making the operators pull their hair these days. The revelation of data should not happen at any cost as privacy is must and most prominent aspect to preclude any possibility of compromise.

B. *Authentication of Data*

In order to ensure the accuracy of the message received, it is must to find out the origin of that message. This task is carried out by authentication. Not only injection of false packets, but also the alteration of packets is possible by introducing certain impairments [3]. Authentication means the verification of identities of senders and receivers. Both symmetric and asymmetric mechanism for achieving this are available involving sharing of secret keys by sending and receiving nodes. This bears a very challenging difficulty because of wireless nature and unsupervised nodes in the network.

C. *Integrity of Data*

This relates to the quality of the received data, it can find out if the message has been tampered with. Although confidential enough, but there is always a potential to get wrecked. The alterations can occur. If there is a presence of a malicious node in the network, and if it injects a false packet of data, or if the data is lost or vandalized owing to the unstable conditions of the wireless channel, the integrity of the data may get disturbed.

D. *Freshness of Data*

Freshness of each message is must even if there is an assurance of confidentiality and integrity. It generally suggests that there is no re-portrayal of the older messages and that the currently sent data is bearing novelty [4]. To do this, the packed is appended with a nonce or a time-related counter showing the sequential position of the message.

E. *Self-organization*

Independent, flexible enough to be self-organized and self-healed nodes are required in the play as a WSN is typically an ad-hoc network. The infrastructure is not fixed for the management of a sensor network. This brings another greatly treacherous hurdle as if self-organization is lacking, devastating results may prevail from the attack or even the hostile environment.

F. *Reliable Localization*

A network utility greatly relies on its ability to accurately locate every sensor in the network directly on its own. In order to locate faulty nodes,

accurate information regarding the locations of each nodes becomes a must handy entity. Moreover, unsecure location information can be easily manipulated by the attackers by either replaying signals or reporting fake signal strengths.

III. ATTACKS ON THE WIRELESS SENSOR NETWORKS

Owing to the broadcasting nature of WSNs, as mentioned earlier, these networks are easily vulnerable to the attacks on security. To top it all, the hostility of the environment where there is no physical protection, the talked vulnerability gets exacerbated. The basic classification of attacks is as active and passive attacks and there are various inside both these categories discussed further.

A. Passive Attacks

An attack is called a passive one when the unauthorized intruders monitor and listen to the ongoing communication. These attacks are rudimentarily on the privacy of the interactions.

1) Privacy breaking Attack

Sensor networks are remotely accessible to its users. Although the collection of information is the backbone of this paradigm, if the site is directly surveilled, a large proportion of the information might be extracted without much irritation. Thus, privacy problem becomes an itch that needs immediate scratching. Moreover, to make it worse, the wrongdoer does not even have to be in its vicinity. Anonymity becomes his greatest strength and reduces the level of risk associated with his unethical activities. Some of the usual attacks [5] against privacy are:

- *Eavesdrop and Monitoring:*Being the most common in the arena, it allows the individual to reveal the contents of the communication. Eavesdropping comes in handy especially at the moment when the channel carries the configuration information of the network, which is potentially more detailed in comparison to data accessed by location server. It can easily kill the privacy.
- *Perusal of Traffic:* Despite being encrypted, the messages being transmitted offer a great potential to analyze the traffic. Such loopholes purvey enough information to the attackers to plan their tactics and vandalize the network.
- *Camouflaged attackers:* Nodes in the network can also be made to hide. Thereafter, such nodes can play the role of a normal node and can lure packets to attempt an analysis of the network by misguiding packets.

B. Active Attacks

When the data streams in the network are taking serious blows by getting listened to and undergoing unwanted and non-triggered modifications all by themselves, the network is under an active attack. Such attacks can be following:

1) Attacks related to routing

These attacks trifle with the network layer of the network architecture. The following attacks can spoil the routing:

a) Information getting changed, spoofed and replayed

As every node performs routing operations in the network, unprotected ad hoc routing becomes vulnerable and routing information gets affected.

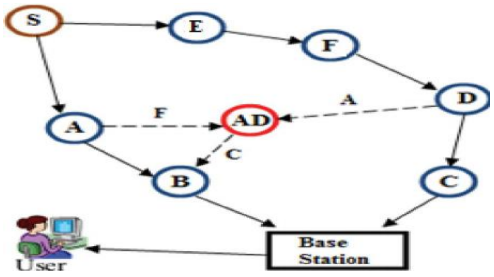

Figure 5 Sybil Attack [19]

Unprecedented loops can be created and the routes can be extended or vice-versa. Moreover, false error messages can be manifested in order to motivate the rise in the end-to-end latency.

b) Selective forwarding

The attackers can create a maliciously dangerous

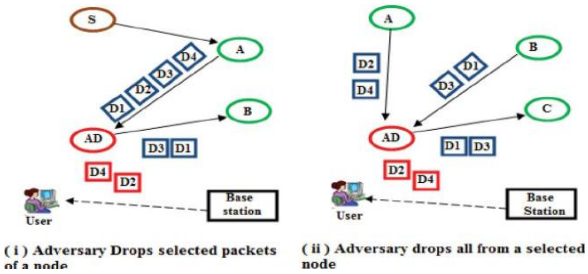

Figure 3 Selective Forwarding [19]

node which can be granted with an ability to select and drop only certain packets, and this attack becomes further catastrophic if it is delivered with

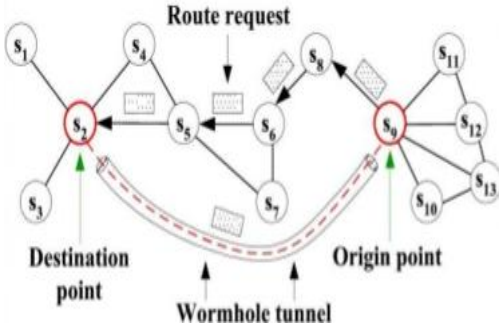

Figure 4 Wormhole Attack [21]

the data about the network traffic. It is an assumption in WSNs that nodes faithfully forward the messages which are received. However, the refusals may be encountered from some compromised nodes but another routes can help neighbors.

Two scenarios are shown below in the figure. In first scenario, the adversary drops packets D2 and D4 and

lets D1 and D3 to be forwarded to B from A. In the second case, again the packets from node Aare dropped while that of B are forwarded to C[6].

c) Wormhole attacks

Through this attack, the perpetrator firstly, records the flowing bits in the network. Then secondly, he tunnels them from one location to another to finally retransmit them in the network [7] as shown in figure 4.

d) Sybil attacks

This attack ensues when a single node is cloned and is presented at more than one locations. The schemes which make the network fault tolerant like distributed storage, multipath routing and topology maintenance, are targeted by Sybil attacks. Multiple identities are presented by a single node, under this attack, which can be easily curbed if network authentication and encryption of messages is looked upon [6].

e) Sinkhole attacks

With this attack, all the traffic is directed to a specific node in the network. The attacker basically tries to pull the whole traffic from a typical area by making a node compromised [6] [7]. The

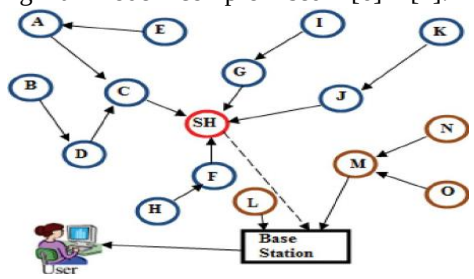

Figure 6 Sinkhole Attack [19]

surrounding nodes can also face some severe compromises due to this attack.

f) HELLO Flood attack

The routing protocol's HELLO packets can also be sent or replayed with elevated energy from one node

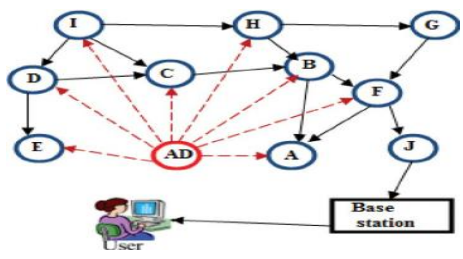

Figure 7 Hello Flood Attack [19]

to another. Thisacts as a weapon for the attackers who uses it to entice sensors in WSN. The attacker, who has a high range of radio transmission and greater processing power, sends HELLO packets to a number of sensor nodes in a larger area.

The influenced sensors take attacker as a neighbor and become a victim as the information meant to be sent to the base station also meets the so called neighbors to experience spoofing.

2) Denial of Service

This attack relates to the malicious actions in the network as well as the unintentional failure of nodes. The activists can easily make the network's ability of giving services, get diminished through this attack. In addition, it can also massively abrupt and destroy the network. Such attacks can be performed in large number on several layers of WSNs. It can be jamming and tampering at the physical layer whereas, on link layer it can be collision, exhaustion and unfairness. Moreover, at network layer it could be many such as, neglect and greed, honing, misdirection and black holes. Apart from this, malicious flooding and de-synchronization could be undertaken on transport layer. However, mechanisms that can prevent this are stringent authentication, traffic identification and pushback along-with payment for network resources [8].

3) Malfunctioning of Node

This attack can make any node malfunction in order to make it generate unreliable data and disclose the integrity of sensor network to put it at stakes. Moreover, the nodes which are usually forgotten are those which aggregate the data such as a cluster-head node [9].

4) Outage of Node

When a node from the network stops functioning altogether, this attack seems to have done its job. To mitigate the effects it is necessary that protocols of the sensor network are robust enough and always have an alternate route ready to be used [9].

5) Subversion of Node

If an attacker captures a node, its encrypting secret keys and other information can be easily disclosed. This attack helps the adversary to take the advantage of this and annihilate the encryption of the network and make it bare to the public [9].

6) Attacks with Node Replication

Often an attacker first extracts the identification of an existing sensor node in the network. Thereafter, he tries to append a new node to the existing topology of the network with the same identification extracted before [6] [7]. This can seriously disrupt the well- being of the network

and plunge the performance of the network on a massive scale. It can misroute or even corrupt the flowing packets in the system. Even the

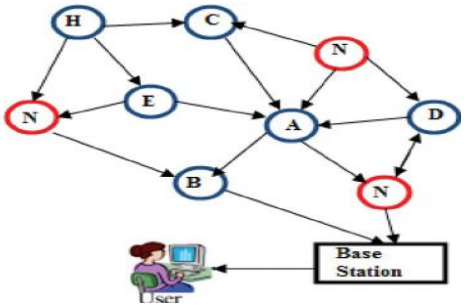

Figure 8 Node Replication [19]

sensors can read information falsely and the network can be disconnected. The replicated sensor nodes can be supplied with the cryptographic keys obtained through physical access. A specific segment of the network can also be attacked as the attacker can easily insert the replicated node at desired point and manipulate the network leading to disconnection [10].

7) Collecting Passive Information
If the attacker is equipped with high-rated resources then he can gather information from the network if it is without encryption. The data stream can be easily picked off with a powerful antenna and receiver. This helps the attacker in finding the physical locations of nodes and destroy them. Apart from this, the content of any application, message IPs, timestamps etcetera, can be observed by attacker. Again strong encryption techniques are required to surmount this [5].

8) False Node
This node injects malicious data into the network and it can also prevent the passing of true data. This is one of the most dangerous attacks. Whole network comes to the verge of destruction as this attack can make other nodes to be malicious as well. The adversary may even use the whole network for his selfish motive [11].

9) Physical Attacks
It is widely known that sensor networks operate in unfriendly harsh outdoor environments. In such a scenario, these become highly susceptible to physical attacks as they are unattended as well as distributed and moreover, their form factor is also low. Under such attack, the nodes are destroyed permanently and losses become irreversible. Cryptographic secrets can extracted, circuitry can be altered, code-modifications may take place and on the top of all, replacements with malicious sensors is also possible to handover the control to attacker.

10) Message Corruption
The integrity of any message gets entirely bluffed when the content carried by it is modified without necessity or the content is erased or impaired [11].

All this discussion easily helps us in analyzing the attacks comparatively to each other. The following table tries to summarize the attacks together. Table 1 shows the comparative prospects of many attacks along with their effects on the network and the plausible measures that can be undertaken to overcome the menace of such attacks.

Table 1. Comparative Analysis of Various Attacks

Sr. No.	Attack	Network Failure	Node Failure	Loss of Encryption	Traffic Congestion	Measure
1	Privacy Breaking Attack	Yes	No	No	Yes	Awareness and Data Acquisition with authentication
2	Routing Attacks	No	No	Yes	Yes	Simple Authentication Protocol
3	Denial of service	Yes	Yes	No	Yes	Robust Communication
4	Node malfunctioning	No	Yes	Yes	No	Tamper-Resistant Packaging
5	Outage of Node	No	Yes	No	Yes	Alternate routing
6	Subversion of Node	Yes	Yes	Yes	No	Algorithms against node capture
7	Collecting Passive Data	Yes	Yes	Yes	Yes	Encryption
8	False Node	Yes	No	Yes	No	Authentication and intrusion detection
9	Physical Attacks	No	Yes	Yes	Yes	Resilient Protocols and packaging

IV. A FEW MECHANISMS OF SECURITY

These mechanisms help the network to detect, avoid and recover from the attacks made on them. A wide variety of such actions exist and can be classified into two categories that is high-level and low-level.

A. Low-level Mechanism

This group of mechanisms involves the following methods,

1) Establishment of key and trust
   Every sensor network on a general basis primarily needs to have a set of encryption keys which it can manage. However, the limited computational capacity and expensive key public management makes it quite challenging. In this mechanism, keys for hundreds and thousands of nodes are scaled and set up. These nodes can be normal or the data aggregating ones. The vulnerability of this is that complete key pool can be replicated by the attackers and if this happens then network can face severe consequences[14].
2) Authentication and secrecy
   Eavesdropping, injection and modification of packets requires a lot of protection. The standard way of defending is cryptography. End-to-end cryptography can give high level of security but should be incompatible with passive participation and local broadcast. This can be helpful in point-to-point communication[15].The key setup and passive participation is simplified and supported by the link layer cryptography. However, eavesdropping and alteration are still possible. Due to its ease of deployment, it is still first choice of new networks.
3) Privacy
   Awareness of presence of the sensor nodes and acquisition of data is imperative because the networks deployed with legitimate purpose in the mind might later on be used in unexpected manner [14].
4) Denial of service robustness
   It is very easy to jam a network's communication if a high-energy signal is broadcasted powerfully enough. Other sophisticated attacks can be violation of protocols like 802.11 medium access control [14].
5) Routing Security
   Many security vulnerabilities exist when it comes to routing and data forwarding. The injection of malicious nodes is which may result into inconsistent routing is the simplest one of them. The simplest way to guard against this is by authentication but with routing messages, the attackers can replay the protocols [16].
6) Node Capture Defence
   The nodes are usually placed in remote places which makes them likely to be captured by adversaries which can lead to privacy invasion, change in programming of the nodes and so on. The packaging of the nodes can be enhanced and made tamper-resistant to defend against this along with the algorithmic approaches [14].

B. High-level Mechanism

1) Intrusion detection
   The composition of secure groups can surely be a promising approach for the decentralised intrusion detection as wireless sensor networks require a solution that is fully distributed and inexpensive in terms ofcommunication, energy, and memory requirements [14].
2) Secure group management
   The groups of nodes are made to make them perform some big operations like data aggregation and detecting particular flow of data and so on. It definitely requires secure protocols. Moreover, the output from group computation needs to be authenticated before it reaches the base station [14].
3) Secure data aggregation
   In order to save the base station of the network from facing overwhelming traffic the data is aggregated and sent to it. The locations of aggregation can be anywhere in the network as nothing is fixed. All the locations must be secured [16].

V. CHALLENGES FACED BY WSNS

WSNs are basically large and of ad-hoc nature, this presents some significant challenges in the formulation of the schemes for the security of network. Being special in nature this network has several constraints in comparison to the networks conventionally used in the field of computers.

A. Medium is wireless

Eavesdropping becomes a child's play when the medium is wireless and information is broadcasted in an omnidirectional manner. The adversary becomes qualified enough to trifle with any ongoing transmission, intercept it in any possible way, alter the messages as per the choice and even replay them for as many times as desired. The valid packets can be easily intercepted and injections of malicious information is like a walk in the park for the attackers. It becomes the need of the hour to modify the traditional mechanisms in such a way that it can curb the growing menace of this modern technical problems [12].

B. Ad-Hoc deployment

WSNs have no particularly defined structure or topology owing to the ad-hoc nature of the networks. At any moment the network can demand the changes in order to tackle the prevailing situations. Node failures, addition of nodes or even the mobility can cause the network to introduce variations. Even the air-drop facility deploys the nodes in the network and nothing is known of the topology prior to that. Self-configuration becomes a high priority as the nodes may fail or be replaced without any warning. This dynamic environment needs some intelligent schemes.

C. Unfriendly environment

Another frowning factor is the environment where the nodes are laid to form the network as it is absolutely hostile. Destruction are possible to happen and also the nodes can be captured by the attackers. Attackers are growingly becoming smarter with the advancements of technology. When a technology is developed the adversaries get something to play with and hamper its development by making it deal with its uninvited challenges. Attackers can now easily access any node in the hostile environment in a physical manner to disassemble it and dismantle it. Thereafter, the sensitive information about the network can be easily extracted which may even contain the cryptographic keys. This represents a serious threat to the welfare of the networks.

D. Resource security

The resources often come with extreme limitations and this poses another considerable barrier in front of those mechanism of security which are hungry for resources. Such constraints of hardware makes it necessary to have such algorithms which are extremely efficient and which can optimally utilize the available bandwidth, reduce the complexity of the computations and handle the usage and access of memory. It is not as easy as it seems to be and this is not something which can be called trivial and can be ignored to prioritize another aspects of the networks. The most precious resource for any of the many nodes in the massive network deployed to remote locations away from the digital civilization of gadgets is the energy that they have to use for the communication or any other purpose. Communication is a power-hungry task. Thus it is highly essential for the security mechanisms to be communication efficient in nature which in turn would help them to be energy efficient indirectly.

E. Scale is Immense

WSNs pose a lot of gigantic hurdles to its designers who may or may not be able to handle it because the adversaries are always four steps ahead. Another of them is the proposed scale of the networks. In simple words there are tens of thousands of nodes which are generally accommodated in a network and handling all of them at the same time is naturally an uphill task without any doubt. And more difficult is to give all them the equal amount of security. Therefore it is necessary that the mechanisms which are built to caress such networks are scalable and should be able to maintain heavy computational tasks without a wink and are highly efficient in communication.

F. Communication is Unreliable

Undoubtedly another threat in this domain is the unreliable communication. A defined protocol is utmost important for the governance of the wellbeing of the network as the communication is vital for this [13]. This is so because the routing of the network is connectionless in nature and is inherently not reliable and everything is carried out through packets. The communication solely depends on the channel however, the broadcast nature again brings compromises even though the channel may be reliable. Latencies can be increased due to multi-hop routing coupled with the congestion of network and high processing times. Thus synchronization among sensor nodes becomes further difficult to achieve.

G. Operations are unattended

It is not unusual to find any node unattended for long time as it may be the demand of the function itself. Such nodes become number one preference of the adversaries who are looking for a suitable to attack and what can be better that a node left unsupervised in an environment which can easily hide the perpetrators to let them enjoy the capturing and destroying nodes physically. Moreover, the probability of attacks also rises in such cases. Apart from this, there are many nodes which are governed remotely and detecting physical impairments and issues become virtually impossible. What's more, there should be no central management point in a sensor network as this will increase the vitality of the network of sensors. The network becomes hardly available for organization and on the other hand it becomes inefficient and easily breakable. The longer the node is left without any attention, the more the likeliness of it being physically tainted.

VI. CONCLUSION

Vulnerability of the networks becomes a common phenomenon in an environment which is hostile and the sensors are deployed without special attention. The popularity of the networks is increasingly getting widened in fields like military, environment, health and commercial applications. It is much more significant for the networks of such kind to be secure. A lot of different types of attacks have been covered in this paper along with the brief discussion of the challenges that seek some reliance. It is hoped that this work may motivate and encourage more masses to raise smarter and robust mechanisms in order to intensify the security and make the network attack-proof and keep the adversaries at the bottom

of the sink. One such mechanism is the convergence of Passive Optical Network (PON) with WSNs which can greatly help in curbing many hurdles. A PON rather than making WSNs accessible for a human operator at several distant locations, is intended to backhaul the data being exorbitantly generated every passing second to the operator at the speed of the light [16]. Moreover, the resource allocation in such converged networks, which can be a cumbersome task for the base station to handle, can be worthily managed using the statistical models of a theory called queue theory. The examples of queues can be easily observed in the everyday life around us. This can be immensely helpful as the demands in such networks are ever growing and needs to be nonstop enhancements need to stay up [17]. Apart from that, the use of sideband modulation schemes ensure a bright future for such converged networks as the data of WSN fuses successfully over the PON in an acceptable manner. This makes sure that the difficulties associated with the medium of this network can be successfully nullified and the potential of these schemes can be easily harnessed for the betterment of this field [18].

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Medicine Recommendation on Basis of Multiple Criteria Using Data Mining & Machine Learning Algorithm

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Abstract-Nowadays people are more conscious about products, especially if that related to health. Many recommendation systems are available to guide the people on basis of what other's use. It is like decision support system which helps user in taking decision. There is lot of information system developed for user and in evolving stage which aims to provide guidance with more n more accuracy. There always news of death due to wrong medication which not always a fault of professionals but sometime it like constraints to their knowledge Medicine recommendation system is available like E-MYCINE but not active due to some constraints. However, the advancement in artificial intelligence and machine learning now everything is transformed into automated and making everything automated up to some extent and try to limit the constraints to increase the efficiency.. The purpose of this paper is to develop such recommendation system which helps healthcare professionals as well as patients in deciding which medicine is best suited for which disease. In this, medicine recommendation system is proposed using Naïve Bayes which takes symptoms as input from user and then after analysis predict disease name, then accordingly recommend medicine as well as generic name of medicine which help user in purchasing low cost medicine.

Keywords- Machine Learning, Data Mining, Recommendation System, Artificial Intelligence, Decision Support System, Naïve Bayes.

I. INTRODUCTION

Recommendation systems are available for product and services which works fine for online platform. These systems collect information from various users to guide another user for providing relevant information. These type of system are less or not available in medical system. Lots of people died due to wrong medication which appeared in news in recent past years that lead to major consequences and patients suffer. There is numerous equipment's as well as expert system is available that helps healthcare professional in diagnosis of disease and save many lives. But there is no universal medicine recommendation system which having all information of medicines, its benefits and consequences that help healthcare professional in advising medicines. Healthcare professionals are intelligent enough to recommend best of best medicine but even they don't know the all names and brands of medicine that might be better than what they recommend or available in market. So the main purpose of this work is to provide such medicine recommendation structure which takes symptoms as input and by predicting disease name, recommend medicine name. By using this structure mishappening can be controlled too much greater extent. So, this recommendation system uses data mining process for analysis of symptoms and algorithms to predict or recommend medicine. There are three ways to develop recommendation system i.e. collaborative filtering, content based filtering, and hybrid based filtering which filters

users view and rating for generating recommendations.

- **Collaborative filtering method:** In online platform this method collaborate all users rating to generate recommendation. Likewise in medicine recommendation, symptoms of patients and then recommend medicine by using Naïve Bayes algorithm for classification of symptoms.

- **Content based filtering method**: In this content of users watched history taken to recommend means the content of product or service taken to generate recommendation. Likewise, it looks deeply into symptoms and analyses them to predict correct output.

- **Hybrid filtering method:** itis combination of collaborative and content based technique and minimizes the disadvantages of above two approaches such as user behavior and content of product matter like TV shows recommendation.

Below is the figure is for medicine recommendation and shows how this system works. It takes input from professionals whom they ask to patients and by giving accurate information of health, algorithm analyses the given input and provide medicine with description.

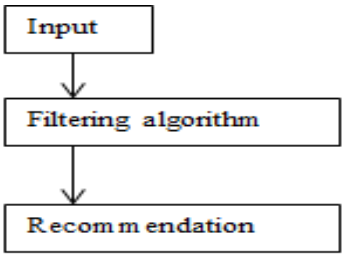

Fig 1: Recommendation System

II. DATA MINING

Data mining is tool which used for data processing, analysis and finding objective which is knowledgeable. It is used in recommendation system for preprocessing and cleansing of raw data to generate recommendations. There are numbers of algorithms present which help in performing all valuable tasks for recommendation generation like classification, clustering, association. So, the data mining process will have these steps:

1. Selection: Identify the sources of information means where to get data which may be any website or data warehouse.
2. Pre-processing: analysis of target data to find out relevance and matching statistics.
3. Transformation: extract relevant data from target data for further use.
4. Data Mining: Apply data mining algorithms, queries to determine the patterns between target data.
5. Interpretingand reporting the results: Knowledge Representation a take actions on basis of findings.

III. RULE BASED SYSTEM

Mainly, recommendation or decision support system built upon Rule Based system and utilizes the IF-THEN rule concept. In this rules are created in form of IF-THEN which means if some conditions satisfy then result will be generated. For this first rules are created having some raw figures and then these rules are analyzed, even some rules are discarded if they don't contribute in particular result then output is generated. Actually this system based upon how human thinks like if (some conditions or event occur true) then result will be desired output. These type of system is built in two ways i.e. first one is forward chaining in which output depend upon input and second one is Backward chaining in which from output to input is inferred. This system is developed by using two approaches i.e. Knowledge based approach in which all necessary data is given as input and stored in memory area; other one is data based approach which include Supervised learning and Unsupervised learning.

Supervised learning system is like someone fitted all necessary arguments & data for prediction in which output also provided .In Unsupervised learning only input are given to system and system itself learn or act according to input to predict output. Rule Based System work upon rules in which firstly rules are made to generate output, then rules are simplified or you can say some of rules are discarded which doesn't contribute in output or not necessary for system, then rules are represented for efficient outcome.

In medical diagnosis, forward chaining rule system is used in which known input like symptoms are given and then output is derived from given input.

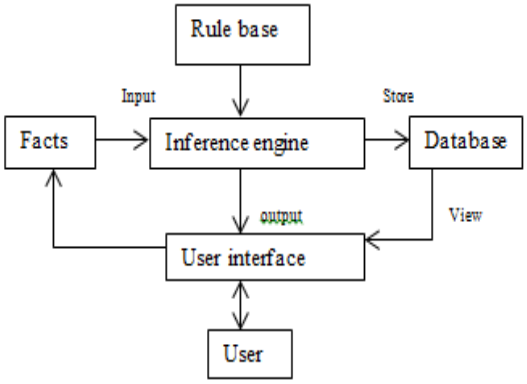

Fig.2: Rule Based System

IV. RELATED WORK

In this [1] authors give insight of categorization of rule based system on basis of their features and characterization. System is classified on basis of input and output format and association between input and output. So, system is divided into classification based, regression based and association based. Further how system should be constructed i.e. on basis of logic used which will be probabilistic based approach on probability logic, deterministic based approach on Boolean logic, and fuzzy based approach on fuzzy logic. Authors discussed Knowledge Based and Data Based approach for construction and also advised to use Data based approach due to some advantage over knowledge based. They also talked about which approach is used for rule generation and simplification that is Separate & Conquer .Prism algorithm uses Separate & Conquer as it has advantage over Decision tree algorithm but it is expensive. So, authors give another algorithm which is "Information Entropy Based Rule Generation" which minimizes the uncertainty which exists in earlier algorithm and generate rules on basis of calculation of entropy of each branch of tree. So it takes less effort as compared to Prism algorithm.

In this [2]authors proposed system for physicians to provide accurate diagnosis of patients. The SOSS architecture provide quality diagnosis to rural area where specialists present or not consist a user interface through which symptoms are entered , a diagnosis manager who diagnose the case, a telemedicine kernel which interact with system and databases where information about disease and medicine.

In this [3] authors explain and used association rule of data mining to improve the rate of prediction of heart disease Association rules having three component which is support, confidence and lift which help in making rules and evaluation of rules. There are some constraints when records get transformed to predict output. These constraints which present in association rule algorithm like input size, validation and verification of rules. So, author gave algorithm which minimizes the above constraints when records get transformed from sample data to predictive outcome of disease.

In this [4] authors propose an adaptive and learning model which depend upon rule based support system. It is a monitoring system which continuously monitors rapidly increasing data in healthcare system and provide accurate pre-processing of data, the storage of data through mobile sensing device. By using these device professionals continuously monitor health of persons like ECG, heart rate, heart beat and other health parameters. The data which accumulated through this process can be used for analytics efficiently and discover hidden patterns in health condition of patients.

In this author proposed medicine recommendation system in which internet reviews are source of input to system [5]. This system is for Diabetes II type disease in which reviews are filtered from numerous people and study done to check feasibility and detrimental effect on patients. Feedback is also used in this for better recommendation of medicine and to propose better and improved recommendation system. The main challenges for this type of system in which accurate reviews should be there, if any false reviews done then prescription generated might be wrong. For success of this system, reviews must be accurate and correct. To get correct reviews sentimental analysis done and on basis of analysis medicine will be added or removed from database after consulting doctors who are specialist of diabetes.

In this author provide insight into how big data analytics with machine learning, can help in examining health issues as well as recommending healthcare system for patients [6]. For this, electronic health records of patients from different-different locations are used for predictive system which integrated with Spark Streaming component of big data. In this authors used Hybrid Recommendation Model which is combination of

collaborative, case based and content based filletring using Bayesian network classification algorithm for diabetes disease.

Physicians undertake different-different characteristics and features to evaluate patient's health and advice or recognize disease. In this paper author proposed recommendation system for recognition of disease and treatment for the same [7]. Author used two variables which is age and BMI and categories the patients according to age. Author used list for representation of data which has three attribute: Symptoms, Name of Disease, and medicine. Pearson's correlation coefficient is used to integrate all information which gathered from patients and relationship established between them. K- Nearest Neighbor algorithm is used to filter disease by applying minimum threshold value on Pearson correlation to minimize the size of data. At last which had biggest coefficient value is chosen as neighbor corresponding to main patient.

V. PROPOSED MODEL

The main motive behind this work to develop medicine recommendation framework which support professional's knowledge and guide patients in verification of medicine. This system will be developed by using concept of rule based system in which forward chaining is used with data mining task along with machine learning algorithms.

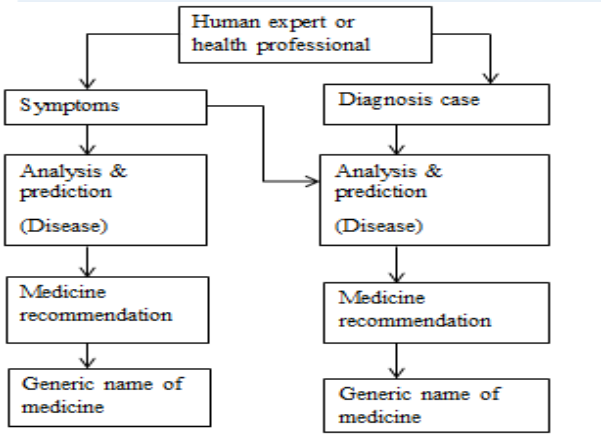

Fig. 3: Proposed Recommendation model.

Rule base system in which rules are input upon which output generated. This system helps healthcare professionals, market professionals in taking best decision from large set of information. Rule base system works upon:

- Generation of rules, in which rules are created which act as input for system.
- Simplification of rules, some of rules are discarded which are not necessary or converted into simple form.
- Rule representation, at last rules are represented in system.

Rule based approach uses classification and regression for prediction of outcome. In this Naïve Bayes classification algorithm used to categorize the symptoms and probability is calculated upon which disease will be predicted then correlation is established between disease and medicine to prescribe best medicine available.

Let's understand how this framework works:

- In this Collaborative filtering approach of recommendation system is used with Naïve Bayes algorithm:
- When symptoms of patient entered to system, it collaborate all others patients data to check for similarity in symptoms.
- Then Probabilistic model of Rule based system is applied to evaluate the probability and correlation between symptoms, diagnosed case to predict the disease then ultimately medicine will be prescribed.

Naïve Bayes Algorithm

- In Naïve Bayes first class labels are created in which any feature is considered independent of other feature; secondly, Maximum Likelihood Estimator is calculated to estimate parameter of features and decide the data distribution format.

  - Training set T which divided into two sets i.e. dependent set X=(x1, x2…., xn)
  - and class variable C=(c1, c2,……., cn).
  - Two assumptions:
    - Firstly assume no pair of features is dependent.
    - Secondly, features having some weight.
    - Probability will be calculated as:
    - P(A|B) = P(B|A).P(A)/P(B)

VI. CONCLUSION & FUTURE SCOPE

In this universal medicine recommendation system is proposed which not only provide medicine name but also its description as well as generic name of medicine which will be beneficial for patients as well as healthcare professionals. The proposed system work upon concept of rule based system and Naive Bayes classification and Support Vector Regression algorithm is used to develop recommendation system without fail. This paper presents all the work which have been done till in medicine recommendation system. In all papers author(s) applied their own new techniques of data mining and machine learning which are available to improve the existing system or gave some new ideas about how recommendation system should look or how it should work for betterment of patients and healthcare service. The main aim of recommendation system to recommend appropriate medicine without fail and optimization of service is above all. Evidence based medicine and collaborative filtering technique is mainly used in prescribing medicine to patients. But still there is scope of improvement in making effective, accurate system. Support Vector Machine algorithm gave more accurate result. But there is not complete package of recommender system in which system can generate output for number of disease. In future we can work with huge amount of data from which we can infer number of disease and then can predict medicine accordingly as big data is latest trend.

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Early Diagnose of Congestive Heart Failure based on Fuzzy Logic Techniques

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Abstract: **In recent ten years, heart failure becomes the leading cause of death in whole world which is estimated by World Health Organization (WHO). Congestive Heart Failure are expanding day by day because of way of life, genetic problem, blood pressure, cholesterol level, pulse rate etc. So the diagnose of disease plays important role for the prevention of heart related problems. Researchers received different methods to analyze it. These days the utilization of system innovation in the fields of medication zone, finding treatment of disease and patient activity has exceptionally expanded. The aim of this paper is to design a fuzzy rule based expert system for detecting the Congestive Heart failure which assists the doctors to identify disease easily. It is an intelligent decision making system because it provide more accurate result. It consider uncertainty issues like ambiguity, vagueness and imprecision. To accomplish the diagnosis process taken different risk factor, signs and symptoms from patients and experts. Fuzzy rule based consists of four parts such as knowledge base, fuzzifier, fuzzy rule, inference engine, defuzzifier. A membership function was designed and incorporated with the measured value to remove uncertainty.**

Keywords: Congestive Heart failure, Fuzzy Inference system, Membership function

I. INTRODUCTION

In today's world Fuzzy techniques are very famous in medical field also because now there is a need of experienced investigative technique in healthcare industries. Fuzzy is one of the tools which can also be used for many of disease detection such as heart disease, breast cancer and lung cancer, Glaucoma disease etc.

Heart disease explains the range of conditions that affect heart. Many of hazards factors for heart disease for example, age, sexual orientations, hypertension, smoking, family history etc. Heart disease involves various types of conditions that can influence the heart work in which types including heart strokes, heart failure, heart attacks, heart valve disease, cardiovascular disease which is leading cause of death over past few years. It affect heart's muscle, valves or rhythm, also are considered forms of heart disease. Clinical choices are frequently made of in views of specialist and experience rather than to on the knowledgeable data information covered up in database. Patients and doctors need genuine detailed information about the chance of growing heart disease.

Heart disease symptoms can be different in both men and women. For example men will probably have chest pain and ladies will probably have different side effects like shortness of breath, nausea etc. In which symbols include; Chest Pain, Chest pressure, chest discomfort. Shortness of breath.

Pain, weakness, coldness in legs and arms when blood vessels become narrow. Pain in neck, jaw, throat and back.

Risk factors of increasing heart related

Age: Increasing age may become risk of damaged and narrow arteries, which affect the muscles of heart.

Family History: Family history of heart disease may increase the risk of heart problems especially in coronary artery disease, if parent develop it in early age (before 55) for male relation such as brother and father and in early age (before 65) for female such as sister and mother.

Gender: Men are having greater risk of heart problem as compare to women.

Smoking: heart attacks are more common in smoking person as compare to non-smoking person because smoking damage the lining of arteries and carbon monoxide in tobacco smoking decreases the volume of oxygen in your blood. So heart has to pump harder to supply the oxygen need to body.

Bad diet: Mostly the heart disease deaths were related with high amount of prepared meat and sugar- sweetened refreshment and low amount of nuts. High stroke hazard was related with low diet of fruits and vegetables and high in salt.

High Blood Pressure: uncontrolled high blood pressure can bring about hardening and narrowing the vessels through which blood flows.

Diabetes: Diabetes expands danger of coronary disease. The two conditions share comparative hazard factors, for example, weight and hypertension.

High Blood Cholesterol level: Large amount of cholesterol in blood can expand the danger of development of plaques and atherosclerosis.

Stress: unrelieved stress may harm arteries and other risk factors of heart diseases.

The analysis of diseases is a essential and complex job in medication. The recognition of heart disease from diverse features or signs is a multi-layered problem that is not free from false assumptions and is frequently accompanied by impulsive effects [5]. Because of the ongoing improvements in the field of expertize, there is no enough examination tools for distinguishing the connections among the information and inside the medicinal services frameworks, there is an accessibility of vast data management tools which results nearly the medicinal data is loose, unverifiable and ambiguous.

The Fuzzy set hypothesis was presented by Prof. Lofti Zadeh in 1965, build to define unattractive data into human reasonable shape. The yielding execution of the Fuzzy logic has been utilized in a wide range of uses. The most critical preferred standpoint of the Fuzzy Expert framework exists in the certain reality that specialists can demonstrate undecided , complex framework into direct human logical kind by utilizing human experience and information as fuzzy logic as the arrangement of linguistic variables. The present paper made reference to a specialist framework by making utilization of fuzzy logic to spot Congestive Heart Failure from its approved symptoms. The precision thinking is resolved using understanding informational collection a record having 6 entirely unexpected properties. By using medicinal expert learning fuzzy rules are created. This present paper arranged learning based master framework for the detection of Congestive Heart Failure.

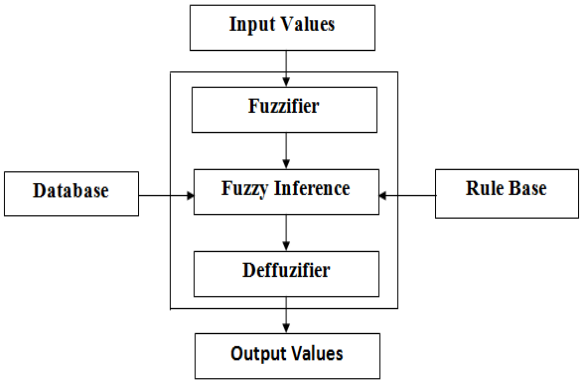

Fig 1.: Fuzzy Expert System

II. RELATED WORK

Nowadays, Fuzzy techniques are widely used in many fields and healthcare applications to solve many issues. Following intends to decompose the fuzzy technologies used by researchers in different way. Different work related with heart disease diagnoses using fuzzy methods have incited the present work. There are various work which have been done by many researcher in past years in which includes;

V.Krishnaiah et al (2015) proposed fuzziness in measured data to remove the uncertainty. They classify the patients on the behalf of attributes by using minimum distance KNN Classifier according to the parametric techniques which results to remove redundancy of data with better accuracy.

Sanjeev Kumar, Gursimranjeet Kaur Planned a specialist framework base on worldwide lab

information base. Master framework comprises of 6 information and 2 yield fields. Result acquired from planned framework was 92% right. Plan framework was tried by master specialists by which client can without much of a stretch check whether a man have coronary illness or not.

V.Krishnaiah, G.Narsimha et al Examination was passed out by utilizing fluffy and K-NN Classifier to evacuate the vulnerability which results to expel the excess of information with better precision of the framework.

Animesh Kumar Paul, Pintu Chandra shill et al Built up a programmed fluffy indicative framework which depended on hereditary calculation and Modified Dynamic Multi-Swarm molecule Swarm Optimization (MDMS-PSO) for foreseeing the hazard level of Heart Problem. At which it clarify the mix of Fuzzy rationale, GA and Modified DMS PSO can contribute more productive and versatile arrangement of restorative analysis with enhanced exactness of framework. The recreation results portrayed that FS effortlessly adjusts with any informational index and it gave better exactness for every one of the informational collections and viewed as more effective in the coronary illness forecast. FSs demonstrate a moderately higher execution when contrasted and existing frameworks and thus, portraying a more solid outcome.

Jose Antonio Sanz, Mikel Galar et al Presented the Kx administrator in the IV-FRM to give the framework component to deal with the additional data given by IVFSs .They proposed a hereditary tuning technique that all the while alters both help of upper bound of the IVFSs and the estimation of x parameter for each run the show. After that connected another approach to handle a medicinal determination issue in which patients are ordered by their classification of danger of anguish from Cardio Vascular Disease.

V.Krishnaiah, M Srivas et al Evacuate the vulnerability of unstructured information, Fuzzy K-NN Classifier implanted with representative methodology which results that interim methodology in making information as emblematic information observed to be effective in giving more precision of the framework.

Priyan Malarvizhi Kumar, S.Lokesh et al Proposed another cloud and IOT based Mobile Healthcare application for checking and diagnosing the genuine infection. They build up another structure for open by which another deliberate methodology was utilized for the diabetes and utilizing medicinal sensors for foreseeing influenced individuals. Likewise propose a Fuzzy Rule based Neural Classifier for analyze the infection. This trial was directed by Standard UCI Repository dataset.

R.Chitra, Dr. V.Seenivasagam et al Proposed another unsupervised grouping framework for heart assault expectation at beginning period by utilizing patient's therapeutic record. Right off the bat the patient's therapeutic detail was preprocessed by information mining strategies to expel the copy record and afterward qualities are ordered utilizing Fuzzy C mean classifier. To decide the danger of heart assault 13 qualities were utilized as info. From 270 patients record, effectiveness of classifier was tried which results 92% of characterization precision.

Kaan Uyar, Ahmet ilhen et al Built up a hereditary calculation based prepared repetitive fluffy neural Network (RFNN) to analyze the heart disease.252 out of 297 occasions of patient's information utilized for preparing and 45 of them chose for testing, which results 97.78% exactness from testing set. Moreover they connected root mean square mistake, likelihood, specificity and F-score for estimation to fulfill the outcome dependent on correlations.

III. PROPOSED SYSTEM

In this part, it explains a fuzzy Inference system with capabilities for medical specialty diagnosing is proposed. This system can be a framework that is specialized towards the diagnosis of Congestive Heart Failure with Fuzzy Inference System. For this reason the system specifies all the input parameters involved in Heart Failure. The fuzzy system allows classifying every membership function of input parameters of all patients by means of their problem as symptoms.

Fuzzy expert framework allows a simple technique for planning a right arrangement with assistance from an uncertain area. The given fuzzy set comparing to membership function characterizes the info credit to its right participation and it should in a range of (0, 1).

$$f(x;a,b,c,d) = \begin{cases} 0 & x < a \\ \frac{x-a}{b-a} & a \le x \le b \\ 1 & b \le x \le c \\ \frac{d-x}{d-c} & c \le x \le d \\ 0 & d \le x \end{cases}$$

IV. FUZZY WORKING OF INPUT, OUTPUT AND MEMBERSHIP FUNCTIONS

Fuzzy rules are use to convert input variables (Crisp values) into fuzzy variables for the prediction of the problem. Fuzzy IF-ELSE rules are made for INPUT and OUTPUT variables. In this paper the decision making system is performed on MATLAB 2013a software. This projected system is employed to predict Heart Disease. The framework comprises of 5 input variables and 1 output variable taken all through conclusion of Congestive Heart Failure. The amount of input variables changes in Blood pressure, Cholesterol level, Blood sugar, old peak, Chest pain. Each input variables is related to two or three membership functions with ranges 0 to 10 and rules are generated in Mamdani Inference System.

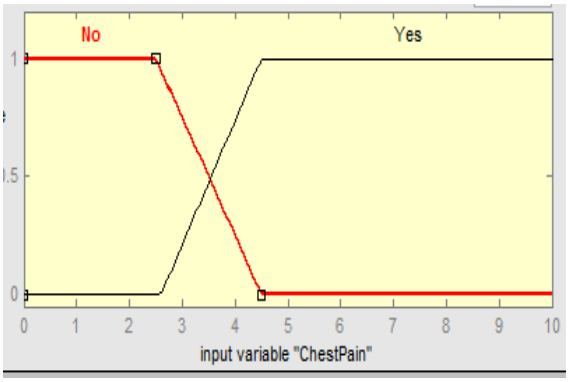

Fig. 2: Membership Plot for Chest Pain

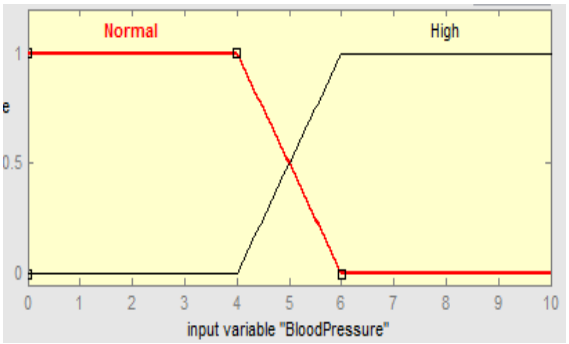

Fig.3: Membership Plot for Blood Pressure

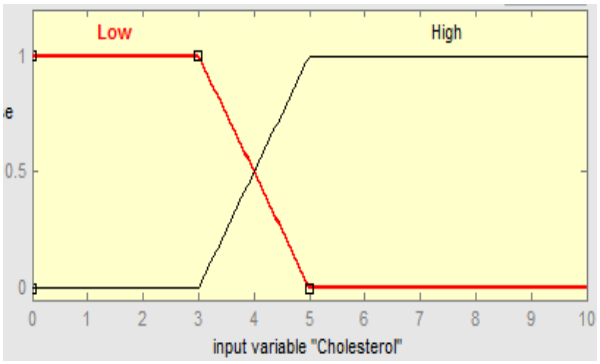

Fig. 4: membership Plot for Cholesterol level

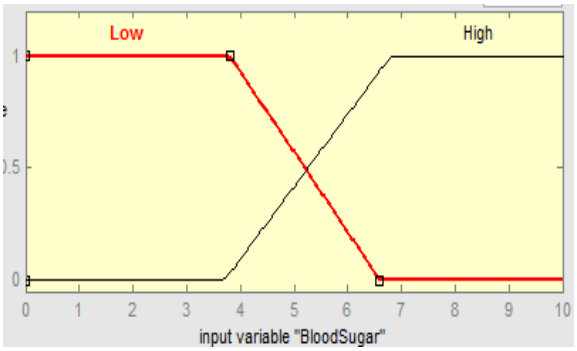

Fig. 5: Membership Plot for Blood Sugar

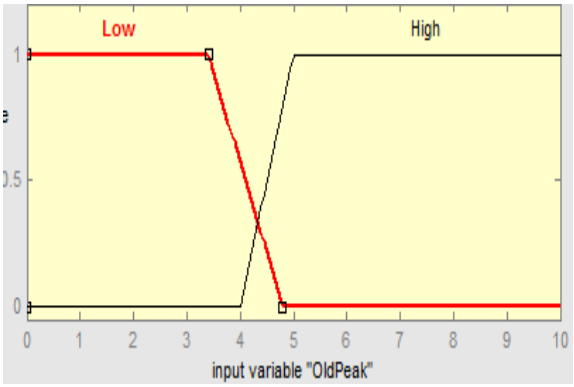

Fig. 6: Membership Plot for Old Peak

Fig. 2 present the membership function of Chest Pain which are made up of two membership plot for No and Yes with occur membership parameters values[2.7 4.6 10 10] and not occur membership parameter values [0 0 2.5 4.5]. Fig. 3 present the membership Plot for Blood Pressure which are made up of two membership plots Normal and High with occur membership parameter values [4.1 6.1 10 10] and not occur parameter values[0 0 4 6]. Fig 4 present the membership plot for Cholesterol level which are made up of two membership plots Low and High with occur membership parameter values [3.1 5.1 10 10] and not occur membership parameter values [0 0 3 5].Fig 5 present the membership plot for Blood Sugar which are made up of two membership plots Low and High with

occur membership parameter values [3.7 6.6 10 10] and not occur membership parameter values [0 0 3.8 6.7]. Fig 6 present the membership plot for Old Peak parameter values [4.1 5.1 10 10]

The output is the presence of Chance of Heart disease ranges from 0 to 10. If the Off chance values increases, then it expands the chances of heart illness also. The membership parameter values for output variables in which the chances of heart disease occur are ranges between [3 5 10 10]

The Defuzzification plays out the turnaround of fuzzification technique. The Defuzzification changes over the fuzzy output got from inference framework into the crisp variables. Fig. 8 shows the rule viewer of the anticipated framework. It shows the aftereffects of the whole anticipated framework. From the left side at the most elevated we tend to get defuzzified values, we have the tendency get chance of heart disease=6.29 which involve the patient have more chances of heart disease.

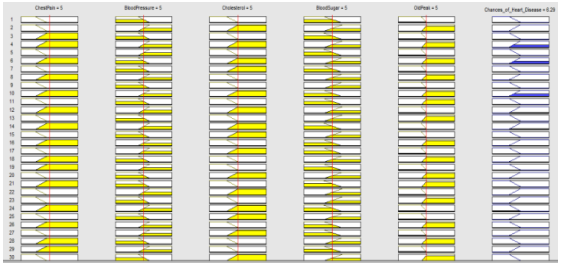

Fig. 7: Rule Viewer

V. CONCLUSION

Fuzzy Inference system is use to diagnose the Congestive Heart Failure in which initially crisp values are converted into fuzzy values which is the stage of Fuzzification. Defuzzification process is conducted the result into crisp values for Congestive Heart Disease status. This process results much better to handle the uncertainty during analysis process. The system can be increased by increasing the number of input attributes. It can likewise be stretched out that framework to have an information which might be utilized for sometime later and references and furthermore to store patient's information. We can plan to design and develop an efficient Congestive Heart Failure system by using significant pattern and artificial intelligence techniques.

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Enhancement in Education System through Cloud Computing

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Abstract: Education plays an important role in maintaining the economic growth of a country. Nowadays the classroom teaching is altering and students are fetching extra technology oriented and Therefore in his varying environment, it's significant that we believe about the newest technologies to incorporate into the teaching and education procedure. The newest technology established currently is Cloud Computing. By sharing IT services in the cloud, an educational institution can outsource noncore services and better concentrate on offering students, teachers, faculty, and staff the essential tools to help them succeed. This paper focuses on the impact of cloud computing on the education system and how we can provide the quality education by using the above technology. In this article throw illumination on the essential preface of Cloud Computing and how cloud computing can be initiated in the education to developed teaching and learning methodology which can bring a revolution in the area of learning.

Keywords—Cloud ,Education, Information, Infrastructure, Services

I. INTRODUCTION

Through the previously two decades the development of distributed computing has distorted the functioning of systematic and profitable purposes [2]. This report has grows numerous newer functions. The current growth of distributed computing is Cloud computing. In additional terms Cloud computing ways storing and access data and agenda over the Internet instead of computer's hard drive. In other terms cloud computing provides shared resources, software and information through Internet as a PAYGO (Pay-as-you-go) basis. Cloud computing can be a received optioned in the universities and educational institutes for studies. The betterment of choice and flexibility to the IT departments by building adaptable computational infrastructure once and then uses it for several purposes for several times[1].

Teaching is now not just limited to classroom with students. Today's Education is greatly reliant on Information technology. The indict of IT technology is changing and which puts more additional financial burden on institute. Continuous upgrading hardware and software is difficult and also it leads high cost to maintain them [3]. Cloud Computing provides the solution for this problem. The aids of cloud computing the user uses the platform and purposes on-campus or off-campus or grouping of together depending on the institutions required. It proposes the services at the least cost to users like student, faculties who can attain it everyplace any era.

II. CLOUD COMPUTING

Cloud Computing is a creative innovation that is reforming the way we do processing. The key idea of cloud registering is that you don't purchase the equipment, or even the product, you require any longer, rather you lease some computational power, stockpiling, databases, and some other asset you require by a supplier as indicated by a compensation as-you-go demonstrate, making your venture littler and arranged to activities as opposed to resources procurement. In any case, there is significantly more than that; obviously, and there are a wide range of ways how this approach can be placed in action [1].

NIST (US National Institute of Standards and Technology) characterizes cloud figuring as: " a model for empowering pervasive, advantageous, on-request arrange access to a common pool of configurable processing assets (e.g., systems, servers, stockpiling, applications, and administrations) that can be quickly provisioned and discharged with negligible administration exertion or specialist organization interaction"[15].

Cloud Computing gives us implies by which we can get to the applications as utilities over the web. It enables us to make, design, and tweak the business applications on the web. Cloud Computing refers [10] to controlling, designing, and getting to the equipment and programming assets remotely. It offers online information stockpiling, foundation, and application. Cloud figuring offers stage independency, as the product is not required to be installed locally on the PC. Hence, the Cloud

Computing is making our business applications mobile and collaborative.
iCloud,Microsoft'sSkyDrive, Humyo, ZumoDrive. Cloud processing administrations are classified into three unique levels:

1. Software as a Service (SaaS):
These sorts of use are for the most part intended for end-clients, conveyed over the web. SaaS works such a great amount of better for understudies since it gives access to applications whenever, anyplace, for gadgets like PC, PDA, tablet, or another web-empowered gadget. Including more clients or scaling the product to more classrooms or grounds is turns out to be simple assignment with SaaS. For instance, a school can scale its SaaS [1] arrangement from 50 understudies to 5,000 of every a matter of hours – unbelievable in the traditional IT situation.

2. Platform as a Service (PaaS):
PaaS [1] is the gathering of improvement devices and administrations which is utilized for coding and sending the applications snappy and proficient. With PaaS, Students, instructors or different academicians can grow new applications or administrations in the cloud which is stage autonomous, and furthermore, make them broadly accessible to clients through the Internet. It likewise gives administrations to testing, conveying, teaming up on, facilitating, and looking after applications [15].

3. Infrastructure as a Service (IaaS):
IaaS [1] is the blend of equipment and programming that forces everything – servers, stockpiling, systems, working frameworks. These are otherwise called on request server farms which give figure power, memory, and capacity, ordinarily estimated every hour as indicated by asset utilization. It can be utilized to fulfill the framework needs of understudies, staff or some other academia's.

Cloud figuring refers [10] to the utilization of the system of remote servers that are facilitated over the Internet, and there are numerous cloud arrangement and administration models. A standout amongst the most one of a kind attributes of cloud figuring is that the administrations from information stockpiling to a production of programming applications can be benefited on pay-per-utilize premise.

III. CURRENT SCENARIO OF EDUCATION SYSTEM

Educational framework [4] is constantly in view of the imprints, evaluations, and figures. Be that as it may, in actuality, the commonsense information, intelligent reasoning, and some training are required to stay in the rivalry. In addition, viable learning has incredible hugeness to be in rivalry these days consequently to confer the functional information Institute needs to construct most recent arranged Laboratory which brought about the most noteworthy cost in equipment setup and because of innovative outdated nature, it will get to be repeating taken a toll for the foundation. Henceforth there is have to discover doable arrangement and the arrangement is Cloud Computing administrations [5]. To defeat from such sort of issue the Institute can buy in an admin
istration from any cloud specialist co-op on the bases of pay as you go. Another factor is that Institutes vigorously rely on content administration framework as indicated by that Institute can likewise procure an administration to store the substance on the cloud and any understudy or staff or any scholarly worlds can utilize that from anyplace and whenever and on any device [9].

IV. IMPLEMENTATION OF CLOUD COMPUTING IN EDUCATION SECTOR

The below figures are shown how the educational institute is using various services of Education cloud in departing quality education

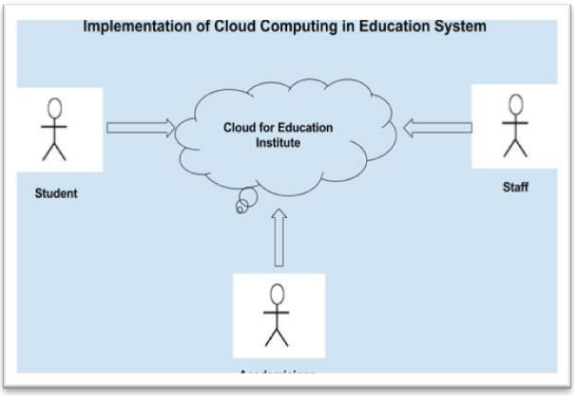

Figure 1 Education Cloud for Different User

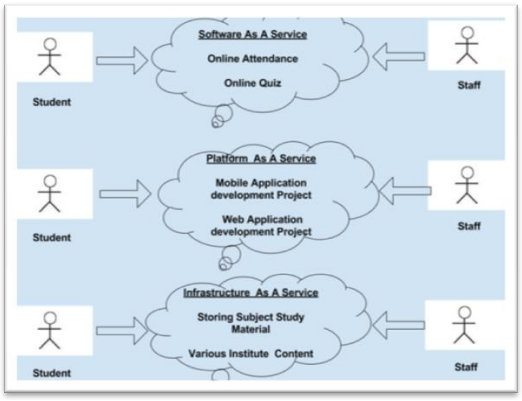

Figure 2 Various Services of Education Cloud

The potential clients of Education cloud are understudies, staff or academicians. Every client has their own qualifications to get to the particular cloud administrations. Embracing SAAS of Education cloud, showing staff can keep up the participation, lead online test and numerous more with the particular programming bundles .Adopting PAAS Institute can sort out viable sessions as and when required from Education Cloud. For e.g., creating ventures like portable applications, web applications, and so forth. Receiving IAAS Staff can transfer their examination materials or any related substance on Education cloud and understudy can get to these materials and substance 24*7*365 [6].

Benefits of cloud computing for institutions and students

The improvement of instructive cloud, new web applications, for example, Lecture Tools, Slide share and so forth enables the teacher to complete their work in their internet browsers rather putting away and conveying it on the hard drive. Its gives the advantages, for example,

• Personalized Learning: Cloud registering manages open doors for more prominent understudy decision in learning. Utilizing an Internet-associated gadget, understudies can get to a wide cluster of assets and programming apparatuses that suit their learning styles and premiums [5].

• Reduced Costs: Cloud-based administrations can enable foundations to diminish costs and quicken the utilization of new advancements to meet developing instructive needs. Understudies can utilize office applications for nothing without purchasing, introduce and stay up with the latest on their PCs. It likewise gives the office of Pay per use for some applications [6]. Accessibility: Availability of the administrations is the most critical and wanted by the client utilizing the training cloud.24 X7 is the accessibility that is required by this framework without disappointment. From anyplace one can login and get to the information [5-6].

• No extra Infrastructure: Colleges and governments are currently allowed to center around their objectives that is making more research offices accessible to the understudies and making nature worldwide in show disdain toward sitting around idly on agonizing over the structures, labs, educators etc. [1].

• Go Green: Education cloud will clearly diminish the carbon footprint [7].

• User Friendly: This new office is easy to understand and no compelling reason to stress over the multifaceted nature. It is straightforward and simple to operate [8].

V. CONCLUSION

Cloud processing is a happens innovation later on of the years which offers a scope of reward to the training level for the understudies, resources for all.Disregarding these limitations cloud processing presents unfailing administrations to understudies and resources with the goal that showing learning philosophy transform into helpful and subjective. Also the got cloud administrations from Education cloud Institute can lessen their use in keeping up their research facility.

The key aspired of this article is to draw attention to the achievement of cloud computing in education will form a ‘revolution’ in the habitual education scheme.

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Analysis of Weighted Visibility Graphs in Evaluation of Austim Spectrum Disorder and Epilepsy Relationship

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Abstract—Preliminary evidence have documented the applications of weighted Visibility Graphs (VGs) across various disciplines. Its application in neuroscience field is in its initial stages and has been extended to the automatic detection of epilepsy and Autism Spectrum Disorder (ASD). However, the studies relating epilepsy and ASD are insignificant in number. The motive of the present work is to explore the relationship between ASD and epilepsy by transforming the single channel Electroencephalogram (EEG) signals into weighted VGs. The characteristics of the obtained network are extracted using the six complex network features (such as assortativity, modularity, average weighted graph, hierarchical complexity, graph index complexity, entropy). The combined effect of these features has been evaluated using Support Vector Machine (SVM) and K-Nearest Neighbor (KNN) machine learning classifiers. The experimental results reveal the relation between ASD and epilepsy through the combined effect of HC-, assortativity, entropy-modularity, entropy-GIC with an accuracy of 99.2%. The other factor such as AWG has the potential to distinguish ASD and epilepsy with an accuracy of 99.2%. In sum, the present findings suggest that ASD and epilepsy share a common underlying mechanism and are closely related. This relationship can further lead to improved clinical diagnosis and intervention.

Keywords— autism spectrum disorder, epilepsy, visibility graph, weighted, relation

I. INTRODUCTION

The most prevailing brain and developmental disorders that affect the individuals' thought process, perception, behavior and daily routine include: epilepsy, schizophrenia, Autism Spectrum Disorder (ASD), intellectual disability and depression [1]. Despite the continuous research in providing efficient, computer-aided, less subjective and automatic methods [2], the doctors still rely on subjective methodologies such as questionnaires or interviews and visually inspect the brain signals such as Electroencephalogram (EEG) signals for detecting disorders. This dependency on the traditional beliefs misdiagnoses other co-occurring disorders and lead to unawareness among people. Moreover, the co-occurrence of these disorders further poses the problem and eventually leads to poor diagnosis. For example, the occurrence of ASD in epilepsy has much higher possibility than other disorders like intellectual disability. The statistics and meta-analysis studies reported that the rate of co-occurrence of ASD and epilepsy is nearly 30% among the individuals and epileptiform discharge rate is 60% in case of absence of epilepsy [3, 4]. This suggests that ASD and epilepsy are the co-morbid conditions which reveals that certain underlying neurobiological mechanisms are common between these disorders. The individuals who are suffering from frequent and early age seizures have maximum chances of being affected with ASD [5, 6]. The age at which epilepsy can be expected in ASD is around infancy and puberty, and in the majority it affects around puberty [7, 8]. The studies in different domains have provided different phenomenon leading to the disorder bidirectional relationship. Some of the findings are:

(i) Various animal models (especially rodents or mice) have been used to genetically understand the ASD and the epilepsy phenotype [9].

(ii) Variations in the genetics and neuropathological mechanisms such as hyper-excitation in minicolumn circuits, abnormalities in the GABA neuro-

transmission and EEG (temporal lobe) define the symptoms observed in seizures as well as ASD [10].

(iii) Multiple studies have provided an evidence of genetic and metabolic disorders, vitamin (coblamin and folate) and mineral deficiencies and immunity dysregulations [10]. These atypicalities lead to decreased inhibitory or increased excitatory brain balance.

(iv) Anxiety, sleep problems [7] and environmental factors such as air pollution and exposure to other chemicals [11].

(v) Questionnaire based studies [12] and regression of language and behavior in ASD and epilepsy [13].

(vi) The studies after statistical analysis have reported lower IQ level, age, gender, and various co-morbidities as the common mechanisms shared by ASD and epilepsy [14].

The symptoms of both the disorders overlap and individuals with seizures show impairments which are also found in ASD, such as cognitive delay, aggression, repetitive and irritable behavior which further delays the diagnostic process. Also, due to the communication deficits and behavioral abnormalities, the symptoms of seizures remain unrecognized and undiagnosed in ASD. Moreover, the inter-ictal epileptiform discharges leads to the uncertainty that whether it is due to ASD or brain dysfunctionalities. Therefore, it is not clear whether ASD is primary and epilepsy is secondary condition or epilepsy is primary and ASD is secondary. Thus, making it difficult to differentiate individuals with seizures and ASD at an early age and they remain poorly understood. Although the literature fails in providing convincing evidence that can exactly associate ASD and epilepsy and can provide the distinguishing biomarkers, yet it points to the possibility that a common mechanism is shared by the disorders.

There is a plethora of methodologies to detect these disorders individually ranging from linear approaches such as time-frequency analysis for extracting power spectral density, correlation, variance and other features to non-linear approaches that includes: fractal dimension, Lyapunov exponent and time-domain analysis (graph theory, Visibility Graphs (VG). In recent literature, the non-linear methods have gained major interest and provided more accurate diagnosis (see Table 1) and the analysis of EEG like non-stationary signals have been proven better in time-domain in comparison to other methods [15]. Although, the use of VGs and weighted VGs in detecting ASD and epilepsy is in its initial phase, yet it has diagnosed ASD with an accuracy of 93.75% [16, 17] and even reported the variations in different neuro-developmental disorders [18].

TABLE 1:SURVEY OF NON-LINEAR ANALYSIS OF NEURO-DEVELOPMENTAL DISORDERS.

Dataset	Parameter Measured	Classifier	Finding
EEG; Own Dataset	Higuchi's Fractal & Katz's Fractal Dimension	Radial Basis	Katz's fractal dimension investigated significant differences in delta and gamma band and diagnosed ASD with an accuracy of 90% [19].
MEG, EEG Public Dataset	Average Strength, Clustering Coefficient, Assortativity, Efficiency of Graphs	SVM	Discriminated ASD from controls with 93.75% accuracy. Interdependence strength within & between bilateral frontal & temporal sensors is quite less [20].
EEG; Own Dataset	Multi-scale Entropy	Statistical Analysis	Reported atypicalities in the neural integrative capacity and information processing in ASD [21].
EEG; Own Dataset	Graph index & Off-diagonal Complexity of VG	Statistical Analysis	Graph index complexity of gamma band discriminated ASD from non-ASD children [16].
EEG; Own Dataset	Fractal Dimension by using improved PSVG	EPNN	Reported alterations in gamma, beta, and alpha bands of ASD individuals with 95.5% accuracy [17].
fMRI; Public Dataset	Interlayer Mutual Information, degree distribution of VG	Kolmogorov-Smirnov Statistic	Reported variations in the brain activity of several disorders such as schizophrenia, ADHD and bipolar disorder [18].
EEG; Own Dataset	Degree Distribution in Difference VG, Degree Entropy	SVM	Better approach for detecting seizures in comparison to other existing methods. It can be extended for improving seizure detection in individuals with ID [22].

(ADHD:Attention-deficit Hyperactivity Disorder; DT:Decision Tree; EEG:Electroencephalogram; EPNN:Enhanced Probabilistic Neural Network; fMRI:functional Magnetic Resonance Imaging; ID:Intellectually Disable; NB:Naïve Bayes; KNN: K-Nearest Neighbor; PSVG:Power of Scale-freeness of VG)

Apart from this, the advantages of VGs are [18]: (i)efficient in extracting out information from noisy

signals without posing any restriction or hypothetical assumption (ii)deals with non-stationary, uni-variate and multivariate time-series (iii)better understanding of interdependent activities in the brain signals. The term 'weighted' in VG represents the strength of the edges between the connected nodes [22, 23].

This weight can help in detecting the sudden fluctuations of EEG signals that can eventually help in discriminating the potentially weak and insignificant connections of the nodes. Thus, both the natural as well as weighted VGs have provided an efficient methodology in finding the underlying brain complexities and discriminating different EEG signals. The weighted VGs concept has been implied in detecting seizures by computing modularity, Average Weighted Degree (AWG) and entropy. These features have explained the clusters or groups of the connected nodes but fails to explain the hierarchical structure of brain topology. The hierarchy of connected nodes is an important parameter to understand brain complexity and topology with more ease [24]. The novelty of the present work is to introduce hierarchical complexity as one of the features for evaluating weighted VGs of EEG signal. The present paper has implemented the weighted concept provided in [15].

The motive of the present paper is to provide representative and promising characteristics that can investigate the relationship between ASD and epilepsy as well as can explore the hidden information from the brain EEG. In order to diagnose the brain abnormalities at early age, provide timely interventions and improve individuals' quality of life, there is a need to identify ASD in children with epilepsy and vice-versa. The present work has analyzed EEG signals of ASD and epilepsy affected individuals using the weighted VGs and complex network parameters set. The different features extracted are:assortativity, entropy, Graph Index Complexity (GIC), modularity, AWG, hierarchical complexity. These features have been fed to classifiers: Support Vector Machine (SVM) and K-Nearest Neighbour (KNN) to find the more accurate set of parameters for defining ASD and epilepsy relationship. To the best of our knowledge, the use of weighted VGs and computing hierarchical complexity is a new concept in detecting epilepsy and ASD.

II. Methodology and Data Collection

A. Methodology

The methodology of the present work has been provided in the form of a block diagram (see Fig. 1). The proposed approach includes conversion of pre-processed EEG signals to weighted VGs, extracting different complexity based features and then classifying the signals for comparing the Epilepsy and ASD subjects.

B. Data Base

The recruited participants: 20 ASD with epilepsy (15 male, 5 female) and 20 non-ASD epilepsy affected (16 male, 4 female) have already received their diagnosis, based on the international criteria, from the experienced professionals. The age of the participants lie in the range 3-10 years. The EEG data of the patients have been collected from the Apollo Hospital, Ludhiana using EEG-1200 (Neurofax, Nihon Kohden, Tokyo, Japan).

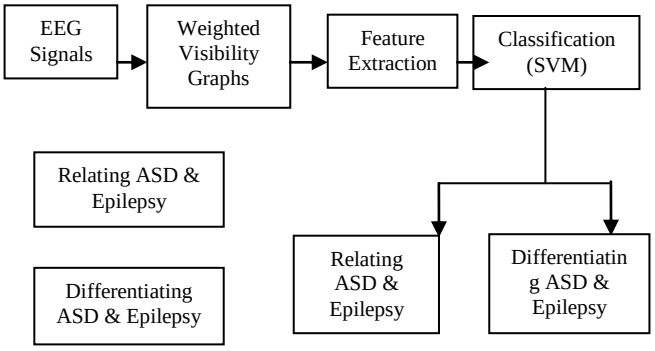


Fig. 1. Block Diagram of the Proposed Work.

The signals were recorded using 22 electrodes (Ag/AgCl), following 10-20 international system, with impedance lower than 10KΩ and 128Hz sampling rate. The obtained data was pre-processed that includes: artifact detection, visual inspection, notch filtering at 50Hz. The single channel signals were obtained in Ictal (during seizure) and Interictal stages for both ASD and epilepsy affected individuals.

III. Feature Analysis Parameters

The different parameters that can be utilized for the network analysis are:

1. *Assortativity*: It provides the measure of correlation between the linked nodes. Its value lies in the range [-1 1], such that high values indicate perfect asssortative patterns between higher degree nodes

and low values indicate non-assortative. It is given by equation, adopted from [25]:

$$\rho = \frac{\sum_{x,y} xy(e_{xy} - v_x v_y)}{\sigma_v} \quad (1)$$

where ex,y is the joint probability of excess degree x and y, vy represents the normalized distribution and σ_v is standard deviation of v_y.

2. *Entropy*: The entropy of any node (say x) of a weighted graph can be computed using equation [23]:

$$E = -\sum_{y=1}^{n} p(x,y)\log(p(x,y)) \quad (2)$$

where $p(x,y) = w(x,y)/(\sum_{z=1}^{n} w(x,z)$ such that w(x,y) represents the weight of connected nodes(x,y).

3. *Graph Index Complexity*: It measures the heterogeneity of the edge distribution [26]. It lies in the range [0 1], with higher values depicting the complexity of the graph. For any VG, with adjacency matrix (ax,y), GIC is given by [26]:

$$GIC_{\lambda_{\max}} = 4g(1-g) \quad (3)$$

where $\lambda_{\max}$ is the eigen-value of (ax,y), and

$$g = \frac{\lambda_{\max} - 2\cos(\pi/(q+1))}{q-1-2\cos(\pi/(q+1))}. \quad (4)$$

4. *Modularity*: This parameter measures the partition strength of a network into different modules or clusters [27, 15]. Its value lies in the range [-1 1] such that the high modularity values indicate that connections between the nodes of same communities are very close but scattered between nodes of different communities and vice-versa. It is given by the equation, adopted from [28]:

$$Q = \frac{1}{2m}\sum_{x,y}\left(A_{x,y} - \frac{k_x k_y}{2m}\right)\delta(n_x, n_y) \quad (5)$$

where m is the total number of edges, Ax,y represents the edge weights, nx and ny is the cluster name of node x and y, $\delta(n_x, n_y)$ has value 1 if node x and y represents same cluster and 0, otherwise.

5. *Average Weighted Degree*: It is the average of the sum of the weights of all the edges that are attached to other nodes in the entire network. The equation used to compute the weighted degree is given as, adopted from [29]:

$$WD_x = \sum_{y \in N(x)} w_{x,y} \quad (6)$$

where wx,y represents the weight b/w node x and y and N(x)is the relative neighborhood of node x.

6. *Hierarchical Complexity*: The hierarchical complexity in a network is determined by nodal degree such that very dense nodes exist on the high levels and sparse nodes exist on low levels. It is given by the equation, adopted from [24]:

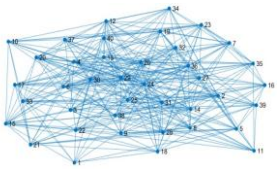
$$R = \frac{1}{d}\sum_{d_l \neq l} \frac{1}{l(r_l - 1)}\left(\sum_{y=1}^{l}\left(\sum_{x \in d_l}(s_{lx}(y) - \gamma_{ly})^2\right)\right) \quad (7)$$

where d is the number of different degrees, $s_{lx}(y)$ is the yth element of xth length sequence (l), rl represents the total number of nodes with degree l, γ_{ly} is the mean value. This complexity is for irregular and unpredictable signals such as brain signals or other real world phenomenon, but has no meaning for regular, random or repetitive patterns [30].

These features are the fed to the SVM and KNN classifier to provide the features that can distinguish as well as can relate epilepsy and ASD. It has been found that the combination of these complex features can yield better accuracy in comparison to individual parameters [15]. In the present paper, the performance of the classifier has been evaluated using the different efficient combination of the features.

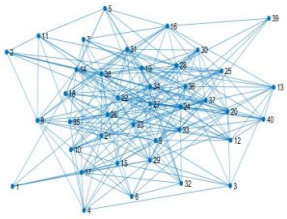
VI. RESULTS AND DISCUSSION

The VGs of EEG signals of ASD and epileptic individuals has been shown in Figure 2. The figure has clearly reflected that Interictal stage EEG is less complex than and Ictal stage for both epilepsy (see Fig.2:a,b) and ASD (see Fig.2:c,d). The complexity of ASD-Ictal VG is more in comparison to epilepsy that indicates more connected network in ASD. In order to find the significant differences in the brain complexities, the extracted feature set has been statistically analyzed using paired-sample t-test (see Table 2). The tabular data have shown the mean differences of features of EEG signals of both the groups (ASD, Epilepsy) in the Ictal and Interictal stage. The assortativity decreases in Interictal stage and interestingly, the positive difference in the assortativity reflect a segregation of the brain network into the groups that are sparsely interconnected.

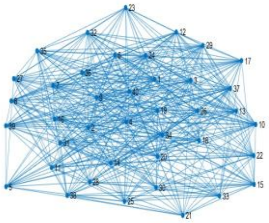


(a)

(b)



(c)



(d)

Figure2: (a)Epilepsy-Interictal (b)Epilepsy-Ictal(c)ASDInterictal (d)ASD-Ictal.

The modularity decreases in Ictal stage and AWG has significantly increased in Ictal stage for both the groups.The HC and assortativity are higher in Ictal stage for both the groups than Interictal stage.

Table2: Paired t-test on Feature Set.

Features	Ictal Stage- Interictal Stage		Group
	Mean	t-test	
Assortativity	0.61944	t(499)=-4.197, p=0.0001	ASD
Entropy	-0.13662	t(499)=0.981, p=0.333	
GIC	0.00375	t(499)=-8.299, p=0.0001	
Modularity	-0.15529	t(499)=12.227, p=0.0001	
AWG	225.4491	t(499)=-14.230, p=0.0001	
HC	0.29112	t(499)=-6.405, p=0.0001	
Assortativity	0.34660	t(499)=-2.926, p=0.006	Epilepsy
Entropy	-0.13239	t(499)=1.096, p=0.2820	
GIC	0.00518	t(499)=-14.026, p=0.0001	
Modularity	-0.15261	t(499)=12.864, p=0.0001	
AWG	141.41	t(499)=-8.332, p=0.0001	
HC	0.2707	t(499)=-7.984, p=0.0001	

The Box plots (see Figure 3-a,b,c,d,e,f) have further depicted the differences in the features of both the groups and have shown the mean values and range upto which parameters can show variations. This statistical analysis has provided the comparison of all the features in both the stages.

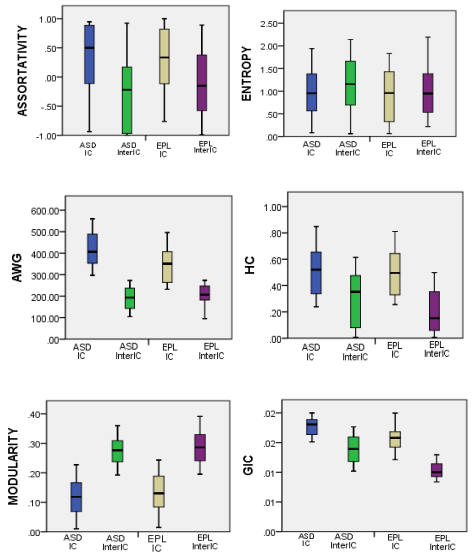


Figure 3: Box Plots of Complex Feature Set.

After statistically analyzing the individual features, the combination of the features were fed to SVM and KNN classifiers. On comparing the performance of both the classifiers, it has been found that SVM has better accuracy relative to KNN (see table 3) for all the cases.

Table 3: Comparison of Classification Accuracy

Combined Feature	SVM	KNN
Interictal	98.4	98.5
Ictal	98.7	97.2
Interictal+Ictal	99.2	97.8

The accuracy for individual stages (Ictal, Interictal) and for combined stage has been computed. The scatter plots of the combined features, some of which are shown in Fig.4, have distinguished as well as related both the disorders. The entropy Vs modularity and entropy Vs GIC plots have shown that ASD and Epilepsy patients show significant differences to each other, in both stages and possess similar patterns. The decrease in modularity values clealry explains the fact that it is difficult to form the clusters in highly noisy and chaotic signal (Ictal stage). The entropy remains same for both the groups and the low values of entropy suggests that these individuals' brain signals do not possess any order. The reduction in entropy in Ictal stage indicates that EEG of both the groups has become more ordered. The HC and assortativity is different for both the groups, in both stages, indicating that ASD with epilepsy show more complexity in comparison to epileptic individuals. But, the increase

in value of HC is favoring the finding that signals have become more ordered in Ictal stage.

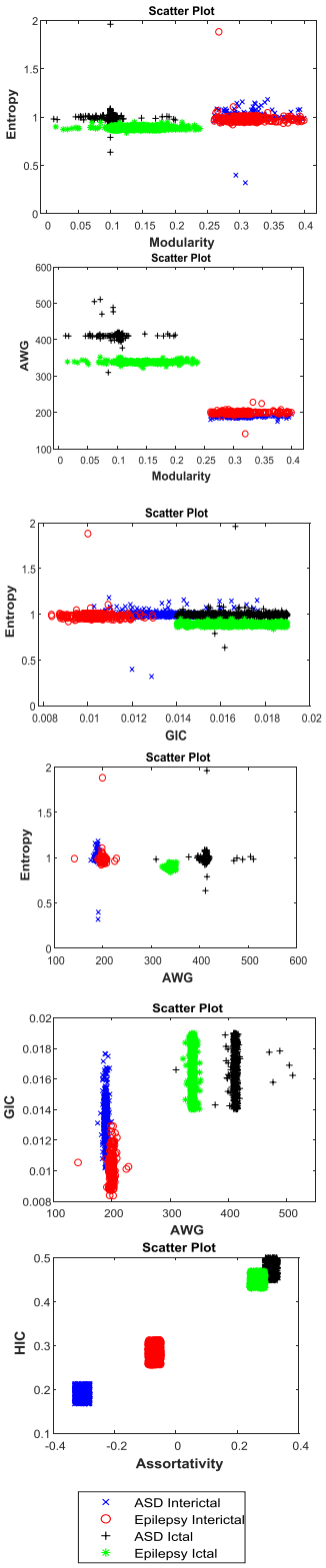


Figure 4: Scatter Plots illustrating Classification Accuracy of ASD and Epilepsy for Ictal and Interictal stages (a)EntropyVsModularity (b)AWGVsModularity (c) EntropyVsGIC (d)EntropyVsAWG (d)GIC VsAWG (e)HICVsAssortativity.

The complexity of ASD individuals is more ordered and possess a hierarchy in comparison to epilepsy. The increase in value of assortativity suggests that signals become more correlated in Ictal stage in both groups in Ictal stage, which also favors one othe previous findings that assortatvity increases during seizure [31]. The AWG Vs GIC and AWG Vs entropy plot shows that AWG is different for both the groups in Ictal stage. Thus, AWG has the tendency to distinguish epileptic and ASD individuals. In sum, all the features are pointing that ASD and epilepsy are related to each other through brain functionality and topology. The classification accuracy attained using SVM and KNN has been shown in tabular form in Table 3.

VII. Conclusion

The present paper has investigated the relation between ASD and epilepsy using weighted VGs. The six different complex network parameters have been analyzed statistically as well as classified using SVM and KNN machine learning classifiers. The classifier has related ASD and epilepsy with 99.2% accuracy on the basis of entropy, modularity, HIC and assortativity and distinguished them through AWG. The set of these complex features related ASD an epilepsy with respect to brain functionality and topology in Ictal and Interictal stage. The findings of the present work suggest that ASD and epilepsy are related to each other and there is a need to explore this relationship with more such metrics and modalities. If the relation of epilepsy and autism will be known in advance, many risk factors can be prevented before occurrence and disorder can be managed properly. In addition, the methodologies similar to present paper can help technicians and clinicians in detecting disorder in more detailed and accurate way. Together with the individual findings in ASD and epilepsy brain signals, the present paper's findings may help to gain insights into the complicated relationship of ASD and epilepsy.

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The Issues and Proposed Solution behind the Automatic Friend Suggestions Feature

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Abstract: Social Networking Sites (SNS) helps people make contacts that would be good for them to know, but that they would be unlikely to have met otherwise. Facebook is the most admired free SNS which is making people throughout the world come close using its feature People You May Know. But the business policy of Facebook of connecting pinnacle of people is literally hindering the privacy of its users. In this paper we are going to take the case study of facebook and examine the troubles faced by users due to the People You May Know friend suggestion feature . We are going to propose a solution to the problem using the notion of discrete mathematics and data structures using C-language.

Keywords: SNS – Social Networking Sites, DFS – Depth First Search, Adjacency Matrix , Path Matrix, Facebook, People You May Know

I. INTRODUCTION

"Facebook", the largest social network ever analyzed [2], has one trade motive of connecting more and more people across the globe. As of the second quarter of 2018, Facebook had 2.23 billion monthly active users [3]. With users in billions, Facebook is striving to link these people on a large scale using many attributes. One such feature and our centre of discussion in this paper is "People You May Know" which the Facebook has been using since 2008 [4].

II. CASE STUDY

People You May Know: People you may know is a Facebook tool which surfaces profiles of other users which Facebook thinks we may have a connection with, so that we can add the other profile into our network. According to Facebook, these suggestions come from some pretty common and surface level data like:

- Mutual Friends (having friends in common)
- Members of same Facebook group
- Members tagged in the posts
- Members having same organisational data e.g. same school, university or work place
- Contacts uploaded (like contacts synced from mobile phones or other accounts)

Now there are many evidences (mentioned below) which show that above is not the only criteria followed by Facebook to show suggestions in People You May Know section. Facebook says that the help centre content is accurate and reflects the most common types of information that inform suggestions [5], which shows that there are some less common types of data which comes into play. This creates the confusion and disturbance in the privacy of billions of Facebook users.

Following are few case studies of the problem created by People You May Know feature of Facebook:

- A Facebook user posted this on the Facebook help centre wall: It is suggesting people with whom I have no shared contacts and whose profile pictures are clearly pornographic. I deleted them on my home page, but from what I read on your helpdesk, they are likely hanging around on my Friends page. I don't want to click on their profile, click on the picture, and then report it. How do I make them go away?[6]
- An article from Forbes shows the complaint of a Facebook user: This morning Facebook suggested my scary ex out of nowhere. There's no contact information in my phone or shared

friends with said entity. I pressed for any commonalities and there were none, not with email, not with the previous profile -- nothing [7]. What if Facebook is suggesting people that are actively searching for you -- whether they be long lost relatives or straight up stalkers?

- A user posted on Reddit: My Facebook app on my iphone suggested 1 friend a person who turned out to be the receptionist at my psychiatrist's office, where I had only been once or twice. I hadn't posted from or (god forbid) checked in at the office. I had only checked/read the news feed while waiting [8].

Hence it is proved that this feature is actually weirdly disturbing the privacy of many users. In this paper, we are going to propose an effective solution for this problem so that every user can see only known and useful suggestions in the People You May Know section.

Methodologies Used - Discrete Mathematics and Data Structures [9]

Tools Used TURBO C++ [10]

III. PROPOSED SOLUTION USING GRAPH THEORY

Before jumping directly to the solution part, we have to understand the implementation of Graph Theory into the large network of Facebook. Consider the whole web of Facebook as an undirected weighted graph in which each node corresponds to a Facebook user and each undirected edge corresponds to the friendship between two users and the weight on each edge shows the degree of interaction between two users.

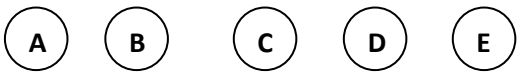
Here we are using undirected graphs as direction has no role in friendship links because if a user A is friends with user B then in the same way user B is also friends with user A, so their facebook friendship is shown in graph theory as follows:

Now the weight of each edge is calculated with the procedure explained as follows:

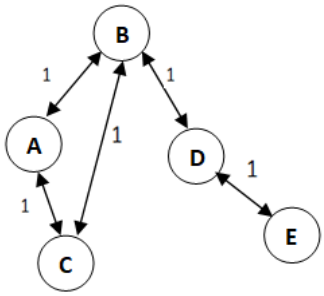
Table No 1

Activity Performed	**Accordingly increment/decrement in weight of edge**
Became friends by accepting friend request	+1
Liking friend's post	+1
Commenting on a friend's post	+5
Tagging a friend on a post	+10
Posting something in friend's wall	+10
Unliking a post	-1
Deleting a comment	-5
Untagging (either way)	-10
Deleting your post from a friend's wall	-10
Unfriending/blocking	Edge destroyed

Let us consider an undirected weighted graph named G representing a friend chain. Let this friend chain contains 5 Facebook users A, B, C, D and E. Originally, let all of these users are not connected to each other then their corresponding graph will look like below G(v,e)=(5,0)



Lets us consider that some of them send friend requests to other members of the set and after accepting those friend requests, there will exist a friendship graph (undirected and weighted) and let that graph look like given below



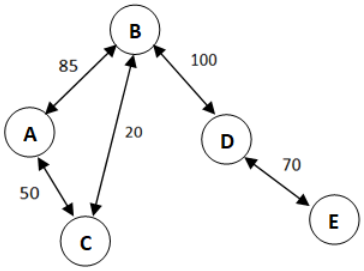
The graph depicts that

A is friends with B and C,
B is friends with A, C and D
C is friends with A and B
D is friends with B and E
E is friends with D

Since weight value decide for accepting friend request is 1.
Therefore e(A,B)=1, e(A,C)=1, e(B,C)=1, e(B,D)=1 and e(D,E)=1

Also the graph is undirected so it should be kept in mind that e(A,B)=e(B,A)

According to the criteria followed by People You May Know feature, A will get the suggestion of both D and E, B will get the suggestion of E, C will get the suggestion of both D and E, D will get the suggestion of both A and C, E will get the suggestion of A, B and C. This may look fine for a network chain consisting of only 5 users, but facebook uses this norm for the friendship chains containing millions of users. This is the main reason of getting random unknown suggestions or getting suggestions of a person you met many years ago.



To overcome this difficulty we are going to set some protocols for getting these suggestions. Before that lets take this data one step ahead. Let us suppose that in a period of say 1 month, these users perform many activities with each other and start gaining more weight on their corresponding edges (according to Table No 1). After 1 month let the graph depicts like shown below

Here e(A,B)=85, which means that the activities performed between users A and B gets the combined value of 85.

Similarly, e(A,C)=50, e(B,C)=20, e(B,D)=100 and e(D,E)=70

Now we will set a minimum scale, let it be of value 80, so that if a user has edge weight of 80 with another user only then he can get suggestions from the friends of second user and that will also be possible only if the edge width of that mutual friend is 80 or above with his other friend and so on.

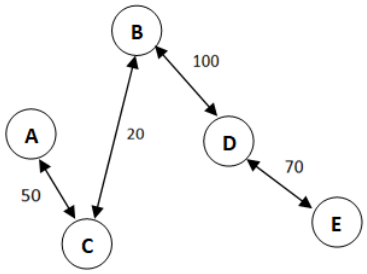
Hence in above case, user A will get the suggestion of user D as e(A,B)>80 and e(B,D)>80.

Here user B will not get the suggestion of user E because e(D,E)<80, and this will automatically depict that user A will also not get the suggestion of user E.

In the same way user C will also get the suggestion of user D only and not user E.

Let us suppose that at some point of time, A unfriends or blocks B. Then the graph will look like

Now, in the current scenario user A will not get suggestions of any other non-friend user as currently he has only one friend i.e. C, but e(A,C)<80.



As we all know that as the time changes, bond of friendship also changes due to which the number of activities taking place between two facebook friends will keep on changing, it may increase at some point of their lives and it may decrease at some other point. And many of the times we stop being in touch with friends who were very special at sometime for us. But we keep getting suggestions of new friends of our old friends. To overcome this issue, our programme will keep on calculating the edge width at the starting of every month to keep a check on the people who are currently important in your lives.

So the whole procedure will go like this, once a user say X accepts the friend request of a user say Y, our programme will start calculating the edge weight between X and Y from the time of acceptance of the request. X will not get any suggestion of some other friend of Y till it get the edge weight value 80. Once e(X,Y)=80, X will start getting suggestions of those friends of Y whose edge weight with Y is more than or equals to 80 and so on. At the end of the month our programme will clear the account by making each edge weight back to zero and will start calculating again with the previous mentioned criteria.

The coding of above solution is as follows:

```
#include<stdio.h>
#include<stdlib.h>
#include<conio.h>
#include<time.h>
#include<dos.h>
static float count=0,count1=0,count2=0;
int choice1,choice2;
void timing(int,int);
void activity();
        time_t timer;
  struct tm *tblock;
// A structure to represent an adjacency list node
struct AdjListNode
{
   int dest;
   struct AdjListNode* next;
};
// A structure to represent an adjacency list
struct AdjList
{
   struct AdjListNode *head;
};
// A structure to represent a graph. A graph
// is an array of adjacency lists.
// Size of array will be V (number of vertices
// in graph)
struct Graph
{
   int V;
   struct AdjList* array;
};
// A utility function to create a new adjacency list
node
struct AdjListNode* newAdjListNode(int dest)
{
   struct AdjListNode* newNode = (struct
AdjListNode*) malloc(sizeof(struct AdjListNode));
   newNode->dest = dest;
   newNode->next = NULL;
   return newNode;
}
// A utility function that creates a graph of V vertices
struct Graph* createGraph(int V)
{ int i;
   struct Graph* graph =  (struct  Graph*)
malloc(sizeof(struct Graph));
   graph->V = V;
   // Create an array of adjacency lists.  Size of
   // array will be V
   graph->array =  (struct AdjList*) malloc(V *
sizeof(struct AdjList));

  // Initialize each adjacency list as empty by
   // making head as NULL
//   int i;
   for (i = 0; i < V; ++i)
        graph->array[i].head = NULL;
   return graph;
}
// Adds an edge to an undirected graph
void addEdge(struct Graph* graph, int src, int dest)
{
   // Add an edge from src to dest.  A new node is
   // added to the adjacency list of src.  The node
   // is added at the begining
   struct  AdjListNode*  newNode  =
newAdjListNode(dest);
   newNode->next = graph->array[src].head;
   graph->array[src].head = newNode;
   // Since graph is undirected, add an edge from
   // dest to src also
   newNode = newAdjListNode(src);
   newNode->next = graph->array[dest].head;
   graph->array[dest].head = newNode;
}
// A utility function to print the adjacency list
// representation of graph
void printGraph(struct Graph* graph)
{
   int v;
   for (v = 1; v < graph->V; ++v)
   {
        struct AdjListNode* pCrawl = graph-
>array[v].head;
        printf("\n Adjacency list of vertex %d\n
head ", v);
        while (pCrawl)
        {
           printf("-> %d", pCrawl->dest);
           pCrawl = pCrawl->next;
        }
        printf("\n");
   }
}
// Driver program to test above function
void main()
{
   // create the graph given in above fugure
   int V = 4,choice;
   struct Graph* graph = createGraph(V);
```

```
   clrscr();
   printf("\n\n There are total for people 1,2,3 and 4");
   printf("\n\nTo whom you want to choose the mutual friend: ");
   printf("\n\nEnter your Choice: ");
   scanf("%d",&choice);
   switch(choice)
   {
    case 1:
                        addEdge(graph, 3, 1);
                                addEdge(graph, 2, 1);
                                addEdge(graph, 4, 1);
                                break;
    case 2:
                        addEdge(graph, 2, 3);
                        addEdge(graph, 2, 1);
                        addEdge(graph, 2, 4);
                       break;
    case 3:
                        addEdge(graph, 1, 3);
                        addEdge(graph, 2, 3);
                        addEdge(graph, 4, 3);
                       break;
    case 4:
                       addEdge(graph, 1, 4);
                       addEdge(graph, 2, 4);
                       addEdge(graph, 3, 4);
                       break;
     default:
                       printf("\n\nYou have Entered a wrong Choice");
                       printf("\n\nPRESS ANY KEY TO EXIT");
                       getch();
                       exit(0);
   }
//    addEdge(graph, 1, 3);    //addEdge(graph,0,1);
//    addEdge(graph, 2, 3);     //0,4
 //   addEdge(graph, 3, 4);     //1,2
  //  addEdge(graph, 1, 3);     //1,3
  //  addEdge(graph, 1, 4);     //1,4
   // addEdge(graph, 2, 3);    // 2,3
   // addEdge(graph, 3, 4);     //3,4
   // print the adjacency list representation of the above graph
   printGraph(graph);
   activity();
   getch();
}
void activity()
{          while(1)
           {
   clrscr();
   printf("\n\n\t\t      TIME      TO      PERFORM ACTIVITY");
   printf("\n\n\t\t    WITH WHOM YOU WANT TO PERFORM ACTIVITY ");
   printf("\n\n\t\t     1. 1 ");
   printf("\n\n\t\t     2. 2 ");
   printf("\n\n\t\t     3. 4 ");
   printf("\n\n\t\t     ENTER YOUR CHOICE:  ");
  scanf("%d",&choice1);
   switch(choice1)
   {
    case 1:
                       goto a1;
                       break;
    case 2:
                       goto a2;
                       break;
    case 3:
                       goto a3;
                       break;
    default:
                       printf("\n\n ENTERED WRONG CHOICE");
                       sleep(2);
                       activity();
   }
   a1:
   {
   while(count<=8)
   {
    printf("\n\n  Which activity you want to perform: ");
   printf("\n1.Tag");
   printf("\n2.Comment");
   printf("\n3.Share");
   printf("\n4.Like");
   printf("\n\nEnter your choice: ");
   scanf("%d",&choice2);
   switch(choice2)
   {
    case 1:
                       count+=1.5;
                       break;
    case 2:
                       count+=1;
                       break;
    case 3:
                       count+=1.5;
```

```
                    break;
    case 4:
                    count+=0.5;
                    break;
    default:
                    printf("\n\nWRONG CHOICE");
                     exit(0);
          }
                    activity();
     }
          }
   // printf("\n\nThe counter of count is %1.2f",count);
     a2:
   {
   while(count1<=8)
   {
    printf("\n\n  Which activity you want to perform: ");
   printf("\n1.Tag");
   printf("\n2.Comment");
   printf("\n3.Share");
   printf("\n4.Like");
   printf("\n\nEnter your choice: ");
   scanf("%d",&choice2);
   switch(choice2)
   {
    case 1:
                    count1+=1.5;
                    break;
    case 2:
                    count1+=1;
                    break;
    case 3:
                    count1+=1.5;
                    break;
    case 4:
                    count1+=0.5;
                    break;
    default:
                    printf("\n\nWRONG CHOICE");
                     exit(0);
          }
           activity();

     }
          }
           a3:
   {
   while(count2<=8)
   {
    printf("\n\n  Which activity you want to perform: ");
   printf("\n1.Tag");
   printf("\n2.Comment");
   printf("\n3.Share");
   printf("\n4.Like");
   printf("\n\nEnter your choice: ");
   scanf("%d",&choice2);
   switch(choice2)
   {
    case 1:
                    count2+=1.5;
                    break;
    case 2:
                    count2+=1;
                    break;
    case 3:
                    count2+=1.5;
                    break;
    case 4:
                    count2+=0.5;
                    break;
    default:
                    printf("\n\nWRONG CHOICE");
                     exit(0);
          }
    activity();

     }
          }
   if( (count>=8) && (count1>=8) )
   {
   count=count1=0;
   timing(1,2);
   break;
   main();
   }
   if( (count>=8) && (count2>=8) )
    {
    count=count2=0;
          timing(1,4);
          break;
          main();
    }
    if( (count1>=8) && (count2>=8) )
    {
    count1=count2=0;
                    timing(2,4);
                    break;
                    main();
   } } }
```

```
void timing(int x,int y)
{
int min=0,sec=0;
            clrscr();
    for(min=1;min<=2;min++)
    {
//          printf("\nThe min is: %d",min);
            for(sec=1;sec<=60;sec++)
            {
             /* gets time of day */
   timer = time(NULL);
/* converts date/time to a structure */
   tblock = localtime(&timer)
   printf("\n\n\t\tThe time is: %s", asctime(tblock));
   printf("\n\n\n\n\t\t\t %d YOU HAVE A FRIEND
SUGGESTION OF %d ", x,y);
                        sleep(1);
                        clrscr();
            }
     //     printf("\nThe min is: %d",min);
     //     clrscr();
    } }
```

IV. CONCLUSION

With Social Networking Sites like Facebook, the world is getting three a bit degree of separation closer. This distance is getting closer and closer as more and more people are signing in to such social networks. The world is much more closely connected to each other than one might think. Technology is working on it day by day to reduce the degree of separation to almost null. We are having no doubt that sooner or later with the help of more efficient techniques, methodologies and tools we will almost nullify the geographical distances between every individual. Though technology is performing a tremendous job in connecting people across the world, some systematic measures should also be taken to make these connections between people more real, valuable and filtered. Where the main concentration is on reducing the degree of separation, some constraints must be applied on the methodologies to make it more authentic and real. This will exactly serve the purpose of a good Social Networking site and the definition of degree of separation will become more accurate in real world scenario.

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Performance Enhancement of Optical Communication System using Optimum Length of DCF

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Abstract- Optical communication system gained significant importance from the last decade because of its high bandwidth transmission capabilities. However, dispersion limits the performance of the system by reducing its bandwidth and increasing the BER. The effect of dispersion may be reduced by dispersion compensation fiber (DCF). In this paper, an optical communication system is designed using a single mode fiber and its performance is evaluated using DCF at different distances. An optimum length of DCF is calculated for 5, 10, 15 and 20 Km ranges. It improves the transmission capacity of the system by reducing the nonlinearities of fiber.The simulative investigation is done in terms of Q factor, power,noise and eye diagram.

Keywords - Optical communication system, DCF, BER, Q factor, Dispersion, Transmission capacity

I. INTRODUCTION

A communication system useselectromagnetic waves for datatransmission from one point to another. Fiber optic communication is a light wave system that uses optical fiber for data transmission and that has revolutionized the telecommunication. This communication system consists of three sections:an optical transmitter, optical receiver and a communication channel(optical fiber). A channel is used to transmit the output (optical signal) from the transmitter to the receiver section by keeping the signal distortion-free.So,fiber losses are the main factors in consideration for designing of the fiber [1-3]However,the fiber losses which degrades the optical communication systems capability is solved by the emergence of optical amplifiers. However, there arenumber of factors that affect the performance of fiber but the main one is dispersion that occurs when signals in the fiber spread while propagating. In optical communication, each optical pulse is allocated a specific bit slot.However, if these pulsesspread they cause intersymbol interference that result in degradation of the transmitted signal. So, the recovery of the accurate transmitted signal becomes difficult. Dispersive and nonlinear effects rather than fiber losses often limit the current light wave systems[4-5].Optical amplifier solves the loss problem but worsens the dispersion problem. So, dispersion management techniques can be used to enhance the transmission capacity of the channel. A method that is utilized to compensate dispersion is dispersion compensation fiber (DCF).An all-optical technique completely overcomes the dispersion when non-linear effects are negligible inside the fiber [6].

In this paper, an optical communication system is designed and investigated using DCF at different ranges. An optimum length of DCF is calculated for different ranges that improves the transmission capacity of the system by reducing the nonlinearities of fiber.

II. DISPERSION COMPENSATING FIBER (DCF)

Dispersion limits the system'sperformance by reducing its bandwidth and increasing the BER. In order to reduce the effects of dispersion, DCF is used in an optical communication system. DCF is a single mode fiber with small core diameter. It has a large negative chromatic dispersion value also called group velocity dispersion. By joining fibers with opposite sign chromatic dispersion (negative) and suitable length, an average dispersion close to zero is

obtained[7]. The length of DCF can be several kilometres and can be placed at any point in the link.

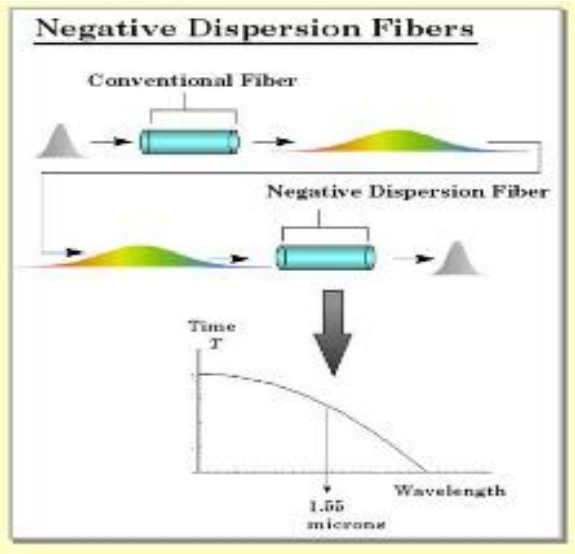

Fig.1 Concept of DCF [7]

III. SYSTEM DESCRIPTION

Figure 2 exhibits thesimulation setup of the proposed system.The optisystem software is used for the investigation of the optical communication system having 2.5 Gb/s bit ratefor variable DCF.

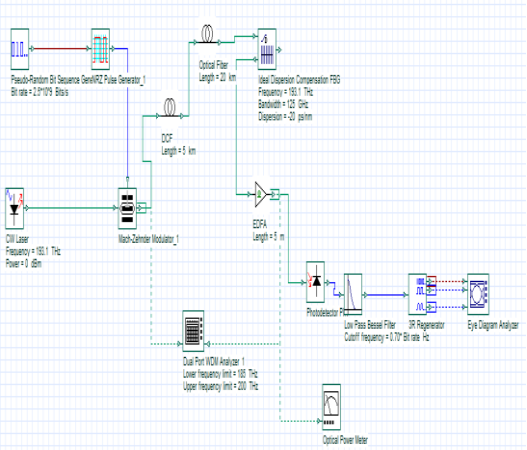

Fig. 2 Simulation setup of proposedoptical communication system using DCF.

The setup comprises of three sections: transmitter, channel andreceiver. In transmitter section, we have a laser whose frequency is set as 193.1 THz and its power is at 0dbm. The Pseudo Random Binary Sequence (PRBS) generates data based on diverse operatingmodes, a Non-Return to Zero (NRZ) generate NRZ coded signal,and finally,the signal is digitally modulated by the user data using Mach-Zehnder (MZ) modulator. The signal from the transmitter output is then transmittedinto the channel that contains DCF, optical fiber and FBG[8]. At the receiver, the optical output from the channel is converted into electrical signal by photodiode. Thereafter, signal is processed into low pass filter (LPF) followed by 3R regenerator and eye diagram[9][10]. In this way, the signal is recovered. Simulation parameters [1][5]used in the system are given in Table 1.

Table1. Parameter used in the simulation

Parameters	SMF	DCF
Reference wavelength	1550nm	1550nm
Length	Variable	Variable
Attenuation	0.25db/ km	0.6db/Km
Dispersion	17.5ps/(nm.km)	-80 ps/(nm.km)
Dispersion slope	0.08 ps/nm^2/km	0.08 ps/nm^2/km
Differential group delay	3ps/km	3ps/km

IV. RESULTS AND DISCUSSION

In order to find out the optimum length of DCF for disparate ranges(5,10,15 and 20 km), we simulate the proposed optical communication at different DCF length(0,1,2,3,4 and 5). Figure 3, shows the graph between DCF length and Q factor at different ranges. From the graph, it is clear that optimum value, the value that enhances the system, is different at different ranges. For 5 km, we get peak if we use DCF of length 1km. At 1Km, the Q factor achieved is 407. Above and below 1Km,the Q factor decreases. Similarly, for 10, 15 and 20 Km, thepeak value of DCF is achieved at 2,3and 4Km respectively that shows the system's capability isbetter only at the optimum length of DCF.

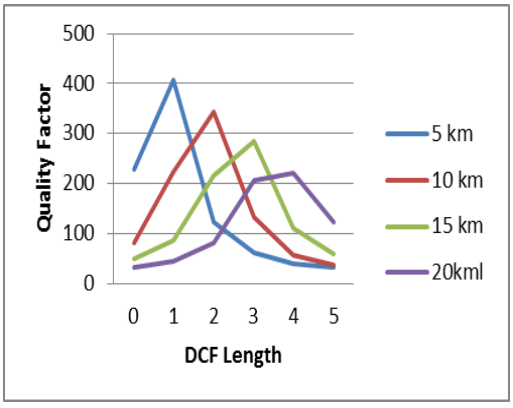

Fig. 3 DCF length versus Quality factor at different ranges.

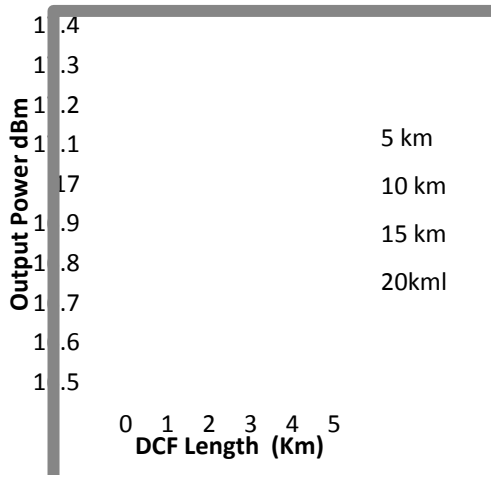

Fig. 4 DCF length versus output power at different ranges.

Figure 4. shows the graph between DCF length and the output power received. The results indicate that as the length of the DCF increases the power received at the output decreases. The result shown in Figure 5justifiesthat noise power increases as theDCF lengthincreases. But, with the increase in fiber length the gain is decreases.

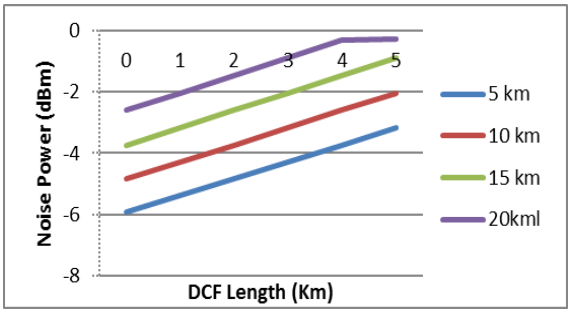

Fig. 5 DCF length versus noise power at different ranges

Table 2. Results received at 10 km fiber length

Length of DCF	Q factor	Output Power (dbm)	Noise Power (dbm)
0	82	17.21	-4.84
1	223	17.17	-4.29
2	344	17.13	-3.73
3	133	17.09	-3.17
4	57	17.05	-2.6
5	38	17	-2.03

Table 2 indicates the results of Qfactor, output power and noise power at 10km for a different length of DCF fiber. The results show that our system performs wellin comparison to other systems in terms of Q factor, output powerrand noise power [5]. Figures 5,6,7 and 8 shows the eye diagrams at 5,10,15,and 20 Km fiber length at 0,1,2,3,4,and 5km DCF length.From the eye diagram, it is clear that increase in the DCF length does not enhance the system's performance rather system performs better only at an optimum value.

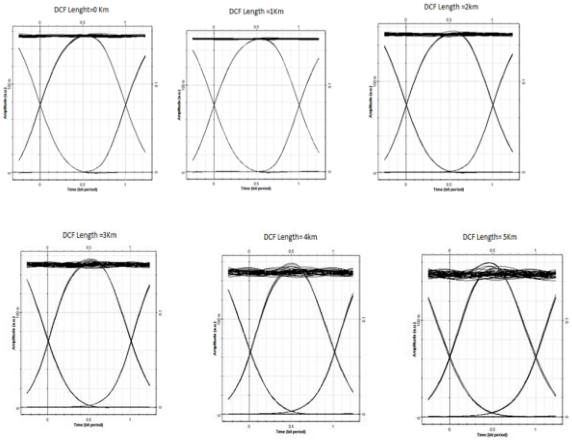

Fig. 5 Eye diagram at 5KM

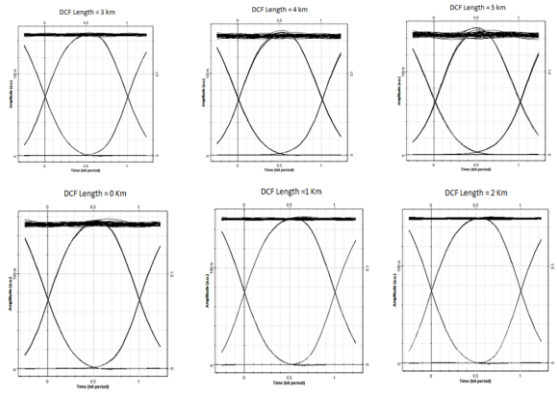

Fig. 6 Eye diagram at 10 Km

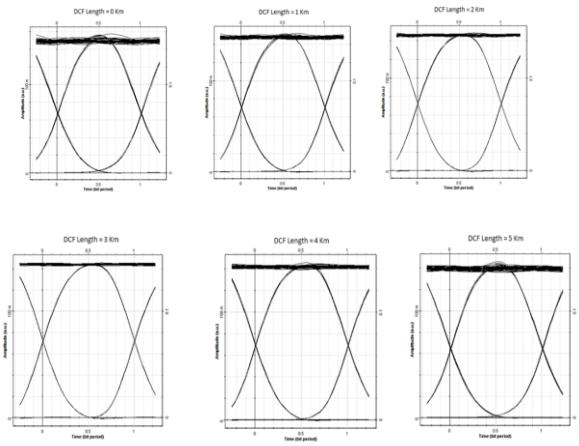

Fig. 7 Eye diagram at 15 km

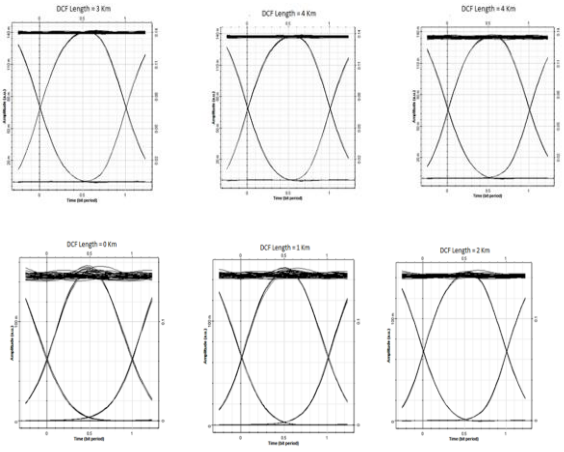

Fig. 8 Eye diagrams at 20 km

V. CONCLUSION

In this paper, the designing and analysis ofan optical communication system is carried out which has2.5 Gb/s bit rate. The system is investigated using different values of DCF (0, 1,2,3,4 and 5 Km) for 5, 10, 15 and 20 km ranges. An optimum length of DCF is calculated for different ranges which improves the transmission capacity of the system by reducing the nonlinearities of fiber. Results indicate that if single mode fiber of 5 km length is used, the optimum value of DCF is achieved at1Km with Q factor of 407. Similarly, for 10, 15 and 20 Km the peak value of DCF is achieved at 2,3and 4Km respectively.

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Performance Analysis of Energy Efficient Heterogeneous Clustering based Routing Protocols for Wireless Sensor Networks using NS2

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Abstract — nowadays, wireless sensor network are deployed sensor nodes to identification an occasion and transmit the data to the base station (BS). Clustering is a method use to minimize the energy utilization of such network. In this paper, we introduced Energy efficient heterogeneous clustering based routing (EEHCR) protocol is based upon the quality of services parameters (QoS). The comparative analysis of EEHCR with low energy adaptive clustering hierarchy protocol (LEACH) and Threshold stable election protocol (T-SEP) on the basis of QoS parameters like as end- to- end delay, packetloss and throughput.

Keywords — WSN, LEACH, T-SEP, EEHCR, CH, BS

I. INTRODUCTION

A mix of sensor nodes in a helpful way is known as a wireless sensor network. In the wireless sensor network, no. of sensors are sent to the distinctive areas. These sensor nodes are work in the distinctive modes. Wireless sensor networks are utilized in the distinctive applications like computerization, natural, territory observing and air contamination checking [5] [13]. Sensor node detects the information and transmits it to the client. The few parts are utilized in remote sensor arranged to resemble as sensor sensor, processor and base station (BS). Generally, sensors nodes are a fundamental segment of remote sensor arrange (WSN). These are light weight, little in size and compact. Sensor nodes are utilized to send the information from the base station. Another part base station is utilized to gather the information from various sensor sensors. Another approach like direct correspondence is utilized to transmit the information from sensor sensors to base station (BS) yet in the base transmission vitality sensors are closest the base station (BS) has more likelihood to send information than sensor sensors which are situated far from the base station (BS) [10]. Along these lines, need to present the idea of clustering. Clustering is an approach used to limit the vitality of utilization. In clustering, the no. of sensors are select the cluster head (CH). At the point when the choice of cluster head (CH) based on initial energy or residual energy. At that point, sensor nodes are transmitted information to Cluster head (CH). The cluster head is utilized to total the information from various sensor nodes and transmit to the base station (BS). Sensor networks are classified as heterogeneous protocols and homogeneous protocols. So need to recommend another approach is known as clustering. Clustering is utilized in WSNs, it is contrasting option to expand the vitality effectiveness and execution of the system. Essentially, it is material to limit the vitality utilization of sensor sensors.

In clustering, a number of sensor nodes are separated into various clusters and an arrangement of sensor nodes are named as cluster head (CH) [12]. Cluster head gathers the information from the other non-cluster heads nodes, furthermore total the information from every one of the sensors and them transmit to the base station. Clustering accordingly consistently dispersed the vitality heap of the system, decreases the vitality utilization and

increment the system lifetime of the system [1] [5]. The various protocols are given below;

A. Low Energy Adaptive Clustering Hierarchy (LEACH) Protocol

LEACH (low energy adaptive clustering hierarchy) protocol is an example of homogeneous protocol. Basically it is called as a proactive routing protocol [11]. The most imperative capacity of LEACH protocol is the game plan of sensor sensors on caused flag force. In this protocol, sensor nodes are partitioned into various locales based on sensors area. The base station is arranged out of detecting region and a unique node is known as a door node and this sensor is put on focus position [10]. Some sensor sensors are found closest to the base station. Along these lines, the information exchanged from sensor sensors to the base station utilizing the immediate correspondence system and rest nodes are participate in the cluster head (CH) arrangement i.e. clustering strategy [14]. Here a sensor sensor turns into a CH by self-assertively picking a number somewhere in the range of 1 and 0. The cluster head (CH) that distant from the sink expended more vitality for single bounce steering to the base station. However, it has a few restrictions as it performs ineffectively when WSNs are conveyed over a gigantic locale [11].

B. Threshold Stable Election Protocol (T-SEP)

To the change of LEACH protocol for a homogeneous system of WSNs another protocol T-SEP was recommended that suitable asset heterogeneity for the better solidness time of the system. Threshold Stable election protocol (T-SEP) is the heterogeneous sort of system [2]. In this protocol, utilized two kinds of sensor nodes like as would be normal node and advanced node. The advanced nodes are approved higher weights when contrasted with ordinary node and thus higher likelihood to be named as the cluster head (CH) in each round. In T-SEP protocol, all sensor nodes are sent haphazardly in nature. On the off chance that the larger part of the sensor nodes is sent far from the base station (BS) it devoured more vitality [7]. The ordinary sensors are conveyed closest to the base station and transmit information straightforwardly to the sink. In any case, the advanced sensors are sent far from the base station and they devoured more vitality for the transmission of information from the sensor sensor to sink. Hence, to expel the confinement of energy in nodes happening a cluster head (CH) development. T-SEP protocol performs better when contrasted with LEACH protocol in the term of dependability time of system [9].

C. Energy Efficient Heterogeneous Clustered based Routing (EEHCR) Protocol

To improvement of LEACH and SEP protocol in WSNs that an EEHCR protocol is utilizes to increase the scalability, stability period of network and increase the lifetime of network. Basically it is applicable to ensure that increase the residual energy of sensor node in WSNs. EEHCR protocol is a distributed competitive unequal clustering approach, it considered a residual energy and average energy of sensor nodes. Similar to that of different energy efficient protocols like as LEACH, SEP, Z-SEP, SEP, A-LEACH our proposed schemes are follows cluster head (CH) formation technique [8].In WSNs due to high quantity of node deployment, same area may get covered by large number of sensor nodes. Therefore, to avoid data redundancy, some nodes may be turned-off. So in this technique, at half of sensor nodes are perform i.e. known as active nodes and some nodes are in rest i.e. called sleep nodes or passive nodes [8].

II. RELATED WORK

Some work related to this strategy is described below:

Akyildiz i., et al. [2002] presented a survey on WSN routing protocol. WSN has number of characteristics to satisfied like accuracy, fault tolerance, power consumption, delay, throughput, energy efficiency, lifetime of sensor nodes, packet delivery ratio, packet loss etc. these requirements help in the development in new research ideas [1]. Biradar R., et al. [2010] provided a review of the various fields in which WSNs has been employed, design issues of routing protocols like as LEACH protocol, SEP protocol, M-GEAR protocol and compared them on the basis of parameters like power consumption, efficiency, delay, data aggregation, scalability [3]. Singh S., et al. [2010] presented a review of the characteristics, applications and design issues in WSNs. Also a different types of protocols like as LEACH protocol, SEP protocol and HEED protocol has been explained. The conclusion obtained is that there is a need for more reliable, more scalability

and energy efficient routing protocols [2]. Faisal S., et al. [2011] implemented a Zonel stable election protocol (Z-SEP) protocol and it compared with the LEACH protocol and SEP protocol. Simulation results show that Z-SEP protocol enhanced the stability period, throughput, network lifetime, data aggregation and efficiency that existing protocols like LEACH protocol and SEP protocol [4]. Nadeem Q., et al. [2013] designed a Multi hop- gateway based energy efficient routing protocol (M-GEAR) protocol for the minimum consumption energy. Simulation results show that our proposed gateway based protocol in better in terms of network lifetime, stability period and throughput [6]. Pramanick M., et al. [2014] had compared LEACH protocol, SEP protocol, Hybrid energy efficient distributed protocol (HEED) protocol on the basis of number of alive nodes, number of dead nodes, number of clusters and number of cluster heads (CH). They concluded that SEP protocol is best in selection of cluster heads (CH) [7]. Chawla H., et al. [2014] provided knowledge of the various applications like as area monitoring, environmental, air pollution monitoring, forest fire detection, land slide detection, water quality monitoring etc and the security issues of Wireless sensor network (WSN) [8]. Javaid N., et al. [2014] designed a Application aware threshold based centralized energy efficient cluster protocol (ATCEEC) Protocol and simulation results show that ATCEEC protocol yields maximum network lifetime, throughput and stability period of network as compared to the selected protocols like as LEACH protocol, SEP protocol and M-GEAR protocol [9]. Pramanick M., et al. [2015] introduced Energy aware sleep scheduling clustered based routing protocol (EEHCR) Protocol. The aims of this scheme are, increased stability period of wireless network and minimizes the loss of data and Performance analysis show that EEHCR has significant improvement over existing protocols LEACH protocol, SEP protocol and M-GEAR protocol in terms of lifetime of network and data units gathered at base station (BS) [12]. Dewli N., et al. [2015] analyzed and compared two wireless sensor network (WSN) protocols, Multi hop-gateway based energy efficient routing protocol (M-GEAR) protocol and modify low energy adaptive clustering hierarchy (MODLEACH) protocol on the grounds of network lifetime, throughput and performance of the network [14]. Anisi M., et al. [2015] proposed a data routing scheme which ensures increased network lifetime by exploiting energy efficiently, supporting reliability, fast delivery of delay-sensitive data and achieving low-cost sensor design. Author's founds that ability to use in both event-driven and query-driven applications, ensuring taking the shortest routing path, transmitting very less number of packets, simplifying the implementation, maintaining the routs, high probability of completeness of responses while realizing significant power savings and increasing the network lifetime [15].

III. SIMULATION SETUP

The network is simulated by network simulator 2.35 (NS 2.35). NS 2.35 tool is also downloaded and install in Ubantu 12.04 version.

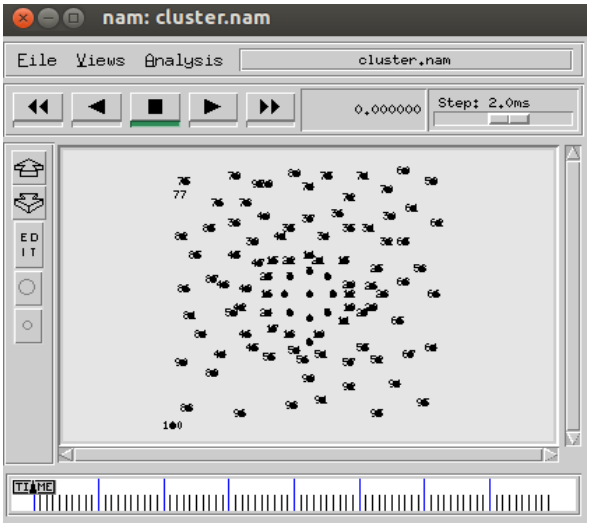

Figure 1. Network Deployment

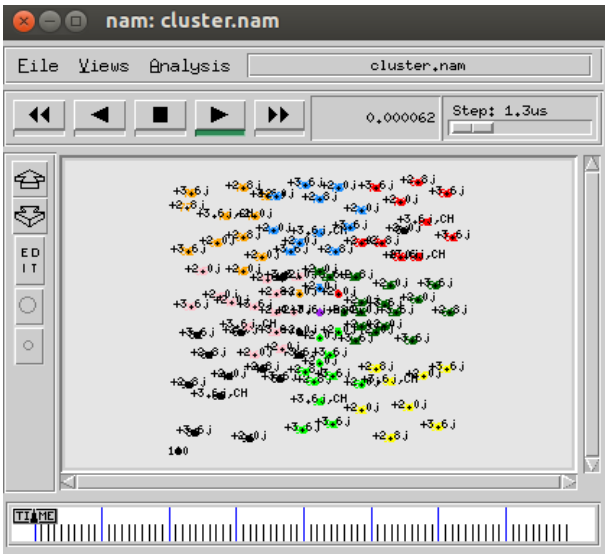

Figure 2. Data Aggregation from CHs

Network simulator 2.35 specifies the IEEE 802.11 standard. The simulation network used a two dimensional view. This simulation defines the size of network area and number of sensor nodes is deployed in network region. In the simulation, show that the process of clustering by the using of concept network animation. Network animation shows the concept of transfer the packets from sensor nodes to base station (BS).

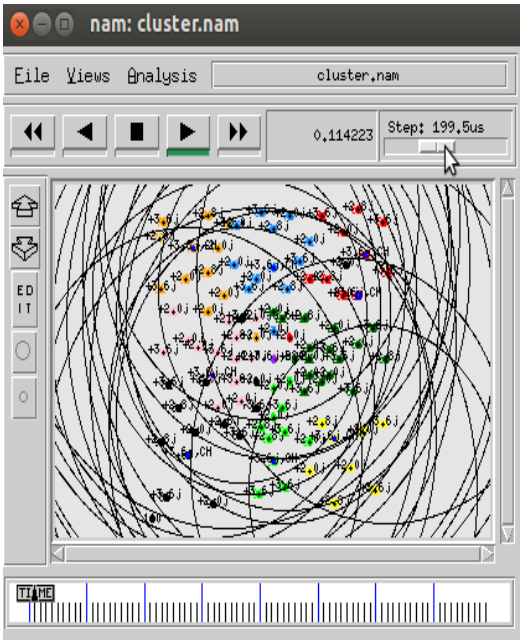

Figure 3. Data transmission from CHs to Sink

The desired specifications of network and its other details are shown in the form of table given below:

Table 1: Network configuration

Parameter	Specifications
Simulation Tool	Network Simulator 2.35
IEEE Standard	IEEE 802.11
Protocol	EEHCR, LEACH, SEP
Total Number of Nodes	100
Total Number of Cluster Head (CH)	8
Network Size (in meters)	500*500 meter
Node Range	50 meter
Sink	1

The figure 1 shows the network deployment, figure 2 shows the data aggregation from all the cluster heads (CHs) and figure 3 shows the data transmission from CHs to base station (BS).

IV. RESULT & DISCUSSIONS

The sensor nodes are deployed randomly and clustering process is used to minimize the coverage area. Another, x-axis defined number of packets per seconds and y-axis are defined simulation time in seconds.

Figure 4 shows the result of delay in graphically. The time required through the packets to reach the base station is called as a end – to end delay. We compare the EEHCR protocol with LEACH and SEP protocol in this paper and more delay in LEACH and SEP protocol because of dynamic clustering. In EEHCR protocol, delay has less as compared to LEACH and SEP protocol.

The number of packets is not reach the sink at the time of transmission is known as a packet loss. Figure 5 shows the packet loss is less in EEHCR protocol as compared to LEACH and SEP protocol because the use of multihoping transmission technique. Otherwise SEP protocol is multi-level heterogeneous network and LEACH protocol is an example of homogeneous network. EEHCR protocol has equally works on heterogeneous and homogeneous networks but it is proposed that works satisfactorily in heterogeneous networks.

Figure 6 shows the result of throughput in graphically. The number of packets are received through the base station (BS) per unit time is known as a throughput. Simulation result shows that the EEHCR protocol performs better as compared to LEACH and SEP protocol.

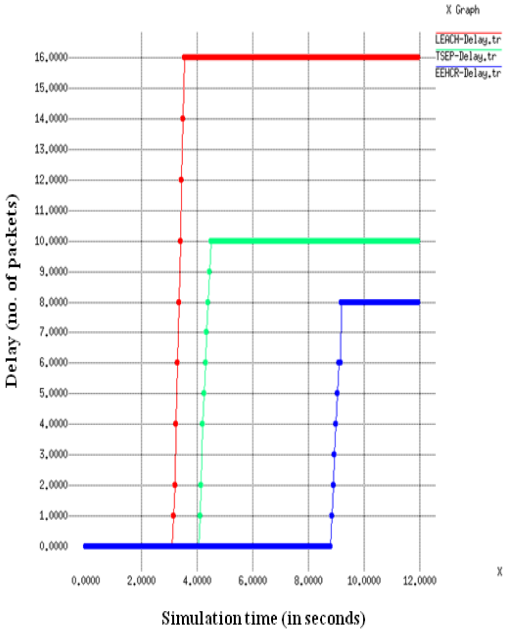

Figure 4. End – to – end Delay

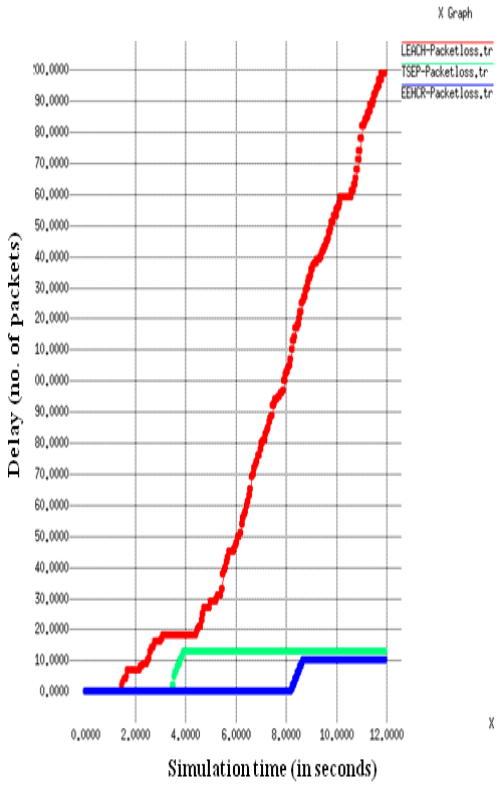

Figure 5. Packetloss

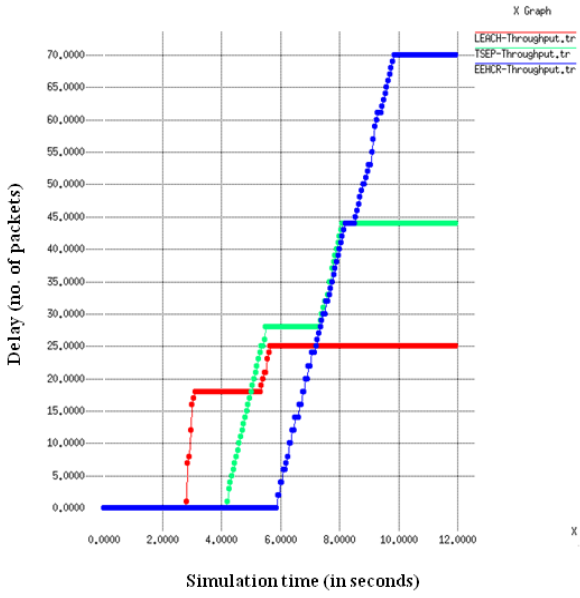

Figure 6. Throughput

V. CONCLUSION

Different techniques are applicable to implement wireless sensor network for the increased of lifetime of wireless network, but still need improvements to overcome the limitations of wireless sensor network (WSN). In this paper, we have evaluated the performance of EEHCR protocol. The results of EEHCR protocol is compared with LEACH AND SEP protocol by the using of QoS parameters. It performs better as compared the others protocols i.e LEACH and SEP protocol.Further the performance of EEHCR is needed to improve for the higher efficiency and accuracy in terms of delay and Packet Loss.

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A Comprehensive Review on Security in Cloud Computing

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Abstract: CISCO has introduced the term "Inter-cloud" as "Cloud of clouds" (2013). The telephone and Internet technologieswhich took 100 and 15–20 years, respectively, for the realization of global federation, Organizations and individuals have been moving to the cloud computing technology looking for effective and fast computing services. Users are concerned about security and confidentiality of data stored and processed in the cloud.Data encryption is being widely employed to secure data. However, as users are using cloud to process data, strong encryption techniques are required to apply. The objective of this paper is to provide an overview of cloud computing and the security and privacy challenges. In this paper we also discusses the risks of technology, security techniques and threats for cloud data.

Keywords - Cloud Computing, Cryptography, Security.

I. INTRODUCTION

Cloud computing has grown rapidly in last few years due to its features of greater flexibility and availability of computing resources at minimum cost. For Companies considering transferring applications to public cloud environments, security and privacy are the important concern.

NIST developed standards, rules, and minimum requirements, for all agency operations and assets to provide information about security, but these shall not apply to national security systems. NIST defined Cloud Computing as a model for enabling convenient, ondemand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or cloud provider interaction [2]. Cloud computing is a rapidly emerged computing shared resources paradigm as it enables the sharingof computing resources at more levels of abstraction, provides on-demand service over the Internet or computer network. Because of its flexibility and availability at lower cost, cloud computing is getting good attention.

1.1 Motivation Aspects for Cloud Computing

Cloud computing can be defined by various ways one of them is through its motivational aspects or features, especially those have been accepted by different firms and groups:

• **Shared resources:** or it can be call asshare pooling, where one resource is shared by many users and are pooled together for more than one consumer. On application, host or network level, resources are assigned and reassigned on-demand of consumers. This gives a sense of location independence where users cannot pinpoint exactly where there computations are being executed [2].

• **On-demand self-service:** Without human intervention, the users can have any external resources like storage or power automatically. This is similar to autonomic computing where the computer system manages it with self management.

• **Global Scale:** Cloud computing has the ability to locate and release resources fastly. This will allow the users to increase the resources whenever they need to address heavy loads and usage, and then decrease by returning the resources when finished.

• **Cost:** In Cloud Computing, users pay for on a consumption basis, whereas in other utility users pay for such as electricity, water and gas. The main characteristic of cloud computing is that the computation is done in the "cloud" and remaining

characteristics stem from or complement this simple fact. Many other characteristics have also been found while literature study but all are complementary to the main characteristics[4].

•**Reliability:** Cloud computing also manages data backup, error recovery and continuity easier and less costly, because data can be found at multiple sites on the cloud provider's network.

1.2 Types of cloud deployments

Cloud computing services characteristic from economies of scale achieved through versatile use of resources, specialization, and other practicable efficiencies. However, cloud computing is an emergedform of distributed computing that still exists. All clouds are not the same. There are three different ways to deploy cloud computing resources: public cloud, private cloud, community and hybrid cloud[3].

- **Public cloud**

A public cloud is one in which the infrastructure and security that it comprises are made available to the enterprises over the Internet. Cloud provider as owner of it, sell cloud services and, is external to company. And the reciprocal spectrum is private cloud.

- **Private Cloud**

A private cloud in which the computing environment is used exclusively by one organization. It is maintained either by the organization or a third party, and may be physically located within the organization's on site data centre or outside of it.Private clouds are used by any mid- to large-size organisations seeking enhanced control over their environment.

- **Community cloud**

A community cloud is somewhat similar to a private cloud, but the infrastructure and computational resources are shared by several organizations that have common privacy, security, and regulatory considerations, rather than for the exclusive use of a single organization.

- **Hybrid cloud**

A hybrid cloud is a combination of two or more clouds (private, community, or public) but are bound together by standardized or proprietary technology that enables interoperability[3].

1.3 Service Models of Cloud

The service model supported by the cloud affect them just like different deployment models affect an organization's scope and control over the computational environment of a cloud. Three frequently-used service models are the following [11]:

- **Software-as-a-Service**. Software-as-a-Service (SaaS) is a model of software deployment for delivering software applications over the Internet, on demand and typically on a subscription basis. With SaaS, cloud providers host and manage the software application and underlying infrastructure and handle any maintenance, like software upgrades and security patching. Users connect to the application over the Internet, usually with a web browser on their phone, tablet or PC.
- **Platform-as-a-Service**. Platform-as-a-Service (PaaS) is a model of software deployment refers to cloud computing services that supply an on-demand environment for developing, testing, delivering and managing software applications. PaaS is designed to make it easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure of servers, storage, network and databases needed for development.
- **Infrastructure-as-a-Service.**(IaaS) is a model Offering virtualized resources (computation, storage, and communication) on demand is known as Infrastructure as a Service (IaaS). A cloud infrastructure enables on-demand provisioning of servers running various options of operating systems and software stack as per needs. Infrastructure services are considered to be the bottom layer of cloud computing systems.Users are given privileges to perform numerous activities to the server, such as: starting and stopping it, customizing it. With IaaS, you charge infrastructure of IT , storage, networks, operating systems from a cloud provider on a pay-as-you-go-basis.

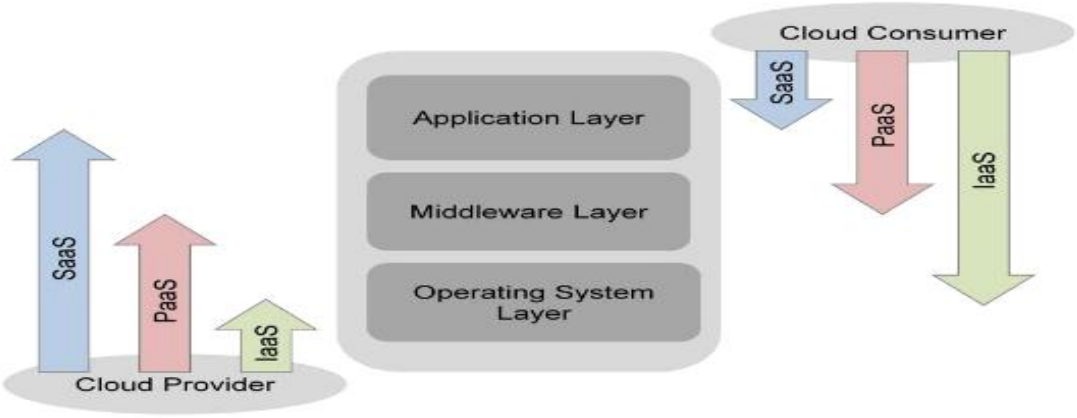

Figure1: Differences in Scope and Control among Cloud Service Model

While Cloud computing can be actualized for an association as a private inner cloud, its principle rationale has been to give re-appropriating parts of that condition to an outside gathering as an public cloud. Likewise with any outsourcing of data technology services, security and protection is concerned.The primary concern is on the risks related with exchanging imperative applications or information from the bounds of the organization data centre to that of third party association (i.e., public cloud), which is promptly available by the global public.Diminishing expense and expanding effectiveness are essential inspirations for moving towards public cloud, yet reducing duty regarding security ought not be. Eventually, the organization is responsible for the general security of the outsourced benefit. Observing and tending to security issues that emerge stay in the domain of the organization , as does oversight over other essential issues, for example, execution and accessibility. Since cloud computing accompanies new security challenges, it is obligation of an organization to check and oversee how the cloud provider secures and keeps up the registering condition and guarantees security of stored information.

II. ASPECTS OF CLOUD SECURITY

The words "Vulnerability," "Threat," "Risk," and "Exposure" regularly are utilized as equivalent words despite the fact that they have distinctive implications and connections to one another.

2.1 **Vulnerability**

It refers to a software, equipment, or procedural shortcoming that may give an attacker the open way to enter a computer or network and have unapprovedaccess to assets within the environment. Vulnerability characterizes the absence or shortcoming of a safeguard that could be abused.

2.2. Exposure

It is an instance of being presented to misfortunes from a threat operator. Vulnerability opens an organization to conceivable harms. In the event that a bank does not appropriately fix its servers, it might be presented to conceivable ruptures in connection to the open holes coming about because of the missing patches. A countermeasure (likewise safeguard) is by and large established to relieve the potential risk. A countermeasure might be an arrangement, technique, a software configuration, or hardware device that dispenses with helplessness or lessens the probability that a risk specialist will have the capacity to misuse weakness. Solid authentication systems, computer antivirus software and data security awareness are a few precedents of legitimate countermeasures.

In any organisation, data security risks must be recognized, assessed, analyzed, treated and appropriately reported. Organizations that fail in recognizing the risks related with the technology they utilize, the people they employ, or the environment where they work typically subject their business to unexpected outcomes that may result in serious harm to the business. Vulnerability might be an service running on a server, unpatched applications or operating system software, or an unsecured physical entrance.

2.3 Threat

This is any potential risk to data or system. The Threat is that somebody, or something, will

distinguish a particular vulnerability and utilize it against the organization or person. Threats misuse existing vulnerabilities trying to cause harm or destruct a resource. A "Threat Agent" is the element that exploits vulnerability. A threat agent could be an interloper, a procedure, or a worker committing an inadvertent error that could uncover secret data or demolish a record's trustworthiness.

2.4 Risk

Risk is the chance of a threat agent taking advantage of vulnerability and the corresponding enterprise effect. As an example, if users aren't educated on procedures and processes, there's a higher probability that an worker will make an intentional or unintentional mistake that could wreck information. Risk ties the vulnerability, threat, and chance of exploitation to the ensuing enterprise effect (see figure 2).

Due to the fact risks can not be absolutely removed, they want to be lowered into suitable levels. Perfect risks are risks that the business comes to a decision to live with, given that right evaluation for these risks become executed and the cost of treating these risks might outweigh the advantages[5].

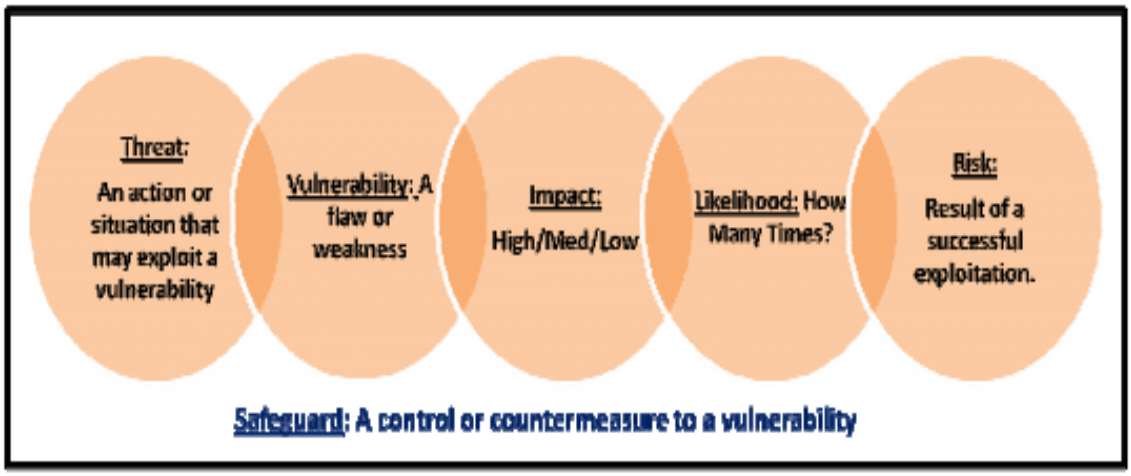

Figure2:Risk=Vulnerability*Threat*Impact*Likelihood.

Cloud Computing leverages several present technologies along with web services, internet browsers, and virtualization, that contributes to the evolution of cloud environments. Therefore, any vulnerability associated to those technology boot affects the cloud, and it can actually have a signify cant impact.From Table1 presents an summary of threats in Cloud Computing. Like Table2 it additionally describes the threats that areassociated with the technology employed in cloud environments, and it indicates what cloud service models are exposed to those threats. we have a tendency toputadditionalstress on threats that arerelated toinformation being stored and processed remotely, sharing resources and therefore the usage of virtualization.

TABLE 1: Threats in cloud computing

ID	Threats	Description	Layer
T01	Account or service hijacking	An account theft is performed by different ways like social engineering and weak credentials. If an attacker gains access to a user's documents, he will perform malicious activities like access sensitive knowledge, manipulate knowledge, and send any transaction.	SPI
T02	Data scavenging	Since data can't be fully removed from unless the device is destroyed, an attacker is also able to recover this knowledge.	SPI
T03	Data Leakage	Data leakage happens once the information gets into the unauthorized hands while it is being transferred, stored, audited or processed.	SPI
T04	Denial of Service	It is attainable that a malicious user can take all the attainable resources. Thus, the system cannot satisfy any request from alternative legitimate users because of resources being unavailable.	SPI

T05	Customer data manipulation	Users attack internet applications by manipulating knowledge sent from their application elements to the server's application. As aexample, SQL injection, command injection, insecure direct object references, and cross-site scripting.	S
T06	VM escape	It is designed to use the hypervisor so asto acquirecontrol of the underlying infrastructure.	I
T07	VM Hopping	It happens once a VM is in position to achieve access to different VM (i.e. by exploting some hypervisor vulnerability)	I
T08	Malicious VM Creations	An offender who produuces a legitimateaccount willcreate a VM image containing malicious code likeas a Trojan horse and store it within the supplierrepository.	I
T09	Insecure VM migration	Live migration of virtual machines exposes the contents of the VM state files to the network. An attacker willdo the subsequent actions: a) Access information illegally throughout migration b) Transfer a VM to associated untrusted host c) produce and migrate many VM inflicting disruptions or DoS	I
T10	Sniffing/Spoofing virtual networks	A malicious VM will hear the virtual network or perhaps use ARP spoofing to send packets from/to otherVMs.	I

Table 2 Vulnerabilities in cloud computing

ID	Vulnerabilities	Description	Layer
V01	Insecure interfaces and APIs	Cloud suppliers provides services that may be accessed through APIs (SOAP, REST, or Hyper Text Transfer Protocol with XML/JSON). The security of the cloud depends upon the protection of those interfaces. Some issues are: a) Weak certification b) Short authorization checks c) Short input-data validation Also, clouds APIs are still immature which implies that are often updated. A fixed bug will introduce another security hole within the otherapplication.	SPI
V02	Unlimited allocation of resources	Inaccurate modeling of resource usage will cause to overbooking or over-provisioning.	SPI
V03	Data-related vulnerabilities	a) informationare often collocated with the information of unknown owners (competitors, or intruders) with a weak separation b) informationcould also besituatedcompletely numerous jurisdictions that have different laws c) Incomplete information deletion – informationcan't beutterly removed d) information backup done by untrusted third-party suppliers e) dataconcerningthe location of the information sometimes is not available or not disclosed to users f) informationis usuallystored, processed, and transferred in clear plain text	SPI
V04	Vulnerabilities in Virtual Machines	a) attainable convert channels within the allocation of VMs b) Unrestricted allocation and deallocation of resources with VMs c) Uncontrolled Migration - VMs may be migrated from one server to a different server because of faulttolerance, load balance, or hardware maintenance d) Uncontrolled snapshots – VMs may bederivedso asto produce flexibility, which cancauseinformationleakage. e) Uncontrolled rollback may lead to reset vulnerabilities - VMs may beinsured to a previous state forrestoration, however patches applied once the previous state disappear f) VMs consistsIPaddresses that are visible to anyone inside the cloud - attackers will map wherever the target VM is foundinside the cloud (Cloud cartography)	I
V05	Vulnerabilitiesin Virtual	a) Uncontrolled placement of VM images public repositories b) VM images aren't able to be patched since they're dormant artifacts	I

	Machineimages		
V06	Vulnerabilities in Hypervisors	a) Advanced hypervisor code b) Versatile configuration of VMs or hypervisors to satisfy organization desire is exploited	I
V07	Vulnerabilities in Virtual Networks	Sharing of virtual bridges by many virtual machines	I

Table 2, We will conclude that information storage associate degree virtualization are itthe foremostcrucial and an attack to them can do the foremost harm. Attacks to lower layer have additional impact to the different layers[12][13].

III. CLOUD SECURITY ISSUES

Cloud storage needs are durable due to availability and security factors. Security problemsare increasing with the rise in cloud service usage [6].Authorization and authentication plays the foremost role for security. Authentication is that the method of secure the information for user's data protection. Access control plays the foremost role for information privacy [1]. It is oftenaccustomed distinguish the privileges, for accessing the information resided in Cloud. Cloud storage was classified into three categories likes object storage, file storage and block storage.Table 3, thoroughly tabularizes the recent analysis work done on the securityproblems in Cloud Computing with advantages and Disadvantages.

Table3.A Survey On Cloud Security Issues

S.No.	Year	Author	Proposed Algorithm	Pros	Cons
1	2017	Noelle Rakotondravony et.al.,[9]	VMI-based Mechanism's.	Invention of target & direction of attacks, providing the applied mathematics of the report.	Briefs the problems and lack on solutions.
2	2017	Rongzhi wang et.al.,[13]	Data Secure Storage based on Tornado Codes (DSBT).	Solve the matter of data change of state	It brings series of negative issues, information security problems detection &retrieve within the information availability.
3	2018	Mylara Reddy Chinnaiah et.al.,[14]	Fault Tolerant Technique IFrFT(Frequency of Configuration interactions), ChIFrFT(Ch aracteristics& Frequency if interactions).	It achievesresponsibleness& fault tolerance of a software packages in a cost efficiency and it's better than NOFT Scheme.	%age of successful interactions is low(25 & 40%).
4	2018	J.Mahalakshmi andK.Kuppusamy [15]	Security-As–A –Service for files in Cloud Computing	An application model is developed that encrypts sensitive data and works well against cryptanalytic attacks.	Key size is restrictedand limitedparameters are verified.
5	2015	Primoz cigoj et.al.,[16]	SSO(Single Sign On) Approach	Unified access point of a management in cloud and a secure strong Authentication.	It tries to remove some vulnerability only. It requires more flexible, secure

					interfaces, control of the user data & privacy and not focusing in the technology development.
6	2014	Younis A.Younis et.al.,[12]	Novel Access Control Model.	Access necessities is dynamic, easy to handle and it is better than MAC and RBAC.	It is to perform high time &large space complexity is found.
7	2013	Jun Hu et.al.,[11]	MAC Access Control Mechanism	Provides the necessary technical &management strategies, Security of information accessing with new Access control mechanism end in controlled accessing of data by authorized users.	Securityprotocol has become the key problems.
8	2011	S.C.Wang et.al.,[10]	GroupKeyAuthenticationprotocol(GKA)	Concentrates on Authentication time. By this approach data trafficis wide reduced and Quality of Service raised.	Eventhough the QOSraisedthe Method relicspoor scalability, an vital part of CloudComputing.

IV. CLOUD DATA SECURITY ALGORITHMS

Cryptography isoutlinedbecause the science and study of remodeling message to create them secure and resistant to attacks by unauthorized user or it's the science and art of "secret writing" shown in figure 3. The original data/message, before being transformedis named as cipher text.

The methodto transform the plaintext into cipher text is understood as encryptionand therefore the process to retransform the cipher text into plaintext is understood as decryption.

The sender uses encryption algorithmand therefore the receiver uses a decryption algorithm. Thus, encryption and decryptionfacilitate to secure transmission of the message and defend the message from unauthorized users[1].

There are three forms of cryptography algorithm that are given below [2] [7]:

- Symmetric key cryptography algorithm
- Asymmetric key cryptography algorithm
- Hashing cryptography

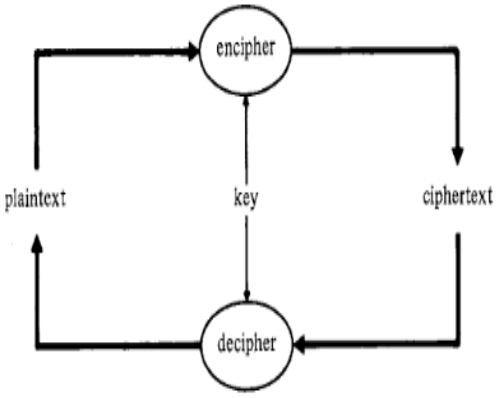

Figure 3: Secret Writing

4.1 Symmetric (Secret) Key Cryptography

This Symmetric cryptographic methodologyuses two totally different algorithms for encryption and decryption respectively, and same one key is utilized by each the sender and therefore the receiver. The sender uses this key and an encryption algorithm to code information, also the receiver uses the same key and the corresponding decryption algorithm to decrypt that data [8].

The description of some frequently used Symmetric key cryptographic algorithms are given below:

AES (Advanced Encryption Standard) could be a symmetric block encryption standard suggested by NIST[3][5] is employed for securing data with the utilization of same key for each encryptionand decryption. . It has variable key length of 128, 192, or 256 bits; default 256. It encrypts data blocks of 128 bits in 10, 12 and 14 round depending on the key size. [4] [7] [10] [11].

DES(Data Encryption Standard) is a symmetric block encryption standard to be suggested by NIST [3]. The DES algorithm is the most comprehensively utilized encryption algorithm on the planet. A similar algorithm and key are utilized for encryption and decryption, with minor contrasts. DES acknowledges a input of 64-bit long plaintext and 56-bitkey (8 bits of parity) and create output of 64 bit block [1] [2].

3DES Triple Data Encryption Algorithm (TDEA or Triple DEA) is a symmetric-key block cipher standard which is like DES strategy yet increment encryption level 3 times than DES [6]. Accordingly this is slower than other block cipher strategies. The block size of 3DES is 64 bit with 192 bits key size [7] .

BLOWFISH Blowfish is a symmetric key cryptographic algorithm that encodes 64 bit blocks with a variable length key of 128-448 bits. Blowfish is the superior than other algorithms in throughput and power utilization [8] [2].

RC4 The RC4 (Rivest Cipher 4) is an encryption algorithm that is a common key stream cipher algorithm requiring a safe exchange of a mutual key [9] [5] [6]. The RC4 encryption algorithm is utilized by normsor standards such as IEEE 802.11 inside WEP (Wireless Encryption Protocol) utilizing 40 and 128-bit keys. To produce the key stream, the cipher makes utilization of a secret internal state which comprises of two parts:

1. A permutation of all 256 possible bytes (denoted "S" below).
2. Two 8-bit index-pointers (denoted "i" and "j").

The permutation is introdced with a variable length key, regularly somewhere in the range of 40 and 256 bits, utilizing the key-scheduling algorithm (KSA).

4.2 Asymmetric (public) Key Cryptography

This cryptographic strategy makes utilization of two separate keys for encryption and decryption individually, an public key for encryption and a private key for decryption. The public key of the sender is utilized to encrypt the message by the sender. The receiver decrypts the cipher text with the assistance of a private key. A portion of the generally utilized Asymmetric key cryptographic algorithms are given below:

RSA (Rivest-Shamir-Adleman) is extensively utilized an asymmetric encryption/ decryption algorithm which includes an public key and a private key. The public key can be told to everybody and is utilized for encrypting messages. Messages encrypted with public key must be decrypted utilizing the private key. It secured client information assimilate encryption before to capacity, client transmission [4] [9] [3] [2]. 4096 bit key size is utilized for execution of RSA algorithm. RSA algorithm involves these steps: 1. Key Generation 2. Encryption 3. Decryption

DIFFIE-HELLMAN The scheme was first uncovered by Whitfield Diffie and Martin Hellman in 1976. Diffie– Hellman key trade is a particular technique for exchanging cryptographic keys [6]. It grants two parties that have no earlier knowledge of one another to mutually make a common mystery key over an insecure communications channel. This key would then be able to be utilized to encrypt posterior communications utilizing a symmetric key cipher.

PAILLIER The Paillier cryptosystem is an asymmetric algorithm given by Pascal in 1999. It has homomorphic property **allows** this scheme to do **typical expansion tasks** on **few** encrypted values and achieving the encrypted sum, the encrypted sum can be decrypted later without knowing the values ever that made up the sum.[3]

4.3 Hashing Cryptography

Hash functions are a major elementary in the field of cryptography, utilized generally in a wide range of critical applications including: message integrity and authentication [15] [16], digital signatures [1], secure time stamping, and countless others. A hash function H is an efficiently-computable algorithm that takes as input an arbitrary-length message M

and potentially a fixed-length key K (considering a keyed hash function), and makes a fixed-length output D called the message digest. H (K, M) = D Here, D = Message Output, K = Fixed Key Length, M = Input Message Length. The description of some widely used Hashing cryptography algorithms are given below:

MD5 (Message Digest5) is an extensively utilized cryptographic hash function with a 128-bit hash value. It forms a variable-size message into a fixed-length output of 128 bits [3]. The information message is isolated into chunks of 512-bit blocks; at that pointthe message is cushioned for making its length divisible by 512[4]. In this sender utilize the public key of the receiver to encrypt the message and receiver utilize its private key to decrypt the message.

MD6 The MD6 Message-Digest Algorithm is a cryptographic hash function. MD6 makes utilization of a substantially unique tree-based mode of task that takes into account more parallelism [8]. MD6 might be seen as a tree-like construction, with a 4-to-1 compression function diminishing the general length of the message at each level [2].

SHA (Secure Hashing Algorithm) is a hashing algorithm. SHA-1 is most widely utilized SHA hash function, yet rapidly it will be supplanted by more current and more stronger SHA-2 hash function. It is as of now utilized in a wide variety of applications, including TLS, SSL, SSH and PGP.SHA1 outputs a 160-bit digest of any sized file or input. SHA-256 algorithm produces an almost-unique, fixed size 256-bit (32-byte) hash [6]. This makes it appropriate for password validation, challenge hash authentication, anti-tamper, digital signatures. SHA-256 is one of the successor hash functions to SHA-1, and is one of the strongest hash functions available. SHA-256 hash functions computed with 32-bit words.

Table-4: Characteristics of Cryptography Algorithms

Scheme	Algorithm Type	Contributor	Key Length	Rounds	Block Size
AES	Symmetric	Rijindael	128,192, 256	10 or 12 or 14	128 bits
DES	Symmetric	IBM 75	56-bits	16	64 bits
3DES	Symmetric	IBM 78	168, 112 bits	48	64 bits
BLOWFISH	Symmetric	Bruce Schneier 93	128-448 bits	-	64 bits
RC4	Symmetric	Ronald Rivest 87	40-128-bits	-	-
RSA	Asymmetric	Rivest,Shamir, Adleman 77	1024	1	Minimum 512 bits
DSA	Asymmetric	NIST 91	-	-	-
Diffie-Hellman	Asymmetric	Diffie, Hellman 76	-	-	-
EI-Gamal	Asymmetric	Elgamal 84	-	-	-
Paillier	Asymmetric	Paillier 99	-	-	-
MD5	Hashing	Rivest 91	128	-	512 bit
MD6	Hashing	Prof. Rivest 08	-	-	-
SHA	Hashing	NIST 95	160	-	-
SHA256	Hashing	-	256	-	32 bit

In the table 4 demonstrates a relative summary between AES, DES, 3DES, BLOWFISH, RC4, RSA, DSA, Diffie-Hellman, EI-Gamal, Paillier, MD5, MD6, SHA and SHA256 is displayed in to five components which are Algorithms, Contributor, Key Length, Rounds and Block Size. The key sizes of the considerable number of calculations are not the same as one another.The key length of DES algorithm is 56 bits. The key size of AES algorithm is 128, 192, 256 bits. The key size of Blowfish algorithm is 128-448 bits. The key size of RSA algorithm is 1024 bits.

V. CONCLUSION

Cloud Computing is a moderately new idea that displays a decent number of advantages for its users; in any case, it likewise raises some security issues. As Cloud Computing holds numerous advancements, it likewise acquires their security issues. Security issues for cloud models: IaaS, PaaS, and IaaS, which vary depending on the

model. Storage, virtualization, and networks are the greatest security worries in Cloud Computing.

In this paper, We have centered to separate vulnerabilities and threats,where we think about vital to comprehend these issues. We made a connection among threats and vulnerabilities, so we can recognize what vulnerabilities add to the execution of these threats and make the framework more robust. We additionally talked about some current security algorithms with the end goal to relieve these security issues.New security algorithms are required and additionally there is requirement to redesign traditional solutions that can work with cloud architectures.

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Handover Classification of Vertical Handover in Mobile WiMAX Using Fuzzy Expert System

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Abstract- Mobile WiMAX (IEEE 802.16e), where WiMAX stands for Worldwide Interoperability for Microwave Contact within the past few years has become the most paramount technologies related to the flexibility for users with a high speed wireless association in Metropolitan Area Network.IEEE 802.16e provides the flexibility for users to employ the Broadband Wireless Communication even once the user is moving. The handover needed due to mobility which occurs when a user moves from one cell to the other. During the handover process, the connection between the mobile terminal and the existing base station break off. To classify the vertical handover in mobile WiMAX we use fuzzy based decision- making system in this paper. The paper was given artificial intelligence techniques like fuzzy logic to provide accurate decision process. The fuzzy rule based mostly makes exploit of expert knowledge to deal with criterion and provides an accurate decision according to rules constructed.

Keywords- IEEE 802.16e, Handover, Vertical handover, GUI

I. INTRODUCTION

WiMAX stands for "Worldwide Interoperability for Microwave Access" are based upon IEEE 802.16 standard [7]. It is a broadband wireless technology providing high speeds for long distance in metropolitan areas [8]. This technology provides triple services(voice, video and data) [1]. The IEEE 802.16 does not support mobility and due to this IEEE 802.16e-2005 was introduced [14]. It is additionally referred Mobile WiMAX that allowed full user mobility [8].It allows the user to move freely until data transmission from one cell to another cell [14]. It successfully fulfills the demands for high wireless data rate, large area coverage and low cost [8]. The handover (HO) process is crucial when user moves from one cell to other in order to shift the connection from the serving BS to the new BS, without interrupting any communication that was in progess [8]. So, Handover is an paramount and eminent concept in Wireless Networks where the term states handing over the control of transmission from a MS one BS toanother .This scheme is most likely to occur when the MS reaches the range of one BS and is entering anotherBS. One another paramount reason for a change in BS can be the overloading of BS with requests. The HO is often after the BS combine with MS called the SBS while the new BS is referred as the TBS [19].There are two types of handover in mobile WiMAX are horizontal handover and vertical handover. Horizontal handover of mobile WiMAX consist of hard and soft handover [2]. Horizontal

handoff that occurs within the same network i.e. when the mobile user switch between the networks using same technology [10]. It is additionally referred as layer 2 handover in Mobile WiMAX [1]. Vertical handover occurs in the heterogeneous wireless network i.e. when the mobile users move in different networks which have different technology [10]. It is additionally referred as layer 3 handover in Mobile WiMAX [2]. Layer 3 Protocols consist of Mobile IP (MIP), Proxy Mobile IP (PMIP) [12]. MIP based handover incurs the large handover latency the result of mobile node generate plenty of handover messages in wireless area. There is the basic downside that handover latency will increases, the general recital

of wireless network downgrade, as a result the connectivity of real time services is not maintain and lots of packet losses happen [16]. PMIP that is extremely popular recently because the network based mobility support network.The handover latency depends on messages if the messages reduce than latency also decreases as a result of a mobile node doesn't contribute in handover procedure. If layer 3 handover is provided using PMIP, the handover performance in mobile wimax can be improved by reducing variety of handover messages [16].

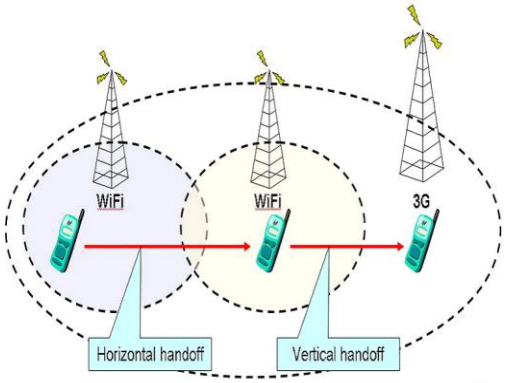

Fig. 1 Horizontal and Vertical Handover

The term "fuzzy" means hazy or vague. Thus, fuzzy theory could be a theory that aims to specific vague human language as computer language. Professor Lofti A. Zadeh at the University of California, Berkeley revealed the paper on fuzzy sets [21]. A binary logic supported the two values yes and no is usually inadequate once relating human reasoning. Fuzzy logic employs the total interval between 0(no) & 1(yes) except only two truth values to explain human reasoning [27]. In fuzzy logic, every element expresses the degree from which it belongs to a set. This is often termed as a membership value and is expressed as a real number between zero and one, wherever one denotes that an element absolutely belongs to a set, and zero denotes that an element does not belong to the set [21]. It can be employed once managing with uncertain information whereas a network shows dynamic nature. Normally a fuzzy logic consists of four main blocks: a fuzzifier, defuzzifier, inference engine, and fuzzy rule base shown in figure 3 [15]. During the fuzzifier stage, the input criterion of the fuzzy logic system will be reformed into fuzzy set [2]. The fuzzy set contains totally different level of membership in an exceedingly set as low, medium, high. A fuzzy rule base that contains a number of fuzzy IFTHEN rules [20]. In fuzzy inference engine rules are evaluated by applying if-else rules conditions. In the last defuzzification stage we obtain the crisp outputs [2]. We purpose centroid method for defuzzification. This paper discussed an expert system by making use of fuzzy logic to classify horizontal handover from its different criterion.

II. RELATED WORKS

Lee E., et al.[2017] implemented a fuzzy logic depend methods for handover decision that determined a handover is essential or not. It has been concluded that induced handover to the WiMAX network depend upon the specific factors, such as altitude and speed [25].

Sharma P., et al.[2016] implemented a fuzzy based model that reduced the handoff delay in horizontal WiMAX. As handover delay reduced packet loss also reduced and system efficiency increased. Authors concluded that handover delay reduced quite half that valid handover. As handover delay reduced, packet loss also reduced and system efficiency enhanced [2].

Kammoun A., et al.[2016] proposed a vertical handover judgment algorithmbased on fuzzy logic system for the handover initiation and on the utility function for the network selection. Authors related to the RSS-based algorithm with proposed algorithm. It has been concluded that proposed algorithm presents better performances when the mobile speed increased. [9].

Zineb A., et al.[2015] implemented a fuzzy logic supported vertical handoff decision algorithm that is to decide whether a handover is essential or not and chooses the paramount candidate access network in lower delay. Authors used Multiple Attribute Decision Making methods to make suitable handover decisions. Authors concluded that an improvement of decision time by 40 % comparing to classical approach [6].

Suganya C., et al.[2014] discussed the handovers and its role employed by the roaming user in each homogeneous and heterogeneous network. Authors concluded that hard handovers are typically used and these handovers provided seamless handovers performance [5].

Yadav J., et al[2014] implemented a method to pick out the simplest best base station for potential soft handover in WiMAX and compared the quality of services with hard handover and soft handover. It has been over that this technique provided a

seamless handover in Mobile WiMAX when the mobile station moving at the speed of 20 m/s [14].

Omar K., et al[2014] discussed two main interworking frameworks ; namely, MIH and IMS for faultless vertical handover in heterogenous networks and also proposed algorithm based on MIH using fuzzy logic. It has been over that the implemented algorithm reduced the chance of VHO link breakdown by up to 75% [4].

Khan A.N., et al.(2013) discussed many handover techniques for mobile WiMAX networks (include cross layer handover method, latency reduction in handover using mobility pattern and other Mac layer handover algorithms) and compared on the premise of handover need and latency. Authors concluded that mobility pattern scheme is most adequate and reduces the HO latency by almost 50% [8].

Gupta C., et al.(2012) presented a comparative study of assorted things of handover technique so as to produce mobility to the WiMAX network. Authors concluded that hard handover is appropriate for low speed mobile WiMAX networks. Futhermore soft handover is appropriate for high speed [15].

Grine M., et al.(2012) proposed hard handover algorithm that compute the received signal strength value and ease the mobile station to situate the location. By means of this algorithm on the entire handover reduced. Packet loss ratio also decreased [18].

III. SYSTEM MODEL

This part explains the approach adopted in constructing the fuzzy framework for decision - making system. Fuzzy build upon decision support system acquire expert knowledge, experience and understanding of IF-ELSE rules to form fuzzy inference. Thus, a fuzzy logic permits a straight forward method for manipulative a precise result with support from a vague region. Fuzzy Logic supported algorithm is proposed during this paper so as to classify of vertical handover in mobile WiMAX. Within the present paper we are using Fuzzy toolbox in Matlab for our model purpose. Handover classification are often done by victimisation certain input parameters by varying them we are able to conclude the results. The handover type we discussed during this is layer 3 or vertical handover. Vertical handover happens in between the different cells as in case of WiMAX and Wifi or WLAN and WiMAX. Input parameters used in this proposed algorithm are: Receive signal strength (RSS), BS Load data, Handover Latency, Packet Loss Ratio, Timer and output parameters are: MIP, PMIP and No Handover.

In this model we used a trapezoidal membership plot. The trapezoidal membership plot is a function acquire four variables a, b, c, d whereas a and d represent feet of trapezoidal with membership degree 0 and b and c represent shoulders of trapezoidal with membership degree 1 is illustrated by equation:

f(x;a,b,c,d)=

IV. FUZZY MODELLING AND WORKING

Fuzzy rules and fuzzy analysis isbasis to the fuzzy inference system that converts input variable (crisp value) into the fuzzy variable for the cataloguing of L3 handover in mobile WiMAX. The input parameters employed during this proposed algorithm are received signal strength, BS load data, handover latency, packet loss ratio, timer and output parameters are MIP, PMIP, No handover. Mamdani inference system is employed for classification owing to its ability for illustrates expert knowledge in a very progressive manner and works nearly like individuals. In order to design fuzzy expert system model for L3 handover classifying we have to define Membership functions for each input and output parameters. Some of the Membership functions are defined as follows:-

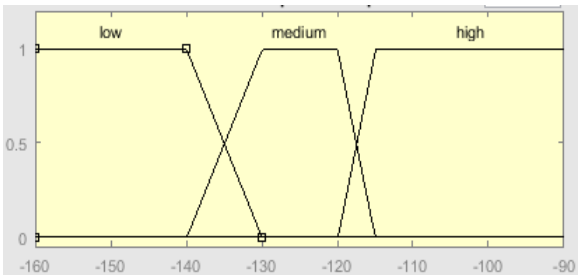

Fig. 2 Membership plot for RSS

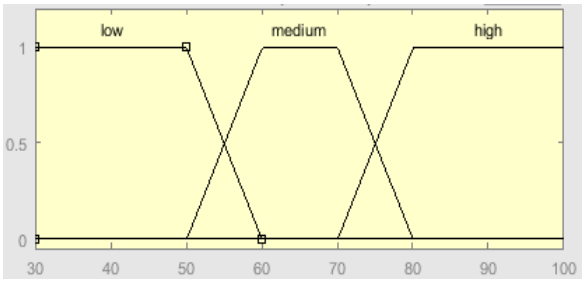

Fig. 3 Membership plot BS Load Data

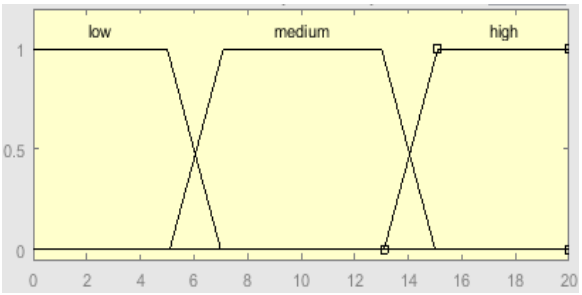

Fig.4 Membership plot for HandoverLatency

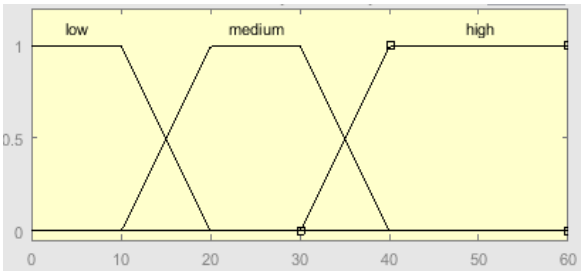

Fig. 5 Membership plot for Packet Loss Ratio

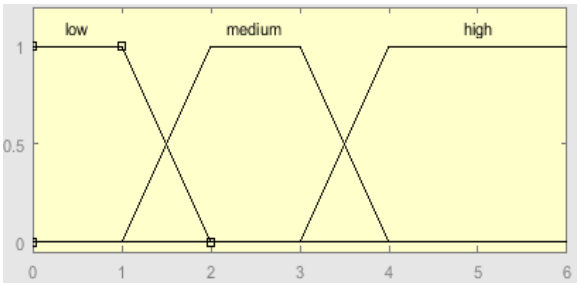

Fig. 6 Membership plot for Timer

Fig. 3 shows the membership plot for RSS is expressed in dbm. It lies of three linguistic variables low, medium and high. During this we use trapezoidal membership function for linguistic variables, for Low linguistic variable the range happens from -160dbm to -130dbm, for Medium the range is from -140 dbm to -115 dbm, for high the range is from -120 dbm to -90 dbm. Fig. 4 shows the membership plot for BSS load data the values lies in between 30 to 60% for low linguistic variable, for medium its range is from 50 to 80%, for high its range lies between 70 to 100%. Fig. 5 shows the membership plot for handover latency. Its value lies in between 0 to 7 ms for low linguistic variable. For medium its range is from 5 to 15 ms, for high its range lies between 13 to 20 ms. Fig. 6 shows the membership plot for packet loss ratio. Its value lies in between 0 to 20% for low linguistic variable, for medium its range is from 10 to 40%, for high its range lies between 30 to 60%. Fig. 7 shows the membership plot for timer, for low linguistic variable the range occurs from 0 to 2 sec, for medium its range is from 1 to 4 sec, for high its range lies between 3 to 6 sec.

After formalizing membership function for each inputs and outputs successive step is to write down rules. Rules analysis takes place in rule viewer window of fuzzy logic tool box.

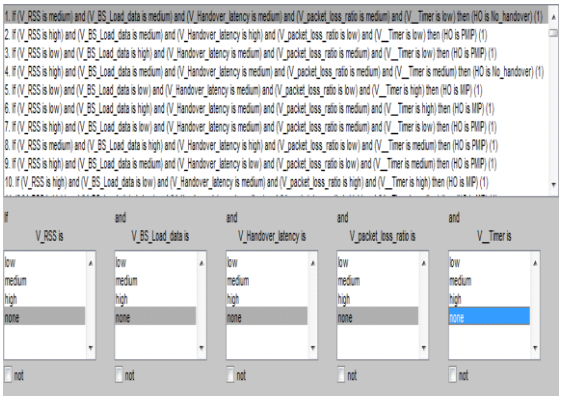

Fig. 7 Rule Editor

In Fuzzy based system model once formalizing the model we can evaluate the result exploitation rule viewer. There is a bar in rule viewer that is shown in red colour in the centre of the rules through moving this bar the values of the parameters goes on changing. Fig. 9 displays the rule viewer of the proposed system. It shows the results of whole system. From the right side at the top we get defuzzified values, we get handover = 148 which means there is PMIP.

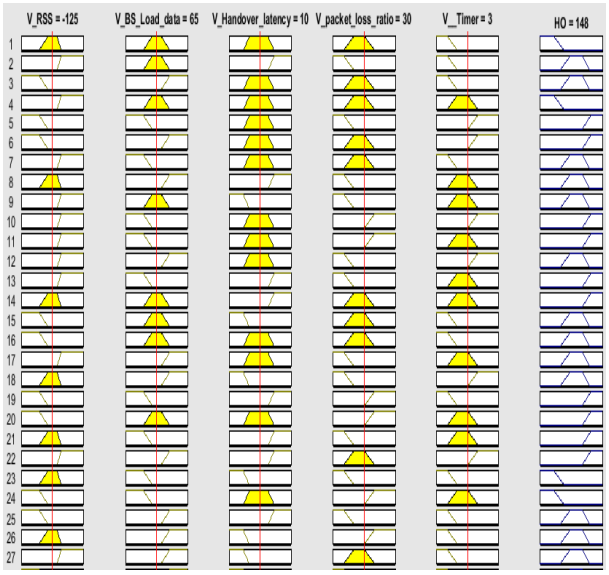

Fig. 8 Rule Viewer

A. GRAPHICAL USER INTERFACE

Graphical User Interface (GUI) provides the users a rich and hassle free environment for viewing, manipulating or running their programs.MATLAB

provides a useful tool called "GUIDE" for building GUI which stands for stands for "Graphical User Interface Development Environment" [27].GUI contain components such as: panel, pushbutton, static text, edit text, pop-up menu etc.

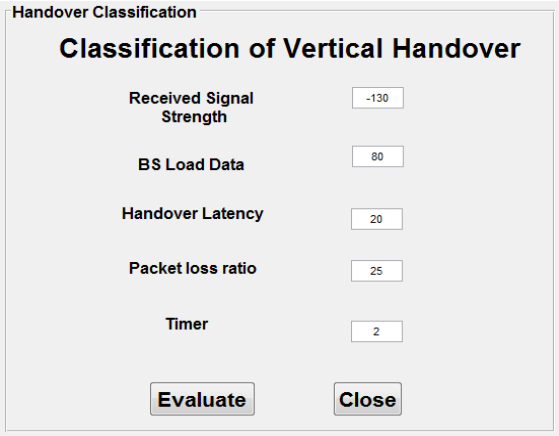

Fig. 9 GUI for classification of vertical handover

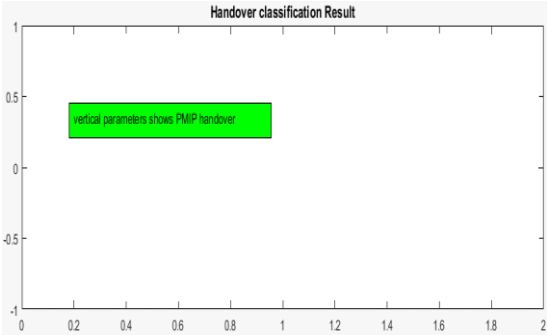

Fig. 10 Result Evaluation

VI. CONCLUSION

Handover in mobile WIMAX networks is a incredibly essential and susceptible issue. Differentiating different types of vertical handover in mobile WiMAX is extremely difficult due to structural similarities between hard and soft handover. In this paper,incontestible a fuzzy framework on decision support system for the classification of vertical handover in mobile WiMAX. The proposed fuzzy inference system predicts the type of vertical handover. Also, this system gives essential and significant conditions for classify of vertical handover. The proposed method can deal with various inputs which can be much better than to handle uncertainty throughout classification process. This present system can be extended by increasing number of inputs.

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Wireless Sensor Nodes, Networks and its Application: A Survey

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Abstract- Wireless sensor systems enholds consideration of numerous scientists. Various applications acquired by Wireless Sensor Networks includes house monitoring, automation, agriculture and security. Because many detectors apply in remote and unsafe places, its implementation and conservation should be simple and extensible. The wireless sensor network has a large number of smaller knots. Knots look for changes in the environment and inform other knots about a versatilenetwork.Detector knots are ideal for distribution in pro-environment or huge landscapes.There are different knots located at different positions, in which temperature and light measurement using the crossbow sensor indicator. This identifies a different node of the node and locates the surrounding temperature at temperature and light and sends it to the sink knots,that are linked with computers using a USB port using a flash and motor-surfing environment.

Keywords: Wireless Sensor, Knots, crossbow sensor, temperature.

I. INTRODUCTION

The wireless detection network has recently been defeated because they have the potential to revolutionize its economy and many parts of life, environmental inspection and maintenance, commercial goods, transportation and the production and management of healthcare industries. Such networks are often controlled in closed environments, such as running nodes that are not compatible with battery-powered environments. These restrictions determine that the sensor network has achieved great potential by seeing the best physical, network and application levels and by making the big businessmen dedicate themselves to laser.

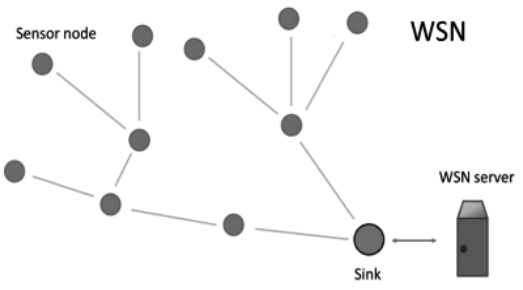

Fig. 1: Wireless Sensor Network

Improvements in wireless networks, micro-manufacturing and integration (e.g., detectors and acquisitions generated by MEMS) and embedded microprocessors, a wide extent of military and commercial utilizations , the livelihood, work Doing and communicating across the surroundings. In aquintessential detector network, each detector knot performs a small amount of memory for a microprocessor and non-signal processing and process organizing. Individual device is rigged with more than one or one finder gadgets, such as an integrated microphone, video cameras or fixed, infrared (IR), terrain or magnetic array, individual detector knot, wireless method with some additional local knots inside your radio communications extent. Communicates with theDetectors depth currently increase depth of the physical environment in the internet. The newly-defined network is in the form of faster and more vital as compared to current TCP / IP networks, and it is erecting new gridlock programs which are a lot divergent against the internet. The information collected and transmitted in an indexing network explains the physical environment, such as temperature, humidity or sponge, and the necessary search interface and search engines efficaciously support level-level tasks effectively. User sensor networks can be integrated along central IP networks through a number of gateways. A gateway route question or user commands for the pertinent knots in a sever network. This sensor directs the data, occasionally collected and compacted, to those users who request it or use the instruction. In addition to data records in each sensor, the gateway can have a data depository

service. The depository can assist as an mediator among users and indicators, allocating continuous information storage. It is familiar that 1 bit of communication through wireless media at a distance, engrosses extra energy than that bit.[5]

Datanetworking and management for the Detector Network will be much larger than generating rapid router, switches and browsers. A matrix of sensors In various applications, it is better to label knots in an indicator network, rather than IP addresses, such as node location or proximity, how data has been narrowed, has been routed, and overall Peer and a global fundamental support are based on search protocols for sensor networks and the environment.

Wireless sensitivity networks are recent year trends and immense amount of smaller knots are included. Then, the knots imagined an environmental change and told them about flexible network architecture. Sensors are ideal for applying in node-resistant environments or in larger geographic areas. Sensor nodes take advantage of the supportive efforts to provide high quality research in time and place in contrast to conventional immobile detectors, that are two main functions in the Deployment:

- The sensors can be installed far from the real process, which means that something is known by understanding. In this access, huge detectors that use some potential methods to differentiate the objective from environmental noise.

- Some censors that only raise awareness can be deployed. The location of the sensor topology and communication has been carefully designed. Transmit the time series of reported transitions to the central nodes where the calculation is performed and the data is reconstructed.

A wireless sensor network is a group of knots systematized in an interdependent network. There may be several types of memory, including an RF transceiver (usually with a single omnidirectional antenna), each node, the processing capability (one or more microcontroller, CPU or DSP chips), a Power supply (eg ex., Batteries and solar cells), and accommodate numerous detectors and actuators transmitting knots to wireless communications and often being applied on the basis of an ad ad hoc itself. Recently, wireless sensor networks are starting at a high speed. It is expected that in 10-15 years the world is covered with the wireless sensor network, with access to the Internet is stupid. It can be considered as an Internet Wireless Sensor Network is widely used in the electronics, including its new technology environments, including medical, military emergencies, transportation, entertainment, home automation and transportation control, national defense and intelligent vacations. With the endless potential for the task area, it is interesting.

1.1 Sensor Network Clustering

It is broadly untaken that a small data transmit can be used to perform various amount of arbitrary executions on the communication processor. In addition, in the solid deployment censor network, the physical environment will create alike data on the nearby sensor node and the communication of such data is more or less unnecessary. Therefore, all these facts are using some groups of knots so that the data of the knots of a group can be connected or compacted in a restrictive manner and only the brief data can be circulated . Not only can this global data be transmitted and installed, this reduces traffic and, therefore, the content in the wireless sensor network. Dense Deployment This process of sensor node grouping is known as clustering in large scale censor networks. The wise way to add and subtract data related to a cluster is known as data collection.

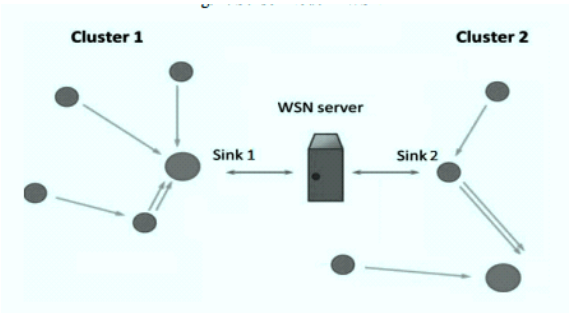

Fig.1:Clustering in WSNs.

Wireless sensitization networks include some problems in the process of grouping. The first problem is how many organizations should be formed, secondly, what number of knots should be taken in a cluster. The triennial problem is that clusters have a cluster-hand process. Another issue that has concentrated on many research articles has begun to play different roles through networks. This means that the user can put in the form of power some other powerful nodes in the network which can work as a cluster handler and a more

general knot job like a group member. Taking into account the above problems, numerous protocols are being proffered.[5]

1.2 Sensor Network Applications

A network of high-level information processing task sensors, such as search, tracking, or classification is designed to establish performance measures for these purposes are well cooked, incorporating the detection of false alarms, classification and quality errors of the way. Sensor networks are large and application requirements, method of deployment of the application, a means of detection methodology, or power supply (such as can be significantly different in the battery vs wall socket).[4] Examples of commercial and military uses incorporates :

- Industrial detection and diagnosis (for example equipment, factory, supply chain)
- Basic security (for example, electrical network, water distribution)
- Warfare or WarlandAwareness (for example, mottegraphad tracking)
- Contextual sound computing (for example, smart home, receptive environment)
- Environmental monitoring (for example traffic, housing, security)

1.3 ADVANCEMENTS OF WIRELESS SENSOR NETWORKS

With the random advancements of wireless communications, microelectricalsystems and modest power consumption designs is slowly heading towards evolution of cost-effective, energy-efficient multifunction detector knots. The detection, transmission, and battery units are the main constituents of detector knots. Single indicators posses ability to investigate events that occur in the area of their deployment.

Reliable data traffic is an important aspect of the reliability and service quality in many wireless sensor network applications. Different applications have different reliability requirements, for example, an application to collect environmental parameters such as temperature, humidity, etc. Occasionally you may ignore the occasional loss of a particular sensor value, but for an application that is an important part of the data collected by each sensor and the end-to-end reliability of each individual pack. It must be assured to each distinctive packet.[16]

Routing protocols provides sensor data transmission room for detector knots to save the nodes energy in the system. Data aggregation performs an important role in the energy conservation of the Detector Web. Data collection techniques have not only been used to find an optimal path from the source to the sink, but also to get rid of the expansion of the data, because communication is the hardest way to transmit many important raw data, and thus data transmission Reduces the number of At the same time many sensations can understand the same event, although from a different perspective and if this data can be more efficiently addressed as it passes through the network, it becomes more useful for an application. This setting is an appraisal of RFID and other related information, including information from RFID and other related information.[16]

It is a very important part of the deal, but it is not a question of confidentiality of the sensitivity of the sensors, but it can be used as an appraisal.

Various Networks of WSNs:

Researchers have focused on Wireless Sensor challenges that have limited resource capabilities of the hardware i.e. memory, processing power, bandwidth and energy deposits. Much research is currently being conducted in the following areas:

Scientists have looked at the challenges of a wireless sensor, whose hardware has limited capabilities. Memory, Processing Power, Bandwidth and Energy Deposit . Most development is being done in the following areas:

- Enhancing lifespan of the network.
- Elaborating accuracy of data transfer.
- Facilitating effortless arrangement and preservation.
- Unfolding approaches which impose safe, personal and unimpeachable networks.

There are significant applications of a wireless sensor network (WNSN) such as Remote Environment Monitoring and Target Tracking. This availability, especially in recent years, has been

enabled by the ability of small, cheaper, and intelligent sensors. These sensors are equipped with a wireless interface so that they can communicate with each other so that a network can be created. The design of a WSN depends on the application, and it should consider factors such as environmental, application design goals, price, hardware, and system deficiencies. We review many new applications and then review the literature on various aspects of WSN.

An indicator network system is created by a low-power large number of sensors and can be an effective tool for data gathering and integration by each sensor in different areas of the environment. The data collected through each sensor node is communicated through a network in a base station that uses all the collected data to determine the data properties. The cluster produces clustering sensors in groups that the sensor only transmits information to the head of the cluster and then communicates the CHs information at the base station. We estimate the number of clusters-head counted in the random sensor in a range field. Algorithm reduces total energy spent in wireless sensor networks when all sensors transmit data from cluster-head to base station.[13]

- **Sensor Military Network**

In beginning of the 1950's, the long-term sound sensor (hydropon) system, called Voice Surveillance System (SOSUS), were placed in Pacific and Atlantic seams for surveillance of schnorkel. Beam is used to detect and detect the water hazard from multiple hydrophon airways. At a Recent times, SOSUS has been taken over by more complex, unified undersea surveillance system.[3]

Air Safety Radar's network can be considered as a model of large detectors. Both ground-based radar systems and air signs and mastery systems (AWEX) have been included in networks that provide all weather monitoring and telecommunications

One more instance of sensitivity to wireless devices is the Air Dyaded Seismic Intrusion Detector (ADIS) system, which is used by the US Air Force in the Vietnam War. Each ADCID node was about 48 inches, 9 inches in diameter and weighing 38 pounds.

Next Generation Wireless Sensor Nodes

- **Wireless Integrated Network Sensor:**

The integrated wireless network sensor (WINS) creates a new one Technology of information of compact distribution and of low base Power nodes include sensors, acquisitions, calculations And communication systems [1,2] Distributed WINS nodes Autonomous, self-organized, wireless detection and Control networks (see Figure 1). WINS includes nodes Microsensor, signal processing, computing and low power Wireless networks WINS has been developed during the last five years Security in the war chef, protective operations in the vehicle position Based care and application in industrial automation And WINS healthcare technology includes MEMS devices Interface level and micro power sensor partitions Systems, signaling process and micro power RF Communication Circuit WINS also includes new signals Event identification, processing algorithm for networks Communication protocols for low power, and methods for this Traditionally developing low power WINS networks Internet Protocol and networks

By supporting the dense distribution of measuring the low cost The nodes increase the network of distribution sensors The effect of monitoring the condition (ex.Aerospace vehicles) or monitoring the ecology]Increasing the density of sampling points In addition, Current applications take advantage of significant advantages Dense distribution allows dramatic communication energy Multihop networks and low tariff reduction In the end, the WINS wireless network also benefits Tolerance to tolerance and distribution division of sensation Communication[1].

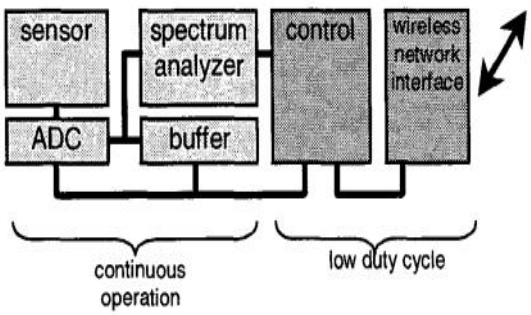

Fig.2. : Block Daigramof architecture of WINS[1]

- **Imotes-2(High-performance Wireless Sensor Network Node)**

WINS offers comparatively robust process and transmission potential, other analysts efforts are developing smaller, more efficient nodes with small power consumption. The Mica family was launched in 2001, which includes Mica, Mica 2, Mica 2 Dot and Mikes. Although Mika still used the 8-bit 4-MHz microcontroller (Atmega 103L), it had better capabilities in terms of memory and radio than previous products. [10]

Imote2 is a progressive wireless detector knot platform. Thelow-power PXA271 XScale CPU is the base of Imote2 and also adds 802.15.4 compatible radio to it. It is a modular design and has a stackable expansion boards with both top and bottom interface. The top conductors for the basic extension cards provide a certified group of I / O signals. The lower connectors provide additional high-speed interfaces for the application specific I / O. A battery-powered system can be connected on both sides.[6]

Applications

• Digital Image Processing

• Condition Based Maintenance

• Industrial Monitoring and Analysis

• Seismic and Vibration Monitoring

APPLICATIONS:

- Monitoring earthquake and vibration
- Digital Image Processing
- Maintain on the basis of the situation.
- Monitoring and Industrial Situation.

By supporting the dense distribution of measuring the low cost The nodes increase the network of distribution sensors The effect of monitoring the condition (ex.Aerospace vehicles) or monitoring the ecology]Increasing the density of sampling points In addition, Current applications take advantage of significant advantages Dense distribution allows dramatic communication energy

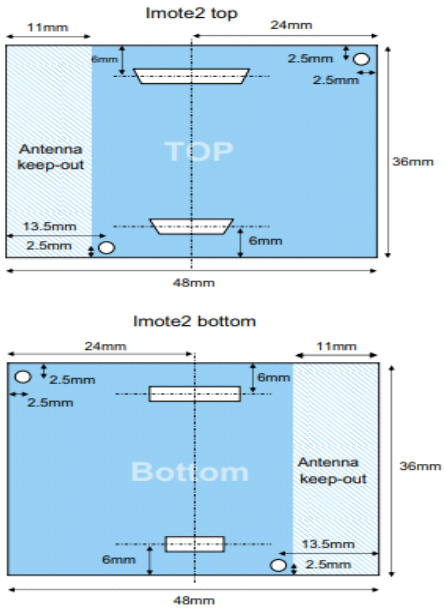

Fig3.: Imotes-2 stackable expansion boards with both top and bottom interface. [6]

- **UCLA Medusa MK-2 Node:**

The philosophies of attraction and the places of operation are quite different from those of WINS; On the one hand, the thick thickness is prepared for simple applications of detection and signal processing, where the demand for calculation and communication capabilities is low. On the other hand, Venus is an integrated version of the PDA, for the most modern complex computer applications with more medicinal space requirements. To eradicate the gap between the two entities, the Medicae MK-2 sensor node was established in 2002 in UCLA. A was made by Embedded Network Sensing (CNES). One of the special features of the Medsa MK-2 is that it is dedicated to less computer-based work, including the first two microcancrator, ATGA 128, radio base band processing and sensor sampling. Second, the AT91FR4081 is a more powerful microcontroller (40 MHz, 1 MB flash, 136 KB RAM) which can be used to store more modern, but less frequent signal processing applications (for example, Kellman Filters). The combination of these two microcontrollers provides greater flexibility in the development and deployment of WSN, especially for those requiring high computation capabilities and long-term requirements [2].

Fig4 : Medusa Knot from ULCA.[2]

NEED of Microscopic Sensor Nodes:

Changes in the small-scale indicator node have many advantages.

(1) Small sensor nodes are easy to prepare at a much lower cost than a large-scale sensor. If they also degrade, then the future value of the US $ 1 target can be understood in the future

(2) With such low cost mass and small sensor nodes, they can be highly paid with freemina or high density detection field. Therefore, the small detection range and the low level accuracy of each individual node provide a small sensation distance and many sensor lists around the target, which makes the signal-to-noise ratio (SNR) high.

(3) Computing and communication devices can be linked to the sensor, large samples in the network and intelligent information can be merged. The intelligence of the sensor node and the availability of multiple sensors on board have also increased the overall flexibility of the system.

(4) Due to its small size and self-assembly power supply, the sensor nodes can be easily deployed in areas where energy replenishment is not available, which includes an anti or hazardous environment. The nodes also increase with reduced size.

(5) The density of high nodes enables fault tolerance at the system level due to redundancy of nodes.

II. CONCLUSION

Unlike other networks, WSNs have been developed for special tasks. Applications include, in others, monitoring of the environment, monitoring of industrial machinery, monitoring systems and military locations. Each application differs in the characteristics and needs. Using the motivation and automotive configurations, the measurement of temperature and lightweight parameters has been completed. Sensors or nodes are placed at different places and the environmental standards of these places are measured. TinyOS is a very comprehensive and complicated system. There are so many applications and tools that should be studied before you can understand the whole system. From the results of our quantitative analysis of the proposed Hypercolic Cluster-based routing protocol, it indicates that the consumption of energy can be reduced systematically by adding more sensors to one group of head. The number of sensor indexes, controls and management nodes for data accumulation can be adjusted according to the network environment. In future work, changes in the size of the head size will be checked for different network conditions. This work will be expanded to include distribution of non-union organizations.

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Classify Blood Cancer by Image Processing Techniques and Fuzzy

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Abstract- Blood cancer is the biggest jeopardy invasive (suffering) cancer in human, this cancer secondary prominent cause of death for human in blood cancer. We can also say that its lukemia . When any patient is suffered from the lukemima always one question come in their mind i.e lukemia is curable or not. Yes it is curable 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. In this paper proposed a technique of image segmentation and fuzzy expert system to diagnosis the blood cancer. These tools and techniques is used to prior expose of cancer disease. Also classify the type of cancer. Acute or chronic and the stage of tumour.

Keywords—blood cancer; image segmentation, fuzzy expert system

I. INTRODUCTION

Daily Billions of cells are made in human body. Normally it develop in human body in such a systematic way of new cells only made at there, where cells are need but in cancer this act prove invalid result. Leukemia starts when cells in the bone marrow arise without any limitation. These out of growing cells usually convert in to tumor.

Leukemia is a type of cancer that affects the bone marrow causing increased production of white blood cells which influx the blood stream. Leukemia is cancers of the blood.

White blood cells may be produced in excessive amounts and are unable to work properly hichweakens the immune system. The blood is made up of fluid called plasma and three types of cells and each type has special functions [4].

Suppression of hematopoiesis and, thereafter, anemia, thrombocytopenia, and neutropenia. Immature WBC can also accumulate in various extramedullary sites, especially the system has two parts training and testing. Both the parts undergo following steps. Image acquisition is step collecting images of the blood from microscope with proper magnification from any of the hospitals. Second step is image preprocessing where following steps are followed Initially color conversion takes place; color image is converted to gray scale. Followed by filtering the image, removal of meanings, gonads, thymus, liver, spleen, and lymph nodes. Hence due to excessive lymphoid blast or myeloid blast in the marrow they also flow into the peripheral blood stream. Diagnosing leukemia is based on the fact that white cell count is increased with immature blast (lymphoid or myeloid) cells and decreased neutrophils and platelets [1].

Hematology is the study of blood, including its organs of origin, functions, diseases and disorders. In hematology, the analysis of various blood components,

especially leukocytes and erythrocytes, which are the this work, is based on the microscopic observation of stained blood smears fixed to a glass slide. The components of blood can be differentiated based on their color. When stained, the blood components usually show the following pattern: the blood plasma leukocyte cytoplasm are intermediate in brightness, and leukocyte nuclei are the darkest. [5].

Noise from the image and finally histogram Equalization is done to increase the quality of image in terms of contrast. Third step is segmentation using. Image processing is concerning with digitalimagestoextract useful information. It is involved in different other topics such as layout land use, Character recognition coin recognition , Medical imaging Medical imaginguses the information

extracted from digital image to enhance the diagnostic of different diseases. White blood diseases; Leukemia and Myeloma, threaten people's lifenowadays. Leukemia is found when the bone marr ow produces abnormal white blood cells, which don't properly.

It may be either acute or chronic. MyeloidLeukemia (AML) is sub categorized to (M0M1,M2,M3, M4,M5,M6,M7).Acute lymphoblastic leukemia (ALL) is sub categorized to (L1, L2, L3)[2].

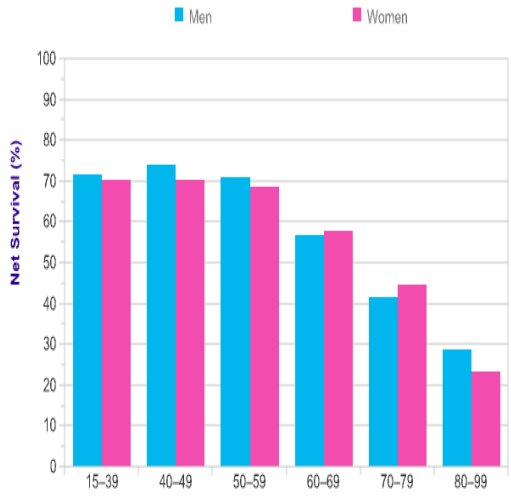

Figure.1:Death rate according to blood cancers

II. TYPES OF LEUKEMIA

A. Acute Lymphocytic Leukemia(ALL)

It occurs in children of age 1-12 years and adults of age 40 years. Here lymphocytic cell of WBCs gets affected. all Is also known as Acute Lymphoblastic Leukemia. ALL most common in men compare to women.[6]

B. Acute Myeloid Leukemia (AML*)*

It occurs in children of age 1 year and old age patient. Enlargement of spleen and bone pain these are the prime symptoms of acute myeloid leukemia. In this myeloid line of stem cells are affected.[6]

C. Chronic Leukemia

Human body does not show any symptoms at early stages.Means at early stage abnormal cells does not affect the working of normal cells. It progresses slowly and affects large area of blood cells and getting symptoms last stage. Atlast stage,it is incurabl e.[6]

D. Chronic Lymphocytic Leukemia(CLL)

It occurs in senior citizen patients who suffer from old age diseases. Lymphocytes are affected. It does not show any symptoms at early stage.[6]

III. RELATED WORK

Morphological analysis of blood slides are influenced by factors such as hematologists experience and standardized reports. A low cost and efficient solution is to use image analysis for quantitative examination of stained blood microscopic images for leukemia det ection [1].

A fuzzy based two stage color segmentation strategy is employed for segregating leukocytes or white (WBC) from other blood components. Discriminative features i.e. nucleus shape, texture are used for final detection of leukemia. In the present paper two novel shape features i.e.,

Hausdorff Dimension and contour signature is implemented for classifying a lymphocytic cell nucleus. Support Vector Machine (SVM) is employed for classification. A total of 108 blood smear images were considered for feature extraction and final performance evaluation is validated with the results of a hematologist[1].

Random Forest classifier is applied for final decision. proposed approach aims to early discovery of white blood cells cancer, reduce the misdiagnosis cases in addition to improve the system learning methodology. Moreover, allowing the experts only to have the final tuning on the result obtained from the system. The proposed approach achieved an accuracy of 93% in the first category and 95% in the second category[2].

The segmentation helps in knowing the precise size and shape of the cancer cell and the area. First we enhancement strategies to improve the quality in of contrast and standardize the pixel values in the picture Afterenhancement,egmentation is done to concentrate on area of interest; in this case it is nucleus.

K-mean segmentation used for segmentation. At that point we apply Feature extraction after that we have connected it to classifier to get the desired results as whether the cell is cancerous or not.[3]

Image acquisition is the initial step collecting images theblood from microscope with proper magnification. Concentrated for the detection process. Segmentation is followed by feature extraction where features of nucleus are extracted using GLCM and GLDM. In the training part features of pure cancer cell is stored in knowledge base. In the testing part, the cell which needs to be tested is taken as input.[3]

IV. PROPOSED WORK

This part explains the approach adopted in constructing the general fuzzy framework for call creating the system. The fuzzy inference system could be a framework that relies on fuzzy set theory, gains a and consequently induces fuzzy relationship. In order to accomplish fuzzy description to fullest i.e. to achieve terribly high interpretability, the potential to know generalization is of extremely important. The word generalization, we have a tendency to mean that ability to express the state-action agreement as compact as possible. Generalization rules grant extra compact rule base, rapid inference and higher fuzzy interpretability. A fuzzy dependent decision support system attains skilled information and skill and understanding of IF-ELSE rules to design fuzzy inference. Thus, a fuzzy expert system permits an easy method for designing a correct solution with help from an unsure region. The corresponding to a membership function defines the input attribute to its correct membership and it must in a range of (0, 1). A fuzzy set could be a set that has value and has fuzzy borderline. The trapezoidal membership plot could function having four variables a, b, c, d wherever a and d represent feet of the trapezoid with membership degree zero and b and c represent shoulders of the trapezoid with membership degree 1 is illustrated by the equation (1):

$$\text{Trapezoidal}(x;a,b,c,d) = \begin{cases} 0 & x < a \\ \dfrac{x-a}{b-a} & a \le x \le b \\ 1 & b \le x \le c \\ \dfrac{d-x}{d-c} & c \le x \le d \\ 0 & d \le x \end{cases}$$

V. FUZZY MODELLING AND WORKING

Fuzzy rules and fuzzy analysis is that the keystone to inference system that converts input variable (crisp va lue) into the fuzzy variable for the prediction of the inference system that converts input variable (crisp va lue) into the fuzzy variable for the prediction of amalady.Fuzzy IF ELSE rules are the foundations ma de victimization input (antecedents) variable and outp ut (consequent) variable within the manner IF A (INPUT) THEN D (OUTPUT) wherever A and D contain some explicit info associated with each input and output parameters. This current paper is simulation connected paper and medical decision-making system is performed victimization fuzzy toolbox in MATLAB 2013B software. This projected system is employed to predict the blood cancer tumor. The system consists of 4 numbers of input variables and 1output variable taken throughout diagnosis of leukemia. The amount of input attribute changes in skin color, lumps, fatigue, family history and abnormalities, weight changes. Every input attribute is related to two or three trapezoidal membership function. Mamdani inference system is employed for diagnosing due to its ability maybe expert knowledge in an exceedingly progressive manner and works just like mortals. Also has a capability to handle real-world applications.

Image acquisition is the initial step collecting images theblood from microscope with proper magnification. Concentrated for the detection process. Segmentation is followed by feature extraction where features of nucleus are extracted using GLCM and GLDM. In the training part features of pure cancer cell is stored in knowledge base. In the testing part, the cell which needs to be tested is taken as input

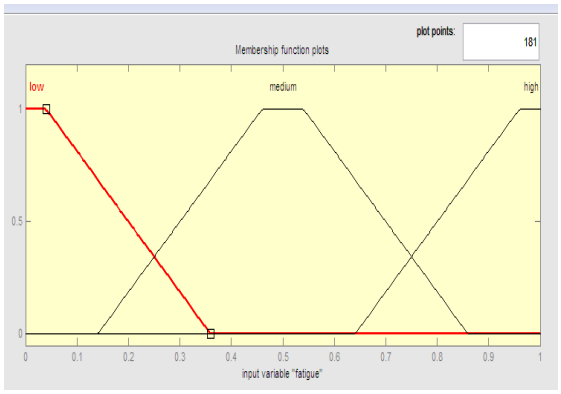

Fig. 2: Membership Plot for Change in fatigue

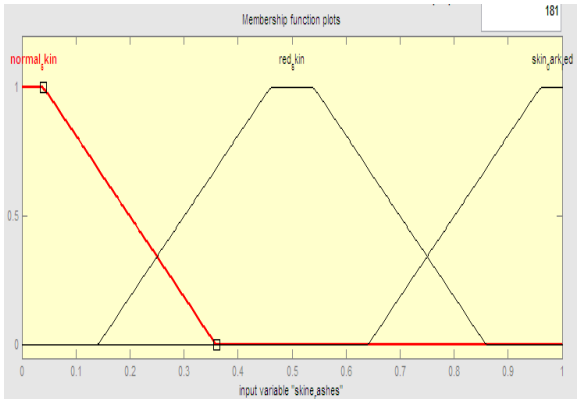

Fig. 3: Membership Plot for Change in Skin

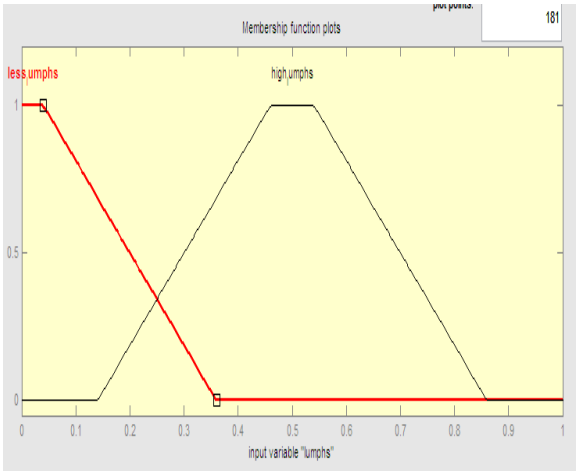

Fig. 4: Membership Plot for Change in lumps

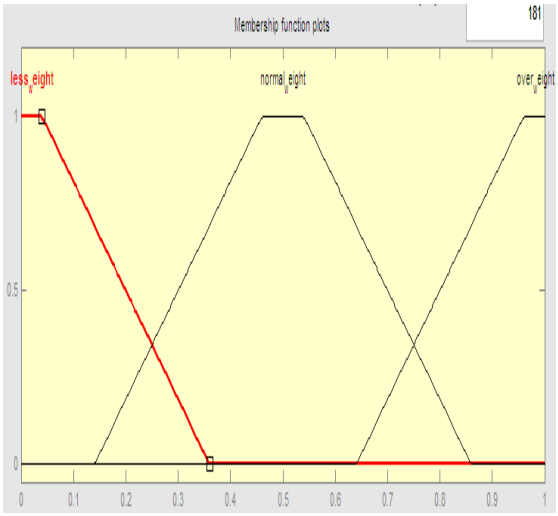

Fig. 5: Membership Plot for Change in weight

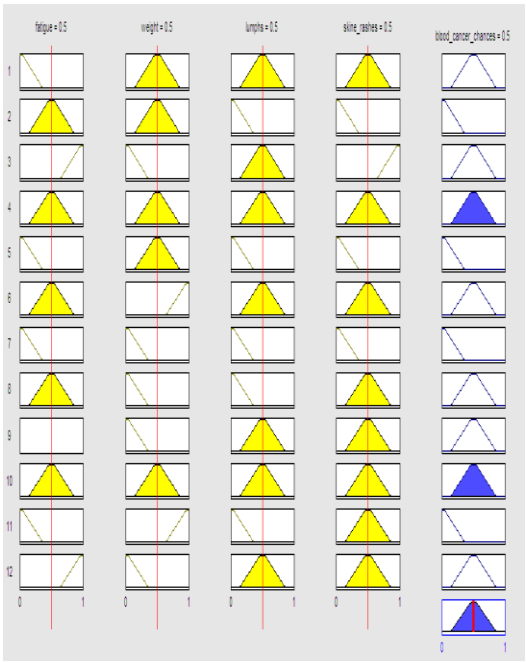

Fig. 6: result viewer

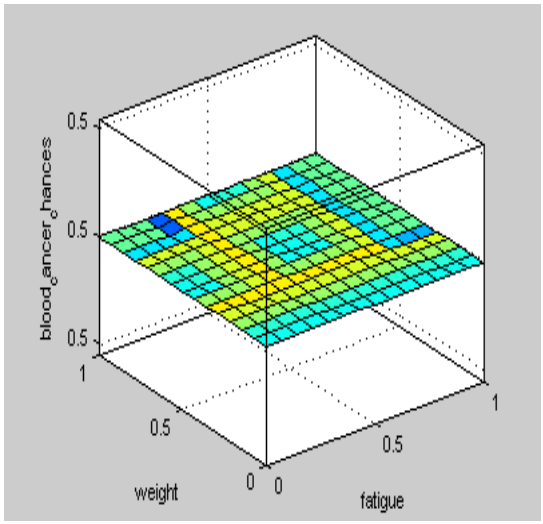

Fig:7 Result

The Defuzzification performs the reverse of fuzzification method. The Defuzzification converts thefuzzyoutput obtained from inference system into the crisp variable. The common Defuzzification technique used is the center of the area.

It indicates the results of the entire projected system. Fromtheleft side at the highest we have a tendency to get defuzzified values, we have the tendency get tumor=o.5which implies the person is stricken benign tumor. Fig 9 displays the surface plot of the change in skin color and the lump. Asthegraphindicates that as the change in skin color increases and lump is equallyincreaseinthetumor.

IV. CONCLUSION & FUTURE DIRECTION

Blood cancer start in humas when cell arise out of limit in bone marrow(BM). BM make immature cell then enter in blood stream. Due to this our bone marrow starting make WBC cell and reducing the plates count in our body . and it converts in to blast cell. We were try proposed the technique image segmentation and fuzzy system to identify and classify the blood cancer earlier. If we detect the cancer at 12 the system to the early stage than we can solve the solution early and save th e count of humans by this. The projected technique will cope with varied inputs which may be much better than to handle uncertainty during diagnosis process.

The long run work is that researchers will increase input attributes supported symptoms to form the system additional helpful for that indivisual additional helpful for that individual malady. It can also be extended

that system to possess a info which may be used for future use.

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Cyber Security Challenges and Its Emerging Trends on Current Technologies

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Abstract- Cyber Security plays an important role in the field of information technology .Securing the information have become one of the biggest challenges in the present day. Whenever we think about the cyber security the first thing that comes to our mind is 'cyber crimes' which are increasing immensely day by day. Various Governments and companies are taking many measures in order to prevent these cyber crimes. Besides various measures cyber security is still a very big concern to many. This paper mainly focuses on challenges faced by cyber security on the latest technologies. It also focuses on latest about the cyber security techniques, ethics and the trends changing the face of cyber security.

Keywords- Cyber security, cyber crime, cyber ethics, social media, cloud computing, android apps.

I. INTRODUCTION

Today man is able to send and receive any form of data may be an e-mail or an audio or video just by the click of a button but did he ever think how securely his data id being transmitted or sent to the other person safely without any leakage of information?? The answer lies in cyber security. Today Internet is the fastest growing infrastructure in everyday life. In today's technical environment many latest technologies are changing the face of the mankind. But due to these emerging technologies we are unable to safeguard our private information in a very effective way and hence these day's cyber crimes are increasing day by day. Today more than 60 percent of total commercial transactions are done online, so this field required a high quality of security for transparent and best transactions. Hence cyber security has become a latest issue. The scope of cyber security is not just limited to securing the information in IT industry but also to various other fields like cyber space etc. Even the latest technologies like cloud computing, mobile computing, E-commerce, net banking etc also needs high level of security. Since these technologies hold some important information regarding a person their security has become a must thing. Enhancing cyber security and protecting critical information infrastructures are essential to each nation's security and economic wellbeing. Making the Internet safer (and protecting Internet users) has become integral to the development of new services as well as governmental policy. The fight against cyber crime needs a comprehensive and a safer approach. Given that technical measures alone cannot prevent any crime, it is critical that law enforcement agencies are allowed to investigate and prosecute cyber crime effectively. Today many nations and governments are imposing strict laws on cyber securities in order to prevent the loss of some important information. Every individual must also be trained on this cyber security and save themselves from these increasing cyber crimes.

II. CYBER CRIME

Cyber crime is a term for any illegal activity that uses a computer as its primary means of commission and theft. The U.S. Department of Justice expands the definition of cyber crime to include any illegal activity that uses a computer for the storage of evidence. The growing list of cyber crimes includes crimes that have been made possible by computers, such as network intrusions and the dissemination of computer viruses, as well as computer-based variations of existing crimes, such as identity theft, stalking, bullying and terrorism which have become as major problem to people and nations. Usually in common man's language cyber crime may be defined as crime committed using a computer and the internet to steal a person's identity or sell contraband or stalk victims or disrupt operations with malevolent programs. As day by day technology is playing in major role in a person's life the cyber crimes also

will increase along with the technological advances.

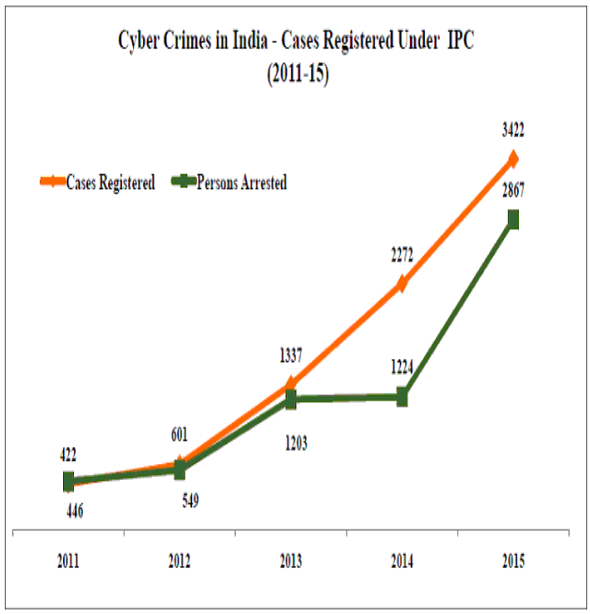


Fig-1Cyber crimes in India- cases registered under IPC (2011-2015)

III. CYBER SECURITY

Privacy and security of the data will always be top security measures that any organization takes care. We are presently living in a world where all the information is maintained in a digital or a cyber form. Social networking sites provide a space where users feel safe as they interact with friends and family. In the case of home users, cyber-criminals would continue to target social media sites to steal personal data. Not only social networking but also during bank transactions a person must take all the required security measures.

Table I

Incidents	**Jan-June 2012**	**Jan-June 2013**	**% Increase/ (decrease)**
Fraud	2439	2490	2
Intrusion	2203	1726	(22)
Spam	291	614	111
Malicious code	353	442	25
Cyber Harassment	173	233	35
Content related	10	42	320
Intrusion Attempts	55	24	(56)
Denial of services	12	10	(17)
Vulnerability reports	45	11	(76)
Total	5581	5592	

The above Comparison of Cyber Security Incidents reported to Cyber999 in Malaysia from January–June 2012 and 2013 clearly exhibits the cyber security threats. As crime is increasing even the security measures are also increasing. According to the survey of U.S. technology and healthcare executives nationwide, Silicon Valley Bank found that companies believe cyber attacks are a serious threat to both their data and their business continuity.

98% of companies are maintaining or increasing their cyber security resources and of those, half are increasing resources devoted to online attacks this year.

The majority of companies are preparing for when, not if, cyber attacks occur.

Only one-third are completely confident in the security of their information and even less confident about the security measures of their business partners.

There will be new attacks on Android operating system based devices, but it will not be on massive scale. The fact tablets share the same operating system as smart phones means they will be soon targeted by the same malware as those platforms. The number of malware specimens for Macs would continue to grow, though much less than in the case of PCs. Windows 8 will allow users to develop applications for virtually any device (PCs, tablets and smart phones) running Windows 8, so it will be

possible to develop malicious applications like those for Android, hence these are some of the predicted trends in cyber security.

IV. TRENDS CHANGING CYBER SECURITY

Here mentioned below are some of the trends that are having a huge impact on cyber security.

4.1 Web servers

The threat of attacks on web applications to extract data or to distribute malicious code persists. Cyber criminals distribute their malicious code via legitimate web servers they've compromised. But data-stealing attacks, many of which get the attention of media, are also a big threat. Now, we need a greater emphasis on protecting web servers and web applications. Web servers are especially the best platform for these cyber criminals to steal the data. Hence one must always use a safer browser especially during important transactions in order not to fall as a prey for these crimes.

4.2 Cloud computing and its services

These days all small, medium and large companies are slowly adopting cloud services. In other words the world is slowly moving towards the clouds. This latest trend presents a big challenge for cyber security, as traffic can go around traditional points of inspection. Additionally, as the number of applications available in the cloud grows, policy controls for web applications and cloud services will also need to evolve in order to prevent the loss of valuable information. Though cloud services are developing their own models still a lot of issues are being brought up about their security. Cloud may provide immense opportunities but it should always be noted that as the cloud evolves so as its security concerns increase.

4.3 APT's and targeted attacks

APT (Advanced Persistent Threat) is a whole new level of cyber crime ware. For years network security capabilities such as web filtering or IPS have played a key part in identifying such targeted attacks (mostly after the initial compromise). As attackers grow bolder and employ more vague techniques, network security must integrate with other security services in order to detect attacks. Hence one must improve our security techniques in order to prevent more threats coming in the future.

4.4 Mobile Networks

Today we are able to connect to anyone in any part of the world. But for these mobile networks security is a very big concern. These day's firewalls and other security measures are becoming porous as people are using devices such as tablets, phones, PC's etc all of which again require extra securities apart from those present in the applications used. We must always think about the security issues of these mobile networks. Further mobile networks are highly prone to these cyber crimes a lot of care must be taken in case of their security issues.

4.5 IPv6: New internet protocol

IPv6 is the new Internet protocol which is replacing IPv4 (the older version), which has been a backbone of our networks in general and the Internet at large. Protecting IPv6 is not just a question of porting IPv4 capabilities. While IPv6 is a wholesale replacement in making more IP addresses available, there are some very fundamental changes to the protocol which need to be considered in security policy. Hence it is always better to switch to IPv6 as soon as possible in order to reduce the risks regarding cyber crime.

4.6 Encryption of the code

Encryption is the process of encoding messages (or information) in such a way that eavesdroppers or hackers cannot read it. In an encryption scheme, the message or information is encrypted using an encryption algorithm, turning it into an unreadable cipher text. This is usually done with the use of an encryption key, which specifies how the message is to be encoded. Encryption at a very beginning level protects data privacy and its integrity. But more use of encryption brings more challenges in cyber security. Encryption is also used to protect data in transit, for example data being transferred via networks (e.g. the Internet, ecommerce), mobile telephones, wireless microphones, wireless intercoms etc. Hence by encrypting the code one can know if there is any leakage of information. Hence the above are some of the trends changing the face of cyber security in the world. The top network threats are mentioned in below:

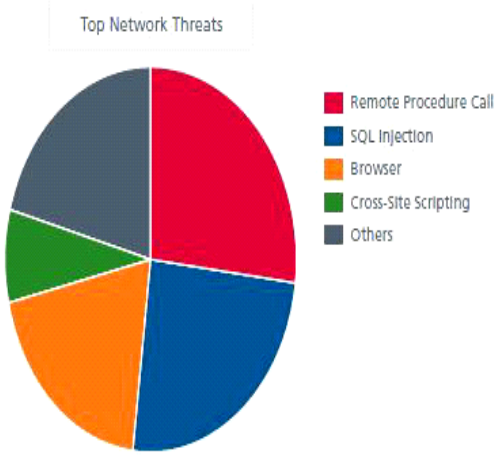


Fig-2 The above pie chart shows about the major threats for networks and cyber security.

V. ROLE OF SOCIAL MEDIA IN CYBER SECURITY

As we become more social in an increasingly connected world, companies must find new ways to protect personal information. Social media plays a huge role in cyber security and will contribute a lot to personal cyber threats. Social media adoption among personnel is skyrocketing and so is the threat of attack. Since social media or social networking sites are almost used by most of them every day it has become a huge platform for the cyber criminals for hacking private information and stealing valuable data. In a world where we're quick to give up our personal information, companies have to ensure they're just as quick in identifying threats, responding in real time, and avoiding a breach of any kind. Since people are easily attracted by these social media the hackers use them as a bait to get the information and the data they require. Hence people must take appropriate measures especially in dealing with social media in order to prevent the loss of their information. The ability of individuals to share information with an audience of millions is at the heart of the particular challenge that social media presents to businesses. In addition to giving anyone the power to disseminate commercially sensitive information, social media also gives the same power to spread false information, which can be just being as damaging. The rapid spread of false information through social media is among the emerging risks identified in Global Risks 2013 report. Though social media can be used for cyber crimes these companies cannot afford to stop using social media as it plays an important role in publicity of a company. Instead, they must have solutions that will notify them of the threat in order to fix it before any real damage is done. However companies should understand this and recognize the importance of analyzing the information especially in social conversations and provide appropriate security solutions in order to stay away from risks. One must handle social media by using certain policies and right technologies.

VI. CYBER SECURITY TECHNIQUES

6.1 Access control and password security

The concept of user name and password has been fundamental way of protecting our information. This may be one of the first measures regarding cyber security.

6.2 Authentication of data

The documents that we receive must always be authenticated be before downloading that is should be checked if it has originated from a trusted and a reliable source and that they are not altered. Authenticating of these documents is usually done by the antivirus software present in the devices. Thus good antivirus software is also essential to protect the devices from viruses.

6.3 Malware scanners

This is software that usually scans all the files and documents present in the system for malicious code or harmful viruses. Viruses, worms, and Trojan horses are examples of malicious software that are often grouped together and referred to as malware.

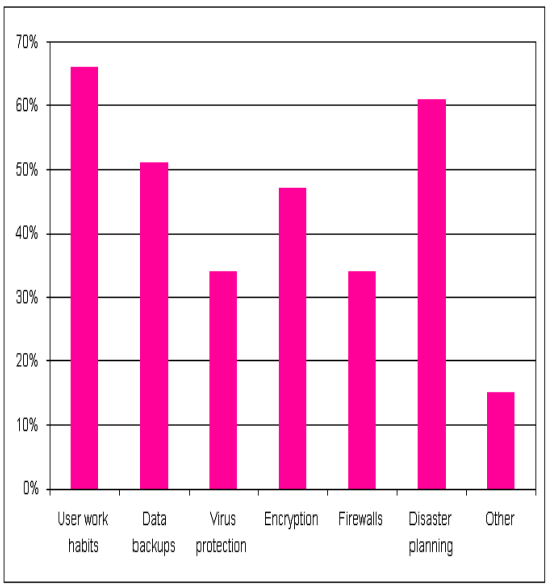
6.4 Firewalls

A firewall is a software program or piece of hardware that helps screen out hackers, viruses, and worms that try to reach your computer over the Internet. All messages entering or leaving the internet pass through the firewall present, which examines each message and blocks those that do not meet the specified security criteria. Hence firewalls play an important role in detecting the malware.

6.5 Anti-virus software

Antivirus software is a computer program that detects, prevents, and takes action to disarm or remove malicious software programs, such as viruses and worms. Most antivirus programs include an auto-update feature that enables the program to download profiles of new viruses so that it can check for the new viruses as soon as they are discovered. An antivirus software is a must and basic necessity for every system.

Table II: Techniques on cyber security



VI. CYBER ETHICS

Cyber ethics are nothing but the code of the internet. When we practice these cyber ethics there are good chances of us using the internet in a proper and safer way the below are a few of them:

- DO use the Internet to communicate and interact with other people. Email and instant messaging make it easy to stay in touch with friends and family members, communicate with work colleagues, and share ideas and information with people across town or halfway around the world
- Don't be a bully on the Internet. Do not call people names, lie about them, send embarrassing pictures of them, or do anything else to try to hurt them.
- Internet is considered as world's largest library with information on any topic in any subject area, so using this information in a correct and legal way is always essential.
- Do not operate others accounts using their passwords.
- Never try to send any kind of malware to other's systems and make them corrupt.
- Never share your personal information to anyone as there is a good chance of others misusing it and finally you would end up in a trouble.
- When you're online never pretend to the other person, and never try to create fake accounts on someone else as it would land you as well as the other person into trouble.
- Always adhere to copyrighted information and download games or videos only if they are permissible. The above are a few cyber ethics one must follow while using the internet. We are always thought proper rules from out very early stages the same here we apply in cyber space.

VIII. CONCLUSION

Computer security is a vast topic that is becoming more important because the world is becoming highly interconnected, with networks being used to carry out critical transactions. Cyber crime continues to diverge down different paths with each New Year that passes and so does the security of the information. The latest and disruptive technologies, along with the new cyber tools and threats that come to light each day, are challenging organizations with not only how they secure their infrastructure, but how they require new platforms and intelligence to do so. There is no perfect solution for cyber crimes but we should try our level best to minimize them in order to have a safe and secure future in cyber space.

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Performance Comparison of Mobility Techniques in Unmanned Aerial Vehicle (UAV) based WSN

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Abstract : Unmanned aerial vehicle(UAV) based WSN[4]is designed in areas where human approachability is zero. UAV networks consist of multiple mobile UAV's acting as nodes capable of data gathering, processing and communication also. These vehicles rely on onboard batteries for their operations as well as movement. So efficient mobility models were designed so as to minimize the consumption of battery's voltage. This paper presents the comparison of different mobility techniques[1] in the event driven UAV based Wireless Sensor Network (WSN) on the basis of their energy consumption values as well as node density. OMNET++ 5.5is used for the designing and computation of this UAV wireless sensor network.

Keywords: UAV basedWSN, Energy consumption, Mobility models,Modulation,MIXIM, OMNET ++.

I. INTRODUCTION

UAV is a kind of mobile node(Drone) that can be controlled remotely or fly separately through software-controlled flight plans in their embedded systems, working in concurrence with onboard sensors and GPS. In the past, UAVs were generally associated with the military actions, where they were used initially for intelligence gathering, anti-aircraft target practice, or as weapons platforms. Now a days, Drones are used in a wide range of applications like, surveillance, traffic monitoring, weather monitoring, drone-based photography, as well as videography, agriculture and even delivery services also.

The UAVs plays a significant role in gathering information about the areas which are not suitable with respect to human survival or where human approachability is nearly zero. UAVs can capture information easily from those kinds of areas as they are controlled remotely by human beings and they continuously transmit the monitored information to the human base stations.

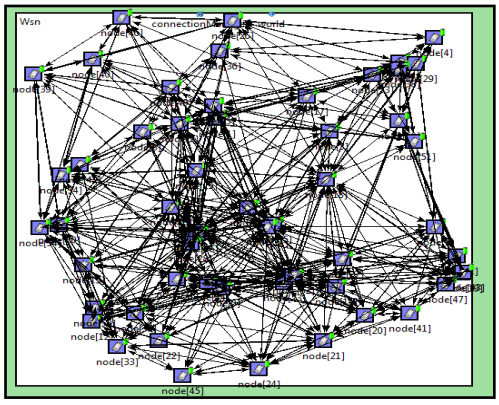

Figure 1: Wireless sensor network

A Typical Unmanned Aerial Vehicle based Wireless Sensor Network (WSN) consists of individual mobile nodes which are proficient to interact with their environment by sensing and controlling physical parameters. These nodes are deployed in very large number to collect the information as their communication as well as mobility ranges are finitely defined. These nodes have to work together to accomplish their tasks as, usually, a single node is incapable of doing so and

wireless communication helps them to enable this collaboration.

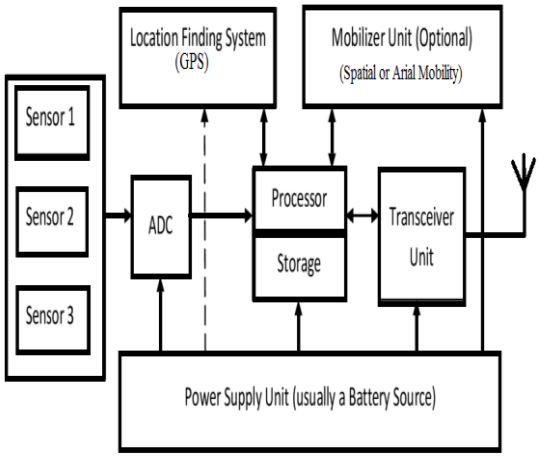

Figure 2: Typical mobile sensor node

The purpose of choosing mobile nodes in place of static node in these kinds of environments is to reduce the load of nodes which are present near the sink terminal. In case of static network, energy of nodes which are present near to base station is continuously draining as these nodes were all time busy in transferring the data sensed by other nodes to the base station. So to remove this problem and to make the network more energy-efficient, the concept of mobility is introduced in the WSNs. With the help of the mobility, the nodes can move in the network and share their responsibility of transmitting data to the base station or sink[6]. With the help of the mobility, the efficiency of sensing an event is also increased. But in addition to this, there is a drawback of mobility that the movement of nodes also consumes energy from the onboard batteries. So to cope up with this drawback there is a need of energy-efficientmobility models.

OMNET++ 5.5[14] with MIXIM 2.3is used for the designing and computation of energy consumption for different mobility models used in UAV based wireless sensor network. The performance of these models is also checked for variable node density (50,100,150,200).

MIXIM[13] is an modeling framework created for mobile and fixed wireless networks in OMNET++.It provides a user-friendly graphical representation of wireless networks in OMNET++

In Section 2, we are going to describe the system architecture. After that we present our scenario wiseanalysis and their results in Section 3. Finally, our concluding remarks are presented in Section 4.

II. SYSTEM ARCHITECTURE

This UAV based network architecture have variable node density of 50,100,150,200 nodesi.e. mobility models were analyzed for increasing node density in the fixed 3D environment of size 500*500*500 m^3. The communication between the sink node and other sensor nodes is totally based on IEEE 802.15.4[8] standard. The frequency band of 2.4 GHz is used in this network as it has the highest data rate of value 250Kbps.The modulation technique used is Minimum Shift Keying.

A. 2.1 Connection manager

It is responsible for connections between different nodes of WSN. Some of the parameter which is common in both the scenarios isshown below:-

Table 1

Parameters	Values
No. of nodes	50,100,150,200
Channel frequency	2.4 GHz
Max. transmission power	1.1m
Attenuation threshold	-100dBm
Minimum Path loss coefficient (ALPHA)	2.5
Physical layer sensitivity	-100dBm
Battery capacity	1000 mAh
Battery voltage	3 V
Network header length	24 bit
Sink address	Node 0

B. Mobility Models

The four different mobility models used in this work are explained below:-

a. GaussMarkovMobility

In this technique, gauss Markov principle is used to control the randomness of movement of the nodes in the environment. We can also call this randomness as Brownian motion. For totally random motion, the value of parameter a called randomness factor is taken to be zero.

b. LinearNodeDistributionMobility

In Linear Mobility model, all hosts are placed at constant distances in a line with an orientation. While applying this mobility technique in the network, we must initialize mobility model parameters, positions as well as orientation values.

c. ConstSpeedMobility

In this technique, the whole movement of the host nodes is performed in controlled manner. Initially, velocity and update interval for each Host is defined. If the velocity is greater than zero, thenthis module calculates a random target position for the Host.

d. StationaryMobility

As the name stationary Mobility shows, there is no net movement of the nodes in the network i.e. the whole network is static in nature. So there is an increase in no. of hops required for communication with the sink which directly increase the average energy consumption value of the network.

III. Analysis of UAV based WSN

Four scenarios are created on the basis of node density and analysis of UAV based WSN is performed for all four possible scenarios.Moreover comparison of mobility models is also shown for each scenario.

Scenario 1: node density=50

Table 2

Sr. no.	Mobility models	Energy(mWs)
1	LD	0.0862
2	CS	0.1253
3	GM	0.1193
4	SM	0.1395

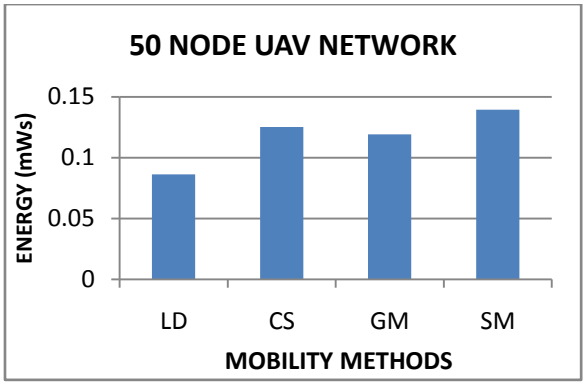

Figure 3: Energy v/s mobility methods

The above table2 and figure 3 shows the energy consumption value of the 50 node UAV network. It is shown that a stationary mobility technique is least energy-efficient whereas linear node distribution technique is the most energy-efficient technique among all mobility techniques.

Scenario 2: node density=100

Table 3

Sr. no.	Mobility models	Energy(mWs)
1	LD	0.0636
2	CS	0.0771
3	GM	0.079
4	SM	0.0839

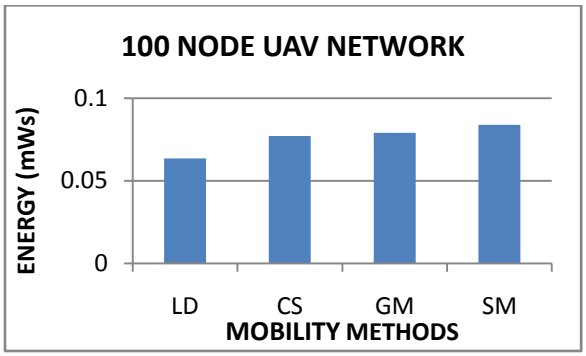

Figure 4: Energy v/s mobility methods

The above table3 and figure 4 shows the energy consumption value of the 100 node UAV network. It is shown that energy consumption achieved by linear node distribution mobility technique is lowest as compared to all mobility techniques.

Scenario 3: node density=150

Table 4

Sr. no.	Mobility models	Energy(mWs)
1	LD	0.0595
2	CS	0.0681
3	GM	0.0683
4	SM	0.074

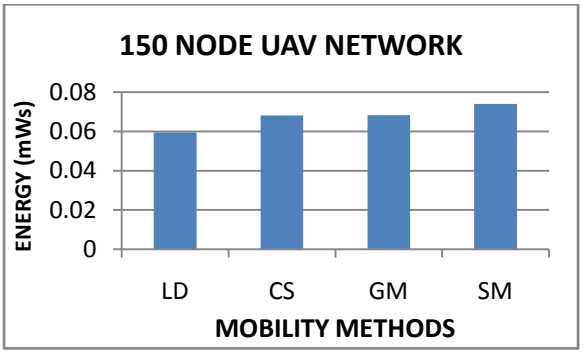

Figure 5: Energy v/s mobility methods

The above graph shows variation in the energy consumption achieved by all the mobility techniques. It is shown that linear node distribution technique consumes lowest energy in comparison to all techniques.

Scenario 4: node density=200

Table 5

Sr. no.	Mobility models	Energy(mWs)
1	LD	0.0574
2	CS	0.0637
3	GM	0.0618
4	SM	0.065

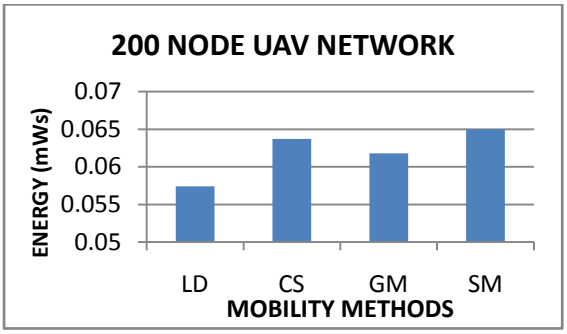

Figure 6: Energy v/s mobility methods

In 200 node scenario, the energy consumption shown above is minimum than all previous scenarios for each mobility model.

IV. CONCLUSION

In this paper, we have greatly experienced the use of network simulation software OMNET++. We have simulated different scenarios based on parameters such as node density and mobility models in case of UAV based WSN and analyzedthe energy consumption value for the above said parameters.By analyzing these scenarios we have concludedthat, energy consumption in case of linear node distribution mobility model/technique is lowest among all the mobility models used in the network. It is also observed that with an increase in node density in a particular area, average energy consumption reduces as coverage of the network enhances with increase in no. of nodes in that environment. With anincrease in coverage, less retransmission of data packets are required between sensors and hence improve Quality of service of the network.

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Handover Schemes in Mobile WiMAX(IEEE 802.16e): A Review

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Abstract: Mobile WiMAX (IEEE 802.16e), where WiMAX stands for Worldwide Interoperability for Microwave Access within the past few years has become one of the most paramount technologies as a result of it's the flexibility for users with a high speed wireless association in a Metropolitan Area Network. IEEE 802.16e provides the flexibility for users to use the Broadband Wireless Communication even once the user is moving. Mobility brings with it the need of handovers which occur when a user moves from one cell to the other. During the handoff process, the connection between the mobile terminal and the serving base station break off. In this paper, we have discussed about and types of Mobile WiMAX handover.

Keywords- IEEE 802.16e, Handover, Types of Handover.

I. INTRODUCTION

WiMAX stands for "Worldwide Interoperability for Microwave Access" which is based upon IEEE 802.16 standard [7]. It is a broadband wireless technology providing high speeds for long distance in metropolitan areas [8]. It is the technology that is able to provide triple services(voice, video and data) [1]. The initial standard IEEE 802.16 does not support mobility and for this purpose IEEE 802.16e-2005 was introduced [14]. It is additionally referred to as Mobile WiMAX that allowed full user mobility [8].It allows the user to move freely until data transmission [14]. It successfully fulfills the demands for high wireless data rate, large area coverage and low cost [8]. When a user moves from one cell to another, a handover (HO) process is crucialin order to switch the wireless connection from the serving BS to the new BS, without interrupting any communication that was in progess [8]. So, Handover is an paramount and eminent concept in Wireless Networks where the term states handing over the control of transmission from a MS from One BS to another. This scheme is most likely to occur when the MS reaches the range of one BS and is entering another BS. One another paramount reason for a change in BS can be the overloading of BS withrequests. The BS combine with the MS before the HO is often called the SBS while the new BS is referred to as the TBS [19]. The IEEE 802.16 standard defines the Wireless Metropolitan Area Network air interface specification (officially known as the IEEE Wireless MAN standard) [20].

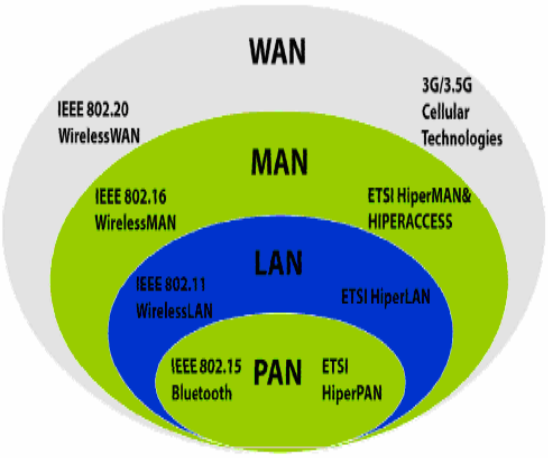

Figure 1: Wireless Standards [1]

Figure 1, shows the various wireless standards. The IEEE 802.16 Working Group is the IEEE group for Wireless Metropolitan Area Network

II. RELATED WORKS

Lee E., et al.[2017] proposed a fuzzy logic based methods for handover decision that determined a handover is necessary or not. Authors concluded that induced handover to the WiMAX network depend upon the specific factors, such as altitude and speed [25].

Sharma P., et al.[2016] proposed a fuzzy based model which reduced the handoff delay inhorizontal WiMAX. As handover delay reduced packet loss also reduced and system efficiency increased. Authors concluded that handoff delay reduced more than half of that valid handoff .packet loss also reduced and system efficiency delay [2].

Kammoun A., et al.[2016] proposed a vertical handover decision algorithm based on fuzzy logic system for the handover initiation and on the utility function for the network selection. Authors compared to the RSS-based algorithm. Authors concluded that proposed algorithm presents better performances when the mobile speed increased. [9].

Zineb A., et al.[2015] proposed a fuzzy logic based vertical handoff decision algorithm that is to determine whether a handoff is necessary or not, and selects the best candidate access network in lower delay. Authors used Multiple Attribute Decision Making methods to make suitable handover decisions. Authors concluded that an improvement of decision time by 40 % comparing to classical approach [6].

Suganya C., et al.[2014] discussed the handovers and its functions used by the roaming user in both homogeneous and heterogeneous network .Authors concluded that hard handovers are generally used and these handovers provided seamless handovers performance [5].

Yadav J., et al[2014] proposed a technique to select the best base station for potential soft handover in WiMAX and compared the quality of services with hard handover and soft handover. Authors concluded that this technique provided a seamless handover in Mobile WiMAX when the mobile station moving at the speed of 20 m/s [14].

Omar K., et al[2014] discussed two main interworking frameworks ; namely, MIH and IMS for seamless vertical handover in heterogenous networks and also proposed algorithm based on MIH using fuzzy logic. Authors concluded that the proposed algorithm reduced the probability of VHO connection failure by up to 75% [4].

Khan A.N., et al[2013] discussed Several handoff techniques for mobile WiMAX networks (include cross layer handover technique, latency reduction in handover using mobility pattern and other Mac layer handover algorithms) and compared on the basis of handover requirement, and latency. Authors concluded that mobility pattern scheme is most efficient and reduces the HO latency by almost 50% [8] .

Nandal D., et al.[2012] presented an analysis of Mobile WiMAX standard handover procedure and types. Authors concluded thatthe handover process before HO initiation, network topology acquisition including network topology advertisement, neighboring base station (BS) scanning, and the target BS association are carried out by backbone network [7].

Prakash G., et al. (2011) presented the features of the Wimax technology and future benefits of Wimax. Authors concluded that Wimax become the leading standard for Wireless MAN networks in the world market place [21].

III. HANDOVER IN MOBILE WIMAX

A special demand for a mobile device is the ability to change the serving Base Station (BS) if there exists another BS with better link quality in the reach of the Mobile Node (MN) [5]. HO is defined as a process in which a mobile node (MN) shiftfrom the air interface provided by one BS to the air interface provided by another BS [5]. It is basically used to hook up one base station to another base station in order to remain the continuity of the call [2].It is a process to maintain the connection in the communication session when a MS moves from one location to another between the coverage areas of various BSs [10] as shown in fig 2.

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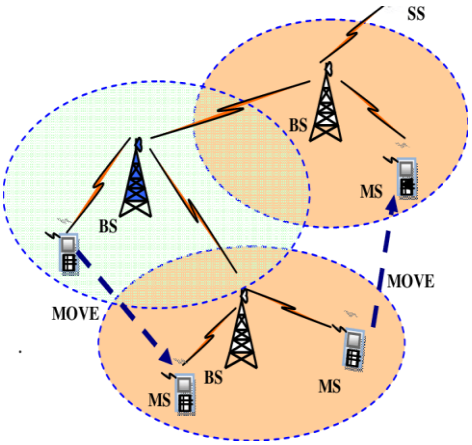

Figure 2: WiMAX Handover [19]

3.1 The reasons for HO can be various they are [5],

1) RSS is not enough for maintain suitable connection at the edge of the cell, the call needs to be transferred to another cell.

2) When the MSS is moving away from thearea covered by on BS and entering into the area covered by another BS, then handover is required to transfer the connection of MSS form current BS to other BS before the MSS moves out of the range of first BS, to avoid call termination [16].

3) When the traffic handling capacity of any BS is exhausted then in order to accommodate more or new calls, loaded BS by means of handover transfers the ongoing or newly originated call to the neighboring BS with overlapping coverage area [16].

4) In vertical handoff, a rapid network is occasionally available changes its network to thecheaper one.

IV. TYPES OF HANDOVER IN MOBILE WIMAX

HO is a method to continue the connection within the communication session once a MS shifts from one location to a different between the coverage areas of various BSs. In this case, handover is broadly classified into two types that are horizontal handover and vertical handover. Various protocols are defined separately for handover in layer 2 and layer 3 as shown in figure 3.

4.1 Horizontal Handover

Horizontalhandover that only occurs within the same network i.e. when the mobile users switch between the networks with the same technology [10]. It is additionally referred to as layer 2 handover in Mobile WiMAX [1].Fig 3 depicts horizontal Handover, When MS moves from WiMAX network to WiMAX network, i.e. source and target BS's are both employed on WiMAX standards [15].]. In case of horizontal handover there exits two handover protocols in mobile Wimax that is hard handover and soft handover.

4.1.1 Hard Handover

Hard handoff (HHO) is based on the principle of "break before make mechanism" means before connecting to the new base station the connections with the current base station should be terminate [2]. During HHO, the MS communicates with merely one BS at a time [7] as shown in fig 4. Hard handoff is also occurs at a lower mobile speed [2].

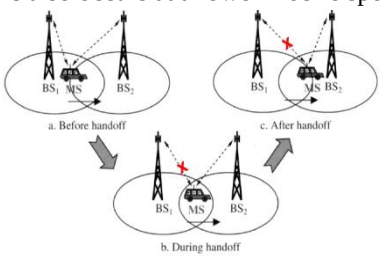

Figure 4: Hard Handover [17]

4.1.2 Soft Handover

Soft handover (SHO) is based on the principle of "make before break mechanism" which means that connections are established before termination of currentconnection [2]. During SHO, a mobile station communicates with two base stations at the same time [7] as shown in fig 5. Soft handoff is basically used when the mobile speed is high [2].

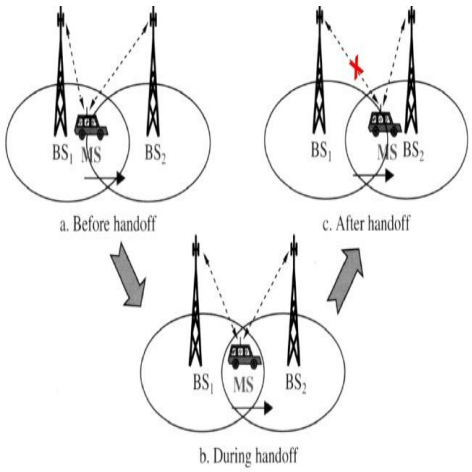

Figure 5: Soft Handover [17]

4.2 Vertical Handover

Vertical handover occurs in the heterogeneous wireless network i.e. when the mobile users move in different networks which have different technology [10]. It utilizes the multichip environment only [4].In case of vertical handover there exits two handover protocols in mobile Wimax that is mobile IP (MIP) and proxy mobile IP (PMIP).Fig 6 depicts Vertical Handover ,When MSS moves from WiMAX to some other network [like WiF)], i.e. source BS is employed on WiMAX standard but the target BS is employed on WiFi (802.11) [16].

4.2.1 Mobile IP

MIP is conventionally layer-3 mobility support protocol. MIP based handover incurs the large handover latency as a result of mobile nodes generate plenty of handover messages in the wireless area. There is a basic problem that handover latency will increases, the general performance of wireless network downgrade, as a result the connectivity of real-time services is not maintained and lots of packet losses happen [25].

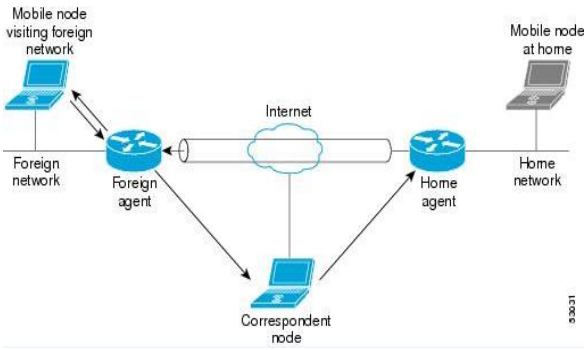

Figure 7: Basic MIP [28]

Mobile IP introduced four functional entities: (i) Home Agent (HA), (ii) Foreign Agent (FA),(iii) Mobile Node (MN), (iv) Correspondent Node (CN) as shown in fig 7. Each MN is resident in its home networkwhere it receives a permanent Home Address (HoA).When an MN moves out of its homenetwork and visits a foreign network, it obtains a temporary address which is known as Care-of-Address (CoA) by the FA in that foreign network. When the MN moves from one foreignnetwork to another foreign network, it registers its new CoA to the HA that is located in the homenetwork. The HA keeps track of the HoA and CoA for all MN. A packet from CN destined to MNis sent to HoA of MN. The HA intercepts all the IP packets destined to the MN and tunnels themto the CoA of the MN [28].

4.2.2 Proxy Mobile IP

PMIP that is extremely popular recently because the network based mobility support protocol. PMIP primarily based handover decreases the handover latency by reducing the amount of handover messages, as a result of a mobile node does not contribute in handover procedure. If layer-3 handover is provided employing PMIP, the handover performance in mobile WiMAX, can be improved by reducing variety of handover messages [25].

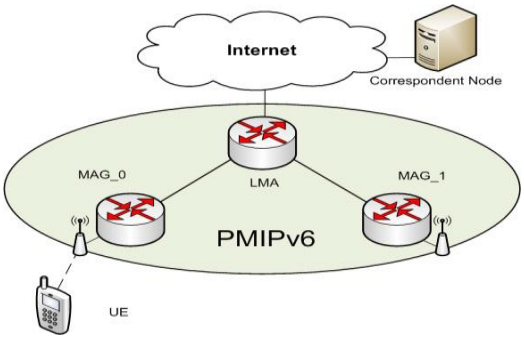

Figure 8: Basic PMIP [27]

In this, Local Mobility Agent (LMA) and Mobile Access Gateway (MAG) are the two integral parts of PMIPv6 domain. The functionality of LMA is similar to that of Home Agent(HA) of MIP. But unlike HA, LMA can perform network-based mobility management. MAG acts on behalf of the MNs attached to its access link and performs the mobility related signalling.

VI. CONCLUSION

This paper analyzes the current handover situation in WiMAX networks. In the first version of WiMAX standards, the mobility was not supported at all. By the time became a need of user mobility. Because of this reason several types of handover in WiMAX technology were introduced. Hard handover allows only low speed mobility (portability or simple mobility). For higher speed mobility (portability, simple mobility or full mobility) was soft handover implemented. In case of MIP, handover incurs the large handover latency as a result the connectivity of real-time services is

not maintained and lots of packet losses happen as compared to PMIP.

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Hierarchal Fuzzy Expert Prediction Algorithm for Predicting Breast Cancer Tumor Using System- A Review

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Abstract: Breast Canceris commonly found in women causing millions of deaths annually. At present there is no effective way to prevent Breast Cancer because the main reason behind the disease is unknown and characterized by abnormal multiplication of cell in the human body. As it is diagnosed very late, this often causes very expensive treatments and may lead to serious problems.Early diagnosis of Breast Cancer is not possible as all the techniques used for diagnosing Breast Cancer is very time consuming and expensive. So artificial intelligent expert system is required, which can easily predict Breast Cancer tumor at an earliest stage and help the patient in survival of disease.Fuzzy Expert System which can make precise decision and helps in prognosis of disease at an early stage.

Keywords: Fuzzy Expert system, Malignant, Benign.

I. INTRODUCTION

The most widespread disease today is Breast Cancer. It is the second biggest cause of deaths among women. It is commonly found in women causing millions of deaths annually [6]. At present there is no effective way to prevent Breast Cancer because the main reason behind the disease is unknown. It is characterized by abnormal multiplication of cell in the human body. As it is diagnosed very late, this often causes very expensive treatments and may lead to serious problems. The widespread technique used for detecting breast cancer is Mammography, but it is very difficult to differentiate between breast tumors due to structural similarities between them. So early detection of breast cancer helps in full recovery of the disease. Computer aided diagnosis or detection (CAD) system which uses computer technologies to detect abnormalities such as calcification, masses can play a key role in early detection of breast cancer and helpful in reducing death rate among women.Breast Cancer Tumors are of two types namely as Malignant Breast Tumor and Benign Breast Tumor as pictorially represented in figure 1.Benign Tumors are non-cancerous cells which do not spread in the whole body but present in particular part of the body. When a tumor is diagnosed as benign, doctors will usually leave it alone rather than remove it.Even though these tumors are not generally aggressive toward surrounding tissue, occasionally they may continue to grow, pressing on organs and causing pain or other problems. In these situations, the tumor is removed allowing pain or complications to subside [8].Malignant tumors are cancerous and aggressive because they invade and damage surrounding tissue. The main signs and symptoms of malignant tumor are change in skin color appears “orange pseudo” and breast lump become red and fixed. When a tumor is suspected to be malignant, the doctor will perform a biopsy to determine the severity or aggressiveness of the tumor. Malignant tumors spread from one part of body to other parts of the body and it are very difficult to remove [7, 8].There are various methods or techniques used for diagnosing breast cancer such as Mammography, Biopsy, Magnetic Resonance Imaging and Fine Needle Aspiration [9]. Mammography is a specific type of imaging that uses a low-dose X-ray system to examine breast, and is currently the most effective method for detection of breast cancer.

Mammography offers high-quality images at a low radiation

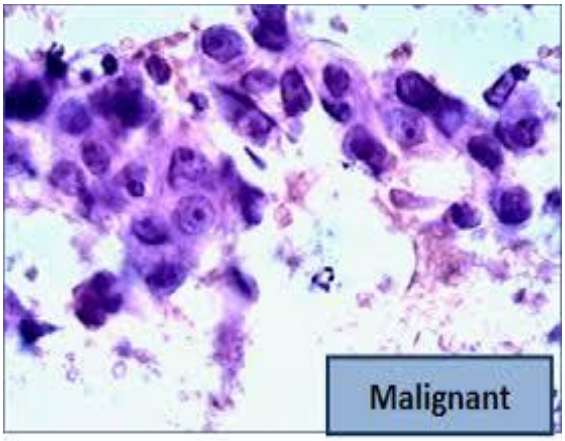


Figure 1(a):Malignant Breast Tumor [15]

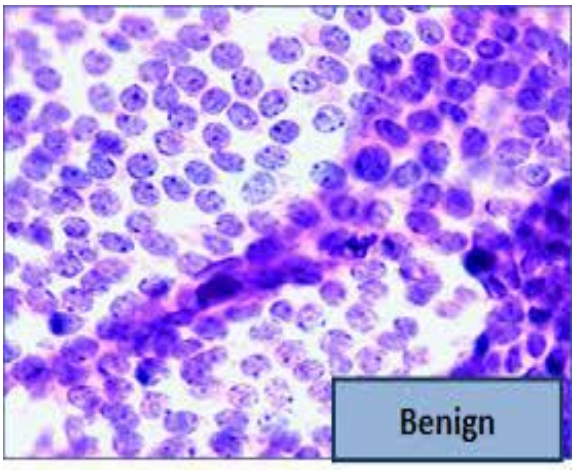


Figure 1(b): Benign Breast Tumor [15]

dose, and is currently the only widely accepted imaging method used for routine breast cancer screening. Current guidelines of the American Cancer Society (ACS) recommend that women aged 40–49 years have a routine mammogram every one to two years beginning at the age of 40. There are two types of Mammography: one is film mammography and the other is digital mammography. In film mammography, the image is created directly on film, whereas digital mammography takes an electronic image of the breast and stores it directly on a computer. In the first type of CAD systems, the films are scanned, digitized, and saved on the computer for further examination. The second type of systems use full-field digital mammographic (FFDM) technology, which is expected to provide a higher signal-to-noise ratio, a higher detection quantum efficiency, a wider dynamic range, and a higher contrast sensitivity than digitized film mammograms [9].

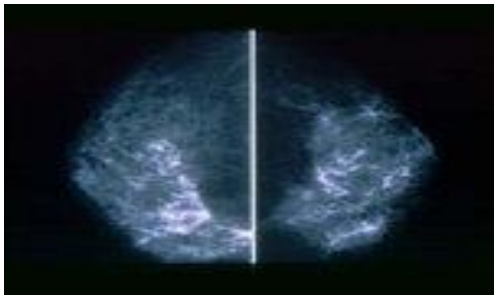
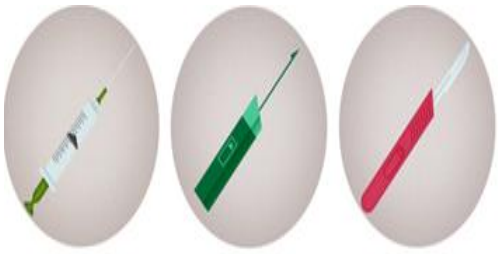


Fig 2: Mammography [8]

Biopsy is most widespread technique used nowadays. It is an operation done to remove small tissues from an area of breast and examine under microscope. It is most efficient and expensive method to find whether person suffering malignant or benign but biopsy is costly so it is less used. There are three types of biopsies as Core Needle Biopsy, Surgical Biopsy and Fine Needle Aspiration.Core needle biopsy is the procedure to remove a small amount of suspicious tissue from the breast with a larger “core” (meaning “hollow”) needle. It is usually performed while the patient is under local anesthesia, meaning the breast is numbed. During the procedure, the doctor may insert a very small marker inside the breast to mark the location of the biopsy. If surgery is later required, the marker makes it easier for the surgeon to locate the abnormal area. As with a core-needle biopsy, a surgical biopsy is done while the patient is under local anesthesia. Typically, this test is performed in a hospital setting where a medicationis administered to make the patient drowsy. The surgeon makes a one- to two-inch cut on the breast and then removes all or part of the abnormal lump and often a small amount of normal-looking tissue, known as the “margin.” If the lump cannot be easily felt but can be seen on a mammogram or ultrasound, a radiologist may insert a thin wire to mark the suspicious spot prior to the surgeon performing the biopsy. Once again, a marker is usually placed internally at the biopsy site at the conclusion of the procedure.



Core Needle Biopsy | Surgical biopsy | Fine Needle Aspiration

Figure 3:Types of Biopsies [10]

Fine Needle Aspiration is an invasive examination that consists in obtaining material directly from the tumor. The collected material is then examined under a microscope to determine the prevalence of cancer cells. This approach requires extensive knowledge and experience of the cytologist or pathologist responsible for the diagnosis. Automatic morphometric diagnosis can help make the results objective and assist inexperienced specialists. It also allows for screening on a large scale where only difficult and uncertain cases would require further examination by the specialist [9]. Magnetic Resonance Imaging (MRI):During a breast MRI, a magnet connected to a computer transmits magnetic energy and radio waves (not radiation) through the breast tissue. It scans the tissue, making detailed pictures of areas within the breast. These images help the medical team distinguish between normal and diseased tissue [8].

Medical oncologists diagnose breast cancer based on past professional experience and knowledge which can lead to wrong diagnosis. In recent years Artificial Intelligence has been used in different areas including medical area. In medical field has decision support system (DSS) were designed which assist physicians in diagnosis of Breast Cancer. According to Aristotelian logic, for a given proposition or state we have two logical values: true-false, black-white, 1-0. The greatest advantageof using fuzzy logic lies in the fact that scientists can model non-linear, imprecise, complex systems by implementing human experience, knowledge and practice as a set of inference (or fuzzy) rules that use linguistic (or fuzzy) variables [7,5].

II. FUZZY EXPERT SYSTEM

Artificial Intelligence is defined as the concept of solving real problems in such a manner where complex problem deals with help of machines. Artificial Intelligence is the study and developments of machines and software that can reason, gather knowledge, think, communicate and perceive the objects [2].

The fuzzy set theory is a mathematical discipline, firstly introduced in 1965.It is mostly used in control engineering. The word fuzzy means which is not clear, indistinct. Fuzzy logics are conventional tools for handling imprecise, uncertain and unmolded data in intelligent decision system. In fuzzy set theory a fuzzy set, F, is described by the membership function

$\mu(x): U \rightarrow [0, 1]$ ..... [1]

of that variable in fuzzy set [4] where element, $x \in U$ have degrees of membership with any value between 0 and 1. A membership value of zero corresponds to the case where the element is definitely not a member of the fuzzy set. A membership value of one corresponds to elements with full membership in the fuzzy set. It defines the degree of fuzziness and membership

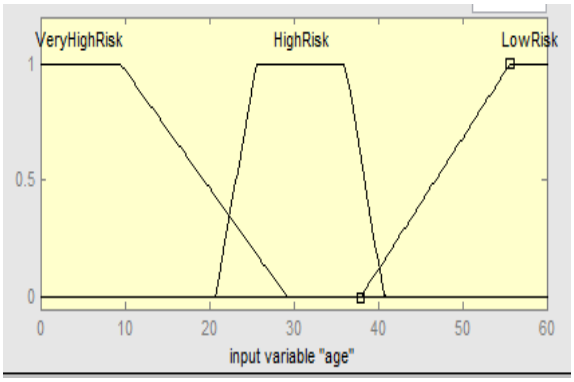


Figure 4:Membership Functions[3]

The greatest advantage of using fuzzy logic lies in the fact that scientist can model non-linear, imprecise, complex systems by transposing human experience, Knowledge and practice in inference (or fuzzy) rules that uses fuzzy or linguistic variables and has very vast applications in real life as well as in various areas. Basically, the fuzzy logic procedure implies 3 steps -

Determination of a set of fuzzy linguistic variables set A, for each of the input or output system variables that describe the observed phenomenon. Each input may have number of linguistic variables or fuzzy variables.

Definition of a set of fuzzy inference rules between input (I) and output (O) fuzzy variables (such as IF I1 is x1 AND I2 is x2 … THEN O1 is z1 …, where x1, x2, y1, y2, z1, z2, are linguistic values).

3. Definition of a membership function for each fuzzy variable: G (e): U -> [0, 1], where 'G(e)' is the membership function of the 'e' (can be any input or output variable) fuzzy variable and U is the variation interval for the same variable.TheFuzzification and the de-fuzzification are the two bounds between the fuzzy logic system and the measured phenomenon data. Fuzzification is used for the transformation of a real value $x \epsilon R$ (acquired from the studied process) in one of the fuzzy values from a fuzzy set for a specific fuzzy variable. Defuzzification is the inverted process that transforms the output fuzzy variable

(computed by the set of inference rules between the input variables) in a crisp, real value x ϵR (normally sent back to the process, as Control feedback). The most commonly used defuzzification method is center of area [5].

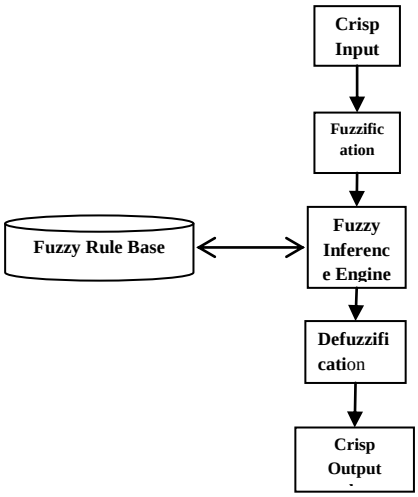


Figure 5: Fuzzy Expert System [5]

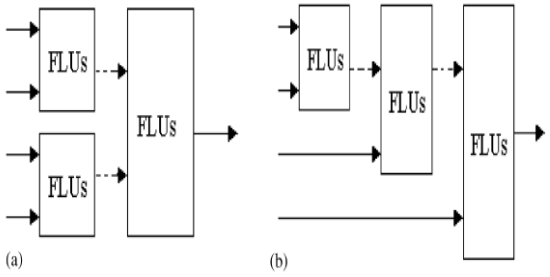


Figure 6: Hierarchical Fuzzy Logic System.

The design of fuzzy controllers is commonly a time-consuming activity involving knowledge acquisition, definition of the controller structure, definition of rules, and other controller parameters. At present, one of the important issues in fuzzy logic systems is how to reduce the total number of involved rules and their corresponding computation requirements. In a standard fuzzy system, the number of rules increases exponentially with the number of variable increases. Suppose there are ninput variables and mmembership functions for each variable, then it needs $\mathbf{m^n}$rules to construct a complete fuzzy controller. As nincreases, the rule base will quickly overload the memory and make the fuzzy controller implementation difficult.

In fact, the complexity of a problem increases exponentially with the number of variables involved. Hence, to deal with the "curse of dimensionality" and the rule-explosion problem, the idea of hierarchical fuzzy systems (HFSs) was reported. These hierarchical fuzzy systems consist of a number of low-dimensional fuzzy systems in a hierarchical form. The hierarchical fuzzy systems have the advantage that the total number of rules increases only linearly with the number of input variables [5]. For the hierarchical fuzzy system in Fig. 1, with 4(n=4) input variables and 5(m=5) membership functions, then each low-dimensional fuzzy system consists of $5^2(m^2)$ rules and, therefore, the total number of rules is $3\times5^2 =75[(n-1)*m^2]$, which is a linear function of the number input variables n. But, the number of rules in the standard fuzzy system is $5^4 =625$. It could be found that the total number of rules is greatly reduced under hierarchical fuzzy systems structure.

To overcome the problem that the outputs of intermediate layers do not possess physical meaning and consequently are hard to design, we propose a new kind of mapping rule base schemes to get the HFSs rule bases where the outputs of the previous layer and the inputs of next layers are defined as intermediate mapping variables. Meanwhile, the outputs of the first layer of FLUs and the inputs of the other FLUs are just decided by the intermediate mapping variables. The intermediate mapping variables are the further result described in Section 3. By the intermediate mapping variables, one can easily design the involved fuzzy rules in the middle layers of the hierarchical structure. As such, all of the rule bases of FLUs need not to be redesigned. Also, using this method, we can get the same input–output model as the conventional single layer fuzzy logic system, the total number of the involved rules can be greatly reduced as well as the system stability can be guaranteed.One of the important issues in fuzzy logic systems is how to reduce the number of involved rules and their corresponding computation requirements. In fact, the number of fuzzy rules grows exponentially with the number of input variables. Specifically, a single output fuzzy logic system with n input variables and m membership functions defined for each input variable. In given problem, the number of rules in the standard fuzzy system is $5^4 =625$.

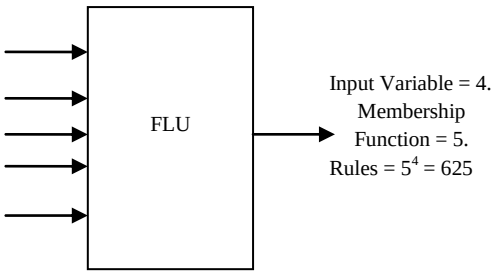


Figure 7: Conventional Single Layer Fuzzy Logic System.

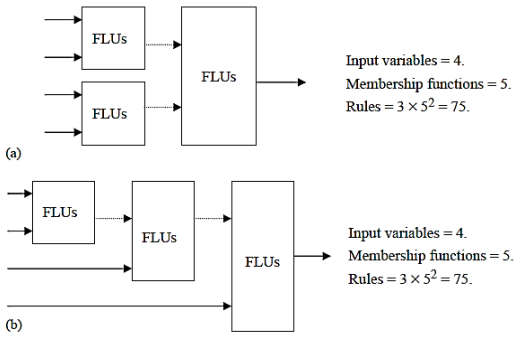


Figure 8: Hierarchical fuzzy logic system.

Fuzzy Expert System has potential to be applied in almost every medical field. Fuzzy logic is a data handling methodology that prevents ambiguity and hence particularly suitable for medical application. It uses the concept of fuzziness in a very effectively manner. Fuzzy expert system uses the concept of if else rules for modeling. The techniques of fuzzy logic have been explored in many medical applications. Fuzzy logic is preferred over multiple logistic analysis of lung cancer using tumor marker profiles. Fuzzy logic also used in diagnosis of acute leukemia and pancreatic cancer and also patient's survival with breast cancer. It is general term for various computation techniques based on natural evolution process that imitates the process of natural selection and survival of fittest in solving real world problems. The most widely most used computation technique for medical applications are Genetic Algorithms. The main principles of Genetic Algorithms have been used to predict outcome in critically ill patients. MRI segmentation of brain tumors is also done through Genetic Algorithms. Artificial intelligence techniques are used for diagnostic sciences in biomedical image classification. Model-based intelligent analysis and decision-support tools are important in medical imaging for computer-assisted diagnosis and evaluation. CAD helps radiologist who uses the output from a computerized analysis of medical images as a second opinion in detecting lesions, assessing extent of disease, and improving the accuracy and consistency of radiological diagnosis to reduce the rate of false negative [7].

III: LITERATURE SURVEY

Fluentes-Uriarte., et al. [2008] described a comparison of results in breast cancer diagnosis using fuzzy logic methods, the first case uses fuzzy clustering with FCM (Fuzzy- C-Means) algorithm, second method is implementation of fuzzy inference system with Genetic Algorithms and creating the optimal rules. Authors concluded that in case of fuzzy inference system results obtained are more effective [17]. Balancia V., et al. [2010] proposed a method for best follow up decision process which is dependent on Breast Cancer Risk. Authors introduced a set of fuzzy rules that can be used to process the relevant data from breast cancer cases in order to give a breast cancer risk prognosis which can be qualitatively compared to that of an expert. Authors compared fuzzy values with clinical database and concluded fuzzy results are better than clinical values [5]. Keles A., et al. [2011] proposed an expert system called EX- DBC (Expert System for Diagnosis of Breast Cancer) for differentiating magliant and benignmammographic findings. The golden method used for diagnosis of Breast Cancer is Biopsy but Biopsy is patients discomfort. Fuzzy rules are used in inference engine of EX-DBC by neuro- fuzzy method. Authors concluded that the developed EX-DBC system has high positive predictive rate (96%) and specificity (97%) for breast cancer. Thus, this model can provide significant contributes to prevent unnecessary biopsy in diagnosis of breast cancer. Besides it can be benefited from this system for training of students in medicine [11].Surendiren B., et al. [2012] introduced a Hue Saturation Value weight function for classification of malignant and benign masses present in mammogram. The 233-mammogram dataset has been obtained from Digital Database for Screening Mammography (DDSM) benchmark dataset. Authors concluded that better results are obtained for classification using statistical measures and results agree to the standard BIRADS system [4].Tintu P. et al. [2013] proposed an innovative approach to diagnose breast cancer in Wisconsin Prognostic Breast Cancer (WPBC) data sets using Fuzzy-c-means. Authors introduced fuzzy –c-means intelligent technique to diagnosing breast cancer and have been tested to data set from Wisconsin University for classification of cancer cases. Authors concluded that by using Fuzzy-c-means technique, with higher efficiency and accuracy would be capable of identifying cancer cases whether malignant tumor or benign tumor cases [14].Muhic I., et al. [2014] proposed a new approach for the diagnosis of Breast Cancer called Fuzzy-C-means clustering (FCM) algorithm and pattern recognition. Algorithm has been applied to breast cancer clinic instances obtained from the

University of Wisconsin. Using FCM algorithm clinic instances are grouped into two clusters, one with benign instances and other Magliant instances. Authors concluded that this is a better classification as compared to other methods used for diagnosis of Breast Cancer. Although a surgical biopsy results in almost 100% accuracy in diagnosing benign and malignant breast cancer, it is invasive, expensive, and inconvenient for the breast cancer patient. FNA with visual interpretation varies from 65% to 98% in accuracy [9].Veta M et al. [2015] reviewed methods that have been proposed for the analysis of breast cancer histopathology images. This research area has become particularly relevant with theadvent of whole slide imaging (WSI) scanners, which can perform cost-effective and high-throughput histopathology slide digitization, and which aim at replacing the optical microscope as the primary tool used by pathologist. Breast cancer is the most prevalentform of cancers among women, and image analysis methods that target this disease have a huge potential to reduce the workload in a typical pathology lab and to improve the quality of the interpretation. Nehra E., et al. [2016] introduced how Artificial Intelligence affects our modern life and from what Artificial Intelligence is got or branches of Artificial Intelligence. Inventions of Artificial Intelligence that are made and what is its future scope. Author concluded that artificial intelligence has simplified our life in every aspect it can be article writing or game playing or taking any important decision [1].Walia N. et al. [2016] proposed a decision support system for diagnosis of tuberculosis using a fuzzy expert system. Authors briefly explained the implementation between different input attributes and their symptoms. Authors concluded that proposed a fuzzy expert system for diagnosis of tuberculosis give an accuracy of 78% and this system can give aid to physicians [18].Feng T-C et al [2016] proposed symbiosis based modified DNA-ABC optimization algorithm for hierarchical fuzzy classification. It combines the advantage of the DNA coding chromosome structure and DNA computing to enhance communication between different swarms. It overcomes dimensional and overlapping issues and also obtains the optimum classification rate through suitable membership function extraction. The procedure is divided into four main parts. First, membership functions (chromosome) are extracted by DNA coding and evaluated through fuzzy classification. Second, new chromosome (food source) generation and the fittest chromosome are retained in each feature dimensionduring the employed bee repeat cycle by evaluating the fitness function of eachchromosome.

IV. CONCLUSION

Although number of techniques had been used for detecting breast cancer such as MRI, Biopsy, Mammography, etc. but all the techniques used for detecting breast cancer are time consuming and expensive. Medical experts make decisions according to their past experience which sometimes may lead to wrong decisions.The recognition of abnormalities in mammogram such as calcification and masses and several findings mislead the radiologist because lack of experience or human error. Interpretation of mammograms is a very complex task for radiologists. Also Differentiating malignant breast tumor from benign tumor is very difficult task as there many structural similarities between them and it is very time-consuming method to accurately identify the structural differences between them. So,from the literature it is concluded that there is need an expert which can differentiate malignant breast tumor from benign breast tumor and is very necessary to develop a successful prognosis method which can detect breast cancer tumor and its classification.

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Enhancing Energy Efficiency through Green Technology: An Overview

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Abstract: The innovation in the area of green technology is emerging in both in practice and in academia. It is essential to conserve the natural environment and resources, and to curb the negative impacts of human involvement with the application of Green technology. Green technology is environmentally responsible for the use of computers and its related resources. The reality of rising energy costs and their impact on international affairs coupled with the increased concern over the global warming climate crisis and other environmental issues have shifted the social and economic consciousness of the business community. The move to become more environmentally friendly is more than just a means to a better corporate image; it is also a means to cost reduction in an ever inflating IT budget. Despite the huge surge in computing power demands, there are many existing technologies and methods by which significant saving can be made. This paper provides a number of ways by which an organization can reduce their energy footprints while maintaining required levels of computing performance.

Keywords: Green technology, ICT, eGovernance.

I. INTRODUCTION

In the past, the only focus was on IT equipment processing power and associated equipment spending while infrastructure that includes power and cooling but data center space was always assumed available, ready, a given and affordable. Today, the infrastructure is becoming a limiting factor that can determine how and if IT equipment can be installed to meet business growth. The driving force behind this change comes from the ever growing business computing needs, fast growing burden of energy cost, growing awareness of global warming issues and increasing sense of national energy security. On the fronts of global warming issues and energy security, various regulations and laws will soon be in place that will force the use of IT equipment that meet certain energy efficiency requirements.

Problems faced due to environmental changes

The three most critical environmental changes faced by society today are climate change, resource degradation, and pollution. Most of the computer resources use harmful substances like PVC and lead, and many of the parts are not biodegradable. At the same time computers and mobile related products get outdated fast and get collected as e-waste. In the meantime due to the increased use of IT, the overall energy consumption by IT resources increases every day. According to research conducted by Gartner, Inc. the global information and communications technology (ICT) industry accounts for approximately 2 percent of global carbon dioxide (CO2) emissions.

Objectives

Green computing refers to supporting business critical computing needs with least possible amount of power or sustainable computing. This represents a dramatic change in priority in IT industry. Driving force behind the concept of green computing is "Maximize all minimized".

1. It focuses on reducing the environmental impact of industrial processes and innovative technologies caused by the Earth's growing population.

2. It has taken upon itself the goal to provide society's needs in ways that do not damage or deplete the resources.
3. The other reason of adopting an eco-friendly lifestyle and making conscious decisions so as to reduce the harm to the planet and create positive conditions for the environment to grow and succeed.

II. ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY IN MAKING COMPUTING GREEN

ICT could help cut carbon emissions in two ways:

1) It can be used to provide technological solutions that help all sectors of the economy to reduce their energy usage. For example recent studies suggest that ICTs could reduce energy consumption in buildings by up to 17% by cutting energy in areas such as lighting. Simple solutions such as holding video conferences rather than flying to meet international colleagues can also help us become greener.

2) ICTs can help people precisely measure their energy consumption, so they can make informed decisions on whether and how to change their lifestyle. For example smart metering can provide consumers with detailed information about their energy usage patterns, allowing them to control their power needs and save money.

Companies participating in making computing green

There is a lot of progress going on with turning 'Green'. The two largest micro processor companies, Intel and Advanced Micro Devices, have both come up with what they consider low wattage processors. While AMD was first to this arena, Intel says they are catching up and even trump AMD's offerings in the server processor market. A recent article by *Chis Mellor* shows that while Intel claims better efficiency, it is only in low memory configurations and only while under heavy workload. As soon as the server is in idle mode or put into larger memory configurations the AMD processor has a reduced energy consumption of up to 30% over Intel's offering. Both companies are keenly trying to increase their efficiencies instead of solely relying on performance. Leading vendors such as Hewlett-Packard (HP), Dell and Acer are adopting green computing in a major way in India. Energy efficient PCs made from recyclable materials and programs to help cut electronic waste could help drive PC growth in India.

Governments go green

United States-First initiatives on green computing took place in 1992 when voluntary labelling program known as Energy Star was implemented in the US by the Environmental Protection Agency (EPA). This method has now been adopted by several other countries. Energy Star reduces the amount of energy consumed by a product by automatically switching it into "sleep" mode when not in use or reducing the amount of power used by a product when in "standby" mode. Surprisingly, standby "leaking," the electricity consumed by appliances when they are switched off, can represent as much as 12 percent of a typical household's electricity consumption.

In 1998, the *China* National Development and Reform Commission (NDRC) founded the China Energy Conservation Program (CECP), a non profit organization in charge of the administration, management, and implementation of the certification for energy- conserving, water-saving, and environmentally friendly products. CECP is dedicated to encouraging manufacturers to produce more resource-efficient products and help consumers make more sustainable purchase decisions.

In *Japan*, the Energy Conservation Center is responsible for raising public awareness on energy conservation, training and state examinations for energy managers, and their energy-conservation campaign and exhibition (ENEX).

In *India*, Calling in for the environmentally benign progress, Prime Minister Manmohan Singh has given his vote for proper enforcement of regulatory standards to prevent green damage to the environment while making sure that there is no return to the license permit raj system. To deal with the issue of residual pollution caused despite regulation, the Prime Minister emphasized on the polluter must pay principle. This will discourage the polluters and also provide a means of financing the corrective steps necessary to counter the pollution caused

Green Computing Practices

Some of the easiest ways to support Green Computing would be the use of:

a. LCD monitors rather than traditional CRT monitors which can reduce the energy intensity by more than 50%.

b. Less heat generating, and more energy efficient microprocessors - microprocessors not only require energy, but they generate a huge amount of heat which needs cooling through an inbuilt fan, in turn requires more energy.

c. Longer battery life and enhanced power management.

Process Improvements for Green Computing

Although the hardware aspect of green computing can generate significant economic profit, further could be gained from process improvements as well. The simplest of all is switching off the equipment when not in use for a reasonable period of time. Many low cost solutions have come out to ease the process of switching off multitude of devices in one go, such as Smart Socket and Standby Buster. Some other process improvements can be outlined in detail below,

Thin Client

In situations where the full potential of standalone PCs are not used or required, Thin Client Computing can be used. It is a display-only device that displays applications that run on a separate server rather than on the PC. Under this method, computing is functionally held at a remote location and will be accessed via online desktop screens. These client products can be cheaper, less complex, and consume much less energy than a typical desktop PC. It limit the number of applications that can be run on the terminal compared to a PC, it could provide an energy and cost efficient system where standard application are required.

Grid Computing

In this, the resources are effectively shared between many users. Under this method, the capacity of many different computers can be combined to achieve large scalable projects from hardware resources without interfering with each other. It allows the consolidation of number of virtual servers/computers to one physical server/computer, while maintaining the individual properties of each of the systems. It has already revolutionized the way scientists share and analyze data, enabling researchers to share computer power over the Internet.

Virtualization

It is the process of dividing the resources of a computer in to several execution environments. For example the hard drive of a PC can be divided in to two different partitions. Partition is a logical division to create two separate hard drives. The hard drive is not physically separated, but virtually separated. Therefore running such a server at lower load wastes power and utilizing the server at higher workloads can significantly increase benefits of operational efficiency and increase the energy efficiency.

How green computing can be implemented

A. Reduce power consumption of computers and peripherals

1. Power down CPU and all peripherals during extended periods of inactivity.
2. Power up and power down energy-intensive peripherals according to need.
3. Employ alternative energy sources.
4. Reducing power consumption in notebook computers.
5. Use notebook computers rather than desktop computers.
6. Estimate power usage.

B. Choosing the right display

1. Use Liquid Crystal Display monitors rather than Cathode Ray Tube monitors.
2. Choosing the right display size.

C. Conserve paper

1. Use paperless methods of communication.
2. Do not print out copies of e-mail messages unless necessary.
3. Use smaller font sizes and decrease spacing between lines to keep the document as few pages as possible.
4. Use a printer that can print double-sided documents.

5. Store information in soft copy rather than hard copy format.

D. Purchasing and using equipments appropriately

1. Use refillable printer toner cartridges.
2. Determine whether the existing equipment can be upgraded rather than being replaced by a new one.
3. Request recycled or recyclable packaging from equipment vendors.
4. Try to buy energy efficient products.
5. Reducing toxicity.

Green Computing solutions

Green Computing is founded on the triple bottom line principle which defines an enterprise's success based on its economic, environmental and social performance. This philosophy follows that given that there is a finite amount of available natural resources, it is in the interest of the business community as a whole to decrease their dependence on those limited resources to ensure long-term Green Computing solutions, as to address a broad set of environmental issues targeted at attaining sustainability. These solutions include:

- Energy Efficiency – Maximizing the power utilization of computing systems by reducing system usage during non-peak time periods.
- Reducing Electronic Waste – Physical technology components (keyboards, monitors, CPUs, etc.) are often not biodegradable and highly toxic. Several business and governmental directives have been enacted to promote the recycling of electronic components and several hardware manufacturers have developed biodegradable parts.
- Virtualization – By utilizing a single server to provide the virtual services that would otherwise need to be provided by multiple systems, overall power consumption is reduced.
- Employing Thin Clients – These systems utilize only basic computing functionality (and are sometimes even diskless), utilizing remote systems to perform its primary processing activity. Since antiquated systems can be used to perform this function, electronic waste is reduced. Alternatively, new thin client devices are now available that are designed with low power consumption.
- Telecommuting – Providing the facilities necessary to allow employees the ability to work from home in order to reduce transportation emissions.
- Remote Administration – Allowing administrators the ability to remotely access, monitor and repair systems significantly decreases the need for physical travel to remote offices and customer sites. As with telecommuting, this reduced travel eliminates unnecessary carbon emissions.
- Green Power Generation – Many businesses have chosen to implement clean, renewable energy sources, such as solar and wind, to partially or completely power their business.

III. COMPANIES SHIFTING TO GREEN COMPUTING: SAVE ENERGY & CUT WASTE

New research shows just how much energy companies can save from a migration, even while the same research shows even wider business benefits from green computing. A study just published by CSC asked more than 3,600 IT decision makers across eight countries in the Americas, Europe and Asia about how and why their companies migrated to green computing options. While the top-level findings, especially around green IT, were not surprising, the broad array of benefits businesses accrued from the cloud chart some new territory. The survey found that 64 percent of organizations cut their energy use and reduced waste as a result of a shift to cloud services. That finding is certainly in line with other studies, including one from the Carbon Disclosure Project published that showed how green computing can lead to $12.3 billion a year in energy savings by 2020.

According to NextGen Research's study titled, "Green Computing: Reducing the Environmental Impact of PCs, Servers By Using Safer Materials, Slashing Power Needs" the goal of producing a 100% wholly-green computers, from inception to production to end of a PC, laptop, monitor and server's lifestyle is a ways away. However, while the green computer may not be in full effect for some time, computer and server vendors are working on making their products increasingly more energy efficient and environmentally benign, as a way to take a stance

in the green computing equipment segment which is set to grow from $47 billion in 2009 to $223.7 billion in 2013, according to the study.

IV. GREEN COMPUTING SCENARIO IN INDIA

For a long time there was no improvement in the growth of indigenous authentic hardware equipment manufacturer in the country and almost every company and the household customers were dependant on foreign companies who were either importing the equipments or producing part of them in Indian subsidiaries. Mainly those subsidiaries were using the low priced human resource for assembling purpose. Lack of basic research initiative and congenial infrastructure has resulted in absence of good patents and commercial production of indigenously built equipments. Due to tax relief given by the Government in the last few years for importing computer hardware accelerated the import and resulted in the minimization of the machines, equipments and peripherals. In this situation many small and medium scale industries were induced to start procuring the hardware at low prices and venture into the building of IT infrastructure for the company. But during the activities price was the most important criterion. At that point of time the basic objective was to build basic infrastructure without considering the principle of green computing. In the later stage when at the recent time the concept is grown enough it is not possible for most of the small and medium scale companies to redo the task of IT infrastructure development over and above bearing the cost of maintenance and procurement of software.

Even with the old non green hardware it was observed that most of the boards (Around 73.78 % as found in local survey in and around Kolkata, Siliguri, ADDA) faced a question by the stakeholders about the justification for the IT expenditure and they also insisted to calculate the cost benefit ratio of the investment and unfortunately most of the boards failed to give good answer due to confusion and initial fault in planning which resulted in the massive underutilization of the equipments and failure of MID which was not very prudent and robust with respect to the changing business dynamics.

So in the backdrop of the above discussion it can be concluded that most of the SMEs will not be interested right now to change their IT infrastructure to green infrastructure. Even if they are concerned about the concept they will wait until the cost is recovered from the old infrastructure. Though when they will procure any new equipment they will have a choice of green equipment but in that case also price will play a deterrent role decision-making. Regarding the large companies and MNCs cost of procurement of new green equipments is not very tough but again disposal of the old equipments is not a very easy task. Apart from this the problem of homoeostasis of the employee is also a negative factor.

Again most of the large companies now a days gone for implementation of Enterprise Resource Planning package or at least started using large customized software coupled with use of Database Management Systems and eventually having very large distributed database in different servers. They may also have massive networking infrastructure or Client Server Architecture and at this stage it is really not easy to switch over to new equipments and reinstate the operation without any effect to the soft resources and connectivities and data communications at different level.

In India the IT backed business intelligence and operation is now in a growth phage and the stakeholders are really concerned to maximize the return on investment and as a result of this it will not be easy to implement the principle of green computing in the IT infrastructure.

Emerging Technologies in e-Government

Moreover the human resource of the country is not very much concerned with the effect of toxic materials used in the equipments and so no public movement is visible now in regard to this object.

At present if the Government through legislation make it mandatory on the part of the Companies to comply with the green standard then the green movement may start in the country in a conspicuous manner.

But as in every other case until the awareness is built up there will be no true development of green computing in the country

V. CONCLUSION

Green Computing is not only a new trend; it is a technology of itself. While all of these technologies are beneficial, the most beneficial to existing corporations are those that directly affect their

processes and IT infrastructures. In order to utilize new technology, an individual needs to be aware of the products they are buying. Paying attention to things like the energy star rating along with the components of a computer can help to greatly reduce the amount of electricity used on a day to day basis. Replacing old equipment with new and more efficient equipment is only effective if the efficiency difference is high and the old equipment can be recycled or reused instead of simply ending up in a landfill. Every individual can help to encourage Green Computing by acknowledging corporations that use the new technology.

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Python- The Fastest Growing Free /Open Source Programming Language

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Abstract: Today a vast variety of programming languages are being used by experts as well as novice users throughout the world. Each programming language has its own advantages and disadvantages. All these programming languages can be segregated into two types: Proprietary and free/open source programming languages. Python is a powerful high-level, object-oriented programming language created by Guido van Rossum. The main objective of this research paper is to study the reason behind python being credited as the most flexible and powerful language in the recent times. This paper features about the comparison of python with other languages. At the end of this paper all comparisons has been explained in form of table for quick reference.

Keywords: FOSS, C, C++, java, python.

I. INTRODUCTION

Python was conceived in the late 1980s by Guido van Rossum, but its implementation began in december1989. Python is a free/open source programming language i.e. of FOSS (Free and Open Source Software) category. It is probably the simple and flexible programming language. Python is basically used for numerical computations, clinical computing, writing and working with web applications, application software and bundle management systems. In python everything is in object form. Its design pattern emphasizes more on code clarity and concision. Every programming language has personal structure as well as functions. It is also called as novice's language. The syntax of Python is quite developer friendly as evaluate to others programming languages like C, C++, JAVA, php. There are various implementations of Python such as CPython, Jython, IronPython and PyPy. Nowadays, python programming language is used for growing many various famous web products Google, PBS, NASA, Library of congress, the ONION and many more. Python is used for developing many web products: YouTube, Google, Yahoo! map, Shopzilla, Ultraseek.

II. PYTHON VS JAVA

- Python runs a lot slower as compare to Java.
- Python takes very less reminiscence in contrast to java, that's why the space complexity of python is much higher than Java.
- Python requires more effort compared to java.
- For evaluation python requires much less number of lines or statements compared to Java.
- Python functionality is three-five instances short than Java.
- Python can also use as scripting language in addition to programming language.
- Java is considered as low-stage implementation programming language; on the other hand, Python is excessive-stage or glue type programming language.
- Python include 33 keywords as and java includes 53.

Example:
Python
Print ("first program!"**)**

JAVA

```
public class FirstProgram
public static void main(String[] args)
   {      System.out.println("first-program!");
                        }
```

Output-

first-program!

III. PYTHON VS C++

- Python functionality is relatively 5-10 times shorter than a C++.
- Python is basically a high-degree language and C++ is center stage.
- Python used to mix components written in C++ that's why python acts as a glue language.
- Python is a flexible language in calling features and returning values in comparison to C++.
- C++ work faster than Python.
- Python is an interpreted language while C++ is a pre-compiled programming language.
- C++ provides better isolation and is more auditable than Python.

Example:

Python

```
Print ("first program!")
```

C++

```
#include <iostream.h> void main()
{
        cout <<"first program!";
}
```

Output-

first program!

IV. PYTHON VS JAVASCRIPT

- Python doesn't much engage in classes as comparison to JavaScript.
- Code reusability is higher in Python than JavaScript.
- Python is better in scalability than JavaScript.
- Python is better in maintainability than JavaScript.
- Python is excessive-degree programming language whereas JavaScript is very low stage language.
- Python include 33 keywords as compare to JavaScript includes 63 keywords.

Example:

Python

```
Print ("first program!")
```

JavaScript

```
<html>
<head> </head>
<body>
  <script>
    alert('first, program!')
  </script>
</body>
</html>
```

Output

first program!

V. PYTHON VS C

- Functionality of Python is comparatively five-10 instances shorter than a C.
- Python is a excessive-stage programming language and C is low degree programming language.
- Python used to mix components written in C language that's why python acts as a glue language.
- Python is not good in calling features and returning values in evaluation to C.
- C is much faster than Python.
- Python is an interpreted programming language while C is a pre-compiled programming language.
- Python uses garbage collection mechanism whereas C doesn't.

Example:

Python

```
Print ("first program!")
```

C

```
#include <stdio.h> void main()
Printf("first program!");
```

Output-

first program!

VI. PYTHON VS C#

- Python is free/open source product but C# is a part of Microsoft.
- Syntax of Python is simple as compare to C#.
- Tools in Python are much easier to learn as

compare to C#.

- Python is dynamic language than C#.
- C# is excellent in writing GUI programs. However, Python is tremendous for performing computational duties.
- C# lacks accuracy whereas c doesn't.
- Python is quick as compare to C#.
- Python consist of 33 keywords whereas C# includes 79 keywords.

Example:

Python

Print ("first program!")

C#

MessageBox.show ("first program", "Important message");

Initialization and usage of various Array

	Python	**Java**	**Javascript**	**C**	**C#**	**C++**
Create an array	Array=[]	type[] Aarr;	Var cars=['BMW','BENZ'];	Type A[size];	type[]Array;	type Array[size];
Indexed array	Arr=[1,2,3,4,5]; Arr[0]	Arr=new int[5]; Arr[0];	var first=cars[0];	Int b={10,20,30,40};	int[]cars= new int[]{10,20,30,40};	int a={10,20,30};

Examples:

1. Python

```
~$python
>>>from array import *
myarr=array(' a ', [1,2,3,4,5] )
for a in myarr
print(a)
```

2. JAVA

```
class Test
{
public static void main (String[] args)
{
// declares an Array of integers. int[] y;
// allocating memory for 5 integers. y = new
int[5];
// initialize the first elements of the array y[0] =
10;
// initialize the second elements of the array
y[1] = 20;
//so on... y[2] = 30;
y[3] = 40;
y[4] = 50;
// accessing the elements of the specified array
for (int i = 0; i < y.length; i++)
        System.out.println("Element at index "
        + i + " : "+ y[i]);
}
}
```

3. JAVASCRIPT

```
<html>
<body>
<h2>JavaScript Array</h2>
<p>The toString() method returns an array as a
comma separated string:</p>
<p id="first"></p>
<script>
var cars = ["Benz", "i10", "i20"];
document.getElementById("first").innerHTML
= vehicle.toString();
</script>
</body>
</html>
```

4. C

```
#include<stdio.h>
int i,Result,a[]={10,20,30,40,50}; void main()
{
for(i=0;i<5;i++)
{
Result+=a[i];

}
printf("Result");
}
```

5. C#

```
// Initialize array for example char[]  x = new
char[5];
x[0] = 'P';
x[1] = 'Q';
```

```
    x[2] = 'R';
    x[3] = 'S';
    x[4] = 'T';
    for (int i = 0; i < x.Length; i++)
    {
MessageBox.Show (x[i].ToString ());
    }
    Array.Resize(ref array, 3);
    for (int i = 0; i < x.Length; i++)
    {
MessageBox.Show(x[i].ToString ());
}
```

6. C++

```
#include<iostream.h>
int i,result, a[]={16,26,36,46,56}; void main()
{
for(i=0;i<5;i++)
{
result+=a[i];
}
cout<<result;
}
```

VII. COMPARISON

A Comparison of Common Programming Languages

Language	Extension(S)	Level	Developer(S)	Date	Implement	Paradigm(S)	Purpose	Free?	Script
C	.c, .h	Low	Dennis Ritchie	1972	Compiled	Imperactive, structured	General	Yes	No
C++	.cc, .cpp, .cxx, c++, .hh,, .hpp, .hxx	High	Bjarne stroustrup	1983	Compiled	Procedural,functional, object-oriented, generic	General	Yes	No
C#	.cs	High	Microsoft corporation	2000	Compiled	Concurre nt, event-driven, functional, generic, imperative	General	No	No
Java	.class, .java, .jar	High	Sun Microsystems	1991	Compiled	Object – oriented	General	Yes	No
Javascript	.js	High	Brendan eich	1995	Interpreted	Functional , imperative , object oriented	Web	Yes	No
Python	.pyc	High	Guido van rossum	1989	Interpreted	Object oriented	General	Yes	No

VIII. CONCLUSION

This paper introduces Python programming language as an excellent choice for learning and real world programming. In this paper we have discussed the characteristics, types of programming support offered by python language and comparison of python with other programming languages along with syntax and functionality. Then, different types of programs written in Python language were compared with other languages like java, c, c++ and C#. According these we conclude that Python is a simple, fast, powerful, portable, blendy, glue-type and open source programming language.

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Mid band based least significant bit substitution technique for QR code Steagnography

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Abstract: The image steganography is taking a new turn in present day world. It is now a strong technique in computer science and security of the digital content. The use of QR code is increasing day by day and this advance version of 2D bar code proves to provide higher content capacity. The cover image in previous works were used as jpeg or bmp image. This type of image was able to handle greater distortion, providing higher PSNR. In this paper, we have implemented, image steganography on QR code as cover image. The PSNR has to be maintained so that the message in the QR cod is not lost.

Keywords: Image steagnagraphy, LSB, OR Code, Image PSNR, MSE, Data Hiding, Bit Sequence Message.

I. INTRODUCTION

QR code (abbreviated from Quick Response Code) is the trademark for a type of matrix barcode (or two-dimensional barcode) first designed for the automotive industry in Japan. A barcode is a machine-readable optical label that contains information about the item to which it is attached. A QR code uses four standardized encoding modes (numeric, alphanumeric, byte / binary, and kanji) to efficiently store data; extensions may also be used

Fig Quick Response Code

The QR (Quick Response) Code is a two-dimensional (2-D) matrix code that belongs to a larger set of machine-readable codes, all of which are often referred to as barcodes, regardlessof whether they are made up of bars, squares or other-shaped elements.

		QR Code	PDF417	DataMatrix	MaxiCode
					
Developer		DENSO Wave	Symbol Technologies	RVSI Acuity CiMatrix	UPS
Type		Matrix	Stacked barcode	Matrix	Matrix
Data capacity	Numeric	7,089	2,710	3,116	138
	Alphanumeric	4,296	1,850	2,355	93
	Binary	2,953	1,018	1,556	-
	Japanese, Chinese or Korean characters	1,817	554	778	-
Main features		Large capacity, small size, high-speed scanning	Large capacity	Small size	High-speed scanning
Main applications		All categories	Office automation	Factory automation	Logistics
Standards		AIM, JIS, ISO	AIM, ISO	AIM, ISO	AIM, ISO

Table Features of codes

II. STEAGNOGRAPHY

Steganography is the technique of embedding secret messages in such a way that no user other than the known one can view the message[12]. Steganography implements by replacing bits of less used data in data files (such as graphics, sound, text, etc.) with bits of different secret message. This hidden information can be plain text, cipher text, or even images[14]. Steganography can be used when encryption is not supported. An encrypted file may still hide information using Steganography, so even if the encrypted file is deciphered, the hidden message is not seen. Generally, a steganographic message will appear to be something else: a picture, an article, a shopping list, or some other message - the covertext[17]. Classically, it may be

hidden by using invisible ink between the visible lines of innocuous documents, or even written onto clothing. In WW2, a message was once written in Morse code along two-colored knitting yarn. Another method is invisible ink underlining, or simply pin pricking of individual letters in a newspaper article, thus forming a message. It may even be a few words written under a postage stamp, the stamp then being the covertext[13].

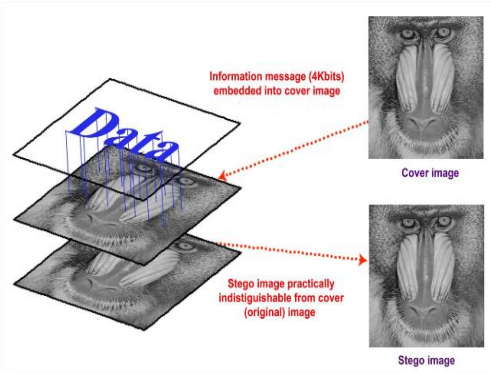


Fig. Embedding of the message

III. IMAGE BASED STEGANOGRAPHY

Embedding a message into an image requires two files. The first is the innocent-looking image that will hold the hidden information, called the cover image. The second file is the message—the information to be hidden [27]. A message may be plain-text, cipher-text, other images, or anything that can be embedded in a bit stream. When combined, the cover image and the embedded message make a stegoimage[17]. A stego-key (a type of password) may also be used to hide then later decode the message. Most steganography software recommends the use of lossless 24-bit images such as BMP[19].

IV. LEAST SIGNIFICANT BIT (LSB) TECHNIQUE

In the LSB technique, firstly the image is divided into 3 planes i.e. red, green and blue. Each plane has the pixel representation of the image with fixed intensity values.

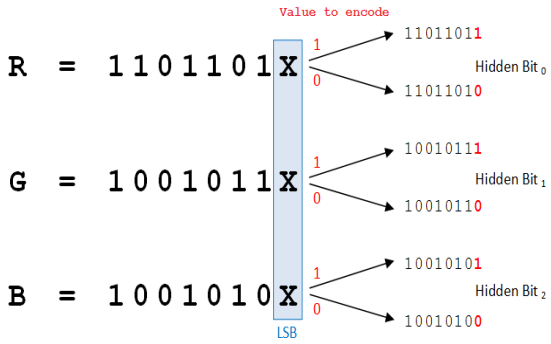


Fig. Least significant bit insertion (LSB)

The intensity change in smaller values is unrecognizable by human eyes. This key idea is utilized and the least significant bit of any pixel can be replaced and no effect is manually visible in the image. These pixels are replaced by the pixels of the message image. As a result, the message gets hidden inside the cover image. Inserting the message into the cover image is known as encryption process and extracting the message back from the stego file is known as decrypting.

V. PREVIOUS WORK

Kumawat, Deepika, et al. [1]This paper aims to showcase one of the latest automaticidentification technology concepts. In the recent past theconcept of Quick Response Code (QR Code) has attained asignificant recognition and is being used as datarepresentation mean. 2D Barcode are widely used due to highcapacity storage and fast processing step, QR Code is one ofsuch types of 2D barcode. Advertising and education are thetop most span where the utility of this application continues togrow. This paper aims on providing detailed information onall the concepts of Quick Response Code. It expressessignificance, structure and entire procedure used to representdata in the form of barcode. First experiment is to apply noisein QR Code (encoding) and second is De-noising (decoding)using Median and Wiener filters.
Luo, Ming, Siqin Wang, et al. [2] QR code is the commonly used two-dimensional (2D) barcode recently with the advantages of larger QR content and error correction capability. General QR reader can scan the contents of the QR code. When the content of the QR code is secret information, the information security becomes important. To protect the security of secret information, the new proposed method can embed secret information into the content of QR code. In this new proposed method, the QR content can be easily decoded by a

QR reader. Because general browsers can read the QR content, so few people can be decoded the QR code can scanning to the secret information. The new method is based on the error correction of the QR code, the QR code reduced distortion, and increases the capacity of hiding secret information. The mechanism based on module so the new method is more efficient. The new way can be applied to mobile phones and mobile devices.

Mehboob, Beenish, and Rashid Aziz Faruqui et al. [4]Many techniques are used to hide data in variousformats in steganography. The most widely used mechanism onaccount of its simplicity is the use of the Least Significant Bit.Least Significant Bit or its variants are normally used to hidedata in a digital image. The other bits may be used but it is highlylikely that image would be distorted. This paper discusses the artand science of Steganography in general and proposes a noveltechnique to hide data in a colorful image using least significantbit.

Barhate, B. H. et al. [9]In this paper the concept of Image Steganography is tested forWatermarking algorithms. Least Significant Bit (LSB) basedspatial domain technique and Mid Band Discrete CosineTransform (DCT) domain techniques are compared. Aftercomputing the results using coefficient DCT Mid bandwatermarking algorithm is more secure than LSB.

Proposed Method

In this part, the structure of the proposed technique is described, where a QR code will be generated according to the format described by a JAPANESE company DENSO wave [2]. The versions of the QR code are from 1 – 40 depending on the size of the message. For the correction level: QR code has four correction levels, from high to low L, M, Q, H corresponding to the error correction rate of 7 %, 15 %, 25%, 30 % respectively.

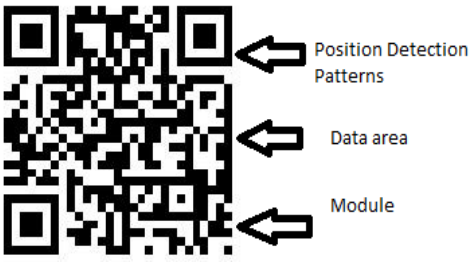


Fig. 2D bar code

The QR code generated is considered as the cover image and using Mid-Band DCT technique; steganography is performed so as to embed the secret message. For embedding the secret code, a secret message has to be incorporated in order to provide greater security.

The first part of the technique generates the QR code having version number 1 – 40 based on the size of message to be embedded. Larger the size of QR code, higher is the error correction level. The original form of an image is changed due to the unwanted information: termed as Noise. Due to the embedding of secret message noise gets induced. When the QR code is generated it is converted into the form of image having JPEG format.

Upon the analysis of this image, based on image histogram it is found to have high and low intensity pixels (pels) in a well-defined format. These pels can be used to embed the secret message which results in poor image quality of QR code.

VI. EXPLANATION

The transform domain based technique "DCT" helps to embed the hidden secret message effectively as we know that transform domain technique is far more superior than the spatial domain technique since robustness against lossy compression and different filtering options such as median, high- pas and low- pass filters etc. This technique gives a greater assurance about the quality at the receiving ends. The middle band frequency coefficients of an 8*8 DCT block are shown in the Fig. below.

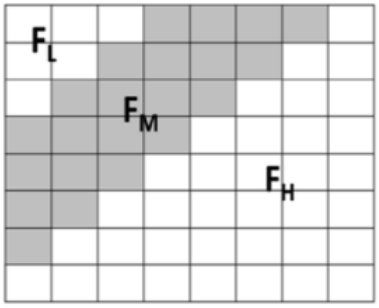


Fig: DCT region for Mid - frequency

The DCT Technique, divides the image into blocks of 8x8. Low frequency (F_L) is used to denote the lower frequency coefficients of the block where as high frequency (F_H) is used to denote the higher frequency coefficients. The mid band is used for embedding to provide additional resistance to lossy

compression techniques while avoiding significant modifications of the cover image.

By selecting two locations from mid frequency region DCT technique will be used to provide distortion less steganography. Low frequencies are avoided to embed secret data since human vision system is more sensible to modifications in this band.

The quality of the secret image embedding is measured with the parameters PSNR and MSE while maintaining the identification of the QR code. The secret message embedded in the QR code is a kind of noise signal for the QR code which emerges in the form of BLUR in the QR code. This BLUR can reduce the readability of the code by the scanner. As a result, the integrity of the QR code is not lost. Our proposed technique will maintain an equilibrium between the efficiency and security of this scenario. Various levels of noise will be measured and expressed in order to prove the robustness of the proposed technique.

VII. METHODOLOGY

The methodology explains the detailed working of the image steganography process. In the proposed technique, while inserting a secret message image into carrier image[25], two files are required. One is the cover image and second file carries the message itself to be hidden.

ALGORITHM

Phase- I Algorithm used to insert data image into the cover image:

Step 1: Load the cover image.

Step 2: Load the Message Image.

Step 3: Convert text message into binary bit sequence and divide into two groups of even and odd.

Step 4: Calculate and find LSB of each pixel of the cover image.

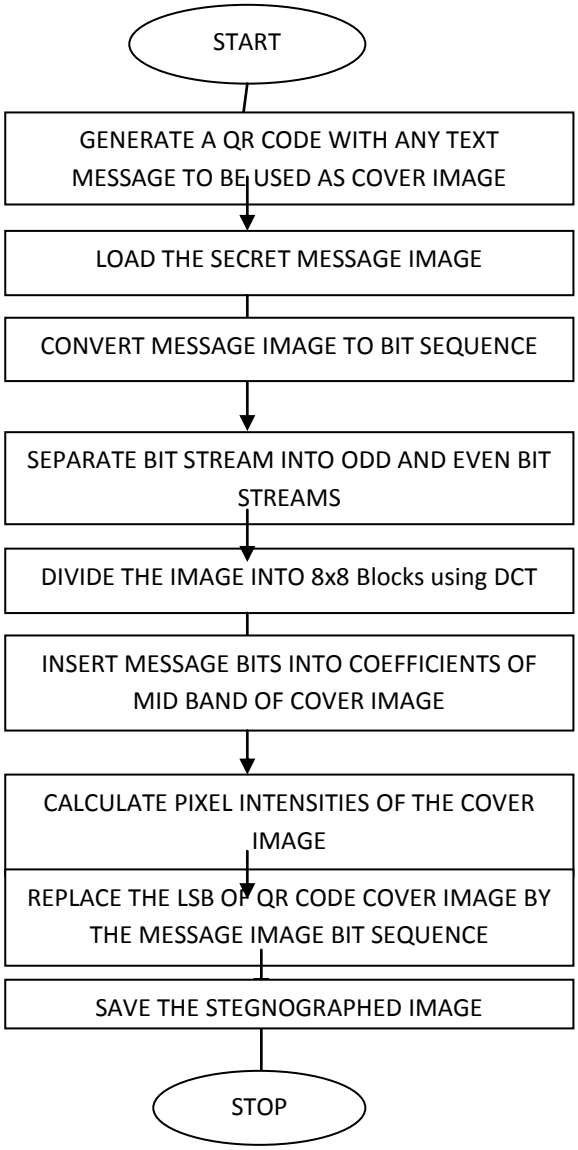
Step 5: Replace each bit of message image with the Mid Band of cover image.

Step 7: Save the Stegnographed image.

Using this method, the message image is converted to bit sequence and each message is converted to the two groups of even and odd sequence. Similarly, all the even groups are concatenated on the other hand odd groups are concatenated. Now the LSB substitution is implemented. The algorithm alters the LSB's of the all images in the mid band section of the cover image and a final image is reconstructed. Not this final image is compared against the original image to calculate out the image quality factors.

The image quality factors are PSNR and MSE[34]. The image steganography system hides the secret message inside the QR code which is being used a s QR code. The image content may reduce the visual quality of the image. Thus, to study this perceptual effect, the peak signal to noise ratio (PSNR)[6, 12] and MSE(*t*) is used to calculate weighted average of the squares of the distances between *t* and the class marks with the relative frequencies as the weight factors. Thus, the best measure of the center, relative to this measure of error, is the value of *t* that minimizes MSE.

Flowchart



Results Table

S. No.	Payload	Payload Size	Cover Image	Message Image	PSNR	MSE
1	Hellojkhsfjhxkjcvjhd,xcbvmxhm,dfbvjh,xbdv	43 B			42.4296	0.058523\ 45\3
2	;uioehjkhjkshadkhlasjkdhaslwkejrkwjelwkqje	42 B			42.4302	0.058516 2

VIII. FUTURE SCOPE

Further in future, this technique as it can be implemented in any product selling companies, departments like ecommerce, military, bussiness and even in daily life. New algorithms with better performance for the implementation of hiding the secret message which are compatible with new technologies, are always required. In future work of this algorithm, random plane selection (in case of colored QR code) or pixel wise message bit sequence distribution can be implemented for replacing bits with Least Significant Bit (LSB), which in turn provide very high security of the embedded message.

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Track 2
MECHANICAL ENGINEERING

Effect of Titanium Powder Mixed Electrical Discharge Machining on Material Removal Rate (MRR) of AISI P20 Steel

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Abstract: AISI P20 steel is widely used for tooling purposes for injection molding industries. In present work, experimental investigation on electrical discharge machining of AISI P20 steel has been carried out to investigate the material removal rate (MRR). Orthogonal array (OA) technique is used to vary various input parameters i.e. (polarity, peak current, pulse on time, gap voltage and concentration of abrasives). Percentage contribution of electrical discharge machining variables has been identified by using analysis of variance (ANOVA) technique. Experimental results are presented to show the effect of variables on material removal rate (MRR) of AISI P20 steel:

Keywords — Electrical Discharge Machining, AISI P20 Steel, Material Removal Rate (MRR)

I. INTRODUCTION

Welcome In last five decades, technology of EDM has played an essential role in manufacturing industries and became crucial in manufacturing applications such as die and mold making, micro-machining, machining of composite ceramics and prototyping etc. The phenomena of electrical discharge or spark machining in EDM process takes place over a very short period of time in the gap between electrode and work piece, which is filled with dielectric liquid involving melting and evaporation of the tool electrode as well as work piece material. However, an EDM gap phenomenon is very complex and hence not yet fully understood. Earlier in 1770, Joseph Priestly an English scientist discovered the erosive effect of electrical discharges. In 1943, soviet scientists B. R. Lazarenko and N. I. Lazarenko reversed the effect of metal removal from electric circuit breakers and optimized this phenomenon for material removal purposes. The mechanism of erosion of material from work piece mainly conversion of electrical energy into thermal energy through a series of sparks occurring into inter electrode gap between tool electrode and the work piece. Powders in the dielectric fluid enlarge the gap between the work piece and electrode and improve the surface finish by reducing the spark energy and dispersing the discharges more uniformly throughout the surface of work piece to be machined [1]. M. L. Jeswani [2] is noted 60% improvement in MRR and 15% reduction in electrode wear ratio when 4 g/l graphite powder was added in dielectric fluid (kerosene oil) of EDM process. Y. S. Wong et al. [3] noted that appropriate settings of electrode polarity and Pulse parameters and the correct combination of work piece material and powder characteristics have a significant influence on the mirror-finish condition. The negative electrode polarity is necessary to achieve the mirror-finish surface. B. H. Yan et al. [4] Noted that peak currents of EDM-drilling and volume fraction of Al_2O_3 were confirmed to have significant affects on the material removal rate (MRR), electrode wear rate and surface roughness. In comparison, the flushing pressure and electrode rotation speed have minor affects on the MRR, electrode wear rate and surface roughness. Y. Chen et al. [5] noted that the current value and the ratio of the pulse duration and the pulse interval exert the greatest influence on surface quality. It was also concluded that to achieve the desired surface finish, a multi-stage erosion machining process is advisable. However, a relatively large gap voltage is more suitable to achieve a super- fine surface

finish. W. S. Zhao et al. [6] Experimentally observes that PMEDM makes loss of discharge energy in the gap leads to reduction in melting the material so machining efficiency becomes lower and so the surface roughness becomes smaller as compared with conventional process of EDM. P. Singh et al. [7] investigated the effect of Al powder mixed in the dielectric fluid of during EDM of hastelloy using copper electrode tool. Author used process input parameters e: g (concentrations of Al powder and grain size of powder). MRR, TWR, %age wear rate, surface roughness was taken as output parameters to measure process performance. Results concluded that both the input parameters strongly affect the machining performance of hastelloy. The addition of aluminum powder in dielectric fluid increases MRR decreases TWR and improves surface finish of hastelloy. Singh et al. [8] investigated effect of electrical parameters on the performance of EDM of hastelloy using copper tool electrode. Author used process machining parameters e: g (Peak current, gap voltage, pulses on time and duty cycle). MRR, TWR, % wear ratio and surface roughness are taken as response parameters to measure process performance. Results indicated that all the input machining parameters strongly affect the machining performance of hastelloy.

II. EXPERIMENTAL PROCEDURE

A. Equipment and work-piece material used

A number of experiments runs were conducted on ZNC (OSCARMAX-S645 CNC EDM Machine) shown in figure no. 1.Dimensions of dielectric tank (LxWxH: 1500mm x 940mm x 520mm) with a capacity of 1200 liters. The work-piece material was used for experimentations i.e. AISI P20 steel having size of 40x40x10 mm and tool electrode material i.e. copper having diameter of 9.5 mm. physical and mechanical properties of copper i.e. density 8.96g/cm^3, thermal expansion at 25°C µm/m/k, electrical resistivity at 20°C 16.78n.Ω-m, tensile strength 90MPa, thermal conductivity 401W/m/K. The surface of work-piece material i.e. AISI P20 steel was machined on lathe machine and finishing was done on grinding machine. Tool electrode material i.e. copper was first faced on lathe machine and then fixed on fixture of EDM machine for experimentation. The properties of titanium abrasive are: dark grey color, density 9.3g/m^3, electrical resistivity at 20°C 420n.Ω-m, thermal conductivity 21.9W/m/K. A steel tank of mild steel material having capacity of 8 liters was made in workshop to carry out the abrasive mixed experiments. The steel tank was filled with 6 liters dielectric and placed on the bed of EDM machine at proper place. Titanium abrasives size having 100mesh with measured quantity was mixed in dielectric tank for experimentation work as per Orthogonal Array plan.

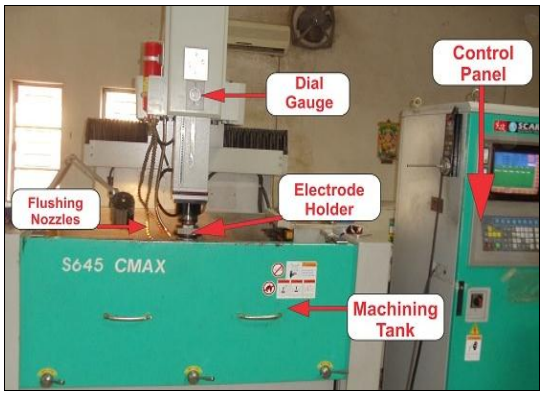

Fig.1 OSCARMAX-S645 CNC EDM Machine

Table.1 Properties and Composition of AISI P20 Steel

Work Piece (P20 Steel)	AISI P20
Hardness (HRC)	48
Density (g/cm^3)	7.85
Elastic modulus (GPa)	207
Yield tensile strength (MPa)	827-862
Ultimate tensile strength (MPa)	965-1030
Compressive strength (MPa)	862
Thermal conductivity (W/m/K)	41.5
Poisson ratio	0.28
C(%)=0.40, Mn(%)=1.00, Si(%)=0.40, P(%)=0.03, Mo(%)=0.35, Cr(%)=12.0, Co(%)=0.25, S(%)=0.03	

B. Experimental Design

Table 2 depicts the various conditions of experiments used in the abrasive electrical discharge machining of AISI P20 steel. Five EDM input machining variables were selected i.e. (tool electrode polarity, peak current, pulse on time, gap voltage, and abrasive concentration in EDM dielectric fluid). All the variables are varied at three levels except polarity which varied at only two possible levels namely positive and negative. Table 3 depicts values of these variables; their symbols used and selected range.

Table.2 Setup of experiments and operating conditions

Condition	Description
Work piece	AISI P20 mold steel
Tool electrode material	Copper
Tool electrode diameter	9.5mm (solid rod)
Dielectric fluid	EDM oil
Grain size of abrasives	100 mesh
Polarity	+ve and -ve
Peak current	6-12
Pulse on time	120-200
Gap voltage	40-80
Abrasive concentration	0-12

Table.3 Design scheme of machining variables

A. Orthogonal Array (OA)

Symbol	Control Variables	Level 1	Level 2	Level 3
A	Polarity	+ve	-ve	-
B (amp)	Peak current	6	9	12
C (µs)	Pulse on time	120	150	200
D (volt)	Gap voltage	40	60	80
E (g/l)	Abrasive concentration	0	6	12

According to Taguchi methodology, the effect of different input machining variables on the performance characteristic in a condensed set of experiments can be examined by using the orthogonal array (OA). Orthogonal arrays of Taguchi design makes it possible to carry out fractional factorial experiments in order to avoid numerous experimental works as well as to provide shortcuts for optimizing input variables. In the present work, L_{18} orthogonal array is selected in which one variable varied at two levels and four variables varied at three levels. This orthogonal array has 5 columns and 18 rows. The experiments are performed as per this orthogonal array and results are noted down for surface roughness values of bottom of machined blind holes. Table 4 shows the variation of input variables as per selected orthogonal matrix.

B. Orthogonal Array (OA)

In the Taguchi methodology, the S/N ratio is used to find the deviation of the performance characteristic from its desired value. Usually, there are three kinds of the performance characteristics in the analysis of the S/N ratio, i.e., (a) lower-the-better, (b) higher-the-better, and (c) nominal-the-better. In machining operations the lower the surface roughness is always desirable. So, the lower-the-better surface roughness is selected. For lower-the-better category the signal-to-noise ratio for the i^{th} performance characteristic in the j^{th} experiment at the k^{th} test can be expressed as:

$$(S/N)_{ij} = -10*\mathrm{Log}_{10}\left\{\frac{1}{n}\sum_{k=1}^{n} y_{ijk}^2\right\}$$

Where 'n' is the number of tests.

Exp. No.	Coded Variable Levels				
	(A)	(B)	(C)	(D)	(E)
1	1	1	1	1	1
2	1	1	2	2	2
3	1	1	3	3	3
4	1	2	1	1	2
5	1	2	2	2	3
6	1	2	3	3	1
7	1	3	1	2	1
8	1	3	2	3	2
9	1	3	3	1	3
10	2	1	1	1	3
11	2	1	2	2	1
12	2	1	3	2	2
13	2	2	1	2	3
14	2	2	2	3	1
15	2	2	3	1	2
16	2	3	1	3	2
17	2	3	2	1	3
18	2	3	3	2	1

C. Orthogonal Array (OA)

Significance of input machining variables as well as their contribution to affect output response characteristic is tabulated using analysis of variance technique. Range of variation of signal to noise ratio of input variables are calculated as delta values in response table.

II. RESULTS ANALYSIS AND DISCUSSION (FOR LARGER IS BETTER)

Taguchi method is used to analyze the result of MRR for larger is better criteria. The analysis of variance for Means for MRR (larger is better) is shown in Table no. 5. Response for means for MRR (Larger is better) are shown in table 6. From the delta values and the rank assigned to various input parameters and by considering the case "MRR: larger is better", it is clear that Polarity is the most significant factor and Gap Voltage is the least influencing factor.

Table.5 Analysis of Variance for Means for MRR (Larger is Better)

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Polarity (A)	1	0.046269	0.046269	0.046269	70.88	0.000
Peak Current (B)	2	0.001927	0.001927	0.000963	1.48	0.285
Pulse on Time (C)	2	0.003017	0.003017	0.001508	2.31	0.161
Gap Voltage (D)	2	0.001836	0.001836	0.000918	1.41	0.300
Concentration of Abrasives (E)	2	0.001851	0.001851	0.000925	1.42	0.297
Residual Error	8	0.005222	0.005222	0.000653	-	-
Total	17	0.060121	-	-	-	-

Table.6 Response Table for Means for MRR (Larger is Better)

Level	Polarity (A)	Peak Current (B)	Pulse on Time (C)	Gap Voltage (D)	Concentration of Abrasives (E)
1	0.005575	0.049456	0.050514	0.059319	0.048976
2	0.106975	0.048474	0.044105	0.042668	0.049234
3	-	0.070895	0.074206	0.066838	0.070614
Delta	0.101400	0.022421	0.030101	0.024171	0.021638
Rank	1	4	2	3	5

ANOVA tables are used to summarize the experimental results. The table concludes information of analysis of variance and case statistics for further interpretation. After the ANOVA procedure, further analysis was performed in graphic plots. The scatter plots of output response parameters are drawn to observe their variation against input machining parameters. MRR is analyzed for larger is the better criteria. Main effects plot for means of MRR are shown in Figure no. 2.

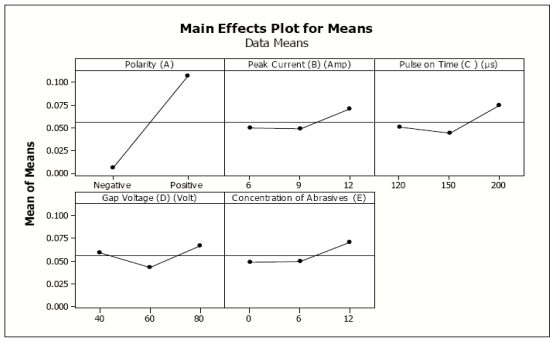

Fig.2 Main effects plot for means (MRR)

From figure no.2 it is clear that MRR is more for positive polarity as compare to MRR obtained using negative polarity. In positive polarity small mass electrons with high velocity strike the work-piece with heavy momentum and with high energy which causes more erosion. But in the negative polarity, heavy mass ions flow towards the work-piece and strike it with less momentum which erodes less material from work-piece and hence less is the MRR. MRR increases with increase in peak current. An increase in peak current produces strong spark, which produces the higher temperature, causing more material to melt and erode from the work piece. It is well known fact that the spark energy increases with pulse on time. It has been observed that material erosion rate slightly decrease as the value of pulse on time increases from 120µs to 150µs.

It is perhaps due to the reason that plasma formed at high pulse on time hinders the energy transfer in the inter electrode gap and hence decreased the erosion rate of the work piece material. But further increase in pulse on time above 150µs to 200µs, higher spark energy in the inter electrode gap obtained at high pulse on time is responsible for increasing the material erosion rate. MRR decreases slightly when the gap voltage increases from 40V to 60V because discharge gap increases with an increase in voltage. Flushing efficiency is reduced at high voltages which lead to a reduction in MRR. After 60V, the MRR increase sharply with increase in potential application up to 80V.

The reason is strong potential applied across the mating surfaces overcomes the earlier reduced flushing efficiency effect. With the addition of abrasives into the dielectric fluid, MRR increases significantly. Addition of abrasives in the dielectric fluid enlarges and widens the spark gap size. Due to this the discharge occurs early in the spark gap. Increased frequency of 59 discharges per pulse causes more erosion of material from work surface and hence MRR increases. The criterion of MRR (Larger is Better) is satisfied by different input machining parameters as per their levels shown in table 7.

Table.7 Values of input parameters at maximum MRR

Factor	A	B	C	D	E
Values	+ ve	12	200	80	12

III. CONCLUSION

After conducting the detailed experimental investigations and analyzing the results obtained through Analysis of Variance approach, following conclusions regarding the effect of input factors (polarity, peak current, and pulse on time, gap voltage and concentration of abrasives in EDM oil) with respect to output parameter e.g. Material Removal Rate (MRR) can be made. Work surface erosion is large when machining setup is at positive polarity as compare to work surface erosion obtained when machining setup is at negative polarity. Electrode surface erosion is smaller when machining setup is at negative polarity as compare to electrode surface erosion when machining setup is at positive polarity. When machining setup is at positive polarity the light mass electrons with high speed flow and strike the work-surface with greater momentum and with greater striking energy which causes more erosion. But when machining setup is at negative polarity, heavy mass ions flow towards the work-piece and strike it with lower momentum which erodes less work surface material and hence less is the MRR. So WR when machining setup is at positive polarity is less than the WR when machining setup is at negative polarity. This is due to the reason of more MRR at positive polarity and lesser at the negative polarity.

IV. FUTURE SCOPE

In the present experimental findings, it has been documented that the all the selected input machining factors/parameters affect the output responses in certain ways. This creates a lot of scope for the future work. Some of these fields may be documented below.

1. In EDM setup the work surface erosion occurs as powerful sparking across the mating surfaces of tool and work piece creates very high temperature. However circulating dielectric fluid cools down the work piece and tool surfaces at much rate. This causes temperature variation during one complete cycle of sparking. This variation in the temperature in one complete cycle can be measured and analyzed.

2. In the last decade, a process of making electrodes through compacting and sintering process known as Powder metallurgy technique is emerged as new useful technique. The machining characteristics of this P 20 steel and other difficult to machine metals and alloys can be analyzed using these P/M tool electrodes.

3. Surface integrity characteristics like Friction, wear behavior, micro-cracks and hardness of the surface machined thorough electro discharge machining process can be evaluated.

4. Rapid heating and cooling makes hardened layer on the wok-surface. Various characteristics of this layer can be analyzed.

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A Review on Solar Energy Collection for Thermal Applications

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Abstract: In this article, a review of the various types of solar energy collectors and their applications is presented. In the beginning, breakdown of various ecological problems linked with the consumption of conventional sources of energy are presented and the benefits offered by renewable energy systems are outlined. An introduction to the uses of solar energy is given followed by a description of the various types of collectors including flat-plate, compound parabolic, evacuated tube, parabolic trough, Fresnel lens, parabolic dish collectors. Characteristic applications of the different types of collectors are discussed in order to study the scope of their applicability. The applications include electricity generation, solar water heating, space heating and cooling, air and water systems and heat pumps, solar refrigeration, industrial process heat, desalination, solar furnaces etc. As can be seen solar energy systems can be used for a wide range of applications and delivers significant environmental benefits, therefore, they should be used whenever possible.

Keywords—solar energy; renewable; water heating; air heating; solar collectors

I. INTRODUCTION

One of the most widely accepted definitions of sustainable development is: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". There are many factors that can help to achieve sustainable development. Today, one of the main factors that must be considered is energy and one of the most important issues is the requirement for a supply of energy that is fully sustainable. Such a supply in the long-term should be readily available at reasonable cost, be sustainable and be able to be utilized for all the required tasks without causing negative societal impacts. This is why there is a close connection between renewable sources of energy and sustainable development.

There are many alternative energy sources which can be used instead of fossil fuels. The decision as to what type of energy source should be utilized must, in each case, be made on the basis of economic, environmental and safety considerations. Because of the desirable environmental and safety aspects it is widely believed that solar energy should be utilized instead of other alternative energy forms, even when the costs involved are slightly higher. The greatest advantage of solar energy as compared with other forms of energy is that it is clean and can be supplied without any environmental pollution. The objective of this paper is to present the various types of collectors used to harness solar energy, their thermal analysis and performance, and a review of applications.

II. SOLAR COLLECTORS

Solar energy collectors are special kind of heat exchangers that transform solar radiation energy to internal energy of the transport medium. The major component of any solar system is the solar collector. This is a device which absorbs the incoming solar radiation, converts it into heat, and transfers this heat to a fluid (usually air, water, or oil) flowing through the collector. The solar energy thus collected is carried from the circulating fluid either directly to the hot water or space conditioning equipment, or to a thermal energy

storage tank from which can be drawn for use at night and/or cloudy days.

There are basically two types of solar collectors: non-concentrating or stationary and concentrating. A non-concentrating collector has the same area for intercepting and for absorbing solar radiation, whereas a sun-tracking concentrating solar collector usually has concave reflecting surfaces to intercept and focus the sun's beam radiation to a smaller receiving area, thereby increasing the radiation flux. A large number of solar collectors are available in the market. In this section a review of the various types of collectors currently available will be presented. This includes FPC, ETC, and concentrating collectors.

1. STATIONARY COLLECTORS

Solar energy collectors are basically distinguished by their motion, i.e. stationary, single axis tracking and two-axes tracking, and the operating temperature. Initially, the stationary solar collectors were examined. These collectors are permanently fixed in position and do not track the sun. Three types of collectors fall in this category:

A. Flat Plate Collectors (FPC)

A typical flat-plate solar collector is shown in Fig. 1. When solar radiation passes through a transparent cover and impinges on the blackened absorber surface of high absorptivity, a large portion of this energy is absorbed by the plate and then transferred to the transport medium in the fluid tubes to be carried away for storage or use. The underside of the absorber plate and the side of casing are well insulated to reduce conduction losses. The liquid tubes can be welded to the absorbing plate, or they can be an integral part of the plate. The liquid tubes are connected at both ends by large diameter header tubes.

The transparent cover is used to reduce convection losses from the absorber plate through the restraint of the stagnant air layer between the absorber plate and the glass. It also reduces radiation losses from the collector as the glass is transparent to the short wave radiation received by the sun but it is nearly opaque to long-wave thermal radiation emitted by the absorber plate (greenhouse effect).

FPC are by far the most used type of collector. FPC are usually employed for low temperature applications up to 100°C, although some new types of collectors employing vacuum insulation and/or TI can achieve slightly higher values [5]. Due to the introduction of highly selective coatings actual standard FPC can reach stagnation temperatures of more than 200°C. With these collectors, good efficiencies can be obtained up to temperatures of about 100°C.

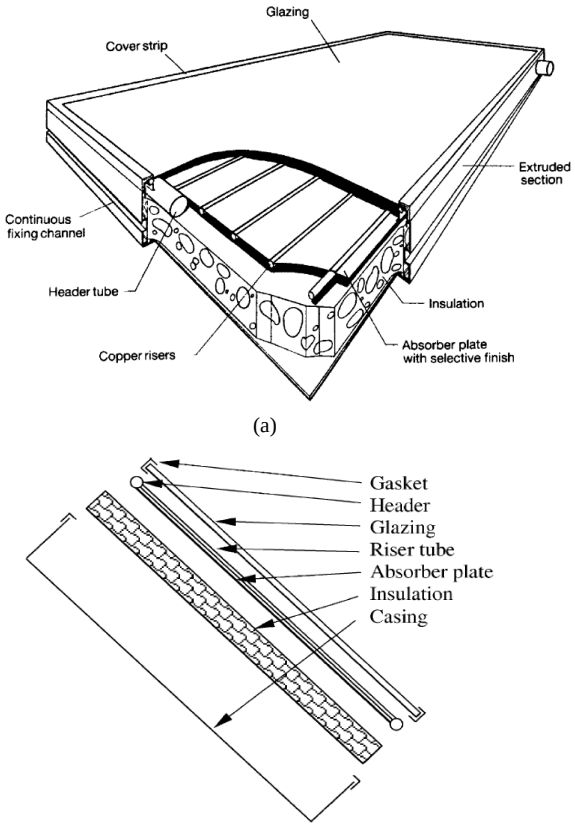

Fig. 1. Schematic diagram of a typical flat plate collector (a) Isometric view (b) Exploded side view.

B. Compound Parabolic Collectors (CPC)

CPC are non-imaging concentrators. These have the capability of reflecting to the absorber all of the incident radiation within wide limits. Their comprehensive review was carried out by [6-8]. The necessity of moving the concentrator to accommodate the changing solar orientation can be reduced by using a trough with two sections of a parabola facing each other, as shown in Fig. 2.

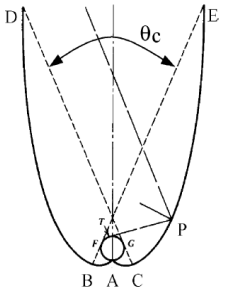

Fig.2. Schematic diagram of a compound parabolic collector.

Compound parabolic concentrators can accept incoming radiation over a relatively wide range of angles. By using multiple internal reflections, any radiation that is entering the aperture, within the collector acceptance angle, finds its way to the absorber surface located at the bottom of the collector [8,9].

C. Evacuated Tube Collectors (ETC)

Conventional simple flat-plate solar collectors were developed for use in sunny and warm climates. Their benefits however are greatly reduced when conditions become unfavorable during cold, cloudy and windy days. Evacuated heat pipe solar collectors (tubes) operate differently than the other collectors available on the market. These solar collectors consist of a heat pipe inside a vacuum-sealed tube, as shown in Fig. 3.

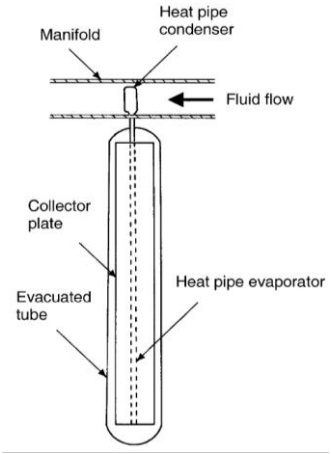

Fig. 3. Schematic diagram of an evacuated tube collector.

ETC have demonstrated that the combination of a selective surface and an effective convection suppressor can result in good performance at high temperatures [9]. The vacuum envelope reduces convection and conduction losses, so the collectors can operate at higher temperatures than FPC. Like FPC, they collect both direct and diffuse radiation. However, their efficiency is higher at low incidence angles. This effect tends to give ETC an advantage over FPC in day-long performance.

2. Sun tracking concentrating solar collectors:

Energy delivery temperatures can be increased by decreasing the area from which the heat losses occur. Temperatures far above those attainable by FPC can be reached if a large amount of solar radiation is concentrated on a relatively small collection area. This is done by interposing an optical device between the source of radiation and the energy absorbing surface. Concentrating collectors exhibit certain advantages as compared with the conventional flat-plate type. The main ones are:

1. The working fluid can achieve higher temperatures in a concentrator system when compared to a flat-plate system of the same solar energy collecting surface.

2. The thermal efficiency is greater because of the small heat loss area relative to the receiver area.

3. Reflecting surfaces require less material and are structurally simpler than FPC. For a concentrating collector the cost per unit area of the solar collecting surface is therefore less than that of a FPC. The collectors falling in this category are:

A. Parabolic Trough Collectors

In order to deliver high temperatures with good efficiency a high performance solar collector is required. Systems with light structures and low cost technology for process heat applications up to 400°C could be obtained with parabolic through collectors (PTCs). PTCs can effectively produce heat at temperatures between 50° and 400°C [10].
PTCs are made by bending a sheet of reflective material into a parabolic shape. A metal black tube, covered with a glass tube to reduce heat losses, is placed along the focal line of the receiver (Fig. 4). When the parabola is pointed towards the sun, parallel rays incident on the reflector are reflected onto the receiver tube. It is sufficient to use a single axis tracking of the sun and thus long collector modules are produced. The collector can be orientated in an east–west direction, tracking the sun from north to south, or orientated in a north–south direction and tracking the sun from east to west.

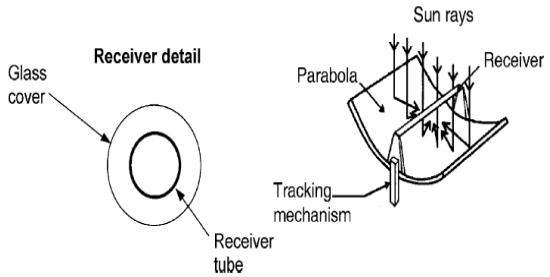

Fig. 4. Schematic of a parabolic trough collector.

B. Linear Fresnel Reflector

LFR technology relies on an array of linear mirror strips which concentrate light on to a fixed receiver mounted on a linear tower [11]. The LFR field can be imagined as a broken-up parabolic trough

reflector, but unlike parabolic troughs, it does not have to be of parabolic shape, large absorbers can be constructed and the absorber does not have to move. A representation of an element of an LFR collector field is shown in Fig. 5.

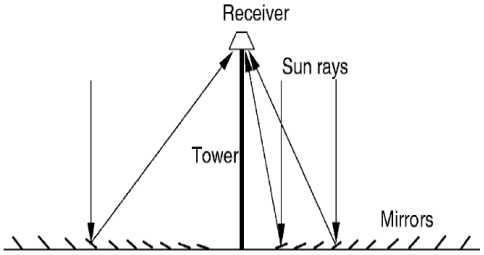

Fig. 5. Schematic diagram of a downward facing receiver illuminated from an LFR field

The greatest advantage of this type of system is that it uses flat or elastically curved reflectors which are cheaper compared to parabolic glass reflectors. Additionally, these are mounted close to the ground, thus minimizing structural requirements.

C. Parabolic Dish Collector

A parabolic dish reflector, shown schematically in Fig. 6, is a point-focus collector that tracks the sun in two axes, concentrating solar energy onto a receiver located at the focal point of the dish. The dish structure must track fully the sun to reflect the beam into the thermal receiver.

The receiver absorbs the radiant solar energy, converting it into thermal energy in a circulating fluid. The thermal energy can then either be converted into electricity using an engine-generator coupled directly to the receiver, or it can be transported through pipes to a central power-conversion system.

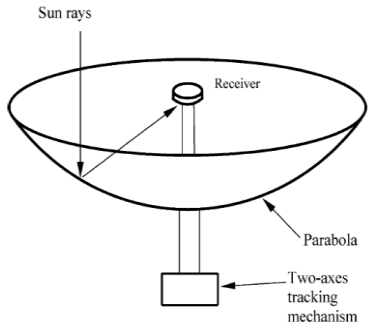

Fig. 6. Schematic of a parabolic dish collector.

Parabolic-dish systems can achieve temperatures in excess of 1500°C. Because the receivers are distributed throughout a collector field, like parabolic troughs, parabolic dishes are often called distributed-receiver systems.

III. SOLAR COLLECTOR APPLICATIONS

Solar collectors have been used in a variety of applications. These are described in this section. In Table __ the most important technologies in use are listed together with the type of collector that can be used in each case.

D. Solar water heating systems

The main part of a SWH is the solar collector array that absorbs solar radiation and converts it into heat. This heat is then absorbed by a heat transfer fluid (water, non-freezing liquid, or air) that passes through the collector. This heat can then be stored or used directly [12]. In solar water heating systems, potable water can either be heated directly in the collector (direct systems) or indirectly by a heat transfer fluid that is heated in the collector, passes through a heat exchanger to transfer its heat to the domestic or service water (indirect systems) [13]. The heat transfer fluid is transported either naturally (passive systems) or by forced circulation (active systems). Natural circulation occurs by natural convection (thermosyphoning) [14], whereas for the forced circulation systems pumps or fans are used.

Five types of solar energy systems can be used to heat domestic and service hot water: thermosyphon, ICS, direct circulation, indirect, and air. The first two are called passive systems as no pump is employed, whereas the others are called active systems because a pump or fan is employed in order to circulate the fluid.

E. Solar Space Heating and Cooling

The components and subsystems of solar collectors are employed for solar heating and cooling systems. There are again two principal categories of such systems, passive and active. The fluid used for heating and cooling is generally air and the collectors used for space heating are also called solar air heaters [15,16].

The term passive system is applied to buildings that include as integral part of the building elements, that admit, absorb, store and release solar energy and thus reduce the needs for auxiliary energy for comfort heating. As no solar collectors are employed in the passive systems in this paper, only active systems are considered.

Active solar space systems use collectors to heat a fluid, storage units to store solar energy until needed, and distribution equipment to provide the

solar energy to the heated spaces in a controlled manner. A complete system includes additionally pumps or fans for transferring the energy to storage or to the load which require a continuous availability of non-renewable energy, generally in the form of electricity [17].

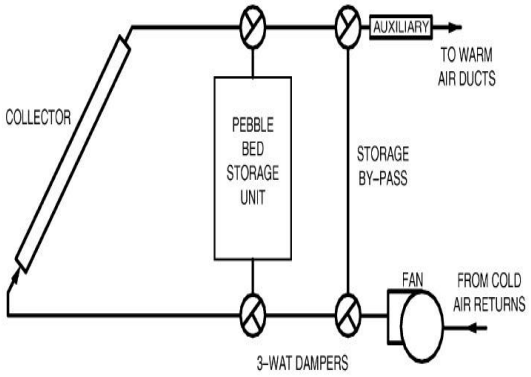

Fig. 7 Detail schematic of a solar air heating system

Solar cooling of buildings is an attractive idea as the cooling loads and availability of solar radiation are in phase. Additionally, the combination of solar cooling and heating greatly improves the use factors of collectors compared to heating alone. Solar air conditioning can be accomplished by three types of systems: absorption cycles, adsorption (desiccant) cycles and solar mechanical processes.

F. Solar refrigeration

Solar cooling can be considered for two related processes: to provide refrigeration for food and medicine preservation and to provide comfort cooling. Solar refrigeration systems usually operate at intermitted cycles and produce much lower temperatures (ice) than in air conditioning. When the same cycles are used in space cooling they operate on continuous cycles. The cycles employed for solar refrigeration are the absorption and adsorption [18]. During the cooling portion of the cycles, the refrigerant is evaporated and reabsorbed. In these systems the absorber and generator are separate vessels. The generator can be integral part of the collector, with refrigerant absorbent solution in the tubes of the collector circulated by a combination of a thermosyphon and a vapour lift pump [19].

There are many options available which enable the integration of solar energy into the process of 'cold' production. Solar refrigeration can be accomplished by using either a thermal energy source supplied from a solar collector or electricity supplied from photovoltaics. This can be achieved by using either thermal adsorption or absorption units or conventional refrigeration equipment powered from photovoltaics. Solar refrigeration is employed mainly to cool vaccine stores in areas with no mains electricity and for solar space cooling.

Photovoltaic refrigeration, although uses standard refrigeration equipment which is an advantage, has not achieved widespread use because of the low efficiency and high cost of the photovoltaic cells.

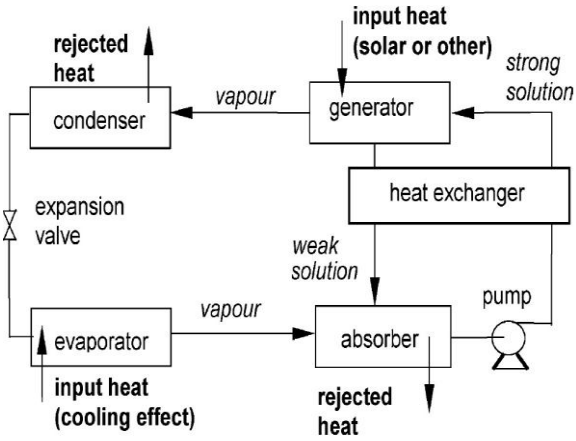

Fig. 8 Schematic of Solar refrigeration system.

G. Solar Desalination

About 97% of the earth's water is salt water in the oceans; 3% of all fresh water is in ground water, lakes and rivers, which supply most of human and animal needs. Water is essential to life. The importance of supplying potable water can hardly be overstressed. Man has been dependent on rivers, lakes and underground water reservoirs for fresh water requirements in domestic life, agriculture and industry. However, rapid industrial growth and the population explosion all over the world have resulted in a large escalation of demand for fresh water. Added to this is the problem of pollution of rivers and lakes by industrial wastes and the large amounts of sewage discharged. The only nearly inexhaustible sources of water are the oceans. Their main drawback, however, is their high salinity. It would be attractive to tackle the water-shortage problem with desalination of this water.

Desalination can be achieved by using a number of techniques. These may be classified into the following categories:

a. phase-change or thermal processes; and
b. membrane or single-phase processes.

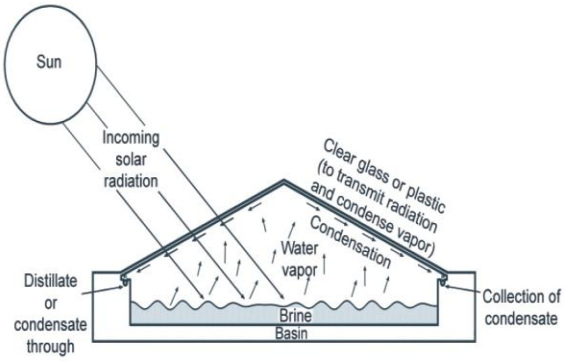

Fig. 9 Schematic of Solar desalination system.

Solar energy can be used for sea-water desalination either by producing the thermal energy required to drive the phase change processes or by producing electricity required to drive the membrane processes. Solar desalination systems are thus classified into two categories, i.e. direct and indirect collection systems [20]. As their name implies, direct collection systems use solar energy to produce distillate directly in the solar collector, whereas in indirect collection systems, two sub-systems are employed (one for solar energy collection and one for desalination) [21]. Conventional desalination systems are similar to solar systems since the same type of equipment is applied. The prime difference is that in the former, either a conventional boiler is used to provide the required heat or mains electricity is used to provide the required electric power, whereas in the latter, solar energy is applied.

A representative example of direct collection systems is the conventional solar still, which uses the greenhouse effect to evaporate salty water. It consists of a basin, in which a constant amount of seawater is enclosed in a v-shaped glass envelope [22]. The sun's rays pass through the glass roof and are absorbed by the blackened bottom of the basin. As the water is heated, its vapour pressure is increased. The resultant water vapour is condensed on the underside of the roof and runs down into the troughs, which conduct the distilled water to the reservoir.

H. Solar thermal Power Systems

Conversion of solar to mechanical and electrical energy has been the objective of experiments for more than a century, starting from 1872 when Mouchot exhibited a steam-powered printing press at the Paris Exposition. The idea is to use concentrating collectors to produce and supply steam to heat engines.

The basic process for conversion of solar to mechanical energy is shown schematically in Fig.10. The process of conversion of solar to mechanical and electrical energy by thermal means is fundamentally similar to the traditional thermal processes [23]. These systems differ from the ones considered so far as these operate at much higher temperatures. Energy is collected by concentrating collectors, stored (if appropriate), and used to operate a heat engine. The main problem of these systems is that the efficiency of the collector is reduced as its operating temperature increases, whereas the efficiency of the heat engine increases as its operating temperature increases. The maximum operating temperature of stationary collectors is low relative to desirable input temperatures of heat engines, therefore concentrating collectors are used exclusively for such applications [23].

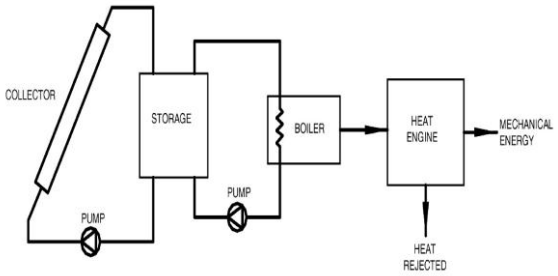

Fig. 10 Schematic of a solar-thermal conversion system.

IV. CONCLUSIONS

Several of the most common types of solar collectors are presented in this paper. The various types of collectors described include flat-plate, compound parabolic, evacuated tube, parabolic trough, Fresnel lens and parabolic dish type collector. Additionally, typical applications are described in order to show to the reader the extent of their applicability. These include water heating, space heating and cooling, refrigeration, industrial process heat, desalination, thermal power systems, solar furnaces and chemistry applications. It should be noted that the applications of solar energy collectors are not limited to the above areas. There are many other applications which are not described here either because they are not fully developed or are not matured yet. The application areas described in this paper show that solar energy collectors can be used in a wide variety of systems, could provide significant environmental and financial benefits, and should be used whenever possible.

ACKNOWLEDGMENT

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Track 3
APPLIED SCIENCES

Relations and Utility of Mathematics in Other Fields - A Review

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Abstract: The mathematics has drastically engineering, agricultural, medical and applied sciences (Physics, Chemistry and Biology) etc. The modern mathematicians are creating the bridge with other fields. Addressing the bigger questions of life "How information flows in brain (Neuroscience), dynamics of disease. Mathematics is widely used in everywhere like making Google the best search engine due to linear algebra. It has ability to solve and quantify e.g. "relevance with help of mathematics". Now a day it is widely used in designing complex models to address the future population problems of traffic, home, food, security, transportation etc. So Mathematics is just not a calculation but also is a magic tool of nature with us to understand nature and life. This paper represents the review of utilization of mathematics in other fields.

Keywords: Utilization and collaboration with e.g. Engineering, Agricultural, and Management Applied sciences, Medical Sciences (Human Brain, Neurosciences)

I. INTRODUCTION

Mathematics has vital mission for the enhancement engineering, science, philosophy, biotechnology etc. It provides solution to various problems which are very helpful for the application in different areas. This Paper represents the examples of functional areas, where mathematics is emerging as a fundamental component for the other discipline in research. "Mathematics is the mother of all Sciences" "We will always have STEM with us. 'Mathematics is the science of measurement, quantity and Magnitude'. It is exact, accurate, precise, systematic and a logical subject. This paper represents the review about the application of Mathematics in other disciplines.

Mathematics in Engineering: - Mathematics is backbone of engineering field and it widely used in various engineering fields like civil, mechanical, Architect, Electronics, electrical and computer. In civil engineering the mathematics is applied from simple pillars of your home to large dams and bridges. How many material used to create any building, we can now use the mathematics. To check the mileage of car, distance of traveling destination. Figure no. 1depicts the degree of mathematics in engineering Career.

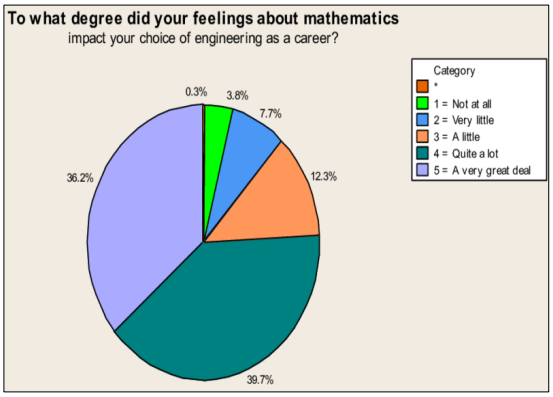

Fig.1The degree of mathematics as career in different field of engineering.

Engineers say that computational tools are "a different type of mathematics" usage that offers speedy and standard solutions when interpreted correctly and are broadly used in engineering problems. The ever-increasing availability of computerized techniques and tools. The Civil engineering has majors tended rating mathematics as lower on average as compared to the students in other fields. With the average rating of 1.74 as compared with 2.26 and 2.23 for the mechanical engineering and ICT/Electrical engineering majors.Figure.2 depicts the rating factor between civil, mechanical, ICT and electrical.

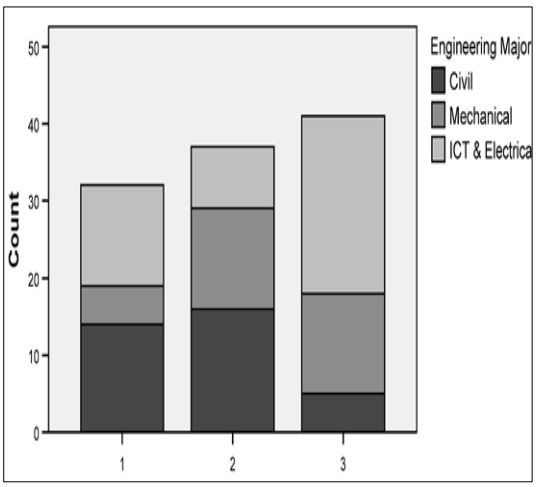

Fig.2 The rating factor between different fields of engineering.

Mathematics in Management: Now a day's, Mathematics is widely used in all type of organizations e.g. marketing, sales forecasting, accounting, inventory management and financial analysis. The economics majors are planning to continue use of mathematics in graduate school. Those are strongly recommended to take regular calculus instead of business calculus, linear algebra and other higher maths courses. The other optimization techniques like linear programming, matrix algebra, probability theory; thoseare used for business mathematics program. Mathematics helps to minimize the losses and maximize the profits by techniques like determining ideal pricing, analyzing production costs, discerning sales patterns for future sales.

Mathematics is widely used for Census, Analysis of data, for calculating data regarding Controlling the Inflation, calculating the population etc. We can say that without mathematics Business can't be existing.

Mathematics in Medical Field: Medical field is very interesting field for the career orientation. The variations in the field of medicines created abundance of jobs. Advancements in new technology, curing diseases and saving lives are possible through elementary mathematics, geometry and algebra. For drawing up statistical graphs of epidemics or success rates of treatments the medical professionals use maths along with x-rays and CAT scan, which is a special type of x-ray called a Computerized Axial Tomography Scan. In the field of medical sciences accuracy matters so it is very useful for nurses and doctors for mathematical calculations for complex tasks. Information through the numbers can help the nurses to communicate with doctors and patients as well. Figure 3 depicts the complexity of brain scanning pictures and understanding the different views through computational techniques using mathematics.

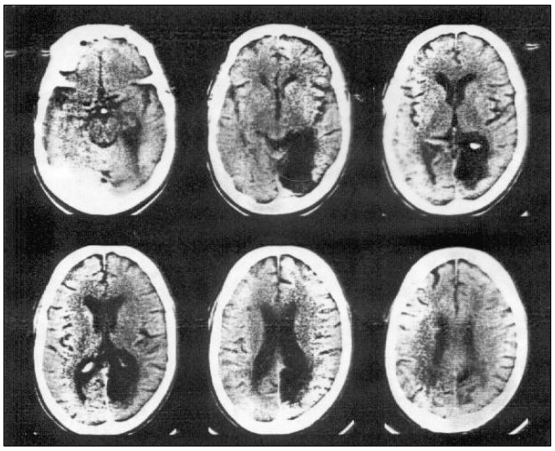

Fig.3 the different view of brain scanning

Mathematical Neuroscience: - It focuses on developing a model neuronal activity. Major problem of neuroscience is how does the nervous system process flow of information? Main problem of Population genetics: how genetic mutations and selection are propagated in a population. Epidemiology: dynamics of diseases are not easy to understand so Mathematics is playing vital role in the solution of these problems.

Human brain Mathematics: DARPA (Defense Advanced Research Projects Agency) freshly asked for mathematical model building proposal of the human brain. This proposal can modify the way through digital computers can be build. So the modification in altering the views of intelligence and consciousness and our humanity can easily be made.

Ratios and Proportions: For administering the medication for the patients, the nurses use ratios and proportions. They need to recognize the quantity of medicine, which a patient needs depending on their physical attributes like age and weight. Nurses need to understand the doctor's instructions for prescribing the dose for the patient e.g. such instruction may be given as: 25mcg/kg/min. For weighing of52 kg of the patient the amount of how many milligrams the patient should receive in one hour. For this task the nurses use conversion formulas to convert micrograms (mcg) to milligrams (mg). Let say, if the (1mcg =

.001mg), we can easily get the amount (in mg) of 25mcg through a proportion as shown in formula ahead.

By using Cross Multiplication we can find the amount in (mg). By using the optimization tools, techniques and governing equations like differential equations and statistics in modelling for predicting cardiac defibrillation, potential drug targets, comparing human brains, screening treatments for harmful side effects.

Mathematics in Agriculture: Agriculture is vast field, which purely dependent on climate and changes in weather. Mathematics acts as a crucial part in agri-tech modernization. It is obvious that farmers are going to farm for earnings throughout the year, this is to be understood that maths is saying about their financial conditions, bank loans, EMIs, weather conditions, productivity from their workforces, season and the market etc. The correct and timely decisions can easily be made through the appropriate calculations using maths e.g. difference between profit and loss, the quantity and types of farming different crops around the years. In the field of Agriculture the Mathematics can be used as follows:-

1) Calculating the areas of Lands
2) Predictions for calculating day, weeks and months for the crops to be fully grown to harvest.
3) Computing the areas
4) Consideration of volume and weight
5) Planning for planting the crops by having the information by counting the most harvested crops per harvesting time.
6) Keeping track with banks and other account.

Mathematics in Physics, Chemistry and Biology: As we Know "Mathematics is mother of all Sciences" In Physics, Chemistry, and Biology. For Measuring the distance, speed, velocity, acceleration we used differential operators as shown in formula ahead.

Mathematics is used for collecting numbers of electron, protons for the structure of atoms without mathematics it is impossible. In Physics mathematics has vital role for wave equation, Electric Current., circuits etc. Biology is incomplete without mathematics Modern mathematicians sometimes dismiss physics as "applied mathematics" The problem of the planets created the discipline of dynamical systems. The heat, wave, and Maxwell's equations drove the development of partial differential equations. Now a day, the crystallography is moderately answerable for the progress of group theory. Mechanics of Quantum is a vital stimulus for functional analysis, relativity theory for problems in geometry and string theory. Figure 4 (a, b) depicts the relation and map of mathematics with other fields.

II. CONCLUSION

Mathematics is virtually a phenomenon of nature which we are applying in general life. There is no any other field in which we can't apply Mathematics. The advance governing equations has bridged the gap between mathematics and other field like Engineering, Medical science, Agriculture, and applied sciences. Mathematical science has created an interest in the maintenance of a strong mathematical science enterprise for globally in order to contribute to the supply of well-trained persons in science, technology, engineering and mathematical (STEM) fields.

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[8] Verdana grace, "the role of mathematics in engineering practice and in the formation of engineers"esearchgate.

A Review on Inventory Modeling For Varied Manufacturing Systems

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Abstract: This study provides review of literature in all relevant areas of inventory systems classical as well as systems of current research. Various inventory systems such as volume flexible manufacturing system, imperfect production process, reverse manufacturing, inflation and time value of money, trade credit, etc are described and efficient decision making is discussed in varied situations. An attempt is made to critically review the existing research work in the field of inventory concentrating on various structures of manufacturing with the help of mathematical models. The study emphasizes on the optimization trend and inventory policies. It also investigates various reverse logistic models to know whether reverse manufacturing affects the total average cost or not. The management stand point in connection with reverse manufacturing is also dealt with.

Keywords: Decision making, deteriorating rates, flexible-manufacturing, machinery breakdown, multi-echelon supply chain, perishable inventory.

I. INTRODUCTION

In past decades co-ordination based supply chains have recognized to respond quickly to customer needs and reduce the cost of carrying inventory for a multi-echelon supply chain. In the present competitive consumerist society, the manufacturers employ newer methods of distribution as well as newer formats of distribution. The companies are entering almost everywhere whether in rural markets or semi- urban areas and reaching out to the unexpected segments of potential customers. As far as distribution is concerned new departmental stores, new shopping malls are sprouting up in the unrepresented geographical areas as well.

Many supermarket managers have observed that for some items, the demand rate and the amount of inventory displayed are directly related. According to Levin et al. ,"at times the presence of inventory has a motivational effect on the people around it. It is a common belief thatlarge piles of goods displayed in the supermarket will lead the customer to buy more." Silver and Peterson have also observed that sales at the retail level and inventory displayed are directly proportional to each other. Many marketing researchers and practitioners have got attracted to investigate the modeling process.

Reverse logistics have been receiving much attention since the past few years. In this concern, the views of several researchers must be discussed. Schrady(1967) was the first who studied the problem on optimal lot sizes for the production and recovery, whereas Nahimas and Rivera(1979) studied an EPQ variant of Schrady's model with a finite recovery rate. The waste disposal model was invested by Dobos and Richter (1999) by considering the returned rate as a decision variable. A further investigation on production/ remanufacturing system with a constant demand that is satisfied by non-instantaneous production and remanufacturing for single and multiple remanufacturing and production cycle has been undertaken by Dobos and Richter (2003-2004). Dobos and Richter (2006) extended their previous model and assumed that the quality of collected returned items is not always suitable for further repairing.

El Saadany and Jaber(2010) extended the models developed by Dobos and Richter by assuming that the collection rate of returned items is dependent on the purchasing power and the acceptance quality level of the returns. Alamri(2010) developed a general reverse logistics inventory model. Chung and Wee (2011) advanced an inventory model on the short life cycle

deteriorating product remanufacturing in the green supply chain model. An optimal returned policy for reverse logistic inventory model with back orders was derived by Saxena and Singh (2012). Further the effects of remanufacturing in an integrated production inventory model consisting of forward and reverse supply chain over infinite planning horizon was investigated by Singh et.al. (2013). An advanced derivation ofreverse logistic inventory model with imperfect production, stock dependent demand, flexible manufacturing and shortages over infinite planning horizon by them.

II. LITERATURE REVIEW

In the context of classical lot size model the relation was studied by Haley and Higgins (1973). It is believed that in general, optimality of the total cost of an inventory system requires order quantity and payment time decisions simultaneously. They derived the conditions under which the standard solution reduces to optimal solution.

(i) EOQ and Deterministic model of perishable inventory

B.C. Giri and K.S. Chaudhuri (1997) proposed an EOQ-type inventory model for a perishable product where the demand rate is a function of the on-hand inventory. According to them," The traditional parameters of unit item cost and ordering cost are kept constant; but the holding cost is treated as (i) a nonlinear function of the length of time for which the item is held in stock, and (ii) a functional form of the amount of the on hand inventory." Accoring to Levin at el. ,"at times the presence of inventory has a motivational effect on the people around it. It is a common belief that large piles of goods displayed in a supermarket will lead the customers to buy more." Silver and Peterson have also noted that the sales at the retail tend to be proportional to inventory displayed. Datta and Pal, Mondal and Phaujder, Baker and Urban presented the inventory model which focused on demand rate as the power function, dependent on level of on-hand inventory; the holding cost per unit item per unit of time is taken as a constant. Mhlemann and Valtis-Spanopoulous were the first who developed the model on the variability in the holding cost. In an EOQ model with a constant demand rate, they expressed the holding cost as a percentage of the average value of capital invested in the stock.

Van der Veen in his inventory model took the holding cost as a non linear function with constant demand rate whereas Weiss worked on the same model keeping holding cost per unit as a non linear function of the length of time for which the item was held in stock. Later on, Goh in his model employed holding cost as (i) a non linear function of the length of time the item is held in stock (as in Weiss) and (ii)a non linear function of the amount of the on-hand inventory (as in Van der Veen).The non linearity in time for holding cost is justified for the inventory system in which not only the cost of holding an item in stock increases but also the value of unsold inventory decreases with each passing day.

In perishable inventory literature, the perishability is classified in terms of fixed lifetime and random lifetime. Nahmias discussed that fixed lifetime product has a deterministic shelf life while the random lifetime scenario assumes that the useful life of each unit is a random variable. B.C.Giri and K.S. Chaudhuri extended Goh's model to cover the inventory of a deteriorating item where the rate of deterioration at any instant is a constant fraction θ ($0<\theta<<1$) of the on-hand inventory. Both the models on nonlinear time-dependent and stock-dependent holding costs have been discussed in their model with the objective to minimize the total cost function of the inventory system over a long period of time.

(ii) Optimal pricing and inventory policies

Steffen Jorgensen and Peter M. Korthas studied an optimal control problem of pricing and inventory replenishment in a system with serial inventories. Firstly they considered a setup in which management of two stocks is decentralized such that pricing decisions are made by the store manager who also decides on the level of in-store inventory. The warehouse manager makes the replenishment decisions concerning the stock in the warehouse. Then they studied the problem where stock management and pricing decisions are centralized. Optimal trajectories for inventories, replenishment rates, and retail price are derived by using phase diagrams and a formal synthesizing procedure. They assumed that demand at the retail outlet depends on the consumer price as well as in-store stock of the product. The demand decreases with price but increases with the displayed

inventory of the product. A large stock generates more demand and leads the consumers to buy more than if the inventory is small. Wolfe(1968), Schary and Becker (1972) and Levin et al. (1972) were the first to use the idea of letting the demand rate depend on the level of the inventory , whereas the problem of determining optimal ordering and inventory policies under stock dependent demand was addressed by Baker and Urban (1988), Goh (1992,1994) and Gerchak and Wang (1994). They used EOQ approach and determine an optimal lot size, ordered and delivered at the beginning of each cycle. An implicit assumption of this literature is that the whole stock of the product is on display and hence is capable of affecting demand. P.M. Kort and S. Jorgensen studies a different situation and assumes that there are two stocks of the product. One is displayed in the retail store and the size of this stock affects sales. Another stock is stored in central warehouse (distribution centre).From this stock, the retail store's inventory is replenished, but clearly the size of stock in the warehouse cannot affect consumer demand.

P.M.Kort and S.Jorgensen considered a setup in which management is decentralized. The store manager decides how his inventory should be replenished and sets the consumer prices as well. The central warehouse manager makes the replenishment decisions concerning the stock. Their model includes pricing as second decision variable that infuences consumer demand, where the EOQ literature often has assumed a constant sales price. The reason behind including price is that marketing studies have found that the impact on sales of a large inventory may be enhanced by price cuts.

(iii) A reverse channel structure with flexible manufacturing

Singh et.al. (2013) have investigated the effects of remanufacturing in an integrated production inventory model consisting of forward and reverse supply chain over infinite planning horizon. They have observed that environmental degradation has emerged as a serious social and economic problem. Policies to re-use and recycle used materials have been made by the government with a view to prevent further environmental degradation. One of the popular methods undertaken by the manufacturing organizations to recycle the goods after these have been procured from the customers and their reuse effectively for the same purpose is reverse manufacturing. A paper in the backdrop of a very high level of ecological consciousness on the part of government and society has been prepared by them. They have tried to include implication of research topics such as flexible manufacturing system.

An increase in the shelf space can provide more variety to the customers. Levin et al. and Silver and Peterson have observed that more customers are attracted if greater quantity of same item is present as they may have the notion of getting a wider range for selection. Gupta and Vrat have performed on models for stock dependent consumption rate. Schweitzer and Seidmann have signified the optimizing processing rate for flexible manufacturing systems. For deteriorating item with price and stock dependent demand economic production model was advanced by Teng and Chang (2005). Singh and Jain worked on reverse money for an EOQ model in an inflationary environment under supplier credits. Singh and Singh (2010) also worked on supply chain model with stochastic lead-time under imprecise partially backlogging for expiring items. A great contribution on an inventory model for deteriorating items with shortages and stock dependent demand under inflation for two- shops under one management was done by Singh et.al. (2010). Yadav et al.(2012) developed an inventory model of deteriorating items with stock-dependent demand using genetic algorithm in fuzzy environment. Singh et al.(2013) developed a supply chain inventory model for shortages with variable demand rate.

A model which consists of two systems forward manufacturing and reverse manufacturing was worked by Singh et.al. (2010). According to the model, the production starts at the very beginning of the cycle considering inventory is zero. At the beginning of each cycle, the process of collecting returnable items in a separate store also begins. At a point where the production from the forward manufacturing system stops; the collection process of returnable items also stops at the same point. At this very point the remanufacturing of reusable items begin at a constant rate. This accumulated inventory of remanufacturing products, which are assumed to be as good as the newly produced products is consumed when the shortages from the forward manufacturing system begin to surface.

There is no production and inventory of remanufactured items is consumed till it becomes nil. When remanufacturing is undertaken, from the management standpoint there is no perceptible cost difference in terms of total average cost consisting of holding cost, set-up cost and deterioration cost.

(iv) Optimizing inventory policy for products with time-sensitive deteriorating rates

Multiple-echelon supply chains industries suffer inventory management with costly deteriorating rates that changed along with the time, such as TFT-LCD panel manufacturing industry. Kung-Jeng Wang, Y.S. Lin and Jonas C.P. Yu worked on such a model.Past decades have advocated co-ordination based supply chains in order to respond quickly to customer needs and get reduction in the cost of carrying inventory for a multi-echelon supply chain. Inventory policies describes how to stock inventory and when to replenish. It determines (i) How much product is stored at a site, (ii) when replenishment orders are generated, and (iii) what quantity is replenished. Practically, products in a multiple-echelon supply chain have distinct deteriorating rates and the rates change along with the time. Because members in a supply chain suffer from different deteriorating costs, they would come up with self-centered decisions on inventory policies which may hurt other members and the overall cost of the supply chain. Their study focuses on investigating how distinct deterioration rates of product will affect individuals as well as system performances under a three echelon supply chain.

Decision making for inventory in a supply chain is very challenging. Clark and Scarf (1960) were the first to consider multi-echelon stock in inventory research. Wee (1998) derived an integration model of deteriorating products between a buyer and a seller. Vishwanathan and Piplanib (2001) proposed a one-vendor, multi-buyer supply chain model and analyzed the benefit of coordinating inventories through the use of common replenishment epochs. A cooperative approach for a vendor-buyer inventory system to minimize the joint inventory cost was studied by Yang et al. (2007). Jong and Wee developed a JIT single buyer single-supplier integrated deteriorating model with multiple deliveries (2008).

Joint Economic Lot Size(JELS) models is a promising replenishment policy in SCM.JELS generates lower total inventory relevant cost allowing the net benefit to be shared by both parties. Goyal (1976) was the first to introduce an integrated inventory policy for a single- producer single-customer problem. His research showed that an integrated inventory policy results in a minimum joint variable cost. Banerjee (1985) developed a joint JELS by combining two economic order quantity (EOQ) models from the buyer and the vendor. By considering both the buyer and the vendor at the same time, he also showed the JELS model has minimum joint total relevant cost. Later Goyal (1988) generalized Banerjee's model by relaxing the assumption of the vendor's lot-for lot policy. YU et al. (2008) developed a mathematical model of single deteriorating rate to take into account an integrated supply chain.

Hence the model developed by Wang (2011) proposed integrated policy that takes account of the producer, the distributor, and the retailer, the joint cost is found to be much less than as those in the individual policies. Their study have examined the impact of different deteriorating rates of a three echelon supply chain with replenishment inventory policies. The joint cost function is convex to deteriorating rates of products. The compensation policy is applied to cost reduction and benefit losses.

(v) Inventory model with random machine breakdown and stochastic repair time

Classical economic production inventory model believes in the total reliability of production system. But this assumption is unrealistic. Production depends upon machinery and machinery can breakdown at any time. The repair time for machines also depends upon the nature of fault. Due to machine breakdown production has to be stopped for unpredictable time. During this period the inventory that is stocked previously is used to meet the current demand. When inventory level reaches zero, there are lost sales. According to Gruen et al., (2002), Verhoef and Sloot,(2006) only 15%-25% demand is backlogged. It means that 75%-85%of demand results into lost sales. It acts as a big setback for a production unit. No manufacturer wants to lose its customer. So production system needs to be flexible so that it can produce goods according to the existing situation. Initially a unit needs to pile up goods to meet the

ongoing demand (after deducting the defective goods) and to face any future tragedy during which there is no manufacturing of goods like machine breakdown, lose of men, lack of capital, non availability of raw material, problem in transportation, etc..

According to Groenevelt et al. (1992) a production unit can work on two different policies. It is their decision whether they want to resume the production of interrupted lot or not. They are only few people who wait for the item to come. They mostly prefer to visit some other store or buy some substitute of that particular item. According to Jan de Vries organizational architecture is a most important factor in the performance of an inventory system irrespective of the fact believed that more optimally an inventory system works as more efficiently it is planned and controlled.

Anwaruddin Tanwari et al, (2009) proposed the idea of performing maintenance work of three different types to avoid the situation of lost sales. One is failure maintenance, second is preventive maintenance and third is predictive maintenance. Failure maintenance has to be done when a equipment breaks down. Preventive maintenance is useful when equipment/machinery is still in operating condition but we want to prevent or reduce the chance of occurrence of failure. Predictive maintenance is undertaken at regular intervals to check any kind of deterioration of machine when it is still in use.

III. CONCLUSION

The study reveals a complete and up-to-date review of published articles on inventory models scenario. EOQ and deterministic model of perishable inventory examined that the demand rate is a function of the on-hand inventory. Several authors took the holding cost as a non-linear function with constant demand rate whereas others considered it as a non- linear function of the length of time. The optimal control pricing and inventory policies have been discussed in detail. Review of various models on reverse logistic investigation concludes that reverse manufacturing is good option to adopt for competitive advantage in business as also contributes in environmental protection. The available relevant models have been described and classified into a number of categories and their principal features have been discussed.

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Arousing Elements Related To the Odes of John Keats- A Review

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Abstract: - An ode is a sort of lyrical stanza or a poem and it conveys romantic, glorious and enthused emotions. It is uttered in words that are creative, imaginative, venerable and sincere. Just like the lyric, the word ode had been taken from the Greek word "translit", which means to express. Since the era of 17th century, the odes had significantly changed the way of expressing, praising, glorifying and describing the events, nature of an individual and structured poem intellectually and emotionally. Odes are available in three typical different forms e.g. (Pindaric, Horatian, and irregular). The Pindaric odes follow the outward appearance and fashion of Pindar. The Horatian odes pursue attributes of Horace. Moreover, the odes of Horace consciously imitated the Greek lyricist e.g. "Anacreon" and "Alcaeus". Irregular odes make use of rhymes and they are not similar to three-part form of the Pindaric ode and they also don't follow the two or four lines stanza of the Horatian ode. The Romantic meditative odes were created from these anecdotal customs. It tried to merge the stanzaic intricacy of the irregular ode with the private meditation of the Horatian ode and drooping down the emotional dominion of the Horatian tradition. This paper represents the review on arousing elements related to the odes of John Keats.

Keyword: Keats' Odes (Poems), Arousing elements.

I. INTRODUCTION

John Keats was born on 31 October 1795 and died in the year of 1821. In his early age, his father was died by a fall from a horse and later on due to tuberculosis his mother died. He was eldest of four children of Thomas and Frances Jennings Keats. Even in the short span of his life. With almost fifty-four poems in three volumes and some magazines he had possibly occupied the highest outstanding career of any English poet. Some of the most attractive and enduring poems in English were written by John Keats. He wrote six lyric odes in sequence between the months of March and September in the year of 1819, which was one of his utmost achievements. At the age of twenty four Keats's poetic success was made the more incredible accomplishment by the age at which it ended. After finishing the "Ode to Autumn", He died in month of February-1821. He was amazingly quite insightful to the mingling of pain and pleasure. These papers insight John Keats Odes (Poems) and the Romantic elements related to his Odes.

- **Poetry of John Keats**

In Keats' poems the depiction of the objective that he contemplated can be easily seen. In his Odes, one can experience his apprehension about most of senses like kinetic, tactile gustatory, organic, as well as visual and auditory and the experiences he oftenely dealt closely with his personal living and disasters he faced in his early life. He purely believed that a style should be simple in accordance as by "Wordsworth". A little concern can be 'feeling' with contemporary public and political events.

- **Arousing Elements in an ode on a "Grecian Urn" - The Immortality of Beauty**

In this ode, John Keats utilized the "Grecian Urn" to exemplify the immortality of beauty. Keats addressed an olden "Grecian Urn". He described the "Urn" as a "historian" which knows how to tell a story. He aimed his delights to communicate in

the form of a “Grecian Urn”. He shaped a ‘Grecian Urn” out of his thoughts and imaginations by using the magic of words. He etched it with various images of men and maidens performing dance and play; and of a priest leading a parade to an outdoor alters. So, the "Ode on Grecian Urn" may be addressed as personification of his thoughts about persuasiveness of beauty upon life. According to Keats, beauty has no age and it is immortal. Through this ode, he affirmed the immortality of attractiveness and beauty through an ‘Urn”, which was shaped centuries ago. John Keats has long since passed away, but he shaped the beauty that is still alive in his work of art. Keats felt that beauty is everlasting as well as being on the way of arriving the truth about life [1]. He captures the moments of extreme experience then freezes them into marble immortality. He catches the undying beauty all the way through an “Urn” which is 'Sylvan Historian' and he appreciated the idea of something being preset there and cannot be changed everlastingly.

- **Powerful Imagination of John Keats**

Keats could not listen to the pipes on Urn but still can imagine the deep sensation and sweet melodies of the pipers etched on the Urn. He could thought that even thou the pipers are not singing but still ears of imagination can hear them loudly. 'The heard melodies are lovable, but those unheard are sweeter’. All the generations will be continuously hearing the sweet memories everlasting.

Keats was ruptured by the silence of images etched on the urn and that fell him into his deep imaginations of thoughts and he also felt enthusiasm of delight in the calmness of the quiet small town with its peaceful citadel. The small town will be empty forever and that means lots to John Keats just to create beat imagination for that moment. The immortality of the senses mentioned on the Urn filled Keats with envy. The generations those are one after the other has been wasting away.

'When the old age shall this generation waste,
Thou shalt remain...'

We can feel the panic in these lines about an early death of Keats' father and brother. Keats seems to place fundamental meaning into 'old age' but the pain from threatening death restrained him from terming 'old age' as 'tuberculosis'.

- **Description of Vividness**

Keats described the picture on Urn so clearly that it intensely appeals to our mind that one can straightforwardly imagine the facts in the figures. The mystifying priest which was leading the garland dressed heifer lowing to the skies will embody itself into our imagination even if we are totally stranger to such a scene in the treatment of a simple thing, these things were mentioned on the Urn which was presented in an unusual aspect. Keats began to cry that human beings are not endless like the men, Gods, and maidens mentioned on the Urn.

➢ **Arousing Elements in "Ode to a Nightingale"**

"Ode to a Nightingale" just starts with a change of facts in the natural sight. The poet feels as though he has drunk hemlock or opiate. This serves only as stimulus to raise the emotional problems or personal crisis. During the writing of this ode Keats’s brother Tom’s early death was his person problem. He found solace by pouring out his thoughts mentioned by the nightingale. This nightingale was regarded as a source of his consolation.

- **Longing for Death**

The enjoyment of death was the predominant mood, which was mentioned. Keats feels the highest intensity of love for the nightingale as an approximation to death or the longing for death. Every stanza has either a direct reference to death or some term associated with death in the first stanza. For instance, Keats implies death by longing for hemlock. In these lines, there is an almost direct implication of death: he wishes to drink the beaker of wine to leave the world without being seen.

- **Away from the Troubles**

Keats could not discover a divine home in his own flesh, bone and soul. He is seeking a region which is capable of providing the proper environment for his passionate melancholic and isolated soul. The voyage he longs for in "Ode to a Nightingale" is away from the known, conventional and dull environment that is far away from the troubles of his own soul toward an exotic and mysterious place: toward the 'Warm Soul of France' with its sunburned mirth, provincial songs and dances. He wants to go to a place where his exhausted and troubled soul might discover peace and find a heaven. He wishes to be like the nightingale to disappear in forest of peace, joy and true beauty,

but he is helpless that he cannot fly as the nightingale can. So he straight away needs a glass of wine with 'beaded bubbles winking at the brim' to disappear and be with that nightingale.

- **Diversity of Appeals to the Senses**

All through the ode, we discern a concreteness of description in which all the senses combine to give the total and full expression of the thing he writes about. In the description of a glass of wine:

‘‘ ... the blushful Hippocrene
With beaded bubbles winking at the brim
And purple stained mouth....’’

The poet appeals to our sense of 'taste, of sight, of smell and even to our sense of hearing with the bubbles dying away one after the other on the edge of the glass. Keats succeeds, in the ease, in conveying profound reflections by pictures and images. Moreover, these profound reflections would not have been so visible and life-like even in a painting.

- **Pain and Misery - Immortality**

In the world of Keats, sorrow predominates over joy and his world is full of unhappiness and heartbreak. Like many Romantics, Keats finds melancholy in delight and pleasure in pain. In "Ode to a Nightingale", he sees no light at all in the light of moonlight. He is so wrapped 'Up in his dark mood that he cannot see the flowers at his feet. All his senses seem to have failed. Keats yearns for immortality and immortal beauty. He reveals his envy for the nightingale's immortality in these lines: 'Thou was not born For death immortal bird’, and 'The voice I hear this passing night was heard in the ancient days by the emperor and the clown.' Keats reaches his aim and now both the nightingale pouring out her song and Keats embodying his poetry in lines will be enjoyed forever is immortal.

- **Arousing Elements in "Ode on Melancholy" - Melancholy everywhere**

As mentioned before, Keats believes in the world which is full of misery, heartbreak, pain and oppression. Like the other romantics, he rarely laughs. Keats wrote that for Romantics, "there is just one approach to be pleased, but there are lots of ways to be unhappy and depressed" But even that 'only way' has hardly ever been experienced by any one member of the Romantic writers. Keats, who is not able to see and enjoy the beauty of the flowers at his feet, is now under an acute emotional sensibility and feels melancholy everywhere. The melancholy pours down like a 'weeping cloud', it fosters 'the drop headed' flowers, but once the flowers 'hide the green hill' Keats still broods over melancholy and calls the flowers 'April shroud'. The depression of Keats exists in the identical way as the prettiness does and where we have joy, we will also have melancholy disguised:

'Aye, in the very temple of Delight
Veiled Melancholy has her sov'reing shrine’

lf we search for it, melancholy is there waiting to envelop everybody but only someone who is very sensitive and has a 'keen tongue' will taste melancholy. 1n other words, melancholy wins over the sentimental person and adds him to her collection as a trophy. It is obvious that Keats himself becomes such a person who tastes the sadness of melancholy when he squashes the grape against his sensitive palate.

- **Longing for Eternal Beauty**

Keats persistent theme, 'longing for eternal beauty' is reintroduced in "Ode on Melancholy" but only to weep for not being able to stop the inevitable end "the human destiny has tragic that prettiness, delight and existence of life itself are temporary and turn into their opposites" Melancholy dwells with Beauty - Beauty that must die. The grape of joy turns into melancholy when bursted.

- **Arousing Elements in "Ode to Autumn" - Comfort and Peace in Nature**

Keats, for instance, wrote his "Ode to a Nightingale" under a tree and wrote "To Autumn" after a Sunday walk. Because of the significance of nature, Romantic poetry has become almost synonymous whit nature poetry. Nature is regarded by Romantics, to be consoling and morally uplifting. It is a kind of spiritual healer. Keats finds consolation after his brother's death in listening to the nightingale in the full moonlight. He finds peace and comfort in the plains with feathered rosy clouds touching the horizon. Everything about nature is taken as an equally fit subject for poetry. The subjects that are the meanest and most unpromising are the best subjects for poetry. Keats is one of the Romantics who experimented in the simple treatment of the simple subjects about nature. "To Autumn" has an abundance of these simple incidents and situations, but they are described with an accuracy of observation: the gourd swelling, the hazel shells plumping, the wheat sitting carelessly on a granary floor with its

chaff soft lifted by the winnowing wind, and the smell of the poppies making the uncut wheat drowsy, obviously need a complete and close observation of nature to be turned into fine poetry.

II. CONCLUSION

The study depicts that John Keats was an extraordinary and creative poet. The odes written by him covered almost every tragedy of his life span. He was deeply influenced by early death of his father, brother and mother. In every ode, he tried to engage the misery of his life with the death of his family. This deep sorrow altered his thoughts to create original and imaginative ideas, which have been mentioned in his odes. Moreover, he expresses the soothing power of nature aesthetically that how it nurses and heals the wounds of mankind. The following are the finding out of his odes:

- In an ode on a "Grecian Urn" - The Immortality of Beauty: - the beauty is everlasting (means it is immortal). He also depicted that human beings are not immortal like the men, gods and maidens as it is mentioned in this particular Ode. But factually, it should be accepted that everything is transient in this mortal world and nothing is for permanent. The aesthetic artifacts long lastingly can immortalize themselves only by imprinting their beauty and grace on the minds of their viewers.
- In "Ode to a Nightingale" - He found solace by pouring out his thoughts mentioned by the nightingale. This nightingale was regarded as a means of his consolation. The melodious voice of nightingale signifies the source of nature to soothe the human soul. Mother Nature has the power to nurse that in the harmony of it man becomes forgetful about his worries for some time.
- In "Ode to Autumn": - He finds peace and comfort in the plains with feathered rosy clouds touching the horizon. He mentioned nature as the biggest source of his extraordinary beliefs. The natural objects attired in all their beauty add a lot to make the power of nature worth.

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Role of Institutional Credit in Growth of Agriculture

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Abstract: The institutional credit has been conceived to play a pivotal role in the agricultural development of India. A large number of institutional agencies are involved in the disbursement of credit to agriculture. However, the persistence of money lenders in the rural credit market is still a major concern. In this backdrop, the study has examined the performance of agricultural credit flow in India. Various growth trends show a capital formation in agriculture in both Public and private sectors also examined. The share of public sector in total investment has decline 50 percent in early 1990 to 20 percent in 2000 decade. Although private investment increased 50 percent to 80 percent in the same Period. Institutional credit to agriculture in real terms has increased tremendously during the past four decades. A large number of formal institutional agencies like Co-operatives, Regional Rural Banks (RRBs), Scheduled Commercial Banks (SCBs), are involved in meeting the short- and long-term needs of the farmers. The structure of credit outlets has witnessed a significant change and commercial banks have emerged as the major source of institutional credit in recent years.

Keywords: - Capital formation public and private, institutional credit and non institutional credit

I. INTRODUCTION

Agriculture plays a crucial role in the development of the Indian economy. It accounts for about 19 per cent of GDP and about two thirds of the population is dependent on the sector. Credit is one of the critical inputs for agricultural development. It capitalizes farmers to undertake new investments and/or adopt new technologies. Investment or capital formation is one of the basic requirements for growth of any sector. Capital formation in agriculture comes from Public and private investment. A large number of studies have attempted to analyse the various dimensions of capital formation in agriculture. In India a multi-agency approach comprising co-operative banks, scheduled commercial banks and RRBs has been followed for purveying credit to agricultural sector. The share of institutional credit, which was little over 7 per cent in 1951, increased manifold to over 66 per cent in 1991, reflecting concomitantly a remarkable decline in the share of non institutional credit from around 93 per cent to about 31 per cent during the same period (NSSO). The contribution of institutional credit towards agriculture growth and demand for production credit in relation to its institutional supply has been examined whether indebtedness is associated with lack of adequate availability of institutional funds and its over supply (Sidhu *et al* 2008).

Agriculture is a dominant sector of our economy and credit plays an important role in increasing agriculture production. Availability and access to adequate, timely and low cost credit from institutional sources is of great importance especially to small and marginal farmers. Along with other inputs, credit is essential for establishing sustainable and profitable farming systems. Most of the farmers are small producers engaged in agricultural activities in areas of widely varying potential. Experience has shown that easy access to financial services at affordable cost positively affects the productivity, asset formation, income and food security of the rural poor. The major concern of the Government is therefore, to bring all the farmer households within the banking fold and promote complete financial inclusion.

The green revolution provided a breakthrough in agricultural production in India. There are mainly two sources of agricultural credit in India i.e. Formal source of agricultural credit and informal and non- institutional source of agriculture credit. Since independence, cooperatives' loans were the

major source of institutional agricultural credits in India. Fourteen major commercial banks after nationalization in 1969, were directed to advance loans to the agricultural and rural sector in a significant manner; another six commercial banks were added to this category in 1980. In spite of taking various measures to rejuvenate farm credit, the flow of credit to the agriculture sector remained inadequate quantitatively and qualitatively. The institutional source meets only 51 per cent of the credit requirement of the farm sector (Rao, 2003).Informal and non-institutional agriculture credit include friends, relatives, commission agents, Traders, moneylenders etc. the non-institutional sources

are largely approached by the farmers due to lack of their security assets, frequent needs, inadequate supply of institutional credit, undue delay, sophisticated procedure and malpractices adopted by the institutional lending agencies (Singh, 1971; Singh, H., 1971; Singh, 1973; Sharma, 1978; Nahatkar,2002).

II. CLASSIFICATION OF AGRICULTURAL CREDIT

A large number of formal institutional agencies like Co-operatives, Regional Rural Banks (RRBs), Scheduled Commercial Banks (SCBs), Non–Banking Financial Institutions (NBFIs), and Self-help Groups (SHGs), etc. are involved in meeting the short term, medium term and long-term needs of the farmers on the basis of time and purpose. Time duration of short term credit is less than 15 months and mostly used by the farmers for purchasing seeds, fertilizers, diesel, insecticides, pesticides etc. On the other hand time period of medium term credit is 15 months to 5 years for the purpose of purchasing spray machines or drainage improvements etc. Long term credit mostly used by the farmers for purchasing machinery, buying land, permanent land improvements, constructing building, roads, sheds etc.

III. GROWTH IN CAPITAL FORMATION

Investment or capital formation is one of the basic requirements for growth of any sector. Even though the Gross Capital Formation (GCF) in agriculture & allied sectors as percentage of Agricultural GDP has increased from 14.9 percent in 2006-07 to 19.8 per cent in 2011-12 when compared with the overall capital formation in the economy which is about 40 percent of the GDP, capital formation in agriculture sector is much lower. Further, the share of public sector capital formation in agriculture & allied sectors has come down from 25 per cent in 2006-07 to about 15 per cent in 2011-12 where as that of private sector has gone up from 75 per cent to 85per cent. In fact during the first four years of the 11th Five Year Plan, capital formation in public sector in agriculture as per cent of agricultural GDP has come down from 3.5 per cent in 2007-08 to 3.0 per cent in 2011-12. While a higher share of private sector investment in agriculture is a welcome feature, public sector investment is critical as it is generally found to accelerate private investment. However, from 2006-07 to 2010-11 an inverse relationship is observed between growth in public sector and private sector investment.

TABLE 1.1 GROSS CAPITAL FORMATION IN AGRICULTURE AND ALLIED SECTORS

YEAR	GROSS CAPITAL FORMATION IN AGRICULTURE(RS CRORE)		
	PUBLIC	RIVATE	TOTAL
1980-1981	13174	15384	28558
1985-1986	11248	24208	24208
1990-1991	8938	29116	38054
1995-1996	9560	17776	27336
2000-2001	8085	37395	45480
2005-2006	19909	73211	93121
2010-2011	19918	111306	131224
2011-2012	22095	124483	146578
SOURCE:- CENTRAL STATISTIC OFFICE			

IV. GROWTH OF INSTITUIONAL CREDIT

Agricultural credit started depicting a growth after bank nationalization and it has been growing continuously. This has resulted in a significant increase in the access of rural cultivators to

institutional credit and the contribution of informal agencies as credit sources has declined. The share of institutional agencies in the total agricultural credit supply was 7 per cent in 1951, which rose to 66.3 per cent in 1991. The next decade witnessed a slight decline in its share and it fell to 64.3 per cent in 2002-03.The government has made renewed efforts to enhance the credit supply and the agricultural credit through institutional sources has more than quadrupled in the past seven years in nominal terms. The efforts like nationalization of banks, establishment of RRBs, strengthening of credit institutions etc. have been quite effective in reducing the role of informal agencies in rural credit market. However, still non-institutional agencies continue to play a significant role in the rural credit market. These include reliance of borrowers on moneylenders and other informal sources despite their usury and exploitation. Kumar *et al.* (2007) have reported that the interest rate being charged by the informal sources was to the tune of 36 per cent to 120 per cent per annum.

TABLE 1.2 Direct Institutional Credits To Agriculture And Allied Activities (Long And Short Term) RS IN CRORES

YEAR	COOPERATIVES	CBs	RRB	TOTAL
1990-1991	48.19	46.76	3.35	101.88
1991-1992	57.97	48.06	5.96	115.38
1992-1993	64.84	49.60	6.98	125.30
1993-1994	84.84	54.00	7.52	150.13
1994-1995	98.76	74.08	10.83	187.73
1995-1996	124.83	92.74	13.81	236.92
1996-1997	132.54	106.75	17.48	263.45
1997-1998	141.59	115.37	21.03	286.56
1998-1999	150.99	146.63	25.15	326.97
1999-2000	256.78	163.50	29.85	455.34
2000-2001	272.95	164.40	39.66	481.87
2001-2002	305.69	186.38	45.46	541.95
2002-2003	340.40	252.56	58.79	651.75
2003-2004	400.49	362.03	71.75	834.27
2004-2005	450.09	483.67	119.27	1053.03
2005-2006	481.23	805.99	153.00	1440.21
2006-2007	540.19	1152.66	202.28	1895.13
2007-2008	576.43	1134.72	238.38	1949.53
2008-2009	587.87	1606.90	264.99	2459.76
2009-2010	749.38	1882.53	346.40	-
2010-2011	-	2227.92	439.65	-
2011-2012	-	3128.77	530.58	

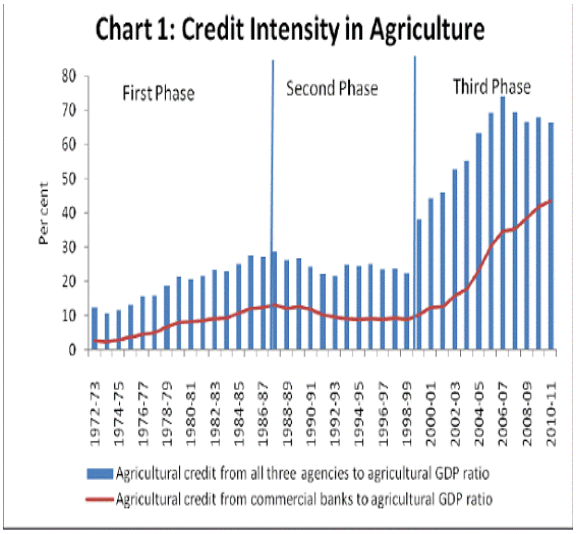
SCBs: Scheduled commercial Banks. RRBs: Regional Rural Banks

Source: 1. Reserve Bank of India

2. National Bank for Agriculture and rural Development

V. CREDIT INTENSITY IN AGRICULTURE

Over the last 40 years, there has been a striking increase in the credit intensity of agriculture as measured by the ratio of agricultural credit to agricultural GDP. The credit intensity increased from 12 per cent in the early 1970s to 67 per cent Between 1970s and 2010, there were, in fact, three distinct phases in the behaviour of credit intensity. The first phase from early 1970s to the mid 1980s, saw a moderate increase in credit intensity. The second phase from the mid 1980s to late 1990s saw a declining trend. This was a period when the share of institutional sources in total debt of cultivator households was also on a decline. By contrast, in the third phase starting 2000, there was a marked increase in the credit intensity of agriculture.



Source: Handbook of Statistics on Indian Economy, RBI (2010–11)

VI. PERFORMANCE OF CREDIT INSTITUIONS

Among the institutional sources of agricultural credit, cooperatives have been the oldest, and for a long time, the dominant source. Starting with the nationalisation of banks, commercial banks have gradually become an important source of agricultural credit, although the growth in their share has not been monotonic. At the beginning of the 1980s, cooperatives supplied about half of the total institutional credit while commercial banks had a share of about 40 per cent and RRBs just about 2 percent. The share of commercial banks had increased continuously through the 1980s

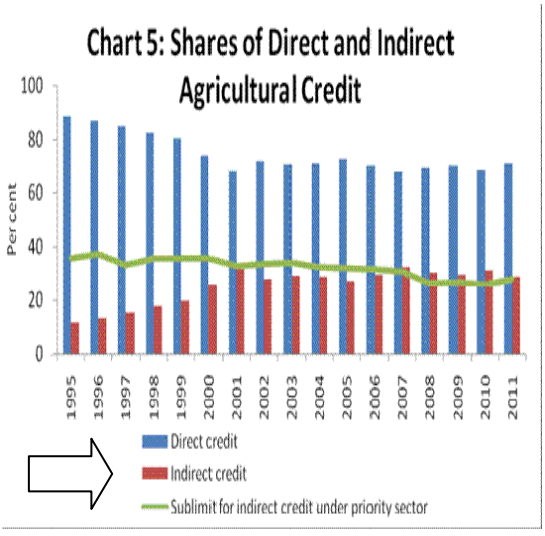
overtaking the share of the cooperatives. This trend, however, reversed in the 1990s when the share of commercial banks declined. This is possibly accounted for by the fact that this was a period when banking penetration across the country, as measured by the number of rural branches and average population per branch, showed a fall during this period.

A. Sharp growth in commercial bank credit to agriculture in the 2000s

The decline in the share of commercial banks in total institutional credit to agriculture in the first half of the 1990s as indicated above began to change with a moderate revival in the second half of the 1990s, and then a steep rise in the first half of 2000s. Agricultural credit from commercial banks grew significantly faster than that from cooperatives during this period.

B. Faster growth of indirect credit to agriculture

Since the second half of the 1990s, indirect credit to agriculture grew faster than direct credit taking the share of indirect credit in total agricultural credit supplied by commercial banks from about 11 per cent in 1995 to 29 per cent by 2011. During the second half of the 2000s, indirect credit even exceeded its prescribed sublimit under the priority sector guidelines by a narrow margin. The rising importance of indirect credit can be interpreted as a reflection of the growing credit needs for strengthening the supply chain infrastructure and the consequent widening of the definition of indirect credit



Source: Priority Sector Returns of Scheduled Commercial Banks, RBI.

VII. CHALLENGES IN AGRICULTURAL CREDIT

A. Demand-supply gap

By far, the biggest challenge is the demand-supply gap in agricultural credit. Notwithstanding the expanded rural credit network and growth in quantum of credit, the demand-supply gap has been widening. During the period 2002/03 to 2007/08, when agricultural GDP grew at an average rate of around 3 per cent per annum, the demand-supply gap in total institutional agricultural credit was estimated to be around 14 per cent (as a proportion of actual supply of agricultural credit).Clearly, if agricultural sector had grown faster than 3 per cent, the corresponding demand-supply gap in agricultural credit would have been much larger.

Table : 2 Agricultural Credit: Demand-Supply Gap

YEAR	ACTUAL SUPPLY OF TOTAL AGRICULTUE CREDIT (RS BILLIONS)	ESTIMATED DEMAND FOR AGRICULTURAL CREDIT (RS BILLIONS)	DEMAND-SUPPLY GAP (IN PERCENT)
2002-03	2562	2665	4.0
2003-04	3004	3260	8.5
2004-05	3583	3811	6.4
2005-06	4411	4944	12.1
2006-07	5361	6745	25.8
2007-08	5817	7741	23.1

Note: Calculations based on the data published in the Handbook of Statistics on Indian Economy, RBI (2010–11).

The demand for agricultural credit is estimated within a simultaneous Demand-Supply equation system taking data from 1997 to 2007, using two stage least square procedure. The exogenous variables in the system, at their lags and levels are employed as instruments.

In order to derive the demand-supply gap, it is assumed that, agricultural GDP grows at 3 per cent per annum, which **wathe** actual average growth rate of agricultural GDP, during the period 2002–03 to 2007–08. The estimated coefficients of the demand equation for agricultural credit was applied to the agricultural GDP trend incorporating this assumption, yielding estimates of demand for agricultural credit that prevailed during this period.

B. Transaction costs

Anecdotal evidence suggests that a number of factors inhibit smooth credit delivery to the agriculture sector. These are: (i) insistence on collateral, (ii) complicated loan administration procedures, (iii) distances from the villages to the branches, (iv) higher monitoring and follow up costs, (v) culture gap between bank officials and farmers, (vi) political interference, (vii) inflexible lending policies and procedures including cumbersome documentation, (viii) difficulties in recoveries of overdue loans, (ix) lack of provision for consumption credit, (x) absence of effective systems for screening credit risks and, finally (xi) a misplaced belief that the borrowers in the agricultural sector, particularly, small and marginal farmers with low per capita incomes are risky and hence non-bankable. Some of these factors ostensibly translate into higher transaction costs, which include expenses incurred in appraisal of borrowers, processing, documentation and disbursement charges, loan monitoring/supervision and collection, and the proportionately allocated cost of branch, division and head office expenses. Quite clearly, it is necessary to reduce such transaction costs to lower the cost of delivery of credit and cost of funds to the ultimate borrower in the agricultural sector.

C. Unlicensed cooperative banks

The deteriorating financial position of unlicensed cooperative banks is an issue of concern. Of the 402 cooperative banks in the country as on March 31, 2009, 313 were unlicensed. The Committee on Financial Sector Assessment had recommended that no unlicensed cooperative bank is to be allowed to function in the country after March 31, 2012. In the intervening three year period, RBI and NABARD worked closely with the cooperative banks and licensed 270 of them, in some cases by relaxing the licensing norms.

Thus as on April 1, 2012, there remained 43 cooperative banks which could not meet even the relaxed licensing norms. In order to maintain the integrity of the cooperative system and to protect public interest, the Reserve Bank imposed Directions on these 43 banks prohibiting them from accepting fresh deposits. The Directions do not imply any ban on the normal operations of the banks concerned with the existing account holders.

The Board for Financial Supervision of the Reserve Bank directed that these as yet unlicensed banks be given six months time, up to September 30, 2012, to formulate Monitorable Action Plans for attaining the eligibility norms. The Regional Offices of the Reserve Bank in states where these unlicensed banks are located have been asked to form Task Forces to monitor the progress of these banks towards meeting the licensing norms. While imposing the Directions on these banks prohibiting them from accepting fresh deposits, the Reserve Bank has been guided by the need to protect the interests of depositors and the decision was taken in the best public interest.

D. Credit for promoting rain-fed agriculture

Nearly 65 per cent of agriculture in India is rain-fed, cultivated largely by small and marginal farmers. Evidently, improving productivity here is critical to overall agricultural growth. We cannot raise agricultural growth consistently to 4 per cent per annum without a focus on research and agricultural credit in rain-fed areas. There is also need for more robust weather insurance and agricultural extension services to target diversified livelihood options in the rain-fed areas. As appraisal and disbursement of credit for rain-fed agriculture requires a different orientation and approach, there is also a need to design innovative credit products. Such products would help in building the confidence of bankers in rain-fed agriculture, and would also ensure the financial and economic inclusion of the vast majority of small and marginal farmers from these areas.

VIII. RESULT

The agricultural performance engrosses many production factors; agricultural credit is one of them. The performance of institutional credit to agriculture and the determinants of institutional agricultural credit use at households' level have been analysed. The study has shown that the institutional credit flow to the agriculture has been increasing for the past four decades. However, different patterns in the growth of agricultural credit have been observed during different sub-periods. The structure of the sources of credit has witnessed a clear shift and commercial banks have emerged as the major source of institutional credit to agriculture in the recent years. Further, the portfolio of institutional credit to agriculture has

also changed and the share of investment credit in total credit has declined over time. The declining share of investment credit may constrain the agricultural sector to realize its full potential. Study also conclude that the cost of borrowing higher in case of non-institutional sources of finance as compared to institutional sources; still there is a strong presence of informal credit in the agricultural credit. Most of the farmers also suffered the malfunction and mismanagement of institutional agencies and highly borrowed loan from non-institutional agencies like money lenders, traders, with high rate of interest. The choice of a credit outlet and the quantum of institutional credit availed by farming households have been found to be affected by a number of socio-demographic factors. The effect of education has indicated the need for capacity building of borrowing farmers. Imparting training to borrowers regarding procedural formalities of financial institutions could be helpful in increasing their access to institutional credit.

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Track 4
INNOVATION IN MANAGEMENT/ EDUCATION/ PHYSICAL EDUCATION/ SOCIAL SCIENCE/ TOURISM

An Overview of Report on Application of Behavioral Insights to Financial Literacy and Education Programs and Initiatives

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Abstract: An ambitious thrust is felt for applying of the behavioral insights in financial literacy and educational initiatives to enhance effectiveness and long term impact in financial decision behavior of Individuals. The present study is an overview of report on surveys (by IOSCO committee 8 on Retail Investor(C8)and OCED/INEF on their members) related to application behavioral insights(BI) to the investor educational programs and initiatives .The survey attempts to identify the approaches of BI that may be considered by stakeholders for designing financial education initiatives . Though the report explain seven behavioral framework for designing interventions for desired behavioral change, yet there is need to generate cost effectives approaches for building new behavioral framework/model or behavior change design, based on own experience of stakeholders. The report shows that majority of respondents (IOSCO and OCED/INFE members) reported that they are actively seek or learn about behavioral insights through various resources like available literature , events and networks to maximize the efficacy of Financial Literacy and Educational Initiatives . The report is an evident that almost of half of the respondents is not applying BI in Financial Literacy and education initiatives but expressed their willingness for this in future initiatives for deeper understanding of Investor decision making and behavior.

Keywords: Behavioral Insights, Behavioral Frameworks, Behavioral Techniques, Financial Literacy, Investor Education

I. INTRODUCTION

Behavioral insights is an inductive approach that focus on discovering the human behavior about making choices through empirical testing by combines various insights from psychology, cognitive and social sciences. Since there are number of barriers like psychology, cognitive and social factors that influence the humans' financial decisions.

A great emphasis has been given on the exploring the application of Behavioral economics to the financial literacy and education programmes/ Initiatives for retail investor since the inception of Committee 8 on Retail Investor by International Organization of Securities Commission IOSCO[1] . The evident of the financial crisis, under normative approach based on the assumption of 'Rationality of Investor' fails to explain the behavior of investor. Thus there is a thrust to know how an investor actually thinks and behaves[2]. Behavioral Science aims bring about the way of people thinking and behaving through empirical evidences resultants from psychological, cognitive and social factors. Behavioral Insights are considered as a device to have information about the investors' behavioral that helps in designing effective financial literacy programmes and initiatives. Such behavioral insight approaches and frameworks will be helpful tools in hands of Policy makers and security regulators for desirable financial decision behavior.

The report on survey "Application of Behavioral Insights to Financial Literacy and Investor Education Programmes and Initiatives" highlights important key concepts and reviews of literature related to insights from behavioral sciences. The report also provides researches related to application of behavioral insights in designing the financial literacy programmes and initiatives.The report elaborates essential features of BI for designing the interventions like public policy that aim to achieve the desired behavioral change. The

main highlights of report on the mentioned survey are as follows:

1. The surveys were conducted on IOSCO and OCED/INFE members from December 2016 to January 2017.
2. The surveys were conducted with the objective of assessing the Incorporation Behavioral Insights applications in financial literacy and education initiatives and programmes.
3. The report seeks to identify present practices and researches that must be helpful to policy makers in designing and developing the behavioral-informed education programmes.

The present paper will follow as below mentioned parts on the basis of report contents:

Part I: Global Vision for Financial Literacy and Education with Behavior Insights for general consumer

Part II: De-biasing approaches in Behavioral Insights –literature review

Part III: Behavioral Framework applicable to design of Investor Education and financial literacy Programmes.

Part IV: Application and approaches of Behavioral Insights to Investor Education and financial literacy initiatives by IOSCO and OECD/INFE Members.

Part V: Conclusion

The report will contribute to the work done by World Bank and OECD in researches especially in field trials, significance of Behavioral Key concepts, techniques for evaluation.

Part-I: Global Vision for Financial Literacy and Education with Behavior Insights for general consumer

The need of financial literacy and financial education has been officially recognized by OECD Government through exclusive and wide-ranging project in 2002. The project has been extended further in 2008 by creation of International Network on Financial Education (INFE/OECD) with membership over 240 public Institutions around 100 Countries. Organization of Economic Co-Operation and Development (OECD) defines financial literacy as a 'Combination of awareness, Knowledge, Skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve financial well being.'In 2013, International Organization of Securities Commission (IOSCO) Board created 'A Committee on Retail Investor (C8)' with Strategic Framework for Investor Education and Literacy[3]. The strategic framework of C8 aims to posit the Investor education and financial Literacy programmes that can help the retail investor for better financial management and decision. IOSCO and OCED/INFE agreed to work jointy on this area to explore the application of BI in Financial literacy and Investor Educational initiatives.

It has been identify by OCED and IOSCO C8 that Financial Literacy programmes suffer from some limitations. It is observed through empirical behavioral researches that retail Investors are not consistent in rational decisions and suffering from biases like psychological, cognitive and social that influence their rational financial decision. The individual tends to employ heuristics and biases to simplify the financial decision making instead of access to comprehensive information[4],[5].

The Financial Literacy programmes fails to assure desired outcome like better financial decisions by consumers, regulatory intervention to achieve desired results. There is a great challenge of developing the simple effective and low cost method of Financial Literacy and educational programme inclusive of Behavioral Insights.

Behavioral Insight, according to OECD, as one discipline, along with Behavioral Science and Behavioral Economics, "which mix traditional economics strategies with the insight from psychological , cognitive sciences and other Social sciences to discover the many 'irrational' factors that influence decision making[6]" . The aim of application of Behavioral Insights is to improve the consumers' decisions through policy and regulatory intervention. These interventions must be based on the empirical evidences through efficient and full proved experimental methods[7]

Though financial literacy and education initiatives focus on the welfare of investor to take accurate financial decisions with regard to saving, investment avenues, and appropriate use of credit and risk awareness, yet providing such awareness is not enough to change financial behavior of Consumers in long run. The limitation of financial literacy initiative can be explain with cognitive factors to some extends. The cognitive factors like participants may not understand the contents or may not able to confess the need to use such knowledge or unable to retain the information due to shortcoming of methodology or techniques used in providing information.

Not only the behavioral biases that lead to bad financial decisions, but may also affects the adversely on attending the Financial educational initiatives[8] .for example, the overconfident consumers will reject the important information and tend to behave according to their beliefs[9].

The social factors are great motivator and drivers in individual decision behavior. Financial decisions like investment and spending are sometimes taken

under influence of social factor like peer pressure, herd behavior and seeking a social status.

Thus the consideration for an effective financial literacy and education are cognitive factor, social factors.

For designing effective financial literacy and educational initiatives, there is need to address two approaches:

1. The programme and initiatives must contain elements of awareness along with motivation for behavioral change in Investor consciously.
2. The context and environment must be taken care of while creating such initiatives. The efforts will induce the individuals to behave in rational manner after analyzing and assessing their system 1 e.g. nudging.

The part B discusses how behavioral insights are being used to address these two approaches.

Part II: Approaches in Behavioral Insights –literature review

Since heuristics and biases are key elements that influence the rational financial decision of an individual[10]. Thus the aim focus in application of behavioral insights is to reduce such behavioral biases.

1. DE-BIASING

Under this report, Debasing refers to action oriented intervention with an aim to reduce and mitigate the effects of behavioral biases on financial decision making. There is no explanation with regard to whether such a de-biasing strategy have impact on present or long term particular decision behavior of individuals or not. On the basis of objective of intervention, the de-biasing approached can be classified:

A) De-Biasing Techniques Of Individuals

Under this approach, the focus is on development of decision maker through supply of knowledge. This will help the individual to analyze financial issues more effectively. Off classroom teaching methodology like simulation system[11], experimental learning helps in improving the capability of Investors by diminishing the presence of biases. Since several experiments are conducted by psychologist to test effectiveness of de-biasing strategy.

The aim of such strategies is to encourage the people to look at the situation in different way so as to overcome the narrow thinking. Under such approach the methodology is taught to decision maker to identify the different objectives and to handle each objective at a time instead of all objectives at a time. This will enable a decision maker to generate alternatives and to act effectively in decision making[10].

B) De-Biasing Techniques Based On Environment

This approach is known as 'choice architecture', the focus is on altering the environment and situation so that decision makers' biases become irrelevant and enable them to opt for desired outcome. Thus interventions of Policy makers by offering economic[12] or noneconomic incentives are used to create or design the environment which may be conducive for desired outcome of rational financial decision by analyze the benefits changed environment.

Though economic and non economic incentives create conducive environment for rational financial decisions still investor need to opt or make choice related to change in his behavior.

'Choice Architect' and 'Nudge' are attractive interventions, thus focus on more automatic processes of judgment and influence "change behavior without changing the minds[13]"

Thus environment modifications (like compulsive commitment of future rise in salary towards debt reduction) enhance the chances of behavioral change. Environment modifications offered with less hassle factors help the participants to act immediately during or after the Policy making / financial literacy initiatives.

However there is huge gap in studies related to occurrence of behavioral biases and de-biasing experiments. There is a great need of scientific research related to testing de-biasing techniques and techniques to cope up behavioral biases and heuristics.

2. OTHER APPLICATIONS OF BI TO FINANCIAL LITERACY

With view to deal heuristics and biases, as per report the below mentioned techniques can be considered important for behavioral change while designing Financial Literacy programmes.

-Rule of Thumb: Generally Learners incorporate 'rule of thumb' (based on principles and teaching fundamentals) in the decision behavior instead of traditional financial knowledge. And at the same time Chances of Procrastination and misunderstanding are less. Thus rule of Thumbs helps in tackle & reducing the chances of heuristic and behavioral biases.

-Mass Media: MM is considered as powerful tool to create impact on behavioral aspects by engaging emotionally the large audience with educational content or stories. The report has evident of evaluating economic impact of financial literacy by World Bank in South Africa through using mass media i.e. Television soap Opera on Debt Management. The event was successful as viewers were less likely to engage in gamble and hire purchase agreements. Likewise In Nigeria World Bank assessed the impact on entrepreneur of a

movie that encourage saving message. Though Mass media proved to reach at large audience yet has short term influence in decisions.

-Visual Tools Counseling : As evident of US experiment in the report, the level of users' self-efficacy and financial knowledge[14] is considered to be higher in using of Video or interactive programmes than text based or passive educational programmes . Thus Behavioral insights also drive the use of the visual tools in financial literacy initiatives.

-Financial Coaching: Though Customized coaching experiments evident to be more impactful on behavioral change than on financial Knowledge however, motivating participants to be consistent in attending coaching session remains a challenge.

-Trans-theoretical Model of Change – (TTM) is a integrating psychological model for Behavioral change. The model elaborates how people modify a problem behavior or acquire a positive behavior. This model is based on assumption that behavioral change is not a discrete event rather it is a long process. The model explains stages of change: pre-contemplation, contemplation, preparation, action, maintenance and termination. The application of this model can provide a base for development of an effective and impactful intervention and financial literacy initiatives. It is evident through a survey showing that most of financial distressed people are on pre-contemplation stage[15] which means people may not be aware of problem or probable have no intention to alter their behavior. The application of the model for Personal Finance management suggests that it might be more effective to first to teach 'an avoidance strategy[16]' to limit impulsive purchases among individuals, before bringing an 'approach strategy' of saving among the individuals.

3. BEHAVIORAL SCIENCES RESEARCH FINDINGS WITH PROSPECTIVE APPLICATIONS IN FINANCIAL EDUCATIONAL INITIATIVES

The report discusses two selected psychological theories i.e. Theory of Planned Behavior and Financial Socialization. The theories study various factors and variables that have potential of influencing or eventually changing the financial behavior.

According to The Theory of Planned Behavior (TPB)[17] the Intention of an individual determines his/her behavior and three factors that influence intention are attitudes, subjective norms and perceived behavioral controls. The theory explained the young adult's perceived behavioral control was one of the factors that are related to their financial wellbeing [18].

Through family socialization theory, it is suggested that Family financial socialization is one of the key element that affecting financial behavior throughout the life of an individual. Thus it is very important to incorporate the element of involving the families as participants in the financial literacy initiatives.

The report focus to analyze relationship of the personality framework with financial behavior through 'Five Factor Model'/ Big Five Inventory i.e. already applied in an investor education campaign[19]. Though the personality traits measures are helpful in designing the financial literacy programmes for target audience on the basis of personalities for effectiveness, yet there is extensive research is required to investigate the casual relationship between traits and financial behavior.

Part III: Behavioral Framework applicable to design of Investor Education and financial literacy Prograamme

To develop an effective intervention for desirable Financial Behavior change, there is a need to have frameworks by Behavioral Sciences. Though researchers have identify and analyze 19 Frameworks of Behavioral change Intervention yet the present report focus on only those framework which are employed by IOSCO and OECD/INFE members.

1. **COM-B:** refers to Capability, Opportunity, and Motivation- Behavior (COM-B) system proposed by Michie et.al(2011) . This Behavioral system consists of three factors i.e. Capability, Opportunity and Motivation. These factors interact to generate Behavior. The Exhibit.1[20] shows single and double – headed arrows that indicate the potential influence between system components.

While observing the challenges existing in the literature of financial capability, the system permits to believe that psychological factors might have more influence than the knowledge or awareness in Financial decision behavior.

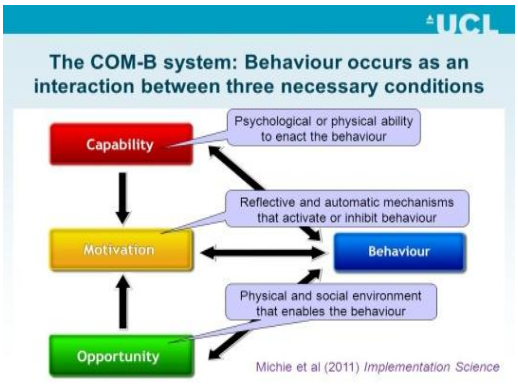

Exhibit 1: The COM-B System[20]

2. **BCM: The Behavioral Change Wheel:** As shown in Exhibit: 2[21]it is three layer behavioral framework developed from 19 frameworks of Behavioral Change that are identified in literature review.

-In the inner most layer, the COM-B framework is used that explains the Behavior occurs as an interaction between three necessary conditions.

-The middle layer consist of nine types of Interventions needed to put the system into new configuration with the minimum risk of it reverting

-the outer most rim of the wheel consists of seven policy categories to support the delivery of intervention with aim of achieving the desired financial Behavior Change.

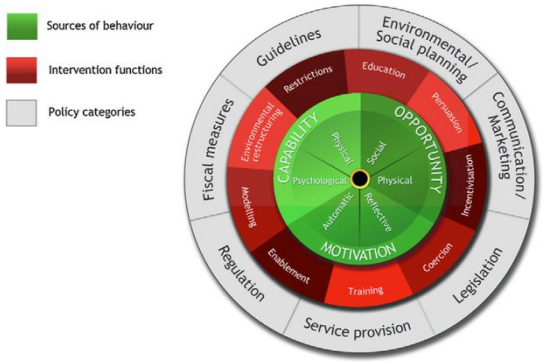

Exhibit 2: Showing the BCW Framework[21]

3. **MINDSPACE:** The framework provides nine-coercive approaches to understand the behavior of Individuals.

Messenger	We are heavily influenced by who communicates information
Incentives	Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses
Norms	We are strongly influenced by what others do
Defaults	We 'go with the flow' of pre-set options
Salience	Our attention is drawn to what is novel and seems relevant to us
Priming	Our acts are often influenced by subconscious cues
Affect	Our emotional associations can powerfully shape our actions
Commitments	We seek to be consistent with our public promises, and reciprocate acts
Ego	We act in ways that make us feel better about ourselves

Exhibit 3: The MIINDSPACE Framework[23]

The "4Es" MINDSPACE Application Framework provides policy tools to bring change in Behavior shown in Exhibit 4.

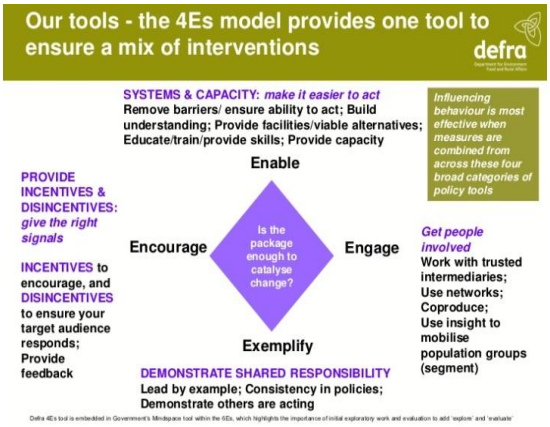

Exhibit 4: 4E MINDSPACE Application Framework[23]

4. **EAST:** The EAST 'Easy, Attractive, Social, and Timely, Framework created by BIT (Behavioral Insights Team) in 2012 to provide simpler Model to the policymakers that incorporate the insights missing in MINDSPACE. The policymaker should create an intervention with use the framework based on four principles(mentioned below) to encourage a certain type of Behavior as :

- **Make it Easy**

-tie together the supremacy of defaults.
-decrease the 'hassle factor' of taking up a service
-make simpler messages.

- **Make it Simple**

-create a center of attention.
-propose rewards and sanctions for utmost result.

- **Make it Social**

-· confirm that the majority people do the desired behavior.
- · make use of the power of networks.
- persuade people to make a obligation to others

- **Make it Timely**

-timely inhabitants when they are likely to be most interested.
-quick populace when they are likely to be most accessible.
-facilitate people plan their reaction to events

The four stages method is recommended to apply EAST by BIT:

1. Define the target / desired Behavior
2. Analyze the Context from environment and people prospective.
3. Design and review the effective intervention
4. analysis, Learn and accustom

5. **TEST Framework:** The TEST Framework "Target, Explore, Solution and Trial" developed by BIT in 2016 with aim to explore the development and implementation of trials. Whereas EAST was created to develop an intervention.

6. **Design for Behavioral Change (CREATE)**:The Framework based on ideology of applying improved design technology to build up innovative investor Education and financial literacy product initiatives with a view to change Financial Behavior. As shown in Exhibit 5, Design process involves the needed skill. The Financial behavior can be analyzed by Data analysis and further to define evaluation metrics. The Product development and Users' experience techniques helpful in stimulating product use.

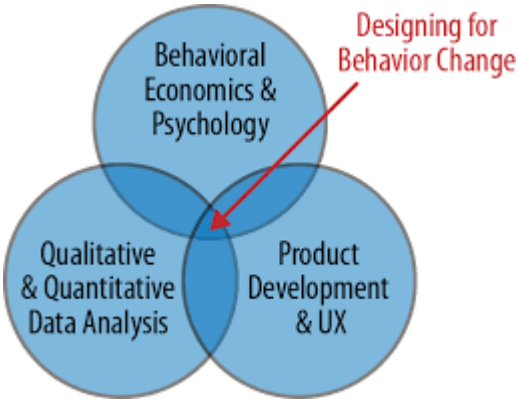

Exhibit 5: Needed Skills For the Design For Behavior Change[24]

The Framework for Behavioral Change Involves four steps that are Understand, Discover, Design and Refine as shown in exhibit 6

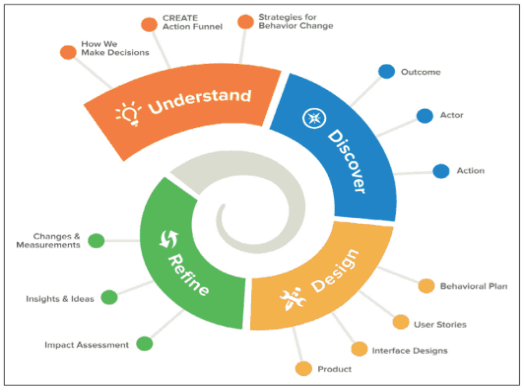

Exhibit 6: Framework of Design for Behavioral Change[25]

The framework explained that Behavior change process have five stages (as shown in Exhibit 7). The funnel describes the distraction of audience that can be used to detect and correct the design flaws in the programmes and Initiatives. Thus Framework manual explains strategies that encourage the participation and avoid leakage.

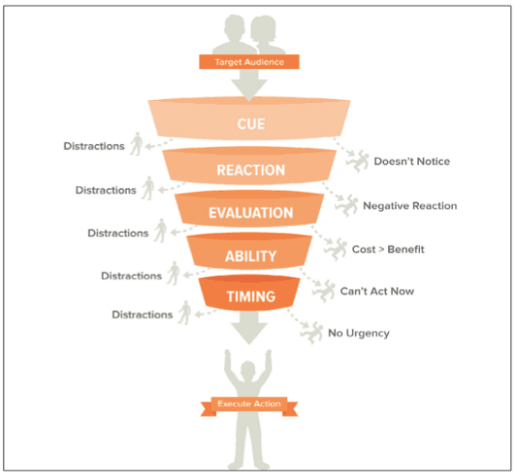

Exhibit 7 CREATE and Generalized Conversion Funnel[25]

7. **Conceptual Framework for financial Behavior Change with educational strategies**

With aim to support design and evaluation of financial literacy initiative, the three different theories are combined by two academicians in 2010. The elements of Framework are from: TTM Tran- theoretical Model of Behavior change, Targeting Outcomes of Programmes Model, Ecological system Theory and Diffusion Theory.

Part IV. Application and approaches of Behavioral Insights to Investor Education and financial literacy initiatives among IOSCO and OECD/INFE Members

A) Survey Result on Application Behavioral Insights by IOSCO and OCED/INFE members:

The two survey was conducted by IOSCO and OCED/INFE on resources committed by their members , their experience towards application of Behavioral Insights in their Initiatives. From Dec. 2016 to September 2017, 59 members of IOSCO representing 49 Jurisdictions & 34 member of OCED/INFE from 30 countries replied for surveys.

Though 11 members from OCED/INFE also participated in IOSCO - C8 Survey and reflected their response for both Financial Literacy and Investor Education in their jurisdiction, yet their reponse was counted only once.

The majority of the respondents reported that they are actively learning through the existing information resources i.e. existing literature, events workshop and networks. The observation are:

- Approximately half of respondent members reported to dedicate resources doe training research and application of behavioral insights in either financial literacy or Investor education or both.
- 1/3 of respondent members reported that they have active participation in seeking or gaining application insight. Five respondents reported that they are using framework like COM-B, MINDSPACE, and EAST for the application of BI in Financial literacy Initiatives.
- A few of respondents reported of using approaches by utilizing the behavioral elements.
- The respondents highlighted the tools like use of online resources, face to face interaction, developing social skill and financial decision making techniques with objective of enhancing financial literacy level.
- Many respondents are working on consumer behavior through qualitative and quantitative research for testing prototypes in designing effective educational tools.
- Some are using random control trials and some are using choice architect intervention for testing the consumer behavior in controlled environment.

C) **Approaches :** The approaches to taken into consideration about behavioral insight and their possible application for designing the financial literacy and investor education initiatives and programs in general are:

1. set up a actual Understanding of the problem
2. plan the intervention taking the context into account.
3. initiate small
4. appraise thoroughly
5. Interact, learn, and keep track
6. build thought leadership
7. Consider combining traditional approaches and those based behavioral insight
8. Review programmes/initiatives regularly

II. CONCLUSION

The Impactful Investor education and financial literacy programs with behavioral insight enable Individuals efficient in taking financial decision. Behavioral Sciences have focus on identifying the barriers in behavior change.

It is believed by members of IOSCO and OECD/INEF that the keys to develop deeper understanding of Individual behavior are sharing knowledge and experience as well as collaborations. The report will be very helpful in policy decisions related development and implementation of effective Investor education and financial literacy initiatives.the result of complementary surveys on IOSCO and OCED/INEF related to extent of usage of Behavior insights in financial literacy and investor education initiatives by their members, resources committed for application of BI by their members, literature review related relevance of BI & their application , identifying theories and techniques as potential tool

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A Study on Audience Profiling of Show Rooming Customers

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Abstract: The problem of increasing number of Customers using the physical store for the evaluation of product and later on ending up buying it online. The companies have started to report such behavior in increasing manner. It has therefore become necessary for the companies to identify the kind of segment that is involved in doing this activity. The paper has tried to address this issue by the way of cluster analysis to find whether the demographics of the cluster favoring the certain activity is common of not. The paper has also analysed that cluster comparison of the two formats. The cluster favoring showrooming activity is in favor of which format of shopping. During the research it was discovered that on a data sample of 207 of students 52 which amounted to quarter of the sample fell in to the cluster of psychographics that showed the traits of a showrooming active shopper.

Keywords: Showrooming, Cluster Analysis, Cross Shopping Behavior, Brick and Mortar, Audience Profiling

I. INTRODUCTION

Showrooming refers to the practice of examining merchandise in a brick-and-mortar store or other offline setting, and then eventually buying it online, sometimes even at a lower price. Online stores offer lower prices than the brick and mortar counterparts as they don't have same overhead costs. In other words, the act of visiting stores to examine and try a product before buying it is known as Showrooming (Zimmerman, A, 2011).

Prior to the internet was such a big deal, consumers used to visit various retail stores all by themselves to walk around first, window shop and then deciding what to buy all in the same outing. There were limited options they had for products at the local retail storefronts they visited. Ironically, an employee would had to call another store to see if the product was made available in another location (Zimmerman, A, 2011).

A) Changes in Retail Showrooming -

Now, consumers can not only search to see where a product is available, but also can find multiple different retailers online on their mobile device which sells the same product and qualities, usually at lower prices, and all these can happen within a fraction of seconds through their mobile phones.

This is especially true if the product being large like mattresses or kitchen table or rather cost expensive like a branded watch or sunglasses. In these cases, consumers get to know what they're getting exactly before they are to buy it. Thus, they partake in showrooming to feel comfortable on the purchase they're about to make, albeit at a lower price (Rapp et al, 2015).

B) Mobile influence in Retail Showrooming

If one runs a brick-and-mortar retail store and one thinks mobile is one's friend, then one should think again. Some of the impacts of customer showrooming via mobile devices are:

- Having quick access to other retailers who can offering the same product at a discounted price
- If the store doesn't provide much information as other online retailers, the customers may think that the product is somehow subpar
- If other store makes the product easier to buy online, that's what the customer will likely do to buy from them Some of other impacts of showrooming -

- Showing the customer up front that one has the lowest price
- Giving the opportunity to the retailers to engage the customer in an informed conversation if the sellers notice they are thus searching competitors' sites, hopefully resulting into a sale
- Creating a positive outline experience for the customers while they're showrooming for they don't want to go to any rival

Mobile thus acts like a frenemy i.e both as friend and enemy. It could thus work for or against and that's going (Zimmerman, A. 2012).

C) Showrooming and Consumer Demand

Consumers' demands for cross and omni-channel marketing are sequentially increasing. Not only this situation is opening doors to endless possibilities for businesses and consumers, but also it's giving multiple competing retailers the opportunity to reach varied customers.
According to a SecureNet study, over 50% of the Americans use their mobile devices to search a product online while they are in store. That number has increased to 68% among the 18 to 29 years old demographics, and increased again to 72% for the 30 to 44 years old group (Rapp et al, 2015).

D) App Creation for Easier Showrooming -

One way that online shopper are making the most of today's mobile showrooming trend is by creating apps to make showrooming from an electronic device easier. For example, a leading online retail company has launched a price-checking app which offers 5% off on any item that is scanned if the item gets to exist on their site. Price-check mobile applications are making the showrooming process easier and faster.
Many retailers have created apps which enable users in comparing and contrasting various products contained within the stores. This helps consumers make informed decisions while keeping them engaged in their specific store, thus decreasing the odds that they'll choose for doing their business (Mehra Et Al, 2013).

E) Electronic and Appliance-Based Showrooming -

Electronic appliances (FMCD) are among the most show roomed categories. Over 60% of consumers who are shopping for these types of products have been using smart phones on regular basis. They tend to understand technology more than average person, allowing them to fully search their options. For this reason, showrooming is very popular. Electronics and appliances also are of high-cost, thus leading to consumers looking for cheaper options.

Best Buy slogan had been declining in its brick-and-mortar sales and it blames the issue on showrooming. Therefore, in order to combat the showrooming customers, Best Buy offers shoppers the lowest price for products irrespective of what they are shopping online or in-store (Quint Et al, 2016).

F) Showrooming and Product Price -

Online price-matching is certainly part of buying process. Many retailers in the United States match their price with main online competitors. However, not all major retailers will match to every online retailer. Over 50% of the adults in the United States owned a mobile device like Smartphone or tablet. Online and in-store sales were not connected and uneven. Consumers began to test out to order the same or perhaps similar products from online retailers and now it has only become a new way for shopping.
Technology – specifically mobile and digital marketing has been responsible for changing the retail game and consumers are getting more accustomed to these changes, expecting retailers to also keep up pace with these lines and provide them with smooth shopping experiences. Showrooming is a direct result for these advancement in technology and changes in consumer behaviour. The growing showrooming trend is putting forward a change in a way the retail industry has been functioning and how it will operate in both the near and offshore far future (Rapp et al, 2015).

The increasing product commoditization and price transparency by online retail channels have left many brick and mortar stores bearing the costs associated on being used as physical showrooms

without reaping the rewards of the final sale. As customers continue taking advantage of retail stores to gather data and turn to competing channels for purchasing (Zaubitzer, 2013). The role of the retail salesperson has now shifted and retailers have now been left without clear understanding of how to manage this change in the retailing landscape spree. In this research, we have first defined "showrooming" and investigate individual i.e. salesperson and the level of experiential consequences of perceived showrooming (Mehra Et Al, 2017). After researching the paper published we found negative relationships between perceived showrooming and salesperson self-efficacy and salesperson performance, which are positively moderated by salesperson coping strategies and cross-selling strategies. It was suggested that the negative effects of showrooming can be configured though specific salesperson behaviours and strategies. Further, it was explored that at the store level reaffirm a negative relationship between perceived showrooming behaviors and performance. Finally, in this study we tried to ascertain the audience profile of the respondents who are actively involved in showrooming activity.

II. LITERATURE REVIEW

The budding phase of retail formats resulting in cross-format shopping has been a subject of research in the economies of developed as well as developing nation (Carpenter and Moore, 2006; Miller, Reardon and McCorkle, 1999). The cross shopping is very common in developed economies (Skallered, Kornelliusen and Olsen, 2009) and it has been observed that even though the major portion of such economy's retail market is in the hands of organized sector, but even then the inter cross-shopping has been found higher than intra (Bustos and Gonzalez, 2008). Similarly the structure of Indian retail is changing and causing high level of competition among the organized and traditional stores in price and non-price tactics (Srivastava, 2008). This competition from the new formats of retailing has caused the consumer to visit multiple formats to evaluate the value for money factor (Neilson, 2011). The value for money in any em erging and developing market plays the role of ace. This factor influence decision making in store choice. Benefaction of the new store formats has been based on the perceived utility that a shopper will derive from it (Solgaard and Hansen, 2003; Zeithaml, 1988; Sweeney and Soutar, 2001). But does this factor play the most important role in cross shopping also. Since there is only one study that supports the argument in the area by Jayasankaraprasad, 2014 it can be hypothesized that the value for money will play an important role in this study as well.

The term 'value' has been defined by many researchers in different context like Sirohi and colleagues, 1998 defined it as the implicit trade-off between money and goods. But in many studies by other researchers like Bolton and Drew, 1991; Grewal et al, 2003; Volle, 2001 has stressed on other components also fall under the same value category like service quality, quality of store merchandise and price promotion by the store. Consumer switching works like cherry picking in the field, the juicier one gets picked first regardless of what part of field it is in. Therefore retailers are constantly engaged in offering variety of promotion in order to keep it fresh and engaging the customer more (Fox and Hosh, 2005; Nielson, 2008). Offering a variety of fresh promotion is done in order to make the store offers more relevant to the shopping motives of the buyers. Consumer's heterogeneous behavior in developing a store patronage preference can only be well understood if we understand the shopping behavior (Dholkia, 1999; Jin and kim, 2003).

III. RESEARCH METHODOLOGY

The study was aimed to find out the audience profile of the respondent. The purpose solely was to find out that, if it is at all possible to segment the showrooming active people on the basis of demographics. Since it was meant only for the students of higher education one demographic was certain and that is occupation.

A) Sampling

The study was conducted in semi-urban city of Kurukshetra and since the city had two universities the data was gathered from both the universities. The data collection was done mostly from the Postgraduates and that too the one who were pursuing their masters in business and commerce. The sample size for the study was 207 respondents. The data collection was done by judgmental sampling technique. Due to shortage of resources and time the data collection was done in a non-

probability sampling method. The other reason for the same was the adoption of modified scale. The scale that has been used to determine was (Zaubitzer, 2013).

Demographic profile of the respondents

Annual Income	Frequency	Gender	Frequency	Residing	Frequency
Below 3Lakh	58	Male	97	Rural	81
3 – 5Lakh	57	Female	110	Urban	59
5 – 7.5Lakh	42			Semi-Urban	67
Above 7.5 L	50				

Table 1.1

B) Measures and Methodology

The data collection tool was a questionnaire. The questionnaire had three parts. Part A was the demographic profile of the respondents. Part B was psychographic analysis for the determination of sopping behavior and pattern and then part C was a comparative analysis of many variables for online and offline shopping platform.

This study the major focus was first on part B which was analysed with Cluster analysis. The data collected was analysed with help of Kmeans clusters. In this technique after application hierarchal cluster technique and studying the dendogram, it was observed that there are basic 4 major formations that are arriving our of it and showing 4 different patterns of behavioral out come. Then K-means cluster was applied in which an ANOVA table was also requested for studying the variation in statement on the basis of clusters and the number of clusters as studies via dendogram was given 4.

It was then observed after studying the ANOVA table in cluster analysis that out of 15 statements two statements did not show much difference in the opinion and these two statements were removed and the test was applied again. (As shown in Table 1.2)

Number of Cases in each Cluster		
Cluster	1	72
	2	32
	3	52
	4	51
Valid		207
Missing		0

Table 1.2

	Cluster Mean Square	df	F	Sig.	
I get an extra energy go out on weekends for shopping	35.36	3	24.058		0
I Don't like when someone else shops for me	5.938	3	3.445		0.018
For me it is important to get the best price for the product	12.618	3	7.119		0
I can visit the store with no intention of buying	27.543	3	16.882		0
I don't have problem in walking out of store	22.464	3	14.567		0
I compare prices of product in different store	0.401	3	0.213		0.888
I should only get advice if I want to buy the product	4.568	3	2.553		0.057
Sellers time is wasted by the customers who don't buy	5.57	3	2.922		0.035
I find it immoral to consult seller and then not buy	12.719	3	8.031		0
I collect product information in many stores before buying	25.932	3	15.569		0
If the seller spent time with customer, the sale chances are definite	35.855	3	25.454		0
I like physical store as it gives me real feel of shopping	29.53	3	20.449		0
For apparels physical store is any day my choice	42.101	3	28.781		0
I am an expert when it comes to internet	4.737	3	2.715		0.046
I can spend hours in a day online	27.72	3	18.962		0

IV. RESULTS

Then after the removal of the two statements the Cluster analysis was applied again.

Number of Cases in each Cluster		
Cluster	1	72
	2	32
	3	52
	4	51
Valid		207
Missing		0

Table 2.1

	Cluster Mean Square	df	F	Sig.
I get an extra energy go out on weekends for shopping	23.658	3	14.402	0
I Don't like when someone else shops for me	11.952	3	7.311	0
For me it is important to get the best price for the product	13.379	3	7.596	0
I can visit the store with no intention of buying	33.005	3	21.282	0
I don't have problem in walking out of store without buying	32.088	3	22.922	0
Sellers time is wasted by the customers who don't buy	21.199	3	12.654	0
I find it immoral to to consult seller and then not buy	13.645	3	8.69	0
I collect product information in many stores before buying	22.025	3	12.78	0
If the seller spent time with customer, the sale chances are definite	23.82	3	15.014	0
I like physical store as it gives me real feel of shopping	34.959	3	25.633	0
For apparels physical store is any day my choice	17.42	3	9.532	0
I am an expert when it comes to internet	7.521	3	4.414	0.005
I can spend hours in a day online	14.031	3	8.431	0

Table 2.2

The F tests should be used only for descriptive purposes because the clusters have been chosen to

maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

The above Final Cluster shows that the Cluster no 3 with 52 respondents showed the pattern of falling towards showrooming phenomena. It can be seen that it was far more than the other three clusters. The only statement in which the rating is a bit low is the one in which the statement is asking the respondents to rate in favor of the brick and mortar store. In the next step

Final Cluster Centers

	Cluster			
	1	2	3	4
I get an extra energy go out on weekends for shopping	3.46	2.34	3.75	2.45
I Don't like when someone else shops for me	2.61	3.44	3.62	3.29
For me it is important to get the best price for the product	2.81	2.28	3.56	3.31
I can visit the store with no intention of buying	3.29	2.38	3.92	2.16
I don't have problem in walking out of store without buying	3.18	4.16	3.79	2.22
Sellers time is wasted by the customers who don't buy	2.94	3.97	3.12	2.2
I find it immoral to consult seller and then not buy	3.38	2.13	3.46	2.59
I collect product information in many stores before buying	2.64	3.91	3.9	3
If the seller spent time with customer, the sale chances are definite	3.63	3	3.21	2.1
I like physical store as it gives me real feel of shopping	3.24	2.53	4.25	2.39
For apparels physical store is any day my choice	3.68	3.13	2.96	2.37
I am an expert when it comes to internet	3.17	3.63	3.98	2.59
I can spend hours in a day online	2.43	2.63	3.48	3.25

the frequencies of the three demographic variable for the clustered was tested to see whether the audience profiling can be done or not.

The results after the cluster analysis for the 52 respondents demographic profile were as follows

Annual Income	Frequency	Gender	Frequency	Residing	Frequency
Below 3Lakh	18	Male	22	Rural	21
3 – 5Lakh	11	Female	30	Urban	12
5 – 7.5Lakh	12			Semi-Urban	19
Above 7.5 L	11				

The results came out to be inconclusive and the profile on the basis of cluster can't be created. The cluster however shows the positive outcome on the psychographics related to shopping behavior and pattern. Therefore it can be concluded that there is a segment of people who are actively participating in Showrooming activities it is just that these can't be segmented on the basis of demographics. No fix kind of demographic is actively involved therefore the behavioral traits are indicator rather than demographics.

V. CONCLUSION AND DISCUSSION

The retailers must maintain the store factors rather than relying on a demographic pattern based on gender or class of an Customer to know whether the customer is in store with the intention of buying or just window shopping. The results of the study clearly indicates that the demographics are not going to become a sign towards helping the retail counter in knowing the intentions of a buyer. Mobile phone as a technology is proving itself to be equally damaging for a retailer as much it is empowering his business. The customer is now empowered with the ability to cross-check the pricing of a product standing the store while looking a product for availability at a lesser price.

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A Study of Vacant Hour Activities of Postgraduate Students

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Abstract: Life satisfaction and well-being are generally conceptualized and assed in terms of happiness, satisfaction, moral, quality of life, self-esteem and mental and physical health. Thus vacant hour is operationalized as an external behavior that can be defined and measured according to the individual's internal psychological state. Every person experiences vacant hour in his life in some form. A great deal can be learnt about a person by finding out what he does during his leisure. Vacant hour activities vary in individuals based on their life style and characteristics of individuals. The type of activity and period of participation is also affected by age, gender, stream of study and cultural characteristics of an individual. Also the progress of a person depends upon the way he utilizes his vacant hour. Hence the study has been conducted to study the vacant hour activities of male /female, urban/rural and arts/science students and to make recommendations and suggestions for the further studies.

Keywords: Happiness, satisfaction, moral, psychological state.

I. INTRODUCTION

Every person experiences vacant hour in his daily life in some form. Individual gains personal benefits from utilizing vacant hour activities. It helps in supporting identity, intellectual, physical and linguistic development. The progress of a person depends upon the way he utilizes his vacant hour. Hobert Hoover beautifully stated, "This civilization is not going to depend on what we do as work as much as we do in our spare time". Life satisfaction and well being are generally conceptualized and assessed in terms of happiness, satisfaction, moral, quality of life, self-esteem and mental and physical health. Thus leisure is operationalised as an external behaviour that can be defined and measured according to the individual's internal psychological state.

When a student is in postgraduateclass, he must face a problem- how to use leisure time in a productive way. In a college there are more spare time and more temptation than those in senior high school, one must think it carefully about your leisure time, otherwise you will find that you have lost too much valuable time to richer your experience and improve your knowledge. From ancient time to modern society, study is considered to be the most important task of a student; young students have much time every day. They have much energy and potential. If their vacant hour is not used productively or constructive, they will indulge themselves into antisocial and destructive activities. This time can be used to keep them away from stress or develop their personalities to lead a happy and purposeful life.

II. VACANT HOUR

The dictionary meaning of the word 'Vacant hour or leisure' is ease, relaxation, and freedom from employment or duties. So it can be considered free time. Every person experiences leisure in his life in some form. A great deal can be learnt about a person by finding out what he does during his leisure. In fact, the progress of a person depends upon the way he utilizes his vacant hour. Although the concept of vacant hour has varied in some respect from time to time. It has always carried with it the idea of free time that is spare time at one's disposal. It is interpreted as time not spent on the activities of making a living, keeping alive or maintaining one's efficiency- eating, sleeping and the ordinary care of body.

Joffre Dumazedier (1974), "Leisure is activity apart from the obligation of society to which the individual turns at will, for relaxation, diversion or broadening his knowledge and his spontaneous participation, free exercise of his creative capacity."

III. ACTIVITY

Activity is defined as purposeful and having an expected outcome. It may be incorporated into your routine and performed unconsciously or deliberately. Activity is performed to pass the time, satisfy our interests and/or fulfill our responsibilities. Family and friends may be included in the activities of obligation and meaning, such as daily household and family responsibilities. Family and friends may be included in the Activities of obligation and meaning such as daily household and family responsibilities. 'Work' (for our purpose) is considered as an activity for which we receive payment. Volunteerism, household chores and family care giving are also examples of activities.

IV. SIGNIFICANCE OF THE STUDY

If the time is money than vacant hour or leisure time is gold for a student for developing sound and well balanced Personality. "Leisure is the most powerful possessions of mankind. Civilization have built and destroyed through its use. He who would destroy man seeks first to control his leisure and institution which serve the interest of full choice."It can fairly said that proper guidance and with proper utilization of these leisure time Activities of our students, we can enhance the total impact of education that we give them in school and then uplift the good qualities in our young generation. Increasingly the area of leisure and recreation has come to be recognized as an important context for child and adolescent development. It is beneficial to young people because of the opportunities for socialization and peer interaction that leisure activities offer and because of psychological and physical health benefits. Participation in organized leisure and recreation by young people is also seen as having positive benefits for society since it reduces the amount of time available in anti-social behaviour. Young people living in these areas may have high level of exposure to the sale and use of illicit drugs, criminal activity and anti-social behaviour. In general these social environments provide little in the way of leisure and recreational amenities for children and young people. Playgrounds and playing areas are often minimal, inadequate or non-existent and the preferred and often only option for young people is to 'hang around' on the street. It is important to understand the way in which young people think about leisure, their beliefs about, and attitudes to leisure, the meaning of leisure to them and the forces that influence and shape their involvement in leisure activities. **Liana Sayer(2006),** found that men who have more free time feel less rushed than men with less leisure time. But even woman have more time free from paid work and household tasks, they do not feel less rushed. **Rebecca Shragge(2010),** studied thatthe college students have too much time and they do not know to spend their time. A recent survey found that of the 63,000 UC students on average dedicate 41 hours per week to social and leisure Activities, allocating 28 hours, according to the study are spent on non-academic computer usage. Though the largest amount of time was dedicated to the internet usage on sites like facebook, 10.5 hours were spent on average per week on socializing with friends and parting.

V. OBJECTIVES OF THE STUDY

- To study the vacant hour activities of male /female, urban/rural and arts/science students.
- To make recommendations and suggestions for the further studies.

VI. SAMPLING

The representative of the population is called a sample. By observing the characteristics of the sample, one can make certain inference about the characteristics of the population from which it is drawn. To obtain a representative sample, there are several methods of sampling.

In the present study, a representative sample of 200 postgraduate students was selected from Jalandhar District of Punjab. The sample was taken for comparison of male-female students, rural-urban, and arts and science students.

Tool Used:-

To study the vacant hour activities of postgraduate students, the scale was prepared by investigator and it was used to collect data.

VII. CONCLUSION

It is find that there is very less percentage of science students who spend their vacant hour in sleeping and shopping as comparison to arts group of students who have more time from their studies and they prefer to sleep and shopping for their leisure time.

The results of present study is male and urban post postgraduate students have high and equal amount of interest to spend their leisure time in physical activity at least 30 min in a day.

Analysis of 3rd activity and 7th activity which deals with go to clubbing and night parties during their leisure time shows that all students irrespective of their gender, group and locale have difference among leisure time activities.

The present study shows that music is feed of soul and listening music during vacant hour has every individual's activity. No doubt some differences are there but it clearly shows that listening music is the best activity to spend vacant hour.

It is concluded that most of male students are interested in surfing on internet and most of male students have account on antisocial site and they prefer to spend their vacant hour in front of computer with using facebook, yahoo and gmail.

The results show that near about some responses given by male/ female, urban/rural, arts/science students to spend their vacant hour in participating in any volunteer work for enjoyment and social service. It is present form of the data that reading is the most common leisure time activity among young people.

It is concluded from the data that most of postgraduate students prefer to spend their leisure time with their family. This data shows that family is the most part of everyone's life as compare to other aspects. But students who have jolly and talkative nature they prefer to spend their leisure time with other people. Female students are strongly interested to gossiping in their vacant hour due to their talkative nature but male students have less interest in gossiping.

Male students in comparison to female students and urban students have strongly interested to play with pet during their vacant hour. The data shows that female students have high interest in gardening as compare to their male counterparts.

It is highlighted from above discussion that all Postgraduate students irrespective of their gender, group and locale have near about equal interest in talking and chatting on phone.

Results indicate that all postgraduate students have near about same response to the statement that boys and girls spend their leisure time differently.

It is interpreted that female students feel bored as compare to male students. It is also found that science students have less response that they feel bored during their vacant hour.

Female students have high interest in spending their vacant hour in participation in cultural events as compare to others.

VIII. EDUCATIONAL IMPLICATIONS

The findings of present study will be helpful in-

- Volunteer work providing also right incentive structure in programs that aims to increase the educational attainments of students.
- The activities that are worth considering in this research include learning as well as leisure work.
- The findings of present study will be helpful for students to know the importance of vacant hour.
- Some of the activities that are included under the leisure category can be viewed as compliments to more standard types of learning which include time spent on sports and listening music.
- Some of the activities as for pleasure as well as structured time spent on sports and social activities are associated with high achievements.
- The present study will be helpful for the teachers to organize the good and healthy vacant hour activities.
- With the help of study, teacher can organize a guidance programmemes for students to make a good use of vacant hour.
- Time spent on learning will depend on quality of school/college.

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Value Conflict among Adolescents in Relation To Resilience

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Abstract: This paper writing is inspired by the young minds and their problems, their some of the most pressing current questions in the field of education, and day to day life. Which includes, what are values? What is value conflict? What are the most important types of value conflicts? What is resilience? How value conflicts affect resilience? How value conflict and resilience are related with each other? What are the most effective ways of enhancing resilience among these young and fragile minds? These multidisciplinary approaches gives insight into their tender questions, and all the literature review included in this study are the concepts of healthy adaptive, integrity positive approach over the passage of time in the aftermath of adverse conditions of modern era. Because the resilience is a complicated construct and it may be defined differentially in different situations related with individuals, family circumstances, organizational culture, size and dimensions of society and last but not the least the culture adopted. With regards to value conflict and its types and their relation with resilience, there was a consensus that the empirical study of this construct needs to be approached from various levels of studies and analysis perspective which includes Genetic, developmental, demographic, Cultural, economical background. This empirical study of value conflict among adolescents in relation to resilience will inform efforts made at fostering values with the recognition that resilience may be enhanced on numerous levels.

Key Words: Resilience, Value conflict, Inspired, Enhancing, Fragile, Perspective

1. INTRODUCTION

Value conflict lie at the root of a people's identity. They are extremely difficult to resolve the essential need for the welfare of the mankind because they hold the seed of personality disorganizations, inversely related to adjustment and are found responsible for the promotion of social tension and unrest. Conflict as a state of being torn between completing force or in which more than one response tendency is aroused strive simultaneously for expression where satisfaction of another drive happens to be a central factor in human exercise. Every conflict has a definite predisposition to escalate, to become more intense and hostile to proliferate more issues and to involve stronger and more destructive attempts to control hence it involves controlled and specified application of sanctions in a fashion on ''Increasing magnitude over time'' and escalation involves the some process with a '' Decreasing Magnitude over time." Some conflict come and go due to their momentary situations other endure for a life time because they stem from the very nature of man or from the relation of the individual to that environment hence they vary in degree and significance. A great deal of human accomplishment comes from the productive and cumulative behavior of non-conflict. The opposition of basic impulses by rigid conscious shows a wide soared effect on the functioning and growth of person sanctioned by society that become an integral of individual self through the process of development. It is sum total or individual's way of behaving that is judged through person's ethical rightness wrongness." Marti us English Dictionary," A conflict is a clash between ideas and feeling."

R.L Bharadwaj (2001),Whenever two or more incompatible goals, motives, activities or impulses are active a the same time in relation to desirable or pro-social aspects of the well being of the humanity, they can be said to be the value- conflicts."

I. TYPES OF VALUE CONFLICT

There are six types of value conflict: -

1 Evasion vs. Fortitude

There are the two end poles to stand to meet a reality. As a matter of fact Evasion refers to one's tendency of avoid once or "not giving the importance it deserve," to the event experienced in day to day life

due to their harmful unpleasant and complete consequences. In short it is just experiences felt and forgotten and to feel good about himself. On the other hand fortitude refers to one's tendency to act of taking into account of an event with can did assumption and boldness to face the situation adequately. In fact it is purely a pro-social response based on ethics to the events of the social world that may called to the high value of justice sacrifice and discretion that may land him into the need of changing in his frame of humanity. Thus evasion Vs Fortitude value conflict refers to one's tendency to the event they deserve one dimension and stand boldly hold in the ethical principle adjustment …at the other one. The state of indecision if it arise whether to go for evasion or to fortitude be deemed as conflict associated with value.

2**. Dependence vs. Self Reliance**

Dependence and self reliance are purely relative and vary from man to man and place to place in certain degree on the continuum from one pole to dependence is a tendency to seek the help of other individual making his decision or in carry out difficult task in the walks of life. Although dependence is an inevitable phenomenon of life to certain extent. But high degree of dependency on others affects the development of personality adversely. Self reliance refers to the tendency of taking decision by his own judgment based on facts and situations in accordance with his own acumen, intelligence and creative potential, these needs a high degree of experience in making a choice based on rational thoughts and incisive decision making to resist imposed suggestion. This dependence vs. self reliance value conflict refers to the change of difference and difference of degree in making decision based insistence from other or by one's own dependence judgment. However the indecision as to dependence to be self reliant is deeply disturbing and represent the value conflict associated with two dimensions.

3. Selfishness vs. Probity

Selfish and probity are to say the two side of the same coin presently the unevenness of human behavior selfish is associated with the expedient mode of behavior when it appears that individual needs might be the best served by action. Allurement to such temptations resulting a considerable feeling of guilt later on probity value conflict is a state of indecision leading to inclimation to gain by either moral or immoral means.

4. Hate vs. love

Love and hate all two conspicuous extremes of emotional manifestation, related to value of human behavior and spread over continuum of extreme founded to hate. Hate is feeling of extreme dislike by one toward another. It varies between strong dislike malignity and even enmity, hate or hatred can provide feeling of anxiety insecurity, low- esteem, jealousy and slowness in the conscious development. To love and hate loved one very prominent virtue for the healthy development of personality. It is the most conical and pervasive of all influences extreme in enduring environment where the love warmth are the most valuable feature manifested in the expression of tender feeling, founded an affection of something, It is a holy and devoted attachment of an individual towards another.

5. Fear vs. Assertion

Fear and assertion are the two important dynamics of human behavior that represent the two extreme of human activity. Fear is an emotion of violent equitation or fright in the presence of danger or discomfort resulting in the feeling to flee away from danger, fatigue, and worry indecision and over sensitivity is also the discussed manifestation of fear. The fear robs the individual of his courage and cripples his reasoning and other adjustment capacities. However instead of accepting the eventuality and making constructive efforts, the individual often manifest the feeling of fear reacting in term of complete denial, concealment and even be pretending not to realize it.

Assertion refers to the ability to act courageously, despite to the ability of feeling of fear with complete understanding of the fact and finding means to nullify the dampening of his spirits, as many interpersonal difficulties and resultant, maladaptive behavior arise because of person's inability's to assert themselves to the situation adequately. It should be borne in minds that the necessity traduce a fear vs. assertion value conflict refers to the state of indecision expanding the efforts in trying to deny or conceal their fears, instead of learning to function effectively in spite of fear.

6. Pragmatism vs. Idealism

The pragmatism and idealism are the two significant ways of life associated with the difference if how are doing it and how it should be. Pragmatism refers to the tendency of an individual based on practicable considerations or the changing palters in making his choice of action varying form situation to situation that make him inclined towards practicability of an act of achievement rather theories and ideals in day to day behaviour. Idealism refers to a physical tendency of an individual towards the highest conceivable perfection based on conceptual doctrine of personal conduct in choosing the course of action in day to day life

Events. Thus, pragmatism vs. Idealism value conflict refers to the state of in decision between the practical considerations and ideal conception in choosing the course of action in day to day life events.

Since value conflicts lie at every root of people's identity. They are extremely difficult to resolve and de-escalation of the conflicts become an essential need for the welfare of the mankind because they hold the seed of personality disorganization. **Adolescence** is a period of stress and strain and in this period, adolescent is marked with a number of problems. There are lot of conflicts, anxieties and adjustment problems in the adolescents. As a result, they may acquire some negative traits that affect their personality also. The role of good emotional health in human life is very important for facing and resolving these value conflicts.

From biological point of view, "Adolescence period is associated with physical maturation."

From psychological point of view," Adolescence refers

to social and intellectual maturation. "

According to crow and crow (1956), "Adolescence is considered to include the year between the onset of puberty and assumptions of adult responsibilities According to Hurlock (1973), "Adolescence begins when the individual attains sexual maturity and ends with when independence from adult authority is legally assured on the average adolescence extend from 13 to 18 years in girls and 14 to 18 year for boys."

Piaget elaborated on adolescence as, "The age of great ideas and the beginning of theories as well as time of simple adaptation to reality."

So, an adolescence is a period of in which adolescent is emotional unstable. The poor emotional intelligence and gross erosion of values among adolescents are the two serious problems, which the parent, teachers and society at large meet to study and rectify.

The present study is a humble effort in the direction to find out how far the emotional intelligence help in resolving value conflict among adolescents.

Resilience

Resilience is the ability to bend but not to break, it's the bounce backing of an individual in provided circumstances or even growing oneself in the context of adverse life experiences. Resilience is the art of reintegration of self. It's the process of moving further and not returning back. It's an insightful integration in positive manner as a result of lesson learned from an adverse experience. There are various issues we have to deal with, when we start defining resilience. As a teacher I am interested in how will children are doing in all of the age salient development tasks that we expect children to achieve as they move along in life. But of course those kinds of progressive tasks are of very progressive historically, culturally and even geographically. Jane McGonagall described four type of resilience.

1. Physical resilience- you are physically resilient if you don't sit longer than an hour at a time. You keep moving, especially when you don't feel like it. I don't know about you, but as I age, the temptation to sit on the couch or to nurse a pain by not moving is high. A physically resilient person works out the kinks and makes physical activity a priority.
2. Mental resilience-You are mentally resilient if you test your brain, Do puzzles, and play board games. Try new hobbies, Read new books. Stay engaged in work .Grow a garden, In short, mentally resilient folks stay challenged.
3. Emotional resilience- You are emotionally resilient if you engage in regular reflection of things beautiful, fanciful, and visionary. Emotional resilience exercises our capability to imagine, dream, plan, and create. It fortifies the soul; Emotional resilience allows us to find positive things even when circumstances stay grim.
1. Social resilience: When you stay in touch with others socially, you are being socially resilient; Hugs and handshake stimulate the brain. Having a friend who you look forward to visiting with and taking the initiative to stay engaged is social resilience. Linda Bloom has explained the seven factors of resilience these are as follows

   1. We can adopt an orientation that embedded in the trauma, tragedy or loss is opportunity
   2. Hardiness
   3. Sense of Humor
   4. Purpose and meaning
   5. Spiritual orientation
   6. Reframing adversity as opportunity for growth
   7. Gratitude is counting one's blessing. It is more than a feeling; It is a chosen attitude towards life.

II. LITERATURE REVIEW

Richard A Easterlin(1976), Concluded that growing resorts to family limitation in rural nineteenth century America may have partly reflected the increasing value conflicts farmers had in realizing their aspirations for their children's material welfare. Kagade, S.V.(1997), concluded that girls are found to be more extrovert then boys, Boys and girls were not found significantly different in educational adjustment and an idea self concept.

Jain, Vidyut (1998), concluded that sex as a variable affected the value score of the male and female

subjects. The value preference shown by the subject of rural and urban group showed low significant difference.

Dang(2000), Found that concept of moral values changes with change in society. The moral value change but there are some universal values such as respect for one's parents and elders, honesty, generosity, mutual understanding etc. which do not change.

Kaur, Gurpreet (2000), found that there was significant relationship in aesthetic and poltical values and insignificant relationship in theoretical, economic and religious values.

Grewal I.K.(2004), conducted a study entitled " A comparative study of value pattern of successful and failed students." And found that there is no significant relationship among failed students and their values.

Grewal Inderjeet (2004), Conducted a study on value conflict among introvert and extrovert teacher trainers and find significant relationship between Value conflict and introverts and non- significant relationship between value conflict and extroverts.

Rani Bandana (2006), conducted a study entitled, "a comparative study of value conflict of adolescent in relation to gender and locate". And found that a significant relationship exists in the mean scores of various dimensions of value conflict between male and female adolescents and between students in rural and urban of Ludhiana district.

Grewal I.K. (2006) in her study on values depicted that students of religion and social values were more in religious trust based schools white economics and political values were more in government and religious schools.

Bronfenbrenner,U (1979) found that experience and values associated with three dimensions (political and civil engagement ethics and moral character and service to community) predicted higher levels of responsible citizenship among undergraduate college students.

Kaur Harpreet (2007), conducted a study on mental health of post graduate students in relation to their value conflicts and found that there exists non-significant relationship between value conflicts and students with good mental health.

Bajpai Amita (2008) conducted a study on value patterns of parents of children with high and low moral Judgement of children.

Panashar M and D.N. Sansanwal (2018), concluded a study on "Value among tribal rural and urban adolescent girls and found that there exists no significant difference between tribal rural and urban girls for religious moral environmental educational family and career value and significant difference between tribal rural and urban girls for economic and political values.

Van de Vjjver and leund(1997) argues that the culture must be replaced by its constituents, or context variable, and that problem of equivalence need to be addressed if measures are to retain their content validity.

Chan.E. (2007) argues that cross-cultural studies must avoid the tendency to test one set of biased indicators in diverse culture context. Cross national studies face a related problem. How do we balance assumptions of homogeneity across Minority and majority world contexts with the need for sensitivity to within group and between group heterogeneity?

Goodman, (2011) to measure the prevalence of behaviours and cognitions thoughts to be congruent with positive development or developed their own scale based on review of the literature most often published in Minority World journal. Bottrell,D(.2009) used the word resilience in their title, most measure provide an assessment of strength that are that are relevant to all young people regardless of the strengths that were the most relevant young people regardless of the degree of adversity they face.

In D.Cicchetti And D.J. Cohen (2006) Resulting measure shows marked difference from others that assess resilience. Although individuals and relational factors are just as prominent , community supports, values and culturally distinct factors are unique features of CYRM-28.

Luthar (2006) have discussed the international, and contextual factors in the lives of youth.

Masten and Obradovic,(2006)given the multiple processes involved in resilience's, there are also multiple pathways to resilience, embedded in varying contexts that require our attention and understanding. Onwuegbuzie, Bustamante and Nelson (2010) mixed research is particularly useful for measurement development and construct validation emphasizes multiple source of data and crossover analyses. In reports detailing the development of resilience measures, we find evidence of qualitative inquiry only during the earliest phases of item generation. In contrast, our goal when constructing the CYRM-28 was to build a culturally sensitive measure with face and item validity wanted a measure that was perceived as relevant by all our global partner and showed the potential for design congruent with mixed methods as used within transformative paradigm. To challenge the cultural bias of existing Minority World theories and measures of resilience, and develop ones that demonstrate greater cultural relevance to Majority world population, we included qualitative

phases of research to facilitate the inclusion of question regarding culturally relevant assets. Ungar,M.Ed (2011) Resilience across culture studied the contextual factor analysis in the lives of students.

Hypothesis

On the basis of the above related literature, the following hypotheses have been formulated: (1)There exists a significant relationship between Resilience and Value conflict of adolescents

(1.1) there exists a significant relationship between Resilience and value conflict of adolescents' boys.

(1.2) there exists a significant relationship between Resilience and value conflict of adolescents' girls.

(2) There is a significant difference in Resilience between adolescents' boys and girls.

(3) There exists a significant difference in value conflict among adolescents' boys and girls.

III. METHOD AND PROCEDURE

A procedure is to research worker as tools are to a carpenter. Taking a specific pinpointed problem and trying to find out a solution in a scientific manner to it is a procedure of research.

Every research tries his best to establish authenticity and trustworthiness of the data collected with the objectives verification of generalization. Such verification requires logical analysis of problem and devising of appropriate methodologies. Hence, Planning and procedure for the study is chosen for saving it from becoming a heap of humped ideas picked up from here, there and anywhere. However, much a truism of the stated formulation that the method and procedure of any study are bound up with its purposes, might seem to be true, yet its implications is of immense methodological consequences. Methodology makes the most important contribution towards the enrichment of any study. In a research, there are numerous methods and procedure. Method selected should always be deliberations. Though people consider methods and procedures are same thing yet these terms mean differently when we conduct research work. In all types of researches, stamps and procedures are more or less the same but there approach and purpose is different. This difference in approach to study is called difference is purpose is different. This difference in approach to study is called difference in methods of study. The selection of method depends upon the nature of the problem selected and the kind of data necessary for its solution, in which scientific investigation, the accuracy and reliability of result depends upon the accuracy of data. The sampling of the data is the sheet of anchor of any research project as it is the data that the research owes its success too. There are numerous methods by which we can conduct our

Study like, experimental method, historical method, case study method, and genetic method. For collecting data one may use one method or more than one but it should be clearly defined and well understood.

IV. DESIGN OF THE STUDY

The objective of the present study is to explore the difference between more judgement and home environment of male and female and adolescents and relationship between moral judgement and home environment of adolescents. To carry out the above said exploration and to meet objectives of the study, descriptive survey method was used 't' test was employed to find the difference between moral judgement and home environment of male and female adolescents and coefficients of correlations was employed to find the relationship between moral judgement and home Environment of adolescents.

The present study was delimited to school situated in Urban and rural area.

SAMPLING: Probably no concept is as fundamental to conduct of research and interpretation of its result as is sampling. In every research project, it is not only difficult but also impossible to include the whole population. Generally what the research workers do is to select a part of whole population to draw conclusion and made generalisation about the whole based on the study of the representative part of the whole of population.

According to good (1963), "sampling is the essential part of all statistical procedures." It is not merely the adjunct of all sciences and is force to sample from a universe of all possible abbreviations rather than believe that one observation provides an absolute and in notable truth. Every experiment needs only a sample of all possible observations which could be made. A sample must be representative and adequate. There are basic requirements for sampling procedure to fulfil keeps in view the limited resource of time, money and test material, the sample has been picked up from various school of Ludhiana.

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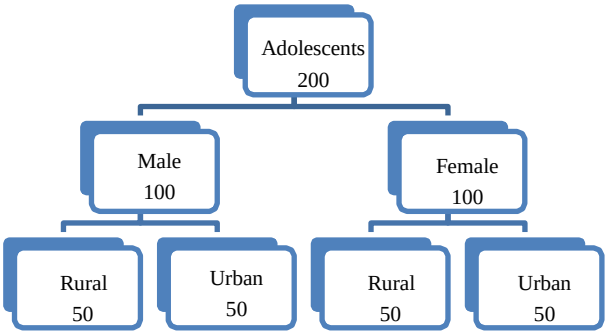
Abilities of everyday life. It has 24 items to measure value conflict when four relevant items should measure each value conflict.

Description of sample **N=200**



Sr No.	Name of School	No. of Students
1	Govt. Senior Secondary for Boys	50
2	Khalsa Senior Secondary School for Girls	50
3	B.C.M. S.S. School, Basant Avenue	50
4	New GMT Public School, Ludhiana	50

STATEMENT OF THE PROBLEM

The proposed study has entitled" **VALUE CONFLICT** AMONG **ADOLESCENTS IN RELATION TO RESILIENCE."**

OBJECTIVES OF THE STUDY

1. To find out the difference between Resilience of adolescent boys and girls.
2. To find out the difference between Value Conflict of adolescent boys and girls.
3. To find out the relationship between Resilience and value conflicts among adolescents.

This scale has been developed to measure the clear value assumption of the people as they exists beside the approach avoidance type of value conflict related to size dichotomous modes of value prob. Abilities of everyday life. It has 24 items to measure value conflict when four relevant items should measure each value conflict.

According to good (1963), "sampling is the essential part of all statistical procedures." It is not merely the adjunct of all sciences and is force to sample from a universe of all possible abbreviations rather than believe that one observation provides an absolute and in notable truth.

To find out the relationship between Resilience and value conflicts among adolescents.

DISCRIPTION OF VALUE CONFLICT SCALE BY R.L. BHANDWAJ (2001) D.S COLLEGE ALIGARH

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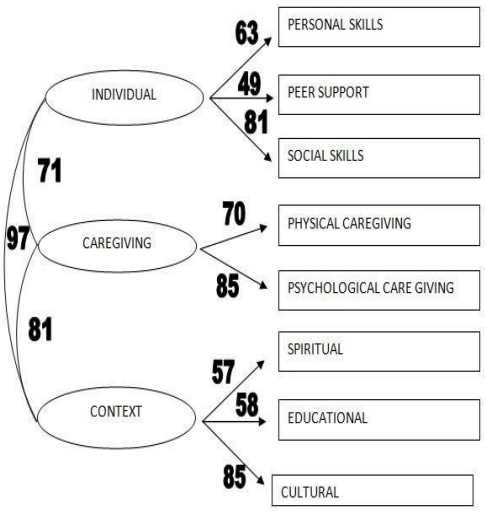
DISCRIPTION OF THE CYRM-28 BY UNGAR AND LIEBENBERGS

The CYRM-PMK is designed for use by primary caregivers or people who play a significant role in the participant's life and are familiar with the youth's life. By comparing the information that a youth provided in the CYRM to the information provided by a person who knows the youth well, data can be compared, cross-referenced, and new information may emerge. However, collecting PMK information is not always visible, such as when participants live in care facilities or when collecting this data exceeds the scope of the study. If collecting PMK data is feasible and would add to your research. Administration of the CYRM-28 takes approximately 15 minutes; while administration of the CYRM-12 takes less time.



While studying resilience we see three dimensions of human beings. Those are as followings

1) Individual
a) Personal skills b) Peer support
c) Social skills
2) Relational
a) Physical care giving
b) Psychological care giving
3) Contextual a) Spiritual
b) Educational c) Cultural

Instructions for administration and scoring

1. The instructions printed on the response sheet are sufficient to take care of the questions that are asked
2. No time limit should be given for completing the scale. However, most respondents should complete it in 10-25 minutes.
3. Before administrating the scale, it is advisable to emphasize orally that responses should be checked as quickly as possible and sincere cooperation is thought for same. The responses should keep confidential.
4. It should also be emphasized that there is no right or wrong answer to the statements the statements are designed to understand the differences in individual factors to various situation the scale is meant to know the difference between individuals and not meant to rank them as good or bad.
5. It should be duly emphasized that all statement have to be responded to and no statement should be left unanswered.
6. Though the scale is self administrating. It has been found useful to read out the instructions printed on the responses sheet to the subjects.
7. Manual scoring is done conveniently, hence no scoring key is provided.
8. Each item or statement should be scored 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree and 1 for strongly disagree.

Collection of data

In order to collect data the value conflict scale was administered to adolescent selected randomly from different schools of Ludhiana District. Before conducting the permission and co-operation of students were related comfortably. Investigator gaveinstructions to the students. And their consent has been taken before administrating the scale.

Administration

The scale can be administered individually or to a large group at a time. After establishing a good rapport. The subject can be asked to respond to limit to the scale for recording the responses and the average

time needed to give responses is usually around 25 minutes.

Scoring

The scoring of value-conflict scale is based on the line of Likert's five point scale. Scoring of item number 1.2,3,5,7,8,9,11,13,14,15,17,19,20,21 and 23 are to be scored from upper to lower in the form of 1,2,3,4 and 5. The scoring of items number 4, 6, 10,

12,16,18,22 and 24 will be in reverse order from upper to lower in the form of 5,4,3,2 and 1. The obtained scores are then to be transferred in the table on last page. The obtained scores are to be added horizontally to determine the value-conflict score for all the six value probabilities separately. such as Evasion Vs. Fortitude, Dependence, and Selfishness's. Probity, Hate Vs. Love, FearVs.Assertion and Pragmatisms. Idealism.

Interpretation of scoring

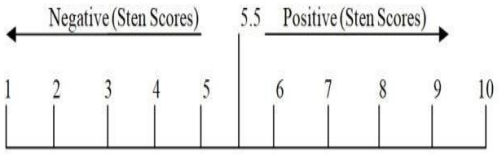
The value conflict score obtained for all the six value-conflict areas shall be interpreted with the help of norms table constructed on different samples of various groups as 'item scores'. In the investigation general norms table has been used which is given as follows.

General Norms
(N=2369)

Description	Sten Value											
	1	2	3	4	5	6	7	8	9	10	Mean	S.D.
A)Evasion Vs.Fortitude	Upto 6	7	8-9	10-11	12	13-14	15-16	17-18	19	20	13-34	3.42
B)Dependence	Upto 4	5-6	7-9	10-11	12-13	14-15	16-17	18-20	21-22	23-24	14-17	4.44
C)Selfishness Probity	Upto 5	6-8	9-10	11-13	14-15	16-17	18-20	21-22	23-24	25-26	26-28	28-30
D)Hate Vs. Love	Upto 5	6-7	8-9	10-11	12-13	14-15	16-18	19-20	21-22	23-24	14.40	4.21
E)Fear Vs. Assertion	Upto 4	5-6	7-8	9-10	11-12	13-14	15-16	17-19	20-21	22-23	13.53	4.18
F)Pragmatism Vs.Idealism	Upto 2	3-5	6-7	8-10	11-12	13-15	16-17	18-20	21-22	23-24	18.60	4.98

To interpret each value conflict score with the help of sten scores, a few guidelines are kept in mind for meaningful interpretation.

1. The interpretation of any score of value-conflicts be made only on the basis of sten values.
2. Sten 1 and 2 on the negative dimensions and 9 and 10 on the positive dimensions are interpreted as high or clear value assumptions of the values in reference.
3. Sten 3 on the negative dimension and Sten 8 on the positive side be interpreted as normal value assumptions.
4. Sten 4 on the negative dimension and sten 7 on the



positive dimension be interpreted as less value assumptions.

5. Closer the mean Sten value of 5.5 on both sides (i.e. between 5&6 Sten values) be interpreted as existing conflicts associated to the value interpreted as to have been sliding towards low conflict of the value- conflict .
6. In group situation the interpretation of value-conflicts shall be made mean of the
7. Sten values, corresponding to the conflict scores of that group.

Thus the present value conflict scale measure clear value assumptions and value-conflicts associated with different probabilities in reference on both the negative and the positive dimensions.

Statistical Techniques used

Statistics is a mathematical technique or process of gathering, describing, organizing, analyzing and interpreting numerical data. Statistics is a basic tool of measurement and research. Statistical methods are especially adopted to calculate the quantitative data affected by multiplicity of cases. The statistical techniques were employed to give concise picture of the whole data so that it can be easily comprehended.

To build a meaningful picture for interpretation of data and testing hypotheses, the investigator has sought the help of following statistical techniques.

Frequency Distribution

Frequency distribution of total scores was prepared. These distributions were prepared to show the trend of the scores and also for comparison of scores on account of different variables. After determining the size of the class intervals tallies were marked and frequencies prepared to facilitate further calculation.

MEAN

Mean is the best- known measure of central tendency. It may be defined as sum total of the separated scores divided by their number. It is more reliable or accurate than the other measures of central values as median and mode, its formula is

$$\text{Mean} = \frac{\sum X}{N}$$

Median

Median is the valid of variable, which divides the total distribution in equal halves

Its formula is: - $\text{Median} = L + \frac{N/2 - F}{f} \times i$

Mode

Mode is most frequently occurring score in the series. It is usually employs us a single inspectional average to indicate in a rough way the centre consideration n-distribution. Their formula is: -

Mode=3 Median -2 Mean

Standard Deviation

Standard deviation is the measure of variables employed in research. It usually the most reliable and dependable indicator of the degree of variability. It is root-mean-square deviation measured from the average. It is calculated by formula:

$$\sigma = \sqrt{1/\square\square\sum(X\square\square - \square\square)^2}$$

Where

σ = Standard deviation

Xi = ith value of variable

N = Number of items

X = Arithmetic mean

Skewness

Skewness used to measure divergence from normality in home environment and moral judgment. A distribution is set to be 'skeyed when the mean, median fall at difference points in the distribution and then balance

Skewed. The degree of Shewness in a frequency may be determined by the formula: -

$$SK \quad \frac{3(\text{Mean-Median})}{\text{S.D.}}$$

Kurtosis

The term kutosis refers to the 'peakedness' or 'flatness' of frequency distribution as compared with normal. A frequency which is more peaked than normal is said to be 'Leptokurtic' and one flatten than normal is called 'platykutic'. Formula for calculating kurtosis is: -

$$Ku = \frac{Q}{P_{90} - P_{10}}$$

Where

Q=Quartile deviation

P= Percentile

Graphic representation

"One picture is worth than thousand words". A graphical representation is the geographical image of set of data. It gives the pictorial view of the distribution and aid in analysis of data.

't' – test

It was used to find out the difference between home environment of male and female adolescents and moral judgment of male and female adolescents. The formula used was:

$$\text{'t'- value} = \frac{\text{Difference of means}}{\text{Standard error of difference}}$$

Where

Degree of freedom = N1+N2-2

N1 =Sample size for variable -1

N2 = Sample size for variable -2

Karl Pearson's Coefficient of Correlation

It was used to find out the degree of linear relationship between home environment and moral judgment of adolescents. The formula used was :

$$r = \frac{\sum x(x-x)(y-y)}{\sqrt{\sum (x-x)^2 (y-y)^2}}$$

V. ANALYSIS AND INTERPRETATION OF RESULTS

In educational research, the step that comes next to
the collection of data is the analysis and interpretation of the collected data. This section is the heart of the research because it gives concise picture to the data. In other words it gives tongue to the otherwise mute data. It involves breaking down the existing complex factors into simple facts and putting the parts together in the new arrangement for the purpose of interpretation. It not only point out the important facts and relationships to give meaning to the data but also make certain generalizations about the data.

The present study was undertaken with the purpose of finding the relationship between emotional intelligence and value conflict of adolescents. This objective was achieved within the framework of the hypotheses mentioned in the chapter 2. The data pertaining to the emotional intelligence and value conflict of 200 students of XI class from government senior secondary schools of Ludhiana district were collected. In order to screen the data for meaningful purpose and to test the hypotheses, the data was analyzed with the help of various statistical techniques. Two types of statistical analysis were carried out for this purpose:

1. Descriptive Statistics: Description of the scores presented in terms of the frequency distribution, mean, median, S.D., skewness and kurtosis.
2. Inferential statistics: For relationship between the variables under study, Pearson's Product Moment Correlation 'r' and for comparison of categories, t- ratio has been calculated.

Presentation of Results

The data is presented in three sections:

A. Table 2 deals with the frequency distribution of scores of resilience for adolescents (Boys, Girls and Total)
B. Table 2 deals with significance of the difference between means of level of Resilience of adolescence boys and girls.

Table 1 Frequency distribution of score of Resilience for Adolescents (Boys, Girls and Total)

Scores	Boys	Girls	Total
	F1	F2	F3
110-120	2	0	2
120-130	16	7	23
130-140	29	30	59
140-150	44	57	101
150-160	9	6	15
Total	100	100	200

Group	Mean	Median	S.D	Skewness	Kurtosis
Boys	138.83	140.50	9.25	-0.671	0.318
Girls	140.38	141.00	6.35	-0.293	0.218
Total	139.61	141.00	7.95	-0.523	0.286

Table 1 shows the values of mean and median of the scores of emotional intelligence for boys

138.83 and 140.50 respectively; those of girls as 140.38 and 141.00 and of total samaple as 139.61 and 14.00 respectively. The values of skewness an kurtosis in case of boys are -.671 and .318 respectively showing the distribution as negatively skewed and platkurtic; those for girls as -.293 and .281 respectively showing the

distribution as negatively showing the distribution as negatively skewed and platkurtic. But the distortion for all the the above three cases are quite small. Therefore the distribution can be taken as normal which is also evident form figure as shown below.

Frequency Polygon of scores of Resilience for total Adolescents

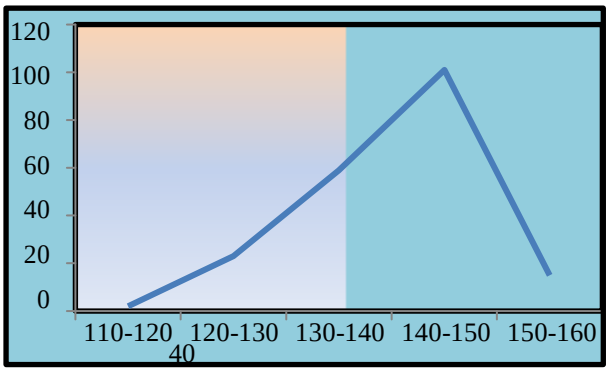


Table 2 shows Frequency distribution [5] **scores of value conflict for adolescents (Boys, Girls and Total)**

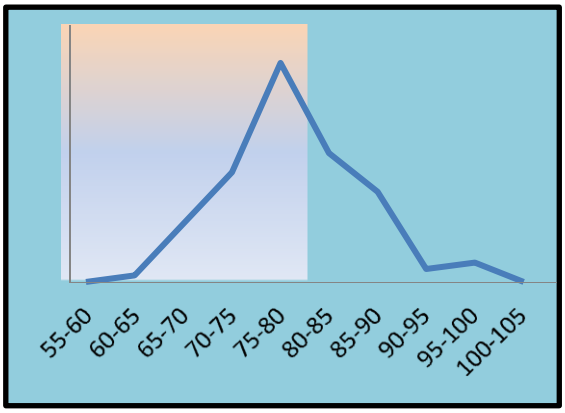
Scores	Boys	Girls	Total
	F1	F2	F3
55-60	0	2	2
60-65	1	4	5
65-70	9	20	29
70-75	17	26	43
75-80	34	22	56
80-85	20	18	38
85-90	14	3	17
90-95	2	4	6
95-100	3	0	3

‘

Group	Mean	Median	S.D	Skewness	Kurtosis
Boys	78.48	78.50	6.97	-.009	.263
Girls	74.66	74.00	7.54	.263	.196
Total	76.57	76.00	7.49	.228	.278

Table 2 shows the values of mean and median of the scores of value conflict for boys as 78.48 and 78.50 respectively, those of girls as 74.66 and 74.00 and of total sample as 76.57 and 76.00 respectively. The value of skewness and kurtosis in case of boys are 0.009 and .263 respectively showing the distribution as negatively skewed and musokurtic; those for girls as .263 and .196 respectively showing the distribution as positively skewed and platykurtic. But the distortion for all the above three cases are quite small. Therefore the distribution can be taken as normal which is also evident from figure 2 as shown.

Fig 2 Frequency Polygon of scores of Value Conflict for Total Adolescents.



COEFFICIENT OF CORRELATION

To investigate the significance of relationship between resilience and value conflict of adolescent students, Pearson’s Product-Moment Correlation ‘r’ was employed.

Table 3 Coefficient of Correlation between Resilience and Value Conflicts of adolescents.

Factor of resilience	Mean	Standard Deviation
Individual		
Personal Skills	200	-0.19**
Peer Support	200	0.19**
Social Skills	200	0.25**
Relational		

Physical Care giving	200	0.05
Psychological Care giving	200	-0.03
Contextual		
Spiritual	200	0.04
Educational	200	-0.22**
Cultural	200	0.05
Total	200	

Table 3 shows the coefficient of correlation 'r' of resilience and value conflict of adolescents. The value of 'r' for Personal Skills, Peer Support, Social Skills, Physical Care Giving, Psychological Care Giving, Spiritual, Educational and Cultural came out to be -0.19, 0.19, 0.25, 0.05,-.0.03,0.04,-0.22 and 0.05 showing the positive relationship between peer support, social skills, physical care giving, spiritual and cultural aspects and negative relationship between personal skill, psychological Care Giving and Educational factors of resilience of adolescents with their value conflict.

Out of these coefficient of correlations between eight factors of resilience and value conflict, the significant relationship exists only between personal skill, peer support, social skills and educational with value conflict adolescents as the coefficient of co relation between personal skills and educational factors of resilience and value conflict came out to be negative, it reveals that the persons who are more aware of themselves and has better educational background have less value conflicts on the other hand the coefficient of correlation between peer support and social skills factors of resilience and value conflict came out to be positive, it reveals that the persons who has better understanding of others and has better social skills have more value conflicts.

Therefore hypothesis 1 stating that there exists significant relationship between resilience and value conflict of adolescents stands partially rejected.

Table 4 coefficient of correlation between resilience and value conflict of adolescent boys

Factors of Resilience	**N**	**R**
Individual		
Personal Skills	100	-0.02
Peer Support	100	0.15
Social Skills	100	0.07
Relational		
Physical Care giving	100	0.12
Psychological Care giving	100	0.06
Contextual		
Spiritual	100	-0.04
Educational	100	-0.03
Cultural	100	0.16
Total	100	0.09

Table 4 shows the coefficient of correlation 'r' of resilience and value conflict of adolescent boys the value of 'r' for personal skills, peer supports, Social Skills, Physical Care Giving, Psychological Care Giving, Spiritual, Educational and Cultural came out to be -0.02,0.15,0.07,0.12,0.06,-0.04,-0.03 and 0.16 respectively showing the positive relationship between peer support, social skills, physical care giving, psychological care giving and cultural aspects and negative relationship between personal skills, spiritual and educational factors of resilience of adolescents boys with their value conflict

The coefficients of correlations between all the eight factors of resilience and value conflict, no significant relationship was found therefore hypothesis 1.1 stating that there exists a significant relationship between resilience and value conflict of adolescent boys stands rejected.

Table 5 coefficient of correlation between resilience and value conflict of adolescents girls

Factor of resilience	**Mean**	**Standard Deviation**
Individual		
Personal Skills	200	-0.38**
Peer Support	200	0.17
Social Skills	200	0.35**
Relational		
Physical Care giving	200	0.06
Psychological Care giving	200	-0.12
Contextual		
Spiritual	200	0.05
Educational	200	-0.27**
Cultural	200	-0.14
Total	200	

****Significant at .01 levels**

Table 5 shows the coefficient of correlation 'r' of

resilience and value conflict of adolescents girls. The

value of 'r' for Personal Skills, Peer Support, Social Skills, Physical Care Giving, Psychological Care Giving, Spiritual, Educational and Cultural came out to be -0.38,0.17,0.35,0.06,-.0.12,0.05,-0.27 and -0.14 respectively showing the positive relationship between peer support, social skills, physical care giving and spiritual aspects and negative relationship between personal skill, psychological Care Giving, Educational and cultural factors of resilience of adolescents with their value conflict

Out of these coefficient of correlations between eight factors of resilience and value conflict, the significant relationship exists only between personal skill, peer support, social skills and educational with value conflict adolescents as the coefficient of co relation between personal skills and educational factors of resilience and value conflict came out to be negative, it reveals that the persons who are more aware of themselves and has better educational background have less value conflicts on the other hand the coefficient of correlation between peer support and social skills factors of resilience and value conflict came out to be positive, it reveals that the persons who has better understanding of others and has better social skills have more value conflicts.

Therefore hypothesis 1 stating that there exists significant relationship between resilience and value conflict of adolescents stands partially rejected

Table 6 significance of the difference between means of level of resilience of adolescents' boys and girls

Group	Factors	N	M	S.D	S.E M	t-ratio
Boys	Personal Skills	100	16.04	2.46	.25	1.07
Girls		100	16.37	1.89	.19	
Boys	Peer Support	100	20.13	2.29	.23	1.91
Girls		100	19.50	2.38	.24	
Boys	Social Skills	100	24.83	2.25	.23	2.32**
Girls		100	24.11	2.31	.23	
Boys	Physical care giving	100	16.37	2.39	.24	2.31**
Girls		100	17.03	1.57	.16	
Boys	Psychological caregiving	100	17.20	2.00	.20	0.74
Girls		100	16.96	2.55	.25	
Boys	spiritual	100	12.83	2.20	.22	2.16**
Girls		100	12.17	2.12	.21	
Boys	educational	100	7.65	1.57	.16	5.70**
Girls		100	8.77	1.18	.12	
Boys	cultural	100	7.79	1.58	.16	4.54**
Girls		100	8.67	1.12	.11	
Boys	total	100	122.84			
Girls		100	123.58			

****Significant at .01 level**

Table 6 reveals that no significant difference exists in resilience of adolescents of boys and girls hence the hypothesis 2 stating that there is a significant difference in resilience between adolescents' boys and girls is partially accepted. As the mean scores of adolescents' boys are higher than those of adolescents' girls on all the dimensions of resilience, it may be concluded that boys are more modern than their female counterparts.

Bar Graph showing Difference of Means of Level of Resilience of Adolescent Boys and Girls

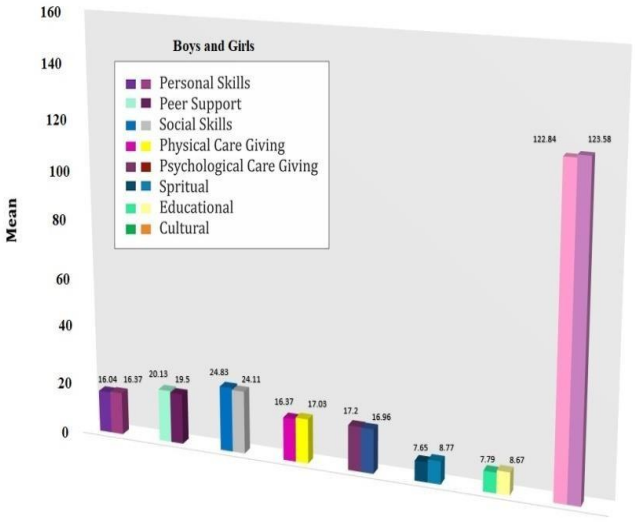


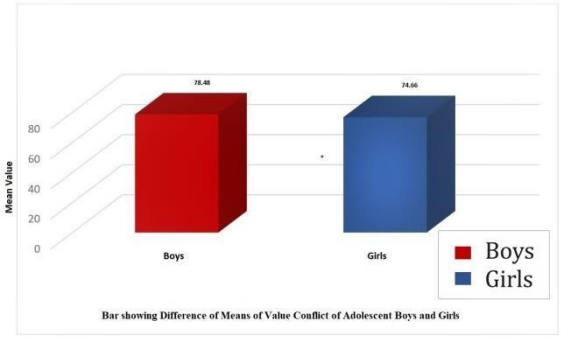
Table 7 significance of the difference between means of value conflict of adolescents boys and girls

S.No.	Group	N	M	S.D	SEM	T-VALUE
1	Boys	100	78.48	6.97	0.70	3.72**
2	Girls	100	74.66	7.54	0.75	

Table 7 reveal that the means scores of value conflict among adolescents' boys and girls as 78.48 and 74.66

respectively and their standard deviation as 6.97 and 7.54 respectively. The t-ratio was calculated as 3.72 which is significant at 0.01 level of confidence. This reveals that a significant difference exists between value conflict between adolescents' boys and girls. Therefore the hypothesis 3 stating that there exists a significant difference in value conflict among adolescents and girls is accepted.

Bar showing Difference of Means of Value Conflict of Adolescent Boys and Girls



Educational Implication of the study

The on the basis of present study we can conclude 10 Ways to build Resilience among student from childhood and at school level.

1. To teach the students to maintain good relationship with close family members, peers and others.
2. To avoid seeing crises or stressful events as unexpected problems.
3. To make the students able to accept circumstances that cannot be changed or dealt with
4. To imbibe the qualities to develop realistic goals and try to put maximum efforts sto moves towards them.
5. To take decisive action in actions in adverse situation and to cop up with the situation.
6. To change their mindset and out look for opportunities of self- exposure after a struggle with problem and loss.
7. From initial stage parents and teachers should develop self- confidence in their kids by putting strong belief and faith in them.
8. To provide them knowledge to keep a long-tem perspective and consider the stressful situations in an easy and broader context.
9. To maintain a hopeful outlook, expecting good things and visualization what is wished, and to achieve what was wished.
10. To take care of one's mind and body, exercising regularly, paying attention to one's own needs and feelings and as well as of others and try to celebrate others success.

VI. CONCLUSION

On the basis of the interpretation and analysis done, we reached to the following conclusions, Out of the coefficient of correlation between seven factors of resilience and value conflict, the significant relationship exists only between only four factors i.e. of personal skills, peer support, social skills, physical care giving with the value conflict of adolescents. As the coefficient of correlation between skills and physical care giving factors of resilience and value conflict came out to be negative, it reveals that the person who are more aware of themselves and has better physical care giving have less value conflicts. The cognitive aspect of moral values generally called moral judgment i.e. it is only an intellectual activity. Development of resilience and values in students is a mental process which takes place in every individual where parents peer and schools have very much influence on his development of resilience. In adolescents' stage, value conflict is influenced by the resilience to some extent, which includes parental behavior, attitude towards each other and towards child. Beside this, other facts which affect the resilience and value conflict of adolescents are school climate, social customs, and religious. taboos. Adolescents with high value and good character are the future of the nation and will take it on the top of the hill of progress. The present study is a humble attempt on the part of the research scholar, not all aspects of the problem could be studies properly. The study had delimitations with respect to operational definition of key concepts, related literature, techniques, tool

used, sample and analysis. The present study opens up certain avenues for further research, so that each individual and student can be benefit.

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Empirical Analysis of the Bitcoin Allure

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Abstract: The study seeks to assess the features of cryptocurrency which has captured the imagination of many. The main focus of the study is to examine the major determinants of bitcoin price. Bitcoin skyrocketed to $19289.97 on December 2017. Time series data has been collected from 2009-2017. Econometric model of Augmented Dickey Fuller test has been used to test the stationarity condition of the time series data. Granger-Causality test has been used to determine the presence of lead lag relationship between the variables. The findings reveal that the size of bitcoin economy is the prime cause of volatility in bitcoin price. Though the future of cryptocurrency is still uncertain due to the possible risks attached to it, but the block chain mechanism if adopted by the banks and other mediums will smoothen the transaction process.

Key Words: Bitcoin, Cryptocurrency, Blockchain, Granger-Causality, Augmented Dicky Fuller.

I. INTRODUCTION

Cryptocurrencies have become a global phenomenon and has captured the imagination of speculators, computer geeks and governments across the world. They have become the topic of debate amongst public media and scientific community. Many cryptocurrencies are floated in the market, like, Bitcoin, Litecoin, Namecoin, Swiftcoin, Ripple, Peercoin, Ethereum etc. but the digital currency that has garnered success is bitcoins. Bitcoin is defined as a chain of digital signatures which is supported by a decentralized network of users. These signatures contain historical information about the holder of bitcoin to authenticate the transaction and its transfer. It is the first virtual currency to be introduced in 2008 by Satoshi Nakamoto and the first to use the concept of cryptography as a means to make payment for various needs. Cryptography enables a user to sign cryptographically and transfer value using public and private keys (Financial Action Task Force, 2014).The fluctuations in price of bitcoins have been tremendous, on January 2011, one bitcoin was trading at $0.3 against US dollar and touched a high of $19289.79 on December 2017. Unlike the central bank of a country issues paper currency, a bitcoin is generated by data mining. This process of generating bitcoins by creating new blocks with the help of software is known as bitcoin mining. Unlike fiat currencies like US dollar and Euro are denoted as EUR or USD etc. bitcoins are symbolised as BTC and circulated in three denominations of 1BTC, 5 BTC and 25 BTC. Each bitcoin is subdivided into 100 million smaller units called 'Satoshis', defined by eight decimal places (Nakamoto, 2008). Contrary to fiat currencies whose value is derived from the trust underwritten by the state, bitcoins value is determined by the demand and supply amongst the people willing to trade in it.Thousands of computers indulged in solving complex algorithms that are used to unravel the problem. The reward for solving the algorithm is a newly minted bitcoin (Kaplanov, 2012).

These freshly minted bitcoins are stored in user's wallet which consists of a public key and a private key. Public key acts like the address of the person to whom bitcoins can be transferred and private key facilitates transfer of bitcoins from the owner to another individual.To ensure the validity of the transaction and avoid double spending of the virtual currency, Satoshi Nakamoto coined the idea of peer-to-peer technology. Bitcoins use this peer-to-peer technology to keep record of allthe transactions that have taken place. (Turpin, 2014). This peer-to-peer technology uses the concept of blockchain which is a distributed network that records transactions to ensure authencity of the bitcoins that have been transferred.Each transaction is recorded over network but the identities of the parties to transaction are not disclosed.Secure trade and

anonymity provided by bitcoins has enabled bitcoin users to trade them digitally.Ease of transaction, absence of any central authority, low cost of transaction and anonymity provided by bitcoins has been the prime driver of the increase in the demand and price of bitcoins (Morawczynski & Pickens, 2009). **(**Barber, 2012) (Bryans and Yermack 2014**)** explainedthat the anonymity and transparency provided by bitcoins and its distributed architecture has been another reason of bitcoins growing popularity. (Luther and White 2014) propounded that,the absence of central clearing and settlement node has increased the demand of bitcoins compared todebit and credit cards. The exchange fee charged by central clearing authorities for transfer of bitcoin is quite low in comparison to the traditional means of money transfer.Another key driver of bitcoin craze is it being limited in number. Only 21 million of bitcoins are available and to generate one bitcoin, miners have to indulge in complex data mining.At the time of conducting this study approximately 16.83 million of bitcoins have been mined having a market capitalization of $192.7 billion (Blockchain.info). The increased use of bitcoins as a medium of exchange hasgained popularity due to their decentralized nature, as they are not monitored by any regulating authority. Blockchain technology adopted to mine bitcoins makes it difficult to counterfeit them as any new block that has been introduced has to be vetted by others to allow that particular block to be added with other blocks. This blockchain technology adopted by bitcoin has further enhanced its appeal and all other cryptocurrencies. To include a new block into the chain all the participants jointly validate a block and once it has been validated by all nodes a new block is included to blockchain (Baron et al. 2015).The feesinvolved in remitting money through traditional means like cheques, cards orPayPal is more as companies exploit users by charging exorbitant amount of money for transaction purposes.(Folkinshteyn et al., 2015) argued that blockchain technology adopted by bitcoins is the prime reason of its increasing demand as it is used for remittances. Money can be transferred from one party to another at low transaction cost, all a person needs is a computer with internet and money can be transferred in a few minutes.The transfer mechanism is similar to sending e-mailsby one person to another. (Grinberg, 2011 and Hayes, 2014) defined blockchain as a technology which records all transactions via a decentralized public ledger. The transactions are verified and validated by all individuals or companies that run softwareto ensure their integrity and prevent any addition of any unauthorised transaction. Many criticized cryptocurrencies as it feared the risk of double spending or counterfeit. This problem of double spending or counterfeit is solved by blockchain technology. As all transactions gets recorded in public ledger which can be verified by anyone and everyone.

Bitcoins can be obtained in primarily three ways-they can be mined by individuals who solve complex algorithm and in return they get bitcoins as rewards. Those who cannot mine a bitcoin can also get hold of this virtual currency by purchasing it from an exchange trading bitcoins. These days many exchanges are indulged in buying and selling of cryptocurrency. CME the world's largest exchange acknowledged the demand of bitcoins and introduced bitcoin futures. Coin.ph which uses blockchain technology entered into partnership with Security Bank which allows the users of Coin.ph to withdraw cash or purchase bitcoins by depositing money into any of the 450 ATMs that have been installed by them (Young, 2015). Bitcoins can be exchange for US dollar, euro or other fiat currencies (Financial Action Task Force, 2014). An individual can get hold of bitcoins by undergoing a sale of goods and services which are denominated in bitcoins. Acceptance of payments in bitcoins by businesses like Reddit and Wordpress has encouraged the use of bitcoins.

Though bitcoins are gaining traction but scepticism about the currency's legality and definition has kept many vary of indulging in the bitcoin craze.(Velde, 2013, Hanley, 2014, Yermack, 2014 and Williams 2014) have defined bitcoins as speculative investment rather than real currency. Contrary to them, studies by (Plassaras, 2013,Satran, 2013,Luther and White, 2014,Folkinshteyn et. al, 2015) have identified bitcoin as a virtual currency. Also,bitcoins have been granted the status of a virtual currency by Financial Crimes Enforcement Network (FINCEN, 2013), European banking authority and European Central Bank (European Banking Authority, 2014). However, Internal Revenue Service of USA have acknowledged bitcoins as a property. IRA regulated that bitcoins and all virtual currencies will be taxed as property (Michael, 2014). (FINCEN, 2013) however cautioned about bitcoins use as a "real" currency, as

virtual currencies are yet to get the legal tender status by countries.

Another feature that has led to the popularity of bitcoins is the irreversible nature of the transactions. Accidental or an unwanted purchase can be reversed for transactions made via credit and debit cards but it is not possible to reverse such kind of transactions through bitcoins (Böhme et al. 2015).

Bitcoins have become a de facto standard as 90 per cent of the market capitalization of cryptocurrencies consists of bitcoins (Swan, 2015). Thus, bitcoin being the most successful of all cryptocurrencies the research majorly looks to symbolize bitcoins for other cryptocurrencies as well. Bitcoin and cryptocurrency has been used interchangeably in the study.

Table 1 present a summary of the bitcoin allure:

Table 1

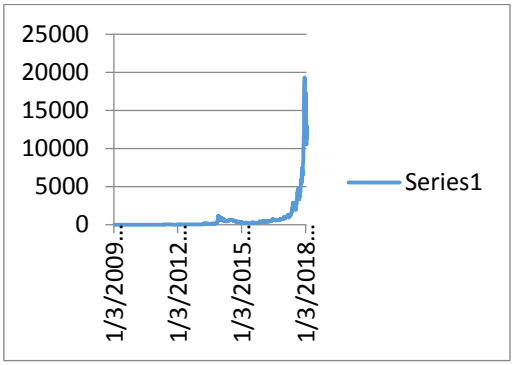
Data on Bitcoin Activity (Till January, 2018)

Number of bitcoins mined	16820025
Market price of Bitcoin	$11697.40
Total number of transactions	295608699
Number of wallet users	22454275
Hash rate	19491456 TH/s
Blockchain size	153681 MB
Estimated daily transaction value	$2822337880
Unique Addresses	574420

Source: Blockchain.info

II. RELEVANCE OF THE STUDY

The present study attempts to assess the potential factors that have caused tremendous volatility in bitcoin prices. The price of bitcoin skyrocketed from $0.3 in 2010 to $19289 in 2017 and has experienced multiple peaks until 2017. At the time of conducting the research, bitcoins are trading at $11138.97 against US dollar. At first, an overview of literature of previous studies has been conducted which have explained the drivers for bitcoin price volatility. Few researchers have categorized cryptocurrencies as a means of speculative investment and some have advocated over the strong potential of cryptocurrencies. Based on studies of (Buchholz et al., 2012), (Palombizio and Morris 2012), (Luther and White, 2014), (Böhme et al. 2015) current study has identified the variables that might explain the extreme volatility in bitcoin prices. The data on number of bitcoins in supply, size of bitcoin economy, global macroeconomic, financial and technical indicators will be analysed. To determine the impact of global macroeconomic and financial factors data will be collected on changes in price of oil and Dow Jones and Hash rate to estimate the impact of technical indicators. Time series data will be collected from 2009-2017. The study also looks to assess the blockchain mechanism and its growing popularity for various transaction purposes.



Source Blockchain.info

III. REVIEW OF LITERATURE

First contribution of the study has been to identify the fundamental reasons for the tremendous rise in price of bitcoins. For this purpose, the research has conducted review of the previous studies and defined the variables undertaken.

Price of Bitcoin

Bitcoin is defined as a chain of digital signatures which is supported by a decentralized network of users (Turpin, 2014). Supply and demand of bitcoin determines the currency's real value (Kaplanov, 2012).

Bitcoin Supply and Demand

(Buchholz et al., 2012) stressed on the limited supply of bitcoin as a key driver for run up against US dollar. (Luther and White, 2014) have explained that bitcoins derive their value from the market forces of demand and supply. Being limited in number any increase or decrease in demand of bitcoin will eventually lead to an increase or decrease in its value against dollar. (Ciaian et al., 2016) applied quantity theory of money and explained that the size of bitcoin economy, velocity of bitcoin circulation and total stock of bitcoins in circulation denoted the demand and supply of bitcoins.The quantity theory exemplified that the

size of bitcoin economy and general price level led to an increase and velocity and stock of bitcoins led to a decrease in the price of bitcoins.

Global macroeconomic, financial and technical indicators

(Palombizio and Morris 2012) explained the exchange rate movement through changes in price of oil. An increase in price of oil causes a downward pressure on currency and a decline in oil price causes an appreciation in currency thus impacting exchange rate system. Similarly, if bitcoins are used as a medium of exchange then a significant change in oil price will cause an appreciation or deprecation of cryptocurrency. (Kristoufek, 2014) explained the presence of a positive relation between bitcoin prices and hash rate.

Research Methodology

Model Specification

To estimate the influence of factors defined in our literature review, we have specified the following bitcoin price equation:

$$p_t^B = \beta 0 + \beta_1 y_t + \beta_2 b_t + \beta_3 m_t + \epsilon_t$$

t is the time subscript, Bitcoin price which is estimated against US dollar is represented with ptB, the size of bitcoin economy is denoted by yt, it has been used as a proxy variable to include the number of unique bitcoin address and the number of bitcoin transactions per day, bt is the number of bitcoins in circulation which is captured through the number of bitcoins that have been mined, mt is used to summarize the macroeconomic, financial and technical indicators and et is the error term.

For time series data to be effective first condition is to check for the condition of unit root. If data has unit root it means the data is non-stationary which will lead to spurious results. In order to avoid spurious results testing of unit root in model is important. Augmented Dickey-Fuller (ADF) test has been used to check presence of stationarity in the data.

Panel co-integration has been used to provide evidence of integration amongst the variables. Granger-Causality test will be used to determine the presence of lead lag relationship between bitcoin prices, bitcoin economy, bitcoin in circulation and macroeconomic, financial and technical indicators.

Data collection and construction

The study seeks to analyse the factors responsible for volatility in prices of bitcoins. For this, bitcoin price has been defined as the dependent variable. The data on bitcoin price has been taken as the value of bitcoin against US dollar which has been extracted from blockchain.info. The independent variables have been defined which explain the factors that might have a considerable impact on bitcoin price movement. To represent the number of bitcoins in circulation, we have undertaken the data on total number of bitcoins that have been mined. Total number of unique address of bitcoins and number of transactions per day have been proxied to represent the size of bitcoin economy. The data on all independent variables has been taken from blockchain.info. To estimate the influence of global macroeconomic, financial and technical indicators, study has included the US Dow Jones index (data for Dow Jones has been taken from US Federal Research Bank, St. Louis) and prices of oil (has been taken from US Energy Information Administration). To estimate the impact of technical indicators we have taken data on Hash rate (extracted from blockchain.info) to determine it influence on bitcoin prices.

IV. DATA ANALYSIS AND INTERPRETATIONS

The study has incorporated panel data on factors influencing bitcoin prices. The variables that have been analysed as the supply and demand determinants of bitcoin price movement are number of bitcoins mined, number of transactions and unique address of bitcoins miners. To estimate the impact of global macroeconomic, financial and technical factors study has analysed Dow Jones stock index, global prices of oil and Hash rate of bitcoin mining. Panel data for five variables has been collected from 2009-2017 to determine the bitcoin price drivers.

Augmented Dickey Fuller test has been used to test the stationarity condition in our time series data. To ensure data is stationary or non-stationary we check the value of Durbin Watson Statistics. Value of Durbin Watson statistics when more than or near to 2 ensure that there is no autocorrelation amongst our residuals and the test applied is a reliable measure. Further, to attest to stationarity in data we compare the negative value of ADF with the negative critical value and when negative ADF value is less than the negative critical value, then the said series is said to fulfil the condition of stationarity. However, if the

ADF value is more than the negative critical value then the said data is non-stationary. Results of ADF which analyses the presence of unit root have been reported in table 2-7. Table 2 depicts, Log_Market price fulfills the condition of stationarity at level, implying rejection of null hypothesis and stating the series as stationary. Table 3 illustrates the result of unit root test and show that Log_Bitcoin economy satisfies the condition of stationarity at second differencing using ADF test. Table 4 demonstrates the Log_Stock of bitcoin has met the condition of stationarity and therefore, rejection of null hypothesis at second difference value of ADF test. Table 5 shows that Log_Dow Jones satisfies the condition of stationarity at difference 1 of ADF test. Table 6 indicates the Log_Oil price is stationary at level. Table 7 shows Log_Hash Rate rejecting the null hypothesis at second difference value of ADF test.

Table 2

	ADF(0)	ADF(1)	ADF(2)
Intercept only			
Log_Market Price	-3.213551	-5.716846	5.721227
Akaike Info Criterion	1.775300	2.204813	2.573742
Schwarz Criterion	1.752119	2.189359	2.504329
Durbin Watson Stat	1.972470	1.146834	1.582238
Probability	0.2657	0.0035	0.0011
			Test Critical Value
1%	-4.803492		
5%	-3.403313		
10%	-2.841819		

Table 3

	ADF(0)	ADF(1)	ADF(2)
Intercept only			
Log_Bitcoin Economy	10.65628	-13.84968	10.13692
Akaike Info Criterion	-2.187509	-3.616561	-2.854769
Schwarz Criterion	-2.210690	-3.720681	-3.089106
Durbin Watson Stat	0.926602	2.079832	2.113632
Probability	0.0001	0.0001	0.0424
			Test Critical Value
1%	-5.604618		
5%	-3.694851		
10%	-2.982813		

Table 4

	ADF(0)	ADF(1)	ADF(2)
Intercept only			
Log_Stock of Bitcoin	-2.496741	-3.048630	11.13255
Akaike Info Criterion	1.570497	1.442466	-2.853022
Schwarz Criterion	1.547316	1.427011	-3.165471
Durbin Watson Stat	1.541477	1.621301	2.765467
Probability	0.7454	0.0070	0.0005
			Test Critical Value
1%	-8.235570		
5%	-5.338346		
10%	-4.187634		

Table 5

	ADF(0)	ADF(1)	ADF(2)
Trend and intercept			
Log_Dow Jones	16.77005	15.02878	11.41199
Akaike Info Criterion	-3.934300	-3.676259	-2.803996
Schwarz Criterion	-3.957481	-3.815086	-2.908116
Durbin Watson Stat	2.457824	2.869610	2.001413
Probability	0.6304	0.4379	0.4615
			Test Critical Value
1%	-7.006336		
5%	-4.773194		
10%	-3.877714		

Dependent	tau-statistic	Prob*	Z-statistic	Prob*
DOW	-3.294508	0.6810	-45.73745	0.9999
ECONOMY	-4.893656	0.2739	471.9089	0.0001
HR	-2.457212	0.9125	-7.980622	0.8605
MINED	-3.138180	0.7309	-26.77954	0.9999
MP	-2.996842	0.7721	-26.56522	0.9999
OILPRICE	-2.998198	0.7717	-32.47005	0.9999

Table 6

	ADF(0)	ADF(1)	ADF(2)
Intercept only			
Log_Oil price	7.199858	5.457842	11.25242
Akaike Info Criterion	-1.199959	-0.987955	-3.300967
Schwarz Criterion	-1.223141	-1.003409	-3.535305
Durbin Watson Stat	2.380361	1.846951	1.180263
Probability	0.4297	0.3219	0.0004
Test Critical Value			
1%	-4.803492		
5%	-3.403313		
10%	-2.841819		

Table 7

	ADF(0)	ADF(1)	ADF(2)
Intercept only			
Log_Hash Rate	-14.05496	-6.984415	-6.871058
Akaike Info Criterion	4.013740	2.566976	2.957019
Schwarz Criterion	4.033600	2.551521	2.887606
Durbin Watson Stat	1.937531	1.246029	1.968442
Probability	0.8844	0.0014	0.0008
Test Critical Value			
1%	-4.582648		
5%	-3.320969		
10%	-2.801384		

Panel Cointegration

Table 8

Panel Cointegration test is used to check whether the stationary series is cointegrated with each other or not. To estimate the cointegration in the series we check the probability value of all the variables. The probability value or the p value if less than 0.05 leads to rejection of null hypothesis implying cointegration exists between the variables.Table 8, shows the result of panel cointegration which highlights that there exists no cointegration between Dow Jones and bitcoin price. Absence of cointegration between Hash rate and oil price is also seen in the study.

Granger Causality

Table 9

Null Hypothesis	F- Statistic	Prob.
Hash Rate does not Granger Cause Economy	52.5908	0.0187
Economy does not Granger Cause hash rate	3.54093	0.2202
Mined does not Granger Cause economy	2.63739	0.2749
Economy does not Granger Cause mined	31.6341	0.0306
Bitcoin price does not Granger Cause hash rate	60.6159	0.0162
Hash rate does not Granger Cause bitcoin price	4.89580	0.1696
Bitcoin price does not	23.8774	0.0402

Granger Cause mined		
Mined does not Granger Cause bitcoin price	0.69045	0.5916

Table 9 shows the result of Granger-Causality test. The p value of hash rate is less than 0.05 which shows that there is statistical significant relationship between hash rate and bitcoin economy and hash rate causes changes in bitcoin economy. Thereexists univariate granger causality between hash rate and bitcoin economy.Also, one way Granger causality is seen between bitcoin prices hash rate implying change in bitcoin prices does cause a change in hash rate. However, Hash rate does not Granger cause bitcoin price movement.

V. CONCLUSION AND POLICY IMPLICATION

The study has analysed the determinants which are responsible for the surge in bitcoin price. The rise in bitcoin prices has been phenomenal from $0.3 to $19289. There have been tremendous fluctuations in bitcoin price movement owing to the lack of clarity regarding the global acceptance of the currency. The paper has tried to analyse the price formation of bitcoin and the factors influencing. The empirical results confirm that bitcoin supply factor like bitcoin economy has a significant influence on bitcoin price economy. It was also observed that the size of bitcoin economy did cause a change in the number of unique bitcoin address and number of bitcoin transactions per day. However, our findings do not confirm with the previous studies and exhibit that the global macroeconomic, financial and technical indicators do not influence the price movement in bitcoin. Contradicting the studies in past, it was observed that the number of bitcoins mined do not influence the bitcoin price movement. This implies that bitcoins are merely held for speculative purposes rather than gaining popularity as a medium of exchange or being accepted as a global currency.Bitcoin seems to lose heat and public trust as the potential virtual currency, after it experienced sharp decline from $19289 to $11138.98 from December 2017 to January 2018. Further, news about various frauds at the exchanges trading bitcoin has further clouded the future of virtual currencies. The risk of theft or loss of private key to access the bitcoin wallet is another challenge due to which bitcoin has failed to get acceptance as global currency. Therefore, the present study is not in agreement with the previous studies that bitcoin can be accepted as a global currency. Also, the price formation of bitcoin is only determined by number of bitcoins mined and not by other global macroeconomic, financial and technical indicators. Thereby, implying bitcoin is a speculative instrument which is losing its sheen due to rise of other popular investments.

The biggest advantage of bitcoins has been its use as an instrument for remittance at cheaper price. Rise of bitcoins has paved way for blockchain technology which has opened avenues in remittance, property transfer, health record storage, contracts etc.The concept of blockchain has enabled many to transfer money from one country to another at a much cheaper rate. Unlike, remittance via a third party which is usually a bank or a financial intermediary is expensive. Blockchain enables to transfer fast and cheap as it eliminates the middleman and maintain a public decentralised ledger which keeps record of all the transactions that take place.Many companies whose sole purpose is to assist in remittance exploit the common man by charging exorbitant fees to facilitate an ordinary financial transaction.With the advent of blockchain users can transfer funds at a much cheaper fees and fast time. Therefore, even if the bitcoin allure fades after sometime the blockchain technology that has been introduced has a huge potential. If exploited properly, blockchain technology will open new avenues to people by eliminating the costly financial regulations and further strengthening financial inclusion.

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Types of E -Resources and its Utilities in Research -A Study

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Abstract: The paper presents and analyses various aspects of E-Resources which are helpful in teaching and learning especially for research scholars. It also discusses purpose of using e resources, benefits, problems while assessing e resources and perceived impact of e –resources on researcher. As digital technology has made research more easy, speedy and comfortable to apply the stored intellect. When stored information is used through the ages for further research; betterment and overall development of the society, researcher feel proud by adding knowledge to community. Furthermore, Electronic resources are easily accessible in remote areas, helps in solving of storage problems and control the flood of information. The current evolution in Information technology brings major changes in the way of Information communication. It also discusses the purpose of using E-resources and perceived impact on user.

Keywords: - E-Books, E-Resources, E-Newspapers, E-Thesis, E-Services.

I. INTRODUCTION

Research is the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. It is an important activity for the development of scientific and technical knowledge deal with the need of researchers in various disciplines. In certain situations, Information Communication technology developments opened up new avenues to e-resources publishing in a big way. E- resources is distribution of information in any electronic form such as CD- ROM, Floppy Disk or Magnetic tape or across a computer network like e-journals, E-Books, ETD etc. accessible dial-up bulletin board or on-line services. The library and information centre is a part of any educational institution which is the hub of teaching and learning activities where students, teachers and researchers get their required information according to their need. In the traditional libraries researcher have to spend much more time for searching a single piece of information and for that they have to depend on library professionals or library staff, but now in present scenario researcher can save its valuable time with the advent of informational technology.

II. RELATED RESEARCHES

Salma Chowdhury, Ph.D Department of Information Science and Library Management University of Dhaka, Dhaka-1000, Bangladesh abstract, in which he has presented and analyzed the status of electronic resources facilities and services provided by the Dhaka University Library (DUL). It also discusses the purpose of using e-resources, benefits, subject coverage status, overall user satisfactions, problems that are faced by DUL users while accessing e-resources and perceived impact of e-resources on users. Finally, it reports the results from questionnaire-based survey of e-resources use and its impact on DUL users. Ray and Day (1998) on the other hand, conducted their study to determine the level of use of electronic resources and how students feel about various issues surrounding electronic resources. The findings of their study are that 91 per cent of respondents acknowledged access to a networked computer via university, and also that more internet access is from work place than from home. The most popular electronic resources used were CD-ROM and the internet. Only 37.5 per cent of the

sample population used electronic journals as an information tool. Another study by Tenopir (2003), studied the 200 recent research publications that focus on the use of electronic library resources and were published between 1995 and 2003 in the report for the council on library and information resources. The study used a variety of research methods, including observations, surveys, interviews, experiments and transaction log analysis. The findings show that both faculty and students use and like electronic resources and most readily adopt them if the sources are perceived as convenient, relevant, and time saving to their natural work flow while doing their research work. Print medium is still used for some reading and is part of research in almost every discipline.

III. NEED AND PURPOSE OF E RESOURCES

Electronic resources have great potential and bright future to attract users. It combines all the benefits of the multimedia, digital coding and Internet. It enable user to carry everywhere and can be read on all types of computers including handled device. It consists of data (information representing numbers, text, graphics, images, maps, moving images, music, sounds etc.) Programmes (instructions etc.) that process the data for use or combination of data and programmes. Electronic resources often include component with characteristics found in multiple classes of materials. Main purpose of electronic resources is providing current information.

- Up to date information that is necessary for research work.
- Save the time of researcher, user and staff.
- It has easily solved the space problem in library
- Easy to use and disseminate information within no time.
- E- Resources can be read and downloaded instantly.
- It provide facility to hold and turn pages easily
- Physically disabled users can hear audible E-resources.
- Due to portability, these resources can be easily carried away.
- Some E- resources are interactive, musical and animated.
- E- Resources neither require bindery and repair nor misplace text books.
- It helps in saving human resources for shelving and rectification.

IV. STRUCTURE OF E RESOURCES

HTML Format, PDF Format, TIFF, Plucker Format, CHM Form, PostScript Format, Desktop Author Format, Rich Text Format etc.

HTML Format:- HTML is the Hyper Text Markup Language that is used for most web pages. E-books using HTML can be read using a standard browser like Microsoft Internet Explorer etc. It requires no need for special equipment. These files can be saved in ASCII format or in Unicode format.

Portable Document Format:- This is published as a .PDF. Initial to it, a file format created by Adobe Systems, to provide a standard form for storing and editing printed publishable documents. Because documents in .pdf format can easily be seen and printed by users on a variety of computer and platform types, they are very common on the World Wide Web. It is designed for printing on standard paper sizes are hard to view on screens with limited size or resolution. PDF files typically contain product manuals, brochures, magazine articles, or flyers as they can embed fonts, images, and other documents. It also contains one or more page images, each of which can zoom in or out. These files typically contain product manuals, brochures, magazine articles, or flyers as they can embed fonts, images, and other documents.

TIFF:-Tagged Image File Format- is a file format for storing images, including photographs and line art.TIFF format is widely supported by image-manipulation applications, by publishing and page layout applications, by scanning, faxing, word processing, optical character recognition and other applications.

Major electronic journal publishers are following:- JSTOR **,**Blackwell Publishers **,**Springer Verlag & Kluwer, American Chemical society etc.

E-Zine- means electronic magazine and it is also called web- Zine. The articles that are stored are accessed via a computer network. Some examples of e-zine are: www.indiatoday.com, www.musicindia.com etc. E-Thesis and dissertation (ETD),An ETD is an electronic document that explains the intellectual works or research of a researcher,

WWW.unesco.orb/webworldtd/contribution.html, http://scholar.lib.vt.edu/theses, www.more.edu.sg

Electronic News Papers- Like ETD, an electronic newspaper is very popular resource which is a self contained reusable, and refreshable version of a traditional news paper that acquires and holds all information in the news paper electronically.

E-Reference books: Many reference books are also brought out in CD-ROM formats and available which can be purchased online through payment. There are a number of reference sources available freely on-line through Internet. http://www.britannica.com/**,** http://dictionary. cambridge.org/

Examples of E-books-
www.digitalbookindex.com, www.bookbunker.biz www.blackmask.com

CD-ROM- It is a compact disk- read only memory is one of a series of devices. It stores a large amount of structured data, bibliographic information full text information and images etc.

E image- an E image is a system of photography, which uses a sensor placed behind a camera lens to translate an image into an electronic signal which can be stored on a disc player and viewing a television screen.

E Newspaper- It is a newspaper that exists on the World Wide Web and holds the information electronically.

E Paper- It is a portable, reusable storage and display medium that looks like a paper but can be repeatedly written on refreshed by electronic means thousand and million times

E Data Bases: It is an organized collection of particular subject and the information can be researched and retrieved electronically. This is a computerized record keeping system. The important thing is that it allows storing data and getting it or modifying. There are two type of databases –Analytical Databases**,** Operational Databases

V. OTHER BENEFITS

- Huge range of information can be obtained. Like 8billion pages, 2000billion Journals etc.
- Timely up to date information is easily available
- Value added functionality (researching)
- Additional skills development.
- Large value of quality, free information.

Disadvantages:-

- Technical barriers to use-need computer, network connection, software problem etc.
- Infrastructural problems-bandwidth and tele-communication, unreliability, electricity supply etc.
- Skills and training required. Cost can be high in some cases and quality not assured.

VI. CONCLUSION

Research is a continuous activity for finding new and better solutions to a problem in any field. For research work, only thing is required is use amount of data, where e resources can easily help. The range of e resources is considerable and growing in every sphere of modern era. The type, quality and usefulness of resources varies from problem to problem or user to user.There are both free and fee resources. New users should be made aware of the difference , benefits and draw backsof various kinds of resources.

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Corporate Governance in India-A Conceptual Framework

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Abstract:With the notorious failures of big corporate houses followed by financial crisis the focus of the national and international companies has been diverted towards the need of strong Corporate Governance framework to prevent such failures in the future. Corporate Governance is commitment of Business ethics and values towards the stakeholders. It deals with timely and accurate information regarding financial performance of the companies. It is a set of mechanism which acts as a shield for the investors and the potential investors to safeguard their interest. The main pillars of the Corporate Governance are responsibility, fairness, transparency and accountability. Corporate Governance gained importanceall around the globe and the winds of the same blew in India as well. The present paper focuses on framework of corporate governance in India considering history, principles and theories of corporate governance followed in India.

Key words: Corporate Governance, Responsibility, Transparency, Accountability.

I. INTRODUCTION

With more than hat rick failures one after the others like Worldcom, Enron and manymore,theissues of corporate governance heated up. The reason for the close down, shattering and failures of these big short corporate houses was poor governance practices and unethical behavior indulged. Later on the financial crises in East Asia then Russia, brazil(Jan,2014) was slowly touching other parts the of the globeforced corporate governance coming up on the hit list of every organization. It was then the subject of corporate governance came into limelight.

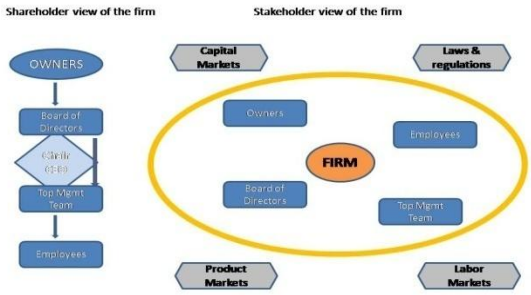
The word corporate governance comprises of two words "Corporate" and "Governance". Corporate means company or organization shared by a group of people together and governance on the other hand means "the way of managing" and together corporate governance works in managing the affairs of a corporate in such a way that the interest of all the stakeholders is protected. As there are number of corporation operating around the globe, need is to develop a law which gives a feeling of fairness and transparency to the stakeholders. The law made, should be such which takes into consideration the benefitand interest of all and reduces the conflict of interest and also watches that right people aredoing right job. So, in short we can say it is philosophy by which an organization is directed and controlled.

Corporate governance against the backdrop of globalization has now become one of the most important issue which is very much required for the survival of organization(Jan,2014).Corporate governance asks for a viable relationship between different parts of a corporation. The system of corporate governance dependsuponfairness transparency and accountability of the management. A good corporate governance system leads to a better reputation of the corporate in the eyes of investors gives good growth and stability to the corporate.

The OECDprinciple of corporate governance states "corporate governance involves a set of relationship between a company's management, its board, its shareholders and other stakeholders. Corporate governance also provides the structure through which the objective of the company are set and means of attaining those objectives and monitoring performance are determined".

Corporate governance cannot just happen of its own there are number of elements who confirm the

compliance of governance .one of the important aspect of corporate governance is the players of governance. Every player of corporate has a role to play. The main and the most important one s are the shareholders, the management and the board of directors"(kaur,2017). At the same time to have an effective system of governance everyone has to play a role. Government and other regulatory authorities should create a good legal environment. The shareholders have to make the board of directorsaccountable. The management should ensure that strategies rules and policies are well executed. Employees at their part should keep their active participation in the working of the company. Auditors being a link between management and owners should give a true and fair financial picture with well verified accounts and books. Creditors should demand for proper financial information, the customers should also be alert to play their part by not dealing with companies which are fraud, non transparent and non customerfriendly(jan,2014)and last but not the least media should keep an eagle and vigilant eye on company s wrong doings. when everyone will directly or indirectly join hands for proper enforcement of corporate governance laws ,results will be in front.



Source: Aguilera and Griffiths (January 2014)

II. HISTORY OF CORPORATE GOVERNANCE IN INDIA

India has worked and launched many corporate governance programs and initiatives since 1990 C11- confederation of Indian industry gave the first voluntary code of corporate governance in 1998. After the CII'scodeof corporate governance the action was by SEBI, now known with the name of clause 49 of the listing agreement. The third one came in 2002 from the Naresh Chandra, committee which handed over its report. The next again was hit by SEBIand the Narayana Murthy committee again came up in 2002, its report was submitted. Taking into consideration the recommendations and suggestions of the Narayana Murthy Committee, SEBI revised the clause 49 of the listing agreement in 2003.Lateronin December 2003 SEBI withdrew the one which was revised in 2003 August and Currently the original one is in force.(Deb,2013)

The CII Code: CII stands for confederation of Indian industry, this CII formed a committee for matters relating to corporate governance and came up with a voluntary code of corporate governance in 1998. The committee believed in a strong conviction that there is a great requirement for good corporate governance in Indian companies to work and perform in global competitive world. It came up with a first draft and then final code of corporate governance with detailed provisions and main focus on listed companies in April 1998.

Desirable Disclosure: All the companies which are listed on the major stock exchange must disclose the information relating to higher and lower monthly averages of the share prices. It is the duty of the stock exchange also to put pressure on the listed companies to adhere to corporate governance rules and submit corporate governance compliance certificate duly signed by CEO or CFO. The disclosure statements isgiven by different credit rating agency.

Kumar Manglam Birla Committee report and Clause 49: In India the first step of corporate governance code was taken by CII and the companies started to adopt it also but then it was felt that in a country like India, there is a need for a compulsory, strict voluntary code which can give more meaning to this corporate governance aspect.So, keeping this in mind the next initiative was taken by SEBI. It was in 1999 Kumar Manglam Birla Committee was formed to promote and enhance the scope of corporate governance in suggestion country and recommendation of Kumar Manglam Birla committee were accepted and amendments were made and came in our hands clause 49 of listing agreements of stock exchange.
The Constitution of Committee: mains constituents of corporate governance are board of directors, shareholders and the Management and these constituents should strongly keepthreethings in mind for a better corporate governance they are accountability, transparency and equitable

treatment for all the stakeholders. **Corporate Governance Objectives:** The objective of the corporate governance is to fulfill the interest of all the stakeholders like stockholders, creditors, suppliers, customers, employees and of course the society. The committee for SEBI particularly keeps in mind the interest of shareholders in corporate governance. It is the duty to increase the value of shareholders but at the same time other stakeholder should also be kept in mind. According to the committee the company should not take corporate governance as a compulsory practice but as a duty and important part of their life.

NareshChnadraCommittee Report: Department of company affairs formed a new Naresh Chandra committee in 2002 August to study in depth the subject of corporate governance and issues related to it. After examining the committees came up with its report at the end of year in December. The main focus of Naresh Chandra committee was on financial disclosure and independent auditing.

NarayanaMurthy Committee report on Corporate Governance: The next milestone in corporate governance came up when Narayana Murthy Committee was formed by SEBI. The committee was headed and chaired by Mr. N.R. Narayana Murthy. The aim of the committee was to work in betterment of corporate governance and to give recommendations for in this. According to the results given by committee major suggestions were given regarding audit committee and reports, related party transaction, code of conduct, management of risk and disclosures of financial nature.

Confederation of Indian industry (CII) taskforces on corporate governance: if so many rules and codes have been formed for corporate governance still we came across a number of scandals and misconducts of the corporation. There have been such so many examples Satyam, Mallya's, Sahara Group etc that have brought so much stock in Indian Economy.

Corporate Governance Voluntary guidelines 2009: The ministry of corporate affairs brought about new corporate governance voluntary guidelines 2009. This set up was brought to improve and exchange the corporate governance practices in concern of board, audit committee,auditors appointment and holding a good whistle blowing policy. (Deb,2013)

Companies amendment act2000:- In the amended companies act in 2000 number of things were added for corporate governance like

- Reporting for statement of director's responsibility.
- Representation in the board of small shareholders by directors.
- Limitations in directorships
- Making of audit committee
- Setting of high value times for wrong doing in various sections.

New clause 49 by SEBI- The listing agreement:- In a meeting on 25th Jan 2000, amendments in the listing agreement was done adding new clause 49 and published it on 21st February 2000. The clause was for corporate governance and included:-

- Appointing right number of executive, non executive directors
- Formation of audit committee
- Remuneration of directors
- Board meetings
- Report of management
- Corporate governance report

Report on corporate governance by advisory group of Reserve Bank of India:- In 1999 a committee was formed with Dr. Y.V.Reddy as chairman. They made an advisory group under headship of Dr. R.H.Patil from national stock exchange. This advisory group made a report on 24th March,2001 having suggestion on corporate governance which can be charged to all companies banks of public sector and public sector enterprises.

Companies (Amendment) Bill (2003):- In 2003, in parliament house there came companies amendment bill which requested big changes in companies act in regard to corporate governance. This bill proposed for changes or medications for around 174. Sections in total but experts, people of industry groups, chamber of commerce, they all opposed the bill and later on it was withdrawn for review by department of companies' affairs.

Revision of clause 49 of listing agreement:- SEBI revised the clause 49 of listing agreements so that nation can have good corporate governance practices SEBI sent a circular to stock exchange

and other concerned to replace the old clause with new revised with immediate effect. This circular came up on 26th Aug, 2003.

Then in 2004 "Concept Paper" on company law came up by ministry of company affairs government of India.

Another expert committees under headship of Dr. J.J.Irani came up to check and suggest on concept paper.

Companies Act 2013:- It was a big day 30th Aug, 2013when companies act 2013 came to the notified giving a new edge to corporate governance. All the sections have not been changed or modified. Here we are throwing light on some important changes that are made an act –

- Concept of one person company
- Changes for cheater documents
- Articles of Association
- Memorandum of associate
- System of holiday meetings
- Directors can attend through video or audio conferencing
- Now AGM to be conducted in 15 months
- Maximum directors on board now increased to 15.
- Compulsorily independent director on the board.
- Woman directors at least one to focus on gender equality
- Auditors to surely report on internal financial system.

Principles of Corporate Governance

Principles help the government in better implementation and compliance of any law and to bring up more economic stability to the nation. The different principles of corporate governance help in giving better security and protection to the stakeholder. The different aspects which are a part of these principles are:-

Principle of ensuring effective corporate governance framework:-This principles focuses on the role of corporate governance in highlighting fairness, transparency and proper allocation of resources also it pressurizes on quality of supervision and implementation.

Principle of Rights and Equitable treatment of shareholders: Shareholders have certain rights and these principles states that the rights of shareholders should be fulfilled so as to protect their interest.

Principle of Interest of other stakeholders:- Stakeholders means any person who is associated with the corporation and has any kind of interest in the organization.Thecompany should make sure that not only the shareholders,It should also regard and take care of all stakeholders.

Principle of Role and responsibility of board:- The board of directors of any corporate house must be well skilled and qualified to do the justice to all the stakeholders as well as making sure that they are adhering to the required norms and commitments to discharge their duties.

Principle of Disclosure and transparency:- Disclosure and transparency are the two vital pillars of the law of corporate governance. It is duty of the board and the management to disclose the material information to all the stakeholders. The information disclosed must be timely and transparent.

Principle of Integrity and ethical behavior:- Integrity is one important aspect which must be ensured in making all the decisions. There must be a developed code of conduct for board and management for sowing the seeds of ethical and managed decision making.

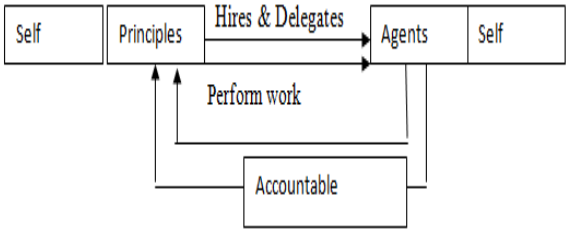
III. THEORIES OF CORPORATE GOVERNANCE

With passageof time we have come across number of theories or models coming up for corporate governance. The reason for the same is because of extreme and dirty competitions,corporationsindulge in wrong doing to be a step ahead. With globalizations situation has become tough there is decrease of government control.So, the need of corporate governance has increased many folds in the present global scenario. There are many theories for corporate governance which explains the relationship among different stakeholders of the organization.

- Agency theory
- Stewardship theory
- Resource development theory

- Stakeholder theory
- Transaction cost theory
- Political theory

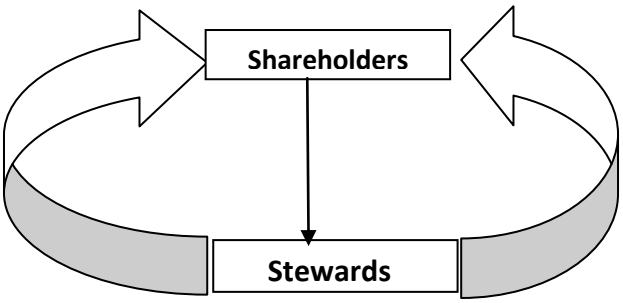
Agency Theory: -Agency theory started with its connection in economic theory by Alchain and Demsets(1972). The further improvements in the same were by Jensen and Meckling (1976).In this theory, shareholders are the principals and the directors as the agents. These agents are hired by the principals and are delegated work to perform. so, it is based on two aspects (Daily et al2003). Firstly, the work of the company is revolving in the hands of two players shareholders and managers and on the other hand, it discusses that there can be self interest of employees and agents and it is not sure they will work with same interest as expected(padilla,2000).Agency theory mainly explains the separation of ownership and control. Agency theory makes agents ,managers and employees responsible for the work given to them(Abdulla and valentine 2009) but agents can be money minded, opportunistic and selfish.



Sources: Abdulla and valentine.(2009)

Stewardship theory:-In stewardship theory .stewards are the people who do all the work for the shareholder in such a way to protect the interest of shareholders and maximize their profits. The extent of their motivation and satisfaction lies in the facts that how well are they able to protect the interest of the shareholders and maximizetheir wealth & profits(Donaldson and Davis 1991).

They are generally the employee and executives of company having pressure to increase the wealth of the shareholders. lth of shareholders. According to this theory a steward gives a shield of protection and tries to maximizes the profits of shareholder through his work.stewards are the people who relieves the tension of number of interest groups(yusoff,alhaji,2012).



Sources: Abdulla and valentine(2009)

Stakeholder theory:-This theory is the theory for the stakeholders-stakeholders are the people who are linked to or have any sort of interest in our company. It came up in 1970's and was developed by freeman (1984) putting in company's accountability to a large number of stakeholders It is the duty of the board of directors and the management to protect the interest of all the stakeholders whether internal or external and on the other hand to make sure that there arise no conflict, problems or rifts between any stakeholders and if arise, the management should make sure to solve the same at earliest. In the stakeholder theory the manager has to take care of a group of people or stakeholders at the same time as compared to agency theory where only shareholders are to be taken care of.(Abdulla and valentine,2009) ..clarkson(1995) advised that in an organization there are so many stakeholders who are working together .the aim should be to maximize the wealth of all the stakeholders

Resource depending theory: Resource dependency theory explains the role of board of directors in making available and protecting of essential resources to an organization. The timely availability of the resources to an organization helps in better performance and survival of the organization(Daily et al,2003) . The resources which the directors can bring to organization are, information, talent, skills, connections, with supplies, customer's, law values.(Hillman.et.al,2000) discussed that the role of providing resources by directors can be performed effectively through his further connections and links in external environment. There are four categories of directors insiders,experts,support specialist and community influential(Abdullah and valentine,2009).insiders-

present and current directors. Business experts can be present, former or people in some other sister concerns giving business advises. Support specialists are the people who provide support like bankers, insurance companies , legal advisors , media spokespersonetc.last but not the least community influential are leaders, political people, authorities, leaders of social groups.

Transaction cost theory: Transaction cost theory say that an organization consists of people with different point of views and objectives . the firms are so large these days that they have to findout new substitutes for allocation of resource(Abdullah and valentine,2009). it has to go through number of deals and transactions within the company and also outside the company. The company compares that whether the cost of contract outside is less than within. If it is so it is accepted or it is done outside.

Political theory: Political theory helps usto teach the politics of such a way to earn the voting support of the shareholders rather than begging or purchasing votes.. It focus on corporate power and other things which can influence the corporate governance mechanism of the company. from last many years now the government of the country is also trying to put political pressure on firms.

IV. CONCLUSION

Corporate governance is the issue which is required in eachand every sector of the economy but is vital and compulsory for the corporate houses where people put in their trust in the form of their investments. While going through the conceptual framework it was realized that Corporate Governance is a subject matter which is fundamentally cannot be apprehended quantitatively. It is not sufficient to make the norms mandatory for the companies but it is necessary that how companies actually take it. Either they take it as a check-box or observe it in their spirit. It is all about the discipline followed by the management to become more transparent for the investors and the potential stakeholders. The code of conduct of the Corporate Governance has been prepared by analyzing all the governance standards around the globe. But there are many loopholes which still need to be focused. It has begun as a voluntary effort but very soon it acquired the mandatory status by adopting clause 49. In this sense this approach has accomplished full circle of oscillation between the voluntary and the mandatory style. Still there is a need of vigorous research in the area of corporate governance to make next generation reforms effective for the coming generations.

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The Impact of Information Technology Innovations in Hospitality Industry

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Abstract: Hospitality industry is one of the most significant and fastest growing industries in the world, and is a major contributor for the economy of a country. Today's world, every industry regardless of its differences is going through a technological driven transformation and hospitality industry had the maximum impact of those changes. Online booking, customer's relationship management, social media, internets, smart phones are transforming the industry thereby enabling a new level of customer service. For the last 20 years, the IT sector had undergo tremendous changes which in turn changes the hospitality industry with innovative technologies which set a benchmark and breakthrough for the future advancement in the industry for many years to come. Despite of a number of changes that are being brought on by these development of technology and innovations, they are there not to replace but to enhance the core services of the hospitality business. The main framework for studying the impact of information technologies and innovations in hospitality is to define on the ground the level of guest satisfactions and development of services and infrastructure. Top quality guest services are the pillar of the industry, the new technologies and innovations makes it easier to deliver satisfactions and memorable experience to the guest.

Keywords: Information technology, innovations, hospitality, guest service.

I. INTRODUCTION

The hospitality industry is often said to be sector which run with a system of innovation and production. Technology played a very crucial role in attaining economic development. The measures taken to improve hotel services and increase in quality and efficiency, reaching customers satisfaction depends on variety of technology and innovations. He ever ending progress of IT (Information Technology) and innovations has had a great impact in hospitality industry. Use of internet and its related technology gained a lot of importance and it became the driving force to work effectively and efficiently. The wide possibilities of the internet increase the comprehensiveness of distribution and make information personalized. The world hospitality Industry was revolutionized due to advancements in innovations and IT. Number of critical problems in hospitality were solved as a result of IT revolution, it is true that for the success of a business to some extent, depends on the capacity and ability in utilizing newly invented technology in managing organization and has a great influence in competition between companies, decision makings, investments etc. The journey of advancement in hospitality has not been smooth, but it makes it clear that development of IT and innovation is the existing competitive critical weapon in all the industry especially in hospitality industry.Information technology gives the birth to the new innovations whether is it the hotel, tourism or travel sector of hospitality industry. Hospitality is a relation between the guest and the host & the main motive of the host is to satisfy the guest, it creates the bonding & make tie between the guest & the host. With the new innovations like reducing paper work from manual work creates professionalism & grow a kind of zeal towards your work. Innovation & experiments reduces the work load always from the prior condition as we can judge from our past decades that manual work increases the work load only although after introduction of information technology the industry becomes boost immediately & makes it very vast. Technology always reduces the barrier which helps to guest in any form to satisfy him/her as we can say implementation of new systems like PMS, CRS, GDS, accounting systems, HR policies, Yield Management systems, Telecommunications. Example: Cyber Security a department of any

organization in Hospitality Industry helps to protect from any type of threat & Malware which could be hack some important information.With the effect of Information technology hospitality industry creates many employment opportunities for deserving candidates. It is the only industry who always welcomes to everyone, always creates & gives the birth to opportunities. Innovation means to increase the level of our-self, to increase your motivation level & zeal power with the help of other information sources.

Information technology was first used in hospitality industry in 1950s, when multinational hotel chains began experimenting with the development field of computer science, moreover, the expense and technicality involved in both developing and running systems made use of computerization economical only for the largest companies. (O'Connor, 1999).

Objectives

- To identify the areas Information Technology innovations effect in hospitality industry.
- To evaluate the level of guest satisfaction gained bydevelopment of information technology innovations.

II. LITERATURE REVIEW

- Woo Gon Kim and Sunny Ham (2006) thinks that IT applications helps greatly in luxury hotel lodging operations; front office applications; back office applications; restaurant and banquet management system; guest-service interface applications.

- O Connor Peter and Murphy Jamie (2011)collectively term that internet's effect hotel industry in the field of pricing; distributions and customer interactions and has a great impact on the hotel industry overall.

- Law Rob, BuharisDimitrios and CobanogheCihan (2014) believes that rapid changes in technological and innovational improvement provides a better and more convenient tools by which customer can purchase hospitality products and services easily and get satisfied.

- VelinaKazandzhieva, Galina Illieva, Hristina and Filipova (2017) collectively conclude that impact of technological innovations in hospitality industry specially in the field of service is depend greatly around guest cycle. Replacing and enhancing the services offered by hospitality industry.

- TetianaHryhorieva and TetyanaPrymak (2018)thinks that enterprises tries to surpass each other, thus, creating ongoing competition, which leads to emergence of various high-tech innovations which effect satisfaction of the needs of customers. In other way, attracting more and more through this the enterprises win the competition.

III. METHODOLOGY

For conducting the study secondary data from various case studies, journals and several websites are used to observe the changes made by information technology and innovations in hospitality industry. The study also based on library research.

IV. FINDINGS

The findings drawn as result of self-interpretation and understanding are:

The areas affected by Internet Technology innovations in hospitality industry:

1. Reservation

Booking room online allow customers to easily get the services that they want at a short period of time, the system used in reservation of hotel rooms not only allow the customers to book the room but also allows them to compare the price amongst many hotels. Reservation makes it easy for everyone involving in the process from both the sellers and the buyers end. Through reservation system a customer can also check out various amenities and services that will suit their desire. Many, like Cloudbeds, EzeeFrontdesk, Frontdest Anywhere, Hotelogix, PMS, Maestro PMS, OPERA, PDRWin etc. are available for the hotels to record and allow online booking of their products and services. From the point of customer, online reservation provider like Expedia, Make my Trip and Orbitz are available through online interfaces.

2. Reputation-online

For most of the customers, information they gather from various online site makes them decide in purchasing the product and services provided by hospitality industry. After having a thorough research on the ratings and availability of amenities and services usually the customer end up buying the product therefore it is very important to maintain good image and reputation all around. Even though hospitality industry is physical in nature, the image and reputation is digital, and being in the field of this industry one must know how to protect it.

3. Guest experience

Technology influenced the way we live, work, socialize and travel in a significant ways and it will continue to do so in the future. The experience that we have gained makes us satisfied as a customer or guest. The experience of guest in hospitality industry also influences greatly by information technology and innovations and will continue to do so in the future. There is no doubt that information technology has a huge impact in shaping the hotel industry, impacted areas in hotels such as automatic check-in and check-out, keyless entry, robotic trend, online booking, on arrival etc. increases the level of guest experience.

4. Organization

Computers become important part of our life and many industries ever since the introduction of computers adopted this never ending innovational technology, the information technology development and improvement brought considerable amount of benefits to the industry. Data generated by the hotels can be stored easily in a minimal time with the help of high-speed hardware and software. Software used in hospitality industry such as Cloudbeds, Opera etc. allows hotel specialized programs dedicated only to management of the business and organizing overall data, work and employee's management. In short, innovation in technology allows the hotel industry to run effectively and efficiently.

5. Coordination

Improvement in information technology has greatly widened the way a hotel communicates with customers and also other business partner or sponsors. Today's world high-speed internet connection allow video calls, voicemail, email, text messages (whatsapp), teleconferencing around the world with considerable less amount of time and less expenses compared to traditional method of long distance calls and telephony which took a long time to convey or delivered. Data can be transfer instantly within various departments of a hotel, partners and customers allowing booking and coordination among various departments of a hotel reducing waiting time and lost in productivity.

The level of guest satisfaction gained by development of information technology innovations.

Guest satisfaction is the main objective of hotel industry. Satisfaction refers to a post-purchase evaluation of a product quality given pre-purchase expectation (Kotler, Bowen&Maken, 2003). Guest satisfaction has direct impact on customer loyalty therefore, it plays vital role in hospitality industry. We often wonder how to satisfy our guest in today's IT world, many hotels started research program on this topic as well. There are many ways in which customers can be satisfied back in olden days but with the inventions of technology specifically in the field of information customers are all aware of the products and services the hotel had to offer them through the usage of this technology, another aspect in terms of guest satisfaction is that, there are numbers of hotels competing in the market who strive towards satisfying guest in the most modern way. The use of technology in hospitality dated back to 1970s and has been rapidly evolving ever since. There are number of ways implemented by hotels in order to satisfy their guest with providing newest adapted information technology. The level of satisfaction gained through information technology greatly rely on innovation in technological amenities, such as: voice over IP, In-voice pay-per-view (PPV), Voicemail/messages, High speed internet access (HSIA), In-room control panel, Universal battery charger, In-room Game system, In-room Fitness room, In-room Video checkout etc. Guest satisfaction could be met easily by hotels if they provide up-to-date technological amenities and facilities.

V. CONCLUSION

One of the main purposes of this study was to find out the impact of information technology innovation in hospitality industry. The

findings/results indicate that in fact information technology had huge impact on various areas in hotels and it increases the level of guest satisfaction by continuously developing information technology used as amenities and services provided in a hotel.

Gathering the latest development in technology allows continuous communication and improves guest experience from booking hotel room (reservation online) to checking out from hotel. It is always important to note that not all development in hospitality industry in various areas and level of guest satisfaction are not driven solely by information technology innovations, when there is a positive impact it will also have a negative impact. From this study we can understand that information technology hand a great impact on overall management of hotel and creating relationship within and outside the industry, most importantly achieving guest satisfaction.

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Mercosur and India- A Literature Review

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Abstract- MERCOSUR, also known as common market of the south is an economic and political integration between the South American countries. MERCOSUR being the largest regional bloc in Latin America tends to bring progressive movements in the trade and tariff policies brings coordination in macroeconomics and sectorial policies and leads to harmonization of domestic legislations. But it too have to face various down falls and crises, may it be Argentina – Brazil trade war or suspension of Paraguay and Venezuela or geographical and economic disagreements in international trade flows. Thus, in this research paper we intended to study the previous literatures of the researchers to have the in depth insight of various phases faced by MERCOSUR.

Keywords: MERCOSUR, harmonization, geographical, Paraguay

I. INTRODUCTION

In 1991, the "Treaty of Asucion" was signed between Argentina, Brazil, Paraguay and Uruguay to create "Mercado Comun del Sur" also known as the Common Market of the South, is a trade bloc agreement that exists between the following South American countries:. This trade bloc was established under the Treaty of Asuncion on 26 March 1991; it was then expanded under the 1994 Treaty of OuroPreto, which set up a formal customs union. The main objective of Mercosur is to bring about the free movement of goods, capital, services, and people among its member states; to adopt common tariff and trade policy; coordinating macro-economic and sectoral policies. The official languages of the trade bloc are Portuguese and Spanish. In addition to the four founding members of Mercosur and Venezuela, there are seven countries with associate member status- Bolivia, Chile, Colombia, Eduador, Guyana, Peru and Suriname and two Observer countries- New Zealand and Mexico. As associate members, they are able to join free-trade agreements but do not receive the benefits of the customs union. Mercosur, the "Common Market of the South," is an economic and political agreement among Argentina, Brazil, Paraguay (which is currently suspended), and Uruguay to promote the free movement of goods, services and people among member states. Mercosur's primary interest has been eliminating obstacles to regional trade, such as high tariffs and income inequalities. In July 2012, Venezuela was admitted to the trade bloc as its fifth full member with complete access to the common market and voting rights, a move that some analysts say will primarily benefit Argentina and Brazil and further politicize the organization. The creation of a regional customs union in 2008, the Union of South American Nations (UNASUR), alsohas raised questions about Mercosur's utility. Moreover, Paraguay's 2012 suspension from the bloc has added fresh concerns about the bloc's future.

The Treaty of Asunción, usually referred as the "Treaty Framework," provided the underlying elements for the creation of the Common Market. The implications of such agreement were the following:

- Free movement of goods, services, and factors of production, by means of the elimination of customs duties and non-tariff restrictions.
- The establishment of a Common External Tariff (CET) and the undertaking of a common trade policy, as well as coordination of positions in economic, trade, regional and international forums.
- The coordination of macroeconomic policies among member countries in the areas of: foreign trade, agriculture, industry, fiscal and monetary issues, foreign exchange and capital, services, customs, transport and communications.

- The commitment to harmonize legislation on the relevant matters in order to strengthen the integration process.

II. MERCOSUR AND INDIA

The Preferential Trade Agreement signed between India and MERCOSUR (trade bloc of Argentina, Brazil, Paraguay and Uruguay in South America) came into force from 1st June 2009. The Preferential Trade Agreement is the first step towards the creation of a Free Trade Area between MERCOSUR and India.

On January 25, 2004, India and the Mercosur countries signed a PTA 'as a first step towards the creation of a Free Trade Area' (Art. 2). The Agreement grants preferential market access for certain product categories and contains provisions on trade measures such as trade remedies and technical barriers to trade (TBTs), generally referring them to the relevant WTO agreements. The parties also agreed to create a Joint Administration Committee that would, amongst others, evaluate the process of trade liberalization established, study the development of trade between the Parties and recommend further steps to create an FTA. The India-Mercosur PTA consists of five annexes. The substance of the annexes is yet to be negotiated on the date of signing and the Agreement would not come into force before these negotiations were concluded. Six rounds of negotiations later and the two parties signed the annexes on March 19, 2005, thus paving the way for the PTA to become operational upon ratification. The first two annexes are the offer lists of product categories subject to tariff concessions of Mercosur and India, respectively. Mercosur list contains 452 products, while that of India has 450 commodities. Annex 3 refers to rules of origin, Annex 4 is on safeguard measures and Annex 5 contains the dispute settlement procedure.

III. LITERATURE REVIEW

Manzetti (1994) described about the Political Economy of Mercosur nations. He stated that Strengthening MERCOSUR may require the delegation of some national power to supranational institutions. Absent this development, it is unlikely that the problems (particularly those related to relative gains) now dividing the MERCOSUR MANZEITI: THE POLITICAL ECONOMY OF MERCOSUR countries can be resolved satisfactorily and integration allowed to advance at a steady pace. It has been suggested that MERCOSUR become a customs union, rather than a common market it may opt for a type of integration along the lines of a free trade agreement (FTA). MERCOSUR's key to success, as either common market or FTA, will depend on the ability of its respective national governments to deal effectively with the problem of relative gains, whenever and however it arises.

Neto (1998)stated that the development of Mercosur has created conducive environment to increasing involvement to Brazilian companies in overseas market. The paper stated that The Brazilian experience among economic integration, foregn direct investment flow and form strategies in Mercosour. Mercosur yielding increase dramatically in FDI and trade among member nations of Mercosur with the implementation of liberalization strategies and low inflation rate making this region develop and grow as never before.

Lecuona (1999)empahisedthat the globalization of worldwide problems of population growth, food scarcity, resource depletion, technology, economic development, and wealth distribution has forced LatinAmerica and the United States to transcend borders to achieve economic growth without jeopardizing the economies and environment of future generations. Cultural, political, economic, and social differences between NAFTA andMERCOSUR abound. These newly integrated markets areanalyzed in terms ofglobalization and theirprobabilities of success.

Silva and Rocha (2000) stated a study on Perception of export barriers to MERCOSUR by Brazilian firms situated in Rio de Janerio .The Study revealed that the major barriers observed by the Brazilian firms were external i.e. psychological factors, corruption, political, economic constraints and lack of competitiveness in the market. The big challenge and main opportunity for Brazilian firms was to export to MERCOSUR nations.

Thomas (2000) revealed in a study based on The European Union and MERCOSUR: Prospects for a Free Trade Agreement.the study stated that the increase in trade flows was modest both in absolute terms and as a percentage of GDP. The PTA between the EU and MERCOSURis not expected, ceteris paribus, to make much of a difference in the

volume of trade expressed as a proportion of total imports. Exports are almost certain to grow rapidly in the next few years, but imports were constrained by the need to reduce current account deficits as a proportion of GDP.

Carranza (2003) stated a study on survival of Mercosur as Domestic and international constraints. Study concluded that mercosur survival depends on outcomes of domestic political struggle in Brazil and Argentina on the harmonization of exchange rate policies between both countries. The trade ward between Argentina and Brazil provoked by the successive devaluation of Currency in 2001 By Argentina economic crisis. Mercosur had to address the democratic while building supranational institutions and effective dispute settlement.

Mecham (2003) observed a study on failing development project of Mercosur member nations.

Mercosur was established in 1991 partly to accelerate 'economic development with social justice'. Mercosur achieved initial success in stimulating intraregional trade growth, but in other areas of development it has proved less successful. There were various political constraints, Structural constraints, Institutional constraints; judicial constraints might have hindered the scope of the Mercosur project.

Pang (2003) conducted study on AFTA and MERCOSUR at Crossroads: Security, Managed, Trade and Globalization. This study stated that in global economy the free trade agreements signed between AFTA and MERCOSUR had inherent difficulties in growth and expansion. AFTA and MERCOSUR should blend the two systems ie the Neo-mercantilism and Neoliberalism to satisfy the political domestic needs and emphasized on economic growth of the two trading blocs.

Hochstetler (2003) explored a study on the role of environmental concerns in free trade areas made up entirely of developing countries. The main focus of study was on the environmental components of the agreement are weak, and have even been downgraded in recent years. Even so, national environmental protections have increased during the years of the Mercosur agreement, and some regional actors are poised to join their northern counterparts in opposition to any potential free trade area of the Americas that does not include environmental provisions.

Carranza (2004) stated in a study on Mercosur and the End Game of the FTAA Negotiations: Challenges and Prospects after the Argentine Crisis. He stated that the negotiations to create a Free Trade Area of the Americas (FTAA) by January 2005 are at a crossroads. Although goals and deadlines have been met, the hard bargaining to reduce trade barriers among the 34 participating countries has just begun. Mercosur is slowly emerging from the crises provoked by the Brazilian devaluation of 1999 and the implosion of the Argentine economy in December 2001.

Zazoso and Lehman (2004) acknowledged a study on Economic and Geographical distances explaining Mercosur sectorial exports to EU. The study revealed that different sectors had different sensitivity to distance and highlight the importance of using the disaggregated data while using international trade flow among Mercosur and EU. The effect of Economic distance among selected industries was negatively correlated with the trade flow. The abundance of cheap labor, land and natural resources leads to inter industry trade among member nations of Mercosur but not benefit for overall economic development for these nations.

Blyde (2006) examined a study on Convergence Dynamics in Mercosur. The study indicated that the income disparities across Mercosur countries and regions have indeed increased during the 1990s. A preliminary analysis regarding the impact of the creation of Mercosur, however, shows that the integration process might not be at the origin of this trend. In Europe, income disparities among EU countries have been declining but income disparities across regions within countries have been increasing. This latter trend has been observed in spite of the EU convergence policy and has been considered to be compatible with recent theories of location. This raises a point of consideration for Mercosur: regional income disparities in Mercosur are much larger than in the EU and the amount of potentially available resources to deal with cohesion objectives are much lower.

Viswanathan (2006) surveyed the Brazil's External policy and stated that The Brazilian government's record in the realm of international relations has been remarkable, whether that of leading the south American countries in withstanding pressures from the US to sign into the

Free Trade Area of the Americas, or requiring reciprocal fingerprinting and photographing for US citizens entering Brazil and imposing penalties on those brazen visitors who tried to challenge it.

Mera (2008) described that 'New Regionalism' (NR) approaches have emphasized the qualitative differences between the more recent wave of regionalism and regional integration attempts in the post-World War II period. This article assesses the extent to which these claims to newness are empirically justified in the specific case of MERCOSUR, the largest regional trade bloc in Latin America. It argues that, consistent with NR perspectives, regionalism in South America since the 1990s has been part of a broader process of national and global economic transformation, which has influenced the character of the process of integration itself. Yet, a careful examination of MERCOSUR suggests that the extent of its newness should not be overstated. MERCOSUR remains a state-led, primarily commercial initiative, andits evolution and sustainability have been fundamentally linked to strategic factors and power configurations at the regional and hemispheric levels. Based on these empirical findings, the article challenges the usefulness of the analytical andtheoretical separation between NR and mainstream international relationsapproaches and illustrates the ways in which their insights can be combined andcomplemented in the explanation of contemporary regionalism.

Meera (2008) pointed a study on 'New Regionalism' approach to America's with respect to Mercosur. The study stated that wave of regionalism and regional integration attempts in the period after World War II and extent to which these claims to newness were empirically justified in the specific case of MERCOSUR, the largest regional trade bloc in Latin America. The consistent with NR perspectives, regionalism in South America since the 1990s has been part of a broader process of national and global economic transformation, which has influenced the character of the process of integration itself. The study examined that the extent of its newness should not be overstated. MERCOSUR rely on formal intergovernmental bodies, which have worked to deepen the centrality of the state in the process of cooperation. Despite attempts to widen the agenda of integration to incorporate social, environmental and human rights issues, MERCOSUR is still primarily a commercial and politicostrategic initiative. Regionalism in the Southern Cone continues to be fundamentally shaped by geopolitical factors and by the distribution of inter-state power at the regional and hemispheric levels.

Morosini (2010) examined a study on The MERCOSUR Trade and Environment Linkage Debate: The Disputes over Trade in Retreaded Tires. The study revealed that objective of economic growth for Mercosur member nations achieved with competing goals, including the preservation of the environment and trade restrictive measures in Mercosur are permitted to protect the life and health of persons, animals and plants. For the process of trade liberalization MERCOSUR promoted sustainable development and the preservation of the environment to formulate policies that guarantee the integrity of the environment without decrease in trade among member nations.

Grigoli(2011) focused a study on The Impact of Trade Integration on Business Cycle Synchronization for Mercosur Countries. The study concluded that to evaluate empirically the impact of reduced trade barriers and increased trade on the synchronization of business cycles and reduction of the trade barriers may bring about more correlated business cycles because of common demand shocks or intra-industry trade. On the other hand, trade integration could generate an increased industrial specialization by country because of inter industry trade with the associated risk of industry specific shock, and thus more a synchronized output fluctuations. This research aims to test this hypothesis for Mercosur countries. Members of Mercosur increase their trade openness, but regional trade decreases, implying a reorientation of the trade activities to countries other than the Mercosur ones. Both business cycles movements and trade integration indexes seem to be sensitive to the DE trending and the normalization technique respectively.

Bustos (2011) demonstrated a study on Evidence on the Impact of MERCOSUR on Argentinian Firms focused on Trade Liberalization, Exports, and Technology Upgradation. The study stated that the increase in revenues produced by trade integration can motivate exporters to upgrade technology. It also mentioned that reductions in Brazilian tariffs increase investment in technology. It was also suggested that expanded export

opportunities can have a positive effect to performance of the firm. As falling trading partner's tariffs induce firms to take actions that can increase their productivity, it also suggested that the cross-sectional differences between exporters and non-exporters are partly induced by participation in export market along with selection of them productive firms in to the export market.

Caceres (2011) studied the Economic Integration and Unemployment factors affecting in Mercosur. In the study it was discovered that strong cross border effects between countries such that national unemployment rates drop in response to shocks of economic growth and devaluation in other member countries leading to framing of design of regional stabilization policies. The convenience of moving away from the traditional approach to economic integration, which is based on trade creation and diversion effects associated with tariff reductions, and formulate a framework whereby integration is a means to combat poverty and unemployment. In that way, countries member of an integration program should adopt an area wide employment generation and poverty reduction policy, so as to exact all the important benefits residing in the integration program. By making poverty the ultimate focus of economic policy in the context of economic integration, much can be gain in terms of employment and poverty reduction.

Arya (2013) stated in a study on MERCOSUR Common Market of the South based on its Origins, Organizational Structure, Latest Developments andthe Contemporary Trade Patterns. Mercosur and India are regions conscious of social inclusion alongside their development agendas. Substantial scope exists for Mercosur and India to explore complementarities and benefit from increased bilateral trade. Mercosur stands tobenefit from India's world class capabilities in software and pharmaceutical industries and export of agricultural products like soybean and corn. On the other hand, India can secure its oil and other natural resource needs by partnering with Mercosur countries. However, there have been hurdles in the bilateral trade relationship like protectionist measures implemented by Argentina for certain goods from India.

Gouvea et.al (2014) described Export Portfolio Assessment of Regional Free Trade Agreements from a Mercosur and Pacific Alliance Perspective. The results indicate that the export portfolio of the Pacific Alliance dominates that of Mercosur from a risk-return perspective. When we compare these two regional FTAs' portfolios to an Asian export portfolio, the performance of the export portfolios of the Latin American RFTAs is dominated by that of the Asian export portfolio. In a larger context, the continual attention paid to these Latin American RFTAs is a reflection of the slow and uneven development of global trade negotiation.

IV. CONCLUSION

Thus, from the above research it is clear that MERCOSUR helps in promoting sustainable development, economic integration, export promotion opportunities and preservation of the environment to formulate policies that guarantee integrity of environment. It helps in promoting international trade opportunities for the member as well as for non- member countries for the overall economic growth.

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Comparative Study for 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.

A) 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. Furthermore apart from the tariff barriers, it was predictable that the trade facilitation procedures would considerably 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 Indicatorsof BIMSTEC economies

Parameter/ Country	Year	India	Bangladesh	Bhutan	Myanmar	Nepal	Sri Lanka	Thailand
Land area (000sq km)	2015	2973190	130170	38117	653080	143350	62710	510890
Population (Thousand)	1997	202853.9	123574.11	520.92	45895.99	22395.25	18323	60544.94
	2015	257563.8	160995.64	774.83	53897.15	28513.7	20966	67959.36
% Share of above 65 pop to total pop.	2015	6	5	5	5	6	9	10
% 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	83.2	92.04	96.33	89.95	98.77	98.64
Compound Growth Rate of GDP in Current Prices (in %)	1997	4	4.5	5.4	5.7	5	6.4	-2.8
	2015	7.6	6.6	3.3	7	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	402.89	667.84	155.89	244.087	882.95	2475.1
	2015	1688.38	1265.71	2836.8	1268.68	751.12	3767.58	5426.3

Source: World development Report (2015), International Monetary Fund, World Economic Outlook (2015), UNESCO, UNDP

Table 1 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 nationsof BIMSTEC (in per cent)

Year	India	Bangladesh	Bhutan	Myanmar	Nepal	Sri Lanka	Thailand
1997	25.88	25.78	31.2	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	19.9	9.02
2001	23	24.1	26.13	57.07	37.2	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	17.5	43.28	36.53	12.81	12.39
2011	17.22	18.29	15.94	42.94	31.75	12.09	12.36
2012	17.5	17.11	17	42.23	36.53	11	12.31
2013	18.21	16.3	17.1	43.72	36.1	10.81	12.02
2014	17.37	16.97	17.09	37.19	35.91	9.67	11.89
2015	17.4	16.11	17.72	33.7	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.

Table 3: Share of Industry 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	32.9	9.85	22.49	27.54	39.63
1999	25.37	25.15	35.64	8.99	21.8	27.28	40.93
2000	26.11	25.28	35.99	9.69	22.13	27.28	41.99
2001	25.17	25.94	37.9	10.58	17.79	26.8	42.14
2002	26.23	26.41	38.6	13	18.09	28.01	42.43
2003	26.04	26.26	39.36	14.25	18.14	28.42	43.63
2004	27.92	26.6	37.74	16.2	17.85	28.61	43.39
2005	28.13	27.22	37.28	18.2	17.69	30.18	43.96
2006	28.84	27.9	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	26.4	28.2	43.91	20.67	15.33	29.9	41.15
2012	26.2	26.71	44.3	19.56	15.51	31.5	43.61
2013	27.81	27.62	44.6	20.21	15.7	32.51	42.51
2014	28.31	26.54	42.11	21.34	15.54	31.21	40.54
2015	30	27.66	42.29	22.59	15.69	30.65	36.91

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 has increased 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.

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.

Table 4: Share of Service sector in GDP of BIMSTEC countries (in per cent)

Year	India	Bangladesh	Bhutan	Myanmar	Nepal	Sri Lanka	Thailand
1997	47.7	49.07	35.01	30.9	35.7	51.23	50.39
1998	48.47	48.73	37.57	31.09	37.6	51.35	49.59
1999	49.98	48.67	37.08	31.09	36.9	52.05	49.68
2000	50.76	49.2	36.62	33.07	37.05	52.82	48.99
2001	51.83	42.96	35.96	32.35	45.01	53.14	48.72
2002	53.02	50.86	35.06	32.46	43.82	57.71	48.13
2003	53.18	51.98	35.45	35.12	44.78	58.34	45.96
2004	53.05	52.36	37.33	35.44	45.47	58.84	46.3
2005	53.06	52.63	39.53	35.88	46.44	57.99	45.77
2006	52.87	52.48	38.88	36.68	48.67	58.02	44.88
2007	52.71	52.38	35.39	36.86	49.83	58.4	44.59
2008	53.93	52.48	36.54	37.87	50.45	57.25	44.39
2009	54.72	52.61	38.08	37.56	50.57	57.64	45.2
2010	55.14	52.96	37.94	38.87	47.84	57.76	42.96
2011	56.37	53.51	40.15	39.95	52.92	58	46.48
2012	56.3	56.2	38.8	40.03	48	57.5	44.21
2013	57	56.12	38.3	40.83	49.2	56.8	45.5
2014	52.59	56.28	39.37	42.51	50.68	60.79	52.73
2015	51.38	56.34	40.86	42.11	51.55	60.61	52.9

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, others member nation shown the increase in percentage share of service sector in 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, Thailand, Nepal and India.

II. 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, owing to its contribution to industrialization and foreign exchange 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-

$$t = \frac{\bar{x}_d - \mu_o}{\frac{s_d}{\sqrt{n}}}$$

H_1 : There is no significant difference in the export performance during pre and post formation of BIMSTEC bloc.

H_2 : There is no significant difference in the import performance during pre and post formation of BIMSTEC bloc.

H_3 : 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

growth from 1980 to 2015 at 95er cent confidence level.

Table 5 : T-statistics for pre and post performance of BIMSTEC trade

One-Sample Test								One-Sample Statistics		
		Test Value = 0								
		t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper	Mean	Std. Deviation	Std. Error Mean
Exports	Phase-I (1980-1997)	1.81	6	0.119	14.28	-4.94	33.51	14.28	20.78	7.86
	Phase-II (1998-2015)	1.78	6	0.125	14.48	-5.4	34.37	14.48	21.5	8.13
	Phase-III (1980-2015)	1.8	6	0.122	14.38	-5.15	33.92	14.38	21.12	7.98
Imports	Phase-I (1980-1997)	1.93	6	0.101	14.28	-3.78	32.36	14.28	19.54	7.38
	Phase-II (1998-2015)	1.74	6	0.131	14.39	-5.77	34.55	14.39	21.8	8.24
	Phase-III (1980-2015)	1.84	6	0.114	14.34	-4.64	33.33	14.34	20.53	7.76
CAGR	Phase-I (1980-1997)	12.92	7	0	17.4	14.21	20.58	17.4	3.81	1.34
	Phase-II (1998-2015)	14.79	7	0	24.5	20.58	28.42	24.5	4.68	1.66
	Phase-III (1980-2015)	18.34	7	0	21.05	18.34	23.77	21.06	3.25	1.15

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.

A) THE EMPIRICAL RELATIONSHIP BETWEEN EXPORT AND GDPAMONG 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.

B) 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:

$$GDP_t = a + b_t Export + \varepsilon_t \quad \text{... (2)}$$

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.

C) 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 have superior 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-

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t\ 1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t\ j} + \varepsilon_{it} \quad \text{...(3)}$$

Where i = 1, . . .,*N* and *t* = 1, . . .,*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, $t_{iT_i}(p_i)$

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^{N} t_{iT}(p_i \beta_i) \quad \text{... (4)}$$

The $\bar{t}$ is standardized to show that the standardized $\bar{t}$ statistic converges to the standard normal distribution as N and T $\to \infty$. 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.

D) 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-

$$y_{i,t} = \alpha_i + \delta_i t + \beta_{1i} x_{1i,t} + \beta_{2i} x_{2i,t} + \ldots + \beta_{Mi} x_{Mi,t} + e_{i,t} \quad \text{... (5)}$$

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-

$$\frac{X_{N,T} \quad \mu\sqrt{N}}{\sqrt{v}} \Rightarrow N(0,1) \quad \text{... (6)}$$

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.

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 assesses causation direction between exports and GDP, Granger test involves estimation of following regressions equations:

If causality runs from EXPORT to GDP, the equation is:

$$\textbf{GDP}_{1t} = \sum_{i=1}^{n} aiXt - i + \sum_{j=1}^{n} \beta jExportst - j + \in \quad \textbf{... (7)}$$

If causality runs from GDP to EXPORT, the equation is:

$$\textbf{Exports}_{2t} = \sum_{i=1}^{n} \gamma iXt - i + \sum_{j=1}^{n} \partial jGDPt - j + \in \quad \textbf{... (8)}$$

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.

III. 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. Studies 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 6: 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 5% level 10% level	-3.857386 -3.040391 -2.660551		

H_0 : Unit root (individual unit root process)

Table 6 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 attains 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 7: 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.

Table8: 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

Table 8 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 between GDP and Exports. Both leads to economic developments of the region.

IV. 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.

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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Analysis of Celebrity Endorsement on a Product for Pushing up Sales in Telecommunication Product (VIVO by Aamir Khan)

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Abstract- This paper is an attempt to get insight knowledge about the influence on buying behaviour of a consumer when eminent celebrities endorsed the product. The growing fad of advertisement tool by means of celebrity endorsement is gaining momentum and it is consider as one of the best available tools to promote the products and brands by renowned companies across the globe. The paper further analysis on the attributes and impact of celebrity endorsement in the market and the level of investment in the companies for the celebrities. The paper also highlights the satisfaction level of the Vivo consumer and a deep analysis on the special features of the product. An in-depth study on the market share of VIVO mobile in India for the last three year was also carried through this research. A quantitative method is used in this research in order to identify the impact of celebrity endorsement on the ROI for brands. Data is collected from 100 samples of questionnaire. From the studies it is concluded that celebrities' endorsement is highly beneficial for the brands and it is also proved that celebrity endorsement has increased the return on investment for the brands at a high rate.

Key words-Endorsement, ROI, celebrity, attributes, Samples.

I. INTRODUCTION

Celebrity endorsement is having a vital importance in the awareness of the products in the markets which indirectly provoke the brands to be popular. It is a way of brand communication, advertising and marketing where celebrities use their reputation to promote products. There are lot of celebrities who endorse the brands like (One Plus by Amitabh Bacchan, XIOMI Y series by Katrina Kaif, Hyundai by Shah Rukh Khan and Maruti by Ranveer Singh). "Celebrity Endorsement is a particular strategy used by marketers to advertise a product from such a platform through which consumers can associate themselves with the brand value from the prospective of the celebrity"(Kotler 2006). In addition Celebrity endorses is an individual who is known by the public for his or her achievement in areas other than that of the product class endorsed. (Friedman and Friedman 1979).

In today's world the celebrities are being admired and they inspired a huge number of people especially the millennial. The choices and lifestyles of a people even changes according to their favourite celebrity. This thing has a great impact and make a huge different in the market. Though there are a number of promotional tools, celebrity endorsement is chosen to be one of the most effective and trustworthy.

On the other hand celebrity endorsement involves a high risk for the brand too as it can defame the brand if any scandal occurs to the endorser. Apart from this it is very expensive and the brand may need to spend millions of dollar which is extravagant for a company unless they are a

multibillion company. Therefore, a thorough study is indispensable to probe the viability of celebrity endorsement for any given product.

II. TELECOMMUNICATION SECTOR

The mobile phone industry is the fastest growing industry within the Indian context. Among the fastest growing sector in the country, telecom has been zooming up the trade curve at a fiery pace. The number of devices launched in India during the first half of 2015 stood at 857 and an estimated 1700 devices will be launched before the end of the year. The mobile phone industry is expected to reach $333.4 billion in 2017 with a CAGR of 6.8% compared to 2014.

III. ABOUT VIVO

Vivo is a Chinese multinational manufacturer of smart phones headquartered in Dongguan, Guangdong province, China. Founded in 1995, vivo entered the telecommunication and consumer electronics industry with landline phones and wireless phones. From 2011, vivo started its Smartphone business. As of 2014, vivo releases and markets its smart phones under the vivo brand, ranking as the 5th top Smartphone brand in China, and 10th top Smartphone brand globally.

In 2014, vivo sold 25 million units in mainland China, in 2015, the sales volume reach 45 million worldwide, with an average retail price of $300. The annual production capacity is 60 million units. Vivo is now among the top five most profitable smartphone brands in China.

Vivo sponsored so many famous properties in India like Colors Comedy Nights with Kapil, MTV Roadies, MTV Bollyland Festival and Vh1 Emerge. Regionally vivo sponsored Vijay TV--Koffee with DD (Season 2), ETV Telugu--Extra Jabardast, ETV Kannada--Majha Talkies, Mazhavil Manorama--D 4 Dance (Season 2), and Zee Kannada--Onduurnalli Raja Rani. As a new brand for Indian consumers, vivo believes in reaching out to every person in every state and this increases the kind of effort to establish the brand in the hearts of consumers. Vivo looks forward to more such associations in the future to create a brand visibility amongst the Indian masses.

IV. LITERATURE REVIEW

Radhika Madan (2010) (celebrity endorsement: A marketing strategy) Celebrities have always been the easiest way to attract the customers because of their mass appeal. Celebrity endorsements do influence the target audience and make them loyal towards the brands. Celebrities help advertisements stand out from the surrounding clutter, thus improving their communicative ability.

Varsha Jain and Subhadip Roy (2010) Study points out the fact that national Celebrities are better than regional celebrities in creating positive consumer attitude. Consumers are open to new product in high and low involvement products categories with the presence of national and regional celebrity. However, when compared within the product categories, it has a higher impact on low involvement product (soft drink) as compared to the high involvement product (car). **Pughazhendi and R.Thirunavukkarasu (2011)** (A study on Celebrity Based Advertisement on the purchase Attitude of Consumers Towards durable Products) Advertisement plays a major role in changing the settled perception or thinking. The Consumers are induced significantly by the celebrity endorser when the target is on qualityand price. The purchase attitude is influenced by the celebrity endorsement factors, product evaluation and brand recognition. **BahramRanjbarian and Zahra Shekarchizade(2010)** Celebrity Endorser Influence on Attitude toward Advertisements and Brands- according to this there is a positive and significant relationship between attitude toward celebrity endorser and attitude toward advertisement and brands. Attitude toward celebrity endorser has directly or indirectly
influence on attitude towards brand, and attitude towards advertisement is a mediator between attitude towards celebrity and attitude towards brands. **PujaKhatri (2006)** "Celebrity Endorsement: A Strategic Promotion Perspective" advertisers agree that celebrity endorsement does not itself guarantee sales. It can create a buzz and make a consumer feel better about the product, which in turn has to come to expectation of customers as real star by delivering the promise.

BhavanaSindhu (2011) celebrity is always considered a big shot in the armour of big brands to impress the masses. An interesting finding, male celebrities are more effective as endorsers than

female. Celebrity endorsement decisively gives more visibility to the product endorsed. But celebrity endorsement is fraught with several dangers like overexposure, overshadowing the brand, negative publicity of the endorser to name a few. All the related factors have to be taken care of; otherwise the celebrity endorsement may prove to be a landmine having a devastating impact on the profitability, products future prospects and brand image. **Jennifer Edson Escales James R.Battam (2005)** study show that consumers report higher self – brand connections for brands with image that are consistent with the image of an in group compared to brands with images that are inconsistent with the image of an in group. Consumer use brands whose image match reference group. This finding that consumers reject the social meaning of brands that arises from out group brand. This also fined that our effect are moderated by brand symbolism, such that brands that communicate something about the yield stronger effect than brands that do not. **Brian D.Till (1998)** the use of celebrity endorses in advertising is wide - spread - as much as 20 percent of all advertising use some type of celebrity endorse. Marketers invest significant dollars in securing the promotional support of well individuals. Principles such as repetition, overshadowing, blocking, belongingness, CS pre- exposure, and association set size, and extinction are introduced and linked to specific managerial suggestions for improving the use of celebrity endorse.

This research study analyses how the attractiveness, behaviour and influencing power of celebrities increases the sale of the products in Telecommunication and Automobile industries. More specifically the study intends to find out whether a national celebrity would have a more favourable impact on the consumer attitude than a regional celebrity when endorsing the same product. This study discusses how a number of celebrities use their identity to help companies in promoting their brand and increasing market growth.

V. OBJECTIVE OF THE STUDY

1) To analyse the impact of celebrity endorsement in the market.
2) To identify whether celebrity has increased brand awareness and sales or not.
3) To find out that celebrity endorsement has influence the purchase intention of people or not.
4) To analyse which factors of celebrities creates an impact on the consumers.

VI. RESEARCH METHODOLOGY

This research study includes quantitative and descriptive methods and data is collected through primary and secondary sources. Primary data is collected through a set of 20 questionnaires and it is filled by various customers who buy VIVO products. The secondary data was collected through books and thorough internet based research was also undertaken. Various business magazines were also refer for the research. The research is an article based research.

VII. OVERVIEW OF VIVO PRODUCTS

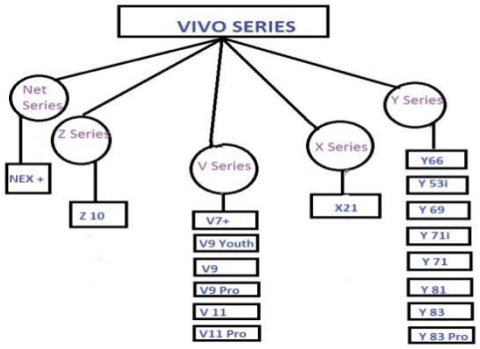


Figure: 01

The figure depicts various series of VIVO. From the figure one can understand, the various series that VIVO have namely Net Series, Z series, V series, X series and also Y series.

VIVO Specifications

Screen: The Smartphone comes with a screen ranges from 5 inch to 6.41 inches.
Processor: Lowest quality processor used in Y53i with Quad Core 1.4 GHz to highest quality
Processor used in V11 pro with Octa Core processor (4*2.2GHz)
RAM: Its ranges from 2GB to 6GB
Storage: Storage available from 16 GB to 64GB which is further expandable up to 128GB.
Rear camera: On the rear panel, dual rear camera consist of 12MP+5MP

Front camera: On the front, it ranges from 5MP to 25MP

Battery: The phone comes with a 2500mAh to 3400mAh battery with 9V2A fast charging support.

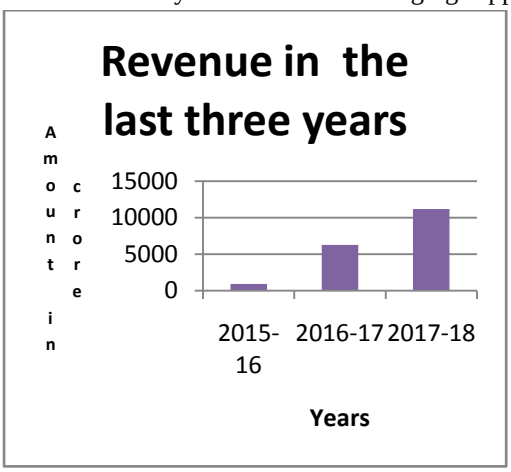


Figure no: 2

From the figure we can make out that in the year 2015 to 2016 the sales volume was up to Rs.2000 crore and the sales volumes increase drastically in the next year i.e. 2016 to 2017 to Rs.8000/- crore.The graph further shows increase in the year 2017 to 2018 touching almost 12000 crore.The data furnished is internet based research. A thorough research through internet was undertaken to know the sales volume revenue of the VIVO products and the finding are portrayed through graph in figure no 2.

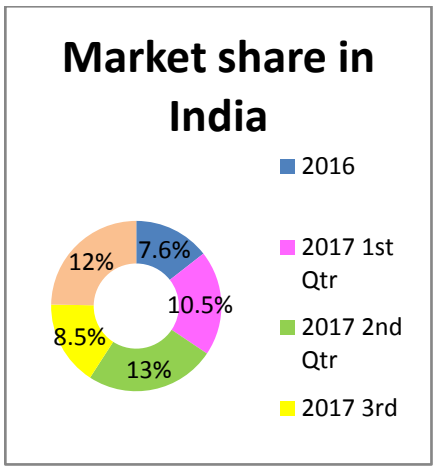
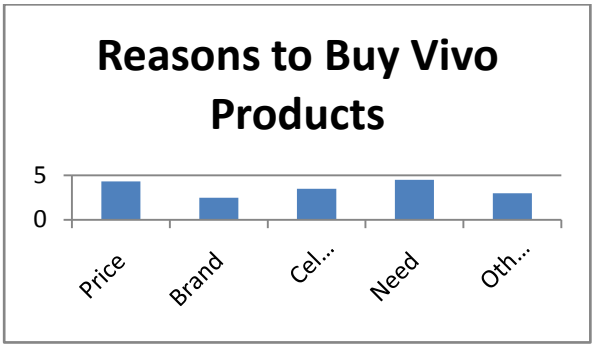


Figure 3

The figure 3 shows the market share of Vivo product in Indian market. The market share is projected on percentage based .When analyse of three years through the graphs, we can see the increase in Market Share specifically in India every year. Consecutive three year show increase in every year. It's a good sign for VIVO India as market share increase every year.



The above graph is the demonstration showing the reasons why people buy VIVO products. The factors consider are price, brand, celebrity endorsement, requirement, any other factors etc. In a rating scale of five, the factor or the reason why people buy VIVO product was analyse through questionnaire and it was drawn to conclusion that need has the highest buying factor compared to other reason.

VIII. FINDING FROM THE RESEARCH

1) A certain percentage of costumers have inclination towards celebrity endorsement for buying the products.

2) The finding also shows that when any celebrity endorses the products its sales volume increases.

3) The researchers also come to the conclusion that if their favourite celebrity endorses the product there is high chance of buying the same.

4) There is a drastic increase in the market share specifically in India of Vivo products when celebrity endorses the same.

IX. SUGGESTIONS

1) AIDA concept should be used while selecting Celebrity to endorse the product.
2) Demographic and geographical constraints should be taken into consideration while using celebrity to endorse the product.
3) Celebrity who is notorious for sabotage activities must not be used.
4) The fame of celebrity should not overtake the brand.

X. CONCLUSION

Celebrity endorsement has become a growing trend for advertising any products though it is FMCG, cosmetics or Telecommunications goods. The expense for celebrity endorsement may be extravaganza but still a good percentage of profit can be extracted by the investor. The rise of using Celebrity by various brand is clearly visible in the market, even in the field of Tourism, Government started identifying brand ambassador for a given destination. It's really indispensable to choose the right celebrity for a given brand to endorse; if there is wrong choice of celebrity it will create negative impact in the market. Many marketer believe in the word of mouth publicity but usage of celebrity can increase the snoop value of their brand.

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A Study on Implementation of Goods and Services Tax (GST) in India

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Abstract: From this year there are mixed response, inexplicit, arguments and opinions among the Manufactures, traders and society about the Goods and Services Tax (GST) to be implemented by Government of India. Various news companies from all around the world put interest on the bill unifying the country and it being an award or achievement of the government. As the Goods and Services Tax Bill was passed or cleared in the Rajya Sabha of India, it also brought India at the center of the world economy. With the passing and clearance of the bill, many international newspapers published their views and rights on how the GST Bill brings a new wave and revolution of economic reform in the country. The paper presents the background, Prospectus and challenges in Implementation of Goods and services Tax (GST) in India. Finally, the paper examines and draws out a conclusion in India.

Keywords: Rajya Sabha, global economy, goods and services tax

I. INTRODUCTION

The 'Book of Genesis' in The Bible suggests to all that a 5th of all crops should be given to the Pharaoh. The province states of Ancient Greece imposed to pay for wars, which were numerous; but once a war was completed any surplus had to be refunded and given back. Athens imposed a monthly poll tax on foreigners or alien peoples. Imperial Rome used tribute extracted from colonized peoples to multiply and square the bounty of empire. Julius Caesar imposed a one-per-cent sales tax; Augustus instituted an inheritance tax to provide retirement funds for the military and security force. However, human bondage remained the best lucrative form of tribute for both Greece and Rome. (Courtesy New Internationalist Magazine).

1.1 Indian Taxation System

India has got a well-structured and simplified taxation system, where in an authoritative segregation or distributed has been done among the Central Government, the different State Governments as well as the Local Bodies.

The Department of Revenue below the Government of India's Ministry of Finance is solely responsible for the computation of tax. This department levy taxes on individuals or company for income, customs duties, service tax and central excise. However, the agriculture based income taxes are taken or levied by the respective State Governments. Local bodies have got the power to calculate and levy taxes on properties and other utility services like drainage, water supply and many others. The past 15 years have witnessed tremendous reformations or recreated of the taxation system in India. Apart from the rationalization of the rates of tax (ROT), simplification of the different laws of taxation has even been done during this time or period. However, the process of tax rationalization is still in progress or completion in the Republic of India. Courtesy New Business Maps of India).

1.2 Constitutional amendment act. For GST

The One Hundred and First Amendment of the Constitution of India, proudly or legally known as The Constitution (One Hundred and First Amendment) Act, 2016, presented a national Goods and Services Tax in India from 1 April 2017. The GST is a Value added Tax (VAT) and is shown to

be a comprehensive indirect tax levy or imposed on manufacture or production, sale and consumption of goods as well as amenity at the national level. It will replace all indirect taxes levied on goods and services by the IGST are a single tax on the supply or provide of goods and services, right from the manufacturer to the consumer or user. Credits of input taxes paid at each stage will be provided or available in the subsequent stage of value addition, which makes GST essentially a tax only on value addition at each stage or level. The final user will thus bear only the GST charged by the last dealer in the supply chain, with set-off benefits at all the back or previous stages Indian Central and State governments. It is aimed at being comprehensive for best or most goods and services. The GST implementation in India is double in nature, i.e. it would consist of two components or things: one levied by Centre (CGST) and another levied by States and Union Territories (SGST).

II. RESEARCH METHODOLOGY

The Researchers used an exploratory research technique based on past literature from respective journals, annual reports, newspapers and magazines covering wide collection of academic literature on Goods and Service Tax. According to the objectives of the study, the research design is of descriptive in nature. Available secondary data was widely or extensively used for the study.

The above table depicts list of taxes centre and state level are being subsumed or combined into GST Keeping in mind the federal structure of India, there will be two components or elements of GST – Central GST (CGST) and State GST (SGST). Both Centre and States will simultaneously levy or impose GST across the value chain and addition. Applied tax will be levied on each and every that goods and services magnetized or attract the same rate of tax. But at present India is planning tax rate at 5%, 12% and 18% which will produces 8Lakh Crore revenue to the government. Under the GST scheme, a person who was depended or liable to pay tax on output, whether for provision of service or sale of goods, is entitled to get incoming tax credit (ITC) on the tax paid on its inputs. Thus, it would definitely a positive change or reform for the Indirect tax system in India.

Goods and Services Tax (GST) a serious doubt on implementing GST by the central government`s pointed or targeted deadline of April 1, 2017

Table 1: List of Asian and Asean Countries Implementing Vat/Gst

S.No.	Country	GDP Per Capita (World Bank, 2011, USD)	Year of Implementation	Current Rate (%)
1	Bangladesh	743	1991	15
2	China	5,445	1994	17
3	India	1,509	2005	12.5
4	Iran	NA	2008	5
5	Japan	45,903	1989	5
6	Jordan	4,666	2001	16
7	Kazakhstan	11,357	1991	12
8	Kyrgyzstan	1,124	1999	20
9	Lebanon	9,413	2002	10
10	Mongolia	3,129	1998	10
11	Nepal	619	1997	13
12	Pakistan	1,189	1990	16
13	Papua New Guinea	1,845	2004	10
14	South Korea	22,424	1977	10
15	Sri Lanka	2,835	2002	12
16	Taiwan	NA	1986	5
17	Tajikistan	935	2007	20
18	Turkmenistan	5,497	1993	15
19	Uzbekistan	1,546	1992	20
20	Thailand	4972	1992	7
21	Singapore	46241	1993	7
22	Philippines	2370	1998	12
23	Cambodia	897	1999	10
24	Vietnam	1407	1999	10
25	Laos	1320	2009	10
26	Indonesia	3,495	1984	10

2.1 Objectives of the Study

1. To study the ambiguous opinions among the Manufactures, traders and society about the Goods and Services Tax (GST).
2. To study about the Challenges of Introduction of Goods and Service Tax (GST in India).
3. To Study on Prospects in Implementation of Goods and services Tax (GST) in India

Table 2: Taxes At The Centre And State Level Are Being Subsumed Into GST.

S.No	At The Centre	State Level
1	Central Excise Duty,	a. Subsuming of State Value Added Tax/Sales Tax,
2	Additional Excise Duty,	b. Entertainment Tax (other than the tax levied by the local bodies), Central Sales Tax (levied by the Centre and collected by the States),
3	Service Tax,	c. Octroi and Entry tax,
4	Additional Customs Duty commonly known as Countervailing Duty, and	d. Purchase Tax,
5	Special Additional Duty of Customs.	e. Luxury tax, and

The above table depicts list of taxes centre and state level are being subsumed or combined into GST Keeping in mind the federal structure of India,

there will be two components or elements of GST – Central GST (CGST) and State GST (SGST). Both Centre and States will simultaneously levy or impose GST across the value chain and addition. Applied tax will be levied on each and every supply of goods and services. Centre would impose and collect Central Goods and Services Tax (CGST), and States would levy and collect the State Goods and Services Tax (SGST) on all transactions within a particular State. The input tax credit of CGST would be available, if discharging the CGST liability on the output at each stage. Similarly, the credit of SGST paid on inputs or services for imposing or levying of tax. This means that goods and services magnetized or attract the same rate of tax. But at present India is planning tax rate at 5%, 12% and 18% which will produces 8Lakh Crore revenue to the government. Under the GST scheme, a person who was depended or liable to pay tax on output, whether for provision of service or sale of goods, is entitled to get incoming tax credit (ITC) on the tax paid on its inputs. Thus, it would definitely a positive change or reform for the Indirect tax system in India.

Table 3: States In India Who Confirm Goods And Service Tax(GST) Constitution Amendment Bill

S.No	State	Passed On
1	Assam	12th August, 2016
2	Bihar	16TH August, 2016
3	Jharkhand	17th August, 2016
4	Himachal Pradesh	22nd August, 2016
5	Chhattisgarh	22nd August, 2016
6	Gujrat	23rd August, 2016
7	Madhya Pradesh	24th August, 2016
8	Delhi	24th August, 2016
9	Nagaland	26th August, 2016
10	Maharashtra	29th August, 2016
11	Haryana	29th August, 2016
12	Sikkim	30th August, 2016
13	Telangana	30th August, 2016
14	Mizoram	30th August, 2016
15	GOA	31th August, 2016
16	Odisha	1th September, 2016
17	Puducherry	2th September, 2016
18	Rajasthan	2th September, 2016
19	Andhra Pradesh	8th September, 2016
0	Arunachal Pradesh	8th September, 2016
21	Meghalaya	9th September, 2016
22	Punjab	12th September, 2016
23	Tripura	26th September, 2016

incoming would be allowed for paying the SGST on output and outgoing. No cross utilization of credit would be allowed.

III. RESULTS AND DISCUSSION

3.1 Courtesy by GST SEVA.com

The above table shows List of Asian and Asian Countries Implementing VAT/GST Worldwide in almost 160 countries there is GST/VAT, Below the GST scheme, no distinction or changes is made between goods and
The above table shows List states in India who confirm of implementing and taking interest in goods and service tax (GST) Constitution amendment bill in their respective states by doing so it will bring harmonization or unification of taxation system in India.

3. 2 Challenges in Implementing GST

1. Note ban has biggest or huge impact on the Goods and Services Tax (GST) a serious doubt on implementing GST by the central government`s pointed or targeted deadline of April 1, 2017..

2. The impact of the November 8 demonetization (Note ban) of high-value currency (500 and 1000 notes) on their respective economies to underline that it is not the appropriate time to implement. That could have a unstable effect on the power money economy.
3. The Centre continues and deterministic to be uncompromising on the issue of jurisdiction over assesses, the states maintain.
4. Political i.e. governmental reasons are determining the fate of GST, which is not the good or correct thing, because ideally GST is an economic and tax reform or recreate, and economic and tax amendment should not be dictated by political.
5. Producers and Manufactures, traders and society are eagerly waiting not only for the date of introduction of GST but also for the rate application to the things, products and services.
6. GST will also have impact on movement of cash and working capital. Cash flow and day to day capital of business organizations which maintain high inventory of goods in different states will be adversely affected as they will have to pay GST at full rate on stock transfer

from state to state. Currently CST/VAT is payable on sale and not stock shifted or transfers.

7. Implementation or creation of GST in Unorganized sectors i.e, unregistered firm will be unfavorable to government of India.

3.3 Prospects of Implementing GST

The starting point or introduction of Goods and Service Tax (GST) in India is now on the main point of horizon. The Constitution Amendment Bill to replace and change the existing multiple indirect taxes by uniform GST across India.

1. The current indirect tax structure is major impediment in India's high money economic growth and competitiveness. Tax barriers in the form of CST, start or entry tax and restricted input tax credit have fragmented the Indian market. Cascading effects of taxes on cost make indigenous manufacture less magnetized or attracted. Complex multiple taxes increase and raised cost of compliance. In this scenario, the starting or introduction of GST is considered.

2. Removal of tax barriers on introduction of uniform and parallel GST across the country with seamless adding balance credit, will make India a common market leading to economy of scale in production and efficiency in supply chain management. It will enlarge trade and commerce. GST will have positive and favorable impact on organized logistic industry and high modernized warehousing.

3. E-processing of tax returns, refunds and tax deductions and payments through 'GSTNET' without human intervention, will reduce corruption and tax escape or evasion. Built-in check on business transactions through seamless credit and return processing will reduce chances and scope for black money generation leading to procurement or productive use of capital.

4. Major benefits of GST would goes to sectors like FMCG, Pharma, Consumer Durables and Automobiles and warehousing and logistic industry.

5. High inflationary impact and power would be on telecom, banking and financial services, air and road transport, construction and development of property and real estate.

IV. CONCLUSION

It can be concluded or decided from the above discussion that GST will bring and generate One Nation and One Tax market. Provide relief and rest to producers and consumers by providing verity, wide and comprehensive coverage of input tax credit set-off, service tax set off and subsuming the various or several taxes. Finite and Efficient formulation of GST will lead to resource and revenue growth or gain for both Centre and States majorly through widening of tax base and improvement in tax compliance. It can be further deciding and concluded that GST has a positive impact on various sectors and various industries. Although implementation of GST needs to requires concentrated efforts of all stake holders namely, Central and State Government, trade and industry. Electronic processing of tax returns, refunds and tax payments through 'GSTNET' without human intervention, will deduct and reduce corruption and tax evasion. Built-in check on business transactions through seamless credit and return processing will reduce scope for black money generation leading to productive use of capital, Therefore It is necessary on the part of the government to educate, conduct proper training, continuous seminars and workshop on GST is need of the hour. Thus, necessary steps should be taken.

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The Influence of Social Media on Youth in Modern Time

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Abstract: Social media is a platform for people to discuss their issues and opinions. Social media is computer tool that allows people to share or exchange information's, ideas, images, videos and even more with each other through a particular network. Social media depend on mobile and web-based technologies to create highly interactive platforms through which individuals and communities share, co-create, discuss, and modify user-generated content. Social media is one of the easiest means and includes media and social networking sites like face book, twitter, Google+ etc. They introduce substantial and pervasive changes to communication between organizations, communities, and individuals. Social Media and the way it effects adolescents is an important topic to have a better understanding of. Smart phones have also speed things up and attributed to how dependent teens are on being connected to the net and checking their profiles.Although with time all generations have come to embrace the changes social network has brought about, teenagers and young adults are the most fanatic users of these sites. According to various research studies in the field of online social networks, it has been revealed that these sites are impacting the lives of the youth greatly. When using these sites such as Twitter, Facebook or MySpace, there are both positive and negativeeffects on the youth. The present paper present is an attempt to explore the positive and negative impact of media on youth.

Keywords: Social Media, Youth, Positive Effect, Negative Effect

I. INTRODUCTION

Social media, basically defined as grouping of internet based an application that builds on the ideological and scientific foundations for transforming communication, in to an effective and interactive conversation between different societies and individuals. Social media is one of the easiest means and includes media and social networking sites like face book, twitter, Google+ etc. This is creating lot of boom in the current generation as it is one of the exceptional resources in conveying the information.Social media may comprise of different forms like magazines, social club, Internet forums, weblogs, social blogs, micro blogging, wikis, podcasts, photographs or pictures, video, rating and social bookmarking.

But now the trend of getting information has totally changed as most of them are using internet to acquire information and to meet people. Social media is different from the usual traditional media which include newspapers, television, radio and films etc. This social media is less expensive when compared to the traditional media and is also easily accessible. This is not only used for communicating and interacting with people worldwide but is also one of the best ways to advance in business. Purva et al. presented that online social networking like Facebook and Twitter have the fastest means of communication and having gained wide popularity, have revolutionized interpersonal communications by providing a platform to individuals for expressing themselves at a global level, beyond their immediate geography. The authors present the study on

diffusion dynamics of specific real world events, discussed on Twitter, with respect to location and time. The events were categorizes into broad categories based temporal (short or long), geographical distribution (local or global), information diffusion (viral or gradual), influence (popular or unpopular) and the cause (natural or planned). It was conclude that the three-dimensional analysis of real-world events by exploring relationships among them

Social media can be categorized in to six types and they are: Joint projects like Wikipedia, blogs like Twitter, content communities like YouTube, social networking sites like Face book, effective game worlds like World of War craft and virtual social worlds like second life. Other than this social media technologies may include: blogs, picture-sharing, vlogs, wall-postings, email, instant messaging, music-sharing, crowd sourcing and voice over IP and many more.

II. LITERATURE REVIEW ON IMPACT OF SOCIAL MEDIA ON YOUTH

Halakerimath and Danappagoudra(2017) found that general information of the respondents indicated that cent percent of the respondents were belongs to 18 to 20 year age group. Majority (64.00%) of the respondents were male. The overall opinion index of the respondents to the extent of 70.05 percent and course studying was positively significant with opinion of respondents. Ali,Iqbal and Iqbal (2016) by using bivariate analysis, result of this study depicts that social media plays vital role in providing learning and job opportunities to the student.Bhardwaj, Avasthi, Goundar (2017) found accessing social networking applications by users range Mobile Devices - 45% (Includes Smart Phones, iPads, Kindles, Tablets); Desktop Computers - 22%; Laptops - 33%...According to Livingstone and Bober (2003), social media was the main cause of generation gap in several ways like lack of awareness, recognition of domestic rules, and in what kids were really acting and what were parents' opinion about their children's doing. People forgot their rituals and traditions because of social media.

Berson and Berson (2005) stated that high use of internet linked high risks, and there had no risk of simple use of internet. In early childhood, they did not know about risks, and they need guider. In teenage, they had not developed abilities to make life's choices.Elola and Oskoz (2008) said, Social media was very helpful in developing business relationship with other states and social media had positive effect in developing and understanding cultural relationships. Brady, Holcomb, and Smith (2010) stated that social media had provided efficient ways for education. Students used social media for e-learning. Lusk (2010) said that, social media could be used for academic purpose by students. Students could learn and enhance their communication skills by the use of social media. Social media had provided new web tools which could be used by the students to raise their learning skills. According to Jacobsen and Forste (2011), media had negative effect on grades, about two-thirds of the students were used media while doing homework, or in class which had bad impact on their grades.Kalpidou, Costin, and Morris, (2011) stated that there was a relationship between social media and grades, Ohio State University described in his study that those students had low grades who spent their time on social media, then those who did not spend their time on social media.According to Waddington (2011), adolescent thought social media as the component of their culture; not a craze. It could enhance their ability and they used it as educational tool. All the studies discussed above shows that, social media have different effects on different people. So, in this study we will check the effects of social media on young students.

A. Positive Impacts of Social Media on Youth

a) *Friends:* Making friends has become easier with these social networking sites like facebook, google+ and twitter etc. in olden days it was a bit tough to make friends unless and until one has personal interest of going out and making friends. Later after in the decades of 70's and 80's mobile phones helped in connecting and improving conversation with people. And now the exploration of social networking sites sprang up and it has changed the whole idea of making friends once more and forever. We can make unlimited friends

worldwide and chat with them without any time limit and even at free of cost.

b) *Empathy:* By connecting with friends through social networking sites we share all of our good and bad experiences with friends. This will improve the relationship between friends and thus creating good bonding. Thus by sharing both good and bad experiences with friends, we will be able to empathize with each other. Sharing one's experiences with friends will also give mental relaxation.

c) *Rapid Communication:* Everybody is becoming so busy with their lives that they don't even have time to communicate with their family members. Our time is getting thinner and thinner with busy work schedule and family commitments. Social networking sites give us a chance to communicate in a speedy and effective manner. Writing in face book, Google+ and twitter will reach as many people as we want just in a span of seconds and with no cost. These sites will allow us to live a life which is unhindered with a small talk.

d) *Be In Touch With the World:* Not only communicating with friends within the circle but we can also make friends worldwide easily. We can build a network of friends and we can share our ideas, photos and videos through these sites. Through this we can have updated news of friends and family members. We can emphasize our location by using location based services like foursquare.

e) *Building Relationship And Finding A Common Ground In An Open Society:* We can make a strong relationship with friends and relatives through these sites. This can help foster friendship and more besides strengthen us. Because friend is the only person with whom we can share everything related to our life. Connecting with groups will help in improving one's own business, thus creating profits. Professional sites like LinkedIn will have many groups based on different criteria. Through LinkedIn people get jobs and some promote their business.

f) *Source of Learning and Teaching:* For students and teachers, the effects of social media are so huge. You can go to Internet and learn or exchange knowledge. Also, there are lots of topic and sources that you can get there. By using those topics, you can have great subjects and topics for discuss to improve knowledge at school.

g) *Education:* Due to the "sharing" option, social networking sites gives people a chance to share informative articles, videos with each other. Moreover, it can help them reach out to their coaches, academic experts, and teachers easily and collaborate with their peers on school subjects.

h) *Encourage Community Participation:* Via forums, people, in general, and teenagers in particular, can contribute their own opinions as well as thoughts on certain subjects and themes that interest them. By taking part in discussions, they will engage in positive self-expression.

i) *Improve Self-Confidence:* In fact, Facebook good comments and likes tend to be strongly positive. In those pick-me-up days, people can check their personal profiles and automatically get affirmation, self-confidence, self-esteem, and validation. In other words, because teenagers personalize their profile; thus, they might experience a sense of independence. Aside from being able to share their own ideas, or interacts with other people, they also participate in groups that help them "fit in" as well as foster their identity.

j) *News Feed:* Social medias like facebook, twitters, instagram, skypeetc provides option of news feed, that helps knowing all kind of news from the globe that include news from your friends as well. A number of people use social media for this advantage of it.

B. Negative Impacts

Social media, now a day's is leaving a negative impact rather being positive. Most of the youth spend lot of time on the internet to visit and check their single or multiple accounts. This will affect students, youth and productivity of work because of the extreme use of technology. The risks of using social media may also include mental health, cyber bulling, texting and revelation to problematical and unlawful content and privacy violations.

a) *Cyber Bulling:* Usage of social media may create a chance for emotional distress in getting frightening, irritating and degrading

communication from another teenager which is called cyber bulling. It's been proved that cyber bulling will build advanced levels of depression and anxiety for victims and also resulted in youth suicide. Most of the females become victims of this cyber bulling.

b) *Texting:*Texting is used to harass people. Using cell phones and social networking sites for instant messaging to threaten, and hassle relationship partners is increasing day by day. One in three teens in relationships has been text messaged up to 30times an hour by a partner to know where they are, what they are doing, or who they are with.

c) *Privacy:*Most of the teenagers are not aware of the website policies when setting their profiles and they may not be even aware of disclosing the information to the third parties like the advertisers. Most of the teenagers like to post their information publicly which will affect them when the hackers or people with cruel intension may use their information for wrong purposes. Brandtzeag et al. (2010) many factors were there in the research to focus on the youngster as the SNSs users. The one and main factor of the research on youth SNS user was this that they are adopting these sites very early that's why they are studied as a first group. Due to lack of awareness of SNSs technology, the use of SNS became a risk associated with privacy issue because of its using everywhere

d) *Waste Of Time*:We agree that social media is good, but 'too much of a …' you know how it goes. Spending too much time can also affect your child negatively and often lead to social media addiction. Addiction can manifest itself as various symptoms and may even affect your child's physical health.

e) *Hate Speech:*The teens using Facebook or other social media sites are at a greater risk of suffering from the hate speech. This problem can be more serious for the girls and the teens belonging to the minorities and communities that are discriminated against. In online interactions, people with unknown identities may easily indulge in the hate speech or disrespectful behaviour. While during a face to face interaction an individual may think twice before passing any such remark.

f) *Social Distrust:* As mentioned that unknown online users may indulge in aggressive or offensive behavior. Teenagers may think if such aggression or offensive is committed in real life situation. This may result in social distrust towards the unknown others.Keeffe et al. (2011) It is very necessary to the parents to be aware of the nature of such websites, because these social networking sites are also containing that material which is not providing a kind healthy environment to the youth.

g) *Identity Theft:* One of the big problems with social media sites is that the teens often do not fully read or understand the privacy settings of their accounts. They are unaware of the risks of disclosing unnecessary personal information. According to a recent survey, 20% of the youth think it to be perfectly safe to post their personal information and photos online. Such teens may easily become victim of the identity theft.

h) *Cyber-Stalking:*Stalking is defined as the obsessive monitoring or attention towards the victim that may harass him or her. Cyber-stalking can be done in many different ways using social media. Sometimes, an ex-boyfriend or spouse may get angry at the breakup of a relation and use social media to pursue the victim. In another case, a relationship that was developed online gets sour and the personal information shared can be used by the stalker. Or, someone may also fall victim to a random cyber stalking attack.

i) *Explicit Or Violent Imagery:* Spending a lot of time on the social media sites like facebook can be dangerous, as often as a result of political events around the world, explicit and violent imagery get shown on the discussion threads. Often it is very difficult to moderate such content due to its viral nature. This may have a negative effect on the minds of the youth, leading them to have a sadistic and defeatist view of the world.

j) *Sharing Too Much:* Everyone of us has its own set of beliefs and ideas that we try to live upto. In our daily life we have an interaction with limited circle of friends. However, sharing such ideas over websites like Facebook may result in dissemination of this information with people that we would not want normal life. This may even prove fatal for our relationship with those

people.Acquisti& Gross(2006)Maximum of these researches are always focusing the youth, because of their altering behavior with respect to their privacy and openness with other adults.

k) *Online Grooming:* One of the most distressing aspects of the social media is the growing evidence that paedophiles may use fake accounts on the social media to make friendships with young children and teenagers. They pretend to be of the same age to win children's confidence. They can then gain vital personal information like their schools and the places where they hang out. They can then use that information to bully and make sexual contact with their victims or exposing them to explicit imagery or content.

l) *Emotional Implications:*Psychological experts warn that social media sites can have emotional implications for teens who are already suffering from low self-esteem or confidence. Such children may judge their success by the number of friends they have on the facebook or if they are included in a specific group of people. This may lead to further diminshing of their confidence.

m) *Lack Of Interpersonal Skills:*Children spending too much time online may consider a virtual relation substitute for a real one. By spending more time online they often ignore the importance and the appropriate behaviour related to face-to-face contact. Hence, the set of interpersonal skills that are necessary for the success in the real life may not develop properly.

n) *Increased Alcohol Use:*A study reports that there is a close relationship between drug or alcohol use, social media, and teenagers.. Sitting in front of computer and they tend to use more alcohol and tobacco. This routine can be increased after you join some clubs or learn from many websites on the Internet.

o) *Alter The Appetite:* This seems so strange when it comes to negative effects of social media on the human life. However, it has its own reason. "Food porn" photos could activate the brain's reward center and compel people to overeat. In reality, one research suggested that even looking at food images after your meal could trigger hunger.

III. CONCLUSION

Social media is a term used to describe the interaction between groups or individuals in which they produce, share, and sometimes exchange ideas over the internet and in virtual communities. The impact of social networks on young people is significant. Children are growing up surrounded by mobile devices and interactive social networking sites such as Twitter, MySpace, and Facebook, which has made the social media a vital aspect of their life. Social network is transforming the manner in which young people interact with their parents, peers, as well as how they make use of technology.The effects of social networking are twofold. On the positive side, social networks can act as invaluable tools for professionals. They achieve this by assisting young professionals to market their skills and seek business opportunities. Social networking sites may also be used to network professionally. On the negative side, the internet is laden with a number of risks associated with online communities. Cyber bullying, which refers to a type of bullying that is perpetrated using electronic technology, is one of the risks.It is decision of an individual to make whether to continue using the sites or not.

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Consumers' Perception of Celebrity Endorsement

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Abstract: Celebrity endorsements are a common tool used by the brand managers. The appeal of celebrity endorsements has attracted both producers and consumers. The study analyzes the perception of consumers about celebrity endorsements. The descriptive research design is used for the study. Primary data is collected through the questionnaire. The data is analyzed through factor analysis. Five factors were extracted. Esteem, Trust, Charisma, Compatibility between product and celebrity, and performance of celebrities were the factors.

Keywords: Celebrity, Perception, Factor Analysis, Esteem, Trust, Charisma, Compatibility

I. INTRODUCTION

A celebrity is a person who is known to the public for his her accomplishments in areas other than the product class endorsed (Friedman and Friedman 1979). McCracken (1989) defined celebrity as "any individual who enjoys public recognition and who uses this recognition when they appear in the advertisement in front of the consumers". According to Schlecht (2003) the person who has distinct features and are recognized by a large section of people become celebrities

In Indian culture celebrities from cinema, sports and other fields are considered icons. People try to emulate the role models and they want to get psychological satisfaction of being associated with the celebrities. Following the role models give a satisfaction that they are just like the role models in some aspect. All top three leading celebrities of 2017 listed in Forbes list are from the world of cinema. Mr. Shah Rukh Khan is globally ranked 65th with earnings of US$ 38 million, followed by Salman Khan with a rank of 71 and earnings of 37 million. Akshay Kumar is the third ranked Indian celebrity with a global rank of 80 and earnings of US$ 35.5 million (The Hindu Business Line, 2017).

Table 1: Highest Earning Indian Celebrities in 2017

S.NO	Celebrity	Forbes Rank	Earnings (US$ Millions)
1	Shahrukh Khan	65	38
2	Salman Khan	71	37
3	Akshay Kumar	80	35.5

Source: The Hindu Business Line, 2017

The average revenues per day was highest for Mr. Salman Khan having a average earnings per day of Rs. 4.5 crores and total estimated endorsements of Rs. 148.5 crores. The second highest average earnings per day was for Mr. Shah Rukh Khan with Rs. 3.5 crores, and total income from endorsements was Rs. 126 crores. There was a big difference in the earnings of next celebrity. Mr. Amitabh Bachchan was the third highest earner with average earnings of Rs. 2.75 crores per day and total income from endorsements of Rs. 74.25 crores (RBSA, 2016).

Table 1.6: Earnings of Bollywood Celebrities

Rank	Celebrity	Avg. Endorsement earnings per day	Estimated Income from Endorsements (2015)
1	Salman Khan	4.5	148.5
2	Shahrukh Khan	3.5	126
3	Amitabh	2.75	74.25

	Bachchan		
4	Deepika Padukone	2	48
5	Aamir Khan	2.5	33.75
6	Hrithik Roshan	2.5	33.75
7	Priyanka Chopra	1.25	15
8	Akshay Kumar	1.75	47.25

Source: RBSA, 2016

Sports celebrities are also popular and widely used in the celebrity endorsements. Most of sports celebrities come from cricket. Mr. Virat Kohli was the highest average earning sports celebrity with an average earning of Rs. 8 crores and total earnings of Rs. 90.95 crores. Though Mr. Mahendra Singh Dhoni was the highest earning sports celebrity with a total earning of Rs. 99.08 crores, his average earnings per day was Rs. 6 crore per day. Among female sports celebrities Ms. Sania Mirza was the highest in both total earnings (Rs. 11.65 crore) and average earning per day (Rs 1 crore). Ms. Saina Nehwal was the second highest earning female sports celebrity with a total endorsement earning of Rs. 7 crore and average endorsement of Rs. 0.75 crore (RBSA, 2016). It is anticipated that the spending on advertising will be 0.45 percent of GDP by 2018 (ibef, 2017).

The popularity of television personalities have made them celebrities and companies are using them in endorsements. The television actors have a share of 4% in the celebrity endorsements by profession, television actresses are slightly higher at 5%, sports personalities have a share of 11% and majority of share is with film personalities. Film actors and actresses both have share of 40% each (AdEx India2013).

The world average of television viewing is three hours and fourteen minutes, for Europe and Middle East the average is three hours and fifty four minutes and for Asia Pacific the average is the lowest among all regions at two hour and thirty two minutes. In India the average television viewing is three hours and sixteen minutes (Dasgupta, 2016).

It was found in a study by Jain and Sudha (2009) that 90.3% of the respondents had watched the retail brands advertisements on television. It was found by Dhotre and Bhola (2010) that 51% respondents watch television daily for one to three hours and 43% respondents watched television for less than one hour and 6% watched more than 3 hours. The respondents had shown highest recall for Mr. Amitabh Bachchan, Mr. Shah Rukh Khan and Mr. Aamir Khan respectively. Ganesan, Saravanaraj, Pughazhendi (2012) also observed that impact of television commercials is high as respondents are impressed by favorite celebrity endorsements. Television is the preferred media for people to watch advertisements Vetrivel and Muthulakshmi (2011).

The highest growth rate in advertising revenue is expected to be for digital advertising from 2016 to 2021. Digital advertising is expected to grow at a compounded annual growth rate of 30.8%, followed by gaming 18.2% and animation 17.2%, followed by radio with 16.10%. Television comes fifth in growth rate with 14.7% CAGR. Print media is expected to have the lowest growth rate among all other mediums with a growth rate of just 7.3% (FICCI-KPMG Media and Entertainment Report 2017). The digital advertising has grown from INR 15 billion to INR 60 billion in 2015 (duffandphelps, 2016) and is expected to grow to INR 294.48 billion by 2021 (FICCI-KPMG Media and Entertainment Report 2017).

Objectives

To analyze the consumer perception about celebrity endorsements

II. LITERATURE REVIEW

Ram, Ravindran and Satish (2009) studied celebrity endorsement impact on B segment cars in rural Kerela. The study used chi square, t test and factor analysis. It was found that advertisement and sales promotion significantly influence buying behavior. 35.3% customers consider advertisement as main reason for choice of a brand.

Jain (2011) found that 72% respondents considered that celebrity endorsements increase sales, 84% agreed that people are motivated by endorsements. Only 26% felt that celebrities use the endorsed product themselves. It was concluded that celebrity endorsements had little effect on sales.

Upadhyaya (2012) called for change in attitude of marketers towards rural markets. It was argued that the profit margin may be less than urban markets

but market size is much larger. It was suggested that companies should cut down the cost on packaging, as rural customers don't require attractive packaging.

Abhishek and Sahay (2013) examined the impact of culture on celebrity brand endorsement. It was argued that in a country with many sub cultures, the sample to study culture should include all cultural sub categories. It was cautioned that using cultural prepositions developed by various researchers like Hofstede should be assessed in light of changes that have taken place in cultural environment of different countries. The authors cited the success of celebrity endorsements in region to which they belong like endorsements of Dhoni was more effective to influence in Jharkhand, Dharmendra in Punjab, Aishwarya Rai in Goa and Karnataka. Role of celebrity in overcoming negative news about company was also found to be constructive, as cited with examples of Amitabh Bachchan in Cadbury case and Aamir Khan in Pepsi case.

Bajwa et al. 2015 examined the impact of celebrity endorsements on television on rural consumers of Sirsa district. It was found that rural consumers watch television for three to four hours. The popular celebrities were Amitabh Bachchan and Mahendra Singh Dhoni. The consumers considered products endorsed by celebrities to be reliable and of good quality. It was also found that endorsements have led to increase of consumerism.

III. RESEARCH METHODOLOGY

The descriptive approach was used for the research. The perception of consumers was assessed through a self administered questionnaire. The questionnaire was designed after review of literature. The scope of study was consumers in Punjab and Chandigarh. The primary data was collected from 600 respondents. 417 questionnaires were returned, out of which 17 were incomplete so were discarded. Thus 400 questionnaires were used for the analysis. The reliability of the questionnaire was assessed by Cronbach's alpha. The Cronbach's alpha was obtained as 0.797. The data was analyzed with the help of SPSS using principal component factor analysis.

IV. FINDINGS

This section presents the findings of the study. The factor analysis was done to identify the factors that influence perception of respondents about celebrity endorsements. To assess the suitability of data for factor analysis, KMO and Bartlett's test of sphericity was performed.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.755
Bartlett's Test of Sphericity	Approx. Chi-Square	4179.030
	Df	105
	Sig.	.000

Source: Survey Data

The KMO measure was obtained as 0.755, and significance value of 0.00 was less than 0.05, so the data was suitable for factor analysis. Table 3 shows the total variance.

Five factors were extracted as they had Eigen values more than 1. The first factor explained 39.14% variance, and the five factors together explained 77.07% of total variance.

Table 3: Total Variance Explained

Component	Initial Eigenvalues		Extraction Sums of Squared Loadings				Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.872	39.145	39.145	5.872	39.145	39.145	3.472	23.149	23.149
2	1.833	12.223	51.368	1.833	12.223	51.368	2.611	17.409	40.558
3	1.479	9.860	61.228	1.479	9.860	61.228	2.505	16.698	57.256
4	1.216	8.107	69.335	1.216	8.107	69.335	1.508	10.052	67.308
5	1.161	7.738	77.073	1.161	7.738	77.073	1.465	9.765	77.073
6	.776	5.172	82.245						
7	.701	4.675	86.920						

8	.547	3.648	90.568						
9	.406	2.706	93.274						
10	.323	2.155	95.429						
11	.212	1.411	96.840						
12	.196	1.303	98.143						
13	.131	.876	99.019						
14	.092	.613	99.633						
15	.055	.367	100.000						

Figure 1: Scree plot

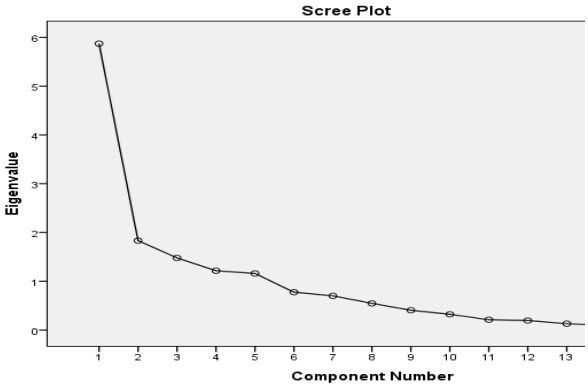

Table 4: Rotated Component Matrix

Rotated Component Matrix[a]					
	Component				
	1	2	3	4	5
My social esteem is enhanced by purchasing products endorsed by celebrities	**.884**				
Customers feel a sense of pride by purchasing celebrity endorsed products	**.858**				
Consumers want to emulate their favorite celebrities by buying products endorsed by celebrities	**.795**			-.317	
Regional belongingness of celebrity attracts customers	**.744**			-.426	
Celebrity Endorsed products are costly		**.837**			
Celebrity Endorsed products are Trustworthy	.351	**.717**	.407		
Goodwill of product is enhanced by celebrity endorsements		**.705**	.437		
Celebrities use the endorsed products in real life	.468	**.661**			
Popularity of celebrity attracts customers			**.776**		
Physical appearance of celebrity make the endorsements more effective			**.737**	.300	
Celebrities transfer their charisma into product			**.625**	-.459	
Celebrities endorse only those products which are judged best by the expert knowledge of celebrities	.311	.460	**.589**		
Match between celebrity and product influences customers to purchase the product				**.799**	
Negative news about celebrities reduces the appeal of celebrity endorsements					-.857
Performance of celebrity in their profession impacts the effectiveness of celebrity endorsements	.365				**.695**

First factor is named as ESTEEM. The variable that make up this factor are social esteem, sense of pride, want to emulate their favorite celebrities and regional belongingness. The factor loadings were; social esteem (0.884), sense of pride (0.858), emulating celebrities (0.795), regional belongingness (0.744). The esteem factor explained 39.14% of variance.

The second factor was named as TRUST. The variables that contributed in this factor were; cost of celebrity endorsed products (loading 0.837), celebrities are trustworthy (loading 0.717), goodwill is enhanced by celebrity endorsement (0.705), and celebrities use the endorsed products in real life (0.661). The factor explained 12.22% of total variance.

The third factor was named as CHARISMA. The variables that clubbed together in the factor were; popularity (loading 0.776), physical appearance (0.737), transfers charisma to product (0.625), and judged best by celebrities (0.588). 9.86% of total variance was explained by factor Charisma.

The forth factor was named as COMPATIBILITY BETWEEN PRODUCT AND CELEBRITY with a factor loading of 0.799. The factor explained 8.1% variance.

The fifth factor extracted was PERFORMANCE OF CELEBRITY. The loading for the variable was 0.695. The factor explained 7.75% of variance.

V. CONCLUSION

The results show that customers are not only influenced by charisma of celebrities, esteem, trust but customers also consider compatibility of celebrities and the product being endorsed and performance of celebrity in their profession. The brand managers only focusing on charisma of celebrity may not get any long term gains from the investments on celebrity endorsements. The example of Snapdeal snapping its association with Aamir Khan due to the controversial statements due to rejection of Snapdeal app by consumer, endorsements of Levi's by Akshay Kumar, Nicorette by Shane Warne, Sergio Tacchini endorsement by Martina Hingis, Amazon endorsement by Swara Bhaskar. Failure of brand ambassador like Dhoni to camouflage operational failure of Amrapali indicates that celebrity endorsement is not a panacea for fooling customers. The celebrity endorsements should not be used as a substitute for good quality products but as a tool to reinforce and highlight the quality and safety of the product. The failure of Maggi in laboratory tests has alarmed consumers about misleading endorsements and has put a question mark on the faithfulness of celebrity endorsements. The brand managers should work on the social ethics and display all relevant facts for consumers and ensure safety of their products and services, otherwise celebrities as well as celebrity endorsements will lose faith of consumers and will not be able to make any significant impact for consumers or companies.

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SHGs – A Way to Eradicate Poverty

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Abstract: SHGs work as financial intermediaries between banks and beneficiaries. The groups work as distribution channels who are distributing microloans to the group members. Microfinance is playing a very important role in eradicating poverty from rural India. SHGs basically consist of 10-20 members. The research paper has studied the compound annual growth rate of no. of credit linked SHGs and loans disbursement to these SHGs by banks. In this paper impact of SHGs on poverty eradication, weaknesses and threats faced by SHGs have been studied.

Key words: Microfinance, MFIs SHGs, SBLP, SGSY, SEWA

I. INTRODUCTION

Term microfinance can be defined as an approach to providing credit, savings, and insurance facilities to the poor all over the world. The concept of microfinance was firstly initiated by Muhammad Yunus honored with Nobel Prize, who has laid the foundation of the modern microfinance industry with the establishment of Grameen bank model in 1976, Bangladesh (Gart Van Maanen 2004). In India, microfinance came into existence in 1973, with the establishment of SEWA (self-employed women's association) in Gujarat. Microfinance is not only to provide small loans to the poor but also to assist them to do work and become self-sufficient. Whereas microfinance is not only covered the facilities like credit, savings, and insurance but also training, counseling and guidance facilities to the poor. Microfinance is playing a very significant role in providing financial assistance to an unbanked segment of the society. In 1992, NABARD (National Agriculture Bank for Rural development) has introduced the SBLP (Self Help Bank Linkage Program) in India as a pilot project. This program is based on the following principles. (Biswas and Sana, 2015)

1. No credit without savings, so saving is compulsory for every member.
2. Saving is considered as collateral for loans.
3. Loans are provided through SHGs.
4. All members are jointly liable for the loans taken by the group.
5. Credit cycles are started with the small loans.

SGSY (Swarnajayanti Gram Swarozgar Yojana) is also using SHGs approach. Under this program, financial assistance is provided to the poor families in the rural areas by forming SHGs for taking up self employment. The government has also taken many initiatives like IMY, SWA-SHAKTI, DWCRA, CAPART, SJSRY, IFAD, Swayamsiddha, RMK etc. for reducing poverty and uplifting the standard of living of the poor.

In India, microfinance basically follows two channels

1. SBLP(self help group bank linkage program)
2. MFIs(microfinance institutions)

SHGs work as financial intermediaries between banks and beneficiaries. The groups work as distribution channels who are distributing microloans to the group members. Microfinance is playing a very important role in eradicating poverty from rural India. SHGs basically consist of 10-20 members. They come together to contribute a certain amount of the money as savings say Rs. 100. SHGs take loans from the banks without any collateral that usually ranges between 10000-15000 at a very low rate of interest. The members of the group give a counter guarantee of each other. Members of the group are encouraged for timely repayment of loans so that they get repeated loans.

SHGs are not only associated with banks but also with the NGOs or other developmental programs. The SCBs (State Cooperatives Banks) are also playing a vital role in providing financial assistance to the poor through SHGs. SHGs basically encourage poor women to save money, take loans from the bank, and become self sufficient. They encourage women entrepreneurship so that women can make themselves and their family self sufficient. It is the revolutionary step towards the women empowerment.

RBI (Reserve Bank of India) has permitted the SHGs to open savings accounts with any of commercial bank, co-operative bank and RRBs (Regional Rural Bank). Initially, SHGs were formed to grow as independent institutions. As they have gained popularity government has also extended subsidies and donations to them.

STEP (Strengthening, training, and employment program) is a project to provide directions to rural poor women. This project also helps the SHGs of rural Punjab. The SHGs are following two models.(Swarleen kaur)

According to the first model, each member of the group has to deposit at least Rs. 100 per month in a bank account. In Punjab, some SHGs in the places like Banur, Mohali, Ropar, Noorpur Bedi, Mullanpur have been working for last few years , having a good cash reserve and provide loans to the members at a rate of interest of two percent. According to the second model, the member has to make some products like pickle, jams, phenyls, detergent etc. and sell them to the market. The earned profit is distributed among the members of the group. In Ludhiana, district of Punjab, SHGs of women are working on this model. STEP project is executed in Punjab by Milk fed. Women have happily deposited RS. 100 in a bank account and now they easily borrow money for buying buffalos, or something income generating activities.

Fatehgarh Sahib, district of Punjab, has the large number of SHGs as compared to any other district in Punjab. SHGs approach is a successful approach in Punjab, has given socio economic empowerment to the women of Punjab. NABARD has played a significant role in promoting SHGs in this district. NABARD has helped the SHGs in skill up gradation through training and development programs provided to the members. In Fatehgarh Sahib, SHGs are by 10-20 women members and loans taken by then ranges between 35000-40000. The main economic activities are performed by them are dairy farming, embroidery, cutting, sewing etc. (fathegarhsahib.htm)

The performance of SHGs are evaluated on the basis of regular meetings, proper recording of books and minutes of meetings, active participation by members in the groups, savings ,loans for income generating activities and timely repayments of the loans. These are the measures on which performance of SHGs can be evaluated by the banks at the time of granting loans to them.

SHG is relatively a new concept in Punjab. The NABARDs SBLP (self help group bank linkage program) had been started in Punjab in 1999. The SBLP has been affected through a commercial bank, co-operative banks and regional rural banks.

Table No: Status of SHGs and Loan Disbursement of Punjab from 1998 to 2017

Year	Cumulative no. of SHGs credit linked	Cumulative loan disbursement (in millions)
1998-99	1	0.04
1999-2000	19	1.02
2000-01	90	2.65
2001-02	407	19.05
2002-03	842	40
2003-04	1648	82.96
2004-05	3091	145.76
2005-06	4561	238.86
2006-07	6454	356.60
2007-08	8965	620
2008-09	11192	833.64
2009-10	12982	1028.09
2010-11	15630	1350.18
2011-12	17813	1588.37
2012-13	19834	1816.26
2013-14	21342	1967.12
2014-15	24011	2303.62
2015-16	26667	2681.98
2016-17	29251	2932.07

Source: NABARD

While interpreting the above table, it has been observed that over the period of 19 years, compound annual growth rate of credit linked SHGs is 71.81% and the compound annual growth rate of loan disbursement is 80.33% in Punjab.

A) Impact of SHGs on the various dimensions to eradicate poverty is as follows:

1. **Impact on economic empowerment-:** There is a positive impact of being a member of group on economic empowerment as women's control on income, access to family resources, and their contribution to family income has enhanced.

2. **Impact on socio cultural empowerment-:** Women's freedom for literacy has increased and discrimination against daughter's education and birth has reduced.

3. **Impact on interpersonal empowerment-:** Participation in family decisions, freedom on spouse selection, selection of marriage timings, use of contraceptive and choice for abortion has improved to some extent.

4. **Impact on legal empowerment-:** awareness of legal and democratic rights has spread among women.

5. **Impact on political empowerment-: the** right to vote and family support for political engagement has improved.

6. **Impact on psychological empowerment-:** URWEGO in Rwanda found that the great impact of the program was on self esteem. Self esteem of the 69% of clients has increased. Women are more aware of social injustice now.

7. **Impact on well being-:** Access to savings and credits has enabled them to use the money for their own wellbeing as well as their kids.

B) THREATS/WEAKNESSES

1. Credit risk-: As we know borrowers belong to a very poor section of society, hence the chances of default in repayment have increased.

2. Lack of awareness-: Rural people are mostly illiterate. So lack of awareness is one of big problem.

3. Unequal geographical distribution of MFIs in India-: Microfinance sector in India is still facing a problem of unequal geographical distribution of MFIs. Most of the MFIs are located in the southern part of India.

4. Improper usage of loan-: Loans disbursed by groups do not serve the purpose of micro loans. These loans might be used for consumption purpose rather than a productive purpose.

5. Lack of access to funding-: The real threat in the growth of SHGs is the lack of access of financial support by concerned agencies to the MFIs.

6. High transactional cost-: High operational cost is the big challenge for the microfinance sector. The real problem is the fixed cost, which is very high whereas the volume of transactions is very small.

7. Credit policies-: Stringent credit policies are gradually ruining the microfinance business. Many clients cannot pay the installment in time and suppliers are very rude to them.

8. High interest rates-: Microfinance loans are given without collateral securities, as the high transaction cost leads to a high rate of interest, which is very difficult to pay by poor people.

9. Lack of support-: Lack of support from the family leads to mental stress among the women, as they are unable to balance the home and SHGs activities.

10. Lack of skill-: Poor women are not trained to do some work because of lack of knowledge, training and skill. These factors negatively influence the microfinance initiatives.

11. Intra group disputes-: Conflict among the members leads to intra group disputes.

12. Lack of distribution channels-: Products manufactured by the group members remain undistributed to the final customers as the less marketing channels available. They feel discouraged as they don't get right price of the products.

C) SUGGESTIONS

1. It is very important for smooth functioning of microfinance program to reach poor women and men, give them access to credit for their betterment.
2. Awareness of microfinance program and its benefits should be spread among the people especially women. Women must be aware about such program.
3. Process of forming of SHGs must be systematic; SHGs must be formed by NGOs or banks.
4. Savings is more important than landings. Saving habits has to be inculcated among the women, as they can use their own funds in the time of emergency.
5. Microfinance has to be fulfilled the current demands of women like health and education.

For women empowerment, women have to be contributed in national income.

6. Training programs should be organized periodically for group leaders as well as group members.
7. Credit policies should not be stringent too. These should be flexible.

Reduction of operational cost and interest rates will improve the repayment rates.

Women's leadership has to be promoted in the MFIs.

8. Guidance should be given to the women how to balance work life and family life.

Basic education and literacy programs should be organized for them.

9. Abilities of the women should be enhanced to use technologies for which finance is required.

10. Institutional credit facilities should be promoted for the women to develop their skills for prompt repayment.

11. Subsidized loans should be given to women under various government schemes.

Proper infrastructure facilities should be provided to the women for implementing the various schemes like dairy farming, tailoring, poultry farming etc.

12. Income generating activities for women should be based upon the available local resources.

13. Savings among the members of the SHG's must be encouraged.

II. CONCLUSION

Women empowerment in respect of social, political, economical, and psychological aspects is an urgent requirement of modern society. Spreading awareness among women is the most urgent need of the modern society. With microfinance through SHGs, women have become more confident and stable. There are many evidence that women's skill, contribution towards family income, participation in family decision making and their status in the society have been improved after obtaining microfinance. Majority of the respondents are of the opinion that financial awareness about savings, credit, and insurance has improved a lot. Better communication skills, health, education and financial literacy among women have been improved. Although microfinance sector is rapidly growing but there are so many problems like illiteracy, lack of awareness, lack of resources etc. Eradication of these problems may uplift the standard of living of the poor women. There is still a big gap between demand and supplies in India as the southern part of India has shown more growth in a comparison to northern India. MFIs are still lagging behind in reaching to the needy in real (Mittal 2014).

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A Study of Spiritual Quotient in Relation To Academic Achievement of Class 10+2 Students

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Abstract: Spirituality is one of the inner needs of human and it gives a security of superior level of predisposition of cognitive development, moral, affective and helps to people know about their existence. Academic achievement is considered as a key criterion to judge one's total potentialities and capabilities. Spiritual intelligence plays a important role for the success of a student. This paper highlights the relation of spiritual quotient in relation to academic achievement of class 10+2 students. The sample comprised of 200 senior school students (100 from government schools and 100 from private schools) randomly selected. For the present study self constructed Spiritual Intelligence test by investigator and academic achievement of students of 10+2 class based upon their previous class academic achievement used to assess the spiritual quotient in relation to academic achievement of 10 + 2 class students. Data was analysed by mean, standard deviation, 't' ratio and coefficient of correlation(r). The outcome obtained for coefficient of correlation(r) between spiritual quotient and academic achievement of 10+2 students for government and private schools is 0.357 which revealed that there is significant correlation between spiritual quotient and academic achievement of students. Students with more spiritual intelligence can achieve better than students with less spiritual intelligence.

Keywords: Academic Achievement, cognitive development, Intelligence, Spirituality, Spiritual Quotient,

I. INTRODUCTION

Today, the world is becoming competitive. The personal progress is measured in the terms of performance. Everybody in this world wants to reach at higher level of performance. Parents are expecting high level of achievement from their children. This phenomenon puts a lot of pressure on teachers, parents & students. Now in these days co-scholastic areas of students are also assessed with scholastic areas. For this purpose researchers and schools are doing efforts to help the students to achieve better in their educational field.

Several factors affect the performance of students, like- home environment, intelligence and conscientiousness etc. There is a question for researchers, "which factor promotes achievement in students?" How far do the different factors contribute towards academic achievement? So many factors have been hypothesized and researched upon. A complete and comprehensive picture of academic achievement still seems unclear to researchers. The search therefore continues. Achievement of students is the outcome of education - the extent to which a student, teacher or institution have achieved their educational goals. In view of achievement of students it is very useful to undertake a synoptic view of the researches conducted in the field so far, as this will indicate the areas where researchers could concentrate.

II. SPIRITUALITY

Spirituality refers to spirit, mind higher faculties, soul and highly refined thoughts and feelings. Spirituality implies habitually or natural looking to things of the spirit. It means awareness of the incorporeal and the concept that spirit exists independently from matter. Spirituality also means to be free from sensuality and to be concerned with the human spirit. The practice of spirituality to understand one's identity as a spirituality being or soul, to consider all other as spirituality brother and

sister and focus on our collective and original spiritual qualities of peace, purity, love and light.

Characteristics of spirituality

a) Spirituality requires personal responsibility: Spirituality requires self disciplined because it is inner work. Taking up spirituality means to be motivated to study to meditate and to spend time checking one's conscience.
b) Spirituality to subtle: The practice of spirituality is essential to strengthen ones conscience and to enable one to hear its small inner voice.
c) Spirituality is individual: One has a unique relationship with truth, with the divine and one's inner self. The process of spiritual practice brings one face to face with one's character and post actions.
d) Spirituality is a connection with Divine: Spiritual person is the one who has a personal experience of with Divine, which includes that dimension of human experience outside the range of sense perception.
e) Spirituality awakens conscience: Spirituality practice awakens and strengthens the conscience, enabling it to function as the moral and ethical inner guide.
f) Spirituality is universal: Spirituality refers to truth and realties that apply to all people at all times and in all places. Spirituality is not blind faith.
g) Spirituality is fearless: Spirituality based people are not fear -based. A spiritual person is not bound by tradition but is free to investigate and be open-minded.
h) Spirituality leads to happiness: One of the prime consequences of leading a spiritual life is profound self-acceptance. This in turn generates feelings of peace and happiness that are not based on anything external, such as fame, position or worldly power.

SPIRITUAL INTELLIGENCE: Spiritual intelligence relies on the concept of spirituality as being distinct from religiosity. Spiritual intelligence is the adaptive use spiritual information to facilitate everyday problem solving and goal attainment (Robert Emmons,2000). Spiritual intelligence is spiritual intelligence is concerned with the inner life of mind and spirit and its relationship to being in the world (Frances Vaughan, 2002). Spiritual intelligence is the central and most fundamental of all the intelligences, because it becomes the source of guidance for the other (Stephen Covey,2004). Spirituality education is the life long process of putting together pieces from our experiences and learning to form a jigsaw map of values rind meetings(Michael Beasley ,2001). We use this emerging map to guide us on our journey of response to life's ultimate question. Without the opportunities to be inspired and grow in understanding of one-self and a developing ability to understand others, personal and social development will remain stunted. Deprived of experience of wonder, awe and mystery children will lead dull uninspired and spiritually impoverishes lives. Spiritual Quotient (SQ) is a higher dimension of intelligence than regular Intelligence Quotient(IQ) and Emotional Quotient(EQ) with wisdom, compassion , integrity and peace. Spiritual intelligence is therefore the key to personal and professional success and fulfillment.

ACADEMIC ACHIEVEMENT: Our society is changing very rapidly. There is an age of competition. In our rapidly changing society and world with the advancement of science and technology the people have become educational minded. Academic achievement has been considered a vital factor in life and is the most important a vital factor in life and is the most important goal of education. Every parent sets high goals towards his/her child. At every step in life, academic record speaks for individual. At the time of admission for entrance of a job, for scholarship and for further studies, good academic result is the only recommendation. So, used in broad sense of educational growth, the term academic achievement refers to the acquisition of all the behavioral changes associated with cognitive, affective and psychomotor domains.

Academic achievement is the proficiency of performance in a given skill on body of knowledge. It can also be stated as ‘status’ on level of a person’s learning and his ability to apply what he has learnt. Achievement is any behavioural change which takes place in an individual as a result of learning experience of various kinds. It is the extent to which a learner is profiling from instructions in a given area of learning. The achievement is considered to be the product of learning attitudes and interest because they are learned, acquired, retained and forgotten just as knowledge and skills. Thus achievement means a

person's level of skill or range and breath of information and what he has accomplished in a designated area of learning behavior. Theoretically achievement has two aspects such as absolute commonly interpreted in terms of academic or educational age or test scores (Biswas and Aggarwal,1971). Academic achievement is a complex and multidimensional phenomenon. It is a product of the interaction between several factors operating in the pupil, such as abilities, motivation, interest and attitude and a complicated set of forces, operating in functional set up of In absolute terms the marks or grades earned by a pupil as assigned to him by teachers on the basis of his written or oral performance in a particular situation are taken as measure of his absolute achievement. A relative measure however is only a myth. When a learner's written or verbal response on answer to a question is judged in terms of marks, the teacher is consciously or unconsciously comparing the response to some other response.

Academic achievement is the outcome of education - the extent to which a student, teacher or institution has achieved their educational goals. Achievement means the extent to which the learner is profiting from instructions in a given area of learning (Crow and Crow,1956).In the dictionary of education, academic achievement is referred to as: Knowledge attainment or skill developed in the school subjects, usually designated by test scores or by marks assigned by teacher or by both and the achievement of pupils in the so called 'academic' subjects such as reading arithmetic and such areas as industrial arts and physical education. (Carter V. Good,1959). The level of academic achievement of pupils in most pupil, such as abilities, motivation, interest and attitude and a complicated set of forces, operating in functional set up of school. In view of the importance of education and academic achievement, it becomes necessary to identify factors which differentiate or affect the individual in the level of achievement. The level of achievement can be affected by psychological factors like intelligence, learning ability, aptitude, study habits etc. The environmental factors also affect the achievement level of students. These environmental factors are socio economic conditions, educational facilities, examination system, personality of teachers etc. We can say that academic achievement is one of the most important goals of education. It is the core of the educational growth. It encourages the students who work hard and bear more. It also helps the teacher to know whether their teaching methods are effective or not and help them in bringing improvement accordingly. It helps both the teacher and students to know where they stand.

III. LITERATURE REVIEW

Bodhananda(2004) through the yoga of detachment recommended that, one accomplishes three levels of intelligence. Level one is the pursuit of excellence, the second level is one's ability to keep one's mind calm under all circumstances, gathering no stress while actively engaged in life, the third level is that of accessing the spirit. The three levels may alternately be called (1) Analytical and/or Technical intelligence (2) Emotional Intelligence (3) Spiritual Intelligence.

Kaur (2004) in "The impact of life lessons on emotional and spiritual intelligence of adolescents" concluded that emotional intelligence and spiritual intelligence could be improved with the help of life lessons.

Sunita (2004) administered a spiritual intelligence scale having 15 multiple choice items and found that (a) those individuals having scores between fifty to sixty are more spiritually adapted and act with spiritual intelligence through sensitivity, compassion and understand (b) individual having scores between 35 and 50 are seekers and striving to strike a balance in materialism and spiritualism (c) individuals having 35 and below seems to be driven by ego rather than any spiritual sense.

Gakhar and Manhas (2005) carried out a study on 400 students of class XI of various private and government schools both in urban and rural areas of three districts of Jammu and Kashmir. The major findings were: (a) Significant and positive correlations were found between emotional intelligence and all the cognitive variables

namely, intelligence, creativity and academic achievement. (b) No significant difference was observed between boys and girls with respect to emotional intelligence. (c) A significant difference was observed in the emotional intelligence of adolescents studying in private and government schools, with the private school students scoring higher. (d) A significant difference was observed between the emotional intelligence of science and arts students, with the science students scoring higher. (e) No significant difference was observed

between adolescents of rural and urban areas and scheduled and non-scheduled caste.

Sreeja(2005) has conducted a study on "Spirituality, emotional maturity, and quality of life among university students at the Department of Psychology-University of Kerala. The results show that there was significant difference between boys and girls in spirituality; but no significant difference between boys and girls in emotional maturity-and quality of life. It was found that spirituality and emotional maturity are independent of religion, but significant correlation was found between spirituality and emotional maturity.

Adeyemo and. Adeleye (2008) investigated EI, religiosity and self-efficacy as predictors of psychological well-being among secondary school adolescents. The study made use of stratified, random sampling in selecting 292 adolescents from 10 secondary schools in Ogbomoso, Oyo State, Nigeria. The results indicated that the three independent variables as a block were effective in predicting psychological well-being of adolescents. Emotional intelligences religiosity and self-efficacy have significant relationship with psychological well-being.

Saidy, Hassan, et al. (2009) in their paper discuss the importance of emotional and spiritual intelligence from the national education philosophy towards language performance of secondary school students. The awareness of the needs to enhance secondary school student's language skills through emotional and spiritual balance should be given emphasis in the current educational system.

Animasahun (2010) investigated the extent to which I.Q, E.I. and S.I. would jointly and relatively predict prison adjustment among Nigerian prisoners. The results of the study revealed that I.Q, E.I. and S.I. are potent predictors of prison adjustment. All the independent variables of the study have significant positive correlation with the dependent variable and also among themselves.

Kaur,B. (2011) in her study of mental health, emotional and spiritual intelligence of government and denominational secondary school teachers found that: (a) There was a significant difference in the emotional intelligence of teachers on the basis of gender and type of school. (b)There was a significant difference in S.I. on the basis of gender and in government secondary schools male teachers scored high in comparison with denominational secondary school teachers. (c) A significant correlation was found between mental health and emotional intelligence of male and female teachers of both types of schools. (d) Positive correlation was found between mental health and E.I. of teachers of both the type of schools but no significant correlation was found in case of male teachers of both types of schools. (e) No correlation existed between E.I. and S.I. of male teachers of both' types of schools but female teachers who scored high on E.I. also scored high on S.I.

Arjinder (2013) Investigated that the students with high level of spiritual intelligence had significantly better mental health, emotional stability, overall adjustment , autonomy, security-insecurity and self concept than the students with low level of spiritual intelligence.

IV. METHODOLOGY ADOPTED

In the present research, to examine the relation between spiritual intelligence and academic achievement of 10+2 class students of government and private schools following method and tools were used.

A. METHOD OF STUDY

Descriptive survey method has been used for the conduct of present study. The administrations of the respective institutes were informed and verbal consent to conduct the study was taken. Consent was also taken from the respondents after explaining to them the purpose of the research as well as the academic use of the data later on. Both the measures were given individually to the subjects. They were assured that their responses would be kept confidential and that it was purely for educational research purpose. Instructions were read aloud by the investigator and simple clarifications of word meanings were given on request without influencing subjects responses. Scoring was done as per given in the questionnaire.

B. TOOLS USED

Spiritual Intelligence Test: This test was constructed by the investigator herself.

Selection and classification of the content, Construction and Editing of Statements:

After consulting many books related to different religions, magazines, religious persons, teachers, parents and friends 120 relevant items were developed. Then each statement was read carefully and edited in relation to working and meaning. These statements were given to 10 judges, teachers and expects for judging the relevance of statements. Then the relevant statements with

appropriate instructions were got printed. These statements were given to people belonging to different religions. They were asked to rate to each item on the basis of 3 points scale i.e. Agree (A), Undecided (UD) and Disagree (DA). 3, 2, and 1 marks were given for favourable statements. After collecting the test the best suited 60 items were them selected and these statements were checked.

SCORING

The responses are to be given on the booklet itself by marking tick ( ) on the selected box. The terms of the scale are so stated that if the answer is 'Positive', say 'agree' a score of 3 is given, for 'undecided' 2 is given and for 'disagree' 1 is given. Similarly for 'negative' answer a score of 1 is awarded for 'agree' 2 for 'undecided' and 3 for 'disagree'. Therefore the higher the score, the greater the spiritual intelligence. Negative statements for which 1(A), 2(UD), 3(DA) marks were given are 1, 3, 11, 13, 19, 27, 29, 30, 32, 33, 43, 47, 51, 52, 57, 58, 60. Rest of the statements are positive and 3(A), 2(UD), 1(DA) marks are given .

Academic Achievement:

Academic achievement of 10+2 students is measured on the basis of marks obtained by the students in previous class i.e. 10+1 class.

C. STATISTICAL TECHNIQUES USED

In order to test the hypotheses following statistical. techniques were used for analyzing the data.

(i) Arithmetic Mean
(ii) Standard Deviation
(iii) t - ratio
(iv) Coefficient of Correlation

V. ANALYSIS AND INTERPRETATION OF DATA

Table 1 reveals that there is no significant difference in Spiritual Quotient of 10+2 class students of government and private schools as t-ratio is found to be insignificant at 0.05 level. It means that 10+2 class students of government and private schools have same S.Q.

Table 1: Showing values of mean S.D. and t-ratio to locate difference in S.Q. of 10+2 class students of government and private schools.

Variables	N	Mean	Standard deviation	t-ratio
S.Q.(Govt. Schools)	100	143.7	10.262	0.719
S.Q.(Private Schools)	100	143.6	9.489	

Reasons for the above mentioned results may be that the age level of students studying in government and private Schools is same. So, their spiritual intelligence quotient is almost same and the other reason may be that environment plays an important role to develop spiritual intelligence. In both the schools environment may be same for the development of spiritual intelligence.

Figure 1 shows the Mean scores of S.Q. i.e. 143.7 of and 143.6 of 10+2 students of government and private schools respectively:

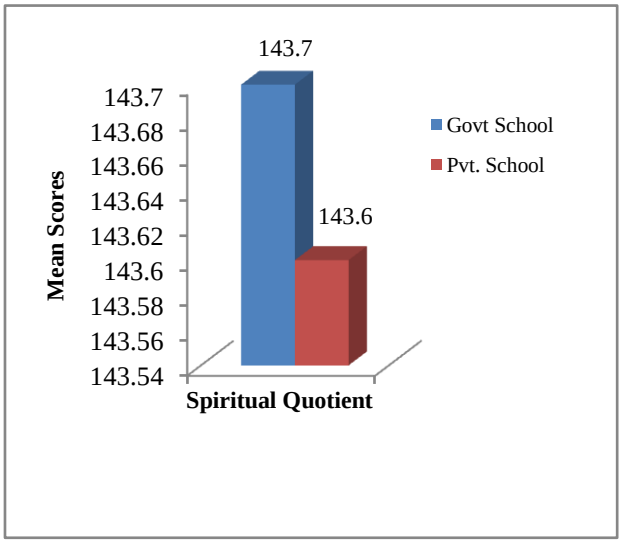

Figure 1

Table 2 reveals that there is significant difference in the academic achievement of 10+2 student of government and private schools as t-ratio is found to be significant at 0.05 level(t=2.46). It means that 10+2 students of government andpPrivate schools differ in their academic achievement. Figure 4.6 shows the mean scores of academic achievement i.e. 54.7 and 57.9 of 10+2 students of government and private schools.

Reasons for the above mentioned results may be that the private schools concentrate more in good academic results due to this the teachers of private schools make use of various innovative methods to make teaching-learning process more interesting. They develop the spirit of competition in their students. private schools motivate, inspire and encourage students more as compared to government schools. On the other hand Government schools do not take any such kind of pains even though they are also getting the cream of the city.

Table 2: Showing the values of mean, S.D and t-ratio to locate difference in academic achievement of 10+2 class students of government and private schools respectively:

Variables	N	Mean	SD	t-ratio
Academic achievement (Govt. School)	100	54.7	9.3	2.46*
Academic achievement (Pvt. Schools)	100	57.9	8.5	

***Significant at 0.05 level**

Figure 2 showing bar diagram of difference in mean scores of academic achievement of 10+2 class students of government and private schools respectively:

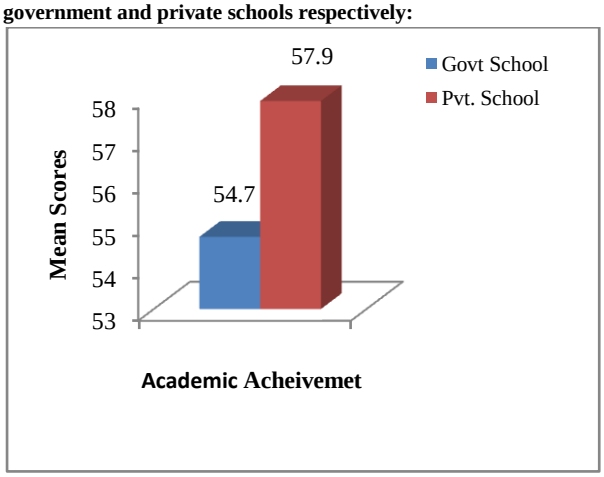

Figure 2

Table 3 reveals that coefficient of correlation is 0.357, which is significant at 0.01 level. Hence, our hypothesis is not accepted and it is clear that there is significant correlation between S.Q. and academic achievement.

Table 3: Showing coefficient of correlation between S.Q. and academic achievement of 10+2 students.

Variable	N	df = (N-2)	Coefficient of Correlation (r)
S.Q. and academic achievement	200	198	0.357**

**** Significant at 0.01 level**

This result shows that spiritual intelligence also affects the achievement of the students. Students with more spiritual interest can achieve better than students with less spiritual interest. The reason for the above mentioned result may be that a spiritual person concentrates more on his work rather than looking into other's work. A spiritual person always tries to achieve his goals by simply concentrating on the way to achieve the goals. Hence negative emotions like fear, jealousy, anger etc. do not affect a spiritual person. So, a spiritual person is able to channelize his energies in proper way and thus achieve better academic results. So, it may be one of the reasons that spiritual intelligence also affects the academic achievement of the students.

VI. CONCLUSION

The purpose of the study was to study spiritual quotient in relation to academic achievement of class 10+2 students of government and private schools. Spiritual values are important to the growth of students and have meaning far beyond the scope of one achievement test score. Academic achievement is self perception and self evaluation of one's objective academic success. Educators need to embrace all factors that may influence academic success. Results revealed that students of 10+2 class of government and private schools have same spiritual quotient but they differ in their academic achievement. The result for coefficient of correlation(r) between spiritual quotient and academic achievement of 10+2 class students for government and private schools is 0.357 which revealed that there is significant correlation between spiritual quotient and academic achievement of students**.** Higher spiritual intelligence is associated with higher academic achievement of students and thus improves the quality of academic achievement.

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Growth Rates of Economic Sectors: A Case of Punjab

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Abstract: Punjab has attained remarkable growth since independence. This growth is a result of green revolution and adoption of new technology. The contribution of Punjab economy to Gross State Domestic Product (GSDP) was 26.93 per cent in the year 2015-16. Punjab economy is considered as the food bowl of India from decades. Punjab is considered as the state of painstaking farmers who have carried out incomparable efforts to bring the state an identity on the global picture. The enhancement in the inputs, irrigation facilities, technology and pulsating policies of the government has led the state to get a dominating and role model position in the country. Punjab is endowed with fertile land and a favorable climate to grow a large number of cereals, fruits and vegetables, oil seeds, pulses and maize etc. The state has basic raw materials, man power as well as a vast consumer market, which are the necessary pre-requisites for the industrial production. The vast potentials of resources available in Punjab can be better utilized by sustainable usage of available technologies. The present study discusses the contribution of three major sectors at the state and national level. The comparative analysis of sector wise growth of Punjab with India and status of growth rate of primary, secondary and tertiary sectors during 10th, 11th and 12th five year plans has been performed.

I. INTRODUCTION: PUNJAB'S ECONOMY

Punjab is one of the northernmost states of India. The confluence of five rivers makes Punjab's agricultural land rich and productive. Approximately 82 per cent of the state's land is under cultivation compared with the national average of 40 per cent.By 2025, it is expected that the state will be among the leading producers of non-food grains as well as exporter of various agri-products. Occupying only 1.5 per cent of India's geographical area, the state accounts for about 17 per cent of the country's wheat production and 11 per cent of rice production. This makes it suitable for agro-based industries, dairy farming and products, and other food processing industries.

Punjab has been ranked first in India in terms of infrastructure facilities offered. Punjab's road, rail and air transport network, connectivity, construction of bridges and infrastructure facilities are rated among the best. As of June 2016, Punjab had a total installed power generation capacity of 12,936 megawatt (MW).The state has attracted Foreign Direct Investment (FDI) equity inflows worth US$ 1.35 billion during the period April 2000 to March 2016, according to data released by Department of Industrial Policy and Promotion (DIPP).Punjab has easiest

Procedures to set up a business, according to a study by the World Bank and KPMG. Punjab had set up a Bureau of Investment Promotion (BIP) in December 2013 for one-stop clearance of investment proposals. Punjab has emerged as a key hub for textile-based industries including yarn, readymade garments and hosiery. With the development of apparel parks, favourable textile policy and other incentives for the creation of textile infrastructure, the state offers opportunities for investment.The average gross state domestic product (GSDP) growth rate for the state of Punjab was about 10.12 per cent between 2004-05 and 2015-16. The state provides investment opportunities in sectors such as textiles, agro-based industries, IT & ITeS, automotive and auto components, sports goods and light engineering goods.

Punjab's economy has grown at annual growth rate of 5.23 per cent consistently against the national average rate of 7.8 per cent during the tenth plan period. During Eleventh Plan period the target of growth for the state is fixed at 5.90 per cent against the national target of 9 per cent (now reduced to 7 to 8 per cent). The crisis in the farm sector of Punjab has now started manifesting through falling farm yields on account of soil nutrients and absence of preparation of new seeds varieties (which is necessary for boosting the yield every year), depletion of ground water resources and mounting farm indebtedness. The present agriculture system is increasingly becoming ecologically and even economically unsustainable. However Punjab hopes for resurging as a front runner up state in economic growth that hinges on rejuvenation of its agriculture sector as well as successfully expanding its manufacturing and service sectors thus bringing about drastic structural changes in the primary sector.

Table -1 Sector-wise Growth Rates-1980-81 Onwards (At Constant Price Percent per Annum

Year	PUNJAB				INDIA			
	PRIMARY	SECONDARY	TERTIARY	OVERAL L	PRIMARY	SECONDARY	TERTIARY	OVERALL
At 1980-81 Prices								
1981-82	10.57	13.13	3.58	**8.92**	6.2	7.59	4.96	**6.1**
1982-83	3.16	1.49	4.44	**3.19**	(-)0.69	4.3	6.5	**3.1**
1983-84	-0.85	7.12	4.05	**2.24**	10.43	9.17	5.15	**8.18**
1984-85	10.95	4.49	3.61	**7.35**	0.03	6.3	6.27	**3.84**
1985-86	8.41	12.93	3.38	**7.88**	0.52	4.53	7.41	**4.08**
1986-87	-0.61	7.12	7.99	**3.48**	(-)1.02	6.9	7.59	**4.28**
1987-88	4.73	5.14	5.57	**5.07**	0.53	6.64	6.08	**4.32**
1988-89	3.2	11.36	5.79	**5.39**	16.26	8.72	7.27	**10.65**
1989-90	10.84	6.88	3.42	**8.14**	1.99	10.48	8.86	**6.89**
1990-91	-1.32	3.39	3.36	**1.11**	4.17	7.01	5.21	**5.36**
1991-92	8.07	3.05	1.54	**4.99**	(-)1.98	(-)1.66	4.94	**0.82**
1992-93	2.26	9.87	4.62	**4.71**	5.75	4.42	5.44	**5.26**
1993-94	3.89	8.8	3.53	**5.01**	3.56	6.91	7.74	**6.17**
At 1993-94 Prices								
1994-95	2.03	4.79	3.01	**2.95**	5.32	9.26	7.01	**6.98**
1995-96	0.05	8.85	6.76	**4.16**	(-)0.35	12.47	10.31	**7.31**
1996-97	7.03	3.04	10.82	**7.35**	8.84	6.56	7.14	**7.51**
1997-98	)4.50	10.55	7.74	**3**	(-)1.47	3.6	9.78	**4.77**
1998-99	3.5	10.65	5.09	**5.59**	5.91	3.84	8.34	**6.5**
At 1999-2000 Prices								
1999-2000	7.28	(-)0.76	8.31	**5.63**	0.57	4.95	10.06	**6.07**
2000-01	1.42	5.66	5.32	**3.93**	(-)0.02	6.75	5.65	**4.35**
2001-02	0.84	(-)2.08	5.21	**1.92**	5.86	2.82	7.1	**5.81**
2002-03	)1.15	3.02	6.25	**2.85**	(-)5.89	6.89	7.47	**3.84**
2003-04	5.77	6.85	5.92	**6.07**	9.29	7.8	8.49	**8.52**
2004-05	2.16	10.1	4.52	**4.95**	0.79	10.54	9.13	**7.47**
At 2004-05 Prices								
2005-06	0.95	11.2	6.64	**5.9**	4.64	10.68	10.91	**9.48**
2006-07	2.85	21.4	8.69	**10.18**	4.58	12.66	10.06	**9.57**
2007-08	3.84	16.6	7.52	**9.05**	5.52	10.27	10.27	**9.32**
2008-09	2.05	4.22	9.57	**5.85**	0.36	4.66	9.98	**6.72**
2009-10	2.82	8.79	8.63	**6.29**	1.47	9.46	10.5	**8.59**
2010-11	1.65	6.27	9.44	**6.52**	8.32	7.64	9.67	**8.91**
2011-12	1.81	2.38	11.82	**6.52**	4.36	8.49	6.57	**6.69**
At 2011-12 Prices								
2012-13	0.87	2.23	8.56	**5.32**	1.2	4	8.1	**5.6**
2013-14	3.71	3.67	6.94	**6.32**	4	5.3	7.8	**6.6**
2014-15	-3.4	3.59	8.94	**4.92**	1.4	5.4	10.3	**7.2**
2015-16(A)	5.22	3.14	6.29	**5.96**	2	7.4	9.2	**7.6**

Statistical Abstracts, Government of Punjab, Various Issues

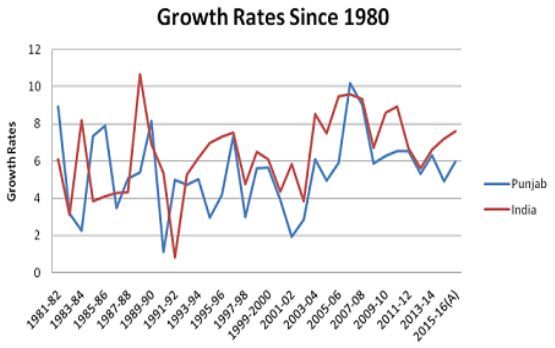

Figure 1.1 depicts the growth rates of Punjab and India since 1980.

A) Trends in Primary sector

Punjab has recorded a very high rate of growth in agriculture since the inception of planning in 1950/51. It was during the 1950s that the basic institutional and economic infrastructures were created in agriculture through land reforms and massive public investments. These investments were made in development of irrigation and electric power, foundation of agricultural research and extension services, strengthening of the cooperative credit structure, and expansion of markets. Simultaneously, land reform legislation was passed and put into effect. Because of large-scale investment in irrigation and other rural infrastructure as well as changes in institutional structure, Punjab was able to record an agricultural growth rate as high as 4.6 percent during 1950/51-1964/65— long before the onset of the "green revolution." Both area expansion and yield increases contributed to this growth.

The introduction of the new seed-fertilizer technology in the mid-1960s marked the beginning of a new chapter in the history of Punjab agriculture. Under the impact of technological improvements from the late 1960s, there appears to have been an unparalleled rise in agricultural production and productivity. Some of the salient features are described below:

First, with adoption of the new production technology during the late 1960s there was a remarkable expansion of area under wheat and rice, while the cultivation of most other crops (for which there was a conspicuous absence of improved technology) registered a slow but persistent decline. It was the technology-price-profitability advantage of rice and wheat over other crops that

was reflected in differential growth in area and output of various crops.

Second, as expected with improved technology, yield rates grew impressively in rice and wheat compared with most other crops.

Third, as a result of rapid growth in both area and yield, the output growth for wheat and rice since the late 1960s has been dramatic.

By 1984/85, these two crops had become the predominant crops of the state and accounted for the major proportion of the total value of agricultural output. The expansion in area under wheat and rice, for which new technology was available, not only necessitated increasing purchases of modern inputs from other sectors of the domestic economy and from outside the state, but also generated increasing levels of marketable surpluses of these crops. As a result, Punjab agriculture became increasingly commercialized and interlinked with the national market. During the year 2015-16 the agriculture sector has witnessed 5.22 per cent growth, which was the highest as compared with growth rates during one decade.

B) Trends in Secondary sector

This sector covers the manufacturing, construction and power sectors. Although Punjab is primarily an agrarian state, yet its future lies in the development of industry mainly through development of agro-based, service and knowledge based industries.

During 1960/ 61-1983/84, income from registered manufacturing in Punjab grew at an annual rate of 7.8 percent, while that from unregistered manufacturing increased at a rate of 6.7 27 percent. During this period the growth rate of income from manufacturing in India as a whole was only 4.3 percent. The nature and composition of manufacturing has undergone a notable change, especially since the advent of the green revolution in the mid-1960s. The 1960s witnessed a phase of rapid agro-industrialization, and the output of small units manufacturing agricultural tools and implements showed particularly fast growth in response to mounting demand from rapidly growing agriculture. In addition, the increase in rural income led to much higher demand for consumption goods. Consequently, many small-scale consumer goods industries came into being. The agro-industries manufacturing agricultural implements and machine tools, fertilizers, pipes and fittings, and automobile parts, and the processing industries such as cotton textiles, sugar, wheat flour, and rice-shelling grew continuously over the 1960/61-1983/84 period. With the establishment of some new large industries such as fertilizers, electronics, and tractors in the public sector, and the expansion of the private sector in textiles and hosiery because of export demand, many consumer goods industries in the registered sector also started to grow rapidly.

Large & Medium Scale Units: There were 586 large and medium scale units during the year 2006-07, with a fixed investment of Rs. 25000 crore which provided employment to 2.31 lakh persons with a turnover of Rs. 37500 crore. Small Scale units Industrial Scenario in Punjab is dominated by Small Scale Industrial units. Promotion of small scale industries has been regarded as an important element of the development strategy. During the year 2006-07, there were 205222 Small Scale Units with a fixed investment of Rs.5500 crore which generated employment to 9.64 lakh persons with a production value of Rs.35000 crore.

A few reasons can be advanced for manufacturing growth lagging behind expectations:

- The first is import leakages.
- Second, because of the extraordinary increase in output in many cases, the existing processing capacities fall far short of requirements. For example, as of January 1, 1983, with a 16.2 percent share in the production of raw cotton, Punjab had only 1.7 percent of all installed spindles and 0.6 percent of all looms in India. With 21.4 percent of wheat output and a 62.0 percent share in wheat procured by the Food Corporation of India, the state had merely 5.8 percent of the roller flour mill capacity in the country. With the recent development of a new variety (COJ 64), Punjab has emerged as one of the most efficient producers of sugarcane, but with 3.4 percent of total cane output, the state had only 1.8 percent of the national capacity for cane conversion. Thus lack of investment in agro-processing seems to be one important reason for the slower-than-expected growth rate of manufacturing.

- Other reasons are perhaps sociological. It takes a long time for peasant societies to switch over to the regular rhythm and discipline of industrial culture. Also, the tensions in Punjab during the 1980s have certainly resulted in further reducing industrial investments in the state and in driving away prospective entrepreneurs.

In the year 2015-16, Secondary sector has observed 3.14 per cent of growth which has been considered very low when compared with the year 2006-07.

C) Trends in Tertiary sector

From 1960/61 to 1983/84, while income from the tertiary sector as a whole recorded an annual growth rate of 6.8 percent that from trade and transport grew at a rate of more than 6.5 percent, banking and insurance at 8.1 percent, and public administration at 8.6 percent. Growth of the tertiary sector is an essential concomitant of a growing economy. For example, the rapid growth of trade and transport is in response to marked increases in marketed agricultural surpluses, much larger activity in agro-processing and agro-input industries, and increased flow of exports and imports. Of particular interest in this context is the role of small market villages and towns that lie on main roads connecting larger townships. These villages and towns have gradually become hubs of economic activity, not only in trading and agro-processing and repairs but also in the provision of social services, health, and recreation. In many cases they have emerged as tiny growth centers serving a network of peripheral villages. The rapid growth of trade, hotels and restaurants, and personal services is in response to increased consumption expenditure. Government and private expenditure on education, health, and other services is also rising rapidly. Rapid growth of public administration is primarily due to the growing role of the state in the development process as well as the excessive overstaffing characteristic of developing countries.

The year 2015-16 has reported 6.24 per cent growth service sector. Table 1.1 elaborated that contribution of Territory Sector to GDP has increased during last decade.

II. CONCLUSION

After a long era of simulated stability, the movement of labour away from agriculture - a routeconcurrentwith economic development - has gathered impetusfrom last two decades. The economy is witnessing the occupational shift. Punjab and Indian economy has witnessed similar trend as far as the contribution to GDP is concerned. In the year 2007-08 the contribution of territory sector to total GDP of Punjab was 9.57 and India was 9.98. The territory sector is flourishing, but it cannot help much to engage the budding low and unskilled labour force. Punjab, thus, remains very much an agrarian economy although its share in the Gross Domestic Product (GDP) has declined.

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Attitude of Consumers towards Online Shopping: A Case Study of Punjab

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Abstract: The present study attempted to know an attitude of consumer towards online shopping in three major cities i.e. Ludhiana, Amritsar and Jalandhar cities of Punjab. 600 samples were selected based on snowball sampling. Research design is purely and simply the framework or plan for a study that guides the collection and analysis of the data. The research design indicates the methods of research i.e. the method of gathering information and the method of sampling. Exploratory and Descriptive design was used. Primary data were collected by conducting direct structured interview using questionnaire. All the respondents were asked the same questions in the same fashion and they were informed the purpose of study. The data were collected by using questionnaire as an instrument. A questionnaire method of survey was used to measure the attitude of Internet shopping. The results reveal that there was no significant difference in age, gender, marital status,income and frequency of shopping. Post-graduate respondents are more intended to change their attitude and the customers possessing diploma level education are less intended to change their attitude towards online buying. Salaried persons are having more intention towards change in attitude and the house wives are having less intention towards change in attitude, So the result proves that consumers do not significantly differ in their internet shopping.

Keywords: Online Shopping and attitude of internet shopping

I. INTRODUCTION

E–COMMERCE At the turn of the third millennium, we are poised at one of the most significant changes in our lives - the move to an Internet-based society. Almost everything is changing - at home, in school, at work, in the government — even in our daily and leisure activities. Some changes are already evident around the globe and others are just beginning. Internet from so long is taken as medium for communication, education and entertainment. Along with these uses, internet from few years has also become a medium for exchange of products and services between a seller and a buyer. As a result, Internet has created a new market for both customers and organizations. This cybernetic market is considered as an alternate market to the traditional market. With advancement in internet technology, significant portion of commercial activities are now taking place over the Internet. As an implication a new industry has immersed by the name of E-Commerce Industry.

In other words, E-Commerce has unleashed yet another revolution, which is changing the way businesses trade. It has put impact on the major portion of the world including business, professions, and of course on people. Its impact lies not just in the creation of web-based companies, but it is building a new industrial order.

The World Trade Organization (1998) defines E-Commerce as, "E-Commerce is the production, distribution, marketing, sales or delivery of goods and services by electronic means."

Thus, we can say that E-Commerce is the process of exchanging goods and services between buyer and seller by making use of internet as a medium

for exchange. E-Commerce can be described as commercial transaction in which neither the paper work is involved nor there is a compulsory requirement of physical contact. Unlike the traditional commerce, purchasing through E-Commerce is characterized by the features like anytime shopping, anywhere shopping, accessibility of wide variety of brands and product range, options to pay through credit card, debit card, electronic wallets or by cash on delivery, delivery of product at doorstep, availability of easy and convenient return policy, no intrusion of sales assistant throughout the whole process of purchase.

It has changed the shopping experience of e-shoppers, as virtual stores score on convenience, assortment and price. Brick and mortar retailers can no longer afford to overlook the potential of this medium. Online shopping has truly come of age and consumers are keen to shop on the net. In this retail business, one does not count footfalls. Nor do customers get the real world, touch-and-feel experience of the goods they buy. The shopping ambience, too, is only as good as the customer wants it to be. Still shoppers are flocking to these "virtual malls" in millions. Online shopping is no longer a whim; it is an acknowledged and important part of the retail practice, with more than a tenth of the world's population having bought products and services over the Internet.

ONLINE SHOPPING SCENARIO IN INDIA

In last few years, invention in telecommunication technologies has resulted in variations in many facets of our lives including the way we look for information, the way we book our travel plans and the way we purchase goods and services. Today, no doubt purchasing through brick and mortar retail stores is preferred, but along with it E-Commerce or electronic commerce is spreading its roots as another mode of shopping in India. The most commonly known form of E-Commerce or electronic commerce is online shopping.

The roots of E-Commerce industry today are found around the world. As per the report published by Indian Brand Equity Foundation (2018), the Indian E-Commerce industry has been on an upward growth route and is expected to outdo the US to become the second largest E-Commerce market in the world by 2034. India's E-Commerce industry is likely to grow from US$ 38.5 billion as of 2017 to US$ 200 billion by 2026. India's internet economy is projected to double from US$125 billion as of April 2017 to US$ 250 billion by 2020, majorly backed by ecommerce. E-Commerce industry in India witnessed 21 private equity and venture capital deals worth US$ 2.1 billion in 2017 and six deals worth US$ 226 million in January-April 2018. E-Commerce start-ups in India received US$ 66 million of funding in January-March 2018. Online retail sales in India are expected to grow by 31 per cent to touch US$ 32.70 billion in 2018, led by Flipkart, Amazon India and Paytm Mall. Online retail is expected to contribute 2.9 per cent of retail market in 2018. Considerable growth of the industry has been generated by increasing internet and smartphone penetration. Internet penetration in India grew from just 4 per cent in 2007 to 34.42 per cent in 2017, registering a CAGR of 24 per cent between 2007 and 2017. The number of internet users in India is expected to increase from 445.96 million as of December 2017 to 829 million by 2021.

The above data signifies that online selling is growing its wings in the country at an astounding pace. The most prominent reasons driving the online purchase are discounts & offers offered by the webstores and option to make payment by cash-on-delivery mode. Besides these two reasons, one of the major reasons observed in metro cities, is their busy lifestyle. Also, the rising internet penetration and broadband availability, and increasing culture of Smart phones and tablets are motivating people to buy products online. Also, The Government of India's policies and regulatory frameworks such as 100 per cent foreign direct investment (FDI) in B2B E-Commerce and 100 per cent FDI under automatic route under the market place model of B2C E-Commerce are expected to further propel growth in the sectors.

With reference to latest trends running in Indian online market, according to report produced by sokrati.com in June 2016, Indian men shop online three times more than Indian women. Among the payment modes offered the most preferred one is cash on delivery by Indian shoppers. Indian e-shoppers majorly purchase clothing and accessories. After this, it is mobile accessories. Many purchase orders are placed during business hours only. Awareness about it is found more in metros or tier-I cities as compared to tier-II & III cities.

II. REVIEW OF LITERATURE

Sunder et al. (2017) carried out a study to understand the parameters considered by consumers shopping and issues at adidas online store. Questionnaires were prepared, and the data was collected from customers and analysed using statistical tool (SPSS). The results found that Consumers' buying behaviour will keep changing with emerging technology. Online retailers too are finding ways to integrate the newest socio-economic and technological trends to provide better and more personalized e-commerce experiences to consumers. As a result, the bar has been raised in the online retail space. Customers were both online and offline, and hence the firm need to focus on both. They need to leverage the dynamic online/offline connection to create a killer brand.

Rehman (2016) examined the potential of Internet Marketing in Saudi Arabia. For this, Exploratory Research design and Descriptive Research design was carried out among 120 respondents. In this study various dimensions of online shopping as perceived by consumers in Saudi Arabia were identified and the different demographic factors were also studied. It was discovered that time factor, ease of purchase, reliability, status symbol, ease of comparing products, risk in monetary transactions, timely delivery, were the key factors which influence consumers' perceptions of online shopping. The study revealed that the perception of online shoppers was independent of their age and education but not independent of their occupation. Finally, the recommendations presented in this research may help foster growth of Saudi Arabian online retailing in future.

Mathew (2015) conducted a study to find the changing trends in online shopping in the apparel sector. The analysis was done through statistical tools based on primary data acquired through survey conducted with questionnaires distributed at the stores and online. and found that people who belong to the age group of 20-22 shop online more often than people of other age groups, respondent's family income affects the online buying behaviour, undergraduates shop online more often than a post graduate or any other qualified person, female respondents is more than the male respondents.

Kumar et al. (2012) in their paper examined the key factors which affect buying motives of consumers for online buying or E- shopping. For this purpose, different models from different research scholars have been studied. One online consumer buying behaviour motive model, (FFF Model), has been designed and suggested based on existing review of literatures. They suggested that future research could use suggested factors (F), filtering elements (F) and then filtered buying behaviour (F), (FFF Model) framework as a basis to empirically explore the factors affecting the online consumer purchasing process and to test the suggested model by the interested researchers in the relevant area of research.

Close and Kinney (2010) indicated that price-motivated consumers have a higher frequency of placing items in their online carts compared to those not motivated by reduced cost offers. This price-related cart use behaviour arises because some sites do not reveal the total price of the item, with tax and shipping/handling fees, until the shopper places item into the cart. They found that promotion programs stimulate promotion programs and recommended every-day low pricing as such discount programs give consumers a greater sense of economic gain and control.

Cheng et al. (2008) conducted a study on the "Influencing Factors of Online Shopping" and documented that consumers think it to be risky to make online payments. The consumers were also expecting a higher level of privacy in online shopping. This study was conducted in China and the Chinese consumer's experience with the internet and computer skill was also found as an important factor influencing the consumer behaviour.

III. OBJECTIVES OF THE STUDY

1. To assess the attitude of consumers towards online shopping

IV. RESEARCH DESIGN

The present study is Exploratory-cum-Descriptive in nature as itendeavours'to assess the relationship between specific factors.

SAMPLE UNIT

As the number of customers, products and firms throughout Punjab is quite large; it is beyond the capacity of the individual researcher to pursue the study on one hundred percent enumerative basis.

Hence, the study was carried out based on an adequate size of sampled customers and products only in three major cities of Punjab i.e. Ludhiana, Jalandhar and Amritsar with highest density of population among the age group of 15 years to 55 years and above.

The study is be limited to categories of products and services available online that includes clothing, footwear, accessories, electronic (white goods), mobiles, tickets (movies, hotels and flights), books and home furnishing.

Sampling Technique

The sampling method used for this study was Non-Probability Sampling. Snowball and Purposive sampling method were used to draw the sample from population.

Sample size:

Sample size influences how the sample findings accurately represent the population (Burns & Bush, 2010). The larger the sample is, the more likely that the generalisations are an accurate reflection of the population (Saunders, Lewis & Thornhill, 2009).

The researcher kept on rejecting the responses which were found to be incomplete and perceivable biased. Therefore, the researcher targeted 750 online buyers from 3 cities of Punjab i.e. Ludhiana, Jalandhar and Amritsar with 250 buyers from each district. It was done to get complete and perceivably unbiased responses and minimises the possibility of unreliability of results resultantly.

So, out of the 750 respondents, 625 questionnaires were received at a response rate of 89 per cent. On further filtering, 600 responses are found to be filled.

SOURCES OF DATA

Data sources are classified as being either primary sources or secondary sources. A source is primary, if the data collector is the one using the data for analysis. A source is secondary if one organization or individual has compiled the data to be used by another organization or individual.

Both primary and secondary data were collected in this research.

Secondary data was collected from

- Various books on consumer behaviour and retailing,
- Journals like Journal of Marketing, Journal of Consumer Research, Journal of Retailing, Journal of Consumer Affairs, Journal of Marketing Research, Academy of Marketing Science Review, Journal of Academy of Marketing Science, International Journal of Electronic Commerce, Journal of Interactive Marketing, etc.,
- Published thesis works, Unpublished thesis works available on internet
- On the other side, the primary data was collected by means of a structured comprehensive questionnaire was developed by the researcher based on the literature review on the relevant topics. The respondents assessed various close ended questions, dichotomous questions, multiple questions ranking scale, nominal scale questions, ordinal scale questions and some of the items on a Likert point scale was used for each statement where 1 = strongly agree (extremely important). and 5 = strongly disagree (not important at each and everyone) Questionnaires was administered in English to respondents through google doc. via internet

V. DATA ANALYSIS & INTERPRETATION

Influence of customers' demographics on online shopping intention

To test the significant influence of customers' demographics on online shopping intention, one way ANOVA is applied to ascertain the significant influence of customers' age, annual income, education, occupation and frequency of shopping on online shopping intention.

Independent samples test is applied to ascertain the significant influence of customers' gender and marital status on online shopping behaviour.

The following null hypotheses were framed:

H03: There is no significant influence of customers' (a) age (b) gender (c) marital status (d) annual income (e) education (f) occupation (g) frequency of shopping on online shopping intention.

Table: Influence of customers' demographics on attitude towards online shopping

Demographics	Classification	N	Mean	SD	t/F values
Gender	Male	408	8.10	1.128	t-value 1.891 (p=0.059)
	Female	192	7.98	0.933	
Age	15 to 25 Years	24	8.07	0.981	F value 0.306 (p=0.782)
	25 to 35 Years	432	8.00	1.052	
	35 to 45 Years	108	8.07	1.344	
	45 to 55 Years	21	8.06	1.209	
	55 and above	15	8.04	1.107	
Marital Status	Married	397	8.01	0.974	t- value 0.869 (p=0.385)
	Single	203	8.06	1.180	
Education	Professional Degree	115	8.03	1.020	f- value 5.739** (p=0.001)
	Post graduate	300	8.33	0.988	
	Graduate	135	7.98	0.960	
	Schooling	28	7.97	1.282	
	Others	22	6.87	0.666	
Occupation	Salaried	340	8.13	1.033	f-value 6.845 (p<0.001)
	Professional	80	8.08	1.294	
	Business	131	8.11	0.996	
	Home Maker	18	7.60	0.803	
	Others	31	7.93	0.857	
Annual Income	Below Rs 2,50,000	32	8.07	1.389	F-value 2.212 P=0.085
	Rs 2,50,000-5,00,000	350	8.10	0.928	
	Rs 5,00,000-7,50,000	168	8.04	1.066	
	Above 7,50,000	50	7.87	0929	
Frequency of Shopping	Once in a week	40	8.17	1.209	f-value 2.182 (p=0.052)
	At least once ma month	209	8.08	1.107	
	Once in 2-4 months	100	8.17	0.982	
	Once in a year	60	7.85	1.142	
	According to the need	191	7.97	0.998	

**** Significant at 1% level**

AGE

The obtained 'F' value is 0.360 and it is not significant at 5% level. The value indicates that there is no significant influence of customers' age on Attitude. **Therefore, the formulated hypothesis H03(a) that "there is no significant influence of customers' age on Attitude" is accepted.**

GENDER

The obtained 't' value is 1.891 and it is not significant at 5% level. The value indicates that there is no significant influence of customers' gender on Attitude. **Therefore, the formulated hypothesis H03(b) that "there is no significant influence of customers' gender on Attitude" is accepted.**

MARITAL STATUS

The obtained 't' value is 0.869 and it is not significant at 5% level. The value indicates that there is no significant influence of customers' marital status on Attitude **Therefore, the formulated hypothesis H03(c) that "there is no significant influence of customers' marital status on Attitude" is accepted.**

ANNUAL INCOME

The obtained 'F' value is 2.212 and it is not significant at 5% level. The value indicates that there is no significant influence of customers' annual income on Attitude. **Therefore, the formulated hypothesis H03(d) that "there is no significant influence of customers' annual income on Attitude" is accepted.**

EDUCATION

The obtained 'F' value is 5.739 and it is significant at 1% level. The value indicates that there is significant influence of customers' educational qualification on Attitude.

Further, the mean table 4.13 indicates that the customers possessing post-graduation as their educational qualification have scored higher mean value of 8.33 and the lowest mean value was scored by the customers possessing diploma and other qualification (6.87). **This shows that the customers with post-graduation are more intended to change their attitude and the customers possessing diploma level education are less intended to change their attitude**. **Therefore, the formulated hypothesis H03(e) that "there is no significant influence of customers' educational qualification on Attitude" is rejected**.

OCCUPATION

The value indicates that there is significant influence of customers' occupation on Attitude. Further, the mean table 4.13 indicates that the salaried persons have scored higher mean value of 8.13 and the lowest mean value was scored by the house wives (7.60). This shows that the salaried persons are having more intentions towards change in attitude and the house wives are having less intention towards change in attitude. **Therefore, the formulated hypothesis H0 3(f) that "there is no significant influence of customers' occupation on Attitude" is rejected.**

FREQUENCY OF SHOPPING

The obtained 'F' value is 2.182 and it is not significant at 5% level. The value indicates that there is no significant influence of customers' frequency of shopping on Attitude. **Therefore, the formulated hypothesis H03(g) that "there is no significant influence of customers' frequency of shopping on Attitude" is accepted.**

VI. FINDINGS OF THE STUDY

The results indicate that:

1. There is no significant influence of customers' age on Attitude towards online shopping.
2. There is no significant influence of customers' gender on Attitude" towards online shopping.

3. There is no significant influence of customers' marital status on Attitude towards online shopping.
4. There is no significant influence of customers' annual income on Attitude towards online shopping.
5. Post-graduate respondents are more intended to change their attitude and the customers possessing diploma level education are less intended to change their attitude towards online buying.
6. Salaried persons are having more intention towards change in attitude and the house wives are having less intention towards change in attitude.
7. There is no significant influence of customers' frequency of shopping on attitude towards online shopping.

VII. CONCLUSION

Based on data analysis, the researcher concludes that people with difference in age group, gender, marital status, annual income does not have significant influence on attitude towards online shopping whereas Post-graduate respondents are more intended to change their attitude and the customers possessing diploma level education are less intended to change their attitude towards online buying.Salaried persons are having more intention towards change in attitude and the house wives are having less intention towards change in attitude.There is no significant influence of customers' frequency of shopping on attitude towards online shopping. So, marketer should understand the needs of each segment to cater to their needs.

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Demonetization and Digital Payment System in India

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Abstract - The computerized installment changed the purchasing conduct of Indian culture. It prevents dark currency showcase. It encourages the administration to keep up a record of all exchange .Advanced Payment Habit has changed after demonetization. Individuals have no other alternative for exchange so Indian culture move gradually from money to computerized exchange framework. On the prior, when advanced installment acquaint individuals falter with change their exchange propensities however after demonetization, they power to do their exchange with computerized installment. This paper looks at the impact that Demonetization has had on the various payment methods in India. Specifically, it aims to see how the various digital platforms have evolved with the advent of demonetization.

Keywords- Demonetization, Digital payment system.

I. INTRODUCTION

At 8 PM on November 8, 2016, P.M. Modi declared that money notes of 500 and 1000 sections will never again be substantial past the midnight, in this way pulling back 86% of trade out flow at that time. The individuals who were in control of invalid notes were requested to store them into banks by December 30, 2016. The activity, known as "demonetization", was at first said to be pointed towards checking dark cash. Through this process, individuals having unlawful wage in real money were anticipated that would be compelled to uncover them or surrender the money to abstain from being indicted. At last, 99% of the money returned into the managing an account framework, as indicated by the yearly Report distributed by the RBI. The cash crunch faced by the people incentivized them to shift to digital payment methods such as mobile and internet banking, m-wallets and UPI.

People in India are still wary about using technology for making payments. The younger, more cosmopolitan generation is becoming familiar and comfortable with the digital lifestyles. People from rural areas and the senior citizens still have their doubts. Also, many of them do not know how to operate through online platforms.

II. LITERATURE REVIEW

Annamalai, S. and Muthu R. Iiakkuvan (2008) in their article "Retail transaction: Future bright for plastic money" projected the growth of debit and credit cards in the retail transactions. They also mentioned the growth factors, which leads to its popularity, important constraints faced by banks and summarized with bright future and scope of plastic money.

Jain, P.M (2006) in the article "E-payments and e-banking" opined that e- payments will be able to check black"An Analysis of Growth Pattern of Cashless Transaction System. Banks, financial institutions, business and common citizens can optimally use the available funds with the help of technology, quick payments and remittances.

Chandra Shekhar Ghosh (2017) in his article "DEMONETIZATION", A Boon or Bane for the Indian Economy. He mentioned that demonetization has improved banking system and led to greater financialisation of savings, people will shift their focus from real estate to financial

assets such as mutual funds, insurance, among others, as an investment avenue. "*We cannot avoid short-term pains for long-term gains".*

Dr.Sweta Singhal (2017) in her article, " Demonetization and E-banking in India", She was of the opinion that, with the introduction of smart phones and mobiles application the usage rate has increased, But there is a long way to go as rural population of India is still waiting for some program from banks that will facilitate their usage of -banking services.

Nancy Prajapati and Sanjeev kumar Singh (2017), In their study they concluded that there is a flood in the demand of online and other digital modes of payments during demonetization because of great shortage of liquidity in banks. Different Banks have launch and promote different apps for easy online transactions like SBI has launched UBI app for mobile banking.

Dr. K.Sreelatha Reddy and Ms. S.Jayalaxmi, in their article "Demonetization–Transformation to Digital India", have explained that customers prefer online banking for faster services and ease of use. They also opined that , if the banks improve key issues of privacy of customers' information, the dream of transformation to digital India may materialize in forth coming period.

Kumar.R (2017)analyzed that demonetization step was a huge step taken by Indian government because around 87% of currency notes were of 500 and 1000 and economy fallen down at that stage because of shortage of currency as major part of our economy heavily dependent upon cash as a result country have faced problem of short of cash. The mainly research conducted on the effects of demonetization on Bombay stock exchange during this phase and the collected data has been analyzed for the window period of -15 to +15 from the announcement of the date. The major findings of the study that cash dependent and consumption based sectors were negatively affected while the financial sector was in benefit.

Anil I Ramdurg, Dr. Basavaraj CS(2016) in their article" Demonetization: Redefining Indian economy", concluded that demonetization includes the efforts towards popularizing E-banking and E-commerce.

Manpreet kaur (2017) in her article," Demonetization: impact on cashless payment system", analyzed that online transaction system is the need of today's society. The cashless payment system is safer and better than the cash transaction system.

Seema Rathi in her study analyzed that there are some problems for public to use digital payment system but Government can create awareness and provide necessary infrastructure to make it possible for public to adopt digital system of payments.

III. OBJECTIVES OF THE STUDY

- To examine the impact of demonetization on online and digital banking.
- To analyze the demonetizations post effects.

IV. METHODOLOGY

The present study is focused on analyzing the impact of demonetization on digital banking system of country .The study considers secondary data which have been extracted from various official websites , journals, articles, books and newspapers etc.

JOURNEY FROM DEMONETIZATION TO DIGITALIZATION

Demonetization in India before November, 2016. The act of demonetization 2016 is not happening for the first time in India, but before it, has happened twice, first in the year of 1946 and then in the year of 1978.

In January 1946, Rs1,000 and Rs10,000 banknotes were withdrawn but the same Rs1,000, Rs5,000 and Rs10,000 notes were reintroduced in 1954, and were again demonetized in January 1978.

The second demonetization has taken place in the year of 1978 by the Janata Party government. It had decided to withdraw Rs1,000, Rs5,000 and Rs10,000 notes by issuing an ordinance on the morning of 16 January that year.

What happened on Demonetization (NOV,2016). On 8th November 2016, Government of India had announced that from today onward rupees 500 and 1000 rupee note will not be a legal tender. This means that 500 and 1000 rupee note will be accepted by anyone except the organization declared by government.

Objectives of Demonetization

The main objectives of demonetization are:

1. To eradicate black money

2. To remove counterfeit currency

3. To fight against terrorism

4. To stop money laundering activities

5. To mitigate corruption and so on.

The government of India has launched the campaign for Digital India to ensure that services are made available to citizens electronically by better online infrastructure and connectivity, that is, digital empowerment. It has encouraged many people to use other e-delivery banking channels for Internet banking—retail, corporate, or mobile banking; UPI; USSD–NUUP; *99# as well as e-wallet banking. Mehta et al. (2016) said over the last 2 years that while the number of Jan Dhan accounts had recorded a stellar growth, the share of these accounts in total deposit base of the banking system had remained under 1%. The demonetization drive of higher-denominated notes should give a push to cash deposits in Jan Dhan accounts, of which close to 43% so far have remained dormant.

From April 1994 to June 2016, the currency has shown a yearly growth rate of 17%, while the share of bank currency has remained around 5%. It was estimated that, for 2009–2010, RBI incurred an annual cost of INR 2,800 crore for printing currency notes as stated by Das and Agarwal (2010). Digital money is safer in comparison to physical cash, as there is greater financial inclusion and lesser leakage of money provided by the government for the development of common people.

DIGITAL PAYMENT FRAMEWORK IN INDIA

National Payments Corporation of India (NPCI) ***99#*** is a payment service provided by GoI in 2014, as a part of Pradhan Mantri Jan DhanYojana (PMJDY). This service was proposed to cater common man as it can be operated through any featured mobile phone and doesn't require internet connectivity. The key services offered by *99# are, Account Balance, Mini statement, send money using MMID, send money using IFSC, send money using Aadhar Number, show MMID, change M-PIN, generate OTP. *99# service works on Unstructured Supplementary Service Data (USSD) technology, a service is provided by Telecom Service Providers (TSPs) on all GSM mobile phones. The transactions through this service can be done only in banking hours and per transaction cost is Rs.1.5.

- **BHIM(Bharat Interface for Money)** is a new digital payments app based on the Unified Payments Interface (UPI). The app is currently available only on Android; so iOS, Windows mobile users etc are left out. BHIM is also supposed to support Aadhaar-based payments, where transactions will be possible just with a fingerprint impression.
- **E-wallets** allow people to transact online by using any electronic gadget like computer or a smartphone. Post demonetization move in India on 8th November 2016, the RBI has promoted the national banks to create their own wallets and thus wallets like SBI-Buddy came into existence.
- **Paytm** is an e-wallet company in India has further got license to enter in the domain of payment banks.
- Other private e-wallet companies like **Freecharge** - Freecharge is e-wallet service provider along with mobile recharge facility.
- **MobiKwik** is an e-wallet company.
- **IndiaBankBazaar.**com provides an online platform for loans and insurance products.
- **Lendingkart**, **PolicyBazaar** and **VistaarFinance** are an online lending platform for SMEs.
- **CapitalFloat** is an online lending platform for working capital finance to SMEs.
- **There are total 456 banks providing mobile banking services according to RBI .**

V. DEMONETIZATION IMPACT ON DIGITAL PAYMENT SYSTEM

Traditionally, online transactions were done either by providing debit and credit card details or through net banking interfaces. While there were issues of security, which kept improving, the payment experience was not very user-friendly. These options were also largely restricted to computers with access to internet. But after the

Smartphone revolution, things have changed entirely. India has seen an explosion in digital payment options, from e-Wallets to the Unified Payment Interface to a combination of the two. There are many cashless payment options available in India.

The following table shows the data regarding volume of digital transactions taken place after the demonetization. The table clearly shows the upward trend in electronic payment system. The tremendous increase can be seen in case of UPI with the rise in volume to 171.2 million from 0.3 million. The increase in the USSD (Unstructured Supplementary Service Data) is also remarkable i.e. 7 million to 156 million. The use of mobile banking payment system has also increased from 72.3 in nov,2016 to 102.5 million in march, 2018. **Source: NPCI**

BENEFITS OF USING DIGITAL PAYMENT SYSTEM

- Transactions done digitally are traceable, and customers can be accounted for such transactions.
- This is useful for the detection and eradication of black money.
- It is convenient, quick and efficient .
- It lets you stay in control about when you pay and the amount you pay.
- You have the option to cancel the transaction right before the payment is done.
- It saves paper, and thus helps save the environment.

MAJOR PROBLEMS ASSOCIATED WITH DIGITAL PAYMENT SYSTEM

- **Security issue**: With the advent of demonetization, many people were downloading and using various digital wallets applications. Paytm reportedly had around 7 million new users in a day. With such a spike in the digital wallet community, there are many hackers looming around. Moreover, these wallets are also operated through the mobile network, which is least secure method. Unlike credit/debit cards where the personal details of the customers are shielded by the bank, these wallets have no such security. Competent hackers can get hold of the valuable information on the phone, which possesses a serious risk to the consumers. The security concerns also extend towards net banking and using debit and credit card online. Not all payment sites are encrypted, and consumers should decide wisely upon using plastic money online. Card details are to be produced only at certified and valid websites and applications, to reduce the risk of fraud happening. Using public wi-fi to make any sort of digital payments is never safe. One should always try to make transactions over a safe, private wireless network. Using a Virtual Private Network (VPN) connection is one of the better practices to keep the data secure.
- **High rural population**: 9 states(Haryana, UP, Goa, Karnataka, Telangana, Tamil Nadu, Bihar, Chhattisgarh, Uttarakhand) have high rural population of more than 50% . This implies a majority settled in rural areas with limited access to banks.
- **Population having computers/laptops with internet and mobiles**: E-Banking and M-Banking are the two common alternatives to traditional banking for performing various banking operations. These require the use of devices such as mobile phones, computers, or laptops with internet connections. Some states had a very low percentage of population having access to such facilities.
- **Main occupation of some states:** The main occupation of rural states is agriculture. Since November was the harvest month, these states suffered due to the hardship of obtaining new banknotes, which resulted in a negative sentiment for the demonetization policy.

SUGGESTIONS TO IMPROVE DIGITAL PAYMENT SYSTEM

Keeping in view the problems faced by public after demonetization and government promoting digital payment systems rather than using cash. Indian government has to take various measures to overcome this situation and to make public use more digital methods. Some of these are discussed here under:

- Internet connectivity should be available everywhere. The connectivity should have adequate bandwidth and should be available free or at cheapest rates.
- Cyber Security framework must be strengthened by the government. There were

many cases which reported that security has been breached and the personal data of many customers has been taken out. The website of IRCTC, Canara Bank was also breached. The legal framework should be quick enough to punish the culprits as well as proper IT mechanism should exist to avoid any frauds and to ensure the security.

- Mobile network availability should be available in villages and remote areas also.
- Financial and digital literacy will be an important step in improving the situation. Common man should be informed and educated about various financial instruments and use of mobile technology to access banking facilities.

Awareness to be created amongst public to use digital technology and mobile apps.

VI. CONCLUSION

The cashless transaction system is reaching its growth day by day , as soon as the market become globalised and the growth of banking sector more and more the people moves from cash to cashless system. The cashless system is not only requirement but also a need of today society. The biometric backed bank accounts not only makes the system fool proof but also serves as an excellent instrument for illiterate people to make payments with just their thumbprints. There are some problems for public to use cashless digital methods at present. But government can create awareness, build trust, provide cyber security framework and provide necessary infrastructure to make it possible for public to adopt digital payment systems. The government has started Vittiya Sakharata Abhiyaan (VISAKA) and outreach campaigns like Digi Dhan Abhiyan and so on to encourage people to adopt digital tools.

"When you expect an honest Government with no corruption and malpractices, you also have to be honest. Honesty is not one way road" – Prime Minister Shri Narendra Modi.

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Factors Influencing the Choice of Integrated Marketing Communication Elements "A Case Study of Xiaomi Mobile Phones"

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Abstract- Xiaomi is a company founded by a serial entrepreneur Lei Jun, who believes that high-quality technology doesn't cost a fortune and he proved it by creating smartly designed Android phones at very moderate costs. Within the four years of launch of this company, it has already shaken the smartphone market in countries like China, India, Indonesia and Brazil and is aiming to be the next buzzword in the international market. This paper analyzes Factors influencing the choice of integrated marketing communication elements "A Case Study of Xiaomi Mobile Phones" helps the organisation to boost their sales and increase customer traffic. The purpose of this research paper is to help the firms in improving customers' product adoption and reducing costs.

Keywords: Xiaom, SWOT analysi, marketing; price strategy, IMC

I. INTRODUCTION

Xiaomi Corporation is an electronics company. It is headquartered in Beijing, China. It is mostly known as the most user-centric mobile Internet Company. Xiaomi offers smartphones, laptops, mobile apps and other related consumer electronics as its products. Xiaomi has also set up another manufacturing unit in India.

Integrated Marketing Communication refers to the use of various marketing tools such as advertising, online marketing, public relation activities, direct marketing and sales campaigns collectively to promote products and brands. By using IMC, similar message goes to the customers through different marketing tools, eventually creating a better impact on them.

Beijing-based Xiaomi Corporation has become one of the world's leading smartphone makers. One key factor is that the company offers its phones to customers at lower prices than competitors.

Need of the study

Under this study, research would help the organizations in understanding the consumers' preferences. It helps the organization to effectively utilize the tools of promotion influencing the IMC activities and to cater to their target audience effectively.

OBJECTIVES

- To study the concept of Integrated Marketing Communication.
- To study the factors affecting the choice of Integrated Marketing Communication elements of Xiaomi Mobile Phones.

II. RESEARCH METHODOLOGY

The research design used for the said study is Descriptive in nature. This research design has been adopted to have greater accuracy and in depth analysis of the research study. Secondary data has been utilized for the research. For this purpose different news articles, books, websites and magazines have been used.

III. LITERATURE REVIEW

Huang et al. Studied that if imc is used properly with current marketing strategy, helps to solve countermeasures for the existing problems, make Xiaomi mobile phone to maintain steady growth

Xiao et. al., analyzed the marketing measures, product development strategy, as well as the background of current strategic distribution in Xiaomi Company.

Lung-Tan Lu's (2017)evaluated a group of comparative strategies for one of the leading smart phone companies in the world: Xiaomi Inc. to turn a crisis into an expansion opportunity.

Huang et al., (2017) examined the case study to assess a group of comparative strategies for one of the leading smart phone companies in the world by using strategic matrixes to assess and evolve strategies for Xiaomi so as to change crisis into a turning point.

Joshi (2017) studied the customer's preferences towards various integrated marketing communication tools in FMCG sector. Under this study exploratory research is carried out by designing structured questionnaire

Rawal et al. (2017) Studied the various marketing strategies used by Xiaomi Inc in India, which are placing the company at a very competitive position than its immediate contenders.

Dong, & Zhang, (2016) observed the Customer involvement in the product development life cycle has not only helped Xiaomi reduce R&D costs but also enabled the company to cultivate a sense of participation and pride among techsavvy lead users.

Lun (2015) Studied the current phone purchase behavior of the consumers and how the behavior is able to create opportunity to the other phone manufacturers to copy Xiaomi's success.

Xu (2015) Observed the background of the founder of Xiaomi and its history and describes the competitive strategy supporting Xiaomi's rapid growth.

Kumar P. D & Gaurav (2015) observed FMCG companies, both Indian and Multinational compete in the Indian market for a high share. In competitive world, the Integrated Marketing Communication tools act as a the important objective of generating awareness, brand recall and to induce purchase decision.

Khattab & Rumman (2015) explored the significant relationship between E-integrated marketing communication and attitudes of customers toward electronic products.

Gupta and Dhillon (2014) analyzed the company's innovative business model, which doesn't rely on hardware to drive revenues but uses it merely as a platform to sell its services. It sells its products primarily through its website. It doesn't maintain inventory and holds weekly sales. It also offers products at very reasonable prices, focuses on social media and hunger marketing and doesn't leverage traditional marketing and sales channels.

Shih et al (2014) examined the case study of an emerging company's successful efforts to leverage social media in order to reach an important audience of young consumers and concluded with various strategies which help in integration of social media into a new firm's operation strategy.

Sjamsoedin(2014) Studied the information about marketing implementation and get a better knowledge regarding the role of product attributes of Oppo, Xiaomi and Zenfone. The method used in this research is quantitative research method using correspondent analysis which will provide an emphasis on numerical data (number) processed with statistical methods.

Keller (2007) Observed that word of mouth (WOM) is the most important and effective communications channel.

Integrated Marketing Communication

The American Association of Advertising Agencies defines IMC as "a concept that recognizes the added value of a comprehensive plan that evaluates the strategic roles of a variety of communication disciplines, and combines these disciplines to provide clarity, consistency and maximum communication impact."

In the competitive world, organizations must gain advantage of the integrated marketing communication effectively, to ensure the harmony of long-term relationships with current and potential customers. Through integrated approach to marketing communication, companies "talk to

with one voice" and the impact of messages sent is synergic.

Integrated Marketing Communication tools refer to integrating various marketing tools such as advertising, online marketing, public relation activities, direct marketing, and sales campaigns to promote brands so that they work in harmony.

Xiaomi Smart Mobile Phones

Xiaomi maintained its lead in the market in the offline channel and online channels. Xiaomi announced its big move towards local manufacturing by setting up its first SMT (Surface Mount Technology) facility in Tamil Nadu in April 2018 and it commands the highest market share with 30.3% as shown below:

Smartphone ,2018Q1	
Company	Market Share
Xiaomi	30.3%
Samsung	25.1%
OPPO	7.4%
Vivo	6.7%
Transsion	4.6%
Others	25.9%
Source: IDC Quarterly Mobile phone tracker, May 11,2018	

IV. FACTORS INFLUENCING THE CHOICE OF INTEGRATED MARKETING COMMUNICATION ELEMENTS

1. Customer loyalty

- Xiaomi Corporation strongly believes that satisfied customers are the best way to market the product. Xiaomi has extensively utilized the word of mouth publicity done by their satisfied customers. One more advantage of word of mouth publicity is its cost effectiveness. Xiaomi has made no expenditure on traditional advertising, rather it has utilized Social media and website advertising to connect with their target audience.
- Xiaomi maintains its unique social media approach of being truthful and open with users and stakeholders, which will definitely appeal to both current and potential fans.

2. Cost-effective marketing

- To eliminate Middleman:

  In order to produce consumers need personalized products, Xiaomi has adopted flexible production network. It has also tried to eliminate middleman to make it cost effective.

- Online direct marketing.
  Xiaomi has not set up distribution channels and has not spent on traditional marketing programmes; rather it has extensively used online direct marketing via social media and websites.
- Service network planning:
  Xiaomi offers service network on its website through online customer service. The customers can send email to company's official email id. They can use online customer forum, micro blog and customer service hotline in order to apply for repair and return.
- No investment done on Conventional Advertising:

  XiaoMi 's main strategy in keeping the prices low is through e-commerce. To keep marketing budget low in maintaining low price, XiaoMi make full use of the advantage of the social media andword of mouth .XiaoMi sustain theirhigh-end quality and features of product by making use of social media including Facebook and 'Mi Fans blog' to keep in touch and gain insights and feedback on their products provided by their loyal customers as well as the 'Mi Fans' for purpose of research and development of products.
- Competive advantage
  According to XiaoMi, 2012 In accordance to Porter's Generic theory, XiaoMi has successfully achieved cost leadership competitive advantage through economies of learning, economies of scale, process technology and value chain. XiaoMi ability in applying the cost leadership strategy through efficiency and maintaining high-end quality is unique and not easy for competitors to imitate.

3. Build sales and profit:

- **Quality products at low prices:**Xiaomi Corporation offers great hardware and software in their products and even that for comparatively very low cost. Xiaomi focuses on the battery life and performance while

manufacturing their products, which is the need of the hour for today's customers.

- Understanding the demand of customers:
  To achieve success, one must know to identify the correct opportunity and correct opportunity lies in understanding the demand of the customers. In today's competitive global world, customers have also upgraded themselves and are demanding features of products as per their needs. Xiaomi also took correct advantage of this opportunity in India by offering valuable and useful smartphones at comparatively low prices.
- Product Innovation:
  Xiaomi Corporation has faith in innovation. Xiaomi has continuously innovated their operating systems and marketing programmes, which in turn benefitted them in a positive way. It has always tried to provide value for money to its customers. Xiaomi's two most important series are Mi and Redmi which are offering different models to customers.

4. **Increase customer traffic:** Xiaomi's customer traffic has increased due to followings:

- Xiaomi's Flash sales:Samsung, Apple, HTC and many more other mobile market players use to market/sell their products through physical stores and third party retailers. But Xiaomi uses to sell most of its products through online mode. Xiaomi's flash sales are one of the example. During such flash sales, the company put limited quantity of its products on sale at a particular time and keep on selling until the stock lasts.
- **Xiaomi ideology:**Xiaomi Corporation has the ideology that, "Always believe that something wonderful is about to happen." They believe in this ideology and also utilizes it wonderfully. Whenever Xiaomi's customers receive their package, they get to see some 'Wow' factors to their surprise. These Wow factors encourages Xiaomi's customers to keep on buying more products. It also motivate their customers to spread a good word of mouth about their company.

5. Greater exposure:

- **Network promotion activities:**Xiaomi Corporation and Alipay jointly launched a lucky free week activities as its sales promotion programme. Xiaomi's products airborne the most popular Singles' Day.
- **Employees direct contact with customers:**Xiaomi gave its employees great opportunity to have a direct contact with its customers. It helped them to collect a lot of information to refine their software. It also helped them to overcome other technicalities.
- **Partnering with famous platforms:**Xiaomi sells its products majorly through online mode. Along with selling products through its own website, it also partnered with biggest online platforms such as Flipkart and Amazon to make it sure that its products reach the maximum number of customers.

6. Brand awareness:

Low priced yet high quality product is the main factor for Xiaomi which influences its market demand. Customers' purchase behaviour is influenced by the prices of the products, which in turn benefits the whole enterprise through increased sales. Xiaomi Corporation's product price strategy has extremely helped it to promote the sale of Xiaomi mobile phones and to enhance its brand awareness among customers and competitiveness among other market players

7. Brand recognition

Celebrity endorsement is highly used now a days as a tool to brand recognition. Xiaomi has also utilized this tool. Katrina Kaif, a famous Bollywood actress has been announced as product endorser for new Redmi Y series by Xiaomi.

V. CONCLUSION & FINDINGS OF THE STUDY

- Today customer is a king of market. Integrated marketing communication is an activity that creates profitable customer relationships bonds and value for the company.
- Xiaomi has successfully managed to be at top notch using word of mouth publicity and building customer traffic and loyalty.
- By implementing marketing strategies, Xiaomi showed a success in the Smartphone business for example Xiaomi on Friday 23 Nov 2018 sold six lakh units of Redmi Note 6 Pro smartphone during its first Black Friday sale

via e-commerce site Flipkart and its own platform Mi.com.

- The study reveals that a well planned and excellent adoption of the factors affecting the choice of integrated marketing communication can be highly beneficial for the company. Hence a huge opportunity prevails for Xiaomi to increase their competitive edge.and provide value products to consumers which they would love to own.

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