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Content Highlights:-

- Pair of L-shapedSlot Loaded semicircular disk Patch Antenna for Dual-band Operation
- One Dimensional Cutting Stock Problem with minimum Usable Residue: A new approach
- Mathematica: An Effective Tool to Bridge A Gap Between Conventional and ICT Oriented Teaching Methods
- Empathetic Leader : The "STYLE" of today
- ICT Based Knowledge Management for Sustainable Economic Development in India
- NoSQL DATABASE: New Exciting Database for Social Media and its Security Challenges
- A Novel Approach to Real Time Health Monitoring System
- OPTrUe: A software package to analyse UV-visible spectroscopic data to determine the optical transition, band energy gap and Urbach energy
- Key Principles of Quality Management in Higher Education

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Journal of Multidisciplinary Research Studies (JMRS) (Print ISSN: 2394-6911) is a biannual journal of the St. Aloysius College Society, Jabalpur, a registered society under registration act 1973 which is engaged in academic and research, with special emphasis on integrating academia and research. The journal JMRS is devoted to publication of original research on varied areas of research studies leading to formative stages that has a promising pragmatic application. Publication is open to researchers from all over the world. Manuscripts to be submitted to the Journal must represent original research reports not submitted elsewhere prior to or after submission to this journal for publication. All the manuscripts for consideration in JMRS are subject to peer-review for taking up final decision on acceptance for publication. The decision of the editorial team will be final.

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Journal of Multidisciplinary Research Studies

"STRENGTH THROUGH HARDSHIP"

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Editorial

Information technology and management have been like two different instruments in the same symphony; neither of them can be separated or excluded for a masterpiece. They both have different sounds and are independent in themselves, distinct yet so together and so dependent on each other for a melodious euphony. Both have grown in the recent times and have discovered such innovations and practices.

The business world has intervolved with technology at a very fast pace since the 80's. Globally, we have seen the advancement of technology and innovation in every area. Reducing poverty, promoting prosperity and protecting the planet has been the focus of every nation. Lasting international peace and security are possible only if the economic prosperity and well being of people everywhere is assured. The key influence of business has been globalization, information technology, sustainability, corporate social responsibility, study of psychology and business ecosystems. The current wave of globalization has been facilitated by the information technology. In the last two decades, we have seen a paradigm shift towards applying management principles to solutions of complex social issues such as environmental sustainability, energy security, access to health care, etc. This has also underlined the need for increased interdisciplinary interaction and influence on business management.

The focus has been on establishing business and research relations and to find global partners for future collaboration. The field of information technology and management continues to impact more organizations worldwide as new technologies and applications are implemented to strengthen everyday business processes. Individuals within these organizations continue to face the challenge of developing and implementing the latest innovative programs that successfully apply management skills and information technology applications within various types and sizes of companies and businesses. This special issue of the Journal on the Conference proceedings of International Conference on Exploring Trends and Challenges in Information Technology and Management held on 5th and 6th January 2015 is an effort to interosculate the latest issues surrounding the management and information technology in organizations.

The Article, *"Pair of L-shaped Slot Loaded semicircular disk Patch Antenna for Dual-band Operation"* by Anurag Mishra, M. Aneesh, Kamakshi, A. Singh and J. A. Ansari deals with frequency and the bandwidth of the proposed antenna for lower and upper resonance frequency is found to be 4.39 % and 7.31 % respectively, using which it is easy to adjust the higher and lower band by changing the dimensions of notch and slot. The theoretical results are compared with IE3D simulation results which are in good agreement.

A cross layer architectural design which has been the subject of emerging research in wireless sensor networks. Kanojia Sindhuben Babulal, Rajiv Ranjan Tewari, have proposed in their article *"Cross Layer Design for Network Lifetime Extension with Retry Limit for Retransmission by Sending the Traffic to Multiple Paths"* to achieve energy efficiency by balancing the traffic load created by each sensor nodes on multiple paths using a cross layer strategy to improve the network lifetime by considering jointly the PHY, MAC and routing layers. Simulation report shows that 20% of network lifetime is increased.

Madhavi R. Bichwe and Ranjana Shende has introduced an approach for video-based face recognition in camera networks. Traditional approaches estimate the pose of the face explicitly. A robust feature for multi-view recognition that is insensitive to pose variations is proposed in their paper titled, *"Multi-View Video Based Face Recognition"* which is developed using the spherical harmonic representation of the face, texture mapped onto a sphere. The texture map for the whole face constructed by back-projecting the image intensity values from each of the views onto the surface of the spherical model. A particle filter is used to track the 3D location of the head using multi-view information. The similarity between feature sets from different videos can be measured using the reproducing Kernel Hilbert space.

The paper by Mala Das explores the possibility of Enhanced Security and Eliminating Pesky in dealing with Biometric technologies. In this information age, securing data is the most challenging task of the system administrator. One of the challenging technologies in authentication and identification is Biometric Systems which are used to verify a person's identity. A wide range of biometric technologies used for enhancing security and eliminating pesky has been discussed in detail.

A new technique of optimization of usable residue in One Dimensional Cutting Stock Problem has been proposed by P.L Powar, Siby Samuel, Khushbu Agrawal, Priya Gupta in the paper *"One Dimensional Cutting Stock Problem with minimum Usable Residue: A new approach"* which introduces a method that leaves minimum usable residue and is expected to take care of warehousing problem up to some extent. The method proposes minimum leftover to be used as non-standard stock (NSS). Moreover, it has been noticed that the trim loss in some cases is reduced.

Sheetal Mehta and Kallol Das's paper *"Mathematica: An Effective Tool to Bridge A Gap Between Conventional and ICT Oriented Teaching Methods"* explores the spectrum of Mathematica application to the topics related to physics and electronics. Teaching, learning and research process can be made more dynamic by the application of viable software like Mathematica, Matlab, Weka, Multisim and Ultiboard etc.. Mathematica is well recognized as a teaching tool because of its potential and now has become an integral part of curriculum in various colleges and universities.

Shraddha Soni emphasized on the latest OCR techniques developed for hand written Devnagri documents.

Nilesh N Dangare and R.S. Mangrulkar focus on the various attacks in Mobile Ad-hoc Network and also compared the algorithm designed for MAN with the existing approaches.

Pearly Jerry introduce various leadership styles like charismatic leader, servant leader, transformation leader in her paper which defines the empathetic leadership styles.

Suneel Soni, Anita Soni and N.K. Totala gave an integrated study of property tax of urban local bodies, using GIS mapping and multipurpose house hold survey for increasing financial resources.

Pratibha Rai and Gonu's paper reports impact of sales promotion on consumer buying behavior in organized retail with special reference to Allahabad.

Atul Dubey and Sourabh Jain presents study of job satisfaction among the private sectors and public sectors employee.

Alice Rashmi Rajan and G. Vazhan Arasu's paper has proposed and ICT based knowledge management for sustainable economic development in India.

Arif Hasan and P. Sasikala paper deals with the use of existing database for social media and its security challenges in NoSQL database.

Jitendra G Chauhan and Prashant S Modi introduces a new approach for real time health monitoring system using android application and bluetooth.

Kallol Das introduced an OPTrUe package to obtain optical constants like optical transition for UV-Visible spectroscopic data.

Balram Purswani and Samar Upadhyay reviews the types of attacks in computer network using Intrusion detection system with data mining techniques.

Ansu Abraham explored the strengthening the supply chain of Indian organic food.

Anjali D'souza and Elena Phillip focused on the key principles of quality management in higher education.

The Journal and publication committee expresses its gratitude to all the scholars and reviewers who have contributed to this journal and solicit their continued patronage and cooperation. It places on record for gratitude to the St. Aloysius College management, editor reviewers, scholars and the publication committee.

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Pair of L-shapedSlot Loaded semicircular disk Patch Antenna for Dual-band Operation

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Abstract

The pair of L-shaped slot in the half circular disk patch provided dual resonance frequency at 8.51 GHz and 13.81 GHz and the bandwidth of the proposed antenna for lower and upper resonance frequency is found to be 4.39 % and 7.31 % respectively. By introducing the two shorting pin resonance frequency is shifted to lower side and found to be 2.5 GHz and 5.05 GHz. It is easy to adjust the higher and lower band by changing the dimensions of notch and slot. The frequency ratio is found to be 1.622 while with shorting pin the frequency ratio is increases 2.02. The theoretical results are compared with IE3D simulation results which are in good agreement.

Keywords: Disk patch, notch and slot loaded patch, shorting pin and dual band antenna.

1. INTRODUCTION

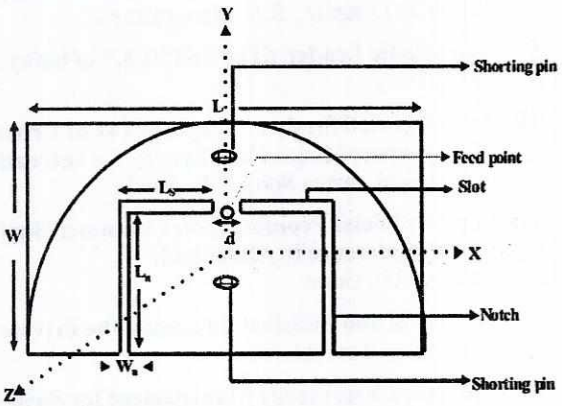
Microstrip antenna is appropriate candidates to meet the mentioned requirement and therefore they are used in broadband range of applications from radars, telemetry navigation, biomedical systems, mobile satellite communications, direct broadcast systems(DBS), global positioning system(GPS) to remote sensing, primarily due to their compactness, fabrication simplicity, conformability and low manufacturing cost.

One of the techniques to obtain the dualband operation is by reactively loading the patch. This is done by the way of cutting slots parallel to the radiating edge of the patch [1], cutting square slot in the patch [2-3]. The loading of the slot on the radiating patch increases the current length that results in lowering of the antenna fundamental resonance frequency which corresponds to reduced antenna size when compared with conventional patch antenna at the given operating frequency.

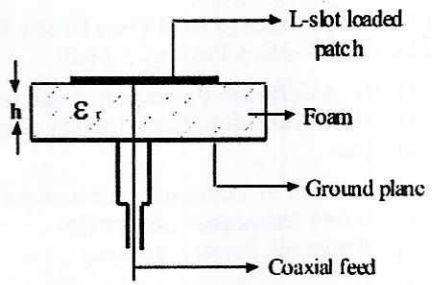
Here we have proposed new type of compact L-slot loaded half diskpatch antenna which exhibits dualband behavior. The proposed antenna also provides a significant size reduction and good impedance bandwidth. Resonance frequency is tuned by changing the dimensions of the notch, slot and position of shorting pin.

2. Configuration and analysis of proposed antenna

The geometry of proposed antenna is shown inFig.1.



(a) Top view



(b) Side view

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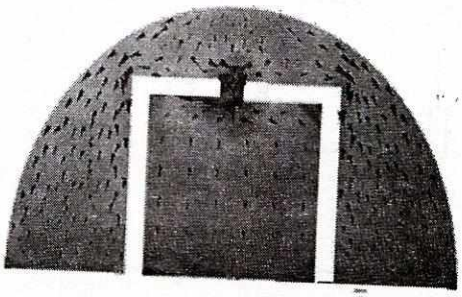
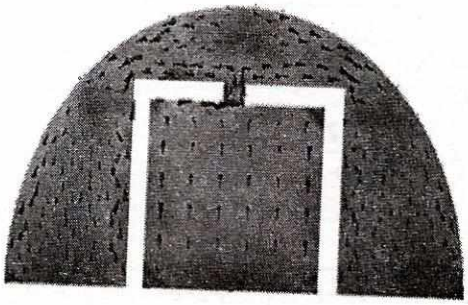


(a)



(b)

Fig.1. Geometry of L-shaped slot loaded semicircular disk patch antenna with current distribution of lower and upper resonance frequency.

Analysis of the half disk patch antenna is similar to that of circular disk patch but the effective radius changes due to 50% reduction in the size. The resonance frequency of half circular disk patch is given as [4]

$$f_r = \frac{k_{nm}c}{2\pi a_e\sqrt{\varepsilon_e}}$$

where knm is the mth zero root of the derivative of Bessel function of order n, c is the velocity of light and ε_e is the effective dielectric constant of the substrate [5], a_e effective radius of the half disk patch is given as

$$a_e = \sqrt{\frac{L_e W_e}{\pi}}$$

A half circular disk patch is analyzed by supposing it equivalent to a rectangular patch with dimensions $L\,xW$ [6], where L=2a and W=$\frac{\pi a}{4}$. The effective radius of the half disk is calculated by equating the area of half disk to the expanded rectangular patch with dimension ($L_e xW_e$), where L_e and W_e are effective length and effective width of the rectangular patch and can be calculated by [6].

2.1 Analysis of notch loaded patch antenna

L-shaped slot in a rectangular patch can be analysed by assuming it as a combination of a horizontal slot along X-axis and vertical notch along Y-axis (Fig. 1). Now when the notch is incorporated in the rectangular patch (L_n x W_n), the two current flows in the patch, one is the normal patch current which causes the antenna to resonate at the design frequency of the initial patch; however, the other current flows around the notch resulting into second resonance frequency. Discontinuity due to notch incorporated in the patch are considered in terms of an additional series inductance (ΔL) and series capacitance (ΔL) that modify the equivalent circuit of RMSA as shown in Fig.2,

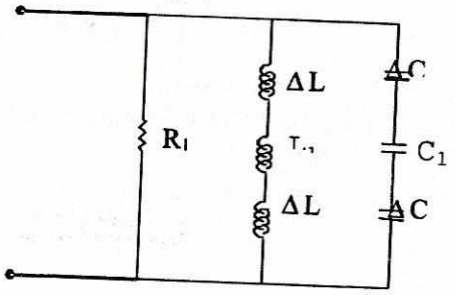


Fig.2. Equivalent circuit of disk patch due to effect of notch

in which series inductance (ΔL) and series capacitance (ΔC) can be calculated as[7-8].

$$\Delta L = \frac{h\mu_0\pi}{8}(L_n/L)^2 \quad \text{and} \quad \Delta C = \left(\frac{L_n}{L}\right).\ g$$

where $\mu_0 = 4\pi \times 10^{-7}$ H/m

L_n = depth of the notch

L = Length of the patch

C_g = gap capacitance and is given by [9].

The value of resistance R_1 after cutting the notch is calculated by [10]. It may be noted that the two resonant circuits, one is the initial $R\,L\,C$ of the circular disk patch and and another one is after cutting the notch (Fig.2), are coupled through mutual inductance (L_m) and mutual capacitance (C_m). Thus the equivalent circuit of the notch loaded disk patch antenna can be given as shown in Fig.3

Fig.3. Equivalent circuit of coupled notch loaded patch antenna

2.2 Analysis of slot loaded patch antenna

When the slot is embedded in the patch, having dimension (L_s x W_s), it can be analyzed by using the duality relationship between the dipole and slot [11]. The radiation resistance of slot on the half disk patch can be given as

$$R_r = \frac{\eta_0 \cos^2\alpha}{2\pi}\int_0^{\pi}\left[\frac{\left[\cos\frac{k^2\cos\theta}{2}-\cos\frac{kL_S}{2}\right]^2}{\sin\theta}\right]d\theta \qquad (1)$$

which yields

$$R_r = 60\left\{\begin{matrix} C+\ln(kL_S) & C_i(kL_S)+\frac{1}{2}\sin(kL_S)[S_i(2kL_S) & 2S_i(kL_S)]+\frac{1}{2}\cos(kL_S) \\ \left[C+\ln\left(\frac{kL_S}{2}\right)+C_i(2kL_S) & 2C_i(kL_S)\right] & \end{matrix}\right\}$$

in which C is Euler's constant=0.5772 and C_i and S_i are the sine and cosine integrals

Now the total input impedance of the slot can be given as [11].

$$Z_{slot} = \frac{\eta_0^2}{4Z_{cy}} \qquad (2)$$

in which $\eta_0 = 120\,\mu\Omega$

and

$$Z_{cy} = R_r(kL_S) - j\left[120\left(\ln\left(\frac{L_S}{W_S}\right)-1\right)\cot\left(\frac{kL_S}{2}\right)-X_r(kL_S)\right]$$

in which L_s and W_s are length and width of the slot respectively

where, R_r is the real part and equivalent to the radiation resistance of slot and X_r is the input reactance of the slot and given as [12]. Now the equivalent circuit of proposed antenna can be given as shown in Fig.5.

Hence the total in put impedance of proposed antenna can be calculated from Fig.3 as

$$Z_L = Z + \frac{Z_m Z_{Patch}}{Z_{Patch}+Z_m} \qquad (3)$$

where $Z = \frac{Z_{Slot}Z_{notch}}{Z_{Slot}+Z_{notch}}$

in where Z_p is the input impedance of the microstrip patch antenna

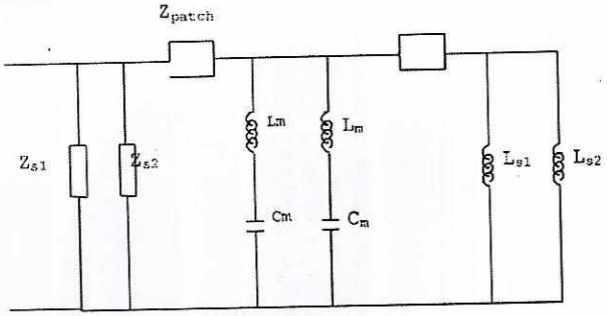


Fig.4. Equivalent circuit of shorting pin loaded half circular disk patch antenna with L-shaped slot

$$Z_{Patch} = \frac{1}{\frac{1}{R_P}+j\omega C_P+\frac{1}{j\omega L_P}}$$

and $Z_{Slot} = \frac{Z_{S1}Z_{S2}}{Z_{S1}+Z_{S2}}$

and $Z_{notch} = \frac{j\omega R_1 L_2}{j\omega L_2 + R_1 - R_1 L_2 C_2 \omega^2}$

in which $L_2 = L_1 + 2\Delta L$

$$C_2 = \frac{C_1\Delta C}{2C_1+\Delta C}$$

and $Z_m = \left(j\omega L_m + \frac{1}{j\omega C_m}\right)$

3. Radiation Pattern

The radiation pattern for L-slot loaded circular disk patch antenna is calculated as [11].

$$E(\theta) = J^n k_0 R V_0 e^{jk_0 r_1}[J_{n+1}(k_0 R\sin\theta) - J_{n-1}(k_0 R\sin\theta)].\cos n\phi \qquad (4)$$

$$E(\phi) = J^n k_0 R V_0 e^{\ jk_0 r_1}[J_{n-1}(k_0 R\sin\theta) - J_{n-1}(k_0 R\sin\theta)].\cos\theta\,\sin n\phi \qquad (5)$$

where V_0 = radiating edge voltage

$= h_1 E_0 J_n(R)$

r_1 = distance of an arbitrary far-field point

R = radius of half circular fed disk patch

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4. Design Specifications

Design specifications for L-slot loaded circular disk patch antenna

Substrate material	Foam
Relative permittivity of the substrate (ε_r)	1.07
Thickness of the dielectric substrate (h)	2.5mm
Radius of the half disk patch (R)	15.0mm
Length of the notch (L_n)	11.0mm
Width of the notch (W_n)	1.0mm
Length of the slot (L_s)	9.0mm
Width of the slot (W_s)	1.0mm
Feed location (x_0, y_0)	(12.6mm, 0.0mm)

5. CONCLUSION

The variation of return loss with frequency of proposed antenna is shown in Fig.5 along with simulated results using IE3D [13].From the figure, it is observed that the antenna resonates at two frequencies fr1= be 8.51 GHz and fr2=13.81 GHz (simulated fr1=5.12 GHz, fr2=8.398 GHz) and 10dB bandwidth is found to be 4.39 % for lower resonance whereas it is 4.66% for upper resonance frequency (simulated 4.28% and 4.45% respectively). Frequency ratio of upper to lower resonance frequency is found to be 1.6621 (simulated 1.6402). The theoretical results are in good agreement with simulated results. When the shorting pin is introduced on the L-shaped slot loaded semicircular disk patch antenna both the upper and lower resonsce frequency in the lower side as shown in Fig.6.

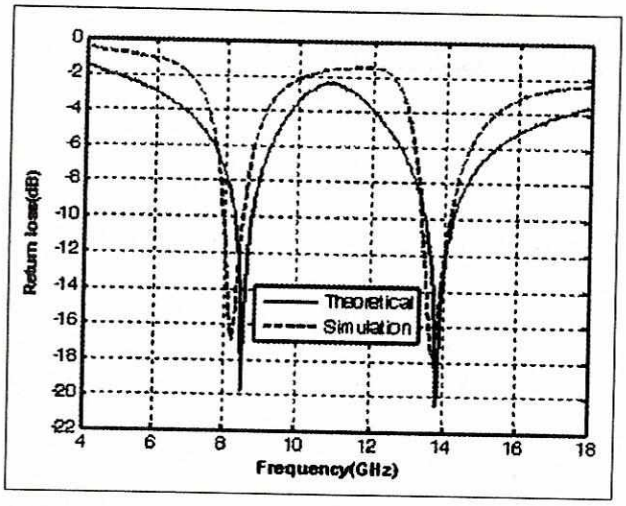

Fig. 5. Variation of return loss with frequency of L-shaped slot loaded patch antenna along with Simulated result

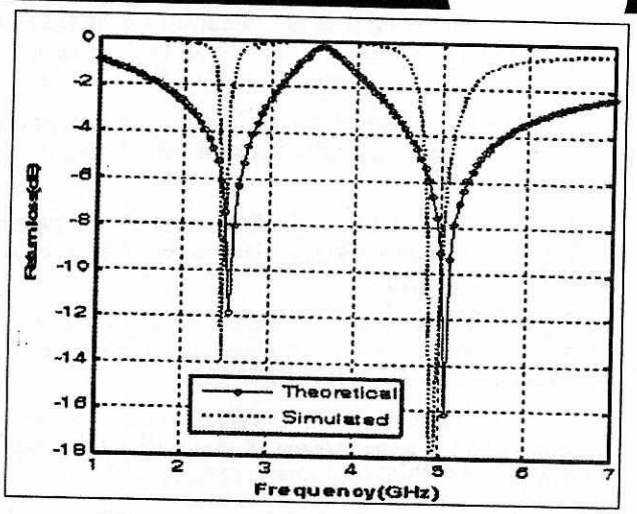

Fig. 6. Variation of return loss with frequency of shorting pin loaded patch antenna along with simulated result

The radiation pattern of the proposed patch antenna for lower and upper resonance frequency is shown Fig.7. The radiation power for lower resonance is be noted that the theoretical results have good agreement with the simulated one whereas for upper resonance frequency it must be maintained that the beam is quite wide.

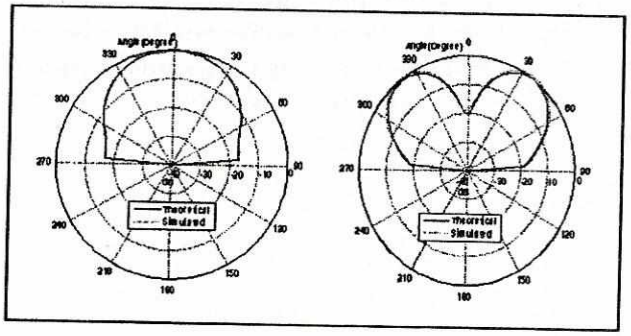

Fig.7. Radiation pattern of L-shaped slot loaded patch antenna for lower and upper resonance frequency

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Cross Layer Design for Network Lifetime Extension with Retry Limit for Retransmission by Sending the Traffic to Multiple Paths

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Abstract

A cross layer architectural design has been the subject of research in wireless sensor networks. We achieve energy efficiency by balancing the traffic load created by each sensor nodes on multiple paths. Instead of shifting the traffic on a single route which would indeed increase the overhead, we shift the traffic on multiple paths. In this paper we propose, a cross layer strategy to improve the network lifetime by considering jointly the PHY, MAC and routing layers. We develop RLRTMP (Retry Limit for Retransmission by sending traffic to Multiple paths). Initially at the network layer, we propose an efficient routing of reports to the sink node by balancing the energy throughout the network. Simulation report shows that 20 % of network lifetime is increased.

Keywords : Wireless Sensor Network, Cross layer Design, Network Lifetime, Retry limit, retransmission.

1. INTRODUCTION

Wireless Sensor nodes can be deployed on a battlefield and organize themselves in a large-scale ad hoc networks. Traditional routing protocol do not takes into account that a node contains only a limited energy supply. Ideally, we would like the sensor networks to perform its functionality as long as possible. WSN requires energy efficient protocols to improve the network lifetime. For this purpose we use cross layer strategy that consider routing and MAC layers jointly. Unlike general purpose computer networks, these networks are primarily designed with a specific sensing task in mind. Energy is the major concern, since the nodes operate with exhaustible batteries; and the quality of data and the network depend on the power consumption of the networks. Naturally, these two create a tight dependency between several aspects of communications and networking. In wired networks and wireless networks both are very different. In wireless communication does not have a fore sable behaviour as a wired channel? On the contrary, the wireless communication medium has variable and unpredictable characteristics. The signal strength and the propagation delay may vary with respect to time and environment where the mobile nodes are unlike a wired network, the wireless medium is a broadcast medium, that is, that is all nodes in the transmission range of a transmitting devices can receive a message. The bandwidth availability and computing resources (e.g. hardware and battery power) are restricted in mobile ad hoc networks. Algorithms are protocols that need to save both bandwidth and energy and must take into account the low capacity and limited processing power of wireless devices. This calls for lightweight solution in terms of computational, communication and storage resources.

An important aspect, in the design of algorithm for MANET and WSNs in fact that is topology is dynamic. Since the nodes are mobile, the network topology may change rapidly and unexpected, thereby affecting the availability of routing paths. The sensor nodes are typically ad hoc, found by local self-configuration. Data centric routing is new useful paradigm for energy constrained sensor networks. The data coming for different sources are aggregated at the intermediate nodes on the way, that reduces volume of data (eliminating redundancy) and same transmission energy. The limited energy capacity of sensor nodes dictates how communication must be performed inside wireless sensor networks. WSNs protocols must make judicious use of the finite energy resources. Typically, sensor nodes avoid direct communication with distance destination since a high transmission power is needed to achieve a reliable transmission. Instead, sensor nodes communicate by forming multihop networks, to forward message to the collector nodes, which is also called the sink nodes. In this regard, efficient routing in such multihop networks becomes crucial in addition to using multihop communication for reducing the energy requirements for communication; an efficient routing protocol is needed to decrease the end-to-end energy consumption when reporting data to the sink node.

In this paper we propose, a cross layer strategy to improve the network lifetime by considering jointly the PHY, MAC and routing layers. Initially at the network layer, we propose an efficient routing of reports to the sink node by balancing the energy throughout the network. This help to improve the WSN lifetime. In wireless sensor networks energy can be saved in two ways, one by concentrating on saving energy of the single node in the network, the second by focusing on saving the lifetime of the whole network. Network lifetime is defined in several ways in literature. Some authors defined the network lifetime as when 50 percentages of the nodes are alive, other way can be when the first node in the network fails. We assuming the network lifetime as the time for the first node in the WSN to fail, a perfect routing protocol would drain energy slowly and uniformly among nodes, leading the death of all nodes nearly at the same time. We propose balancing the energy consumption throughout the network by sending the traffic generated by each sensor node through multiple paths instead of forwarding always through the same path [1]. Network layer maintain the routing algorithm. For doing this we have to focus on determining the set of routes to be used by each sensor node and the associated weight i.e. the routing configuration used that increase the network lifetime. For the retry retransmission we are using the concept of paper [2]. A packet fails only when there is inference on the intended receives. The only source considered here for packet loss is due to collision. Even if the packets collide partially they are considered as collided. For a reliable communication, we allow a limited number of successive transmissions for a packet, after that the particular node is dropped. For a given path between the source and the destination each intermediate node computes a new limited number of retransmissions. The parameter can be adjusted easily by each node. We assume that throughout the process there is some mechanism that notifies the sender of success or failure of its transmission. At the MAC layer, we propose to adjust the retry limit of retransmission over each wireless link according to its required packet delivery probability and the property. Under this scheme, we aim to give more chance of success to packets that had come near to their destination. It rather means that we need to avoid as much as possible losing packets near their destination, so that the waste of bandwidth throughput a path becomes lower. Usually the MAC layer retransmits a packet whose transmission was not successful up to m times, where m is the same retry limit for all the wireless links. We will use different retry limits for different wireless links. We propose a retransmission control mechanism that determines the appropriate retry limit of each link such that the probability of packet delivery over that link exceeds a pre-specified threshold (target per-hop success probability). When we sensibly choose the retry limit at each link, energy conservation around 10 % can be achieved compared to the basic load balancing routing scheme.

We are addressing energy conservation problem from a cross layer perspective. By investigating the MAC and the network layer together, we expect to achieve additional energy conservation.

2. NETWORK MODEL

We represent a WSN by a directed graph G (V, E), where V is the number of vertices and E is the number of edges, is called a connectivity graph. Each sensor node $v \in V$ is characterized by a circular transmission range $R_t(v)$ and a carrier sensing range $R_h(v)$ called the hearing range or receiving range. We have considered in this paper that all the sensor nodes have the same transmission and carrier sensing range denoted by R_t and R_h. During the transmission of a node v, all nodes inside its carrier sensing range, which is denoted by H (v), sense the channel to be busy and cannot access the medium. It is denoted as $H+(v) = H(v) \cup \{v\}$ and by H-(v) the set of nodes v cannot hear. On the other hand, during the transmission of the node v, all the nodes residing in its transmission range, and representing its neighbourhood denoted by N_e (v), receive the signal from v with a power strength such that correct decoding is possible with high probability. A bidirectional wireless link exists between v and every neighbour $u \in N_e(v)$ and is represented by the directed edges (u,v) and $(v,u) \in E$. Graph connectivity is represented by connectivity matrix, in which connectivity matrix of G(V,E) is a matrix with rows and columns labelled by the graph vertices V, with a 1 and O in the positions (m,n) according to whether v_m and v_n are directly connected or not. In this approach we assume sensor node transmit periodically their reports to the sink nodes, denoted by S. Reports send per unit of time by each sensor node v is denoted as R(v). The transmitted packet of v can follow one of the possible paths in the graph G(V,E) that connects v to the sink node S. The path between v and S is denoted by P(v).

We approach to do efficient routing of reports to a sink node by balancing the traffic inside the network and judiciously allocating the retry limit to each link. Therefore, we assume here that there is a retry limit on the number of retransmission on MAC layer when the packet failure occurs. As we know that the retransmission also assume a vast amount of energy and wireless sensor network had limited battery budgets, so it should be efficiently and smartly utilized. In [2] the author aims to give more chance of success to packets that had come near to their destination. It rather means that we need to avoid as much as possible chance of losing packets near their destination, so that waste of bandwidth throughput on a path becomes lower. Normally, the way of choosing a good retransmission scheme should depend not only on the number of hops, but also on factors like transmission probabilities and number of neighbour. But taking care of many parameters at the same time is a complex issue.

In RLRTMP (Retry Limit for Retransmission by Sending traffic to Multiple Paths) we assume that there is a retry limit on the number of retransmissions at the MAC layer. MAC protocol retransmits a packet until its successful

delivery or the retry limit is encountered. Usually the same retry limit is assigned to the entire wireless link. Instead in this approach we suggest using different retry limits for different wireless links. Our main objective is to find out the appropriate retry limit for each link. In other word we can say that we approach to find optimal retry limit for each link that minimizes the energy consumption subject to the delivery probability constraint. The decision on the retry limit must be optimal because if we focusing more on the retry, then the system may slow down to a large extend. Let us consider a path $p \in P(v)$. There is an indicator function indicates about the presence of the link (u,v) in the path p. We denote by E(u,p) the average energy consumed by the node u due to the successful delivery of a packet transmitted by v to the sink node through the path p. E(u,p) only includes the energy consumed in both reception and transmission and not the energy consumed in the idle state. The average amount of energy consumed by node u per unit of time due to the different transmission inside the wireless sensor networks, which is denoted as the E(u), and can be expressed as below:

$E(u) = E_{idle}(u)$

Where E_{idle} (u) is the average amount of energy consumed by node u per unit of time during its idle state, A(v) is average number of report send per unit of time by each sensor node v. The lifetime of the sensor node u is given as:

$T(u) = E_{init} / E(u)$, where E_{init} is the initial amount of energy provided to each sensor node.

There are various definitions available in literature of network lifetime. Some define lifetime as the when the half of the sensor node are alive, other as the till the last sensor node is alive. In our paper network lifetime is defined as the time spend from the deployment until the drain of the first sensor node. So we have to maximize the lifetime of the greediest or most energy consuming node. Indeed to maximize the network lifetime, we have to avoid the fast draining od sensor nodes with high energy consumption, which we can do by efficient routing scheme and by judiciously allocating the retry limit to each link.

We develop an analytical model to derive the E(u) which is consumed at each node per unit of time when our cross layer design is applied. For this we need to calculate the elements E_{idle} (u) and E(u,p) to get E(u).

3. CALCULATE OF E_{IDLE}(U), E(U,P) AND E(U)

E(u,p) = It is the energy that u may consume due to the reception of signals, which may be or not destined to u, i.e., signals transmitted by neighboring nodes to u that participate in forwarding the data packets on p. The set of nodes corresponds to simply to nodes that belongs to the path p and within the nodes u carrier sensing range. The nodes, whose transmission are heard by node u, participate in the transmission of the data packet through p. So we can say that each node induces the following energy consumption at node u. Energy consumed by node u while overhearing the different transmission attempts of the data packet from node k to the node of the path p. The amount of energy can be expressed as the energy consumed by a sensor node for the reception of the data packets and the average number of retransmission. Some amount of energy is utilized in listening to the acknowledgment of the transmission.

E(u,p) transmission = It is the amount of energy consumed by node u during the different attempts to transmit successfully the data packets multiplied by the energy consumed by a sensor node for the transmission of a data packets.

E_{idle} (u) = It is the energy consumed by a node u in the idle state. It is the energy consumed by the node when it is not transmitted mode neither receiving mode. E_{idle}(u) also includes the T_{data} and T_{ACK} which are the transmission times of the data report and the acknowledgment message used during the phase of the transmission. All these aspects are important things to be considered.

We have to analyse and compare both the cases when the no retry limit is used and other when there is retry limit for retransmission. A simulation model have been developed using ns-2 [3] to calculate the probability of unsuccessful transmission on each link according to the routing configuration and the retry limit. After finding the shortest route, data packets are passed through that path, which leads them to the premature death of the node. Because those node are used excessively in comparison to the other nodes in the network. The nodes that have the highest traffic it deals with the maximum route through the traffic which results in the shorter lifetime of that node.

In this paper we have assumed that in the network if any data transaction has to take place or in other words if some source S need to send data to some destination D , then first the shortest route is discovered and after finding that set of nodes, we find the intermediate node concept from [4, 5, 6]. The intermediate node that are participating in the routing will deplete very soon as they are actively participating the routing for forwarding the data packets. So to conserve the energy of those nodes is very important otherwise our network be disturbed as the battery level go down. To overcome this limitation, we adopt a balanced routing scheme. Once when the some of the selected intermediate node has participated in routing, at the next time the other set of intermediate node will be selected, which will help to justice to all the nodes. As different set of nodes are selected every node is getting chance to participate and out network can exist for longer time [7,8]. We can observe that minimal consumption is obtained when the traffic is shared between the different set of nodes. Here in this paper what we have done is that instead of passing the traffic to the same route we are shifting the traffic to other all the paths because then the node will not die at early stages. What we will do is we will find the shortest path and in that we will choose the

intermediate node concept [6]. But as those nodes are heavily used they will for sure deplete fast. Instead we will transfer the traffic to the other node and also after some time we will select the other pair or set choosen as the intermediate group, and we will divert the the data transfer and traffic to that set.

4. SIMULATION AND RESULTS

TABLE 1.
SIMULATION PARAMETERS

Simulation Parameters	Value
Transmission range	12 m
Hearing Range	24 m
Transmit Range	24.75 mW
Receive Range	13.5 mW
Idle Power	13.5 mW
Sleep Power	15μW
Initial energy per node	1 J
Transmission bit range	40 kbs-1

The above are the given simulation parameters. The x-axis corresponds to the time coverage and the y-axis corresponds to alive node network.

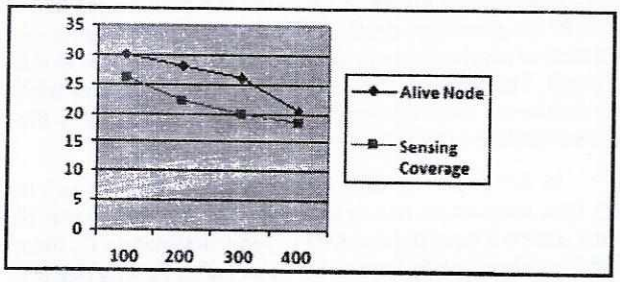

Figure 1. Time compared with the alive node network.

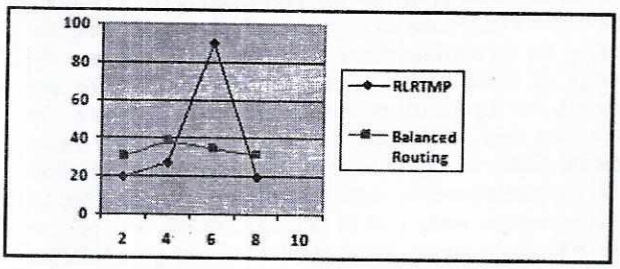

Figure 2. Comparison of the energy consumption between our balanced routing and RLRTMP

The x-axis in figure 2 corresponds to traffic rate per node and y-axis corresponds to the maximum energy consumption per unit of time. The simulation result shows that in comaparison to the traditional routing our algorithm performs better.

5. CONCLUSION

To imagine or to plan an energy efficient protocol is a very critical issue in energy-constrained wireless sensor network.

The conclusion can be drawn that this type of architecture helps in the improvement of network lifetime. The balanced routing benefits from the total available energy resources in the network. The control retry limit mechanism achieves further improvement in the network lifetime.

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Multi-View Video Based Face Recognition

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Abstract

In recent years, multi-camera networks have become increasingly common for biometric and surveillance systems. Multi view face recognition has become an active research area in recent years. In this paper, an approach for video-based face recognition in camera networks is proposed. Traditional approaches estimate the pose of the face explicitly. A robust feature for multi-view recognition that is insensitive to pose variations is proposed in this project. The proposed feature is developed using the spherical harmonic representation of the face, texture mapped onto a sphere. The texture map for the whole face constructed by back-projecting the image intensity values from each of the views onto the surface of the spherical model. A particle filter is used to track the 3D location of the head using multi-view information. Videos provide an automatic and efficient way for feature extraction. Data redundancy renders the recognition algorithm more robust. The similarity between feature sets from different videos can be measured using the reproducing Kernel Hilbert space.

Keywords: Multi camera networks , face recognition, spherical harmonic, particle filter, Kernel Hilbert space

1. INTRODUCTION

Face detection is the first stage of a face recognition system. A lot of research has been done in this area, most of which is efficient and effective for still images only & could not be applied to video sequences directly. In the video scenes, human faces can have unlimited orientations and positions, so its detection is of a variety of challenges to researchers [1][2]. In recent years, multi-camera networks have become increasingly common for biometric and surveillance systems. Multi view face recognition has become an active research area in recent years. In this paper, an approach for video-based face recognition in camera networks is proposed. Traditional approaches estimate the pose of the face explicitly. A robust feature for multi-view recognition that is insensitive to pose variations is proposed in this paper. The proposed feature is developed using the spherical harmonic representation of the face, texture mapped onto a sphere. The texture map for the whole face is constructed by back-projecting the image intensity values from each of the views onto the surface of the spherical model. A particle filter is used to track the 3D location of the head using multi-view information. Videos provide an automatic and efficient way for feature extraction. In particular, self-occlusion of facial features, as the pose varies, raises fundamental challenges to designing robust face recognition algorithms. A promising approach to handle pose variations and its inherent challenges is the use of multi-view data.

2 RELATED WORK

The term multi-view face recognition, in a strict sense, only refers to situations where multiple cameras acquire the subject (or scene) simultaneously and an algorithm collaboratively utilizes the acquired images/videos. But the term has frequently been used to recognize faces across pose variations. This ambiguity does not cause any problem for recognition with still images. A group of images simultaneously taken with multiple cameras and those taken with a single camera but at different view angles are equivalent as far as pose variations are concerned. However, in the case of video data, the two cases diverge. While a multi-camera system guarantees the acquisition of multi-view data at any moment, the chance of obtaining the equivalent data by using a single camera is unpredictable. Such differences become vital in non cooperative recognition applications such as surveillance. With the prevalence of camera networks, multi-view surveillance videos have become more and more common. Most existing multi-view video face recognition algorithms exploit single-view videos. The different methods for face recognition are given below:

A. Still image-based recognition:

This method will also require the poses and illumination conditions to be estimated for both face images. This "generic reference set" idea has also been used to develop the holistic matching algorithm, where the ranking of look-up results

forms the basis of matching measure. There are also works which handles pose variations implicitly without estimating the pose explicitly [3].

B. Video-based recognition:

Video contains more information than still images. A straightforward way to handle single view videos is to take advantage of the data redundancy and perform view selection. Then, for each of the candidates, a face detector specific to that pose is applied to determine if it is a face. Only the frontal faces are retained for recognition. The continuity of pose variation in video has inspired the idea of modelling face pose manifolds. The typical method is to cluster the frames of similar pose and train a linear subspace to represent each pose cluster. Here, the piecewise linear subspace model is an approximation to the pose manifold. The linearity is measured as the ratio of geodesic distance to Euclidean distance, and the distances are calculated between a candidate neighbour and each existing sample in the cluster. The 3D model can be then used in a model-based algorithm to perform face recognition [4].

C. Multi-view-based recognition:

In contrast to single view/video-based face recognition, there are relatively a smaller number of approaches for recognition using multi view videos. Frames of a multi-view sequence are collected together to form a gallery or probe set. The recognition algorithm is frame-based PCA and LDA fused by the sum rule. In, a three-layer hierarchical image-set matching technique is presented. The first layer associates frames of the same individual taken by the same camera. The second layer matches the groups obtained in the first layer among different cameras. Finally, the third layer compares the output of the second layer with the training set, which is manually clustered using multi-view videos. Though multi- view data is used to deal with occlusions when more than one subject is present, pose variations are not effectively addressed in this work [5].

D. Video processing in multi-camera networks:

Camera networks have been extensively used for surveillance and security applications. Research in this field has been focused on distributed tracking, resource allocation, activity recognition and active sensing. They adapt the feature correspondence computations by modelling the long term dependencies between them and then obtain statistically optimal paths for each subject [6].

E Spherical harmonics (SH) in machine vision:

To estimate the SH basis images for a face at a fixed pose from a single 2D image based on statistical learning. When the 3D shape of the face is available, the SH basis images can be estimated for test images with different poses [7]. As a result, they require a 3D face model and face pose estimation to infer the face appearance. An SH-based feature to directly model face appearance rather than the reflectance function is used, and hence do not require a 3D face surface model or a pose estimation step.

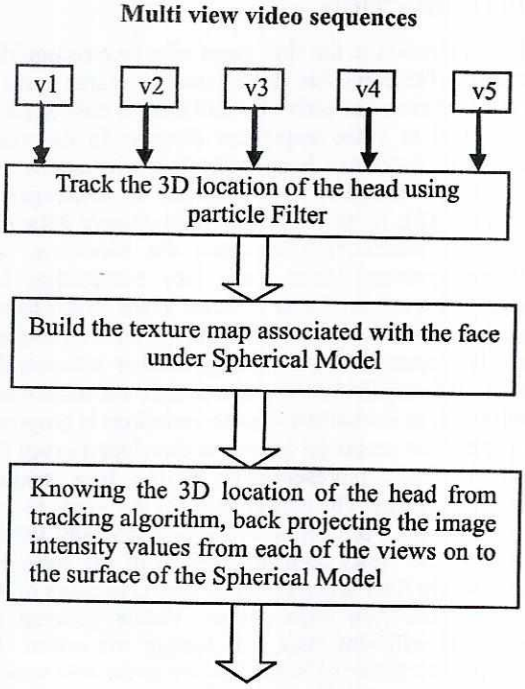
3. PROPOSED WORK

For a given set of multi-view video sequences, first use a particle filter to track the 3D location of the head using multi-view information. At each time instant or video frame, build the texture map associated with the face under the spherical model for the face. Given that the 3D location of the head from the tracking algorithm, back-project the image intensity values from each of the views onto the surface of the spherical model, and construct a texture map for the whole face. Then compute a Spherical Harmonic (SH) transform of the texture map, and construct a robust feature that is based on the properties of the SH projection.

For recognition with videos, the feature similarity is measured by the limiting Bhattacharyya distance of features in the Reproducing Kernel Hilbert Space.

The proposed approach outperforms traditional features and algorithms on a multi-view video database collected using a camera network. Building rotational tolerances into this feature completely bypasses the pose estimation step.

The proposed approach of the Multi-view Face Recognition Algorithm is defined as follows.



(Diagram continued next page)

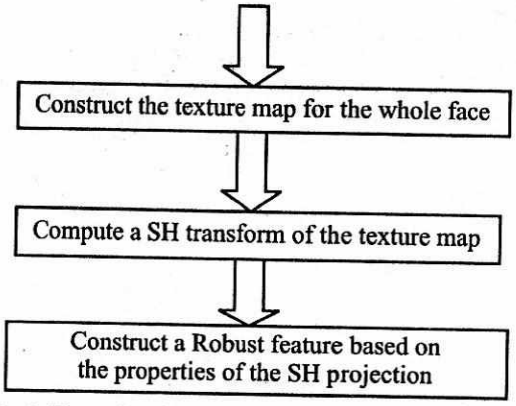


Fig 1: Flow diagram of Multi-view Face Recognition Algorithm

Robust feature:

The robust feature is based on the theory of spherical harmonics. Spherical harmonics are a set of orthonormal basis functions defined over the unit sphere, and can be used to linearly expand any square- integrable function on S^2 as:

$$f(\theta,\phi)=\sum_{l=0}^{\infty}\sum_{m=-l}^{l} f_{lm}Y_{lm}(\theta,\phi).$$

Where $Y_{lm}(\cdot,\cdot)$ defines the SH basis function of degree $l \geq 0$ and order m ? (-l,-l +1, . . . , l -1, l). f_{lm} is the coefficient associated with the basis function Y_{lm} for the function f. The SH basis function for degree l and order m has the following form:

$$Y_{lm}(\theta,\phi)=K_{lm}P_l^m(\cos\theta)e^{im\phi}$$

where K_{lm} denotes a normalization constant such that:

$$\int_{\theta=0}^{\pi}\int_{\phi=0}^{2\pi} Y_{lm}Y_{lm}^{*}d\phi d\theta = 1$$

Here, $P^m l(x)$ is the associated Legendre functions.

In this paper, we are interested in modelling real-valued functions (eg. texture maps) and thus, we are more interested in the real Spherical Harmonics which are defined as:

$$Y_l^m(\theta,\phi)=\begin{cases} Y_{l0} & \text{if } m=0 \\ \frac{1}{\sqrt{2}}(Y_{lm}+(-1)^m Y_{l,-m}) & \text{if } m>0 \\ \frac{1}{\sqrt{2}i}(Y_{l,-m}-(-1)^m Y_{lm}) & \text{if } m<0 \end{cases}$$

The real SHs are also orthonormal and they share most of the important properties of the general Spherical Harmonics. We visualize the SH for degree l = 0, 1, 2.

As with Fourier expansion, the SH expansion coefficients $f^m l$ can be computed as:

$$f_l^m=\int_{\theta}\int_{\phi} f(\theta,\phi)Y_l^m(\theta,\phi)d\theta d\phi$$

The expansion coefficients have a very important property which is directly related to our "pose free" face recognition application.

A robust multi-view tracking algorithm based on Sequential Importance Resampling (SIR) (particle filtering). Tracking is an essential stage in camera-network-based video processing. It automates the localization of the face and has direct impact on the performance of the recognition algorithm.

Multi-View Tracking: It is well known that higher the dimensionality of the state space is the harder the tracking problem becomes. This is especially true for search-algorithms like SIR since the number of particles typically grows dramatically for high-dimensional state spaces. However, given that our eventual recognition framework is built on the robust feature derived using SH representation under the diffuse lighting assumption, it suffices that we track only the location of the head in 3D. Hence, the state space for tracking s = (x, y, z) represents only the position of a sphere's centre, disregarding any orientation information [8].

Histogram: A normalized 3D histogram in RGB space is built from this image region. Its difference with the template, which is set up at the first frame through the same procedure and subject to adaptive update thereafter, is measured by the Bhattacharyya distance. This defines the first cue matching function.

Gradient map:

The magnitude of the image gradient response and its direction are perpendicular to the tangent directions, [9]. Consequently, the second cue matching score formulated as:

$$\varphi(O_t,s_t^i)=\frac{1}{r_j^i}\sum_{m=1}^{M}|\mathbf{n}_m\cdot\nabla\mathbf{I}_m|,$$

Where $r^i j$ is the radius of $E^i j$ measured in number of pixels, n_m is the normal vector of the *m*-th pixel on the arc, and *Im* is the image gradient at this pixel.

Texture Mapping: Once, the texture map of the head center is obtained. First, the sphere's surface is sampled according to the following procedure:

1) Uniformly sample within the range [-R, R], where R is the radius of the sphere, to get z_n, n = 1, 2, . N.

2) Uniformly sample αn within the range [0, 2π], and independent of z_n.

3) $$xn=\sqrt{R^2-Zn^2}\cos\alpha n,$$
$$yn=\sqrt{R^2-Zn^2}\sin\alpha n.$$

Then, a coordinate transformation for these sample points is performed.

4. CONCLUSION

A multi-view face recognition algorithm does not require any pose estimation or model registration step. A multi-view video tracking algorithm is presented to automate the feature acquisition in a camera network setting. The video-based recognition problem can be modelled as one of measuring ensemble similarities in Reproducing Kernel Hilbert Space (RKHS). The performance of this method can be demonstrated on a relatively uncontrolled multi-view video database.

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Biometric Technologies: Enhanced Security and Eliminating Pesky

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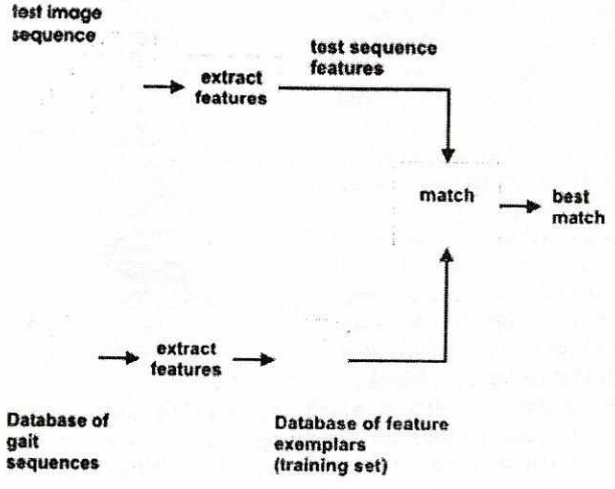
Abstract

In this information age, securing data is the most challenging task of the system administrator. To prevent data from unauthorized access, it is essential to expand security is in authentication. Existing systems of authentication are plagued by many weaknesses. Commonly, textual passwords are used to secure data or user accounts. However these can be cracked by the various applications as the maximum password length is fixed and there are a finite number of possibilities which exist. One of the most secure technologies of authentication and identification is Biometric. Biometric technologies are used to verify a person's identity. This paper presents a review of a wide range of biometric technologies used for enhancing security and eliminating pesky comprehensively and an overview of some of the well-known methods and some of the benefits and drawbacks of the schemes mentioned.

Keywords: Biometric, Gait, Iris, DNA, Face Recognition, Odor, Retina, pattern, metric, E-nose, hand geometry, face-print, figure-print, voice, vein.

1. INTRODUCTION

Biometric is a procedure through which system identifies a human or individual with their biological characteristics. Biometric is a technology, which is based on personal biological data of a human. The biometric is a Greek word which means life measurement (i.e. bio = life and metric = measure). The most general definition of a biometric is: "A physiological or behavioral characteristic, which can be used to identify and verify the identity of an individual" [1]. There are numerous biometric measures which can be used to help derive an individual's identity.



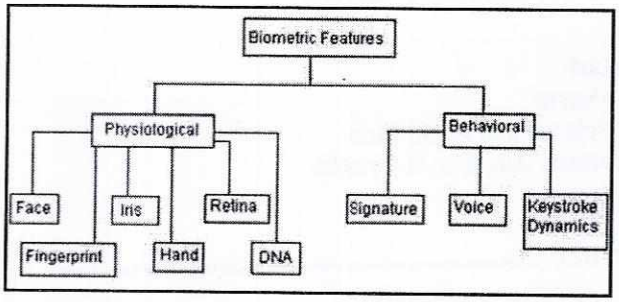
Biometric technology is basically used for security. A biometric system can be used as an identifier or as a verifier. It provides one of the most secure methods of authentication and identification. Biometrics can be used in various ways to identify a person: behavioral (which includes voice and signature) or physiological (hand, iris, face, and fingerprint). A typical biometric system is comprised of five integrated components: A sensor is used to collect the data and convert the information to a digital format. Signal processing algorithms perform quality control activities and develop the biometric template. A data storage component keeps information that new biometric templates will be compared to. A matching algorithm compares the new biometric template to one or more templates kept in data storage[2].

Biometric systems follow the following stages of operation:

1. capture biometric sample of the person
2. extract set of relevant features from the captured sample
3. Compare the extracted feature set against the template set in the database.

Biometric systems operate in two modes, verification (also called authentication) and identification. In the verification mode, the system performs a one to one comparison and the system's decision is either to accept or to reject a claimed identity. In the identification mode, the system performs one-to-many comparisons and the system's

aim is to assign an identity to one of the user templates or to announce no match [13]. These technologies are very useful in areas such as information security, physical access security, ATMs and airport security.



Biometric is used in a wide array of applications, which makes a precise definition difficult to establish. They can be classified into two distinct categories:

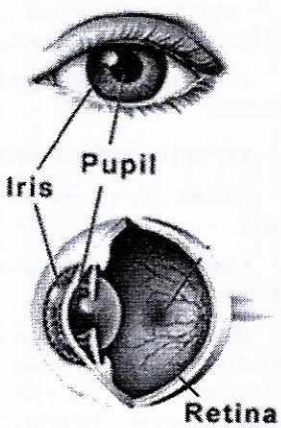
1. Physiological - These are biometric which is derived from a direct measurement of a part of a human body. The most prominent and successful of these types of measures to date are fingerprints, face recognition, iris scans and hand scans.

2. Behavioral - Extract characteristics based on an action performed by an individual, they are an indirect measure of the characteristic of the human form. The main feature of a behavioral biometric is the use of time as a metric. Established measures include keystroke-scan and speech patterns.

In this paper, we present biometric recognition technologies to recognize a person by their physical characteristics such as eye's features (iris, retina), facial features, hand geometry, ear shape, fingerprints, wrist/hand veins, DNA, chemical composition of body odor and with the help of their personal characteristics such as handwritten signature, keystrokes/typing patterns, voice print.

1.1 IRIS RECOGNITION

The iris (plural: irides or irises) is a thin, circular structure in the eye, responsible for controlling the diameter and size of the pupils. The pupil controls the amount of light that enters the eye [21].The iris is the externally visible colored ring around the pupil - of every human eye is absolutely unique. "Eye color" is the color of the iris, which can be green, blue, or brown. In some cases it can be hazel (a combination of light brown, green and gold), grey, violet, or even pink [20]. The color or eye based on the amount of melatonin pigment within the muscle. The human iris is formed by 10 months of age, and remains unchanged throughout one's lifetime [21].



It is a visual biometric. It is a mathematical pattern-recognition technique. It uses camera technology with refined infrared lighting to acquire images of the detail-rich, complex structures of the iris [20].It converts captured image into a 512-byte digital template. This value is stored in a database and communicated to Identification Control Units [21]. Databases of enrolled templates are searched by matcher engines at speeds measured in the millions of templates per second per (single-core) CPU, and with infinitesimally small False Match rates. Hundreds of millions of persons in countries around the world have been enrolled in iris recognition systems, for convenience purposes such as passport-free automated border-crossings, and some national ID systems based on this technology are being deployed [20].

Advantages of Iris Recognition

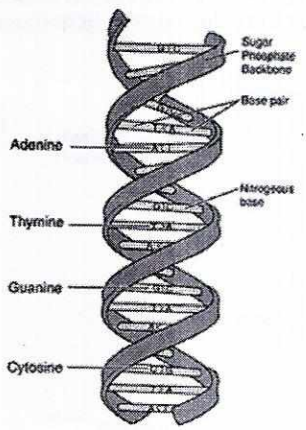
1. Very high accuracy.
2. Verification time is generally less than 5 seconds.
3. The eye from a dead person would deteriorate too fast to be useful, so no extra precautions have to been taken with retinal scans to be sure the user is a living human being.

Disadvantages of Iris Recognition

1. Intrusive.
2. A lot of memory for the data to be stored.
3. Very expensive

1.2 DNA Recognition

DNA is the most secure technology and we used it for high security applications. DNA stands for Deoxyribonucleic Acid. It is the genetic material found in most organisms, including humans. DNA is a large molecule, whose shape resembles a 'double helix' which conceptually looks very much like a ladder twisted into a spiral [7]. It dictates how we look and develop; it serves as a full set of building blocks / 'blueprints' for each person [10]. The use of DNA in biometric applications focuses on the nitrogenous bases which are referred to as 'bases' for short. There are four distinct bases:



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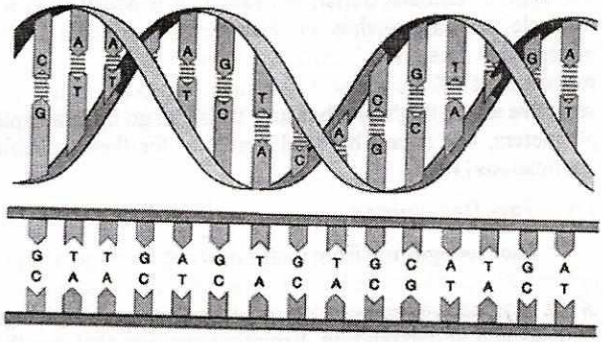
1. Adenine (A)
2. Cytosine (C)
3. Guanine (G)
4. Thymine (T)

Biometric use it to create an individual's DNA profile.



The main steps to create a DNA profile are: isolate the DNA (from a sample such as blood, saliva, hair, semen, or tissue). No two being exactly alike; only identical twins are an exact DNA match. DNA Biometrics requires highly specialized hardware (sequencers, assemblers, laboratories), knowledge (lab technicians) and it is not fully automated then the costs are very high [7]. At present, there is not enough computational power to perform DNA sequencing in 'real-time' due to the vast amount of memory and processing power required during the sequencing phase [8].

The DNA is sequenced using a technique known as Electrophoresis. The molecule is separated into its two constituent strands and placed at one end of a gelatine-like gel, prepared in advance using complex procedures. Electrodes are placed at either end of the gel and a current passed through the gel, causing bases in the DNA to move through the gel. This creates 'bands'; the position and strength of each band depends entirely on the size of the base within the DNA. The larger the sample, the more difficult it will be to move through the gel; strands that are the same size will move to the same position in the gel. Only 200-300 bases can be represented on one gel piece; multiple gels are used and the whole process is repeated for the whole DNA strand [16].

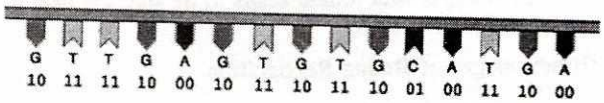
The sequence obtained is separated into four distinct batches and analyzed using a machine known as an 'Assembler'. A lab technician pours the gel containing the sequence into two glass plates which are two hundredths of a millimeter apart. A chemically modified base is then added to each batch and the chains of bases are fixed upon the addition of the chemically modified base [16]. Once the bases have been color coded using the dye, the assembler loads the DNA into 96 lanes that are typically 3 or 4 meters long and 30cm in width and then reads the order of bases at the positions that they are present in the gel. When bases move through the gel and appear at the other end, the dye emits a fluorescent color when scanned by a laser [16].

Advantages of DNA Recognition

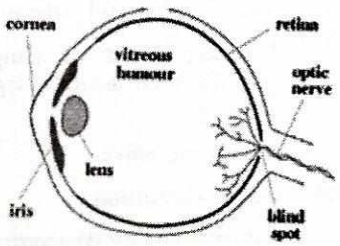
1. Very high accuracy.
2. It impossible that the system made mistakes.
3. It is standardized.

Disadvantages of DNA Recognition

1. Extremely intrusive.
2. Very expensive.



1.3 Retinal Recognition



Retinography / Retinal Biometric is a sophisticated means for identifying people by the pattern of blood vessels on the retina [23]. Retinal recognition uses the unique pattern of blood vessels on an individual's retina at the back of the eye. The retina "is to the eye as film is to a camera." The retina consists of multiple layers of sensory tissue and millions of photoreceptors whose function is to transform light rays into electrical impulses. These impulses subsequently travel to the brain via the optic nerve, where they are converted to images. Two distinct types of photoreceptors exist within the retina: the rods and the cones. While the cones (of which each eye contains approximately 6 million) help us to see different colors, the rods (which number 125 million per eye) facilitate night and peripheral vision. It is the blood vessel pattern in the retina that forms the foundation for retinal recognition as a science and technology [19].

It requires the use of a special scanner about the size of a shoe-box that can map the unique pattern of blood vessels on the retina. The pattern is so complex that even identical twins do not have the same blood vessel configuration. Those who favor its use claim retinography has an error rate of only one in a million [23].

A retinal scanner uses infrared light for mapping. As a person looks into the eyepiece, an invisible beam of low-energy infrared light traces a circular path on the retina at the back of the eye. The blood-filled capillaries absorb more of the infrared light than the surrounding tissue. Because of this, there is a variation in the intensity of the reflection. The scanner measures this reflection at 320 points along the beam path. It then assigns an intensity grade between zero and 4,095. The resulting numbers are compressed into an 80-byte computer code. This code can then be compared with patterns

that have already been entered into the computer's database [23]. Retina biometrics systems are used for those environments where requiring maximum security, such as Government, military and banking.

Advantages of Retina Recognition

1. Very high accuracy.
2. There is no known way to replicate a retina.
3. The eye from a dead person would deteriorate too fast to be useful, so no extra precautions have to been taken with retinal scans to be sure the user is a living human being.

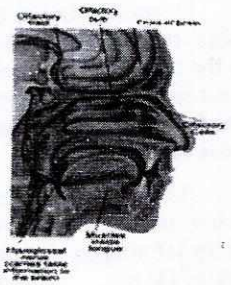
Disadvantages of Retina Recognition

1. Very intrusive.
2. It has the stigma of consumer's thinking it is potentially harmful to the eye.
3. Comparisons of template records can take upwards of 10 seconds, depending on the size of the database.
4. Very expensive.

1.4 Odor Recognition

It is an Olfactory Biometric. Olfaction (smell) has an extremely high importance in the human being. It is one of the five main senses: Sight, Smell, Taste, Hearing and Touch [17]. Peoplewith differing immunity genes produce different

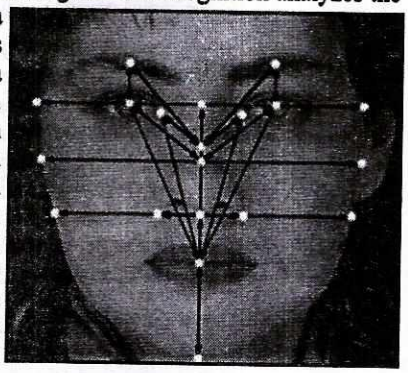
body odors. Each human has unique body odor that is a combination approximately thirty different odorants. To identify people by their body odor a special devices, electronic / artificial noses, so-called ENoses must be used. Two main components of these noses are: sensing system and pattern recognition system. The main idea of ENoses is try to repeat the process of human olfactory model [18]. The schematic representation of ENose can be found in Figure [18]. Sensing system allows tracing the odor from the environment. Each odorant presented to the sensing system produces a characteristic pattern of the odorant. By presenting a mass of sundry odorants to this system a database of patterns is built up. The Pattern recognition system is to train and create the recognition system that will be capable to produce unique classification or clustering of each odorants so that an automated identification can be implemented [18].



To detect human body odor an electronical nose is applied. In principle, this ENose can be considered as an alternative to the dogs' work. Important application is detection of humans buried in rubbles. It is actual task, for example, in earthquakes or damages on coalmines. An electronical nose for humans' detection will be suitable replacement of the dogs. Of course this nose is not too sensitive as the dog's one because dogs can go up to a depth 50 meters, but it can be used perfectly for these specific applications [18].

1.5 Face Recognition

Face recognition from image or video is a popular topic in biometrics research. The face recognition has become one of the most active applications of pattern recognition, image analysis and understanding. Facial recognition analyzes the characteristics of a person's face images input through a digital video camera. Facial recognition systems work with numeric codes called face-prints. Such systems identify 80 nodal points on a human face. Human face is a dynamic object having high degree of variability in its appearance. The nodal points are end points used to measure variables of a person's face, such as distances between eyes, nose, mouth, jaw edges, the length or width of the nose, the depth of the eye sockets and the shape of the cheekbones.These measurements are retained in a database and used as a comparison when a user stands before the camera. This biometric has been widely, and perhaps wildly, touted as a fantastic system for recognizing potential threats (whether terrorist, scam artist, or known criminal) but so far has not seen wide acceptance in high-level usage. It is projected that biometric facial recognition technology will soon overtake fingerprint biometrics as the most popular form of user authentication. Every face has numerous, distinguishable landmarks, the different peaks and valleys that make up facial features. Theuser faces the camera, standing about two feet from it. The system will locate the user's face and perform matches against the claimed identity or the facial database. It is possible that the user may need to move and reattempt the verification based on his facial position. The system usually comes to a decision in less than 5 seconds. Face recognition is completely a highly robust biometrics. The face changes considerably with age, and even due to make-up and expression changes.



Face recognition systems can be divided into two main categories [37].

1. Systems used to verify the identity of a person in a known environment at a fairly constant distance and
2. Systems that try to identify a person from a group of people in a dynamic environment and at a random distance.

Advantages of Face Recognition:

1. Non-intrusive
2. Cheap technology.

Disadvantages of Face Recognition:

1. 2D recognition is affected by changes in lighting, the person's hair, the age, and if the person wear glasses.
2. Requires camera equipment for user identification; thus, it is not likely to become popular until most PCs include cameras as standard equipment.

1.6 Fingerprint Recognition

Fingerprinting is the oldest of these methods and has been utilized for over a century by law enforcement officials who use these distinctive characteristics to keep track of criminals. A fingerprint is made up of a pattern of ridges and furrows as well as characteristics that occur at Minutiae points (ridge bifurcation or a ridge ending). Only specific characteristics, which are unique to every fingerprint, are filtered and saved as an encrypted biometric key or mathematical representation [33]. No image of a fingerprint is ever saved, only a series of numbers (a binary code), which is used for verification. The algorithm cannot be reconverted to an image, so no one can duplicate your fingerprints [32]. There are five basic fingerprint patterns: arch, tented arch, left loop, right loop and whorl. Loops make up 60% of all fingerprints, whorls account for 30%, and arches for 10%. Fingerprints are usually considered to be unique, with no two fingers having the exact same dermal ridge characteristics [37]. Finger scan biometrics requires 250-1000 bytes.

Advantages of Fingerprint Recognition:

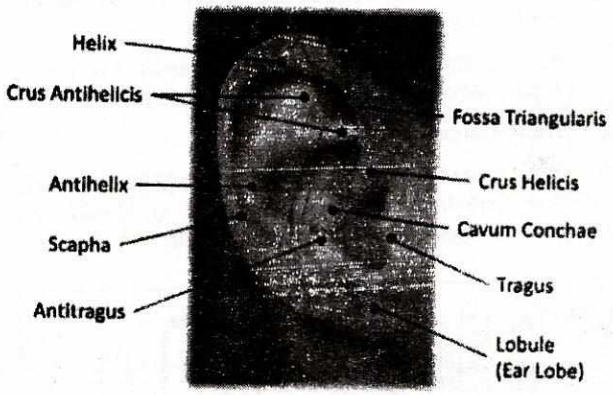
1. Non-Intrusive.
2. High social acceptability.
3. Verification time is about five seconds.
4. Cheap technology.

Disadvantages of Fingerprint Recognition:

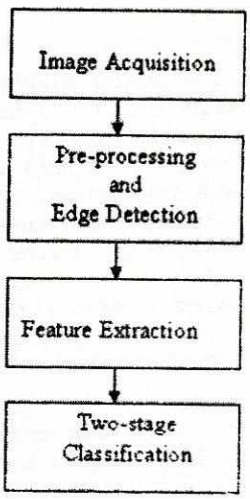
1. A person's voice can be easily recorded and used for un-authorized PC or network.
2. Low accuracy.
3. An illness such as a cold can change a person's voice, making absolute identification difficult or impossible.

1.7 Ear Recognition

The ear is made up of standard features including the helix, the antihelix, the lobe and the u-shaped inter-tragic notch between the ear and the lobe. Ear has a rich and stable structure that is preserved from birth into old age, and does not suffer from changes in facial expression [35]. In a two stage geometric approach, ear recognition can be divided into four major steps-image acquisitions, pre-processing, feature extraction and two stage classifications.



In image acquisition, the side face images are taken from the right side of the face with a distance of 15 - 20 cms between the face and the camera [37]. The ear part is mannualy cropped and coverted to grayscale. During the edge detection and binarization process the grayscale is converted in binary image where, value 1 used for edge pixel and value 0 used for all other pixels. The edges in the binary edge detected image are labeled i.e. each edge is given a unique label. The length of the edge is defined as a number of pixels that constitute the edge. All edges with length less than some threshold value are removed. In this approach the features extracted are divided into two vectors. The first feature vector is found using the outer shape



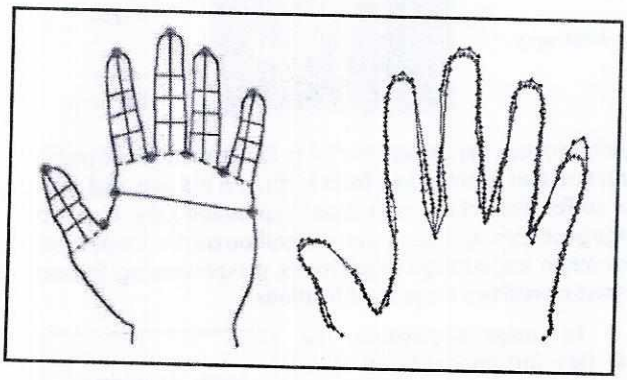
of the ear i.e. the outer edge and the second feature vector is found using all other edges. Classification is the task of finding a match for a given query image in the database. Only the images that are matched in the first stage are considered for the second stage of the classification. This approach is mainly based on the max-line. Max-line can be defined as the longest line that can be drawn with both its endpoints on the edges of the ear (outer edge of the image). For the max-line to be found out accurately the outer shape of the ear should be fine. Only such ears were considered for the experiment.

Advantages of Ear Recognition

1. Ear biometrics are convenient.
2. It is accurate and allows for high enrolment and verification rates.
3. It does not require an expert to interpret the comparison result.
4. It can use with existing cameras and image capture devices will work with no problems.

1.8 Hand Geometry Recognition

It is a type of Visual/Spatial Biometric [2]. Every hand is unique. The use of hand geometryis to identify an individual. It identifies the geometric features of the hand



such as the lengths of fingers and the width of the hand [2]. Spatial geometry is examined astheuser puts his hand on the sensor's surface and uses guiding poles between the fingers to properly place the hand and initiate the reading. Hand geometry scanners take over 90 measurements of the length, width, thickness, and surface area of the hand and four fingers--all in just 1 second. The technology uses a 32,000-pixel CCD digital camera to record the hand's three-dimensional shape from silhouetted images projected within the scanner. The scanner disregards surface details, such as fingerprints, lines, scars, and dirt, as well as fingernails [15].

When a person uses the scanner, it compares the shape of the user's hand to a template recorded during an enrollment session. If the template and the hand match, the scanner produces an output--it may unlock a door, transmit data to a computer, verify identification, or log the person's arrival or departure time. During enrollment, which takes approximately 30 seconds, the user places the right hand in the reader three times. The unit's internal processor and software convert the hand image to a 9-byte mathematical template, which is the average of the three readings. The user's template may reside in internal memory (capable of holding over 27,000 users), or on other media such as a hard disk or smart card chip [15].Internationally, many airports use hand-scan devices to permit frequent international travelers to by-pass waiting lines for various immigration and customs systems. Employers use hand-scan for entry/exit, recording staff movement and time/attendance procedures [15].

Advantages of Hand Geometry Recognition

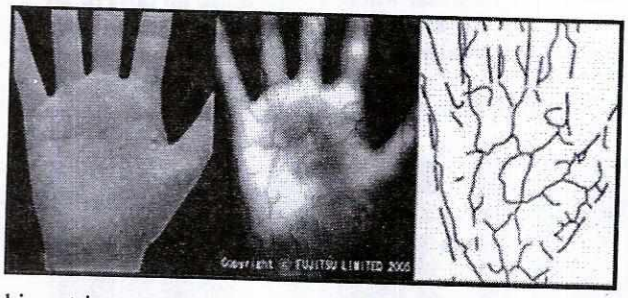
1. Though it requires special hardware to use, it can be easily integrated into other devices or systems.
2. It has no public attitude problems as it is associated most commonly with authorized access.
3. The amount of data required to uniquely identify a user in a system is the smallest by far, allowing it to be used with smart cards easily.

Disadvantages of Hand Geometry Recognition

1. Very expensive
2. Considerable size.
3. It is not valid for arthritic person, since they cannot put the hand on the scanner properly.

1.9 Hand Vein Recognition

Vein recognition is a type of biometrics that can be used to identify individuals based on the vein patterns in the human finger or palm. It is a fairly recent technological advance in the field of biometric. Veins are blood vessels that carry blood to the heart. Each person's veins have unique physical and behavioral traits. Taking advantage of this,



biometrics uses unique characteristics of the veins as a method to identify the user. Vein recognition systems mainly focus on the veins in the users hands. Each finger on human hand has veins which connect directly with the heart and it has its own physical traits. Vein recognition biometric devices are often small, portable and affordable because they often use a single-chip design. It often takes less than two seconds for a vein recognition biometric device to authenticate the user, and contact is not necessary. It is used

in hospitals, law enforcement, military facilities and other applications that require very high levels of security [41].

To obtain the pattern for the database record, an individual inserts a finger into an attester terminal containing a near-infrared LED (light- emitting diode) light and a monochrome CCD (charge-coupled device) camera. The hemoglobin in the blood absorbs near-infrared LED light, which makes the vein system appear as a dark pattern of lines. The camera records the image and the raw data is digitized, certified and sent to a database of registered images. For authentication purposes, the finger is scanned as before and the data is sent to the database of registered images for comparison. The authentication process takes less than two seconds [42].

Advantages of Vein Recognition

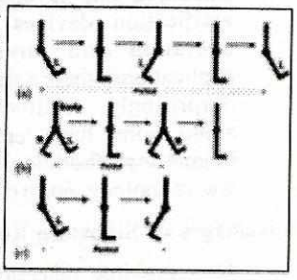
1. Difficult to forge
2. Contactless, hygienic and non-invasive
3. Highly accurate
4. Capable of 1:1 and 1:many matching

Disadvantages of Vein Recognition

1. The technology studies on veins it could create apprehensiveness in some people.
2. The machinery itself is larger than a simple fingerprint reader and could therefore occupy more unnecessary space
3. The technology is still being tested and is yet to be proved reliable.
4. This technology has not reached all areas of the world, and many cultures and elasticity's refuse to apply it.
5. It is an emerging technology it could be priced from $2,000 to $4,000 dollars per unit, making it affordable to certain organizations only.

1.10 Gait Recognition

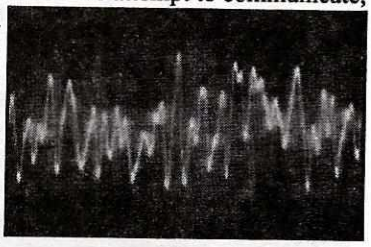
Gait is the coordinated, cyclic combination of movements that result in human locomotion/movement. The movements in a gait repeat as a walker cycles between steps with alternating feet. Examples of motion that are gaits include walking, running, jogging, and climbing stairs. Some objects are all coordinated motions, but they are not cyclic. So, that they are not in gait such as Sitting down, picking up an object, and throwing [14]. In the Figure Stylized body and legs showing sources of different frequencies in a synthesized gait.



Gait recognition is a biometric method. It is a unique biological or behavioral identification characteristic. Through this technology recognize people from the way they walk [13]. Gait recognition technology is not limited to security applications [11]. Gait analysis has been important in the health field for a long time. Basic changes in someone's walking pattern can be an early indicator of the onset of Parkinson's disease, multiple sclerosis and normal pressure hydrocephalus (NPH) [13]. There are two main types of gait recognition techniques currently in development. First is Gait recognition based on the automatic analysis of video imagery and second is Gait recognition based on a radar system to identify speeding cars [11].

1.11 Voice Recognition

Voice recognition is an auditory biometric [2]. The production of sound originates at the vocal cord. In between the vocal cords is a gap. When we attempt to communicate, the muscles which control the vocal cords are in contact. As a result, the gap narrows, and as we exhale, this breathe passes through the gap, which creates sound [24]. A Voice Recognition voice print is a spectrogram. A spectrogram is a graph that shows a sound's frequency on the vertical axis and time on the horizontal axis. Different speech creates different shapes on the graph. Spectrograms also use color or shades of grey to represent the acoustical qualities of sound.All of our voices are uniquely different (including twins) and cannot be exactly duplicated [25].Speech is made up of two components - A physiological component (the voicetract) and a behavioral component (the accent).



In the voice recognition process, first step is an individual produces an actual voice sample. This voice sample produces a stored model voice print or template. Biometric technology reduces each spoken word to segments composed of several frequencies. Each segment has several tones that can be captured in a digital format. Voice scan biometrics commonly requires 1500-3000 bytes. When a person speaks, his or her voice is compared with the previously stored voice template in the database for that individual. The performance of voice recognition systems may vary depending on health and emotional state of the person, background noise and the quality of the audio signal. If the person suffers from a physical ailment, such as a cold, or is unusually excited or depressed, the voice sample submitted may be different from the template and will not match [26]. Random words and phrases are used so that no unauthorized use is suspected [25]. Voice recognition is more often used in an environment in which voice is the only available biometric identifier, such as in telephony and call-center applications [26].

Advantages of Voice Recognition [40]

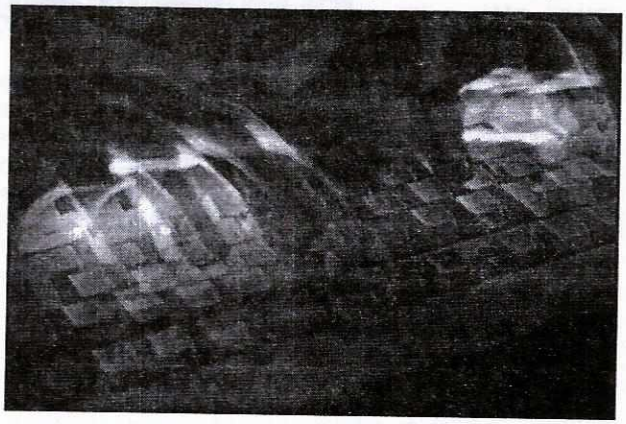
1. Increases productivity
2. Can help with menial computer tasks, such as browsing and scrolling
3. Can help people who have trouble using their hands
4. Can help people who have cognitive disabilities
5. Has long term benefits for students

Disadvantages of Voice Recognition [40]

1. Can be hacked with prerecorded verbal messages
2. Has an initial period of adjusting to each user's voice
3. Less accurate when there is background noise
4. Can be distracting in a cubicle environment
5. The company Nuance is one of the last companies producing the software and is essentially a monopoly

1.12 Keystroke Biometric

Keystroke Biometric Keystroke identification of a person by their personal typing style or keystroke pattern. Each individual has a characteristic typing ability that is unique. Typing biometric is the analysis of a user's keystroke



patterns[27]. Each key stroke is captured entirely by the key pressed, the presstime, and the release time, the data can also be transmitted using low bandwidth [28]. Keystroke Verification Techniques Static verification (Fixed text mode) only based on password typing rhythm. Authentication verify only at login time. Dynamic verification (free text mode) pattern regardless of the typed text. A continuous or periodic monitoring (On-the-fly user authentication) not required to memorize a predetermined text (username & password) [27]. Keystroke Applications A Behavioral measurement aiming to identify users based on typing pattern/ rhythms or attributes. Keystroke dynamics system different modes Identification mode (Find) One-to-many Verification mode (Check) One-to-one Non-repudiation. Keystroke Recognition is completely a software based solution. There is no need to install any new hardware and even software. All that is needed is the existing computer and keyboard that is already in place and use.

Advantages of Keystroke Recognition

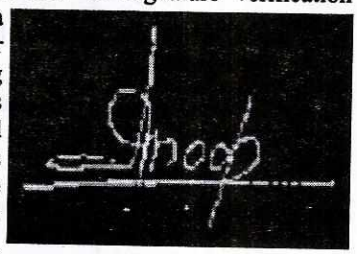
1. More convenient than physiological methods.
2. No additional hardware except a keyboard.
3. Cost effective.
4. It provides a simple natural way for increased computer security.
5. No end user training required.
6. Simple to deploy and use.

Disadvantages of Keystroke Recognition

1. User's susceptibility to fatigue
2. User's hands can also get tired or sweaty after prolonged periods of typing.
3. Dynamic change in typing patterns.
4. Injury, skill of the user
5. Change of keyboard hardware

1.13 Signature Recognition

Each signature has a secret key. That secret key is used to validate the signature was indeed sent by the user that it implies has sent it. Signature verification analyzes the way a user signs her name. Signing features such as speed, velocity, and pressure are as important as the finished signature's static shape.



Signature verification enjoys a synergy with existing processes that other biometrics do not. People are used to signatures as a means of transaction-related identity verification, and most would see nothing unusual in extending this to encompass biometrics. Signature verification devices are reasonably accurate in operation and obviously lend themselves to applications where a signature is an accepted identifier. Surprisingly, relatively few significant signature applications have emerged compared with other biometric methodologies. But if your application fits, it is a technology worth considering [34].

Advantages of Signature Recognition

1. Possible detection of inconsistent user during enrollment stage;
2. Fast and simple training;

3. Cheap hardware.

4. Little storage requirements.

Disadvantages of Signature Recognition

1. Signature verification is designed to verify subjects based on the traits of their unique signature. As a result, individuals who do not sign their names in a consistent manner may have difficulty enrolling and verifying in signature verification.

2. Error rate: 1 in 50.

1.14 3D Password Scheme

The 3D password isa more customizable and very interesting scheme of authentication. In this scheme the passwords are based on the fact of human memory. Normally simple passwords are set, so that human memory can recall them quickly but in this scheme it has to go through the facts of Recognition, Recalling, Biometrics or Token based authentication [29].

The 3D password is a multi-factor authentication scheme. It can combine many existing systems of authentication (such as recognition, recall, token, and biometrics) into one authentication scheme for providing an extremely high degree of security to the user[29].It is an excellent pattern in which biometric scan be coupled together [30].The 3D password presents a 3D virtual environment containing various virtual objects. The user navigates through this environment and interacts with the objects (i.e. a staple that can be punched, a paper or a white board that a user can write, sign, or draw on etc.) [29].In this scheme users should have the freedom to choose the specifications of the 3D password, whether it will be exclusively recall, biometric or token based, a combination containing two or more schemes, etc. [30].Once user implemented any scheme and log in to a secure site, the 3D password GUI opens up. This is an additional textual password which the user can simply put. Once user goes through the first authentication, a 3D virtual room will open on the screen. Here, virtual garage is the virtual room [29].

To describe this scheme there is an example that when the user can enter the virtual environment and type something on a computer that exists in (x1 , y1 , z1) position, then enter a room that has a fingerprint recognition device that exists in a position (x2 , y2 , z2) and provide his/her fingerprint. Then, the user can go to the virtual garage (virtual room), open the car door, and turn on the radio to a specific channel. The combination and the sequence of the previous actions toward the specific objects construct the user's 3D password [29]. The scheme should contain secrets, ones that are simple for the intended user to remember and complex for intruders to guess, because it is difficult to break down into a sequence of steps [30].

Advantages of 3D Password

1. 3D Password is multi-feature and multi-password authentication scheme.

2. Large password key space.

3. More secure authentication scheme as compared to existing one.

Disadvantages of 3D Password

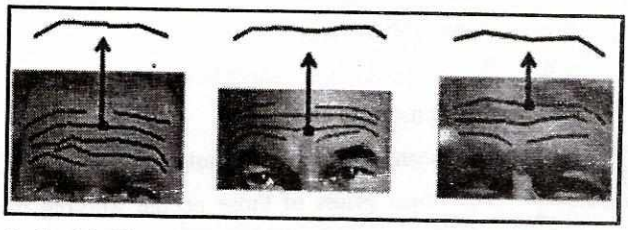
1. Large time and memory requirements.

2. Shoulder-suffering attack is still effective and can affect this scheme.

3. Expensive as compared to previous ones.

1.15 Forehead Recognition

Each face image was factorized into four layers: global appearance, facial organs, skin regions, and irregular details.



In the third layer, a new skin texture representation was used based on text on distributions [36]. Face recognition has focused on analysis of facial features other than typical features e.g. eyes, nose, mouth, chin, ears etc. The evaluation of the discriminative power of wrinkles present in human faces and specifically in the forehead areas as a soft biometric, facial micro-features, facial marks or facial soft biometric, include but are not limited to scars, freckles, moles, facial shape, skin color, hair color, facial hair, tattoos, eye color and shape of nose, beard, mustache and wrinkles. A set of wrinkles as a pattern may be unique to an individual. To evaluating the similarity between two wrinkles patterns the methodology used: Find one-to-many curve correspondences between two curve patterns. Given curve correspondences, calculate the overall distance / similarity between two patterns by combining the distance of each individual correspondence. It is called the Wrinkle Pattern Distance. Several experiments were conducted on the data set of hand drawn.

Wrinkles with different combinations of the metric used to find correspondences and calculate the distance between curve pairs once the correspondences were established. Recently, reported automatic detection of wrinkles as line segments with average detection rate of 80%. Automatic detection, detects wrinkles as line segments and the sequences of line sequences are broken at times. These curves through the line segment create wrinkle curves [36].

1.16 Comparative Analysis of Biometric Technologies

The following table compares some of the biometric technologies, from the point of view of universality, distinctiveness, performance, collectability, performance,

acceptability, circumvention [39]. Comparison of various biometric technologies based on the perception of the authors [39].

Biometric Identifier	Universality	Distinctiveness	Permanence	Collectability	Performance	Acceptability	Circumvention
Iris	High	High	High	Medium	High	Low	Low
DNA	High	High	High	Low	High	Low	Low
Retina	High	High	High	Low	Low	Medium	Low
Odor	High	High	High	Low	Low	Medium	Low
FACE	High	Low	Medium	High	Low	High	High
Fingerprint	Medium	High	High	Medium	High	Medium	Medium
EAR	Medium	Medium	High	Medium	Medium	High	Medium
Hand Geometry	Medium	Medium	Medium	High	Medium	Medium	Medium
Hand Vein	Medium	Medium	Medium	Medium	Medium	Medium	Low
Gait	Medium	Low	Low	High	Low	High	Medium
Voice	Medium	Low	Low	Medium	Low	High	High
Keystroke	Low	Low	Low	Medium	Low	Medium	Medium
Signature	Low	Low	Low	High	Low	High	High

Advantages of using Biometric Technologies

1. No more forgotten or stolen passwords.
2. Positive and Accurate Identification.
3. Highest Level of Security.
4. Offers Mobility.
5. Impossible to Forge.
6. Serves as a Key that cannot be transferred.
7. Safe & user friendly.

Disadvantages of using Biometric Technologies

1. The finger prints of those people working in Chemical industries are often affected.
2. It is found that with age, the voice of a person differs.
3. For people affected with diabetes, the eyes get affected resulting in differences.
4. Biometric is an expensive security solution.

Applications of Biometric Technologies

Biometric applications fall into three main groups:

1. Commercial Applications, such as computer network logins, electronic data security, e-commerce, Internet access, ATMs, credit cards, physical access control, cellular phones, PDAs, medical records management, and distance learning;
2. Government Applications such as national ID cards, correctional facilities, driver's licenses, social security, border control, passport control, and welfare-disbursement;
3. Forensic Applications such as corpse identification, criminal investigation, terrorist identification, parenthood determination, and missing children.

Traditionally, commercial applications have used knowledge-based systems employing PINs and passwords, government applications have utilized systems based on tokens such as ID cards and badges, and forensic applications have relied on human experts to match biometric features [43].

1.17 Future Aspect

Exploration in this field is still in pipeline which has many scopes in the development of adaptive algorithms to cope with forehead regions that may have partial hair coverage and will include the study of information available from skin texture in several micro features such as moles, scars, freckles, etc. Ear recognition using position of the ear relative to the eye brow, the helix-based classification to Iannarelli's system using shape is future prospects in Biometrics.

2. CONCLUSION

In this era, it is imperative that we continuously upgrade our security systems, and the use of biometrics is a step towards the security upgrade that we continuously require. In this paper a review of biometric recognition technologies is given. Biometric technology is fast gaining popularity as means of security measures to reduce cases of fraud and theft due to its use of physical characteristics and traits for the identification of individuals. The traits that are measured cannot be lost or stolen. It does not require user cooperation and allows a large group of people to be identified quickly. It guarantees the physical location of the user. Since the trait is unique to each person it cannot be shared between users. Also it is very cost effective. It can be used for emergency identification and prevents identity theft because it makes it impossible to pretend to be someone else. It is easy to use and appealing to the user as well. The earliest methods of biometric identification included fingerprint and handwriting while more recent ones include iris/eye scan, face scan, voice print, and hand print. Biometrics, however, are not suitable for every application and in some situations biometric identification may give the wrong solution. One of the continuing challenges for the biometric industry is to define the environment in which the technology provides the strongest benefit to individuals and institution.

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One Dimensional Cutting Stock Problem with minimum Usable Residue: A new approach

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Abstract

This paper defines a new technique of optimization of usable residue in One Dimensional Cutting Stock Problem by introducing a method for having minimum leftover to be used as non-standard stock (NSS). The concept behind the usable leftover is very critical in real time application, since the leftover stock to be maintained is difficult. We propose a method that focuses on to leave minimum usable residue, which takes care of warehousing problem up to some extent. Moreover, it has been noticed that the trim loss in some cases is reduced.

Keywords: minimum usable residue, cutting stock problem, leftover stock.

1. INTRODUCTION

Cutting Stock Problem (CSP) is a problem that deals with operations on stock utilization (cf.[2],[5]). It is a problem that deals with cutting large pieces available in inventory into a set of smaller pieces in order to satisfy the demands. These problems are relevant in the planning of utilization of materials in industries like iron, steel bar factories, glass industries etc., to avoid large amount of waste and minimize the total number of stock length cut and also minimize the cost incurred.

Various methods are developed to solve CSP which are based on pattern-oriented (cf.[8],[15]), item-oriented (cf.[10]) or mixed approach (cf.[12]) and also methods are introduced by Cherri [4] (see also[3])to present optimal solution which are applicable to small size problems.

Further, there are articles in the literature which shows the reuse of leftover material in the form of pieces(cf.[7],[9]). The two popular methods COLA (cf.[11]) and CUT (cf.[10]) deal with such type of situations in which there is a provision of reuse of leftover material .Also later Abuabara[1] modified the model proposed by Gradisar [10](see also[11]) with minimum number of constraints and variables in the model.

In this paper, we propose an efficient resolution to the Cutting Stock Problem in which a heuristic method is developed that defines Cutting Stock Problem with minimum Usable Residue (CSPMUR).Reconsideration on the conventional heuristic method, the CSPMUR characterize minimum residue which can be discarded and it will not affect the trim loss. In order to handle smaller inventory, we have imposed a condition on our mathematical model such that the residue under consideration should be minimum i.e. within the lower and higher order length. Therefore CSPMUR deals to leave minimum residue which is manageable.

This approach is an extended version of Gradisar's concept on minimum trim loss with usable leftover. This process is feasible when order lengths are small with proportion to stock length such that the sum of the length of all the orders should not exceed the stock length. This can be made relevant for the application to Coronary Stent where large piece of stent have to be cut into small pieces according to the requirement of the Patient. But this concept is not feasible in the case of transmission tower industry where the ratio of stock length(varies from 7m to 14m) to order length is low or medium.

The authors have worked out with the data extracted from[6] and compared with the existing methods and have obtained better results.

2. DEFINITION OF THE CUTTING STOCK PROBLEM WITH MINIMUM USABLE RESIDUE

In the CSP the scrap is unavoidable which is usually discarded but the question arises if the scrap is big enough (non-standard stock), which cannot be left as useless and if not taken into consideration the consequence is it will affect the functioning of the industry i.e. company will run in loss. Sustenance of then on-standard stock is an extra overhead, since the warehousing is difficult, as it requires space, manpower and maintenance of leftover database. Therefore, we intend to the elucidation of CSP as to minimize the usable scrap and this can be attained by designing the cutting plans in such a way that scraps are minimum that can be ignored or should be larger than the longest order length to go back to the standard stock.

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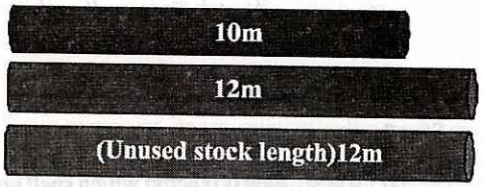
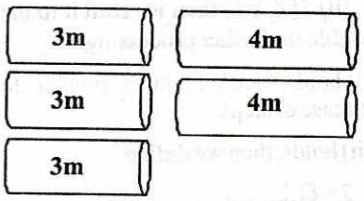
The objective function of conventional CSP is to minimize the waste after cutting the order length from the stock thereby minimizing the waste cost. In this paper, we define the objective function of CSPMUR as to reduce the number of functional (utilizable) pieces left after the order lengths had been cut from the stock length since it is difficult to manage the inventory of these pieces (left over). In accordance with our assertion, we discuss the following illustrative example.

Example 2.1



a) Total Stock lengths

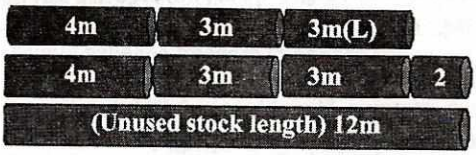


b). Order lengths with demands

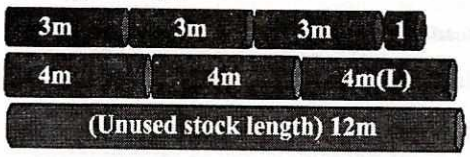
Fig. 1

Solution

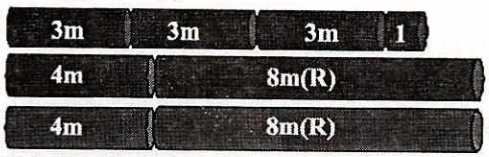
Cutting pattern (a)



Cutting pattern (b)



Cutting pattern (c)



Cutting pattern (d)

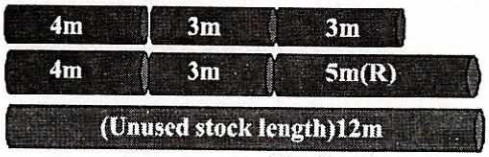


Fig. 2

The stock lengths, order lengths and demands are given in Fig. 1. Various cutting patterns are possible which are represented in Fig.2. Out of options from Fig.2(a-d), Fig.2-d is better when compared with Fig.2(a-c),since it leaves minimum usable residue. According to CSPMUR, the best possible pattern is Fig.2-d, which leaves no trim loss and the residue is large enough which can be merged with the standard stock.

The solution Fig.2a has 3m as usable scrap which is not manageable; similarly usable scrap is also left in solution Fig. 2b and Fig. 2c. Usable scrap is an overhead to the industry, the minimum usable residue canbe obtained by focusing on the fact that while cutting plans are determined it should not be focused on a single order length of demand to be cut in multiple number from a single stock rather concentrate the cutting plan of different order length from a single stock to be cut so that scrap can be reduced with minimum usable residue.

3. New method CSP with minimum usable residue initiated based on existing method

These methods are based on the existing objective function i.e. minimizing the trim loss with usable leftover.

- **First Fit Decreasing Algorithm** due to Cherri et.al[6]:

According to this algorithm the largest stock is initiated to cut the order length until its demand is attained, when it is exhausted, then the next order length is cut from the following second largest stock until the smallest order length is reached.

- **A Generic Greedy Algorithm** due to Sin-Min Lee[14]:

Many real-world problems are optimization problems in that they attempt to find an optimal solution among many possible proposed solutions.

(1) Initialize C to be the set of proposed solutions

(2) Initialize a set S = the empty set $\varnothing$ (the set is to be the optimal solution we are constructing).

(3) While $C \neq \varnothing$ and S is (still) not a solution do

(3.1) select x from set C using a greedy strategy

(3.2) delete x from C

(3.3) if $\{x\} \cup S$ is a feasible solution, then

$S = S \cup \{x\}$ (i.e., add x to set S)

(4) if S is a solution then

Return S

(5) else return failure.

In general, a greedy algorithm is efficient because it makes a sequence of (local) decisions and never backtracks. However, the solution is not always optimal.

These methods as given in the literature aim to minimize the trim loss with no consideration to manage the unavoidable large enough scrap, if discarded will certainly concern the performance of the industry.

In this present paper, authors developed a method of minimizing the non-standard stock(NSS), since it will an overhead for maintaining the data store.

4. ANEWAPPROACH

For our cutting plan, we refer the following basic assumptions considered by Dychoff (see [13]) which is basically assortment of large objects.

Its individualities are

1. One large object
2. Many identical large objects
3. Different large objects

Besides the above conditions Gradisar in his paper [13] has considered the generalized condition on the available stock length viz. few groups of identical large objects. In view of above considerations, we are now in a position to design our cutting plan which has been described as follows:

Order lengths are arranged in descending order with respect to their lengths. The stock length are considered as G1DCSP or S1DCSP where,

l_i= order length, $i=1,2,..,n$.

d_i= required number of pieces of order length l_i

U or U_j=Stock Length, $j=1,2,...,p$.

Where p is the number of diverse standard stock length (cf.[16])in a adequately big stock.

Choose the appropriate stock length U_j so that at least one piece of each order length should be cut from U_j.

p_{ij}= number of pieces of order length is been cut from stock length U_j

$$\sum_{i-1}^{n} l_i p_{ij} \le U_j \qquad (4.1)$$

where p_{ij}=1

Referring equation 4.1 we define δ_j as follows

Step 1.

$$\delta_j = U_j - \sum_{i-1}^{n} l_i p_{ij} \quad ; for\ p_{ij} = 1, \quad j = 1, ..., p \qquad (4.2)$$

The residue left from each stock length should be manageable NSS or non-manageable NSS or minimum NSS which can be discarded for which the objective function is

$$\min \sum_{j=1}^{p} \delta_j \qquad (4.3)$$

(minimizing the usable residue)

subject to

$$\sum_{i-1}^{n} l_i \le U_j \qquad (4.4)$$

We assume p_{ij}=1 (4.1)

$$\sum_{i-1}^{n} p_{ij} = d_i \ ; \ i = 1, ..., n; \quad j = 1, ..., p \qquad (4.5)$$

We check the following:

Step 2

(i) If $\delta_j < l_1$, then δ_j is scrap which shall not be reused

(ii) If $\delta_j \ge l_1$, then we shift it to the stock (NSS) which is reusable for further processing.

If (i) holds, then we take up another stock length and proceed as in case of step 1.

If (ii) holds, then we define

J = {1,2,...,n}

$$\delta_j^1 = \delta_j - \sum_{j \in J} l_j \quad ; p_{ij} = 1 \qquad (4.6)$$

where J (Index set).

We choose the order lengths l_j's in (4.6) in such a way that $\delta_j^1 \ge 0$ ie.,we may not consider some of the order lengths in $\Sigma_{j \in J} l_j$.

Again, we examine δ_j^1 as in step 2. We continue the process by defining δ_j^n till $\delta_j^n < l\_1, i=1,...,n$

Algorithm:

Step 1: read l_i, d_i and U_j

Step 2: arrange l_i and U_j in descending order.

Step 3: $\delta_j = U_j - \Sigma l_i$

If $(\delta_j \le \min) \&\& (\delta_j \ge 0)$

$\min = \delta_j$

$st_k = U_j$

Step 4: Repeat step 3 for $Uj \le Up$

Step 5: pij = 1 $\forall_i$=i,...,n

j++

l_i++

Step 6: repeat step 5 $l_i \le ln$

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Step 7: if $(\Sigma^{n}_{i=1} p_{ij}) = d_i$

$d_i = 0$

Step 8: if $\delta_j \geq l_i$

$U_j = \delta_j$

p_{ij}++ for l_i

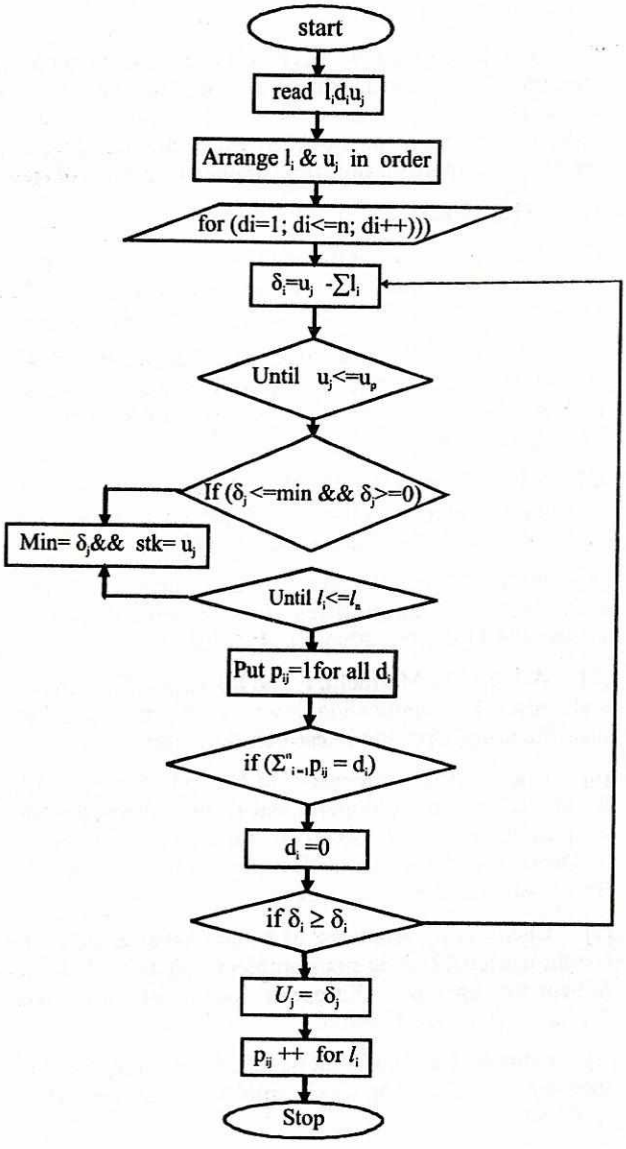
if all $d_i = 0$ then

stop

else

go to step 3.

Flow Chart:



4. Comparative study of the new approach with FFD and Generic Greedy algorithm

In order to compare explicitly our method with FFD and Greedy, we consider **the same data** as analyzedby Gradisar (cf.[6]) in this section.

We now consider the following table of data extracted from [6] with stock length assumed as 3000 cm.

Item	Length(cm)	Demand
1	250	2
2	275	2
3	285	4
4	525	4
5	1380	4

Table 1

- **First fit Decreasing (FFD)**

In FFD the order lengths and the stock lengths are arranged in a descending order. The order lengths are cut from the stock in multiple factors to satisfy the demand. The longest stock is initiated to cut to satisfy the largest order length, until the demand is exhausted. Then the next order length is cut from the following largest stock until we reach the smallest order.

- **Generic Greedy**

The various cut patterns are proposed by cutting the order lengths by various stock length out of which the optimal pattern is chosen to solve the 1DCSP.

- **Our approach**

It deals with the fact that the at least one order length is cut from the stock since the sum of the order length is less than the stock and this process is continued till the scrap left can be discarded.

Comparative analysis

The above methods are applied on data of Table 1 and found that the trim loss computed by the new approach is very less as compared to other two algorithms. Also the scrap left between the smallest order length and the largest order length is almost nil which is the objective of the new approach ie. resolving the problem of maintaining the data warehouse (Table 2).

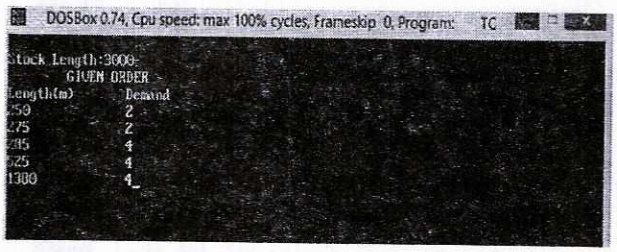
	Constructive		
	FFD	Greedy	New approach
Object cut	4	4	4
Total Length	12000	12000	12000
Total Loss	525	240	4
Total NSS	1669	1954	2190

Avoidable Scrap	0	0	0
Manageable NSS	3	1	2
Unmanageable NSS	1	1	0

Table 2

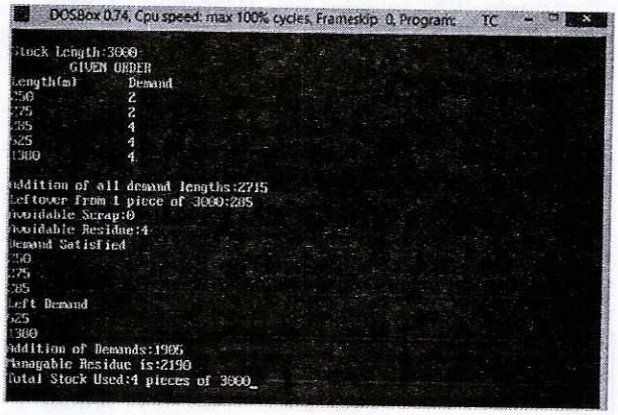
It has been tested in few problems corresponding to randomly generated data and result was found satisfactory. The above algorithm was computerized in C language to calculate the minimum usable residue of which the screen shots are as below.

Screen shot

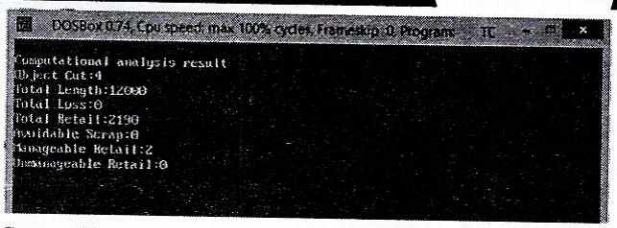


Screen Shot 1. Entering the value of order length, demand and the stock

Screen Shot 2. Sum of the order length and leftover after cut pattern



Screen Shot 3: Utilization of the stock to satisfy the demand



Screen Shot 4: Computational Analysis Result

5. CONCLUSION

This work characterizes a different technique to resolve the 1D-CSP in some cases, which directs to a better possible resolution with low time complexity. The proposed method is suitable when the ratio of size of stock to order length is sufficiently large. It focuses on the cutting plan that the order lengths are cut from stock in such a way that the usable residue left is minimum.

In this approach we have assumed to cut all the order lengths from the stock which may be observed very rare practically, but the future aspect of research can be to cut few order lengths from the stock to reduce the operating cost which will be more feasible from implicational point of view.

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Mathematica: An Effective Tool to Bridge A Gap Between Conventional and ICT Oriented Teaching Methods

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Abstract

In today's high pace world where extreme advancement is evident in the technological domain, requires professionals, researchers, and academicians in particular to be tuned with the current system to achieve remarkable goals. The rejuvenation of Education professionals in terms of technology along with conventional teaching method is prerequisite for an effective teaching and learning process. Teaching, learning and research process can be made more dynamic by the application of viable software like Mathematica, Matlab, Weka, Multisim and Ultiboard etc.. Mathematica is a user friendly computational software program used in many scientific, engineering, mathematical and computing fields, based on symbolic mathematics. Mathematica is well recognized as a teaching tool because of its potential and now has become an integral part of curriculum in various colleges and universities. Some of its significant features like Elementary and Special mathematical function library; 2D and 3D data, function and geo visualization and animation tools; Machine learning tools for data, images and sounds; Computational geometry in 2D and 3D; Toolkit for adding user interfaces to calculations and applications; Tools for 2D and 3D image processing and morphological image processing including image recognition; Data mining tools such as cluster analysis, sequence alignment and pattern matching; Tools for financial calculations including bonds, annuities, derivatives, options etc.; Libraries for signal processing including wavelet analysis on sounds, images and data; Continuous and discrete integral transforms; Database collection for mathematical, scientific, and socio-economic information and access to WolframAlpha data and computations; Tools for connecting to DLL, SQL, Java, .NET, C++, Fortran, CUDA, OpenCL, and http based systems; Tools for parallel programming, etc. make Mathematica versatile. This paper explores the spectrum of Mathematica application to the topics related to physics and electronics.

Keywords : Mathematica, Wolfaram, ICT Teaching methods.

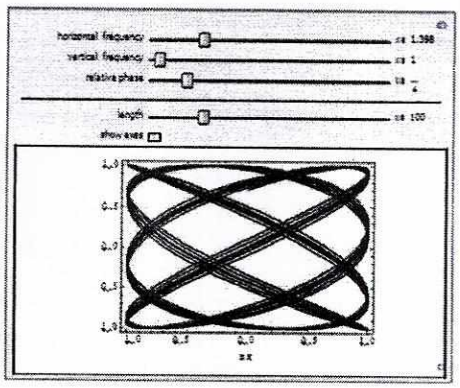
1. INTRODUCTION

The traditional lecturing method being followed by the mass, gradually proving itself less effective as compared to the IT oriented teaching method. The conventional teaching method places students in a passive rather than an active role, which hinders learning. The IT oriented teaching method provides students an interactive and dynamic platform to enhance learning skills, which therefore makes learning process joyful and long-lasting. The revolution of IT has brought remarkable transformation in academia. The application of IT has expanded both horizontally and vertically in the educational domain and shifted the teaching and learning process from a teacher-centered input model, to one that is student centered and based on outputs. Good teaching, in other words, would focus less on what teachers do and primarily on what students learn. This paradigm shift is playing out dynamically in some learning environments but is encountering obstacles in others.

Impact of Mathematica Software Application

The application of IT has set benchmark in academia by making use of various educational software to support conventional teaching method. Among such interactive software is Mathematica software which is user friendly and covers entire spectrum of applications. In this paper author has depicted some of the following demonstrations prepared to aid teaching method and enhances students' involvement in understanding the subject in the classroom.

Lissajous Figures



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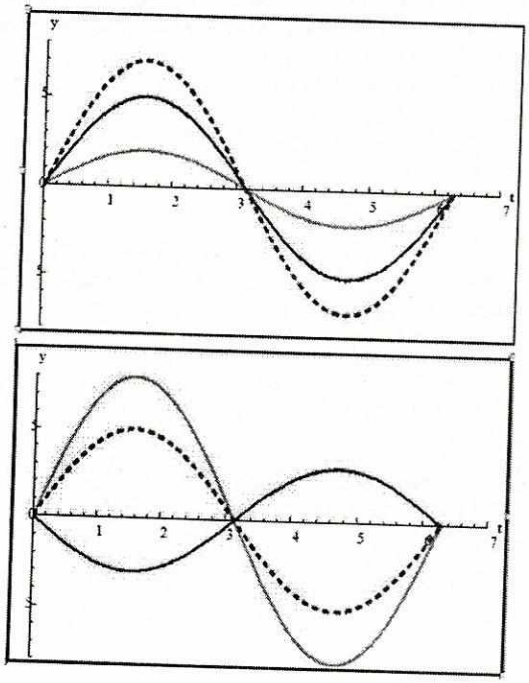
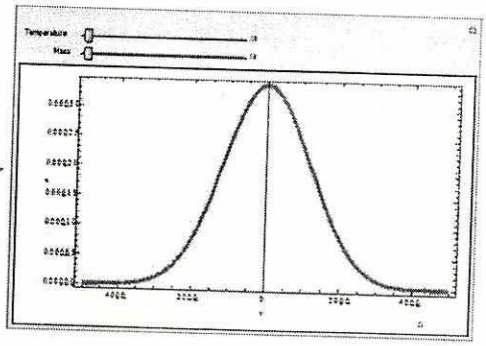
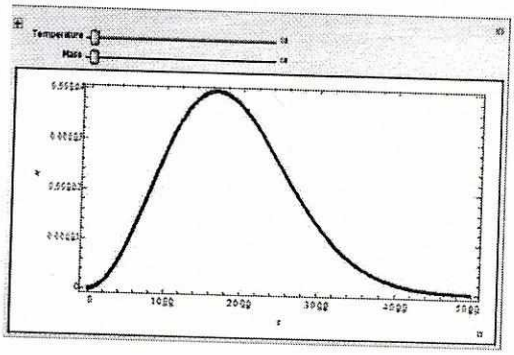
Constructive and Destructive Interference



Maxwell-Boltzmann's Velocity Distribution Law



Maxwell-Boltzmann's Speed Distribution Law



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Probabty Distribution and narrowing with the increase in the number of particles

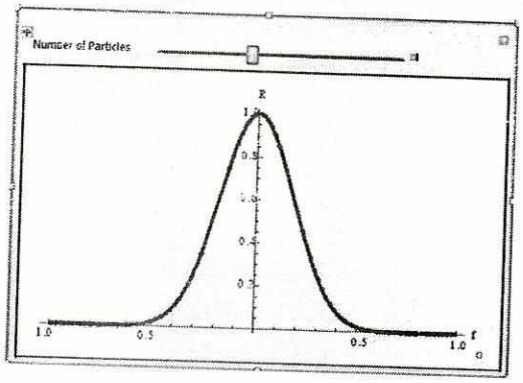
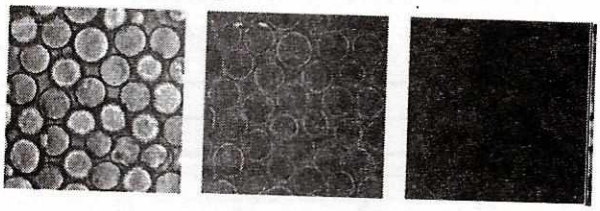


Image Processing



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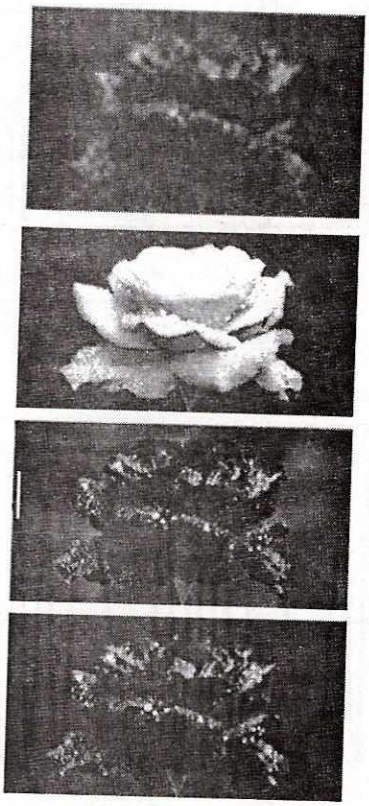
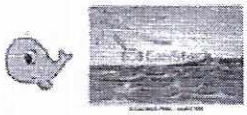
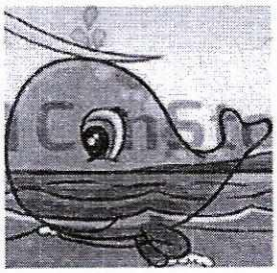
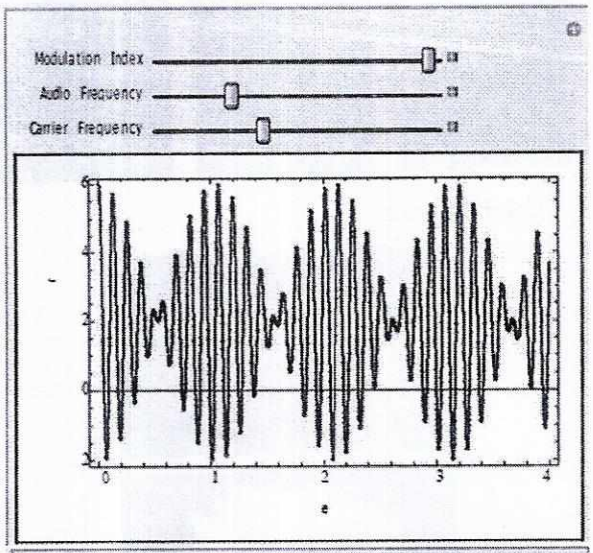


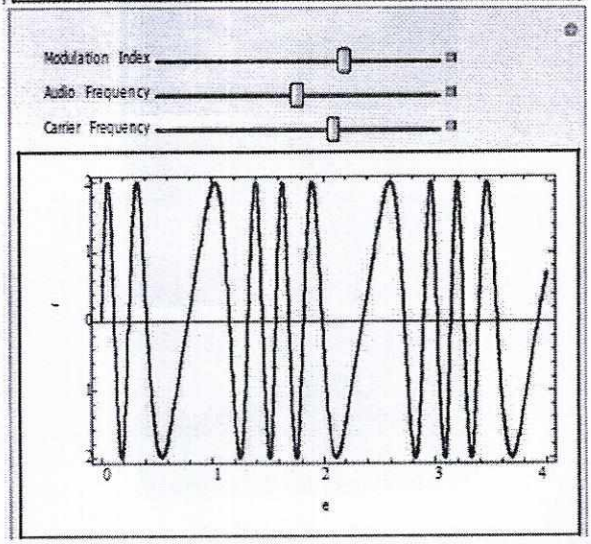
Image Multiply





Amplitude and Frequency Modulation





2. CONCLUSION

It has been observed that IT approach in academics and the inclusion of educational software in teaching process make students more participating and learning. The application of Mathematica software makes subject dynamic instead of static. Therefore it is advisable to explore the application of IT in higher education in lieu of conventional teaching methods.

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A Comparative Study of Optical Character Recognition for Handwritten Documents of Devangri

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Abstract

Initially Optical Character Recognition (OCR) systems have been developed for English. Now a days manual working is a problem. It's the need of hour to convert the data in softcopy from hard documents. Till now many techniques have been developed for offline pattern recognition using character scanning. This paper discusses various findings of latest OCR techniques developed for handwritten devnagri documents.

Keywords: Offline Pattern Recognition, Character Scanning

1. INTRODUCTION

Optical Character Recognition is an area of Pattern recognition which has various research scopes.

From the inception many researchers have done a lot of work. Process of Pattern Recognition has three main steps: observation, pattern segmentation, and pattern classification. Optical Character Recognition (OCR) systems transform large amount of documents. Documentsare of various types like plain documents, documents with image, documents without any noise, documents with noise etc. In India Hindi is a national language and verity of documents are in Hindi only. To recognize the data from handwritten documents is very tedious work because of character set and different writing patterns.

Introduction of Devnagri [1]

The basic character set is of 48 characters in which there are 12 vowels (swar) and 36 consonants(Vyanjan). A unique property of Devnagari script is the formation of conjuncts (Yuktakshar) that are combines of two (bi-consonantal) or three (tri-consonantal) consonants. About 176 bi-consonantal and 24 tri-consonantal conjuncts can be formed. Their formation is by simple rules and restrictions of the language of application. Each of the consonant and the conjuncts can be further modified by vowel modifier (Matra). In a manner similar to that of the formation of conjuncts, combinations of vowels, with the nasal sounds, gives rise to combines in vowels also. There are as many characters in the Devnagari script as there are syllables in the spoken language. The 45 characters of the basic handwritten character set for experimentation is based on their present-day usage. The handwritten character set is shown in Fig.1

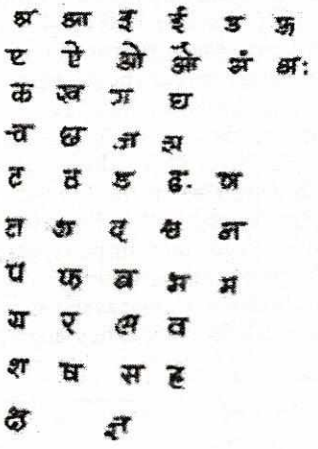


Fig. 1: Basic character set (handwritten).

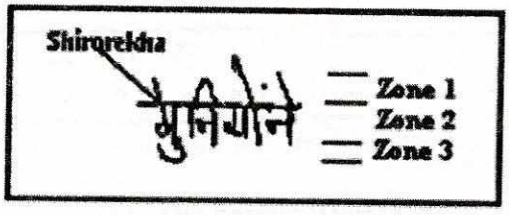
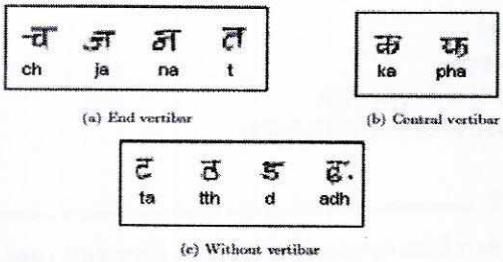


Fig. 2: 'Devnagari' word with modifiers and zones.

Every character has a horizontal header line on the top, called the 'Shirorekha' shown in Fig. 2. This line serves as a reference to divide the character into two distinct portions:Head and Body or zone 1 and zone 2, if the top modifier (matra) is present. The lowermodifier occupies zone 3. The basic character width ranges from very small to large goingthrough many medium sizes. Many characters have a vertibar, which can be present inthe end of the character as

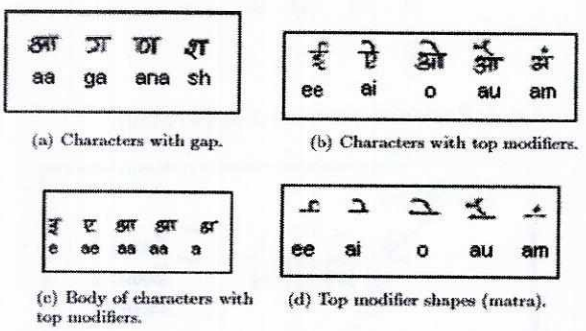
shown for a few representative characters 'ch', 'ja', 'na' and 't' in Fig. 3(a). The vertibar can be present in the middle region as shown in Fig. 3(b)



(a) End vertibar (b) Central vertibar (c) Without vertibar

Fig. 3: Vertibar and non-vertibar 'Devnagari' characters.

Characters 'ka' and 'pha'. Twelve characters do not have a vertibar. Some representativecharacters 'ta', 'tth', 'd' and 'adh' are shown in Fig. 3(c).Fig. 4(a) shows four characters that have gaps ('aa', 'ga', 'ana' and 'sh') and Fig. 4(b)shows five characters with top modifiers (namely 'ee', 'ai', 'o', 'au' and 'am'). These fivecharacters can be segmented in two parts: the top modifier and the body. The body ofthese characters resembles the characters 'e', 'ae', 'aa', 'aa' and 'a' respectively as shown in Fig. 4(c). This reduces the total number of characters to be recognized to 40. The body ofboth third and fourth character ('o' and 'au') in Fig. 4(b) are identified as character 'aa'.The segmented shape of top modifiers above the shirorekha of second and third character ('ae' and 'o') shown in Fig. 4(b) is also similar as shown in Fig. 4(d). Thus a total of fourtop modifiers have to be recognized.



(a) Characters with gap. (b) Characters with top modifiers.

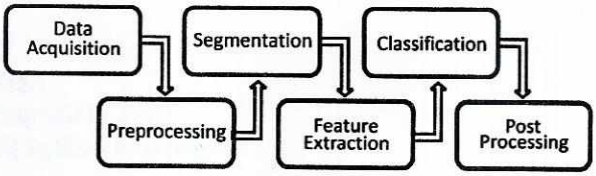
(c) Body of characters with top modifiers. (d) Top modifier shapes (matra).

Fig. 4: Features of Devnagari characters.

General Steps for Character Recognition:

The major steps involved in the handwritten character recognition are :

1. Data Acquisition
2. Preprocessing
3. Segmentation
4. Feature Extraction
5. Classification
6. Post Processing



1. Data Acquisition

There are so many places from where data could be collected. Off-line character recognition capture the data from paper through optical scanners or cameras.[2]

2. Preprocessing

The raw data, depending on the data acquisition type, is subjected to a number of preliminary processing steps to make it usable in the descriptive stages of character analysis. Preprocessing aims to produce data that are easy for the CR systems to operate accurately. The main objectives of preprocessing are:-

a. Noise Reduction
b. Normalization of the data
c. Compression[2]
d. Thresh Holding
e. Skew Detection
f. Thinning[3]

3. Segmentation

Segmentation is one of the most important and essential process that decides the success rate of character recognition system. Segmentation is the process of partitioning an image/document into disjoint and homogeneous regions [4]. This task is attained by finding the boundaries. There are several approaches for finding the character bounds.

There are two types of segmentation: external segmentation, which is the isolation of various writing units, such as paragraphs, sentences, or words, and internal segmentation, which is the isolation of letters, especially in cursively written words.

a. External segmentation
b. Internal segmentation[2]

Devanagari document is decomposed into sequence of lines and words by horizontal and vertical projection respectively. Devanagari words can be further sub divided by removing the shiro-rekha. A devanagari word may be partitioned into three parts. Core characters are in the middle part. The upper part denotes the portion above shiro-rekha and optional modifiers may be in lower part. So, devanagari

character segmentation is very complex because of the presence of various modifiers. [5][6].

4. Feature Extraction

Feature extraction is the process of collecting distinguishable information of an object or a group of objects so that on the basis of this information we can classify objects with different features. I.S. Oh [7] has defined that feature extraction and selection is a process of extracting the most representative information from the raw data. For this purpose, a set of features are extracted for each class that helps to make it separate from rest of the classes.

S. Arora et.al. [8] have proposed technique to recognize non-compound devnagari charcters in which two feature sets are created one as shadow features extracted from scaled Characters are segmented into strokes using our segmentation algorithm. The segmented strokes are coded using our ACDC algorithm. Fuzzy and crisp features are extracted on the segmented strokes of characters.[1]

5. Classification

Classification is performed after the feature extraction. There are several approaches to perform this process.

a. Artificial Neural Network (ANN) - approach has been used for classification and recognition. It is computational model is widely used in situation where the problem is complex and data is subject to statistical variation. The architecture of a neural network determines how a neural network transfers its input into output. This transfer can be viewed as a computation.[9]

b. Vector Machine - It is also a popular approach for classification. Vector machine are sets of related supervised learning method for classification and regression. It is a discriminative classifier formally defined by a separating hyper plane. The basic idea is to find a hyper plane which separates the dimensional data perfectly between the various classes. Vector Machine simultaneously minimizes the experimental classification error and maximizes the geometric margin. [10]

c. Template Matching - This is the simplest way of character recognition, based on matching the stored prototypes against the character or word to be recognized. The matching operation determines the degree of similarity between two vectors (group of pixels, shapes, curvature etc.) A gray-level or binary input character is compared to a standard set of stored prototypes. According to a similarity measure (e.g.: Euclidean, Mahalanobis, Jaccard or Yule similarity measures etc). A template matcher can combine multiple information sources, including match strength and k-nearest neighbor measurements from different metrics. The recognition rate of this method is very sensitive to noise and image deformation. For improved classification Deformable Templates and Elastic Matching are used [11-12]

d. Statistical Techniques- Statistical decision theory is concerned with statistical decision functions and a set of optimality criteria, which maximizes the probability of the observed pattern given the model of a certain class. [13]. Statistical techniques are based on following assumptions:

Empty area around the decision boundary defined by the distance to the nearest training patterns [16]. These patterns, called support vectors, finally define the classification function. Their number is minimized by maximizing the margin. The support vectors replace the prototypes with the main difference between SVM and traditional template matching techniques is that they characterize the classes by a decision boundary. Moreover, this decision boundary is not just defined by the minimum distance function, but by a more general possibly nonlinear, combination of these distances.[17]

e. Combination Classifier - Various classification methods have their own superiorities and weaknesses. Hence many times multiple classifiers are combined together to solve a given classification problem. Different classifiers trained on the same data may not only differ in their global performances, but they also may show strong local differences. Each classifier may have its own region in the feature space where it performs the best. Some classifiers such as neural networks show different results with different initializations due to the randomness inherent in the training procedure. Instead of selecting the best network and discarding the others, one can combine various networks, thereby taking advantage of all the attempts to learn from the data [15].

There are some schemes for combining multiple classifier can be grouped into two categories :

i) Selection and Training of Individual Classifiers

A classifier combination is especially useful if the individual classifiers are largely independent. If this is not already guaranteed by the use of different training sets, various resampling techniques like rotation and bootstrapping may be used to artificially create such differences for improving the classification rate [16].

ii) Combiner

After individual classifiers have been selected, they need to be combined together by a module, called the combiner. Various combiners can be distinguished from each other in their trainability, adaptivity, and requirement on the output of individual classifiers. Combiners, such as voting, averaging (or sum), and Borda count are static, with no training required, while others are trainable. The trainable combiners.

6. Post Processing

Post Processing is the process which performs when classification is completed. It consist of following Steps

1. Represent the output in Unicode format.
2. Correcting error
3. The disambiguation of confusing character pairs.
4. To improve recognition rates linguistic rules can also be applied.

2. CONCLUSION

Methods for treating the problem of Devnagari character recognition have developed remarkably from inception of DOCR. Still a lot of research is needed to tackle the challenges in DOCR so that commercially viable software solutions can be made available. It is hoped that this comprehensive discussion will provide insight into various concepts involved, and boost further advances in the area.

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A Survey on Various Attacks in Mobile Ad-hoc Network

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Abstract

Mobile Ad-hoc Network (MANET) is infrastructureless multi-hop network. The work of the MANET is totally depends on the cooperation of the nodes in the network. In MANET each node can acts as a host or routers. Since the nodes in the MANET can enter or leave the network, the MANET should cope up with the topological changes. The security is the major challenging issue in MANET, due to the infrastructureless, dynamic topology, decentralized system and openness nature of the MANET. The mostly existing traditional security algorithms designed for the MANET are not so secure enough, in-efficient and low in detection of any node's misbehavior, so the performance of the network is degraded. In this paper, various attacks have been discussed and to overcome these attacks the existing approaches have been compared.

Keywords: Mobile Ad-hoc Network, Attacks, Trust based routing.

1. INTRODUCTION

Mobile Ad-hoc network (MANET) is originally designed for a cooperative environment. MANET is a group of wireless mobile nodes that form a network and successful transmission of packets is totally depends on the cooperation of each node in the network. MANET is an infrastructureless network with each node acts a router and has processing capability for other nodes. In MANET, there is no geographical limitation; it is a self-directed and decentralized wireless system, that's why MANET became popular in various areas, such as military application, sensor networks, some public networks and many more. Due to the openness and dynamic nature of MANET, it is more prone to various attacks as compared to the wired networks. Packet information is transmitted from source to destination via intermediate nodes. In MANET, routing is heavily depends on various factors, such as, topology, initiation of request, selection of route etc. Malicious nodes can easily disrupt the route discovery during data forwarding phase, if routing protocol is not secured enough.

Security in MANET is a major aspect in term of packet forwarding and routing. Attacks in MANET can be categories into passive attack and active attack. In Passive attack, the attacker only listen the communication channel to know the confidential information is being transferred without altering or disrupts the operation of the network. The detection of Passive attacks is difficult. In an Active attack, attacker can alters, drop or destroys the data being exchanged. Active attacks can further be classified as External attacks and Internal attacks. External attacks are carried out by those nodes which are not part of the network, while Internal attacks are carried by nodes which are the part of the network and more severe and difficult to detect as compared to the External attacks, for example, black hole attacks, wormhole attacks, DOS attacks etc.

The existing routing protocol can be categories into two types Proactive routing protocols and Reactive routing protocols. In Proactive routing protocol (e.g. DSDV), it maintain the routing information all the time and update the routing information by broadcasting the update messages. In volatile environment, due to the information exchange overhead, Proactive routing protocols are not suitable for the mobile ad hoc network. On other side, Reactive routing protocols only maintain the route, which is demanded to reach to the destination. Two widely used Reactive routing protocols are Ad-hoc On Demand Routing (AODV) and Dynamic Source Routing Protocol (DSR). But these two protocols are also affected by various attacks. Normally, Reactive routing protocols having two processes, that is, route discovery and route maintenance. For providing security, two approaches are popular Cryptographic method and Trust-based method. Cryptographic method provides computational overhead, example SAODV. Trust based method overcome the computational overhead and provide better route decision, example TAODV.

2. VARIOUS ATTACKS IN MANET

Security is the most concern part in MANET for secure transmission of the information. Absence of any central co-

ordination and shared wireless medium makes MANET more prone to the various attacks. These attacks can be classified into the two types: External attacks and Internal attacks.

External Attacks: These attacks are carried out by those nodes that do not belong to the network. It causes congestion sends false routing information or cause vulnerability of services.

Internal Attacks: These attacks are more dangerous as com-pared to the External attacks. This attacks are carried out by those malicious nodes that are the part of the network. In such attack, malicious nodes get unauthorized access and can analyze traffic between the other nodes and may participate in the network activities. Internal attack can be further categorized in two types: Passive Attacks and Active Attacks.

Passive Attack, monitors an unencrypted data traffic and looks for clear-text passwords and sensitive information that can be used in another attacks. Passive Attack includes traffic analysis, monitoring of unprotected communications and capturing the authenticated information such as password.

Active Attack, tries to bypass or break the secured system. Active Attack include attempts to break protection features, to introduce malicious nodes and to steal or modify the information.

A. Black hole Attack

In Black hole attack, the malicious nodes try to create the routing loop or routing the packets on the non-optimal route or it may selectively drop the packets, result in degradation of the routing services. This kind of attack is hard to discover, since network seems to work normal in the view of user.

B. Gray hole Attack

In Gray hole attack, particular malicious node drop the packets for particular node for the particular time. That's why this attack is difficult to discover. This attack can be considered as a form of Black hole attack. In this attack, malicious nodes either drop the packets selectively or in statistical manner.

C. Flooding Attack

In Flooding attack, malicious node sends RREQ packet or false routing information to its neighboring nodes which flood routing table of neighboring node. This prevents the registration of any other new route in the routing table of victim node. This attack is hard to detect, since any normal node frequently broken routes could legitimately initiate frequent route discoveries. One or more malicious nodes any decrease the network throughput.

D. Denial of Service (DOS) Attack

In Denial of Service attack, in prevent the victim from being used all or part of the network connection. DOS attacks may present in all layers of protocol stack. DOS attacks have numerous forms and are hard to prevent. In this, attacker may sent an excessive amount of requests to server, so the server will be busy in testing illegal request and will not be available to other users. This attack not only damage to the particular node but also degrades the performance of the whole network since nodes have limited battery power.

E. Wormhole Attack

In Wormhole attack, two malicious nodes form a tunnel and all the packets which are received at one location of the network will tunnel them to another location in the network, where all these packets will resend into the network. The tunnel between this two colluding attackers is known as wormhole. This attack prevents any routes other than through the wormhole from being discovered.

F. Byzantine Attack

In this attack, an intermediate nodes or a set of intermediate nodes work in collusion and carry out attacks such as creating routing loop and forwarding packets to that path which is not optimal path, which may harm the routing system.

3. RELATED WORKS

Muhammad Ali et al. [2] Proposed a combine efficient techniques from elliptic curve cryptography and distributed Intrusion Detection System (IDS) based on threshold cryptography. The limitation of this scheme is that, it is applicable only to the known attacks. We must have another mechanism to detect newer attacks. Another limitation is that, it added overhead and complexity. The proposed work can be extended through the extension of the current routing protocol by making the communication more secured to protect the routing protocol message.

Naveen Kumar et al. [6], proposed an algorithm which based on Trust based Ad-hoc On Demand Routing Protocol for MANET, and worked on the concept of honest value; calculated on the the concept of hop and trust to protect the network from malicious nodes. In proposed HAODV routing protocol, before forwarding the data through various routes, the routing paths have been evaluated according to the trust metrics by the nodes. This method is based on Honest mechanism to secure the AODV routing protocol. The performance of the HAODV has been analyzed using three parameters namely the number of drop packets, throughput and Packet Delivery Ratio. The HAODV performs well in terms of throughput and number of dropped packets. The future work of this method is to implement the proposed scheme with more number of parameters while evaluating the path.

Naveen Kumar Gupta and Amit Garg [9] proposed a Trust based Management framework for securing Ad-hoc On Demand Distance Vector Routing Protocol. This worked on the concept of Trust factor and selection of most efficient route and using the Trust Value a routing path is evaluated,

also during the route exchange process the route get updated. The performance of the proposed system is calculated based on the Packet Delivery Ratio (PDR), number of drop packets and throughput. The identity information such as IP address and Trust factor value has been used to prevent the attack by the malicious node. This identity information has been assigned to each node in the initialised phase or when the node has been configured. In the future works, to optimize proposed algorithm in terms of number of nodes and establishing the fast mechanism to detect and prevent the malicious nodes even when large number of nodes.

Sumathy Subramaniam et al. [12] proposed a framework for Opportunistic Routing help to improve the lifetime of network and Trust model helps to overcome the vulnerability due to attacks by malicious / selfish nodes, to provide reliable packet transmissions. In Opportunistic Routing, one node is selected among the set of candidate nodes as a potential next-hop forwarder using metrics like number of transmission in the link, link error probability, cost etc. for the packet transmission. This metrics helps in improving the network lifetime. Also, to prevent attack by malicious nodes, the Trust model is used which is based on direct and indirect Trust degree from similar trusted neighbours. On logical level, a proposed framework for Opportunistic Routing have the Two Modules: Routing Module and Trust Module. Routing module mainly responsible for the selection and prioritization of candidate using the proposed metric, help to improve the residual battery power required for the packet transmission. Trust module is responsible for detection and prevention of malicious and selfish nodes. This Trusr module is based on the direct and Indirect Trust degree. As an enhancement to the proposed work, further focus is to determine the delay incurred in transmission of packet from the source to the destination so as to ensure better quality of service in MANET.

Issac Woungang, et al. [13] Proposed an enhanced trust based multi-path dynamic Source routing (ETBMDSR) protocol to securely transmit messages in MANETs. Authors proposed a method to improve the TB-MDSR scheme at least route selection time standpoint. The route selection time is the time (measured in seconds) taken by algorithm to find the suitable secured routing path to transmit the message from source to destination. In TB-MDSR scheme [19], a message between source to destination is first broken into four message parts. At the source node, the message parts get encrypted using soft-encryption and similar XOR operation as in [19] (Step 1). The encrypted message parts are transmitted from source to destination through many trusted paths, constructed using DSR and selected according to the Greedy approach on a path length basis (Step 2). At the destination node, the received encrypted message are decrypted (using similar XOR operations as in [19]) and the original message is recovered (Step 3). The proposed ETB-MDSR scheme is implemented by following same steps as for the TB-MDSR scheme [19]. However, in Step 2, a new Trust management model [18] is implemented. In ETB-MDSR scheme, History of Interaction(HI) module stores the records on the interactions between nodes in suitable data structure. During trust computation, the HI module is maintained and updated by the History Maintenance module and the Trust Computation module select the desired entry in the HI module, then calculate the Trust value which is based on the direct and indirect Trust values (using Direct Computation and Indirect Computation).

Ahmed M. Abd El-Haleem et al. [15], proposed a novel secure reactive routing protocol for MANET, called TRIUMF for securing MANET against Packet Dropping Attack. It is hard to determine wether the node is malicious or selfish node. This proposed protocol makes first effort to distinguish between the malicious and selfish nodes and allow to control the degree of selfishness. The proposed monitoring tool first detects the malicious activity and then the path searching tool identifies the malicious or compromised nodes in the network and isolated them, and then proposed routing protocol select routes securely. In TRIUMF, AOMDV is used [18], or multi-path DSR to establish a two node-disjoint paths between source and destination. But here, the modified RREQ packet is used, containing a list of all unwanted nodes (malicious and selfish nodes), also destination node may have the same list and it discard all routes which contained this unwanted nodes. Also during the RREQ flooding process, the intermediate nodes will insert the previous node's trust rating in the RREQ packet. When the destination node received RREQ packets from multiple nodes, it select a two node-disjoint-paths with the highest path trust value, and certainty factor and unicasts two RREPs back to the source along the selected two routing paths. The scheme presented here, authors used the DLL-ACK and the end to end TCP-ACK as a monitoring tool to monitor the behaviour of the routing path, then used the path searching tool to search the misbehaving path to find the malicious node, and then put the malicious node ID in the black list to isolated it from the route selection. The future work of this scheme is to compare the result and effectiveness of the solution with the existing trust based routing protocols such as, TAODV, TWOACK and TDSR protocols.

N. Bhalaji et al. [16], Presented a Trust based routing model to deal with Black hole and Cooperative Black hole attacks that are caused by malicious nodes. Here, Authors applied the Association based Route selection to the DSR protocol to improve the routing security. The purpose of applying Association based Route selection to the DSR protocol is to select the best and securest route in the network. In this scheme, a Trust value is associated to each node, which represented the value of trustworthiness to each of its neighbor nodes. In proposed scheme, authors classify the Association among the nodes and their neighboring nodes into three types: Unknown, Known and Companion.

Unknown: The unknowns are the non trusted nodes,

having minimum trust level. When any new node join the network, its trust relationship with its all neighbors are low or negligible. Known: These are the nodes which having the trust value in between the Companion and Unknown. Means a node is known to its neighbor means it has received some packets through that node.

Companion: These are the most trusted nodes or the nodes with the highest trust value can be treated as Companion. Here, higher trust level means neighbors had received or transfer many packets successfully through this Companion node.

For calculating the Trust value, authors proposed a very simple equation:

$T = \tanh(R1 + R2 + A)$

Where,

T - Trust value.

R1 - Ratio of number of packets actually forwarded by a node to the number of packets forward that node.

R2 - Ratio of number of packets received form a node but originated from others to total number of packets received from it.

A - Acknowledgement bit (0 or 1).

The future scope consist of analyzing the protocol over Gray hole and cooperative Gray hole attacks.

Zen Yan et al. [17], proposed a Trust Evolution based security solution to provide effective security decision on data protection, secure routing and other network activities. The authors proposed two trust models based on the two ad hoc system models. One is the independent model that represent independent ad-hoc networks, which don't have any connection to the fixed networks. The other model is the cross model, that represent ad hoc networks, with few connections to the fixed networks. Personal Trusted Bubble (PTB) represents an ad-hoc node is the basic unit in both models. In the bubble, the owner of the ad-hoc device has illogically full trust on the device, helpful for the ad-hoc communication and organization. Trust relationship (logical and rational) should be evaluated computationally among bubbles and between bubbles and the fixed networks. The proposed trust evaluation is conducted digitally ahead of any communication and the evaluation result should be considered for the better security decision.

4. COMPARATIVE ANALYSIS

The following table shows the comparative analysis:

Proposed Method

In the proposed method, the parameter known as 'trust value' is calculated against all the intermediate nodes. This trust value is calculated which is depending on the ability to forward packets and RREQ forwarding ability of a node. To obtain this ability the number of packets received and number of packet is sent is counted. The two weight factors are calculated, that is W1 and W2:

Calculate the threshold value:

$$W1 = \frac{\text{Number of packets sent}}{\text{Number of packet received}}$$

Calculate the weight factor:

$$W2 = \frac{\text{Number of Route request received}}{\text{Number of Route reply sent}}$$

The high value of W1 indicate that, the node has a grater ability to forward the packets. Thus the probability of loss of packets is less. The maximum value of W1 is 1. The W2 detects the nodes which continuously receive the the RREQ from its neighbor nodes but never responds to that request by sending the reply i. e. the silent mode. Thus the higher value of W2 means that, the node can frequently responde to the route request of its neighbor node. Then the Trust value of that node is calculated by multiplying the W1 and W2 with the ptrust value.

S. No	Approach	Advantages	Limitations
1	Combining Elliptical curve cryptography and Intrusion Detection System IDS. [2]	Help to ensure the secure communi cation	Computational Overhead is more.
2	Trust Based method worked on the con cept of Honest value. [6]	Help to protect the network from the malicious nodes.	Searching secure routing path is time consuming and more computational overhead.
3	Trust based management framework has been used. [9]	Trusted and shortest path is established.	More calculation is to perform to find out more trusted and shortest path.
4	Framework for the Opportunistic routing of packet from source to destination. [12]	Improve the lifetime of network.	Delay is incurred in the transmission.
5	An enhanced trust based multipath dynamic Source routing (ETBMDSR) protocol. [13]	Provide security to messagetransmission.	Required more lifetime to securely reached to destination.

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6	A novel secure reactive Routing Protocol for MANET called TRIUMP has been used. [15]	Securing MANET against Packet Dropping Attack. Reduce searching time of malicious node.	Only effective to network having only one malicious node from source to destination.
7	Association based Route selection applied to the DSR.[16]	Deal with Black hole and cooperative Black hole attacks.	Only Effective approach to the mentioned attacks.
8	Two Trust models have been used i.e. Independent Model & Cross Model. [17]	Introduced fair and rational security mechanism for ad hoc networks.	Average security level has been achieved.

Here, if any nodes have the W1 value grater than the threshold value is checked. Trust value of any node get increased if it can send the packet, otherwise get decreased.

This trust value is saved in the routing table of that node. Hence secure routing path is establishment according to that trust value rather than the shortest path. In such way, untrusted path can be avoided during the route establishment.

5. CONCLUSION

Hence we conclude that the proposed methodology may increase the security aspect of a system. Mitigation of few attacks will definitely improve the overall performance of a system.

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Empathetic Leader : The "STYLE" of today

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Abstract

The amount of stress a person experiences today in every field of work and life is overwhelming. And during times as these, the individual experiences a need to be understood. He looks up to the leader/the boss/the person in charge of understanding, counseling and wisdom, believing that the leader has the caliber to strengthen and build. Thus, in the present time above all the leadership styles: charismatic leader, servant leader, transformational leader etc. the empathetic leadership style stands out. What is an empathetic leader or rather who is an empathetic leader or Do we need an empathetic leader are the questions which have been tried to be answered. A survey was taken to decipher the leadership style most expected to be in a leader. The characteristics of effective leader, include honesty and integrity, compassion, motivation, self-confidence, thinking skills, expertise, and flexibility were found to be commonly expected to be found in a leader.

Keywords : Leadership, Empatheitic, transformational, servant leader.

1. INTRODUCTION

The amount of stress a person experiences today in every field of work and life is overwhelming. And during times as these, the individual experiences a need to be understood. He/She looks up to the leader/the boss/the person in charge of understanding, counseling and wisdom, believing that the leader has the caliber to strengthen and build. Thus, in the present time above all the leadership styles: charismatic leader, servant leader, transformational leader etc. the empathetic leadership style stands out.

What is an empathetic leader or rather who is an empathetic leader or do we need an empathetic leader are some of the questions which have been tried to be answered. A survey was taken to decipher the leadership style most expected to be in a leader. The characteristics of effective leader, include honesty and integrity, compassion, motivation, self-confidence, thinking skills, expertise, and flexibility were found to be commonly expected to be found in a leader.

To empathize means to be able to put oneself in the other persons shoes. Dictionary meaning of empathy is the intellectual identification with or vicarious experiencing of the feelings, thoughts or attitudes of another. Empathetic means the psychological identification with the feelings, of relating to, or characterized by empathy. The term "empathic correction" which means essentially that we need to put ourselves in the other person's shoes before diagnosing a behavior-related problem and offering advice for improvement. Likewise, leaders need to take time to understand another person's perspective before giving direction, advice, or support. In other words, leaders need to listen with empathy and then lead with empathy. The result is empathic leadership .

The impact of ethical leader behavior on leader effectiveness was studied by Kalshoven, 2009. Ethical leaders are role models and thus are likely to be seen as the group prototype. It was investigated whether ethical leader behavior overall and different specific ethical leader behaviors (fairness, power sharing, and role clarification) influence prototypicality and, in turn, trust in the leader and leader effectiveness. This model was tested in a field study among 244 employees. Results showed that the relationship between overall ethical leader behavior and leader effectiveness is mediated by prototypicality and trust. For the separate dimensions of ethical leadership, we found full mediation by prototypicality and trust for the relationship between fairness and effectiveness and partial mediation for the relationship between role clarification and leader effectiveness. As expected, the relationship between power sharing and leader effectiveness was not significant.

Leader must empathetically respond to all stakeholders who will themselves be in crisis until the greater crisis is resolved. Resiliency is supported when leaders understand the needs of all involved and demonstrate this consistently. Response procedures are more effective when, despite the impact of an abrupt and adverse event, leadership supports everyone to do their best. Empathetic responses build trust and mobilize hope in those who work toward solutions. They offer reassurance and validate the humanity of all involved-personnel and those who rely upon them for resolution. Empathy recognizes and meets the need for strong, ethical and judicious leadership while performing at maximum capacity with strained resources. Meeting the heightened demands of organization requires a sound foundation from which to batten down, gear up and keep going. Effective leaders provide this touchstone for their responders.

Empathy is not just the awareness of others' distress. It is an active and responsive process through which a flexible and adaptive 'dialogue' is sustained. The empathetic team leader, for example, is aware of the need for visible and

accessible leadership in crisis, but more, continues on to provide it. Awareness is the foundation. Using that awareness brings everyone 'home' after a successful resolution. Knowing the concerns, feelings and needs of responders will inform a team leader. Acting upon this information completes a critical dialogue between an effective team leader and those that rely upon that leadership.

The two most important characteristics of leadership for the 21st century are "Intense Will" and "Humility" .In the same year, Daniel Goleman in his seminal book, "The New Leaders", demonstrated the connection between leadership and emotional intelligence (EI) based on the research done by co-writers Richard Boyatzis and Annie McKee. It established that Empathy was a key ingredient of competence in all leadership styles; that the "soft" skills of Humility and Empathy were vital for good organizational leadership was a new concept.

Goleman et al stated "Leaders with empathy are able to attune to a wide range of emotional signals, letting them sense they felt, but unspoken, emotions in a person or group. Such leaders listen attentively and can grasp the other person's perspective. Empathy makes a leader able to get along well with people of diverse backgrounds or from other cultures" .

Goleman, 1998, studied how a leader must be. According to him, superb leaders have very different ways of directing a team, a division, or a company. Some are subdued and analytical; others are charismatic and go with their gut. And different of situations call for different types of leadership. Most mergers need a sensitive negotiator at the helm whereas many turnarounds require a more forceful kind of authority. Psychologist and noted author Daniel Goleman has found, however, that effective leaders are alike in one crucial way: they all have a high degree of what has come to be known as emotional intelligence. In fact, Goleman's research at nearly 200 large, global companies revealed that emotional intelligence--especially at the highest levels of a company--is the sine qua non for leadership. Without it, a person can have first-class training, an incisive mind, and an endless supply of good ideas, but he still won't make a great leader. The components of emotional intelligence--self-awareness, self-regulation, motivation, empathy, and social skill--can sound unbusinesslike. But exhibiting emotional intelligence at the workplace does not mean simply controlling your anger or getting along with people. Rather it means understanding your own and other people's emotional makeup well enough to move people in the direction of accomplishing your company's goals. He discusses each component of emotional intelligence and shows through examples how to recognize it in potential leaders, how and why it leads to measurable business results, and how it can be learned. It takes time and, most of all, commitment. But the benefits that come from having a well-developed emotional intelligence, both for the individual and the organization, make it worth the effort.

A survey was conducted to understand the leadership traits considered to be the most prioritized traits by the leaders in the education, medical and corporate sector. The research survey was conducted through the online survey and personal interviews. 125 respondents were surveyed, which comprised of 40 educationist, 40 doctors and 45 managers. The results were amazing, though as a researcher, it was expected to have an outcome of humility and understanding reflected as highest priority expected for a leader.

Leader/Traits	Intelligence	Honesty	Humility	Understanding	Communication	Empathy
Educationist	18%	10%	15%	15%	22%	20%
Doctors	34%	7%	8%	14%	10%	27%
Managers	18%	9%	12%	15%	23%	23%

The results are remarkable, reflecting understanding and empathy as the major parameters considered to be of paramount importance. For the educationalist whose most important skill is to communicate their ideas and knowledge, it was rated 22 percent important. Empathy was also weighted as an essential characteristic for a good leader with 20%. Whereas honesty as a virtue was not given priority by any of the category of professionals.

Doctors and Medical Professionals considered intelligence to be highly important, whereas humility received the least rating by them. Empathy on the other hand was given 27% weight age. Finally the managers and corporate personnel considered ability to communicate and empathize equally important. Thus reflecting that even though we may function in different capacities and different professions, yet we value the desire to understand and be understood.

2. CONCLUSION

Though we live in a morally deteriorating world, yet the very fact that we are humans, and we give value to emotional intelligence as a key in making our lives better and those around us cannot be unforeseen. This papers' objective was to assess that human values shall never expire and become outdated, no matter what might come to the world. Human values will continue to reflect the tenderness we have and we show to others are the very nature of humanity.

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An Integrated Study of Property Tax of Urban Local Bodies, using GIS Mapping & Multipurpose House Hold Survey for Increasing Financial Resources

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Abstract

Property tax is one of the most important sources of revenue for urban local bodies in India. The growth in revenue from this source has not been adequate with the potential due to inadequate data, legal problems and resource crunch in administration. In last 8-10 years Government has taken major initiatives towards reforming the property taxation methods and administration. Government has been encouraging property tax reforms by providing funds to state governments for implementing it under urban development schemes like JNNURM and UIDSSMT. Government's focus on property tax reforms is a welcome step from Urban Local Bodies' point of view as this will bring transparency, reduce litigation and improve revenue generation. It is important to note that, the reforms proposed or being implemented by Government will also increase challenges in the tax administration. 74th Amendment of the Constitution is to make the Urban Local Bodies efficient units of self governance. For this, the Urban Local Bodies have to become autonomous and depend more on their own revenue resources. Property tax is the single most important tax revenue source available to Urban Local Bodies. Hence, revenues from property tax have to show significant increase. The Government of India guidelines emphasize the need for: proper mapping of properties using a GIS system so that the Urban Local Bodies is able to have a full record of properties in the city and bring them under the tax net; making the system capable of self-assessment that is a system which is formula driven and where the property owner can calculate the tax and; improving collections to achieve at least 85% of the demand(Kulkarni, 2012). The present paper is an attempt to explore the current position regarding property tax reforms prevailing in India; as it is very important regarding urban development which is in the agenda of the new government.

Keywords: Property Tax, GIS Mapping, Financial Resources

1. INTRODUCTION

The importance of reliable information on municipal finances has come to the fore as the cities in India are now developing infrastructure projects that reflect principles of commercial viability and private sector participation. Hence better financial management is essential. Currently, due to lack of good financial management and expenditure management, ULBs are wasting resources which are already scarce and are not able to hold municipal staff accountable. Most ULBs currently follow a cash basis of accounting, which provides inadequate information. Since, a statement of assets and liabilities is usually not prepared; a full picture of assets and liabilities is not readily available for appropriate financial management. There is inadequate cash management and timely quality information for planning, decision-making and financial controlis not available. As opposed to cash basis, accrual basis is a superior method of accounting of the economic resources of urban local bodies. Under accrual accounting, recording of transactions and events takes place whenever a transaction occurs. Even if no cash is received or disbursed, the relevance, objectivity, timeliness, completeness and comparability of the accounting records and statements are much enhanced. Accrual basis clearly distinguishes between items of revenue nature and items of capital nature. This helps in correct presentation of financial statements through an income and expenditure account, balance sheet, and statement of cash flows.

ULB budgets do not reflect citizen priorities as the development and consultation process do not include them. Budgeting is not done in a scientific manner; multi-year, flexible and performance-based budgets are not prepared. There is no system of reporting back to the citizens on actual performance compared to budget priorities. Financial audits in many ULBs are pending for many years. Inadequate internal control systems and absence of an internal audit system hinder risk mitigation and management. A financial management system for ULBs has to be transparent to be able to take into account citizen inputs and their priorities and to be able to share information with the citizens quickly and transparently. Users expect that ULB financial reports will help them to assess the use of resources and ensure their economic impact on the economy of the ULBs; evaluate ULBs spending options and priorities; and assess whether the resources were used in accordance with legally mandated requirements by the ULBs. Finally, an appropriate financial

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management system will permit ULBs to assess their long-term ability to meet financial obligations and their overall financial condition.

2. COMPONENT OF REVENUE GENERATION

Property Tax is the single most important tax revenue source available to a ULB. User Charges is another source of revenue to them. The full cost of Operation and Maintenance (O&M) or recurring cost should be collected. Issuing of Municipal Bonds/ Debentures is an alternative available to them but having service charges payable there upon in terms of interest on them. Their details are as follows:

Property Tax

Property Tax tap the full potential of property tax as a source of own revenue of the ULB; Bring all properties into the tax net ; Introduce system improvements to increase efficiency in tax administration focusing on the entire chain - coverage, billing, collection and enforcement; Make the system of assessment transparent and simple so as to be easily understood and interpreted by all property owners; Eliminate/reduce subjectivity and discretion in assessment particularly at the field level; Remove existing inequities in tax burden on similarly placed or similarly used properties; Enable property owners/occupiers to calculate tax liability on their own, file self assessment forms and pay tax on that basis, putting the onus upon the assesses to pay tax on time; Build in buoyancy and elasticity in the tax base to achieve revenue growth; Reward honest tax payers and penalize defaulters; Have a proper information system for monitoring to ensure full coverage in assessment and full collection of tax dues; Make the systems of assessment, collection and information citizen friendly; Introduce efficient mechanisms for speedy grievance re-dressal and dispute settlement.

User Charges

User Charges rates to be such as to recover full O&M expenditure; Increase in coverage (base) of users; education in losses (commercial and technical losses); Improvement in method of measurement of service; Improvement in billing and collection efficiency (Indu, 2010).

Municipal Bonds and Debentures

Municipal Bonds or debentures are issued by the ULBs and infrastructure funds to be redeemable after a specific period and have a definite rate of interest. The bonds/ debentures after a specific period and have a definite rate of interest there upon payable to the investors. The bond and debentures are issued to public at large or to specific institutional investors. Municipal Bonds are normally both Taxable and tax free in the hands of the holder or investor. The Municipal Bonds market is highly developed in USA; the total quantum goes in trillions of US Dollars. In India the Municipal Bonds market is still developing because of the lack of investors who are ready to buy the instruments. Only ULBs that are large and have buoyant revenue base have been successful in raising funds through the Municipal Bonds. Ahmedabad Municipal Corporation is one of the illustrations worth mentioning. The Municipal Bonds and debentures can be listed in the recognized Stock Exchanges, if the ULBs desire so. This makes the securities highly liquid. It provides opportunities for a ready secondary market to the holders, investors and re-investors. BSE and NSE do provide a facility of listing of such bonds and debentures(JNNURM Primers, 2007; UIDSSMT Tax Free Bonds, 2007).

Property Tax

Initiatives by ULBs

In the context of property taxation reforms, ULBs have taken up the process of survey and preparation of GIS database for properties. In most cases the focus is on data collection through property survey and development of GIS database. With the use of these new technologies there is a need for redefinition of processes for maintaining and updating the property data, which is not being done at present. Considering the growth of urban areas, the problems that may arise in the current scenario: By the time service provider completes the survey and hands over the data to the ULBs the data is already outdated; The absence of user friendly system developed around this database leads to tendency of falling back on old methods and; The potential benefits of technology are not being realized either by municipal staff or by the citizens.

3. PROBLEM AND POSSIBLE SOLUTION

Incomplete Haphazard Property Data

One of the greatest deficiencies in most of the ULBs is the absence of comprehensive property database. The entire land of the ULB area is not accounted for and is full of holes and gaps. Existing property register may have incomplete information, where categories of properties are not defined properly; changes in the built-up area are not updated over the years. Even when information is available it is scattered across departments and an updated comprehensive view of the information is difficult and time consuming to compile: Leads to reduced tax base; Leads to revenue losses, litigations and; No way to monitor self assessed tax.

Development of GIS property data and consolidating with the existing property register would bring out the gaps and holes within the municipal jurisdiction. It is consisted of: GIS based property survey; Detailed measurements of the plots and built-up areas and; Linking with the cadastral base. The benefits are as follows: increased coverage; increased revenue generation and; Ease of data maintenance.

Assessments

In the present scenario the data for tax assessments is not available or it is not being collected on a regular basis. This leads to delay in the process of valuations; May face resistance from property owners for increased tax rates after

valuations and; Huge efforts in re-assessments.

It requires constant: updating of the data used in property valuations; Updating the notified valuation parameters such as guideline values; Regular updating of the property values from the markets; Determining the factors influencing the property price index and; Updating the GIS data for the infrastructure development.

Mutations

Due to lack of coordination between departments in updating data, mutations are not reflected in the property tax register in time. It leads to: wrong billing and litigations and; Owner's confusions during self assessment and delayed tax payments.

A system of constant updating of the mutations on weekly or monthly basis is required. The system can be a semi automatic process, where latest data from the city development authorities can be consolidated with the property register. The system can be completely integrated with the registrar office for automatic data update process for mutations, change of ownerships and new building approvals. The process of obtaining NOC from municipal body can be automated and; Helps tax department in revenue modelling.

Billing and Collection

Generation of demand notices and collection of tax isanother laborious task for the departments of the ULBs. Self assessment has been introduced to ease out the billing and collection process, but this requires a constant monitoring to make sure the tax assessment is as per the policies. There arerevenue losses if the tax assessed by the property owner is incorrectand; Revenue losses if all property owners do not pay tax.

With the help of comprehensive GIS database with all the updates reflected, the bills can be generated dynamically online by owners. Property owners can print the tax bills online. Verify, lodge an appeal in case of any discrepancies. It helps in follow-up on the resolution of the problem. Municipality has complete inventory of properties for tracking defaults and defaulters. Online Property tax collections and accounting built into the system for ease of collections and recovery.

Building Plan Approvals

Non-reflectance of the new buildings in the tax registers due to lack of inter-departmental coordination and absence of mechanisms for updating is responsible for. It results into revenue losses.

Additional effort by staff members are needed to update tax register for new buildings.

Improving Administration and Enabling e-Governance

Absence of organized data and defined processes complicates service platform for citizens and other stakeholders.

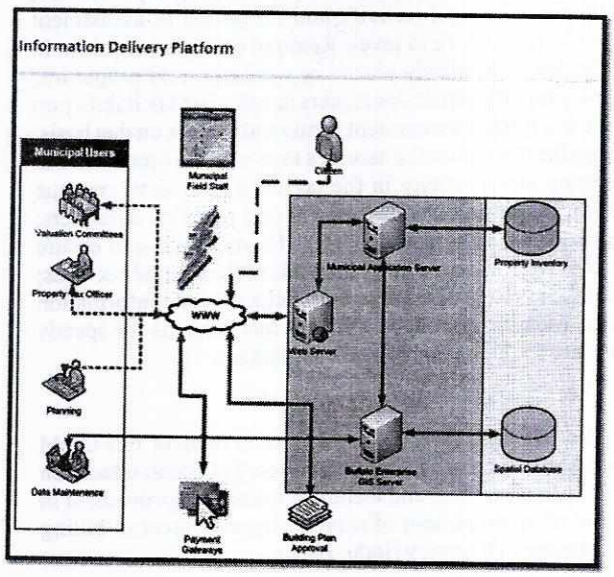
Property data is foundation of municipal service delivery and a pre requisite for a customer service system. Customer database and a variety of customer service interfaces could be developed over the municipal GIS database.

4. CONCLUSION

System Integration Model

In case of ULBs, having already collected property data or appointed vendors for data collection and GIS mapping, Vendor can engage them, as system integrator. In this model, Vendor can integrate the data with the Property Tax Information Delivery Platform. Vendor will study the existing process of the ULBs for property tax management and customize the platform and operate the same for fixed time (Kulkarni, 2012).

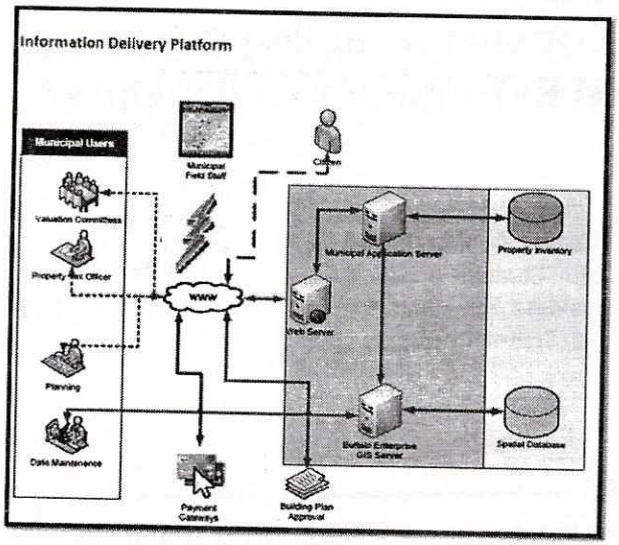
An integrated Information Delivery platform on internet is the solution to the different problems as shown below:



(Source: Kulkarni, Vilas (2012). Property Tax Reforms: Step forward for e-Governance. White Paper on Tax Reforms and e-Governance. Noida, India and Durban: Data World. Cited at: www.dataworld.co.in and www. dataworld.co.za)

Implications

ULBs need an integrated approach for their general administration and financial management improvements. Web based informative integrated models are the solutions which improves the present situation in administration, revenue generation and expenditure control maintaining greater efficiency and effectiveness along with greater transparency. This type of system may helps in reduction of fraudulent manipulation and corruption and offers greater



ease to the tax payers and other stake holders.The outcomes and measuring achievements are as follows: it provides solution for property valuation; Integration of property tax management with enterprise GIS Platform; GIS Base property data Collection is possible; Integration of Property tax management System with e-governance is possible. Service Delivery Platform helps ULBs the process Reduces Pressure on ULBs. Personnel to managing tax bring efficiency in property data handling.

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"impact of Sales Promotion on Consumer Buying Behaviour in Organized Retail with Special Reference to Allahabad."

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Abstract

Indian retail sector has gone through major transformation from last few years with noticeable shifts towards organised retailing. India is the 5th largest retail market in the world. The country stands 4th among 30 countries in terms of global retail development. The current market size of Indian retail industry is about US$ 520 billion with annual growth rate of 14- 15 per cent. The present research paper is highlighting the effective role of sales promotion on consumer buying behavior in order to attract and influence the new and existing consumers in organized retail. Brand, sales promotion, consumer behaviour and consumer satisfaction are the different parameters used in this research paper. The objective of this paper is to study the role and impact of sales promotion adopted by organized retailers on consumers. We have used descriptive research design in this paper.

Keywords : Sales Promotion, Brand, Consumer Behaviour and Consumer Satisfaction

1. INTRODUCTION

The word 'Retail' is derived from the French word 'Retailer' meaning 'to cut a piece off' or 'to break bulk'. Retailing is the main and final link in the chain of production which starts at manufacturing stage and ends at the distribution of goods and services to the end (final) consumer. India is the fastest growing retail market in the world and very dynamic in nature. It has seen tremendous growth in the organized segment since few years. India is the third largest economy in terms of GDP and fourth largest in Purchasing Power Parity (PPP) after USA, CHINA and JAPAN. According to AT Kearney (US based global management consulting firm) India ranked 3rd position among 30 countries in terms of global retail development.

Retailing creates about 15-20 per cent organized workforce in any developed economy. In today's market, due to boom in retail sector in India, many private players like Reliance, Aditya Birla Group, TATA, Future Group and many others entering in Indian retail sector with their ideas and formats. In this research paper, we are trying to study the role and impact of sales promotion used by organized retail companies on consumer buying behavior to attract, retain and create new market for them.

Table-I: Share of Retail Sector in Indian Gross Domestic Product (GDP)

Year	% age share of Retail Sector
2007	8
2009	12
2011	22

Source: AT Kearney

Table II: Share of Organised Retail in total Retail Sector in India.

Year	% age Share	Source
2005	3.5	AT Kearney
2008	5	MC- Kinsey & Company
2010	8	AT Kearney
2013	10	AT Kearney

Sales Promotion

Sales promotion has become a major and main tool used by every organisation in every sector to meet their marketing objectives. It has become a valuable tool for both manufacturers and retailers for influencing the purchase decision. Sales promotion is an important part of the marketing mix. It includes number of various activities such as advertising, publicity, promotion schemes, direct marketing, internet marketing and so on. According to Philip Kotler (2006) sales promotion is an activity that 'consists of a diverse collection of incentive tools mostly short term designed to stimulate quicker and greater purchase of particular products or services by consumer or the trade'. Thus we can say that sales promotion is a kind of promotion method which offers a reward to customers by way of a discount, a coupon, an additional product and various other schemes.

2. REVIEW OF LITERATURE

A. Pughazhendi and Dr. D. Sudharani Ravindran (2011), in their study on "A study on impulsive buying behavior and satisfaction towards retail outlet in Big Bazaar Coimbatore " they have mentioned that consumer impulsive buying behavior and consumer satisfaction have direct relation with buying performance.

Soni Neha and Verghese Manoj (2013), in their study on "Impact of sales promotion on consumer's purchase decision towards white good (refrigerator) at Durg and Bhilai region of CG, India" shows that among the various sales promotion tools like offers, premium and contest are the most influencing variables for consumer purchase decision.

Syed Md Faisal Ali Khan, Dr. DivyaRana and Harpreet Singh(2014), on their study on "An empirical study of organised retailing strategies in developing customer loyalty, changing purchase decision and developing satisfaction in consumer of Indian sub-continent" shows that service and quality are the other factors which play an important role in the organised retailing sector.

Dr. Priyanka Mokshmar (2013), on her study on "Factors affecting the retail outlet preference: the effect of sales promotion schemes among customers of FMCG products " explained that the major factors related to promotion and other value addition aspects that make customer choose and visit a particular retail store for the purchase of FMCG products.

Objective of the Study

To study the different kind of sales promotion.

To know how different sales promotion are able to attract new customers.

To find out whether brand image plays any important role in customer buying behaviour.

Limitations

In this present paper, the survey is restricted to Allahabad only. We have taken 100 sample size which is small and might affect the overall reliability. The study is limited to organised retail store like Big Bazaar, Vishal Mega Mart, Reliance Retail only and cannot be generalized. The study is based on the opinion of respondents through questionnaire and there can be bias. The questionnaire might have excluded some important factors.

Methodology

A research design refers as the framework or plan for a study that guides as well as helps in data collection and analysis of the data. The present study is descriptive in nature and we have used descriptive research design. The data was collected both primary and secondary sources. The primary source of data is respondents (customers) and collected by using a predefined questionnaire. The secondary sources include books, newspapers, articles, websites, various reports, magazines etc.

Data Sources :-

The study has done on the basis of primary and secondary data.

Secondary Data :-

Secondary data is collected from books, newspapers, articles, websites, various reports, magazines etc.

Primary Data :-

Primary data is collected from two wheeler consumers through questionnaire.

Research Approach - Survey Method

Research Instrument - Questionnaire

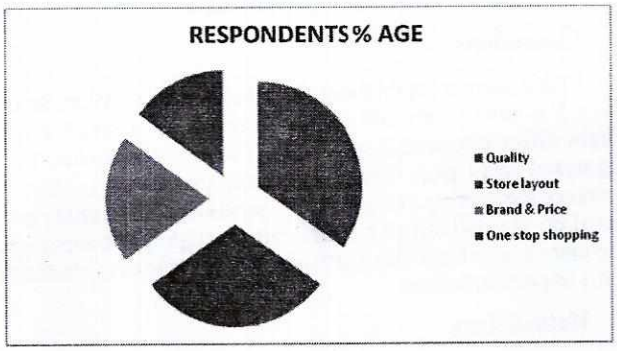
Contact Method - Personal contact

Sample Size - 100

3. DATA ANALYSIS AND INTERPRETATION

1. What is the reason for preferring organized retail store ?

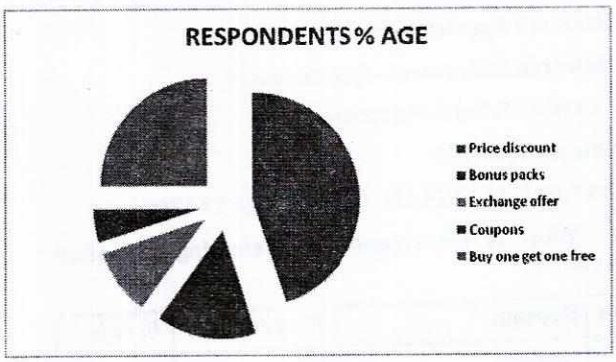
Sr. No	Reasons	Respondents	% Age
1	Quality	36	36
2	Store layout	31	31
3	Brand and price	19	19
4	One stop shopping	14	14



Interpretation: From the above, we find that 36% people preferring organised retail store because of quality, 31% for store layout, 19% for brand & price and 14% for one stop shopping in Allahabad. It is all about quality and store layout which make people to visit organised retail store.

2. Which promotional schemes influence you the most?

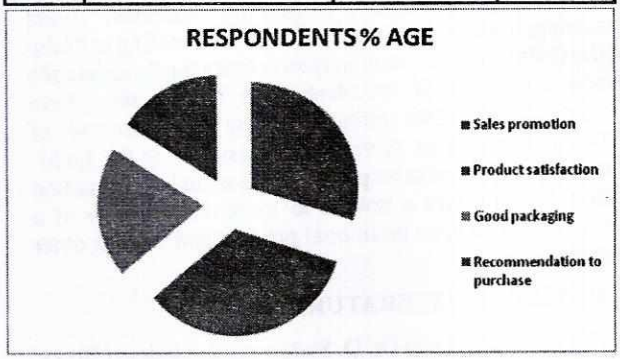
Sr. No	Scheme	Respondents	% Age
1	Price discount	46	46
2	Bonus packs	14	14
3	Exchange offer	9	9
4	Coupons	4	4
5	Buy one get one free	27	27



Interpretation: The above one showing that price discount influence the most 46% people in all other promotional schemes, 27% influence by buy one get one free, 14% are by bonus packs, 9% are by exchange offers and 4%are by coupons.

3. What is the reason of purchasing the products from organised retail sector?

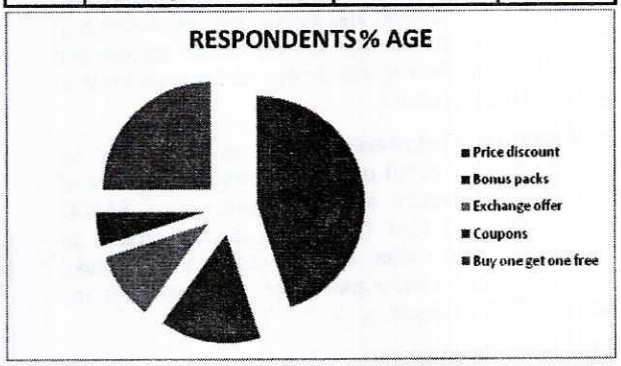
Sr. No	Reasons	Respondents	% Age
1	Sales promotion	29	29
2	Product satisfaction	34	34
3	Good packaging	21	21
4	Recommendation to purchase	16	16



Interpretation: The above chart shows that 34% people feels that product satisfaction is the reason of purchasing any product from organised retail store and 29% peoples for sales promotion, 21% for good packaging and 16% for recommendation to purchase.

4. Does sales promotion influence repeat visit to the organised retail store?

Sr. No	Level	Respondents	% Age
1	YES	68	68
2	NO	19	19
3	To some extent	13	13
4	Can't say	0	0



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3. What is the reason of purchasing the products from organised retail sector?

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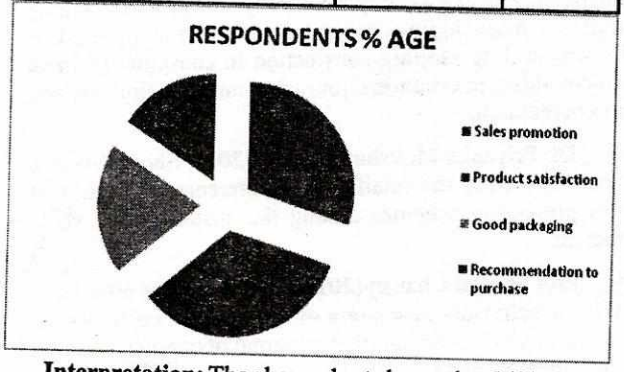
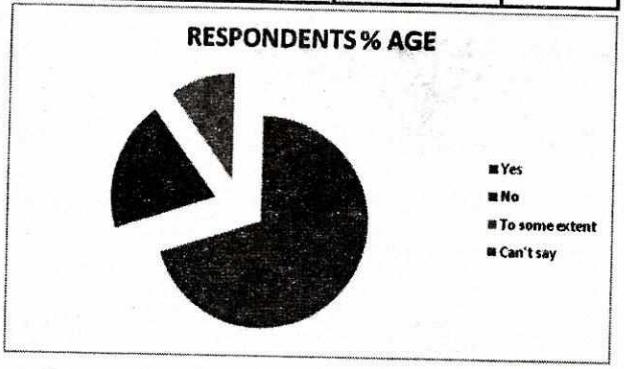
Sr. No	Reasons	Respondents	% Age
1	Sales promotion	29	29
2	Product satisfaction	34	34
3	Good packaging	21	21
4	Recommendation to purchase	16	16



Interpretation: The above chart shows that 34% people feels that product satisfaction is the reason of purchasing any product from organised retail store and 29% peoples for sales promotion, 21% for good packaging and 16% for recommendation to purchase.

4. Does sales promotion influence repeat visit to the organised retail store?

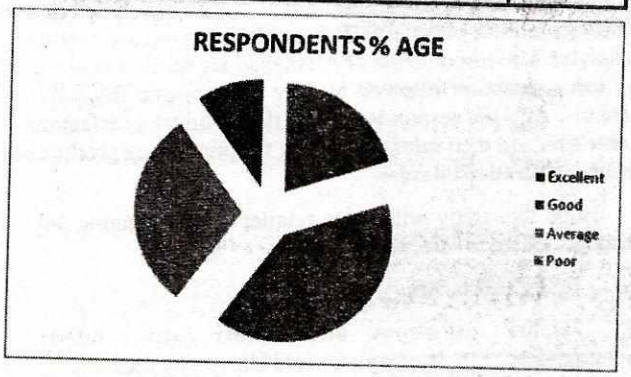
Sr. No	Level	Respondents	% Age
1	YES	68	68
2	NO	19	19
3	To some extent	13	13
4	Can't say	0	0



Interpretation: Table shows that 68% peoples influence by sales promotion and 19% peoples are not and rest 13% people by some extent feel that there is only sales promotion responsible for repeat visit.

5. What will you say about the quality of services provided by organised retail store?

Sr. No	Level	Respondents	% Age
1	Excellent	23	23
2	Good	38	38
3	Average	31	31
4	Poor	8	8



Interpretation: 38% peoples say that organized retail provide good service to them, 31% peoples feel average, 23% peoples are excellent and 8% peoples feels poor to them.

4. FINDINGS

All the respondents are aware about the organized retail stores of Allahabad.

We find that 36% people preferring organized retail store because of quality, 31% for store layout, 19% for brand & price and 14% for one stop shopping in Allahabad. The percentage of quality and store layout make people to visit organized retail store more as compare to other factors in Allahabad.

Price discount influence the most 46% people in all other promotional schemes, 27% influence by buy one get one free, 14% are by bonus packs, 9% are by exchange offers and 4% are by coupons.

In Allahabad 34% people feels that product satisfaction is the reason of purchasing any product from organized retail store and 29% peoples for sales promotion, 21% for good packaging and 16% for recommendation to purchase.

In this research report we find that 68% peoples influence by sales promotion and 19% peoples are not and rest 13% people by some extent feel that there is only sales promotion responsible for repeat visit.

We find that 38% peoples say that organized retail provide good service to them, 31% peoples feel average, 23% peoples are excellent and 8% peoples feels poor to them.

5. SUGGESTIONS

In a city like Allahabad, retail managers should adopt the right marketing strategies and consumer attraction techniques.

They should have proper planning on pricing the product.

They should focus on service and quality of the product.

They should change their promotional schemes time to time.

6. CONCLUSION

On the basis of above findings it can be concluded that sales promotion plays significant role in consumer buying behavior. The respondents of Allahabad are most influenced by price discount followed by buy one get one free offer scheme. And the respondents feel that product satisfaction come first and then sales promotion for purchasing products from organized retail store.

Hope this study will helps retailer while planning any strategy related to sales promotion.

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A Study of Job Satisfaction among the Private Sectors & Public Sectors Employee- Comparisation

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Abstract

Job satisfaction is not the same as motivation, although it is closely linked, but satisfaction includes the management style and culture, employee involvement, empowerment and autonomous work groups. Job satisfaction is a very important attribute which is frequently measured by organizations. It is very difficult to take stand for either of these two forms of administration. This research paper throws light on the comparison of satisfaction among public sector and private sector employees on the basis of key variables. The need of paper states that which sector has more contentment with their job and whether there is any discretion among the employees while selecting the job. The present scenario in India the recruitment and selection of the human resource according to his/her qualification & experience. The reason behind that is not unknown but obviously both the sector provides the scope in different ways. In this paper the analysis of the various aspects like recruitment & selection process, working conditions, pay & promotions, work relationships, skills & abilities, work activities, nature of work, etc and also analysis of the advantage & disadvantage of both the sectors. In this paper the primary data will be collected from the public & private organizations & secondary data will be collected from the various sources. This paper aims at identifying the facets affecting the job satisfaction of employees in both the sector.

Keywords: Job Satisfaction, Govt. Sector, Private Sector.

1. INTRODUCTION

In this competitive environment it is necessary to know the employees views toward their job and to measure the level of satisfaction with various aspects of job satisfaction. This study attempts to find out which facet or dimension affects the job satisfaction Efficient human resource management and maintaining higher job satisfaction level in the organizations, it determine not only the performance of the organization but also affect the growth and performance of the entire economy. Job satisfaction has always been a flash point of discussion among the researchers and scholars since long. Employees are the most valuable asset of every company as they can make or break a organization's reputation and can adversely affect profitability. Employees often are responsible for the great bulk of necessary work to be done as well as customer satisfaction and the quality of products and events. It is very important to manage human resource effectively and to find whether its employees are satisfied or not only if they are satisfied, they will work with commitment and project a positive image of the organization. If they are highly satisfied they produce more and it is profitable for the organization. Job satisfaction is an integral component of organization climate and an important element in the management employee's relationship. Job satisfaction means individuals emotional reaction to job it. It is a positive emotional state that occurs when a person's job seem to fulfil important job values provided. The Public and Private sectors are facing the problem of Job Stress in their permanent employees due to many factors which are not being focused. Job Stress is affecting negatively the Public and Private Sector Organizations. The study will help the chosen organizations, practicing professionals and the research student to highlight those issues that need future investigation as well as it will be a source of knowledge addition for them. They desire security, recognition, new experience and independence. When these needsare not fulfilled they become tense. Dissatisfaction among workers is undesirable and dangerous in any profession; if factors responsible for dissatisfaction can be differentiated, attemptscan be made either to change those conditions or to reduce their intensity so as to increase the holding power of theprofession.

Job Satisfaction

The concept of job satisfaction differs a lot in its meaning. In its literal sense, job satisfaction is the combination of two words - job and satisfaction Job satisfaction is a primary requisite for any successful teaching learning process. If the Lecturers attain adequate job satisfaction, they will be in a position to fulfil the educational objectives and national goals.Job Satisfaction is the

favourable or unfavourable subjective feeling with which employees view their work. It results when there is congruence between job requirement, demands and expectations of employees. It expresses the extent of match between employees, expectation of the job and the reward that the job provides. The factors like physical conditions and social nature affect job satisfaction and productivity. Job satisfaction is the degree to which one's personal needs are fulfilled in the job situation. Job satisfaction has been defined as a pleasurable emotional state resulting from the appraisal of one's job; an effective reaction to one's job; and an attitude towards one's job. Weiss (5002) has argued that, `job satisfaction is an attitude' but points out those researchers should clearly distinguish the objects of cognitive evaluation which are emotions, beliefs and behaviors. This definition suggests that we form attitudes towards our jobs by taking into account our feelings, our beliefs and our behaviors. Job satisfaction consists of the total body of feelings about the nature of the job promotion, nature of supervision, etc. that an individual has about his job. If the sum total of influence of these factors gives rise to feelings of satisfaction, the individual has job satisfaction.

2. REVIEW OF LITERATURE

According to Newstrom (2007), "Job satisfaction is a set of favorable or unfavorable feeling and emotions with which employee view their work and the supervisors need to be alert about employee job satisfaction level". Job satisfaction refers to the feeling and emotions of employees in an organization. It includes the behavior pattern of people that can be favorablel or unfavorable. The progress of work is directly related to job satisfaction. If employees are not satisfied with their jobs, the overall progress of system is affected. The administrators should periodically study the job satisfaction of the employees and try to improve it by promoting human values and dignity. There are two types of factors affecting the job satisfaction Situational characteristics and situational occurrences : these are considered as major factors of job satisfaction. Situational characteristics are salary, supervisory practices, working environment, promotion, whereas situational occurrences are either positive like extra vacation time, rewards etc or negative like faulty equipment. Another view is that job satisfaction is a behavior that shows the satisfaction level of an individual at their work place. A literature review of the more popular theories and models related to job satisfaction. Included in the review are summaries of Maslow's and Alderfer's need hierarchy theories, achievement motivation theory, Herzberg's motivation-hygiene theory, expectancy theory, job characteristics theories, discrepancy theory, equity theory, and studies relating to the clustering of facet satisfactions. Job satisfaction is simply defined as doing a job one enjoys, doing it well, and being suitably rewarded for one's efforts. Suki (2011) examined on job satisfaction and organizational commitment: The effect of gender on employee perception of job satisfaction and organizational commitment. Study revealed that employee's gender has no significant effect on his/her perception of job satisfaction and men and women have the same level of organizational commitment. Job satisfaction portrays the perception of the person towards his or her job, job related activities and environment. It is a combination of psychological and emotional experiences at work. Job satisfaction, as defined by Locke (Lutherans, 2002), is a "pleasurable or emotional state resulting from the appraisal of one's job experience". It is often a result of the perception of the employee as to whether his job provides him with the outcomes he views as important. Job satisfaction is determined by how well the result of the job meets the expectations of the employee or they exceed the expectations. Some important factors influencing job satisfaction may be classified in two categories.

A) Environmental factors:- Job content, Occupational level, Pay and Promotion, Work group and Supervision.

B) Personal factors:- Age, Sex, Educational level, Marital status and Experience.

Importance of the Study

This research paper throws light on the comparison of satisfaction among public sector and private sector employees on the basis of key variables. Theneed of paper states that which sector has more contentment with their job and whether there is any discretion among the employees while selecting the job.

Objectives

To find out the difference in the level of satisfaction between the employees of public and private sector organizations about the factors (Organization Culture, Learning Conditions, Welfare Activities, Clarity of Organizational. Policies. Clarity of Individual Goals, Team Work, Training & Development Activities, Performance Appraisal. Long Service Awards, Occasional Gifts, Working Conditions, Recognition and Award, Salary Structure, Work Stress, Employee Participation and Superior's Contribution, etc).

To measure the extent of Job Satisfaction among employees of Public & Private Sector Organizations.

3. RESEARCH METHODOLOGY

This study has been designed with a view to investigate the level of satisfaction of Public & Private Sector employees to find various aspects on Job Satisfaction. The study covers some Private Organizations like Educational Institutes & Industries& some Public Organizations like Educational Institutes, Industries & Different Departments (like Agriculture, WCD, etc.)

Sample Size& Sampling Methods

The survey conducted on employees on Private and Public Sectors organization. In this study involves the employees of different age group, working in which sector,

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salary structure & gender. A sample sized of 100 employees consisting the 50 Private Sectors & 50 Public Sectors was taken into consideration. Whereas collected data from 86 respondents from 43 in private & 43 in public sectors.The sampling used in this research is sample random sampling. The present study data was collected with the help of structured questionaired. For the present study 5 points likert scaling technique has been used for obtaining the response on each question (i.e. Very Satisfied, Satisfied, Neutral, and Dissatisfied & Very Dissatisfied).

Parameter	Private	Public	Mean (N=43)		Total Mean (N= 86)
			Private	Public	
Age					
25-35	23	11	0.5349	0.2558	0.3953
36-45	11	14	0.2558	0.3256	0.2907
46-60	9	18	0.2093	0.4186	0.3140
Salary					
0-10000	15	0	0.3488	0.0000	0.1744
10000-30000	11	14	0.2558	0.3256	0.2907
30000-60000	12	15	0.2791	0.3488	0.3140
60000 & Above	5	14	0.1163	0.3256	0.2209
Gender					
Male	24	22	0.5581	0.5116	0.5349
Female	19	21	0.4419	0.4884	0.4651

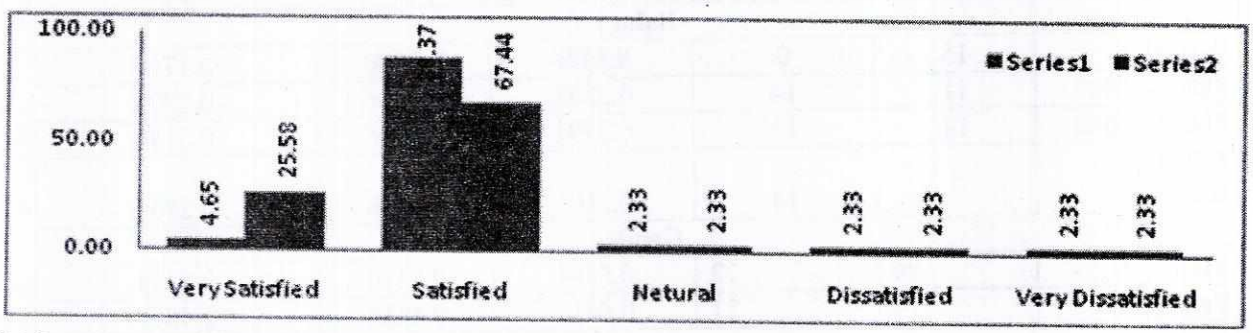
This table has given the detailed information of the respondents. To ascertain whether there is difference in the private & public sectors independent& dependent variables sample used in Chi- Square Test (X2). The Degree of Freedom (n-1) (i.e 5-1) here n=5 because of using 5scale likert scaling technique & degree of freedom is 5%. Confidence Level = 95% i.e. 9.488. Now in this case if x2Cal>x2Tab hence null hypothesis is rejected and alternative hypothesis is accepted. This table shows the result of Chi- Square (X2) test. In every Questions reconceived the Calculated Value is > Tabulated Value (i.e. 9.488 or 9.49)

After the analysis of Chi-Square Test the difference between both the sectors shows by the diagrams. In this that the Series1 is denote to Private & Series 2 Denote to Public Sector. The results of both the sectors as-

Questions	Value of X2
Organizational Culture	10.16
Learning Conditions	10.58
Welfare Activities (Health & Safety)	10.28
Clarity of Organizational Policies	10.85
Clarity of Organizational Goals	10.14
Team Work	9.53
Training & Development Activities	11.25
Performance Appraisal	10.54
Long Service Awards	11.19
Occasional Gifts	12.2
Working Conditions	12.72
Recognition/ Encouragement	10.82
Salary Structure	13.31
Work Stress	19.9
Employee Participation/ Superior's Contribution	9.97

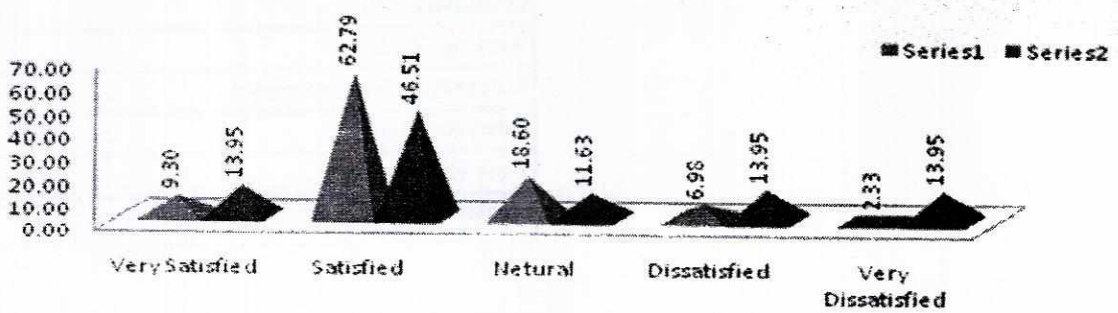
Q.1 Organizational Culture

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	2	4.65	11	25.58
Satisfied	38	88.37	29	67.44
Neutral	1	2.33	1	2.33
Dissatisfied	1	2.33	1	2.33
Very Dissatisfied	1	2.33	1	2.33



Q.2 Learning Conditions

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	4	9.30	6	13.95
Satisfied	27	62.79	20	46.51
Natural	8	18.60	5	11.63
Dissatisfied	3	6.98	6	13.95
Very Dissatisfied	1	2.33	6	13.95



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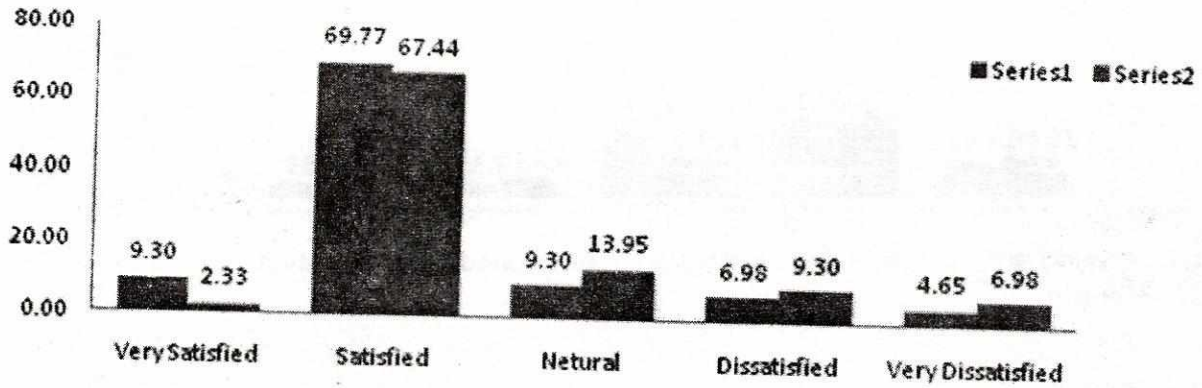
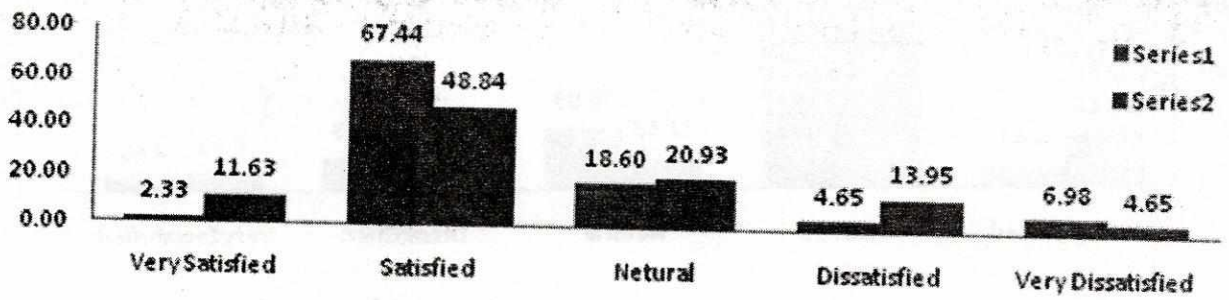
Q.3 Welfare Activities (Canteen & Others)

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	4	9.30	1	2.33
Satisfied	30	69.77	29	67.44
Natural	4	9.30	6	13.95
Dissatisfied	3	6.98	4	9.30
Very Dissatisfied	2	4.65	3	6.98



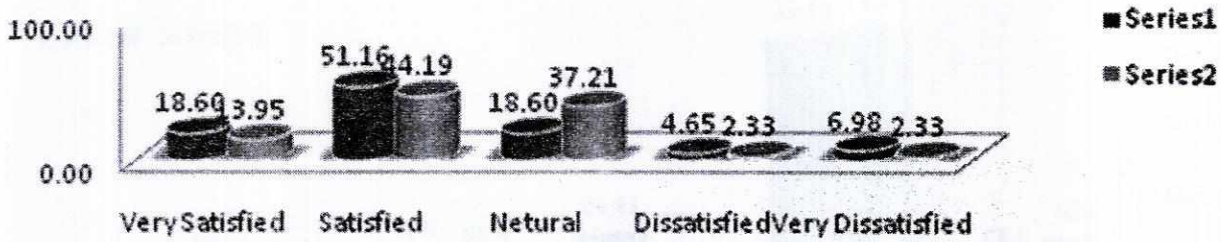
Q.4 Clarity of Organizational Policies

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	8	18.60	3	6.98
Satisfied	23	53.49	24	55.81
Natural	5	11.63	9	20.93
Dissatisfied	4	9.30	5	11.63
Very Dissatisfied	3	6.98	2	4.65



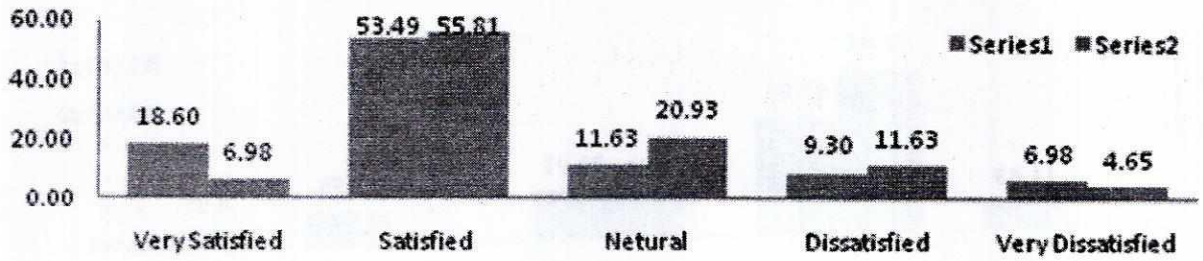
Q.5 Clarity of Organizational Goals

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	8	18.60	6	13.95
Satisfied	22	51.16	19	44.19
Natural	8	18.60	16	37.21
Dissatisfied	2	4.65	1	2.33
Very Dissatisfied	3	6.98	1	2.33



Q.6 Team Work

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	1	2.33	5	11.63
Satisfied	29	67.44	21	48.84
Natural	8	18.60	9	20.93
Dissatisfied	2	4.65	6	13.95
Very Dissatisfied	3	6.98	2	4.65



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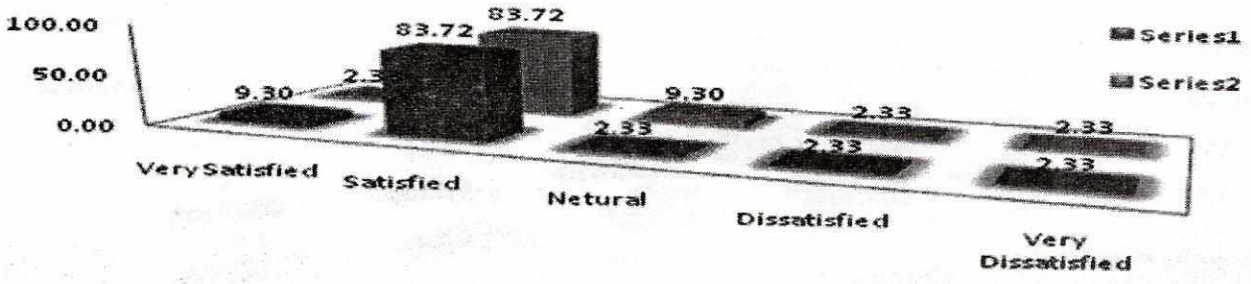
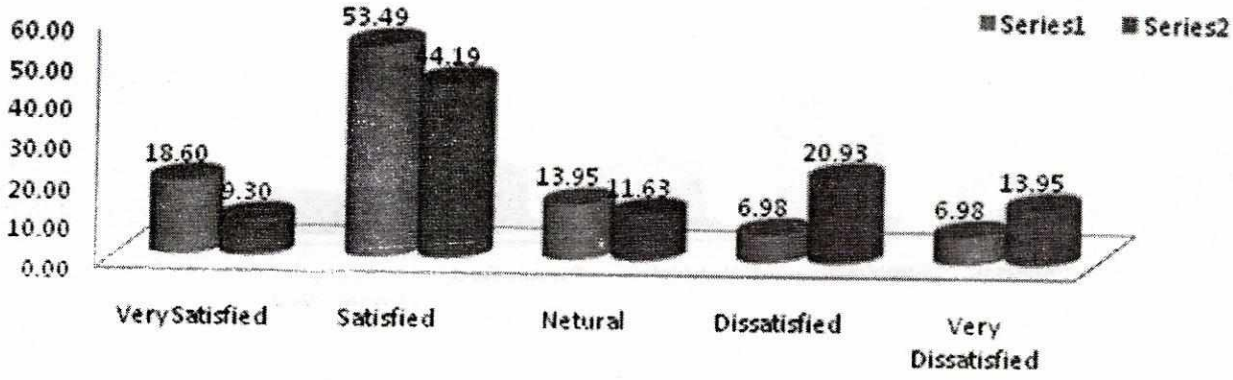
Q.7 Training & Development Activities

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	4	9.30	1	2.33
Satisfied	36	83.72	36	83.72
Natural	1	2.33	4	9.30
Dissatisfied	1	2.33	1	2.33
Very Dissatisfied	1	2.33	1	2.33



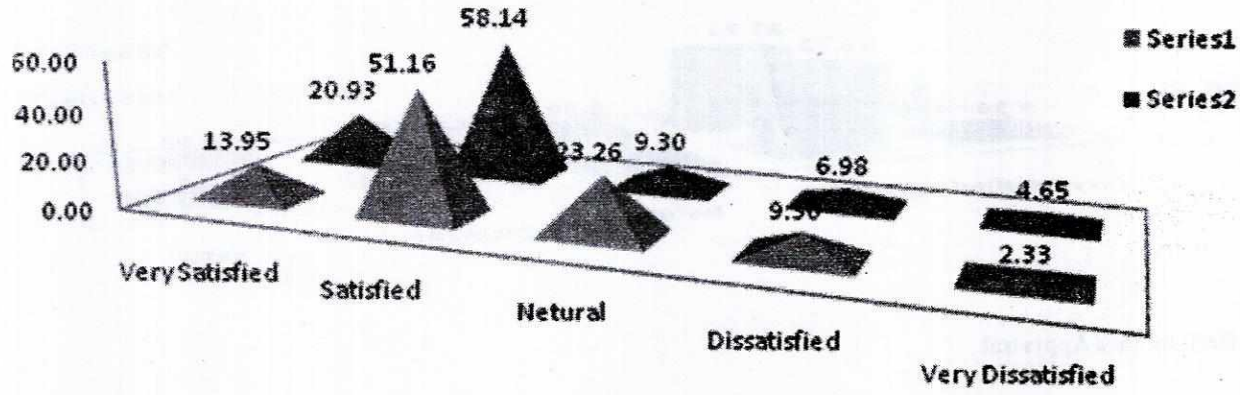
Q.8 Performance Appraisal

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	8	18.60	4	9.30
Satisfied	23	53.49	19	44.19
Natural	6	13.95	5	11.63
Dissatisfied	3	6.98	9	20.93
Very Dissatisfied	3	6.98	6	13.95



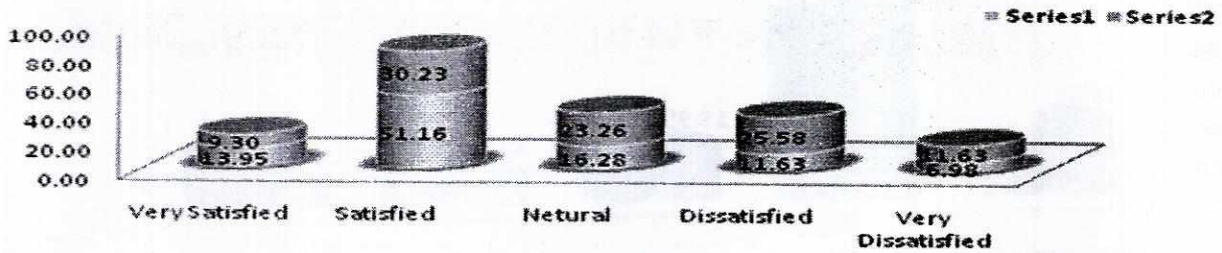
Q.9 Long Service Awards

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	6	13.95	9	20.93
Satisfied	22	51.16	25	58.14
Natural	10	23.26	4	9.30
Dissatisfied	4	9.30	3	6.98
Very Dissatisfied	1	2.33	2	4.65



Q.10 Occasional Gifts

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	6	13.95	4	9.30
Satisfied	22	51.16	13	30.23
Natural	7	16.28	10	23.26
Dissatisfied	5	11.63	11	25.58
Very Dissatisfied	3	6.98	5	11.63



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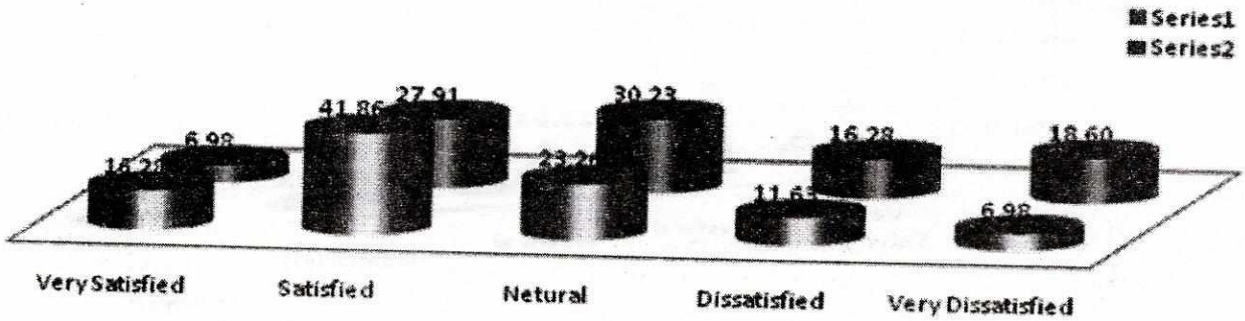
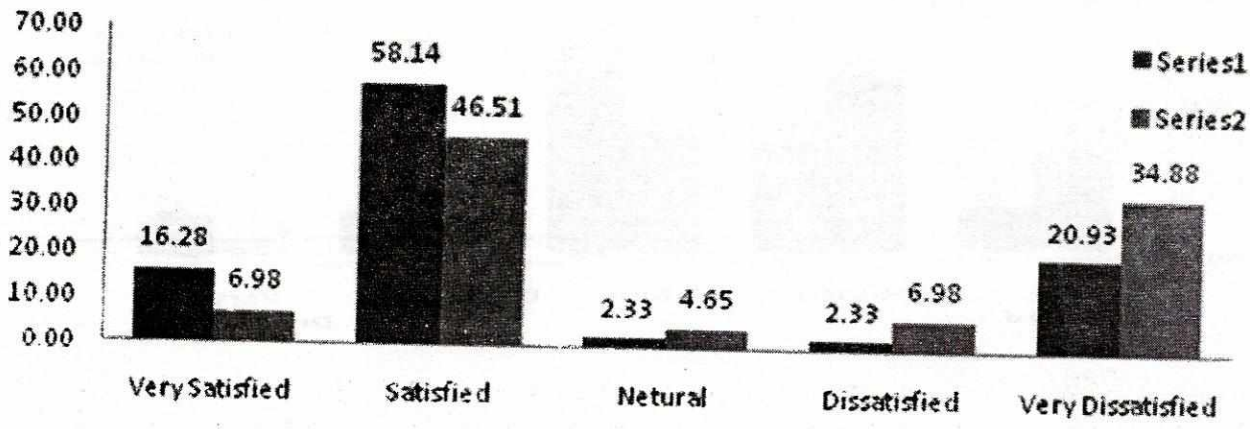
Q.11 Working Conditions (Lighting, Seating Capacity, Drinking Water & Others)

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	7	16.28	3	6.98
Satisfied	18	41.86	12	27.91
Natural	10	23.26	13	30.23
Dissatisfied	5	11.63	7	16.28
Very Dissatisfied	3	6.98	8	18.60



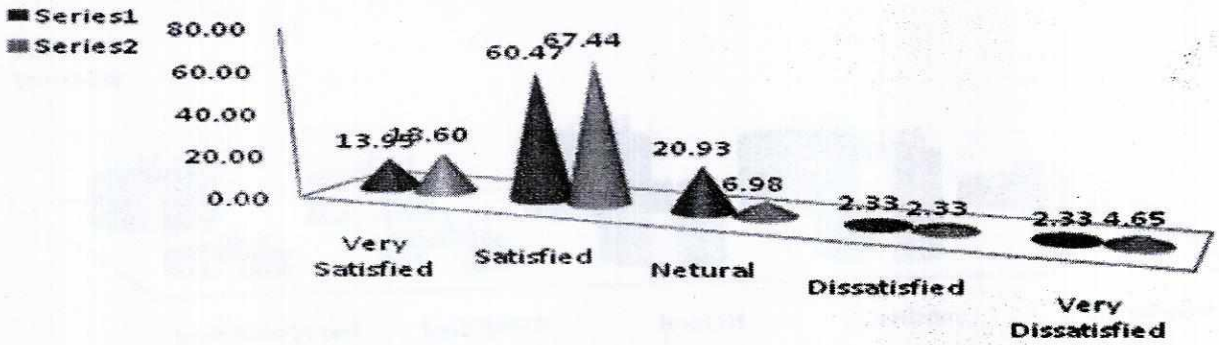
Q.12 Recognition & Encouragement

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	7	16.28	3	6.98
Satisfied	25	58.14	20	46.51
Natural	1	2.33	2	4.65
Dissatisfied	1	2.33	3	6.98
Very Dissatisfied	9	20.93	15	34.88



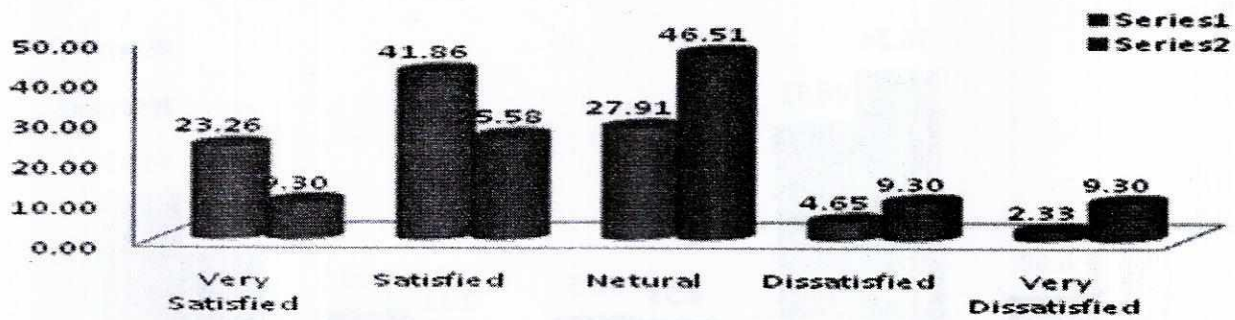
Q.13 Salary Structure

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	6	13.95	8	18.60
Satisfied	26	60.47	29	67.44
Natural	9	20.93	3	6.98
Dissatisfied	1	2.33	1	2.33
Very Dissatisfied	1	2.33	2	4.65



Q.14 Work Stress

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	10	23.26	4	9.30
Satisfied	18	41.86	11	25.58
Natural	12	27.91	20	46.51
Dissatisfied	2	4.65	4	9.30
Very Dissatisfied	1	2.33	4	9.30



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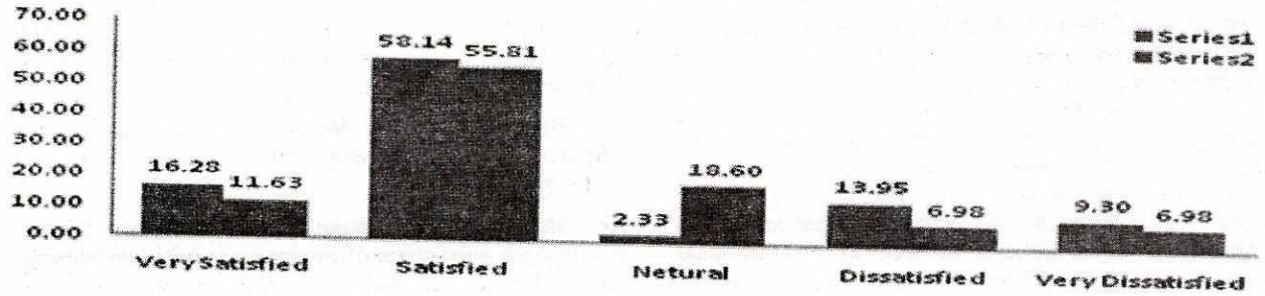
Q.15 Employee Participation & Superior's Contribution

Parameter	No. of respondents of Private Sector	% of Respondents	No. of respondents of Public Sector	% of Respondents
Very Satisfied	7	16.28	5	11.63
Satisfied	25	58.14	24	55.81
Natural	1	2.33	8	18.60
Dissatisfied	6	13.95	3	6.98
Very Dissatisfied	4	9.30	3	6.98



Recommendations

Employees are the assets of an organization and to retain them in organization some Effective measures should be taken into concern. Factors like

Salary, Organizational Culture, Job Stress and long term services should be the prime area for a both the sectors and to alleviate the negative consequences ofthese factors, more effort on the part of policy makers, practitioners, and organizational management has to envisage which are as follows:

Salary should be according to job profile and stress level of employees.

Certain modern techniques like Yoga, Instrumental activities should be included in organization to reduce the job stress.

There must be brain storming between employees and employers relating to their job profile, job stress, and salary from time to time in order to

Increase their job-commitment.

Proper award should be given for overtime.

The productivity of the work force is the most important factor as far as the success of an organization is concerned. The productivity in turn is dependent on the well being of the employees. In an age of highly dynamic and competitive world, to be a satisfied person is a difficult task that can affect him on all realms of life. The growing importance of interventional strategies is felt more at organizational level.

This particular research was intended to study the impact of occupational stress on all the employees of private and public sector. Although certain limitations were met with the study, every effort has been made to make it much comprehensive. It is expected to draw attention from policy makers and men of eminence in the related fields to resume further research. Mostly private sector employee satisfied with organizational culture other than public sector employee but very small % of private sector employee fully satisfied other than public sector employees. In other questions Learning Conditions in private sectors are lots of scope to learn a new things other than public sector. In the welfare activities the private sector is a well maintain than the public sector but the employee satisfaction level in not very high than the public sector. In the clarity of organizational policies the public sector employees are more satisfied than the private sector employee because they know very well about the organizational policies (like Salary, Leave etc.). In the clarity of organizational goals the private sector employees are very satisfied because they really know about the organizational goal as well as individual goals. In the Team Work Private Sector employees are satisfied because they doing the work as a team and achieving the goal other than the public sector employee. In the Training & Development Activities the Private & Public Sector employees both are satisfied in the same ratio but private sector employees are very satisfied other than the public sector employee because they are very develop other the public sector employee. In the Performance Appraisal System or activity the private sector employees are very satisfied other than the public sector employees. In the long services awards the public sector employees are satisfied

other than the private sector employees. In the private sector employees is satisfied other than the public sector employees because they received the occasional gifts from their management in time to time. In the working conditions private sector employees are very satisfied other than the public sector employees because middle & lower level employees also working in the good working conditions (like drinking water, lightening & better seating capacity). In the recognition & encouragement the private sector employees are also satisfied than the public sector employees because they received the recognition for their work & management has also encourage & motivated for apply the new thing in the organization. In the term of salary structure the public sector employee are satisfied than the private sector employees because central & state govt both are give the pay scale but in private sector some organization is give the pay scale other give the consolidated salary. In the term of work stress the private sector employees are satisfied this question because they are doing work in very stress other than the public sector employees. In the employee participation & superior's contribution the private sector employees are very satisfied because his directly & indirectly participation in the organizational rules, policies as well as organizational structure & design. The employees take the active participation in the organizational programme. Overall the research analysis both is important for the nation & its growth.

5. CONCLUSIONS

The purpose of the study to explore and compare to study of the Private & Public sectors employee satisfaction level for the job as well as employee. In this research to take liberty at the discussion of Public Sector versus Private Sector, it can be said that both are equally important for any nation. It should be Public Sector and Private Sector which should be the area of discussion. A harmony between the two is required for any nation to prosper and grow. Further research can be done in this field taking variety of examples and taking to people from middle & lower level of work to see the relative advantages and disadvantages of working in public sector and private sector. There is the major difference in the organizational culture between private & public sector.

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ICT Based Knowledge Management for Sustainable Economic Development in India

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Abstract

"In the emerging economy, a firm's only advantage is its ability to leverage and utilize its knowledge." ...Larry Prusak, Executive Director - The Institute for Knowledge Management. In today's knowledge-based economy; land and capital become secondary and knowledge is the primary source of competitiveness and innovation. Competitive advantage amongst nations has shifted dramatically over the period from "labor" (in the agricultural era) to "capital" (in the industrial era). In the current times, the combined forces of the information technology revolution and the increasing pace of the technological change has shifted competitive advantage to "knowledge" (in the information era). An organization in the Knowledge Age is one that learns, remembers, and acts based on the best available information, knowledge, and know-how. This has created a strong need for a deliberate and systematic approach to cultivating and sharing a company's knowledge base. It is essential for any organization to capture, store, retain, and share knowledge for the sustainable growth. Creation, accumulation and strategic use of cutting edge knowledge plays a crucial role for sustainable growth and development of any country. Under increasing competitive pressure, organizations are examining how they can better manage their intellectual capital and transfer knowledge more efficiently across organizations. The emerging field of KM addresses the broad processes of locating, organizing, transferring and using information. KM requires a suitable institutional setup, requisite infrastructure and conditions conducive to the encouragement of intellectual activities. Information and Communication Technology (ICT)s are the enablers of this change by creating, accumulating and disseminating knowledge. India is a major player in the ICT sector. Our IT companies and professionals play a very big role in the global IT market. India with thriving ICT industry has the potential to become a leading knowledge-based economy though it should overcome some barriers in this regard.

Keywords : ICT, Knowledge Management, Economic Development.

1. INTRODUCTION

Knowledge Management

"Knowledge management is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers." (Duhon, 1998)

While all societies have always had knowledge assets, but now it has taken on a new degree of importance with the advent of the Information Age; constituting a nation's key form of capital-"Intellectual capital". This had primed the pump for the recognition of information and knowledge as essential assets for any organization. Organizations have realized potential of the Intranet flavor of the Internet for linking together their own geographically dispersed and knowledge-based organizations and also that the expertise they had gained, was a product that could be sold to other organizations. This new product of course needed a name, and the name chosen was Knowledge Management (KM). KM is a concept that arose roughly in 1990s becoming one of the main buzzwords of the time.

KM has a wide range of contributors from different fields, industries, and so on, which further perpetuates different understandings of what the term actually means. It is primarily about managing the information and knowledge of and in organizations holistically. It also involves the understanding of-

Where and in what forms knowledge exists;

The systematic management of an organization's

knowledge assets to promote a culture conducive to learning, sharing, and knowledge creation;

Consists of the initiatives, strategies, processes and systems that sustain and enhance the storage, assessment, sharing, refinement and creation of knowledge;

How to make the right knowledge available to the right people at the right time.

Use of ICT in Knowledge Management

ICT (Information & Communications Technology) underpins everything we do in this highly digital age. It is an important channel for acquiring, storing, sharing and reusing the knowledge by processing data and information into Knowledge. It also plays a vital role in information retrieving, because it allows simple access to large amounts of independent information sources. For example, Google, one of the most popular public web knowledge portals that evolved from information portal, is currently widely used in a variety of organizations to support internal knowledge retrieving, synthesizing and exchanging of tasks for knowledge. ICT tools/technologies include computers, telephones, e-mail, databases, data-mining systems, search engines, video-conferencing equipment and many more. Moffettet al. (2004) has classified these tools broadly into three categories as shown in the below table 1.

Table 1 Technology tools for knowledge management [2]

Collaborative tools	Content management	Electronic publishing systems
- Groupware (i.e. Lotus Notes, Microsoft Outlook) - Meeting support systems (i.e. teleconferencing, data conferencing, videoconferencing, e-brainstorming) - Intranet (intra-organization communication) - Extranet (customer/supplier communication) - Knowledge directories (i.e. corporate Yellow Pages)	- Internet/WWW (i.e. information provider Google, Yahoo, You tube etc.) - Document management systems (i.e. e-filing) - Data warehousing (i.e. data mining) - Agents and filters (i.e. information management) - Office automation systems (i.e. assistance tools, digital image processing)	- Business intelligence - Workflow (i.e. helpdesk) - E-commerce (i.e. Internet/WWW, e-tailing) -(Group) decision support systems (i.e. intelligent support systems, executive information systems) -Knowledge base systems (i.e. artificial intelligence, expert systems)

Source: Technological Utilization for Knowledge Management published online www.interscience.wiley.com

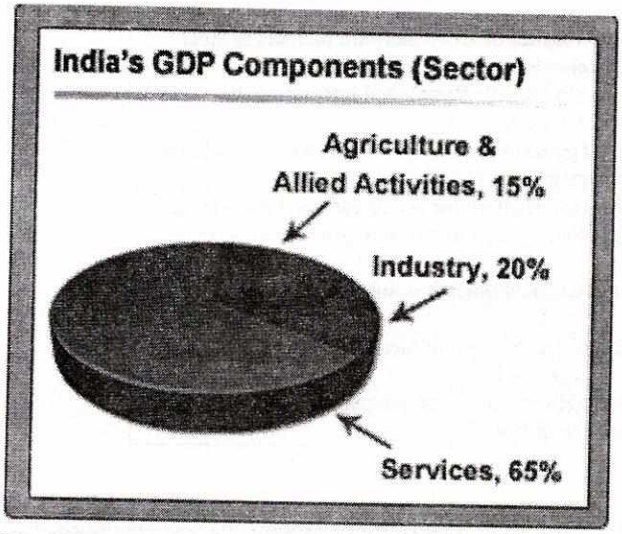
2. KNOWLEDGE MANAGEMENT AND ECONOMIC DEVELOPMENT

KM implies a strong tie to corporate strategy, understanding of where and in what forms knowledge exists. KM helps in creating processes that span organizational functions and ensuring that initiatives are accepted and supported by organizational members. ICT in KM primarily aims at achieving organizational effectiveness by stepping up the speed of knowledge transfer to workers. Employees are encouraged to use technology, not only to collaborate with one another, but also to contact customers and suppliers. Thus the relationship between ICTs and KM processes is conceptualized in reaping the commercial benefits (i.e. higher productivity, lower costs and greater profits) through improved connectivity. Effective management of knowledge through ICT provides organizational competitive advantage through sharing of best practices, achieving better decision making, faster response to key institutional issues, better process handling and improved people skills; and is essential to long-term organizational effectiveness.

3 ICT BASED KM FOR SUSTAINABLE ECONOMIC DEVELOPMENT IN INDIA

Economic growth occurs when real output increases over time. Real output is measured by Gross Domestic Product (GDP) at constant prices. The general definition of economic sustainability is the ability of an economy to support a defined level of economic production indefinitely. GDP (Gross Domestic Product) is the official base measure of output used in most economies. It is the sum total of value of all the goods and services produced in an economy during a given year. In short, it is the X-Ray report of how the

economy is performing. It is the most crucial economic indicator which tells us about the health of our economy. One of the ways of looking at the GDP is by classifying it under sectoral contribution. Under this, the GDP is taken as the total value of goods produced by three major sectors: Agriculture & Allied Activities, Industry and Services. (As shown in the Picture 1)



Pic. 1 Source: http://stockshastra.moneyworks4me.com/

The service sector which includes sub segments like transport, insurance, finance, communication etc. contributes a large share to the GDP in India. Similarly growth in Industry and its sub segments like manufacturing, mining, electricity etc are crucial for the growth of the GDP. These classifications can help us understand the changes in the components of GDP which can actually tell us where the overall economy is headed and where a particular industry or sector is headed. Thus to better understand the current state of ICT based KM for Sustainable Economic Development in India the study is further divided in two parts-

ICT based KM in Agriculture Sector

ICT based KM in Industry & Service Sector

ICT based KM in Agriculture Sector In India

Agriculture plays an important role in Indian economy contributing 14 per cent of Gross Domestic Product (GDP). In the past decade, many information and communication technology (ICT) projects in Indian agriculture have emerged, either substituting or supporting extension services by providing farmers with access to agricultural information. Communicating information to farmers is one of the key factors. ICTs have the potential to reach many farmers with timely and accessible content. The major ICT developments in the field of Indian agriculture have been achieved under two World Bank funded projects i.e. NATP (National Agricultural Technology Project) and NAIP (National Agricultural Innovation Project).

NATP funded by World Bank & was launched in 1998 with the aim of strengthening India's Agriculture Research System with the objective of -

Making information available to the managers and scientists who will use it.

Improving the capacity of researchers and research organization to organize, store and retrieve information relevant to their mandates.

Developing regular procedures and mechanisms for those organizations to share information.

Improving the capacity to plan, monitor and evaluate research programmes

After the successful implementation of NATP, the Indian Council of Agricultural Research (ICAR) has launched National Agricultural Innovation Project (NAIP) on July 26, 2006. The ICAR mentioned in 2006 that NAIP is planned for 6 years to allow time for piloting, learning and scaling-up, wherever possible. The total budget is estimated of US $ 250 million for NAIP. The overall objective of the NAIP is to facilitate an acceleration and sustainable transformation of the Indian agriculture. Some of the Projects Working under NAIP are shown below in table 2-

Name of the Project	Objectives
Consortium for e -Resources in Agriculture (CeRA)	- To develop the existing R&D information resource base - To create an e-access culture among scientists/teachers in ICAR - To develop a Science Citation Index (SCI) facility at Indian Agricultural Research Institute (I ARI) for evaluation of scientific publications
Krishi Prabh a: Indian Agricultural Dissertations Repository	- Dissertations in digital form and make it accessible on-line. - To develop a standard format for submission of e -theses to the SAUs/DUs. -To publish a journal in electronic form/ hard copy form from the Database.

e-GRANTH: Strengthening of Digital Library and Information Management under INARS	. To create Online Public Access Catalog (OPAC) under "Indian Agricultural Research Group Catalogue" - To digitize important institutional repositories - To strength en capacity building for library and information management system
AGROWEB: Digital Dissemination System for Indian Agricultural Research	- To identify standards, develop uniform guidelines, content management strategies and a model template for websites of ICAR institutes. - To develop model websites of all consortium partners to meet requirements of stakeholders. - To design and develop ICAR 'Portal' and integrating the websites of consortium partners. -To build capacity of personnel in ICAR institutes i n design, development and management of websites
E-Publishing and Knowledge System in Agricultural Research (E - PKSAR)	- To provide crucial information for accelerated and sustainable transformation of Indian agriculture through print and electronic mode - To provide improved communication link among information generators
Mobilizing Mass Media Support for Sharing Agro-Information	- To enhance the agricultural communication and awareness in the country at grass-root level - To mobilize the media as an active partner for knowledge sharing and message multiplication

Source: www.icar.org.in

ICT based KM in Industries & Service Sector In India

In the ever changing market place; organizational success in the Industrial/Service sector can be achieved by continuous creation, dissemination, and usage of new knowledge. Globalization and emergence of the digital world has brought the current business through revolutionary change. Almost all the sub segments of Service and Industry sector (tourism, transport, insurance, finance, manufacturing etc.) has opted for mandate automation. Organizations manage and analyze volumes of data and information about new product, services and strategies through their web portals' knowledge repositories.

New services are continually being launched to satisfy customer's existing & future needs. The information-based characteristic of services gives ICT a central role in firm's innovation activities and their performances. Today every organization has two main objectives- to enhance customer satisfaction and to retain employees. Customer satisfaction is the key factor for the success of the business and employees' performance has a huge impact on organizational performance. Employees use their knowledge in providing the best experience to customers; hence KM is crucial for service innovation and it is crucial that companies use KM approach to retain employees and customer's satisfaction. In Service and Industry sector knowledge is managed by following measures-

Orientation/Induction and Training for new recruits to apprise them of the history, culture, strengths etc. of the organization.

Mentoring- mentor trains/grooms the new employee on technical/business/functional knowledge/skill.

Brain storming session on specific topics related to various aspects of business/customer service etc. among staff members from different departments. It generates new/innovative ideas to improve existing processes.

Periodic review meetings (Quarterly/Monthly) in every department/branch/office to review the business position/progress.

Intranet/e-Learning/Knowledge Portals which contain organizations internal circulars, policy documents, manuals, etc.

E- Governance in India - An ICT based KM Initiative

E-governance can be used to refer to a government that uses IT and e-commerce to provide access to government information and delivery of public services to citizens, and all other business partners and stakeholders including private sectors. Knowledge needs to be managed in a time and cost effective manner in order to connect citizens to citizens and citizens to government and vice versa; to make participative government policies and decisions. Since e-governance is largely knowledge intensive, it requires knowledge management applications and techniques to represent government fully and appropriately. The Government of India's e-Governance initiative is an important tool to enhance the quality of government services to citizens and to make government more accessible.

For modernization and technological upgrade of govt.

services, e-governance initiative in India has started with various knowledge portals e.g. https://negp.gov.in, http://india.gov.in/ (national portal of India) and http://www.data.gov.in/ etc. to provide a host of informational, interactive and transactional services to the citizens. It also works as a Knowledge Repository for creating an e-governance information rich store-house of documents. The objective of setting up these portals is to gather and share documents related to all aspects of government projects, information on various sectors, services provided by the govt., govt. processes, govt. initiatives, etc. In a nutshell the objective was to provide open platform for citizens to attain knowledge of govt. data anytime anywhere.

Few of the initiatives that have been taken in this category by the Union and State Governments are described in the following Table 3

Table 3 - ICT based KM in Indian E- Governance

Project	Objective	Services Offered
— —	- Provide relevant information to the rural population	- Daily agricultural commodity rates - Income/Domicile/Caste BPL Family certificate - Rural Hindi Newspaper/ Email
E-Seva in Andhra Pradesh	- To deliver all the services online to consumers / citizens by connecting them to the respective govt. depts. & providing online info. at the point of service delivery.	- Services include online payment of utility bills, issuing certificates, issuing licenses & permits, e-forms etc. Payments can be made by cash/cheque/DD/credit card/Internet
SmartGov (Andhra Pradesh)	- Workflow automation and knowledge Management for implementation in the Andhra Pradesh Secretariat	Automates the functioning of all levels of govt. entities and provides a well defined mechanism for transforming the "hard copy environment" to a "digital environment"
McA 21 Mission Mode Project by the Ministry of corporate Affairs	-Aimed at providing easy and secure online access to all registry related services provided by the Union Ministry of corporate Affairs to corporate and other stakeholders at any time and in a manner that best suits them	- Electronic filling of documents - Automatic record management -Storing of all approved documents of companies as part of electronic records, including provision of access to electronic records for the stakeholders -
TAXNET(An All India Tax Network) & ITDMS (Integrated Taxpayer Data Management System)	- to provide a single centralized database — —	- Electronic filling - info on the tax policy, guidance to file return - automated record management of the tax payer

Barriers to Knowledge Management

A Knowledge Management Barrier can be considered to be any challenge, risk, difficulty, obstacle, restriction or hindrance that obstructs the intra- and inter-organizational management of knowledge. These are the factors that adversely affect the success of KM implementation in the organizations. They may be internal and external type barriers. Internal barriers originate from organizational cultures, organizational structures, etc. The second group of barriers is outside the immediate control of the organization. These barriers might prevent a single person, a group or an

organization to reach an objective when working in a collaborative setting. Creation of a complete catalogue of such barriers is highly difficult; however study of the major barriers in KM Systems is presented as "POT" (psychological, organizational and technological) barriers at 3E (Employee, Enterprise and Economy) level as given in the below Table 4.

Table 4: "POT" Barriers of Knowledge Management at 3E level

Barriers	Employee Level	Enterprise Level	Economy Level
Psychological	• protection of one's interests and position • fear of change • reluctance to do additional work • limited needs for prof. development and self-actualization • lack of initiative • inability to gain and evaluate knowledge on one's own • no courage to share one's observations • fear of making a mistake and its consequences • inability to receive criticism • inability to ask for advice and help	• low awareness of benefits of KM • low involvement of management in implementing and monitoring KM • lack of leader • fear of investing in an employee who may leave for another enterprise • national and cultural differences • inability to cooperate in a group	• enterprise inability to cooperate and associate • reluctance to share achievements and experiences
Organizational	• no possibility of getting rewarded from the organization for the services related to access and acquisition of new skills	• no clearly defined strategy • no feedback with human resource management area • improper information flow • developed hierarchical structure • no inflow of people with new knowledge to enterprise • not integrated staff • unfavorable organizational culture • early retirement of experienced employees • fear of information leak from enterprise • limited expenditures on implementation of KM	• bad legal protection of intellectual property • unstable law • poorly finance and research programs • restricted working conditions

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Table 4: "POT" Barriers of Knowledge Management at 3E level (Cont..)

Barriers	Employee Level	Enterprise Level	Economy Level
Technological	• enterprise inability to cooperate and associate • reluctance to share achievements and experiences	• architecture • distance • lack of technical infrastructure • no system of filing information • no possibility of substitution for period of training	• deficit of KM specialists • no highly specialized and flexible trainings • no contact with the sphere of science and research • education system not adjusted to economy needs, inertia of education system • no uniform system of acknowledging qualifications

Source: http://works.bepress.com/anna_ujwary-gil/13

Recommendations for improving Knowledge Management: -

Even though the field of knowledge management (KM) has been around for 15 to 20 years, it is still evolving and has room for improvement. When improving KM or implementing a new system, one must consider the characteristics of the existing KM infrastructure and establish policies and strategies; aiming at addressing current and sustaining future knowledge needs of the organization; which is necessary to achieve its strategic vision. Here are few ideas on how to improve knowledge management and also to integrate it into the way we do business.

Create an effective operating culture- one; where questions and adjusting activities based on directed learning is encouraged.

Make knowledge management part of everyone's job - It simply means building knowledge management into career paths so that it would be integrated into workflow and a requirement for the staff for moving up in the organization.

Try to keep any solution we implement as simple as possible, since it will help with the initial uptake, but also with the uptake down the road - most people will also be more likely to talk about things they like and are easy to understand.

Introducing small incentives/rewards to encourage an employee to share information.

Instead of focusing on what technologies can do for our [illegible] think about the basics of how people communicate and share things. Technologies that help any kind of business to be successful have human communication at their root.

Be patient, persistent and consistent because strong learning and KM systems take time to develop. People take time to learn new ways of operating; and top management may need to try a number of different tactics to help them along the way.

Training of members of the organization will introduce the mechanics of the new KM system and promote acceptance at all levels of the organization.

ICT based KM in India - Road Ahead

India is emerging as a Knowledge Superpower in a connected global economy. The objective of making India a Knowledge Superpower by 2020 and the emerging threat from countries like China, Vietnam, Taiwan calls for an urgent need of knowledge empowerment. There is a need to be able to meet the indigenous requirements of a knowledgeable and skilled manpower. The major challenge is to enhance the intellectual capital of our country to become a global leader in knowledge led manufacturing and service industries. Loss of corporate knowledge through staff turnover can be a complex phenomenon linked to a number of underlying issues in an organization.

India can no doubt reap tremendous economic gains by developing policies and strategies that focus on making more effective use of knowledge to increase the overall productivity of the economy and the welfare of its population. India has many of the key ingredients for making

this transition. India possesses a large pool of highly educated and vocationally qualified people who are making their mark, domestically and globally, in science, engineering, IT, and research and development (R&D).It has a well-functioning democracy. Its domestic market is one of the world's largest. It has a large and impressive Diaspora, creating valuable knowledge linkages and networks. The list goes on: macroeconomic stability, a dynamic private sector, institutions of a free market economy, a well-developed financial sector, and a broad and diversified science and technology (S&T) infrastructure. In addition, the development of the ICT sector in recent years has been remarkable. India has created profitable niches in information technology (IT) and is becoming a global provider of software services. Building on these strengths, India can harness the benefits of the knowledge revolution to improve its economic performance and boost the welfare of its people. In so doing, India will be able to improve its international competitiveness and join the ranks of countries that are making a successful transition to the knowledge economy. India should continue to leverage its strengths to become a leader in knowledge creation and use. To get the greatest benefits from the knowledge revolution, the country needs to press on with the economic reform agenda that it put into motion more than a decade ago and continue to implement the various policy and institutional changes needed to accelerate growth.

4. CONCLUSION

Effective KM strategy will not only help to realize the potential of existing knowledge in the organization but will also help to capture it before it "moves on". This would institute a sustainable framework that would assist industry across sectors in developing knowledge, skills and abilities in our workforce to International Standards. Organizations able to realize this and act appropriately, will gain an advantage over their competitors and gain vital knowledge in the process which when applied effectively will reap ongoing rewards into the future.

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NoSQL DATABASE: New Exciting Database for Social Media and its Security Challenges

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Abstract

Networked communication through social media is popularly increasing and that result into exponential growth of the unstructured data. While the importance of social media data is increasing day by day. The unstructured data which needs to be handle along with scalability where NoSQL come in to the picture. NoSQL- database which is also known Not Only SQL databases gaining popularity in recent days in social media because of it's higher performance and scalability. This database can store large amount of unstructured data , and significant score over traditional relational database but at the same time it has serious security issues which are to be addressed .This research paper find out ways through which these issues can be eliminated or minimized to its lowest level so that performance of NoSQL database can be optimized in social media.

Keywords : NoSQL,Relational database, performance, scalability, security issues.

1. INTRODUCTION

In recent years focus is changed from web application towards networking, collaboration and social interaction and that result into the increasing importance of social media. Social media includes various applications for the purpose of publication that are contributed by various users.

Unlike a web applications which are organized in their content, social media includes contents which are different in their nature .For that we require a database that can handle these unstructured data as well as scalability.

Social Networking databases are not concerning only with developing a web site but also managing large amount of data that require knowledge of all the aspects of data base management system along with load balancing.

For social networking database we require that our database can handle following properties (i) Decentralized nature (ii) No single point of failure (iii)Supports replication and multi data center replication (iv) Scalability (v) Fault-tolerant (vi) Tunable consistency (vii) Map Reduce support (viii) Proper query language (ix) Can handle large semi-structure or unstructured data (x) The changeability property (xi) The easy-to-use property (xii) Extremely Query loaded

Although there are number of relational databases in the market like Sql Server, Oracle, MySql etc. available in the market but these relational database can not take care all the above specified requirements of a social networking database.

NoSQL databases focus on analytical processing of large scale data sets in warehouses, offering increased scalability over commodity hardware and servers[1].

A. Need of a NoSql over SQL database

(i) NoSql database availability is more easier then SQL database

(ii) SQL database provides SQL queries while NoSql database provides other techniques such as graph traversal for graph database which provides flexible solution suitable for the structure for the social network database

(iii) SQL database provides ACID properties which give strong consistency but at the same time reduces scalability. But social network database concerning more towards scalability rather than consistency which is provided by NoSql database.

(iv) Following diagram shows characteristics of RDBMS and NoSql databases being scaled up both data size and data complixity. RDBMS are limited in both aspects where as NoSql databases are more easily scaled up in the data size.

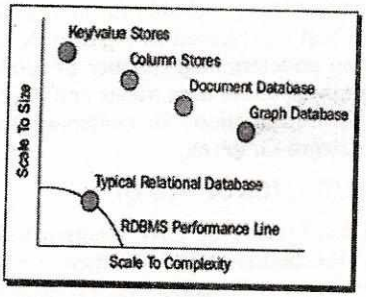

Diagram-1 Relative scalability in data size and complexity of RDBMS and NoSQL

Examples of major companies using NoSql Databases (Ref.2)

Company Name	NoSql Name	NoSql Storage Type
Facebook	Cassandra|Neo4j	Column|Graph
Google	BigTable	Column
LinkedIn	Voldemort	Key Value
Twitter	Cassandra	Column

Table-1

2. SOLUTION FOR RELATIONAL DATABASES-NoSQL

The problem with relational database for handling a unstructured database of a social media can be resolved by using NoSQL,which can be classified as following

A Classification of NoSql Database

NoSQL databases generally can be categorized into the following four groups [Ref.3 and 4]

(i) Key Values Databases: Store uninterpreted arbitrary data values into a system that can be recalled later using a key

(hash). In this type of database there is only one key and its value with no duplicates with high accessability and performance. for example. Cassandra , BigTable , Dynamo, Voldemort etc

(ii) Column Databases: The column family used here is like a table commonly found in a relational database. Store data in a similar key value fashion, except the key is a combination of column, row, and/or timestamp, which points to one or multiple columns (Column Family). Column databases are a distributed multi-dimensional storingmap and are referred as BigTable Clone, for example, BigTable, HBase and Cassandra.Column databases store their content column-wise instead of row-wise.

(iii) Document Databases: Store documents is dynamic that allows for free modification with the ability to add or remove fields of existing documents. Indexing on the named fields enables fast data retrieval. It is designed for storing documents. for example, CouchDB, MongoDB, Terrastore and XML databases as exist.

(iv) Graph Databases: This is suitable for that database where relations are best represented as a graph(elements interconnected with an undetermined number of relations between them). A graph database uses nodes and edges to represent and store the information. for example, Neo4J, HyperGraphDB and Allegro-Graph etc.

4. CHARACTERISTICS OF NOSQL

Eric Brewer [5] has given the CAP theorem for the shared-data systems.This theorem tells that there are three properties of shared-data systems namely data consistency, system availability and tolerance to network partitions but NoSQL satisfy only two properties out of three properties at a time.

The NoSQL databases primarily classified based on CAP theorem [6] as follows [7]:

- Availability and Partition tolerance (AP)

Such systems ensure availability and partition tolerance primarily through consistency. These systems are Voldemart(Key-value),CouchDB(Document), Riak(Document) and so on...

- Consistency and Availability(CA)

Replication approach is used to ensure data consistency and availability. System that are related with the consistency and availability are GreenPlum(Relational), Vertica (Column-Oriented) etc.

- Consistency and Partition tolerance (CP)

Consistency is ensured by database by using distributed node .This each node consists data but database support for availability is not good. System concerns the consistency and partition tolerance are Berkeley DB(Key-value), MongoDB (Document), BigTable(Column Oriented) etc.

4. NoSQL's PERFORMANCE AND SCALABILITY

There are two types of approaches from which we can choose either scale-up approach or scale-out approach to deal with the concurrent global users, commonly referred as Big Users.[8]. Scaling-up approach specifies to a centralized architecture in which functionalities are added to existing servers based on the increase number of global concurrent users and these servers becomes bigger and bigger.

On the other hand scaling -out acknowledge distributed architecture in this in place of adding functionalities to the existing servers the another servers are added for fulfilling the requirement of global users.

NoSQL applies scale-out approach on the three-tier internet architecture and worked very well. The more global users use the application, the more commodity servers are added to the three-tier internet architecture, and performance is achieved by distributing the load on increased number of commodity. Servers, and, cost increases linearly as number of users increases .

Since NoSql database is based upon scale-out approach of scaling therefore if huge number of users start using application then in a linear way another commodity server is added very simply. In this way There is no need to modify the application since the application always sees a single (distributed) database.

Since commodity servers/virtual machines can be quickly added or removed from the server pool when user join or leave database in this way operating cost can be reduced and, the NoSQL databases are highy fault tolerent

databases because the load is distributed across many commodity servers and thus support in continuous operations.

The benefits of scale-out approach is cheaper than the scale-up approach. In scale up approach there is only one single server which is very costly to build, design and support the large big server and that is also less fault tolerant when compared to commodity servers

The advantage of scale-out approach is cheaper than the scale-up approach. in scale-out approach, it is very much expensive to build, design and support the large big server and such server is less fault tolerent when compared to commodity servers. NoSQL are generally open source databases, priced will be charged when servers are added which is relatively inexpensive. Where as the relational databases are commercially available and we require license for purchasing it which is expensive.

5. COMPARISION OF SECURITY SERVICES IN RELATIONAL AND NoSQL DATABASES

Authentication: In relational databases all relational databases came with authentication mechanism, and can choice any of that mechanism to use.Where as in NoSQL databases many NoSQL databases by default does not come with authentication or authorization mechanism, but can use some of external method to perform this operation

Data Integrity: In Relational databases ACID properties that used in relational databases guarantee database transactions are processed reliably that ensure data integrate. Where as in NoSQL databases Eventually consistent is one of BASE properties principle ttherefore data integrity is not always achieved in NoSQL databases

Confidentiality:In Relational databases Data confidentiality is often achieved in relational database because it was use encryption techniques, to store data encrypted.whereas in NoSQL databases Data confidentiality is not achieved.

Auditing: In Relational databases Provide mechanisms to audit that allow writing to the database where as in NoSQL databases most of NoSQL databases don't provide auditing.

Client communication: In Relational databases provide secure client communication mechanism via using encryption and SSL protocols. where as in NoSQL databases most of NoSQL databases do not provide mechanisms of secure client communication.

Currently two incidents occur at MongoHQ (Oct 2013) [Ref.9] and LinkedIn (July 2012)[Ref.10] emphasis the importance of NoSQL data security because many companies are trying to avail the facility of NoSQL database in social media.

Therefore we require external security mechanism for NoSQL database.

6. PROPOSED SOLUTIONS FOR SECURITY ISSUES IN NoSQL DATABASE

The NoSQL databases has a number of security issues [11]. The main focus of NoSQL databases is how to handle the new data rather then its security issues[12]. NoSQL databases do not provide any feature of security. In comparison with the relational databases, NoSQL databases provide a very thin layer of security

The major securities threats and their proposed solution for NoSQL database are as follows[13][14][15].

Weak authentication mechanism and password storage techniques. NoSQL does not provide strong authentication mechanism and strong passweord storage that result in to and that result into information leakage injection attack. cross-site request forgery. password brute force attacks.For removing this issue developers need to impose security in the middleware.

Does not provide consistency: When NoSql was made at that time only its scaling feature kept in mind without considering its consistency feature. NoSQL databases does not satisfies simultaneously all the three properties (consistency, availability, partition fault tolerance) specified by CAP theorem and that is the reason that all participating commodity servers are not entirely synchronized with other commodity server that are keeping latest information.Therfore if a single commodity server stops working that result in to load imbalance among all the commodity servers. For removing this issue different protocols must be used that provide better consistency

Audit:- Security logging and monitoring is not provided by NoSQL database which is required by the PCI-DSS compliance (Requirement 10), to determine the "who, what, where and when" of users accessing a data processing resource, such as a database.For removing this issue provide a mechanism for auditing that allow writing to database

Data in Motion (Inter Node Communications):-

By default NoSQL database does not provide any encryption method for inter node communication. If we need we can avail SSL encryption options for it.

This issue can be resolved by providing mechanism through encryption and SSL protocols

Data in Motion (Client?Node Communications)

By default, the client node communication is not encrypted.SSL can be turned on by editing the corresponding settings under client_encryption_options . This issue can also be resolved by providing mechanism through encryption and SSL protocols

Integrity during transaction:- NoSQL database does not enforce data integrity constraint during transaction. That is why it can be used by financial institution for its critical data. For removing this issue ACID properties must be imposed

Susceptibility for network intruder: Because of its weak protocol architecture and loosely coupled mechanism allows an attacker to backdoor access of a file system for malicious activities For removing this issue better encryption techniques must be used

Insider attacks:- NoSQL databases has very poor logging and log analysis methods, along with it NoSQL databases has very thin security layer that is the reason it becomes very much difficult for users to maintain control over their data. For removing this issue better authentication mechanism must be used.

7. CONCLUSION

NoSQL databases are demanded among social media , because it has schema less data flexibility, scalability and performance. Security issues of NoSQL are to be improved. There are only a few NoSQL (e.g.,Cassandra)that currently meet the data security requirements of PCI-DSS, However, enhanced security is expected without compromising of performance. In NoSQL databases, because many of them are running JavaScript engines to achieve high performance and that becomes reason for JavaScript injection vulnerabilities . Since NoSQL databases does not provide reliable transactions and data consistency that is why it is the responsibility of application developer to adhere more closely to the standards and practices of security coding. Security feature of Relational database and performance & scaling features of NoSQL database are best co-deployed

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A Novel Approach to Real Time Health Monitoring System

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Abstract

According to survey of world health organization in 2012, approx 7.4 million people die in a year due to heart attack. Main Reason behind this is in today's world people don't have time for regular checkups to hospitals. We can develop mechanism in which person's smart phone will become a personal health assistant. In this paper, we will develop real time health monitoring system using the combination of bio-sensors and android application. Using wearable bio-sensors we will get information like heartbeat rate, body temperature and percentage of oxygen in blood. This information will be sent to android application using bluetooth that will do three major functions. First, using this information, application will give person's fitness ratio and if health is not good it suggest medicine with location and integrated offline maps. Second, using bio-sensors data we can know about any critical conditions. So in this case without internet connection required, application will automatically do registration in nearest hospital and give us conformation notification in emergency conditions using web and application's intelligent system. Third, as person will visit any place application will give information about that place like current weather conditions, how long it will take to reach, which medicines may be required on trip according to past history and person's fitness data stored in application. In addition according to distance travelled application will suggest for diet as well. So it will become personal assistant that will work offline.

Keywords: Android, sensors, health, application, offline, blutooth.

1. INTRODUCTION

In today's modern world everyone is using smart phone. It's become a part of our life not only for communication but it can be used for many other purposes like internet search and entertainment. If we use some other electronic circuit in combination with the capabilities of our smart phone then it can give us miracle results. Using smart phone's wireless capabilities and biosensors together, we can implement kind of application that can become helpful in telehealth area [1].

In many villages of rural area, there is no hospital available in nearest distance. So it will become very difficult for patient to go for regular checkups. If person's smart phone itself can able to do this things, then it will become very helpful. So any person can measure his fitness in real time. This will help us to improve quality of care provided at low cost. It provides real time health monitoring 24 hours a day to rural area as well as aged person who can't be able go for regular checkups at labs and hospitals.

2. PROPOSED ARCHITECTURE

A. Hardware and Software Tools

Arduino board is used as a platform in the development process. Arduino is open source. All we have to do is on board programming. We can write our code in c language according to our requirements. That will use capability of board to execute various functions we have written. In our experiment, we will use blend micro [2]. Blend micro is an arduino development board with in-built bluetooth module.

Bluetooth module allows wireless communication between arduino board and smart phone. We require biosensors to measure the data from human body in real time. We require pulse sensor that is used to measure the heartbeat. Body temperature sensors will get temperature from human body. Oxy Sensor will give us amount of oxygen in blood using IR scanner.

Any smart phone with bluetooth capability can run this application. For our experiment, we have used XOLO Q2000L for testing purpose [3]. Eclipse, with the Android SDK as a plug-in will be used as a development of application [4]. Application will be used as a communication bridge between board and phone. Application is written in java and some of user interface is coded in XML.

B. System Architecture

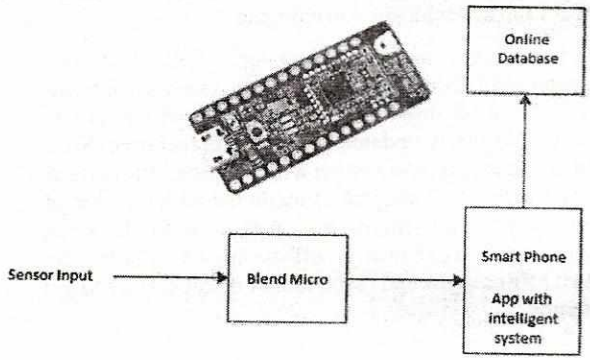

Figure 1: System Architecture

Figure 1 shows the system architecture. Sensors attached to arduino board will get information from human body and transmit it to android application using bluetooth.

3. IMPLEMENTATION

A. Android Application

Paper focus on implementing of android application upon data that we have received via bluetooth. When turning bluetooth on in smart phone it will become discoverable. It will search for nearby bluetooth devices which is available. Board is seen along with its unique board id. We now select the option of pair this devices. Now as pairing is complete, application will start receiving data from sensors that is connected to arduino board. We received this data in bits. Then our application will process this data to produce the desired functionalities and results.

B. Application as a Health Monitoring System

Blend micro is very small sized arduino board that can be together with the sensors used as wearable bio-sensors. Using wearable bio-sensors we will get information like heartbeat rate, body temperature and percentage of oxygen in blood.

To measure the heartbeat we will use pulse sensors that will give us pulse information in real time using bluetooth. Likewise body temperature sensor will give us human body temperature. To measure amount of oxygen in blood we use oxysensor that will generate infrared beam using IR scanner and it pass through our organ and at the other end using difference we can measure the percentage of oxygen in blood.

Now, this three sensors data together we will receive in our application. In application's part we will compare this real time data with taking as a reference of an ideal person's health. Through this difference we will measure fitness in percentage and also that it's in normal condition or not. Now with the combination of these three sensors data if application find anything wrong it will suggest medicine from its history with location information to get that medicine. Now this location information will automatically combine with our application's developed offline integrated maps, so person can go to that medical shop without internet connection required and get his medicine. For this we will use phone GPS and tower location to navigate.

If information is not available in application's history, it will be connected to our online intelligent system via internet [5]. In our online intelligent system, we will maintain database that regularly updated by experts in real time. Now, we send this data to online system with location information. As a result, server will suggest us medicine with location of availability of that medicine. Again with location information, person can now go offline and using GPS with integrated offline maps can reach to that medical store to get the medicine.

C. Application in Emergency Conditions

When person first time install this application in smart phone, there will be internet connection available. At that time application will ask few questions about person's name and blood group etc and generate unique registration ID which will be stored in our online intelligent system. This ID will be unique worldwide with each smart phone.

As we use this application for real time health monitoring, it will be helpful to us in critical or emergency conditions on the go and should work without internet connection required.

Suppose, person is met with an accident or some kind of emergency condition. At this time there will be major changes that will occur in person body like inaccurate heartbeat or percentage of oxygen in blood will become low. These changes will be measured by our biosensors and this information will be sent to our smart phone.

Furthermore suppose smart phone is not having internet connection, at this stage application immediately send one sms to our online server telling that person with this registration id is critical at this location. Our online server will find nearest hospital and do registration in that hospital using online hospital registration API services. Along With conformation of registration, server will send its location via sms to smart phone. Our applications now automatically combine that location with our integrated offline maps and any person now can take person to the hospital. Application will send this information to all your selected phone contacts in application list and their phone will also start continue getting vibration until they read your message.

Additionally our server will generate one message using VoIP (voice over internet protocol) service and call emergency number with this generated message. In this way, if no one is there to take that person to the hospital, ambulance will reach there to take that person to the hospital. This whole process will work offline.

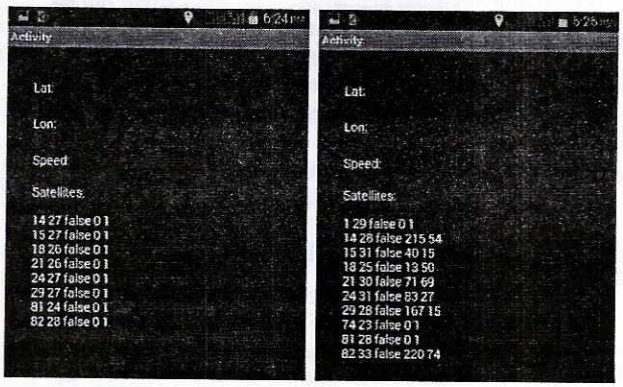

Figure 2: Offline Navigation

In figure 2, we can see that how we can get location information offline only using GPS and tower location of our

smart phone. It is clearly visible in notification area of phone that we are not using any wifi or internet connection to get location information.

D. Application as a Personal Assistant and Trip Advisor

There are many websites available online that can give us weather, humidity and distance information about any place. Suppose we want to visit any place that is new, we will simply enter that location information in our application and we will get all required information from online available about that place. We combine this information with our application past history.

As a result, application will give us information about that place like current weather conditions, how long it will take to reach, which medicines may be required on trip according to past history and person's fitness. In addition according to distance travelled application will suggest for amount of water and diet as well.

4. RESULTS

The result is that it is possible to develop the system with arduino board, biosensors and smart phone that will communicate accurately to get the real time data.

5. FUTURE WORK

In future, we can develop application using wifi capable arduino board. Using central wifi in hospitals, we can get data that accurately measure real time health conditions of each patient simultaneously.

6. CONCLUSION

As an individual, it will be real time health monitoring system even if on the go or in any kind of emergency conditions.

In hospital, we can measure and check any number of patient's physical condition in real time simultaneously. So regularly individual checkups will not be required even if in critical conditions.

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OPTrUe: A Software Package to Analyse UV-visible Spectroscopic Data to Determine the Optical Transition, Band Energy Gap and Urbach Energy

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Abstract

The essentials of an in-house developed software package are being outlined. In this paper are shown how the curated UV-visible spectroscopic data obtained from thin polymeric samples are used to obtain its optical constants like the optical transition, band energy gap and Urbach energy through the OPTrUe package. The paper sketches out the primary physics, the mathematical constructs needed to develop the package, the basic Mathematica™ commands and the steps required to obtain the optical constants.

Keywords: OPTrUe, software package, Mathematica™, spectroscopic data.

1. INTRODUCTION

Optical Transition, Optical Band Gap and Urbach Energy Analysis

The optical band gap is the value of optical energy gap between the valance band the conduction band. The optical band gap of the samples is determined from the absorption spectra near absorption edges. The photon absorption in many amorphous materials is found to obey the Tauc relation [1-2], which is of the form

$$ahv = B(hv - E_g)^n \qquad (1)$$

Where ? is the absorption coefficient, ?? is the photon energy, Eg is the optical band gap energy and the factor B depends on the transition probability and the index n is related to the distribution of density of states. For a indirect transition n = 2 or 3 depending on whether the transition is allowed or forbidden in quantum mechanical sense.

Apart from band gap calculation from absorption edge, absorption edge in the exponential (Urbach) region can yield information on the disorder effect [3]. The lack of crystalline long-range order in amorphous/glassy materials is associated with a tailing of density of states [4-6]. Low values of the absorption edge is characterized by the Urbach energy and is given by equation (2).

$$ahv = \beta(hv/E_U) \qquad (2)$$

where ? is a constant, EU is the Urbach energy which indicates the width of the band tails of the localized states. The optical absorption coefficient just below the absorption edge shows exponential variation with photon energy indicating the presence of Urbach's tail.

2. METHOD ADOPTED

- The exponent 'n' is determined by plot the log of the Tauc relation and then obtaining the slope of the linear section of the plot.
- The slope of the linear section of the log-log plot gives the value of 'n'.
- The value of 'n' gives the nature of the transition.

$$Therefore, we\ have,\ [\alpha(hv)]^{1/n} \propto (hv - E_g) \qquad (3)$$

Hence a plot of $[\alpha(hv)]^{1/n}$ versus energy 'h?' should lead to a straight line whose intersection with the y-axis gives the gap energy E_g, the so-called 'Tauc gap'. The Tauc gap is quite often used to characterize the optical properties of amorphous materials. From the considerations given above it is clear that the Tauc gap gives information on the energy separation of the extended states of valence and conduction bands. The intercepts of the tangents on the energy axis gives the value of the optical band energy gap, E_g.

The Urbach energy is obtained by using the following equations 4, 4(a)

$$\ln(\alpha) = C + \frac{hv}{Eu} \qquad (4)$$

$$Eu = \frac{h}{\frac{d\ln[\alpha(v)]}{dv}} \qquad (4a)$$

One can determine the Urbach energy by plotting the logarithm of the absorption coefficient and taking the inverse of the slope of the linear part of the graph.

3. MATHEMATICA CODE

The OPTrUe package is based on Mathematical Computations and contains code which can be further used in solving various other mathematical problems.

The slope is obtained by the Mathematica command: D[f[x],x] if f[x] = dy/dx

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The band energy gap is obtained by the Mathematica command : Solve[expression[x]==0,x]

Output by using the OpTrUe Package

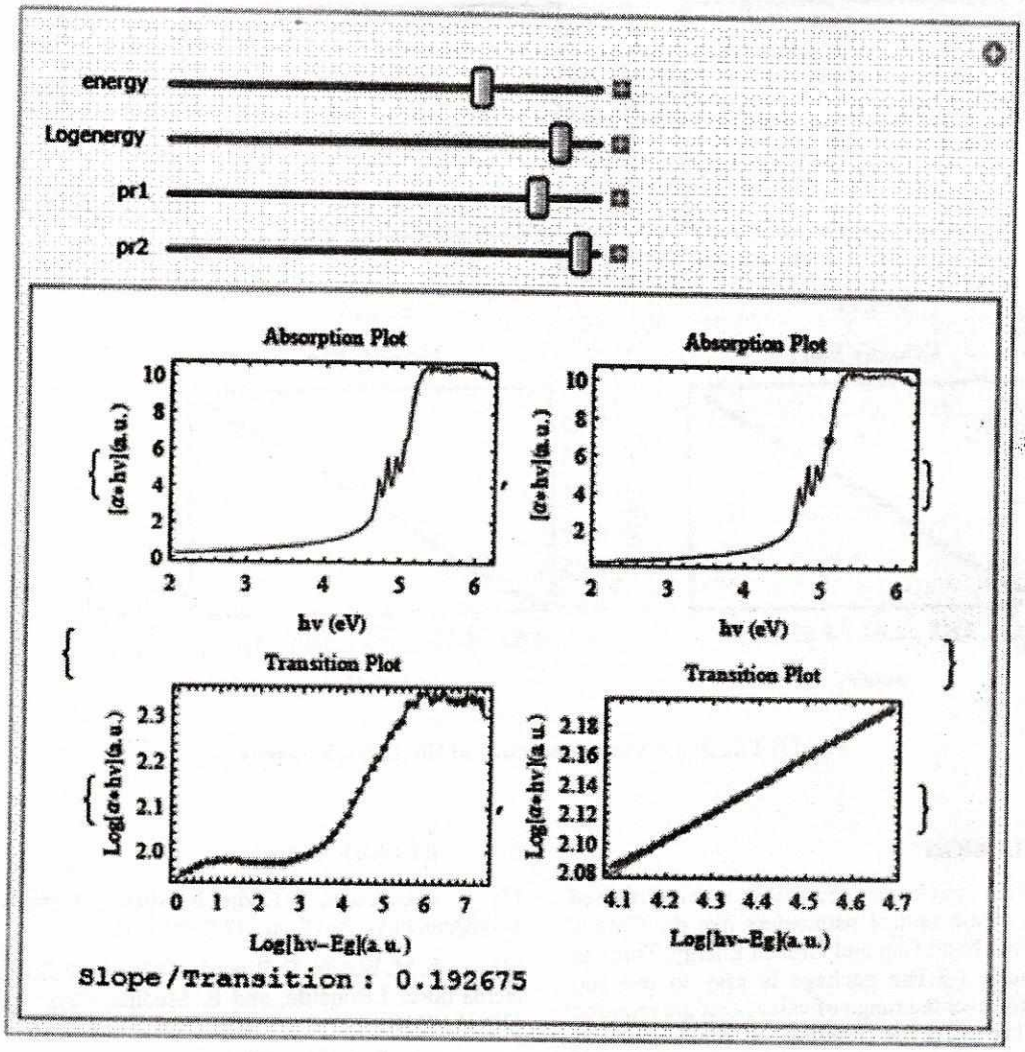
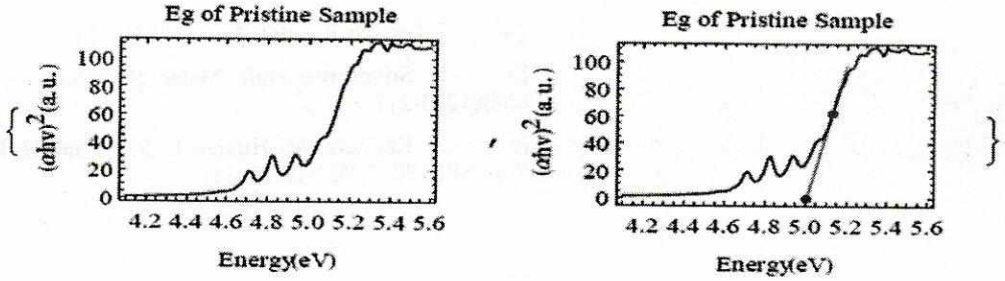


Fig. [1] The figure shows the nature 'n' of the optical transition



Eg = 5.07 eV

Fig. [2] The figure shows the value of the optical band energy gap.

"Eu: "0.17301485833856928` " eV "" or "3.088246582957985` " db"

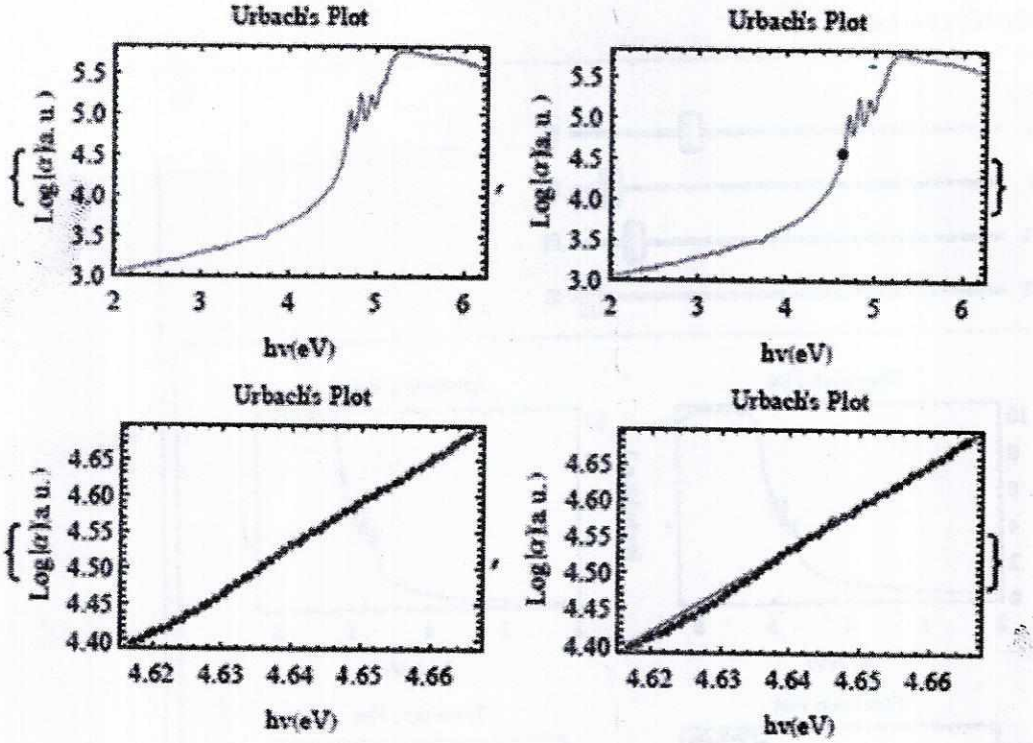


Fig. [3] The figure shows the value of the Urbach energy

4. CONCLUSION

The OpTrUe package provides a customized environment to obtain optical parameters like the Optical Transition, Optical Band Gap and Urbach Energy. This can be seen in figures 1-3.The package is easy to use and sufficiently robust over the range of values that are required for analysis. The package requires a Mathematica™ environment and will be made available on demand to the author.

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Type of Attack in Computer Network using Intrusion Detection System with Data Mining Techniques - A Survey

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Abstract

An Intrusion Detection System (IDS) is a device or software application that monitors network or system activities for malicious activities or policy violations and produces reports to a management station. Some systems may attempt to stop an intrusion attempt but this is neither required nor expected of a monitoring system. Intrusion detection and prevention systems (IDPS) are primarily focused on identifying possible incidents, logging information about them, and reporting attempts. In addition, organizations use IDPSes for other purposes, such as identifying problems with security policies, documenting existing threats and deterring individuals from violating security policies. IDPSes have become a necessary addition to the security infrastructure of nearly every organization. They search for potential malicious abnormal activities on the network traffics; they sometimes succeed to find true network attacks and anomalies (true positive). However, in many cases, systems fail to detect malicious network behaviors (false negative) or they fire alarms when nothing wrong in the network (false positive). Hence applying Data Mining (DM) techniques on the network traffic data is a potential solution that helps in design and develop a better efficient intrusion detection systems. Data mining methods have been used build automatic intrusion detection systems. The central idea is to utilize auditing programs to extract set of features that describe each network connection or session, and apply data mining programs to learn that capture intrusive and non-intrusive behavior. In addition, Network Performance Analysis (NPA) is also an effective methodology to be applied for intrusion detection. Here, we discuss DM and NPA Techniques for network intrusion detection and propose that an integration of both approaches have the potential to detect intrusions in networks more effectively and increases accuracy [3].

Keywords: Intrusion Detection, Network Intrusion Detection System, Data Mining Techniques, Network Performance Analysis.

1. INTRODUCTION

Intrusion detection is defined as the process of intelligently monitoring the events occurring in a computer system or network, analyzing them for signs of violations of security policy. The primary aim of Intrusion Detection System (IDS) is to protect the availability, confidentiality and integrity of critical networked information systems. Intrusion Detection Systems are an important component of defensive measures protecting computer systems and networks from abuse. When an IDS is properly deployed it can provide warnings indicating that a system is under attack. It is critical for intrusion detection in order for the IDS to achieve maximal performance.[4]

2. PROBLEM STATEMENT

The rapid development of computer networks and mostly of the Internet has created many stability and security problems such as intrusions on computer and network systems. Further the dependency of companies and government agencies is increasing on their computer networks and the significance of protecting these systems from attacks is serious because a single intrusion can cause a heavy loss or the consistency of network becomes insecure. During recent years number of intrusions has dramatically increased. Therefore it is very important to prevent such intrusions. The hindrance of such intrusions is entirely dependent on their detection that is a key part of any security tool such as Intrusion Detection System (IDS), Intrusion Prevention System (IPS), Adaptive Security Alliance (ASA), checkpoints and firewalls. Hence accurate detection of network attack is imperative. A variety of intrusion detection approaches are available but the main problem is their performance, which can be enhanced by increasing the detection rates and reducing false positives.

3. TERMINOLOGY

- Burglar Alert/Alarm: A signal suggesting that a system has been or is being attacked.
- Detection Rate: The detection rate is defined as the number of intrusion instances detected by the system(True Positive) divided by the total number of intrusion instances present in the test set.
- False Alarm Rate: defined as the number of 'normal' patterns classified as attacks(False Positive) divided by the total number of 'normal' patterns.
- True Positive: A legitimate attack which triggers an IDS to produce an alarm.

- False Positive: An event signaling an IDS to produce an alarm when no attack has taken place.
- False Negative: A failure of an IDS to detect an actual attack.
- True Negative: When no attack has taken place and no alarm is raised.
- Noise: Data or interference that can trigger a false positive or obscure a true positive.
- Site policy: Guidelines within an organization that control the rules and configurations of an IDS.
- Site policy awareness: An IDS's ability to dynamically change its rules and configurations in response to changing environmental activity.
- Confidence value: A value an organization places on an IDS based on past performance and analysis to help determine its ability to effectively identify an attack.
- Alarm filtering: The process of categorizing attack alerts produced from an IDS in order to distinguish false positives from actual attacks.
- Attacker or Intruder: An entity who tries to find a way to gain unauthorized access to information, inflict harm or engage in other malicious activities.
- Masquerader: A user who does not have the authority to a system, but tries to access the information as an authorized user. They are generally outside users.
- Misfeasor: They are commonly internal users and can be of two types:

1. An authorized user with limited permissions.
2. A user with full permissions and who misuses their powers.

- Clandestine user: A user who acts as a supervisor and tries to use his privileges so as to avoid being captured.

An intrusion detection system can be described at a very macroscopic level as a detector that processes information coming from the system to be protected. This detector can also launch probes to trigger the audit process, such as requesting version numbers for applications. It uses three kinds of information: long-term information related to the technique used to detect intrusions (a knowledge base of attacks for example), configuration information about the current state of the system, and audit information describing the events that are happening to the system. The role of the detector is to eliminate unneeded information from the audit trail. It then presents either a synthetic view of the security-related actions taken during normal usage of the system, or a synthetic view of the current security state of the system. A decision is then taken to evaluate the probability that these actions or this state can be considered as symptoms of an intrusion or vulnerabilities. A countermeasure component can then take corrective action to either prevent the actions from being executed or change the state of the system back to a secure state.

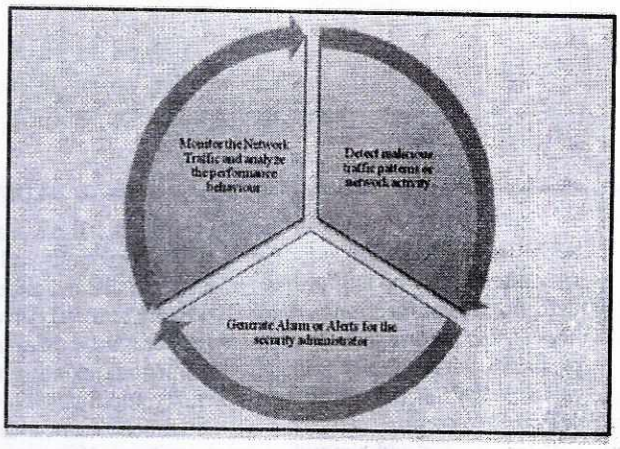

Fig 1. Traditional Network IDS

1. Classification of Intrusion Detection: Intrusions Detection can be classified into two main categories. They are as follow:

A. Host Based Intrusion Detection: HIDSs evaluate information found on a single or multiple host systems, including contents of operating systems, system and application files.

B. Network Based Intrusion Detection: NIDSs evaluate information captured from network communications, analyzing the stream of packets which travel across the network.

2. Components of Intrusion Detection System: An intrusion detection system normally consists of three functional components. The first component of an intrusion detection system, also known as the event generator, is a data source. Data sources can be categorized into four categories namely Host-based monitors, Network-based monitors, Application-based monitors and Target-based monitors. The second component of an intrusion detection system is known as the analysis engine. This component takes information from the data source and examines the data for symptoms of attacks or other policy violations. The analysis engine can use one or both of the following analysis approaches:

A. Misuse/Signature-Based Detection: This type of detection engine detects intrusions that follow well-known patterns of attacks (or signatures) that exploit known software vulnerabilities. The main limitation of this approach is that it only looks for the known weaknesses and may not care about detecting unknown future intrusions.

B. Anomaly/Statistical Detection: An anomaly based detection engine will search for something rare or unusual. They analyses system event streams, using statistical

techniques to find patterns of activity that appear to be abnormal. The primary disadvantages of this system are that they are highly expensive and they can recognize an intrusive behavior as normal behavior because of insufficient data

C. The third component of an intrusion detection system is the response manager. In basic terms, the response manager will only act when inaccuracies (possible intrusion attacks) are found on the system, by informing someone or something in the form of a response.

5. NETWORKING ATTACKS

This section is an overview of the four major categories of networking attacks. Every attack on a network can comfortably be placed into one of these groupings.[2](fig. 2)

1. Denial of Service (DoS): A DoS attack is a type of attack in which the hacker makes a computing or memory resources too busy or too full to serve legitimate networking requests and hence denying users access to a machine e.g. apache, smurf, neptune, ping of death, back, mail bomb, UDP storm etc. are all DoS attacks.

2. Remote to User Attacks (R2L): A remote to user attack is an attack in which a user sends packets to a machine over the internet, which s/he does not have access to in order to expose the machines vulnerabilities and exploit privileges which a local user would have on the computer e.g. xlock, guest, xnsnoop, phf, sendmail dictionary etc.

3. User to Root Attacks (U2R): These attacks are exploitations in which the hacker starts off on the system with a normal user account and attempts to abuse vulnerabilities in the system in order to gain super user privileges e.g. perl, xterm.

4. Probing: Probing is an attack in which the hacker scans a machine or a networking device in order to determine weaknesses or vulnerabilities that may later be exploited so as to compromise the system. This technique is commonly used in data mining e.g. saint, portsweep, mscan, nmap etc.

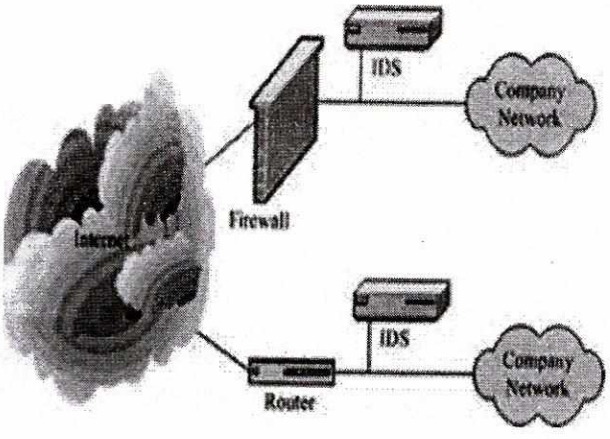

Fig 2. Simple Network

6. DATA MINING TECHNIQUES FOR NETWORK INTRUSION DETECTION

Many researchers have investigated the deployment of data mining algorithms and techniques for intrusion detection. Examples of these techniques include.[1][5]

Feature Selection Data Analysis: The main idea in feature selection is to remove features with little or no predictive information from the original set of features of the audit data to form a subset of appropriate features. Feature selection significantly reduces computational complexity resulting from using the full original feature set. Other benefits of feature selection are: improving the prediction of ID models, providing faster and cost-effective ID models and providing better understanding and virtualization of the generated intrusions. Feature selection algorithms are typically classified into two categories: subset selection and feature ranking. Subset selection algorithms use heuristic search such as genetic algorithms, simulated annealing and greedy hill climbing to generate and valuate a subset of features as a group for suitability. On the other hand, feature ranking uses a metric to rank the features based on their scores on that metric and removes all features that do not achieve an adequate score.

Classification Analysis: The goal of classification is to assign objects (intrusions) to classes based on the values of the object's features. Classification algorithms can be used for both misuse and anomaly detections. In misuse detection, network traffic data are collected and labeled as "normal" or "intrusion". This labeled dataset is used as a training data to learn classifiers of different types (e.g., SVM, NN, NB, or ID3) which can be used to detect known intrusions. In anomaly detection, the normal behavior model is learned from the training dataset that are known to be "normal" using learning algorithms. Classification can be applied to detect intrusions in data streams; a predefined collection of historical data with their observed nature helps in determining the nature of newly arriving data stream and hence will be useful in classification of the new data stream and detect the intrusion. Data may be non sequential or sequential in nature. Non-sequential data are those data where order of occurrence is not important, while sequential data are hose data where the order of occurrence with respect to time is important to consider. Using data mining and specially classification techniques can play a very important role on two dimensions; the similarity measures and the classification schema. Temporal data can be classified into discrete temporal sequential data such as logs time or continuous temporal sequential data such as observations.

Clustering Analysis: Clustering assign objects (intrusions) to groups (clusters) on the basis of distance measurements made on the objects. As opposed to classification, clustering is an unsupervised learning process since no information is available on the labels of the training data. In anomaly detection, clustering and outlier analysis

can be used to drive the ID model. Distance or similarity measure plays an important role in grouping observations in homogeneous clusters. It is important to formulate a metric to determine whether an event is deemed normal or anomalous using measures.

Association and Correlation Analysis: The main objective of association rule analysis is to discover association relationships between specific values of features in large datasets. This helps discover hidden patterns and has a wide variety of applications in business and research.

Association rules can help select discriminating attributes that are useful for intrusion detection. It can be applied to find relationships between system attributes describing network data. New attributes derived from aggregated data may also be helpful, such as summary counts of traffic matching a particular pattern.

Stream Data Analysis: Intrusions and malicious attacks are of dynamic nature. Moreover, data streams may help detect intrusions in the sense that an event may be normal on its own, but considered malicious if viewed as part of a sequence of events. Thus, it is necessary to perform intrusion detection in data stream, real-time environment. This helps identify sequences of events that are frequently encountered together, find sequential patterns, and identify outliers. Other data mining methods for finding evolving clusters and building dynamic classification models in data streams can be applied for these purposes.

Distributed Data Mining: Intruders can work from several different locations and attack many different destinations. Distributed data mining methods may be utilized to analyze network data from several network locations, this helps detect distributed attacks and prevent attackers in different places from harming our data and resources.

Visualization and Querying Tools: Visualization data mining tools that include features to view classes, associations, clusters, and outliers can be used for viewing any anomalous patterns detected. Graphical user interface associated with these tools allows security analysts to understand intrusion detection results, evaluate IDS performance and decide on future enhancements for the system.

7. CONCLUSION

This research is centered on "Developing an algorithm to implement efficient intrusion detection system". The outcome of the proposed work will yield the expected result and fulfill the following objectives:

1. Algorithm to implement Intrusion detection system based on Data Mining Technique.
2. Rationally Reduce number of false positive alarms.

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Strengthening the Supply Chain of Indian Organic Food

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Abstract

One major challenge India faces is feeding her growing population with healthy food. Consumers are getting conscious of food quality issues such as pesticide residues, chemical contamination, wax coatings, artificial coloring etc. However, recently, there is a positive change towards supply of health food, in the form of organic products.

Keywords : Supply Chain, Consumer, Organic Food.

1. INTRODUCTION

The market turnover in organic foods estimated at 5,000 crore now, is projected by experts to touch 7,000 crore by 2015 (CDS Mani, 2012). While the annual growth rate in the conventional food market is less than 5 per cent, the average growth rate of the organic food market is about 20 per cent. Organic food commands a premium in the international market and it ranges from 10 per cent to 50 per cent over conventional foods. Worldwide, about 130 countries produce certified organic products on a commercial scale.

The demand for organically produced foods is growing rapidly in developed countries like Europe, USA, Japan and Australia. The share of organic foods in these countries is approximately 1 to 1.5 per cent. Today, globally trends are changing with a remarkable health orientation. Australia has the maximum area under organic cultivation, followed by Europe and the American continent. The organic market growth rate is highest in Japan, USA, Australia and the European Union. Similarly, the demand for domestic consumption is increasing and in India, the organic sector is getting positioned in the main stream. Stores are increasingly displaying "Organic Wheat", "Organic Rice", "Organic Milk", "Organic Pulses", "Organic Tea", "Organic Eggs" "Organic Fruit Juices", "Organic flowers", "Organic wine" and "Organic clothes" on their shelves.

As per the statistics given by APEDA, currently, India ranks tenth among the top ten countries in terms of cultivable land under organic certification. The certified area includes 15% cultivable area with 0.72 million Hectare, and rest 85% (3.99 million Hectare) is forest and wild area for collection of minor forest produces. The total area under organic certification is 4.72 million Hectare (2013-14). India produced around 1.24 million MT of certified organic products which includes all varieties of food products namely Sugarcane, Cotton, Oil Seeds, Basmati rice, Pulses, Spices, Tea, Fruits, Dry fruits, Vegetables, Coffee and their value added products. The production is not limited to the edible sector but also produces organic cotton fiber, functional food products etc. Among all the states, Madhya Pradesh has covered largest area under organic certification followed by Himachal Pradesh and Rajasthan.

India exported 135 products last year (2013-14) with the total volume of 194088 MT including 16322 MT organic textiles. The organic agri export realization was around 403 million US $ including 183 US $ organic textiles registering a 7.73% growth over the previous year. Organic products are exported to US, European Union, Canada, Switzerland, Australia, New Zealand, South East Asian countries, Middle East, South Africa etc. Soybean (70%) lead among the products exported followed by Cereals & Millets other than Basmati (6%), Processed food products (5%), Basmati Rice (4%), Sugar (3%), Tea (2%), Pulses and Lentils (1%), Dry fruits (1%), Spices (1%) and others. However, India's organic food exports are only about 0.35% of the $64 billion worth global organic food market (www.apeda.gov.in).

However, India's organic food exports are only about 0.35% of the $64 billion worth global organic food market. One reason for this is the challenges associated with the supply chain of organic products. As this is a new market, there are lots of innovations required in the supply chain to make it greener. The paper depicts the links associated with the crop production and operations, transportation, storage, processing, packaging, traceability, retail etc of organic products, and gives suggestive measures for innovative changes to be brought from farm gate to food plate.

1.2. Scope and Potential for Rural Farmers

Many are skeptical about the concept of organic farming that whether it will be able to feed the whole nation or not. However, vast scope for promotion of organic farming in the export market, without compromising with the national food security exists in the state, as farming by tribals and under rainfed conditions is generally organic. India is also bestowed with lot of potential to produce all varieties of organic products due to its various agro climatic regions. In several parts of the country, the inherited tradition of organic

farming is an added advantage. This holds promise for the organic producers to tap the market which is growing steadily in the domestic market related to the export market. Moreover, the fertilizer consumption in India is only 69.66 kg per hectare and pesticide consumption is only 600 grams per hectare, which are far below the world averages. The consumption is less than 5 kg/ha in some of the north-eastern States. Manual weeding is practiced even today in many parts of the country. Agriculture is labor intensive in many farms because of cheap and easy availability of labor. Genetically engineered crops are not yet popular in India, except in cotton. Eco farming is widely practiced and popularized in India with the availability of bio-pesticides, bio agents and organic manures. Therefore, there might not be a need of conversion to organic agriculture in the case of many farms in the country.

Organic agriculture in India has made good progress during the last ten years. With a combined effect of farmers' efforts, NGOs, government interventions and market forces, Indian organic agriculture has reached a stage where it can play a significant role not only in the growing domestic market, but also in global organic food trade.

1.3. Government Support

The Ministry of Agriculture is promoting and spreading organic farming throughout the country with a variety of state-funded projects like the National Horticulture Mission, the National Project on Organic Farming, and the Technology Mission for the Northeast and Rastriya Krishi Vikas Yojana.In addition to national initiatives, a collection of state governments have also initiated their own organic farming promotion programs. Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Nagaland, Sikkim, and Uttarakhand have drafted policies for the promotion of organic farming and, of those, Mizoram, Nagaland, Sikkim and Uttarakhand have declared that they wish to go 100 percent organic in near future. The state government of Kerala has declared some areas in Wayanad and Idukki hill districts as fully organic. As per Times of India Report (21 Oct 2014), Chief Minister of Madhya Pradesh said subsidy will be given on green manure in the state. Besides, arrangements will be made at all mandis to have a counter for organic products. In Bareilly district of Uttar Pradesh, the district magistrate has submitted to the state chief secretary a proposal that 50 hectares of land be set aside as a Special Organic Zone (SOZ). Under this, all residential areas in 5 villages would be earmarked; no expansion would be allowed for 25 years, and under the SOZ would be used only for organic farming. Farmers would get special facilities like 100% subsidy, discount on taxes, solar power grid for 24 hours of power supply, centralized cold storage and refrigerated transport facility (P. Agarwal, 2014).

Agriculture Products Export Development Authority (APEDA) conducts awareness programmes for organic production in collaboration with the prospective State governments. As a result of the awareness programme in Gujarat, an organic farm for production of aflatoxin free organic groundnuts has been set up in the Junagarh District under the technical guidance of National Research Center for Groundnut. With the help of APEDA, Tripura Govt. is in the process of setting up a modal farm for "Kasha" variety of rice. In view of the large-scale pineapple production in Tripura without the use of commercial fertilizers or pesticides, an Agri Export Zone for production, processing and export of organic pineapple products has been set up in the state of Tripura. Model organic farms are set up by APEDA in North Eastern Region for Joha Rice, Sugarcane, Passion Fruit and Pineapple.

APEDA also promotes Indian organic products by regularly participating in the BIOFACH International Fare held in Germany annually exclusively for organic products. The Spices Board also organizes training programmes in organic principles and practices, demonstrations to educate and motivate prospective organic spice growers. Such initiatives need to be strengthened and penetrated in the rural areas also.

2. STRENGTHENING THE SUPPLY CHAIN

Though there is immense scope for organic farming, there are also lots of challenges associated, when it is to be considered as an entrepreneurship. Firstly, organic farming is a market demand-driven agriculture, aimed to cater to the foreign export and affluent section of the society in the country. However, in order to make a dent in the export market, we need to develop high-tech organic technology with strict quality control, meeting international quality standards prescribed for organic produce. Our farmers need to be well versed with the quality specifications.

In India, APEDA regulates the certification of organic products as per National Standards for Organic Production. The NPOP standards for production and accreditation system have been recognized by European Commission and Switzerland as equivalent to their country standards. Similarly, USDA has recognized NPOP conformity assessment procedures of accreditation as equivalent to that of US. With these recognitions, Indian organic products duly certified by the accredited certification bodies of India are accepted by the importing countries. On behalf of Government of India APEDA has developed a National Organic Logo, which could be used as National Organic identification mark by all concerned. Internationally, some agreements are already in place, to harmonize certification between countries, facilitating international trade. There are also international certification bodies, including members of the International Federation of Organic Agriculture Movements (IFOAM), the Organic Crop Improvement Association (OCIA) etc. Where formal agreements do not exist between countries, organic product for export is often certified by agencies from the importing countries, who may establish permanent foreign offices for this purpose.

In order to follow these quality standards, our farmers are required to be well aware of the organic guidelines. But even if they follow all the production guidelines, there are many hindrances when the product travels in the supply chain. If there is compromise in quality anywhere in the chain, it will affect the marketing. This definitely will have an impact on farmers too, who are the producers. Hence, there is a need to strengthen the whole organic farm system for our rural farmers to tap the demand. Right from farm gate to food plate, an 'organic way' has to be followed. The remaining section details the requirements for strengthening the system.

2.1. Specific Package of Practices for Crops

Though farming is our tradition, and the farmers practice the indigenous way of cultivation, they need to be trained on the general specifications of organic farming, as well as cultivation practices for specific crops. At present he Package of Practices (POPs) is developed only for few crops for few regions.

Coffee Board has brought out documents on POPs for Organic Coffee & Guidelines on Production of Organic Coffee. Central Plantation Crops Research Institute (CPCRI) has developed organic production technology for coconut. Organic tea (bio tea) is produced in India as per national standards, based on the guidelines of Tea Board. CICR, Nagpur has standardized package of practices for organic cotton production. Spice Board of India has taken a major imitative in promotion and export of organic spices. It has brought out a document on production of organic spices. Spices Board has standardized Package of Practices (POP) for organic production of ginger, pepper, vanilla, turmeric and chillies. APEDA has also prepared to the product specific and area specific guidelines for production of organic Rice, Sugarcane, Pineapple and Passion fruit.

But still there is a need to develop POPs for many other crops, vegetables, fruits etc. So crop-specific and farming situation-specific POPs for organic cultivation should be developed and after thorough on-farm validation, recommended for adoption. Such proven technology packages needs to be documented in regional languages also.

2.2. Organic Input Centers

It is always economical for small/marginal farmers to prepare their own farm inputs such as vermicompost, bio-pesticides etc. However, input centers in villages itself will help farmers when they are doing group farming, as preparing such inputs is time and labor consuming. For other inputs such as bio-fertilzers and bio control agents government can think of setting up biotech laboratories to ensure availability of quality farm inputs. State Agriculture University in Kerala is taking steps in this direction. Other States can also think in similar direction. There is also a need of quality control labs in the state in order to check the standards of organic farm inputs.

2.3. Strict Regulations of Farm Practices

Avoiding contamination from chemical/GM field is a big challenge in the cultivation of organic crops. Often, there can be leaching of chemicals from conventionally grown farms. Maintaining appropriated buffer zone is one preventive action for controlling the leaching of chemicals from other plots. But our small farmers may find it difficult to waste land as buffers. Another reason for crop contamination is the Gene flow from Genetically Modified crops. This is specially so since most of India's farms are tiny, of 1-1.5 hectares each. For example, there is concern of the contamination of normal cotton fields from Bt cotton fields, with around 65-75 per cent of the production in the country coming from Bt cotton. The gene flow for Bt cotton is highest at 50 meters, but even at 100 meters there is possibility of contamination. Even if one plant in a one-acre plot (it can have 4,000 plants) is contaminated, the chances of contaminated seed in the next season are high (www.businessstandard.com). So a nation, it is better to think of a ban for GM crops, as part of promoting a sustainable business practice.

2.4. Bulk Production

Small entrepreneurs looking for export also face challenges due to non-availability of the produce in bulk. Though individual farmers are showing interest in organic farming, they find it difficult to market the small quantities. The solution may be to encourage group farming in villages, making sure that there is adequate quantity to be sold. Networking organic farmers is a positive step in promoting organic foods.

The newly-emergent organic produce supply chains across Asia have also been excluding small producers due to reasons of high certification costs, the smaller volumes they produce, and tighter control by the chain leaders in the absence of any local market outlets for the organic producers (Raynolds, 2004). In fact, this is the result of the dominance of organic produce markets retailed by supermarkets in the West, for which organic produce is targeted.

2.5. Storage and Transportation

Product integrity shall also be maintained during storage and transportation of organic products. Organic products must be protected from co-mingling with non-organic products and must be protected all times from contact with the materials and substances not permitted for use in organic farming. Storage areas and transport containers for organic product should be cleaned using methods and materials permitted in organic production. Steps should be taken to prevent any contamination before using a storage area or a container not solely dedicated to organic foods. So there is a need to establish separate and decentralized storage facilities for organic farm produce to ensure its organic integrity. There is also need to provide separate local transportation facilities for organic produce to nearby domestic markets.

2.6. Packaging Materials

Packaging material for organic products shall be eco friendly. It should preferably be chosen from biodegradable, recycled or recyclable sources. Waste generating material shall not be used for packaging. Unnecessary packaging material should be avoided. Packaging material should in no way reduce the organic quality of the product. It shall not contaminate the food. However, some companies use packaging materials like plastic crates and plastic nets bags, which are not considered as eco-friendly. So there is a need of bringing in sustainable packaging practices among the organic growers. The codex guidelines for packaging of organic products shall be practiced. But above this, the main hindrance is the unavailability of such packaging materials to small towns and cities, where major production takes place.

2.7. System for Monitoring the Organic Certifications

Often, there is contamination of organic products with other materials. According to the reports of Business Standard, recently, there was widespread reports in Europe that premium organic cotton exported by India is contaminated with Genetically Modified (GM) cotton have tarnished the image of a fast-growing segment of the country's textile exports. The GM was found in cotton garments marked as organic by leading European retailers like H&M, C&A and Tchibo. The source of fabrics was India. According to Organic Exchange, an international non-profit organization that promotes the growth of organic farming, India accounted for as much as 65 per cent of the 175,113 tonnes of organic cotton produced worldwide in 2008-09 (www.businessstandard.com). As per an independent testing laboratory, Impetus, around 30 per cent of the samples were contaminated with GM cotton. Considering these contaminations in the certified products, keeping a closer look at organic certifications is the need of the hour.

At present, TraceNet, a web-based traceability system has been introduced in the country, to trace and track all organic certifications for exports to ensure purity. Inspectors employed by certification agencies will use GPS devices for capturing data so that wrong certifications are eliminated. The major stakeholders for this traceability system of Organic Products are Accredited Certification Bodies in India, Operator Groups, Individual Operators and APEDA as the nodal agency. Each consignment of an Exporter is accompanied by a Transaction Certificate. Certification bodies shall issue the Transaction Certificate through APEDA's TraceNet system, either based on a previous Transaction Certificate in case the product has moved through multiple handlers on the supply chain or based on a Scope Certificate when it was directly procured from an operator, either an individual or a group (tracenet.lsipl.com).

To minimize deceptive practices in the marketplace, specific measures are necessary to ensure that trade and processing enterprises can be audited effectively. Therefore, the real regulation of a process, rather than a final product demands responsible action by all parties involved. In keeping line with this principle, inspection of the organic management system is an integral component of certification. The certification bottlenecks stifle India's organic food exports

2.8. Affordable Certifying Agencies

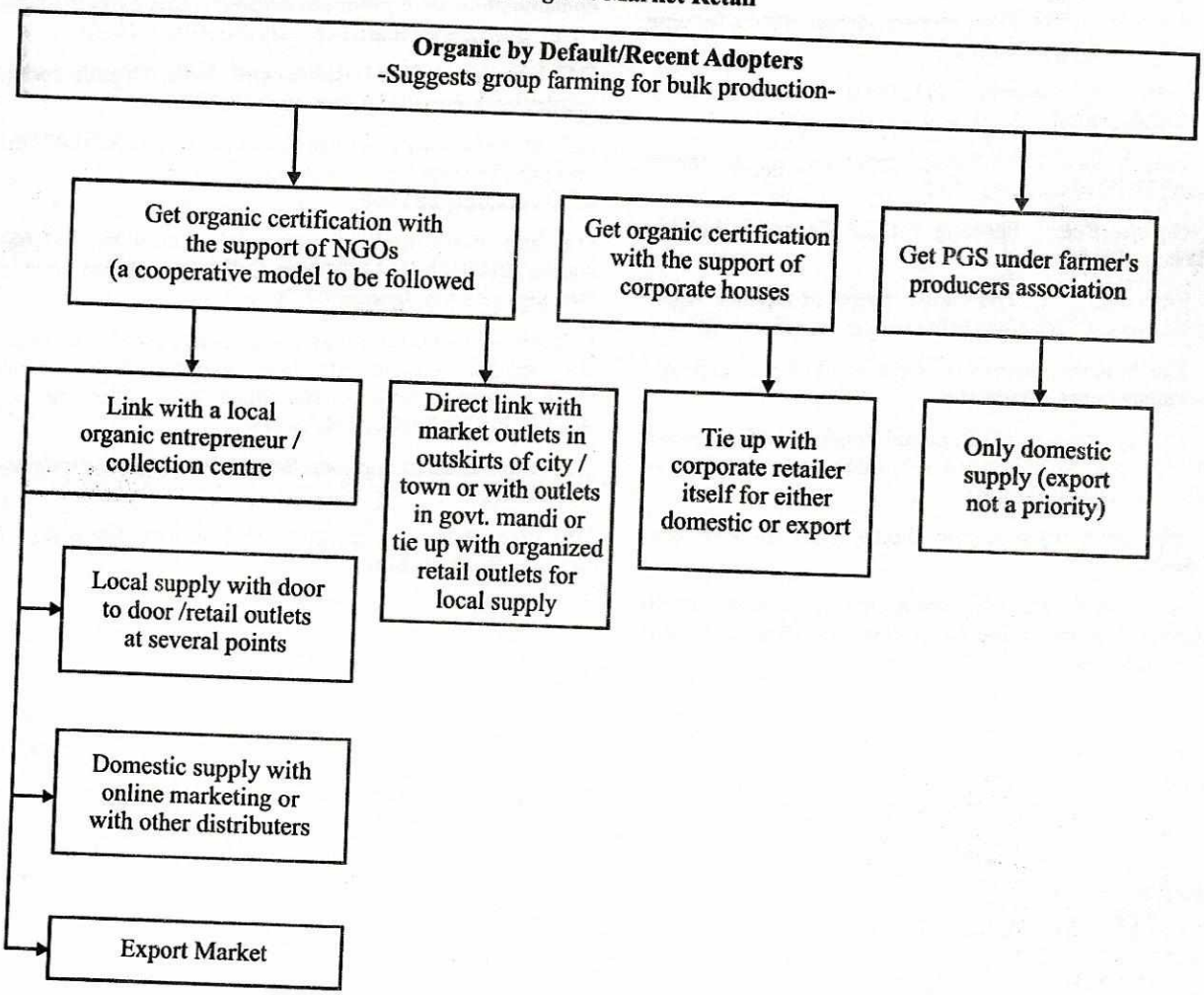
At present, the certification cost is very high, which is difficult for farmers to afford. Hence there shall be more domestic players. Government may also take the initiative for certification. This will make certification accessible to small and marginal farmers. Farmers may also for producers association and get Participatory Guarantee Scheme certification for domestic market. PGS is affordable, as the certification is based on 'trust' factor and with peer monitoring.

3. THE ORGANIC MARKET RETAILS

In the last few years, organic farming has attracted many farmers across the state and many farmers did experiment it successfully. But they do face problems due to lack of convenient market outlets. There is absence of network through which the farmers can sell their products at good price and reap the benefits of their hard work. Today some initiatives taken by government of Maharashtra "MahaPeck Bazar" concept where the farmer sells directly sends goods to consumers but this is still in a very primitive stage. Door to door delivery system is showing encouraging results in Metro cities like Mumbai, Bangalore and Delhi.

In order to propose a market model, it is important to understand the various types of farmers involved in organic production. The growth of organic agriculture in India has three dimensions and is being adopted by farmers for different reasons. First category of organic farmers are those which are situated in no-input or low-inputuse zones, for them organic is a way of life and they are doing it as a tradition (may be under compulsion in the absence of resources needed for conventional high input intensive agriculture). Second category of farmers are those which have recently adopted the organic in the wake of ill effects of conventional agriculture, may be in the form of reduced soil fertility, food toxicity or increasing cost and diminishing returns. The third category comprise of farmers and enterprises which have systematically adopted the commercial organic agriculture to capture emerging market opportunities and premium prices. While majority of farmers in first category are traditional (or by default) organic they are not certified, second category farmers comprised of both certified and un-certified but majority of third category farmers are certified (http://ncof.dacnet.nic.in/). Here I would like to omit the third category, as they are big literate farmers who are established. My focus is on the first and second category of farmers.

The Organic Market Retail



There should be new breed of entrepreneurs in the supply chain with mission driven approach to take farmers back to their organic roots. Market outlets shall be in the outskirts of city as it will ease the transportation for farmers. If the product is meant for processing, all parties in the link has to follow the organic guidelines.

4. CONCLUSION

There is consumer demand for organic products. At the same time there is a need to bring more awareness on both pre and post harvest technology among the farmers and entrepreneurs, bring more awareness among consumers, promote domestic certification agencies, ensure close monitoring of certified products as well as regulations on farm practices etc. Moreover, in handling, storage, transportation, processing and packaging, India has to bring about drastic changes and improvement to reduce wastage, loss and to compete in the global market in terms of quality of the products. Along with the recognition of relevance of eco-farming and organic foods in the current global scenario, it is imperative to take appropriate measures (R&D and Extension) to the development and dissemination of appropriate technologies in this field. More research needs to be conducted on comparison on production cost, yield and income in organic and conventional farm systems, improvement in organic production technologies, and research on inputs to organic farming. Moreover, the results must be made available to the policy makers and farmers.

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Key Principles of Quality Management in Higher Education

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Abstract

Quality exists whether defined or not. Quality is neither a substance, nor a method. It is a goal towards which method is aimed. Quality is the continuing stimulus which causes us to diagnose and redirect our efforts to identify and eliminate deficiencies and drawbacks. Quality consciousness is related to the work environment. Precisely, it is aimed at improving standard of inputs 1. Therefore an accomplished worker may be a non performer in a given environment and a key worker in another. It also depends on how one feels and is connected to his or her work. If one is passionate and dedicated to his or her work, quality comes automatically. But a number of factors are responsible for one to feel as such about his or her work while working in an institution. Thus the key to quality performance is the feeling of oneness with the work.

Keywords : Quality Management, Education, Higher Education.

1. INTRODUCTION

Quality in context of management has been defined by Philip Cross by as "conformance to requirements" and in context of education by D. Green as "fitness for purpose". The requirements and purpose are generally stated in the missions and objectives of the institution. Quality is continuous and consistent high performance, and is almost synonymous to excellence.2As defined by the British Standard Institution (1991) "the totality of features and characteristics of a product or service that bears on its ability to satisfy the stated or implied needs". Green and Harvey (1993) defined quality according to five parameters, such as -

a) Being exceptional.

b) Consistent.

c) Fit for purpose (meeting standards)

d) Value for money.

e) Transformative (to accept qualitative change).

Academic institutions offering professional education or general higher education are in a state of transition, regarding quality and its management in the present scenario, due to the speed at which changes are taking place at various fronts. Quality is to be understood and implemented in multiple dimensions such as described by Garvin (1998). He classifies the definition of quality into five different groups-

i) Transcendent definition (personal and subjective, beyond measurement and logic).

ii) Product based definition (quality is measurable based on the objective of the product)

iii) User based definition (Customer satisfaction)

iv) Manufacture based definition (conformance to requirements and specifications)

v) Value based definition.

Quality therefore could be absolute, relative, a procedure, and a way of life. The implementation of the definition depends on the context of where, why and who.

2. QUALITY IN INSTITUTIONS OF HIGHER EDUCATION

Quality in Higher Education has become a key issue which has attracted a lot of attention in developing countries in the present scenario. These countries need skilled work force to thrive in the emerging knowledge based economy. In India higher education was first established by colonial powers and later was transformed into different areas according to demand. Universities are rooted in the culture of the country and are generally affected by their social, economical and political status. According to Ronald Barnett (1992) there are four predominant concepts of higher education -

1. Higher Education to produce qualified Human Resource.

2. Higher Education as training for a research career.

3. Higher Education as an efficient management for Teaching Profession.

4. Higher Education to extend and excel life chances[3].

The function of higher education is therefore to realize the above concepts and to do so it focuses on Teaching, Research and Extension. The Higher Education scenario in India according to the FICCI Higher Education Summit (2012) India has one of the largest education systems in the world, with 25.9 million students and 45000 diploma and degree institutions. The number of institutions has grown six times and the (GRE) Gross Enrollment Ratio has increased to nearly 18% in 2011-2012. The endeavor is to increase the GRE to nearly 26% by 2020 for which India will need to refocus on its higher educational policies and their implementation. As Dr. Kalam has proposed for the Dream 2020 the universities need to plan for -

- To prepare citizens with global outlook , to be capable of serving in any part of the world.
- Science and Technology to be interrelated and work for the betterment of humans.
- Institutions to be connected through virtual classrooms to bring quality in teaching as well as cost effectiveness.
- To develop a mindset of conserving and sharing in light of growing population and dwindling resources.

3. TRANSCENDENTAL APPROACH

Those who hold transcendental view would say, "I can't define it, but I know when I see it." quality is synonymous with "innate excellence."4 It is both absolute and universally recognizable, a mark of uncompromising standards and high achievement. Nevertheless, proponents of this view claim that quality cannot be defined precisely; rather, it is a simple, un-analyzable property that we learn to recognize only through experience. The stakeholders have different approaches, such as to a student- if he or she is passionate towards the course of his choice then there is quality, he is able to understand, assess and grow. He/she finds everything associated to the course and the institution useful. However for a parent or guardian quality would be when the institution caters to not only academics but also focuses on personality development and character formation. The stakeholders would be also looking for development of skills and employability. The teachers look for quality but in terms of academic accomplishments and how their students are placed in life. The Alumni is an integral part of the institution because the teaching faculty is judged by how their students fare. The management on the other hand has other issues like how the higher education institution responds to competition by other institutions, the intake of students, Financial viability, Assessment and Evaluation etc.

4. THE PRODUCT-BASED APPROACH

Product-based definitions are quite different; they view quality as a precise and measurable variable. According to this view, differences in quality reflect differences in the quantity of some ingredient or attribute possessed by a product.5This approach lends a vertical or hierarchical dimension to quality, for goods can be ranked according to the amount of the desired attribute that they possess. However, an unambiguous ranking is possible only if the attributes in question are considered preferable by virtually all buyers.6Quality differences can, be treated as differences in quantity. There are two obvious corollaries to this approach. First, higher quality can only be obtained at higher cost. Because quality reflects the quantity of attributes that a product contains, and because attributes are considered to be costly to produce, higher-quality goods will be more expensive. Second, quality is viewed as an inherent characteristic of goods, rather than as something ascribed to them. Because quality reflects the presence or absence of measurable product attributes, it can be assessed objectively, and is based on more than preferences alone.7The stakeholder satisfaction is of prime importance. Students want quality service and facilities which can make them as responsible and employable graduates. Academic staff wants better teaching and working environment with appreciation of work quality and benefit. Employers want quality graduates with knowledge, skills and attributes who can contribute to their organizational success. Government wants smooth functioning of the universities with the facilities provided by them. Eight dimensions can be identified as a framework for thinking about the basic elements of product quality they are-Performance, Features, Reliability, Conformance, Durability, Serviceability, Aesthetics and Perceived Quality. In the higher education institutions the eight dimensions can be related in terms of the stakeholders, the student, the parents, the teachers, the management and the alumni. In terms of performance quality combines elements of both the product and user-based approaches. Performance for a student may mean in academics or cultural activities or extension activities. But for a parent it may be an overall development. For a teacher it may be only academics. Product performance, involve objective and measurable attributes; their translation into quality differences is equally affected by individual preferences. The distinction between the two is primarily one of centrality or degree of importance to the user. The introduction of new teaching and learning methodologies, changing course content and delivery methods will bring quality in the system. Continuous improvement and evaluation among the stakeholders should be an ongoing process. Synergistic relationship between Faculty and Students, Faculty and Industry, Student and Industry will ensure strategic quality in Institutions of Higher education.

5. THE USER-BASED APPROACH

In keeping with the socio-economic and cultural transformation that has placed newer demands on the educational system, in terms of greater responsibility and accountability and increased expectations by stakeholders, the system has been pressurized to shift its focus from one in

quantitative expansion to one with emphasis on quality. Such shifts and changes are being witnessed everywhere. Quality of service and customer satisfaction is a key area of concern in business.8Educational administrators are increasingly recognizing what businesses have long understood: customer satisfaction matters. When considering education, quality of educational service and stakeholder satisfaction is very important. The education system, and more so the higher education system in particular, in an attempt to react to the demands and ever increasing pressures from its stakeholders, finds itself in a market-oriented environment, with internal and external customers; wherein, " customer satisfaction", is the rule for survival in the long run and is the core message of Total Quality Management and, hence, there is a need to identify and apply the relevant concepts of TQM to each and every aspect of academic life; that is, to the teaching, learning and administrative activities.

With the economic stranglehold many universities and colleges are experiencing, Institutions of Higher Education now see that both students happiness on campus and later success in the workplace are critical to the economic future of their educational institutions. Satisfied students and working graduates lead to, among other things, individuals who feel good about themselves and their alma mater; can service their enormous student debt; generate interest in their academic home among prospective students; and become donors. Well-educated but dissatisfied students stay and graduate, but they do not feel institutional allegiance.

While colleges and universities generally do not refer to their students as "customers", there is recognition among most institutions that they must do more than educate students in the classroom. The institutions need to focus on the whole student experience. A quality academic experience, no matter how thoughtfully conceived, is not enough. In an academic institution the process should start by identifying stakeholder needs, and then formulate strategies, using the existing capabilities and processes and finally deliver better value with the support of all stakeholders in the system.

- How do our stakeholders see us ? - The Customer Perspective
- What must we excel at? - Internal Perspective
- Can we continue to improve and create value? - Innovation and Learning Perspective
- How do we look to our shareholders? - The Financial Perspective.

When designing strategies and frameworks the following few inter-related questions need to be answered.

- Who are the key stakeholders and their wants and needs? Stakeholder Satisfaction
- What strategies do we need to deliver value to stakeholders? Strategies
- What processes do we require to deliver these strategies? Processes
- What capabilities do we need to operate and enhance these processes? Capabilities
- What contribution do we require from our stakeholders if we are to maintain and develop these capabilities? Stakeholder Contribution

Hence the five facts of performance means Stakeholders Satisfaction, Strategies, Processes, Capabilities and Stakeholders Contribution.9

6. MANUFACTURING BASED APPROACH

Teaching is generally seen as a high-priority contractual obligation to the students who are partners in the co-creation of knowledge. In higher education it is debatable whether quality evaluations assess fitness for purpose against institutional specifications. Quality Management process involves the acquisition, retention and development of human resources and its basic dimensions are: (i) recruitment/selection, (ii) performance appraisal and (iii) training.10 In conformity with this the guiding principles of education are:

- Teaching and learning are fundamental core missions of universities and colleges;
- That active student involvement is essential in curricular design, governance, development, review procedures and quality assurance;
- The preference of research over teaching in defining academic merit needs rebalancing;
- Academic staff are employed not just to teach, but to teach well, to a high professional standard;
- It is a key responsibility of institutions to ensure their academic staff are well trained and qualified as professional teachers and not just qualified in a particular academic subject;
- This responsibility extends to ensuring access to credible training courses in their career and providing opportunities for continuous professional career development;
- It is a key responsibility of academic staff to ensure they are proficient and remain up-to-date in the very best pedagogical practices and all that excellence in teaching requires.

Achieving these goals requires strong governance in

universities and colleges. Ensuring the deliverance of high quality education also has a financial cost. The limited financial resources available, makes it even more essential to focus investment in areas which reap most returns. Public and private funders have an obligation to promote quality in teaching with the same commitment that they invest in research. Both are vital to economic and social well-being.

Teaching and learning in higher education is a shared process, with responsibilities on both students and teachers to contribute to their success. Within this shared process, higher education must engage students in questioning their preconceived ideas so that they can reach a higher level of understanding. Good teaching helps students to question their preconceptions, and motivates them to learn, by putting them in a situation in which their existing model does not work, which matters to them and in which they come to see themselves as authors of answers, as agents of responsibility for change. That means that students need to be faced with problems which they think are important. They need to engage with new questions which are bigger than the course itself, which have relevance to their own lives and which provoke a lively participation far beyond simply getting through assessment or exams.

Quality teaching and learning has broad horizons, taking place in a research-rich environment, where the subject matter is driven by the latest knowledge and research, delivered in a way which encourages students to develop academic literacy and both subject specific and generic skills which they can apply immediately in the real world, especially in the labour market. The best teaching encourages students to be aware of and to draw on the research not only of the teacher, but also of fellow academicians within and beyond the university or college, including internationally. In this era of increasingly rapid globalization, the teaching and learning experience for all students must be globally connected, enabling students to develop an understanding of how their subject is viewed and pursued in different parts of the world.

Education institutions belong to nonprofit organizations, and are oriented towards society not market. Their results are social, immeasurable and qualitative which means that the theory of nonprofit management is applicable to institutions of higher education. People are the most significant source of competitive advantage in nonprofit institutions and hence their management is an important part of organizational strategies because the way institutions treat people has been found to significantly affect organizational performance. The strategy therefore means, a people centered approach which emphasizes the need to develop to their fullest potential all present and future Stakeholders. People management, performance measurement and funding as well as social responsibility are some of the major problems common to all nonprofit institutions. The institutions in the area of education are in particular need of good leadership, capable employees, good quality staff programs and work performance monitoring.

Globalization, demographic changes, IT revolution and Knowledge economy are drivers of contemporary changes determining the new knowledge society while simultaneously searching for new skills and knowledge .The institutions that recognize knowledge workers as the most valuable resource and an important competitive advantage in the knowledge economy have a chance to survive. Knowledge workers use and create new knowledge, and with their skills, abilities and ideas they make significant contribution to success and development of a company. The final results are learning outcomes-new values, customer satisfaction and rich and balanced society.[11] Learning organizations emphasize the importance of human capital as a part of the intellectual capital referring to skills, knowledge, abilities, organization commitment and potentials for innovation, in other word, its creativity. Learning is the key if higher education institutions are to survive, compete and manage their surroundings. 12 Institutions of Higher Education needs to fulfill the three key dimensions : (i) Teaching and Education, (ii) Research and Innovation, and (iii) Knowledge transfer and community service. Universities and Colleges everywhere are being forced to carefully reconsider their role in the society and to evaluate the relationships with their various constitutions, stakeholders and communities.

7. VALUE BASED APPROACH

Developing lifelong learners is central to the mission of higher education institutions. By ensuring that individuals have the intellectual abilities of reasoning and critical thinking, and by helping them construct a framework for learning how to learn, colleges and universities provide the foundation for continued growth throughout their careers, as well as in their roles as informed citizens and members of communities. Value is an orientation towards a whole class of goals that are considered important in one's life. Education aims at the all-round development i.e. the development of proper attitudes, emotions and character in the learners. It covers all aspects of personality- physical, intellectual, emotional, social, economical, political, cultural, moral and spiritual. True education ultimately involves the spiritual growth from individuality to personality through the process of clarification and assimilation of human values.

The broad objective of education is to create a sizeable population of such educated men and women who could understand the world well enough and are able to bring about a change leading to adequate health and education services, a better environment, and elimination of ignorance and deprivation (limitations), which continue to strangulate the developing societies.13 Colleges aim to produce a wide range of benefits. First, and perhaps foremost, is the goal of increasing general and specific knowledge, which increases students' economic productivity. Second, knowledge may be valued in and of itself. This "consumption value" of

knowledge certainly varies across students and, along with a host of other reasons, partially explains why students choose to select non-lucrative fields. Third, higher education is generally believed to produce positive externalities. The most widely cited positive externality stems from productive workers creating economic gains greater than their own personal compensation. Another positive externality is social in nature, wherein informed, knowledgeable citizens can improve the functioning of civic society.

In the words of Prof. D. S. Kothari "Science and Technology are exploding but wisdom is imploding. It is shrinking. Knowledge is expanding and human personality is shrinking. Because of the explosion of knowledge and implosion of wisdom, we find various kinds of grave aberrations, imbalance and calamities." It is here that we are compelled to rethink about our existing educational system. We are proud of our good literacy rate but what about our social, cultural and moral life ? We can see that the main protagonists of communalism, adulteration, loot, theft, killing, child abuse, exploitation, corruption and all other anti-social activities are so-called educated people.

According to Swami Vivekananda "Education for values should be education for man-making and character building". Man-making education means the development of one's personality with the consciousness that one must be a responsible and purposeful member of his community. Tagore, Mahatma Gandhi, Sri Aurobindo, Dr. S. Radhakrishnan and all other thinkers and educationists laid special emphasis upon the development of spiritual aspects and values through education. Each and every person of the society should be conscious about accountability to oneself, family, neighbors, community, society, and more over to God. A close analysis of education reveals that good education is inseparable from value oriented education which should promote a spirit of service, social sensitiveness, cooperation, sacrifice and high moral character.

India is going through tremendous transformations. Growth in access to education has been remarkable during the 11th Five Year Plan period. Ambitious growth targets have been set for the 12th Plan by the government. As the youth of this country aspire for a better life, as millions of them enter higher education institutions as first generation learners, they get exposed to a new world of ideas. In addition to learning about the subjects they have chosen to study, higher education must inculcate in them a sense of social responsibility. Young students who enter universities and colleges are energetic, curious and interested to make some contributions. Proper guidance and support by the institutions at this juncture can reinforce their ethical and social responsibilities. While many individuals in such institutions have undertaken innovative efforts, there has not been an adequate institutional mechanism for promoting the same. The products of such educational institutions should not only improve their livelihoods and advance their professional opportunities, but also become and act like good citizens of the country.

The value-added approach evaluates outcomes in terms of changes obtained through various educational processes e.g., teaching and learning processes. A variant of the latter is the quality as transformation approach, which is strongly student centered. It considers quality as a transformational process within which the better a higher education institution is, the better it achieves the goal of empowering students with specific skills, knowledge, and attitudes that enable them to live and work in a knowledge society. It is in this context 'fostering social responsibility in higher education' needs to be placed as an important pillar of the future directions. By improving engagements with the community, institutions of higher education can reinforce the values of social responsibility amongst the youth. Partnerships with communities and civil society need to be encouraged to realize this potential.

8. CONCLUSION

The economic, social, cultural, technological changes contribute to knowledge society. The present rate of economic growth can be substantially increased if India becomes a super power in the knowledge sector. Two principles characterize most attempts to define quality in education: the first identifies learners' cognitive development as the major explicit objective of all education systems. Accordingly, the success with which systems achieve this is one indicator of their quality. The second emphasizes education's role in promoting values and attitudes of responsible citizenship and in nurturing creative and emotional development.[14]

A conceptual model which leads to student satisfaction and excellence in Higher Education Institutes can be prepared based on the following variables:

- Commitment of Administration and Management: Administration and management, through constant and strict supervision of all processes, should ensure that everybody is committed to achieving quality

- Content delivery: Expert knowledge must be matched with expert skill to transmit that knowledge - the zeal to acquire knowledge must be matched with zeal to transmit it.

- Campus Culture: Paramount attention to be shown in providing excellent infrastructure and physical facilities in the campus for student learning, co-curricular and extracurricular activities.

- Civility: An emotive and positive attitude towards students will lead to congenial learning environment.

- Customer feedback and implementation: Constant feedback from the stakeholders leading to continuous

improvement in the process is the key to achieving excellence.

The higher Education system needs to be strengthened which will be capable of honing the system to attain all-round, multifaceted personality; to acquire leadership qualities, to sharpen communication and interpersonal skills, to acquire knowledge of the latest trends in technology, to have exposure to industrial climate and to gain confidence to face changes in the highly competitive and ever changing world.

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