

**EFFECT OF AGE AND GENDER ON ICT USAGE****Dr. Aruna A. Deoskar¹****ABSTRACT**

Information Communication Technology (ICT) is a boom word in today's competitive world. This is an explosion in Information Technology Sector. Earlier technology was limited with computer inventions and was mainly used by computer experts. Now the things are changed. With more and more inventions, now a day's ICT has become an utmost need of every common individual. ICT is a technological way of handling information and communicating the same in scientific manner. ICT has put up rising impact on all community. Still we are not able to increase the awareness and usage percentage of ICT in today's competitive era. This paper does a study of 150 mobile users to understand the usage of mobile as Information communication Technology Tool. Chi square test is done to prove the hypothesis regarding age and gender effect on ICT usage.

KEYWORDS**ICT, Mobile, Age, Gender, Knowledge Sharing, Learning Tool etc.****INTRODUCTION**

Information Communication Technology is a fast growing field in this global and competitive era. Information Technology according to Marshall, (1984), Madu (2000) is the coming together of computing and telecommunications for handling information. ICT is also defined as the term used to describe the tools and processes to access, retrieve, store, organize, manipulate, produce, present and exchange information by electronic and other automated means. These include hardware, software and telecommunications. (<http://www.unescobkk.org/index.php?id=1013>). ICT helps in increasing the literacy skills and rates at global level. Internet technologies have filled the geographic distance that separate global communities, and so helps in raising the technological development of human beings. Earlier computer was considered as the only mode of handling the information. However, things have changed now. People can play with information anytime and anywhere and so can communicate the information in mobile way. Invention of Mobile phones and then technological growth have helped every common user to be available any time anywhere. Business is not restricted now with fixed working 9.00 to 5.00 office hours. Mobile has brought mobility in every sector.

ICT has range of tools used to manipulate, store, retrieve, transmit or receive information in electronic way. Mobile communications, digital camera, video conferencing, image processing, Internet technology has changed user mindset and definition towards the information sharing media which was limited to Radios and televisions some 50 years ago. Following are various ICT tools used by user in education, medical sector, agricultural and other fields:

- Interactive whiteboard,
- Internet and Intranet,
- EBook's,
- Mobile phones,
- Mobile applications,
- LCD,
- Computers Overhead Projectors,
- Presentation Tools,
- Digital Camera,
- Television,
- Tablets,
- Digital Recorder.

It has already proven that ICT plays crucial role in increasing the effectiveness of teaching learning among today's youth. Practical skills, presentation skills, visualization understanding concepts graphically help in improving the retentive memory of students. Classes become more and more interactive with the use of ICT tools. Does it mean that ICT is more and more useful and applicable to young generations? Can there be any use of ICT for senior citizen or middle age users? ICT is useful and effective to other age group people as well but in different way and using different tool. Mobile phone as one of the ICT tool is very much popular among all age groups of people. ICT can be implemented using any tool and strategy. However, the best implementation

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strategy says that the technology which user uses the most and comfortable can be considered as the best ICT tool. *"ICT has contributed to global growth and democratization and is transforming governments and people's lives."* - Dr. Bitange Ndemo, Permanent Secretary in the Ministry of Information and Communications, Kenya.

"Now is the time to make use of all that we have built [ICT infrastructure] so this strategy comes at the right time. We now have to move to the other two pillars – Transform and Innovate. And delivering quality education comes on top of our list." - Parvez Iftikhar, former CEO of USF Co., Pakistan

Mobile phone has become a very important part of every individuals now days. People use mobile phones for various reasons. Can a mobile phone be considered as a learning tool? Yes, the researcher has observed that mobile phone users are using this tool for texting messages, play games, to chat with friends and colleagues, to get videos, to run internet applications and many more.

Table-1: ICT Tool and Learning Outcomes

S. No.	Mobile Phones (ICT Tool)	Learning Outcome
1	Texting messages	Learning languages
2	Gaming applications	to acquire language literacy in game-like environments
3	Video profile of projects	Project progress
4	Chatting	Communicating people
5	Internet connectivity	Connecting to world
6	Bluetooth	Documents/information on fingertip in e format
7	Music	Enjoyment, Relaxation, Stress relief

Sources: Authors Compilation

NEED OF STUDY

The purpose of this study is to understand the impact of Information communication and Technology on user. The researcher is trying to understand the effect of age and gender on ICT usability ratio with special focus on mobile phones as ICT tool. Mobile phone usage varies from user to user, its usability ranges from simple communication services to transaction, and business related services. Author is trying to analyze the age and gender effect on mobile phone usage as powerful ICT tool.

User in today's competitive world to make the tasks and activities quickly uses ICT and in way that is more productive. Education and learning through ICT has extended the classroom teaching beyond the closed room interaction towards the any corner of world. Globally people are connected to each other for sharing and communicating the information.

Basic objective of this study is:

- To understand the effect of age on mobile phone (as ICT tool) usage.
- To understand the gender impact on mobile phone (as ICT tool) usage.

Hypothesis

- Youngsters (of age group between 18 and 25) are using mobile phone for knowledge sharing and learning.
- Higher number of Male users is using mobile phones as learning tool compared to female users of same age group.

METHODOLOGY USED

Data is gathered through primary and secondary sources. Random sampling technique is used for collecting primary data from four age groups – below 18, between 19 and 30 years, 31 to 45 years, above 45 years. Respondent include good mix of male and female mobile users.

Data Collection and Analysis

Factor analysis is done on different questions to understand the major factors affecting the ICT usage irrespective of age and gender. This gives mobile phones as the highest tool used for information communication & Technology media followed by the laptop and computers. Chi square test is done for hypothesis testing. The structured questionnaire method and interview is used to collect the primary data. Targeted population was 150 of various age group people. Secondary data has gathered published articles and papers through internet source. The researcher has included all the users who are currently availing the mobile phone services. Basic targeted group was smart phone users. The research study group consists of both the genders i.e. male and female. Users were selected belonging to students, businessmen, unemployed persons, senior citizens. The researcher interviewed them

individually and the questionnaire on ICT usage was filled. Researcher has considered extraneous variables for understanding the ICT utilization. Such variables, may affect the dependent variable. Various extraneous variables, related to the mobile phone users, are considered during the study. These are:

- Age of Mobile user (Usage may differ with age).
- Profession of mobile user (User profession might forces to vary the mobile phone usage as ICT tool).
- Duration of using the mobile a day (Age and profession would affect the duration of usage).
- Gender of mobile user.
- Type of mobile internet service.
- Frequency of availing the value added service.

Targeted Population

Data has been gathered from Pune and Pimpri Chinchwad geographical location. A pilot survey was conducted on 150 mobile phone users belonging to various age groups. Classification of collected data covered four age groups: below 18 years of age, 19 to 30 years, 31 to 45 years, above 45 years. Primary data has been collected through questionnaire. Analysis is done through frequency, percentage and mean calculations using SPSS software.

RESULT ANALYSIS AND FINDINGS

Gathered data is coded and is then analyzed to get the research findings. Study involves 150 respondents who are using mobile cell phones for knowledge sharing and as information communication tool. Out of 150 respondents, 68 are female and 82 are male users. Survey includes 45% female respondents and 55% male respondents. Classification is shown in table-2.

Table-2: Classification of Mobile Phone Users According to Gender

Gender	Frequency	Percent
Female	68	45.33
Male	82	54.67
Total	150	100.0

Sources: Authors Compilation

This table and chart shows that the author has gathered the sample from both the groups. Age wise distribution shows that 60.67% respondents are of age between 18 and 45 years. 22.67% respondents are of age group below 18 years and 16% respondents belong to senior group of age 45 and above. Table 3 given below shows the cross tabulation of mobile phone users according to age and gender.

Table-3: Classification of Mobile users According to Age

Age	Frequency	Percent
< 18	35	23.33
19 - 30	53	35.33
31 - 45	38	25.33
> 45	24	16
Total	150	100

Sources: Authors Compilation

Table-4: Age Gender Cross-tabulation

Gender	Age				Total
	< 18	19 - 30	31 - 45	> 45	
Female	14	25	21	8	68
Male	21	28	17	16	82
Total	35	53	38	24	150

Sources: Authors Compilation

The gender age cross tabulation shows that the researcher has collected the user from community belonging to all age groups. In both male and female category, the number of mobile phone users as ICT tool is more in numbers in age group of 19 to 30 followed by 31 and above. Personal characteristics of respondents.

Table-5: Frequency Distribution of Respondents

S. No.	Variables	Female Users	Male Users
1	Marital Status	N= 68	N= 82
	Single	31 (45.59%)	43 (52.44%)
	Married	37 (54.41%)	39 (47.56%)
2	Work Profession		
	Student	27 (39.71%)	40 (48.78%)
	Unemployed	15 (22.06%)	3 (3.66%)
	Employed	26 (38.24%)	39 (47.56%)
3	% Use of mobile (as an ICT tool)		
	Texting messages	58 (85.29%)	77 (93.90%)
	Gaming applications	32 (47.06%)	38 (46.34%)
	Video profile of projects	8 (11.76%)	21 (25.61%)
	Chatting	68 (100%)	80 (97.56%)
	Internet connectivity	48 (70.59%)	58 (70.73%)
	Music	32 (47.06%)	51 (62.20%)
	General Downloading	29 (42.64%)	65 (79.27%)
	Knowledge (information) downloading	22 (32.35%)	35 (42.68%)
4	Awareness of Mobile as an ICT tool		
	Yes	12 (17.65%)	33 (40.25%)
	Not Aware	56 (82.35%)	49 (59.75%)
5	Do you require any training for using mobile as an ICT tool		
	Yes	25 (36.76%)	28 (34.15%)
	Not Required	43 (63.24%)	54 (65.85%)

Sources: Authors Compilation

Table-5 shows that 54.41% of female users are married while 47.56% of male users are married. In all 67 (44.67%) respondents are from student community. It is observed that male unmarried users are using mobile phones more frequently compared to female unmarried users. Further student community is more involved with information or general downloading from mobile phones.

OBSERVATIONS

Researcher has made following observation based on the survey and analysis:

- Every age group uses mobile phones for different purpose.
- Most of the mobile users are knowing that how to use it for different purposes irrespective of age and gender. However, almost negligible number of mobile users is considering mobile phone as an ICT tool.
- Mobile phones can be a part of very effective tool for knowledge dissemination but need is to spread the awareness among every one that mobile phones can be a tool for knowledge dissemination and information generation.
- No one requires any training for knowing how to use mobile phones. However, 35% user feels that training should be provided for using mobile phones as an Information Communication Technology Tool.

CONCLUSION

Now a day's ICT has become an important part in teaching learning process. ICT plays very crucial role in qualitative knowledge dissemination process. Information is available to students on fingertip. With continuous inventions in mobile technology and its increasing has already proven that mobile phones are now an integral part of every individual irrespective of age and gender. Through this paper, the author had analyzed that how age and gender can put effect on mobile phone usage as an Information Communication Technology tool. Male users are using mobile phone as an ICT tool more frequently for learning and knowledge sharing mechanism compared to female users. Text message passing and chatting is more common among female users.

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AN ANALYSIS OF INEXORABLE STRATEGIC CAPABILITY FACTORS SPEARHEADED BY INDIAN OUTSOURCING VENDORS

Dr. R. Vijaya Baskaran²

ABSTRACT

The US \$28 billion Indian business process management sector is into abrupt changing paradigms from cost arbitrage to talent transformation era. At present all India based outsourcing giants are putting up centers of excellence to showcase their top of the line offerings ranging from automation, analytics and cloud offerings to lure marquee clients in a typical way. In trying to build a world class talent pool to put their best practices on the roadshow to reign the global outsourcing market rebranding and repositioning exercises to make India an innovation hub comprising of innovators, academia, buyers on the way. Ever increasing speed of digital tech spends it is right time for Indian majors to deploy phenomenally larger teams and an integrated strategy to build the digital enclave consisting of cloud, automation, analytics, machine learning, 3D printing and platforms in an agile manner to anoint as the outsourcing leader of the digital economy. This paper assesses the ongoing transformational build to make this happen in a swifter traction.

KEYWORDS

Automation, Cloud, Marquee Client, Platform, Mobility, End-to-End Solutions etc.

INTRODUCTION

India has a vibrant national innovation system in place supported by a fairly liberal trade and investment policy regime and needless to observe that India's outsourcing industry has shifted in revenue composition to a more sophisticated and higher end value based service offerings like market and business risk analysis, business research and intelligence clinical trial research, medical image processing and diagnostics, and editorial selection and e-publishing, to name a few (Chanda, 2008).

BPO is primarily rested on the transaction cost theory notion which tells that transaction and production costs are very much associated with a service ultimately determines the outsourcing decision (Williamson, 1975) which has been largely accepted and equally supported by many scholars (Shelanski and Klein, 1995; Clark et al., 1995; Khan et al., 2010). Further Lacity and Willcocks (1998); and Poppo and Zenger (2002) of the opinion that to dutifully avoid opportunism, a detailed and a formal contract between clients and vendors (sellers) is also promulgated by transaction cost theory.

LITERATURE REVIEW

Dynamic capabilities view basically refer to capabilities by which managers integrate, build, and reconfigure internal and external competencies of the firm in addressing the rapidly changing environments (Teece et al., 1997). Kogut and Zander (1992) referred this as combinative capabilities by which they meant as the ability to acquire and synthesize knowledge resources and build new applications from those resources, especially in an ever-changing dynamic environment.

Once again this focus of the dynamic capabilities perspectives on attempting to address the rapid changes in turn captures the environment in which firms consider are invariably subjected to intense pressure from its competitors and the external environment making them to find out ways and means to show how and where to deploy and redeploy these assets across the geographic space which Farrell and Levy acknowledge as this process sits at the core of the motivations for outsourcing (Farrell, 2005; Levy, 2005).

Recent trends in outsourcing have shown Global companies began to outsource near-core activities, which are activities that were earlier marked as core activities. Especially in the last decade, outsourcing has evolved expediting manner and resulted in a probable way as the practice continues to result in new forms and models of outsourcing pertaining to core and non-core moving much more into critical and non-critical activities in the near future. But in reality the mission critical core activities of the organisation will still typically be follow to be conducted close to the heart of the company where the headquarters can inadvertently exercise full control (Harland et al., 2005). As per the views of Carmel & Tjia (2005), IT is always the common denominator regarding every offshored service which are inherently much dependent on IT. Maybe because of this proper reason the name IT-enabled services is used as a most generic term for address the entire spectrum of offshore services.

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RESEARCH DESIGN

In this perspective, this research paper sharply views the trendsetting paradigms of that changing business landscape keeping our skill and knowledge domain creating a distinctive edge over global players in continuously lobbying and convincingly portraying our innovative competencies and dynamic capabilities by the top leaders in the Indian BPO industry. Barring few difficulties for during the period 2009-10 to 2014-15, change in the rankings based on turnover of the firm as listed by NASSCOM India the top 15 players in this segment is taken for analysis. More than 500 firms operate in the business process outsourcing space with top 44 accounting for 54% of the total revenue.

AUTOMATION AND PLATFORM BPO

In the BPO market maturing stages after 2012 the focus got shifted prosaically towards complex process outsourcing engagements from mere transaction process outsourcing, BPO vendors started deploying reasonably opt customer centric, creative and re-use based approaches to deliver value intensive client services.

Evidentially few BPOs have taken steps by creating their own custom applications to suit a distinct client's process needs. Ironically this custom development using traditional software development practices, consumes anywhere from 20-33% of the total deal value and unduly lengthens the ROI time for clients. Other BPOs have acquired software companies to use their platforms to achieve the goal, but the rigidity combined inflexibility make change to those applications makes them not a better choice.

Here comes the Business Process Management (BPM) software offering a unique approach to easily create and re-use custom process applications for the client's process needs that dramatically improve processes rollout time, reduce operating costs and enhance client service either in the existing automated platform the client uses or fully creating a newer agile platform.

TCS has 'Ignio' infrastructure services automation, for retail company optimum inventory management it is 'Optumera' besides developing products around Hyper-ledger Block chain platform the crypto currency BitCoins' technical backbone already attracting more global clients.

For instance Polaris developed Intellect Design arena has 28 products globally accepted on it BFSI vertical expanding fiercely worldwide through this automation route .Emerging verticals like retail, healthcare there exists enormous scope of automated products fulfilling the client expectations and thanks to excellent knowledge pool India is able to sustain in course of these global challenges.

Figure-1: BPO and BPM on Automation



Sources: Nasscom Survey 2014

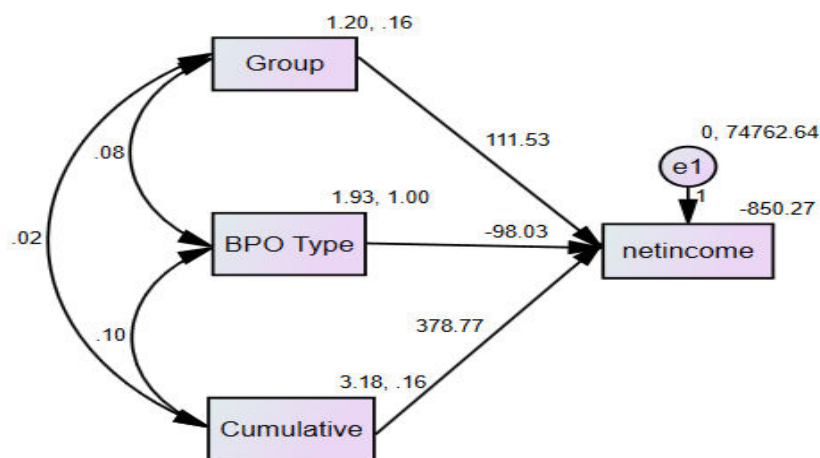
DATA ANALYSIS AND INTERPRETATION

SEM Analysis

SEM was conducted by using AMOS 21.0 to assess fitness of the path model based on the proposed hypothesis. SEM is a combination of factor analysis and path analysis, and allows a more 'causal' explanation of findings (Byrne 2001). There are several criterion set by the SEM researchers to assess and identify the fitness of a model. Hu and Bentler (1999) suggest provocatively that for a model to have a good fit, the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) should be greater than 0.95, and the Root Mean Square Error of Approximation (RMSEA) should be less than 0.06. The RMSEA examines the probability of close model fit and is considered a more appropriate test, as it has been shown to be less affected by sample size (Byrne 2001; Floyd and Widaman 1995). The lower the discrepancy measured by the RMSEA the better, with RMSEA = 0.0 indicating a perfect fit.

In addition, The CFI, a revised version of the Bentler–Bonett (Bentler and Bonnett 1980) Normed Fit Index that adjusts for degrees of freedom (d.f.), ranges in value from 0 to 1.00. Acceptable values are CFI > 0.90, and a value of about > 0.08 for the RMSEA indicates a reasonable error of approximation (Arbuckle 2007). Arbuckle (2007) asserted that all the measures of the Normed Fit Index (NFI), Relative Fit Index (RFI), Incremental Fit Index (IFI), the Tucker-Lewis Coefficient also known as the Bentler-Bonett Non-Normed Fit Index (NNFI) tend to range between 0 and 1, with values close to 1 indicating a good fit. Kline (2004) and Byrne (2001) also suggested that a good fitting model generally has a chi-square / d.f. ratio of less than 3.0 as a measure of minimum sample discrepancy.

Figure-2: SEM analysis-I



Sources: Authors Compilation

In this study, the model fit was assessed using the following reported fit indices: chi-square, chi-square /df ratio, the Root Mean Square Error of Approximation (RMSEA), the Normed Fit Index (NFI), Relative Fit Index (RFI), Incremental Fit Index (IFI), the Tucker-Lewis Coefficient or the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI).

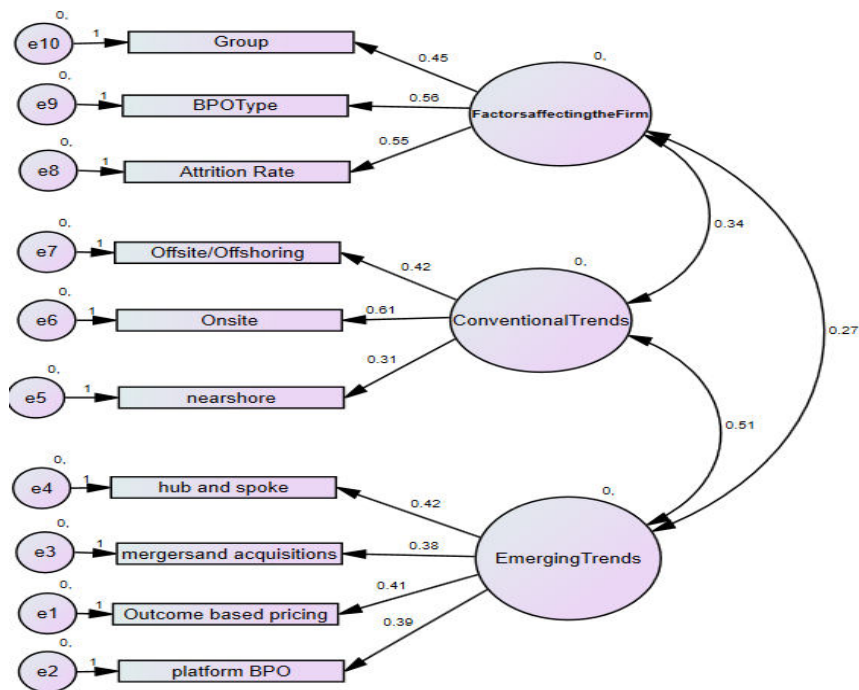
Results obtained from the structural equation modeling are presented in Table 1. The overall fit indices suggested a good fit of the model to the data: CFI = 0.998, RMSEA = 0.000, chi-square = 0.846, df = 1, chi-square /df = 0.848, TLI/NNFI = 0.975, NFI = 0.998, RFI = 0.981, and IFI = 1.000. As suggested by the literature, CFI and NFI were close to perfect fit. Similarly, RMSEA was 0.000, which falls well below the cut-off points recommended by Hu and Bentler (1999), indicating acceptable model fit. In addition, the chi-square /df ratio was below the cutoff point established by Kline (2004) and Byrne (2001).

Table-1: Model fit Indices SEM analysis-I

Chi square	df	Chi square/df	RMSEA	NFI	RFI	IFI	TLI/NNFI	CFI
0.846	1	0.846	0.000	0.998	0.981	1.000	0.975	0.998

Sources: Authors Compilation

Figure-3: SEM analysis -II



Sources: Authors Compilation

The overall fit indices suggested a good fit of the model to the data given in Table 2: CFI = 0.928, RMSEA = 0.042, chi-square / d.f. = 2.894, TLI/NNFI = 0.875, NFI = 0.954, RFI = 0.912, and IFI = 0.903. As suggested by the literature, CFI and NFI were close to perfect fit. Similarly, RMSEA was 0.042, which falls well below the cut-off points recommended by Hu and Bentler (1999), indicating acceptable model fit. In addition, the chi-square / d.f. ratio was below the cut-off point established by Kline (2004) and Byrne (2001).

Table-2: Model Fit Indices SEM analysis –II

Chi square	df	Chi square/df	RMSEA	NFI	RFI	IFI	TLI / NNFI	CFI
124.43	43	2.894	0.042	0.954	0.912	0.903	0.875	0.928

Sources: Authors Compilation

Table-3: BPO employee Perception Factors

ANOVA						
	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Better remuneration	1.778	3	.691	41	2.573	.107
Challenging job	2.278	3	.191	41	11.931	.001**
Lack of Quality Training	.456	3	.324	41	1.405	.293
No Reskilling /Retooling	2.189	3	.288	41	7.604	.005**
Shift timings	2.443	3	.878	41	3.784	.041**
Peer pressure	.856	3	.215	41	3.977	.038**
Higher Education	1.522	3	.652	41	2.336	.130
Benching	1.256	3	.470	41	4.673	.029**

Sources: Authors Compilation

Anova results given in Table 3 shows the factors like Challenging job, Absence of reskilling or retooling, shift timings and peer pressure are statistically significant.



CONCLUSIONS

Companies have long been largely benefited due to scalability and cost arbitrage they received from business processes outsourced that offloads non-core tasks to a qualified service provider with proven capabilities to India. Until recently most of the global enterprises outsourced work horizontally based on specific management function like, finance, HR, logistics etc. Undoubtedly, the final message was a call center was a call center; data entry was mere data entry. Hence, the BPO value proposition centered always around cost/labor arbitrage, centralization, quality and economies of scale.

Today progressive service providers are now investing time, training and resources into the next big industry trend known as Vertical BPO aptly making companies to rechristening themselves as BPM sector. Although most companies outsourced for cost savings, they have now recognized the value of quality delivery and scalability that their partners bring. Incidentally there is a huge opportunity to help these same clients with more complex, industry-specific work that goes beyond the traditional front/back office engagement driven, making Indian vendors to proactively position themselves for the next layer of business process outsourcing one that definitely requires deep domain expertise and industry-specific technology say automation and platform BPO branded as core of BPM. The opportunities are endless if the service provider is willing to make the right investment in these radical specializations.

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DEVELOPMENT OF A SIMULATION MODEL FOR WIRELESS SENSOR NETWORKS FOR LARGE AREAS WITH HIERARCHICAL AND DEMAND DRIVEN OPERATIONAL PROBLEMS

Dr. Kamlendu Kumar Pandey³

ABSTRACT

Several systems are operated on the demand raised by the driving parameters on which the system operates. Modern day sensors can accurately sense the operational parameters. The deployments of sensors in the large geographical area possess challenges of transmitting the raw or synthesized data to sink. The problem addressed here possesses large areas where data on the sink is accumulated from a hierarchy of sub-domains of the system. To simulate this problem a simulation model was prepared which addresses the issues of sensing, transmission, routing, aggregation, link layer issues and processing at the sink. A WSN cluster-based approach is used for the simulation. The class hierarchy is developed in C++ and tested with TCL scripts of ns2. It deals with sensed soil moisture data, its routing, aggregation, Processing and relay to the sink. Both On Demand and Event based approaches are taken in consideration.

KEYWORDS

Wireless Sensor Networks, Simulation Model, Ns2 etc.

INTRODUCTION

Wireless sensor networks formed with the ZIGBEE motes have found their use in many practical problems and helped them to automate the operations of the system concerned. This paper is in reference to the problems, which covers a large geographical area where the placements of sensors are limited by its transmission range and the life by its battery life. Sensors lie at the terminal end of the system for sensing the data.

The problem addressed in the paper is for the domain systems which cover a large area and get the critical operational data through hierarchical channels using cumulative or average based operations. In this context, the sensor nodes not only sense the data but also synthesize it with an optimum sensing interval. This sensing interval depends on the slope variation of the data sensed and the entropy of overall system. Similarly the disseminating interval is also to be decided which is based on the demand query or the extra-ordinary condition which occur in problem domain

In the application framework a complete class hierarchy is developed for node, applications on node, routing protocol, aggregation, processing and Data Generation and dissemination. They also address lower level link and Mac layer issues. The complete application is written using ns2 classes and simulation is written in TCL scripts. Sample runs and results are also done with analysis of some popular protocols suitable for this problem.

RELATED WORK

Bartosz Muszniki et al [1] has discussed various simulation environments and commented on the criteria of their selections. The problem in consideration required a cluster-based approach of WSN. B. Manimekala and M. Kayalvizhi [2] used ns2 simulator to test their problem of WSN using AODV routing protocols. Young-guk Ha et al [3] have also used ns2 to simulate the problem regarding fire tracking. A new PHONEM packet structure is also proposed to deal with clustered base approach, however it is not problem specific but very generic way to deal with cluster based routing. Balendonck, J et al [5] have used WSN in the deficit agriculture but it was a practical approach rather than a simulation. The problem of moisture deficit monitoring and control in irrigated agriculture problem is quite specific application area for which above simulator set up cannot be used as it is. The problem demands rewriting of the simulation classes, strategies, and deal with routing and aggregation in a new way. The study of various routing and aggregation schemes [10, 11, 12, and 13] revealed that TEEN and APTEEN [13] are nearest ones, which can be modified for our purpose. The Mannasim framework, which deals with clustered network and simulates LEECH routing protocol formed the base for the simulation for the current problem.

The paper describes complete design and development of a simulation application framework for WSN based moisture deficit monitoring and control in irrigated agriculture. The paper is organized in following sections:

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TERMS AND THEIR DEFINITIONS

The terms used in the paper are as follows:

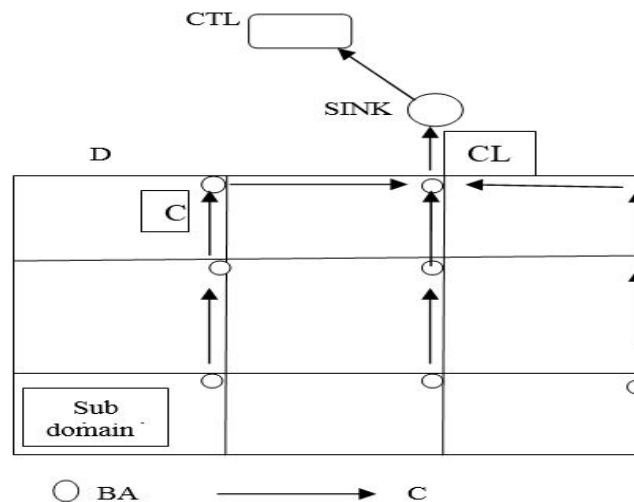
- *Domain (D)*: This represents the primary activity of the system.
- *Area (A)*: It represents the geographical area in which the domain activity occurs.
- *Operational System (S)*: This represents the area, the data to be sensed and the operation mechanic data to run the system based on the sensed data.
- *Channels (C)*: The data-gathering unit (the primary point where any sensed data is accumulated)
- *Node (N)*: The sensing Node. This represents the sensor and mote unit placed in the domain area.
- *Collectors (CL)*: They are the special nodes, which are used to collect data from sensor Nodes. These nodes have the task of performing mathematical or vector based operation on the sensed data and disseminate the data of interest in the network domain.
- *Branch Accumulators (BA)*: They collect the data in the sub-domain and pass it to the upper hierarchy to be synthesized
- *Sensor Network (SN)*: This is the wireless network of all the sensor nodes and collector nodes present in the Operational System.
- *Sink (SINK)*: This is where all the data of sensor network will be accumulated and received. This can be connected to a high power computer system, which can further analyze the received data to generate the control signal for the operational event to occur.
- *Controller (CTL)*: This is an electro-mechanical device, which responds to the signals sent by Sink in order to operate the system. The controller combined with the actuator can operate the system in the manner it is expected.

SIMULATION SCENARIOS FOR SYSTEM

The real examples for system for which the simulation model is developed are systems like:

- Power supply monitoring and real-time fault detection.
- Irrigation water supply from main canals to branches and the field channels.
- Production Pipeline with several sub units of production.
- Water supply model of City to find real time consumption and thereby working out the Demand.

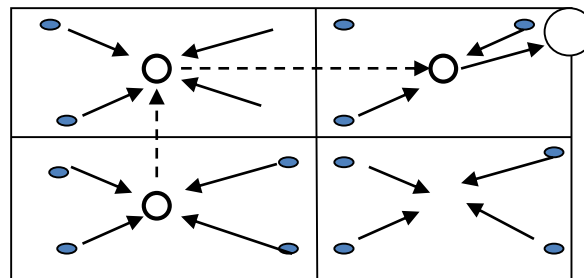
Figure-1: A schematic Representation of the Simulation Problem



Sources: Authors Compilation

The sub domain is further elaborated in Figure-2

Figure-2: The Data Transfer in Sub Domain



Sources: Authors Compilation

The nodes (N) in figure-2 are the ZIGBEE Sensor motes which when interfaced by the appropriate sensor will sense the data. The data sensed at the nodes will be delivered to collector node or the cluster head. The cluster heads can intern transfer the data to branch accumulator. The branch accumulators collect their respective data to sink. The sink can consist of high power computers with databases and tools to analyze the data. The data so analyzed is converted to the signals as understood by the controller or actuator which will initiate the further mechanData of the operational system This simulation tries to understand and create a complete application framework where different strategies and scenarios like sensor layout, packet routing, data aggregation and energy dissipation can be tested so as to optimize the real implementation.

DESIGN & DEVELOPMENT OF SIMULATION APPLICATION FRAMEWORK

The simulation framework was needed to simulate following functionalities of implementation:

- Sensor Node,
- Cluster Head Formation – Dynamic as well as Static,
- Data Acquisition and Dissemination,
- Link and MAC Layer Representation,
- Data Packet Formation,
- Data Packet Routing,
- Data Aggregation,
- On Demand Data Acquisition,
- Event and Threshold Based Soil Moisture Data Acquisition,
- Energy Measurements,
- Generating Trace File Structures for all events in WSN.

a) Class Structure in Application

The existing class structures of ns2 is utilized in developing new classes. The Mannasim Frame work [14] patch for cluster-based WSN is also used to scale ns2. As our application required special treatment in all the functionalities mentioned above, the logic and class hierarchy was created for the same. The class hierarchy is described as under:

Location of files: ~/ns2.35/irrigation/application/. All the classes have their own Tcl Linkage with the same name.

- *DATA_SensorNode.cc*: is used to simulate a Soil Moisture Sensor Node. It contains class *DATA_SensorNode* < (inherits) *SensorNode* (of Mannasim) < *MobileNode* < *Node* of ns2. The node carries data like sensing power, processing power, instructions per second, and Battery power.
- *DATA_SensedData.cc* : This class *DATA_SensedData* is an encapsulation of the Soil Moisture data It contains a generic structure of *AppData* and an *ArrayList* to store the series of Data Packets.
- *DATA_SensorBaseApp.cc*: The class *DATA_SensorBaseApp* < *Application* represents the application mounted on the Sensor Nodes which has functionalities to trigger the data acquisition on demand and event and dissemination. It has the command to start, stop and collect the data in a *SensedData ArrayList*.
- *DATA_CommonNodeApp.cc*: The class *DATA_CommonNodeApp* < *DATA_SensorBaseApp* represents a common data acquisition node. Which sense the data and route it to the Cluster Head.

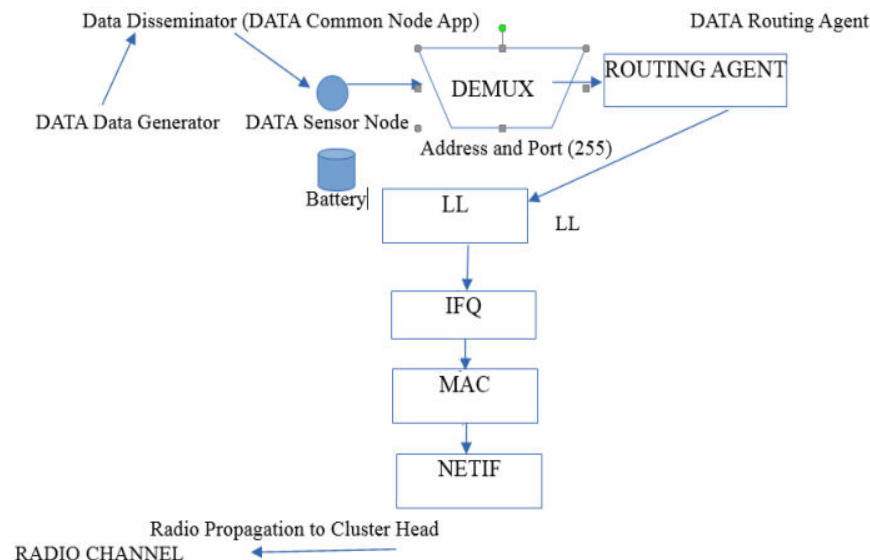
- *DATAClusterNodeApp.cc*: The class *DATAClusterNodeApp* < *DATA_SensorBaseApp* represents the cluster head. It gets the data from common node and perform Aggregate operations. The data from the cluster head goes to sink via ZIGBEE radio-link or GDATA transceiver. The provision of both has been made into it. The simulation script will have facility to attach GDATA or not.
- *DATAAggregateProcessing.cc*: This class *DATAAggregateProcessing* < *Processing* will be responsible to do the job of aggregation depends upon the query parameter or event diagnosed
- *DATADataGenerator.cc*: The class *DATADataGenerator* < *DataGenerator* is the way to simulate the data sensing of the sensor node. The Generator can be configured for the time interval of sensing, buffer to be maintained. The Application classes as if *DATACommonNodeApp* and *DATAClusterNodeApp* will be accessing the buffer filled up by the *DATADataGenerator* and will forward it to Aggregate Processing.
- *DATAOnDemandData.cc*: This class *DATAOnDemandData* < *DATA_SensedData* < *AppData* is a buffer to be loaded when a query is fired from the sink to know the current status of Moisture level in the area concerned.
- *SMRoutingAgent.cc*: This class *SMRoutingAgent* < *RCAgent* < *Agent* is used to forward the data to Demux Address and Demux Port to destination Address by sending them to lower network layer i.e. Link Layer, Mac Layer, NetIf and PhysicalLayer for Radio Relay. The *DATARoutingAgent* uses modified TEEN and Modified APTEEN routing protocol. The class has facility to dynamically switch to LEECH for dynamic cluster formation. In case of threshold, based routing Modified APTEEN is being used.
- *DATAAccessPoint.cc*: The class *DATAAccessPoint* < *AccessPoint* represents the sink node. This class is responsible for gathering the data from cluster head. Proceeding the soil moisture data, Perform discharge calculations on them and sends it to discharge controller of Pump or gate opening sensor in canals.
- *DATA_SensorGDATALL.cc*: This class *DATA_SensorGDATALL* < *LL* is actually the translation of packet data from ZIGBEE Specific Link Layer to GDATA based Link Layer and vice versa. The Mac Layer of GDATA gets the data directly from GDATA Link Layer. The data from sensor is transferred from ZigBee Sensor to the GDATA Module by attaching the module to ADC Pins This class is useful only in cluster head or Sink node and useful in Inter-cluster and inter-sink tranDataission
- *battery.cc*: Here the Battery class of ns2 is used with input power configured in TCL script.

b) Working of Simulation

The classes described here work in coordination with each other with to solve the problem. Following is the schematic representation of important tasks

★ Working of Sensor Node

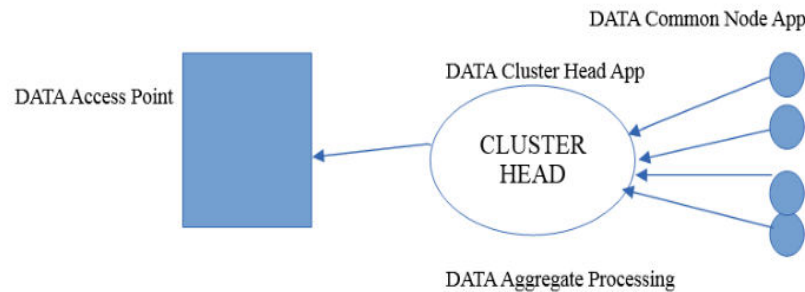
Figure-3: Functioning of a Sensor Node in the Simulation



Sources: Authors Compilation

★ **Data Aggregation**

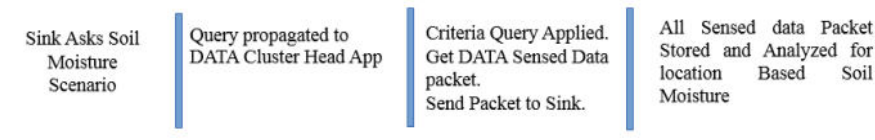
Figure-4: Data Aggregation at Cluster Head



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★ **Sequence diagram on Demand Data**

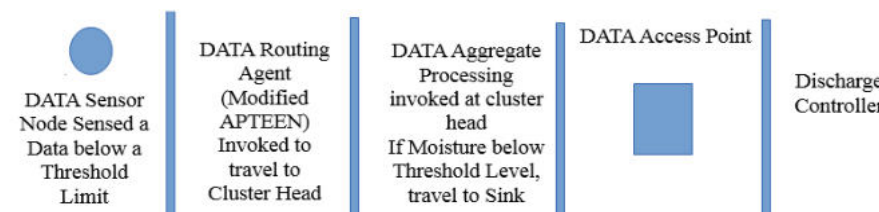
Figure-5: Sequence diagram on Demand Data



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★ **Sequence Diagram for Threshold or Event Based Data**

Figure-6: Sequence Diagram for Threshold or Event Based Data



Sources: Authors Compilation

c) The Simulation

With the above-mentioned application framework, the simulation is carried out on drip irrigation with 50, 75,100,125,150 sensors and 5 Cluster heads and 1 sink node. In case of Gravity, irrigation 10 chaks with five subchak each and one sensor representing one subchak which 50 sensors 10 cluster heads and one sink on minor head is carried out. The General Network Topology Parameters are:

- ✓ Channel Type: Wireless Channel
- ✓ Radio-Propagation Model: TwoRayGround
- ✓ Network Interface Type: WirelessPhy/802_15_4
- ✓ MAC type: Mac/802_15_4
- ✓ Interface Queue Type: DropTail/PriQueue
- ✓ Link Layer Type: LL
- ✓ Antenna Model: Omni Antenna
- ✓ Queue Length: 50
- ✓ Network Layer Protocol: AODV/DSDV/DSR/APTEEN/LEECH

- ✓ Size of the Topography: 700 X 500
- ✓ The Constant Simulation Parameters are,
- ✓ Active Data Senders: 75% Sensor Nodes
- ✓ Sensor Data Size: 64 Bytes
- ✓ Fused Data Size: 512
- ✓ Sensor Data Interval: 1 Data Packet per seconds
- ✓ Channel Error Rate: 0.15
- ✓ Total Simulation Time: 10
- ✓ The Variable Simulation Parameter has Total Sensor
- ✓ Nodes : 50, 75, 100, 125, and 150

With above parameters the TCL script is written for the above simulation parameters. The task of simulation is accomplished by running the Tcl file and storing the output in trace files. Analyzing Trace files using a tool trace-analyzer.

RESULT

Following parameters were analyzed and studied for testing the efficacy of the system:

Packet Delivery Ratio vs number of Nodes for different Routing strategies.

Energy Consumed Vs Number of Nodes for different routing protocol.

Routing Load vs number of Nodes for different routing protocols.

The Result Matrix

A=> AODV B=> DSDV C=> DSR D=> TORA E=> LEACH F=> DataRouting

Table-1: Number of Nodes vs Throghput (packets/ TIL) Ratio for Different Routing Strategies

Number of Nodes	A	B	C	D	E	F
10	2853	2810	2481	2627	4069	3344
20	4471	5174	6776	2913	5847	6945
30	7460	7113	8599	8569	10267	10428
40	13033	11438	14138	12148	14614	13289
50	3207	14109	16277	16335	15924	15068
60	12385	20000	21347	18924	22415	19498
70	11434	20110	21218	21383	21639	20790
80	11887	23396	25123	23289	27523	22554
90	16264	27267	27918	29535	28269	22642
100	18545	26813	29250	29404	30077	20717

Sources: Authors Compilation

Table-2: Number of Nodes vs Throghput (packets/ TIL) Ratio for Different Routing Strategies

Number of Nodes	A	B	C	D	E	F
10	55.21	55.44	55.66	56.51	56.51	56.51
20	55.83	55.89	55.55	55.04	55.38	56.51
30	55.15	54.14	53.29	54.53	55.61	56.91
40	50.92	51.31	51.82	50.75	52.33	55.72
50	47.92	49.45	48.99	46.85	50.69	55.38
60	44.02	43.80	46.79	44.36	50.24	55.10
70	42.50	42.21	43.17	41.20	49.33	54.31
80	39.10	38.60	39.78	40.35	48.32	53.12
90	37.52	37.18	40.57	37.35	47.98	52.84
100	37.35	37.24	39.33	37.75	47.30	52.61

Sources: Authors Compilation

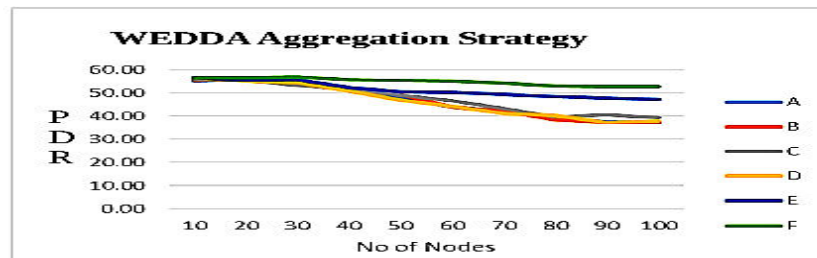
Table-3: Number of Nodes vs Energy consumed in % for Different Routing Strategies

Number of Nodes	A	B	C	D	E	F	Total Energy Remaining in %
10	70.20	70.48	70.55	70.55	71.05	71.12	
20	71.19	69.06	69.70	69.77	68.63	70.20	
30	67.07	67.71	67.35	67.78	68.13	71.26	
40	65.43	64.93	67.00	64.15	69.06	70.69	
50	61.52	60.38	61.73	59.31	63.79	69.98	
60	55.12	55.90	57.96	56.18	63.44	68.20	
70	53.41	51.56	54.12	52.56	62.44	67.71	
80	49.64	50.28	51.70	50.28	61.87	66.35	
90	47.29	47.37	51.14	46.94	60.59	64.22	
100	46.16	47.08	49.36	46.16	58.89	65.22	

Sources: Authors Compilation

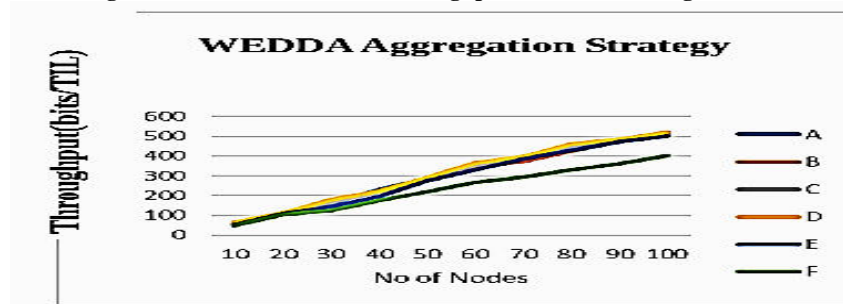
Graphs

Figure-7: Simulation run for PDR vs Nodes



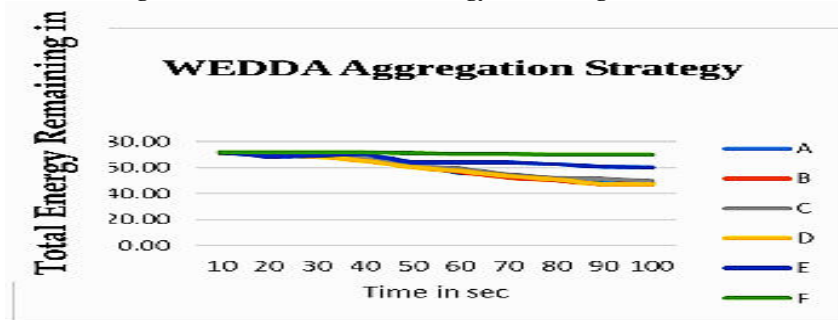
Sources: Authors Compilation

Figure-8: Simulation run for Throughput / TTL Remaining vs Nodes



Sources: Authors Compilation

Figure-9: Simulation run for Energy Remaining (%) vs Nodes



Sources: Authors Compilation

**CONCLUSION AND FUTURE WORK**

The simulation run were conducted in ns2 simulator with a new routing and aggregation strategy. The Tcl simulation files using the newly developed application framework are run on ns2 console and corresponding trace files are generated from the run. It is quite evident that the new application framework successfully runs the new as well as pre-existing configurations and protocols. Although a comprehensive test run is required to test the appropriately modified routing and aggregation strategies suited for simulated WSN. As the packet transfer is not so frequent in this problem hence MAC layer can be made to have more slot time. The existing MAC can be modified for this purpose. The model needs to be tested on the field condition by taking a real problem.

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**A GLANCE AT APPROACHES AND PROCESS OF TEST CASE AUTOMATION****Kumar Gaurav⁴****ABSTRACT**

Test automation offers a possibility to perform various types of testing effectively. Once automated tests have been developed, they can be run quickly and repeatedly. Automation has an advantage of testing software or an application speedily and in an efficient manner in comparison to manual testing. Code- driven, API driven and GUI driven are the three approaches that are discussed in this paper. Further, the paper discusses the process of automation of test cases. Software testing in various stages of the development lifecycle constitute of three parts: selection or generation of specific test cases, execution of these test cases, and evaluation of not only the quality of the software under test but of the test cases themselves. That is, the test effort also needs to be evaluated for its thoroughness. This is discussed in great lengths in this paper.

KEYWORDS**Test Automation, API, GUI, Process of Automation etc.****INTRODUCTION**

Some software testing tasks, such as extensive low-level interface regression testing, can be laborious and time consuming to do manually. In addition, a manual approach might not always be of use in finding certain classes of defects. Test automation offers a possibility to perform these types of testing effectively. Once automated tests have been developed, they can be run quickly and repeatedly. Automation has an advantage of testing software or an application speedily and in an efficient manner in comparison to manual testing.

APPROACHES TO TEST AUTOMATION

There are many approaches to test automation; however, following are the approaches used widely:

- **Code-driven Testing:** The public interfaces to classes, modules or libraries are tested with a variety of input arguments to validate that the results that are returned are correct.
- **GUI Testing:** A testing framework generates user interface events such as keystrokes and mouse clicks, and observes the changes that result in the user interface, to validate that the observable behavior of the program is correct.
- **API Driven Testing:** A testing framework that uses programming interface of the application to validate, the behaviour under test. Typically, API driven testing bypasses application user interface altogether.
- **Code-driven Testing:** A growing trend in software development is the use of testing frameworks such as the xUnit frameworks (for example, JUnit and NUnit) that allow the execution of unit tests to determine whether various sections of the code are acting as expected under various circumstances. Code driven test automation is a key feature of agile software development, where it is known as test-driven development (TDD). Unit tests are written to define the functionality *before* the code is written. However, these unit tests evolve and are extended as coding progresses, issues are discovered and the code is subjected to refactoring. Only when all the tests for all the demanded features pass is the code considered complete.

Graphical User Interface (GUI) Testing

Many test automation tools provide record and playback features that allow users to interactively record user actions and replay them back any number of times, comparing actual results to those expected. The advantage of this approach is that it requires little or no software development. This approach can be applied to any application that has a GUI. However, reliance on these features poses major reliability and maintainability problems. Re labeling a button or moving, it to another part of the window may require the test to be re-recorded. Record and playback also often adds irrelevant activities or incorrectly records some activities.

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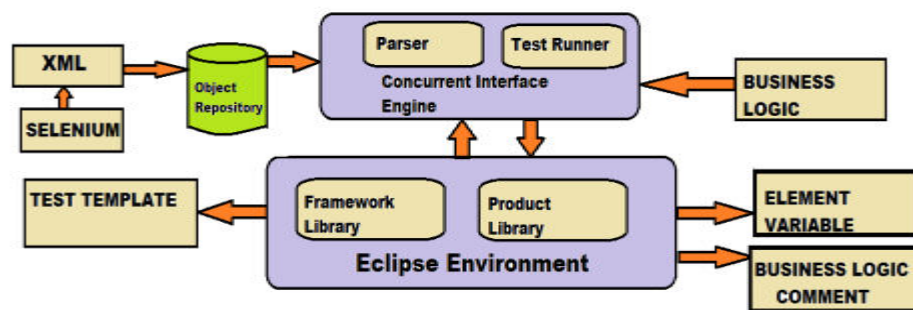
A variation on this type of tool is for testing of web sites. Here, the "interface" is the web page. This type of tool also requires little or no software development. However, such a framework utilizes entirely different techniques because it is reading HTML instead of observing window events.

API Driven Testing: API driven testing is also being widely used by software testers as it is becoming tricky to create and maintain GUI-based automation testing. Programmers or testers write scripts using a programming or scripting language that calls interface exposed by the application under test. These interfaces are custom built or commonly available interfaces like COM, HTTP, and Command line interface. The test scripts created are executed using an automation framework or a programming language to compare test results with expected behaviour of the application.

TEST AUTOMATION INTERFACE

Test automation interface are platforms that provide a single workspace for incorporating multiple testing tools and frameworks for System/Integration testing of application under test. The goal of Test Automation Interface is to simplify the process of mapping tests to business criteria without coding coming in the way of the process. Test automation interface are expected to improve the efficiency and flexibility of maintaining test scripts.

Figure-1: Test Automation Framework



Sources: Authors Compilation

THE TESTING PROCESS

Software testing in various stages of the development lifecycle constitute of three parts: selection or generation of specific test cases, execution of these test cases, and evaluation of not only the quality of the software under test but of the test cases themselves. That is, the test effort also needs to be evaluated for its thoroughness.

Test case generation involves selecting a particular set of test cases (a test suite) within an often practically infinite domain of program execution. Because the domain of all possible test cases is practically infinite, judicious selection of test cases is important.

Various mechanisms for systematically generating test cases with different selection criteria have been proposed, but test case generation is still often left to the programmer.

Test case execution, being the most amenable to automation, has the most sophisticated automation tools available. JUnit is perhaps the most popular example of a test case execution tool. If test cases are to be executed for software modules that have dependencies on other modules however, it is often necessary to develop scaffolding to simulate the environment in which the software under test is running.

GENERATION AND EVALUATION OF TEST CASES

For any particular software unit, the question of what tests we should generate, and how we should evaluate the thoroughness of the test cases generated are of key importance. Different test adequacy criteria are used to answer both questions. Zhu et al. [1] differentiates three notions of adequacy criteria: as a stopping rule, a measurement of test quality, and a generator for test cases.

When test cases are generated manually, a single test adequacy criterion can be used to guide both the selection of the test cases, and evaluation of the test effort. For example, the statement coverage criteria may be used to show that certain statements are not



executed, and thus a test case must be written to exercise those statements. A test suite is then deemed sufficiently thorough when all statements are covered.

When test cases are automatically generated, adequacy criteria can similarly be used to generate test cases. Often, as in the case of the test case generators used in this research, test cases are generated to exhaustively satisfy the criteria used. However, the question remains of whether the generated test cases are thorough enough to reveal real bugs.

From a practical standpoint, analyzing the power of a test suite in the above manner is only a retrospective measure; that is it can tell a tester how many of previously known bugs were discovered, but may not be indicative of how much of the unknown bugs the test suite has missed. Thus, automatically generated (and manually written) test cases are often measured against other adequacy criteria such as a code coverage and mutation coverage.

The generation and evaluation of unit tests can generally be categorized into two classes: black box testing, and white-box testing. Black box testing treats the software unit as the eponymous “black box” where the internal implementation of the software unit is ignored, and what is evaluated is instead its specified behavior; thus, this kind of testing is often called behavioral or functional testing. White box or structural testing, on the other hand takes into consideration the structure of the software under test: its statements, conditionals, etc [2].

TEST CASE GENERATION

Various different automated test case generation strategies have been proposed in the literature. While traditionally viewed as inferior to systematic techniques of test case generation, variations on random testing [3] are still a popular research approach to generating test cases. Clever hybrid approaches such as DART [4] and RANDOOP [5] augment simple random input selection with model-based approaches, and appear to succeed in creating effective test cases.

One alternative to random testing is model-based testing. Korat, a novel framework for automated testing of Java programs. Given a formal specification for a method, Korat uses the method precondition to automatically generate all (nonisomorphic) test cases up to a given small size. Korat then executes the method on each test case, and uses the method post condition as a test oracle to check the correctness of each output. [6]

Test Case Evaluation

Once a test suite is executed, it is imperative that the tester will evaluate the thoroughness of the test suite. The traditional test-adequacy criteria for this evaluation is code coverage. Indeed, the IEEE standard for software unit testing [7] specifies complete statement coverage as a minimum requirement for unit tests. Statement and branch (i.e., decision) coverage has been in popular use since at least the early 70's [8]. It is quite common to have a rule of thumb of between 80-90% code coverage for testing of commercial-quality software [9].

THE ORACLE PROBLEM

Test cases are useful only if one can execute them, and compare them to the software component's specified expected behavior. With manually written tests, it may be sufficient for the tester to also manually assert the expected behavior of a component.

For example, one may want to test a stack component. A possible test case would be to push an item into an empty stack. If we want to know that the stack component behaved correctly, we have to verify that the stack size is one, and the top of the stack is indeed the item we pushed into it. This is a standard unit testing convention: create an object, call one or more of its public methods, and programmatically assert that the object is in the correct state.

However, manually writing asserts is infeasible for automatically generated test cases when the number of test cases are large. Clearly, there is a need for a better automation mechanism to determine the correct behavior of the software component beyond writing assertions manually for every test case.

The solution is to somehow consult an oracle, a software construct that tells whether the program is in the correct state or not. This problem of how to determine whether the software under test behaved correctly under a test case is often called the oracle problem [10].

CONCLUSION

Software testing therefore consists of generating test cases, execution of these test cases and comparing it with the expected behavior (e.g. consulting an oracle), and evaluation of these test cases using certain adequacy criteria.



Much of the literature and available tools concern themselves with automating only one or two aspects of this process. With Java, for example, there are disparate tools for test case execution (e.g. JUnit), code coverage metrics (Clover [11]), mutation analysis (Jester [12]), and design-by-contract mechanisms for use as oracles (JML).

JML, the Java Modeling Language, whose specifications can be used as an oracle for test cases, and it includes a tool, JML Unit [13], which integrates an automated test case generator with JML as an oracle and JUnit as a test case execution mechanism. Subsequent research has enhanced the tools available for automated testing in JML [14]. However, even with these tools, the programmer does not have the adequate infrastructure to evaluate the effectiveness of the automated testing mechanism without access to other tools. That is, given two automatically generated test suites, how can we decide which one is more effective? For example, in Cheon's work, evaluation of their testing strategy involved hand-seeding mutants, instead of automatically generating them.

Autotest [15] is a similar random testing tool for Eiffel, which appears to collect code coverage (but not mutation coverage) information in addition to automatically generating and executing test cases. In that work, the authors emphasize integration between user-generated tests and automatically generated ones. This is also a central theme to the research contained herein - that the integration of manual tests with automated testing can provide a more thorough evaluation of the software under test.

Thus, there is a need for higher level of integration of automated testing tools, providing an end-to-end integrated approach to automated unit testing. Testing support is designed into the programming language and its runtime system; and tools are available for automatic generation, execution, and evaluation of test cases.

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THE COMPARATIVE STUDY OF QUANTUM THEORY AND SHREE YANTRA

Tushar Bhatt⁵

ABSTRACT

In this paper, we are trying to compare the Shree Yantra and the realities of sciences as well as the cosmic energy and we can try to prove that the Shree Yantra is pure scientific concept. It was well-designed geometrical figure and powerful mathematical tools. By comparison, our main goal is the spirituality is not only belief but it is pure science. Using such kind of scientific tools and some facts regarding modern sciences we try to establishing the Shree Yantra is the generated by using great scientific phenomena as well as mathematical models.

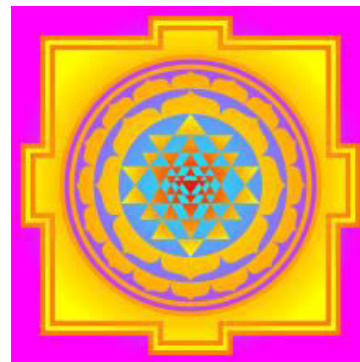
KEYWORDS

Modern Science, Quantum Theory, Gravity, Nuclear Forces, Nucleus, Molecule, Consciousness, Qualia etc.

INTRODUCTION

Shree Yantra, also known as Shree Chakra, is called the mother of all Yantra because all other Yantra derive from it. Shree Yantra is one of the most auspicious, important and powerful Yantra it not only gives the maximum knowledge about whole of the universe. It is the source of attaining all worldly desires and fulfilling all wishes through inner cosmic power and mental strength.

Shree Yantra – “Shree means Wealth and Yantra means Instrument”. Therefore, the Shree Yantra means an “instrument for wealth”. Shree Yantra brings about material and spiritual wealth. Shree Yantra has that unexplained power to fulfill all our wishes and Change our life for the better. It helps us push indefinitely and easily the limits of growth-both spiritually and materialistically. Shree Yantra is highly sensitive and has magnetic powers. Shree Yantra is said to be a divine storehouse of energy, which pick up particular cosmic ray wave emitted by the planets and other universal objects and transform them into constrictive vibrations.



In the Shree Vidya school of Hindu tantra, the Shree Yantra ("sacred [Shree Chakra]") is a diagram formed by nine interlocking triangles that surround and radiate out from the central (bindu) point. The two dimensional Shree Chakra, when it is projected into three dimensions is called a Maha Meru. {[Mount Meru]} derives its name from this Meru like shape. It represents the goddess in her form of Shri Lalita or Tripura Sundari, "the beauty of the three worlds" (Bhoo, Bhuva and Swa). The worship of the Shree Chakra is central to the Shri Vidya system of Hindu worship. Four isosceles triangles with the apices upwards, representing Shiva or the Masculine. Five isosceles triangles with the apices downward, symbolizing female embodiment Shakti. Thus, the Shree Yantra also represents the union of Masculine and Feminine Divine. Because it is composed of nine triangles, it is known as the Navayoni Chakra. "These nine triangles are of various sizes and intersect with one another. In the middle is the power point (bindu), visualizing the highest, and the invisible, elusive centre from which the entire figure and the cosmos expand. The triangles are enclosed by two rows of (8 and 16) petals, representing the lotus of creation and reproductive vital force. The broken lines of the outer frame denote the figure to be a sanctuary with four openings to the regions of the universe". In a recent issue of Brahmagvidya, the journal of the Adyar Library, Subhash Kak argues that the description of Shree Yantra is identical to the yantra described in the Śvetāśvatara Upanishad. Together the nine triangles are interlaced in such a way as to form 43 smaller triangles in a web symbolic of the entire cosmos or a womb symbolic of creation. Together they express Advaita or non-duality. A lotus of eight petals, a lotus of sixteen petals, and an earth square surround this resembling a temple with four doors. The various deities residing in the nine layers of the Shree Yantra are described in the Devi Khadgamala Mantra.

The Shree Chakra is also known as the nav chakra because it can also be seen as having nine levels. "Nine" comes from "Nau or Nava" of Sanskrit. Each level corresponds to a mudra, a yogini, and a specific form of the deity Tripura Sundari along with her mantra. These levels starting from the outside or bottom layer are:

- Trailokya Mohan or Bhupur, a square of three lines with four portals,
- Sarva Aasa Paripurak, a sixteen-petal lotus,
- Sarva Sankshobahan, an eight-petal lotus,
- Sarva Saubhagyadayak, composed of fourteen small triangles,

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- Sarva Arthasadhak, composed of ten small triangles,
- Sarva Rakshakar, composed of ten small triangles,
- Sarva Rogahar, composed of eight small triangles,
- Sarva Siddhiprada, composed of 1 small triangle,
- Sarva Anandamay composed of a point or bindu.

The Shree Chakra (called the Shri Yantra) is the symbol of Hindu tantra, which is based on the Hindu philosophy of Kashmir Shaivism. The Shree Yantra is the object of devotion in Shree Vidya

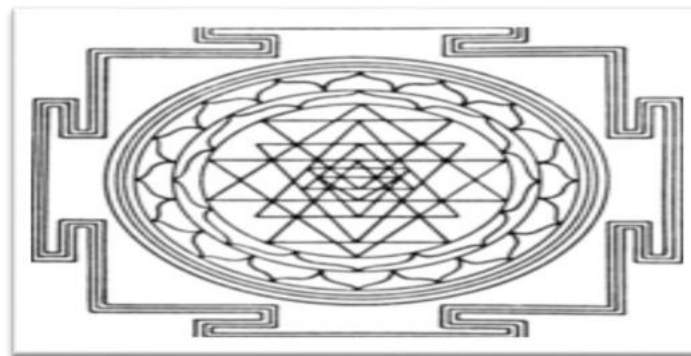
THE CONSTRUCTION OF SHREE YANTRA

Making Shree Yantra in 14 following steps:

- Step-1: Draw inner circle and triangle with apex down.
- Step-2: Draw Triangle with apex up.
- Step-3: Draw Triangle with apex down.
- Step-4: Draw Triangle with apex up.
- Step-5: Draw Triangle with apex up.
- Step-6: Draw Triangle with apex up.
- Step-7: Draw Triangle with apex down.
- Step-8: Draw Triangle with apex down.
- Step-9: Draw Triangle with apex down.
- Step-10: Draw Bindu or Point.
- Step-11: Color the inner part; draw 8 petals and color them.
- Step-12: Draw 16 colored petals and color them.
- Step-13: Draw 3 circles and color them.
- Step-14: Draw Bhupur and color it

So resultant figure is given below:

Figure-1



Sources: Authors Compilation

IMPORTANCE OF SHREE YANTRA

This Mandala or Shree Yantra is considered to be the adobe of cosmic wisdom “Shree Vidya is the abstract intelligence where from the cosmos originates, where on it flourishes and where in it dissolves, like the images in a mirror”. For this reason, the Shree Yantra helps us to understand whole cosmos as it is.

MODERN SCIENCE AND SHREE YANTRA

Quantum theory deals with the small-scale world of atoms and particles. The theory of relativity covers the large-scale structure of the universe. Scientists are searching for a complete and consistent theory that unifies quantum and relativity theories.

The Background of Quantum Theory

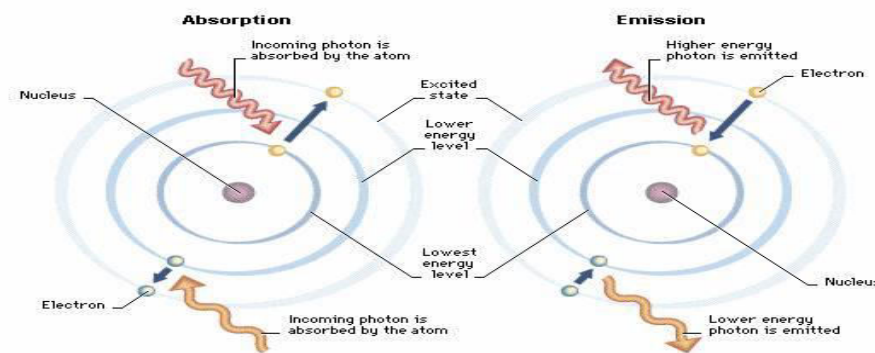
In 1900, max Planck published his theory explaining the emission spectrum of black bodies (Quantum theory). Plural of quantum is quanta. In Physics, Quantum refers to an indivisible and elementary entity known as Planck constant for measurement of length and time. The Plank length is 10^{-36} meters. In addition, the Plank time is 10^{-43} seconds.

Now as per the quantum theory, there are five types of energy level:

- Excited State.
- Lower Energy Level.
- Lowest Energy Level.
- Absorption of Energy.
- Emission of Energy.

Showing in the following figure:

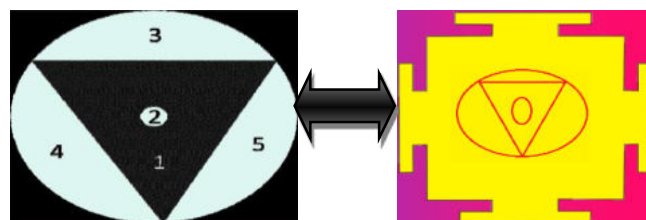
Figure-2: Different Energy Levels of Quanta



Sources: Authors Compilation

Now same situation will be arise in the first chakra or Quantum envelope we explain it by following figures:

Figure-3: Different Energy Levels in Chakra 1 (Shree Yantra)



Sources: Authors Compilation

Here in above figure, the numbers 1, 2, 3, 4, 5 indicates the different energy levels, which are same as energy levels of quanta. Here we are observe that:

Table-1

Similarity table -I		
E. Level	Spiritual Symbolism	Scientific Symbolism
1	Shiva or the Cosmic Consciousness	Cosmic wisdom or Consciousness
2	Para Shakti or the Cosmic energy	Gravity
3	Ichha Shakti or the potency for inertia	Strong Force
4	Gyaan Shakti or the potency for knowledge	Weak Force
5	Kriya Shakti or the potency for action	Electromagnetic Force

Sources: Authors Compilation

Now, our question is what Consciousness is?

The Consciousness is the state of being aware of and responsive to one's surroundings. Now we understand one by one stage of energy. We can try to explain the lord Shiva is a supreme stage of energy or Consciousness. There are 11 (eleven) characteristics of lord Shiva as follows:

- Come what may, you must never tolerate evil.
- Self-control is the key to living life to the fullest.
- Keep calm and carry on.
- Materialistic happiness never stays for long.
- You must learn how to suppress negativity gracefully.
- Desires lead to obsessions and obsessions lead to Destruction.
- Respect your better half.
- You must control your ego and let go of pride.
- Do thorough research on something you are likely to get into.
- Understand that everything is temporary.
- Dance.

Observe that all characteristics are needed to be energy and here we are known that energy as a consciousness. That energy covered by whole cosmos for this reason the energy of lord Shiva will be known as cosmos energy. Energy is meaningless without consciousness, so energy with consciousness, which is called cosmic wisdom. This is covered by first chakras 1st part reciprocal shape triangle.

According to Shaktism and Hindu mythology, Adi Para Shakti - the Goddess, Devi - is the Supreme Being. She is also popularly referred to as "Adi Shakti", "Parama Shakti", "Maha Shakti", "Mahadevi", or even simply as "Shakti". "Parama" means **absolute**, "**Satya**" means the **Truth** as per many Shakta texts.

Now, Newton's says that the gravity is absolute. First, we understand gravity and after it, we are showing the proof by meaningful example.

What is Gravity?

Gravity is a force of attraction that exists between any two masses, any two bodies, and any two particles. Gravity is not just the attraction between objects and the Earth. It is an attraction that exists between all objects, everywhere in the universe. Sir Isaac Newton (1642-1727) discovered that a force is required to change the speed or direction of movement of an object. He also realized that the force called "gravity" must make an apple fall from a tree, or humans and animals live on the surface of our spinning planet without being flung off. Furthermore, he deduced that gravity forces exist between all objects.



Newton's "law" of gravity is a mathematical description of the way bodies are observed to attract one another, based on many scientific experiments and observations. The gravitational equation says that the force of gravity is proportional to the product of the two masses (m_1 and m_2),

In addition, inversely proportional to the square of the distance (r) between their centers of mass. Mathematically speaking,

$$F = Gm_1m_2 / r^2$$

Where, G is called the Gravitational Constant. It has a value of $6.6726 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$.

The effect of gravity extends from each object out into space in all directions, and for an infinite distance. However, the strength of the gravitational force reduces quickly with distance. Humans are never aware of the Sun's gravity pulling them, because the pull is so small at the distance between the Earth and Sun. Yet, it is the Sun's gravity that keeps the Earth in its orbit! Neither are we aware of the pull of lunar gravity on our bodies, but the Moon's gravity is responsible for the ocean tides on Earth.

Is gravity an Absolute Truth?

When somebody jumps from the top of a building, you will fall to the ground. This affects all people regardless of their belief or disbelief in gravity. We are hoping to get some other people's perspectives on how gravity, a favorite example in the subjective/absolute truth debate, applies to absolute or relative truth.

How gravity is related to cosmic energy or parashakti?

Figure-4



Sources: Authors Compilation

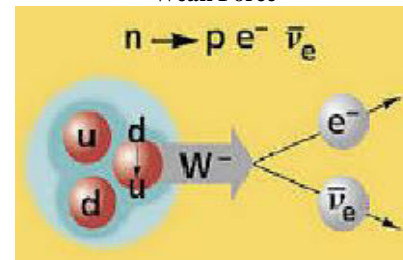
Now by above figure we shows that the earth and moon are related to each other only by gravitational force similarly whole planet are together if and only if by gravitational force. In our spiritual literature parashakti work like the same. Parashakti is an energy, which is availing completely without it nobody can able to do something.

Similarity Table – II

Gyaan Shakti or the potency for knowledge



Weak Force



Power is based on knowledge and makes use of knowledge; on the other hand, power reproduces knowledge by shaping it in accordance with its anonymous intentions. Power (re-) creates its own fields of exercise through knowledge. Foucault incorporates this inevitable mutual inherence in his neologism power-knowledge, the most important part of which is the hyphen that links the two aspects of the integrated concept together.

The **weak force** is one of the four fundamental **forces** that govern all matter in the universe (the other three are gravity, electromagnetism and the strong **force**). While the other **forces** hold things together, the **weak force** plays a greater role in things falling apart, or decaying.

By Gyanshakti, we can able to transform our wasted energy into right direction and ultimately achieve the human goal: **Be Perfect**.

By weak force, the radioactive beta decay is possibly due to the weak interaction, which transforms a neutron into a proton, an electron, and an electron antineutrino.

Now the question is **why Gyanshakti is weak force**.

Answer is so sweet, as the weak force is defined while the thing is falling down and our spirituality is believes that the Gyan is falling in person from the universe or the Guru. For this reason, only these two terms are similar to each other.

Three main forms of Shakti: Indian philosophy states that creative power has three parts:

1. **Gyana (jnana) Shakti** – the power to know
2. **Ichha Shakti** – willpower
3. **Kriya Shakti** – the power to act

These three Shakti's can be thought of as intention, formulation and expression. For example, you intend to do something, you formulate a plan in your mind, and you act on that plan, expressing your inner state into the outer world. You create something.

Similarity Table - III

Iccha Shakti or the Potency for Inertia



Anything that has Iccha Shakti is alive, luminous and desirable.

Iccha Shakti is the essence of vibrant health, feeling good in your own skin and feeling that your life has meaning and value.

When you have Iccha Shakti, you have the energy to engage with life in meaningful ways. Iccha Shakti empowers you to seek growth and change and to find purpose and fulfillment in everyday life. Iccha Shakti is the foundation for a conscious life.

When Iccha Shakti is directed inwards, it empowers you to raise your consciousness, to experience yourself as part of something greater. Ultimately, Iccha Shakti is the fuel that powers your spiritual growth and the awakening of consciousness.

The willpower or Iccha Shakti is most powerful tool for receiving the human goal it is the Strong force because while the willpower is increase then and then person becomes a success or achieve the goal otherwise not.

By strong force we are able to make a join two atoms and distribute the same rule apply for will power also by positive willpower we are able to create otherwise destroying also.

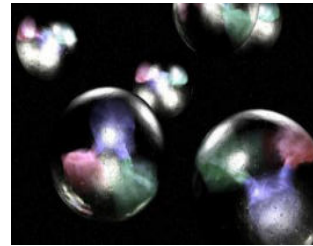
It is your will as a desire. It is your will as a realization of self. If you know how to operate the will, you have the best world of living and enlightenment.

All the psychology, Vedanta science is bound to depend on your will. Without your will, this world has no meaning. For you everything is there to live in this world and to come out through this world, when you know how to use the "Will". It is such a power, which can bring the boon of God in your feet. God gave it to you while creating you. He offered all his power to yourself and to go beyond that. How is it you made it dormant?

It is your mind, which has abandoned you. It is your weakness of living where you have surrendered. Will with your surrendering to go beyond the world. Go through the mind. It is your power, which has direct contact with God or Supreme. All philosophy of the world is created by mind and through the mind. It may have come from the mind but it is above the mind.

Mind is just a channel and channel cannot be the supreme or the origin. Origin is much beyond. To reach to origin of yourself, your power of thought – Iccha Shakti is very important. Understand thought is more powerful than the mind. Though it has come from the mind but it is the most powerful and beautiful method to realization. I want you to come into the field of the 'Will Power', which can give you everything, what you want. The last mission of the will is to enlighten you because enlightenment can have everything with living enlightenment. Thus, awake your thought power and enjoy its power.

Strong Force



The strong nuclear force is one of the four fundamental forces in nature; the other three are gravity, electromagnetism and the weak force. As its name implies, the strong force is the *strongest* force of the four. It is responsible for binding together the fundamental particles of matter to form larger particles.

In the context of binding protons and neutrons together to form atomic nuclei, the **strong** interaction is called the nuclear **force** (or residual **strong force**). In this case, it is the residuum of the **strong** interaction between the quarks that make up the protons and neutrons.

Similarity Table - IV

Kriya Shakti or
the potency for action



Another meaning of Kriya is an outward physical manifestation of awakened kundalini, such as a spontaneous body movement related to Kundalini energy flow. O Kriya Shakti is "a power of thought" said to be greatly studied by yogis.

The Kriya-Shakti, or Nine Powers of Action, are the most potent magical powers, or siddhis, at the command of the tantric adept, and, as such, elude the best of Orient lists in detail sufficient for explication, as befitting occult lore of this extraordinary level of attainment. Although most authors list only eight of the mahasiddhis or great powers, Danielou believed that any list of the 'miraculous' powers would have to include that most godlike of talents, omniscience. The Nine Powers are believed dormant in us all. By re-remembering them, we too, might be as gods, aishvarya. Hence, it is to be presumed that only the highest adepts—yogins—can master them.

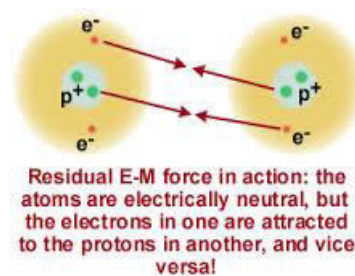
In Advanced Method of Concentration refers to the siddhis as "super powers" and, indeed, with an arsenal such as the nine Kriya-Shaktis at one's disposal, it is hard to imagine a wonder one could not perform. Briefly, the Nine Powers are:

Anima (atomization); Mahima (immensity); Garima (gravity); Laghima (lightness); Prapti (attainment); Prakamya (at will-ness); Ishitva (domination); Vashitva (holding in one's power); Yatrakamavasayitva (transformation at will). One finds manifestations of these powers in the shamanic, sorcery, or magical traditions of all peoples. For example, what is Yatrakamavasayitva if not 'shape-shifting' commonly claimed as an ability of certain Native American shamans? However, each of the Nine Powers has application in the magic (k) of the west, as I shall demonstrate.

CONCLUSION

- The shree Yantra is very scientific and powerful geometrical figure.
- The defining energy in shree Yantra is not only spiritual or virtual thing but these are very near to the universal scientific tool.
- Each part of shree Yantra is fully energized by cosmic energy.
- The old Quantum theory is parallel to the part of Shree Yantra like the Triangles or circles.
- All parts of the Shree Yantra store beautiful energy, which is same as the energy defined in the Quantum energy.
- In this paper, we can try to explain The Shree Yantra is not only spiritual or virtual matter but it is pure science and related to powerful part of the science like Quantum theory.

Electromagnetic Force



The **electromagnetic force** is one of the four fundamental interactions in nature. The other three fundamental interactions are the strong interaction, the weak interaction, and gravitation. Lightning is an electrostatic discharge that travels between two charged regions.

The **electromagnetic force** is a special force that affects everything in the universe because (like gravity) it has an *infinite* range. It has the ability to attract and repel charges. Since material in solid and liquid forms are made of charges having a unique order, they, too, may be manipulated by this force. It is also responsible for giving things **strength, shape, and hardness**. Three types of fields known as the electrostatic field, magnetostatic field, and the electromagnetic field can generate the electromagnetic force. Some of Earth's greatest philosophers brilliantly used the concept of field lines to help visualize how another object can move one object without actually touching each other.

It is very strong and this is surprising too because it can work over an infinite range. To give you an idea, the **electromagnetic force** is approximately 10^{36} times **stronger** than the earth's gravitational field! That is (to put it in perspective)

1,000,000,000,000,000,000,000,000,000,000 times **stronger** than **gravity** on Earth! If this were not the case, all material would collapse into a black hole! Forces compete, on Earth the electromagnetic force wins. In a black hole, gravity is a very strong contender.

"What does the electromagnetic force repel and attract?" The charges create electric fields, which drive an electromagnetic force causing unlike charges to attract and like charges to repel. You experience the electromagnetic force when you rub a balloon on your hair and your hair clings to the balloon.



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**CURRENT ERA IN DIFFERENT SECTORS: DATA MINING****Dr. Ramandeep Kaur⁶****ABSTRACT**

This paper is totally based on the different sectors for data mining concept. The answer of, this question “how it works?” is also giving in the paper with process of data mining concept. It is continues innovation in disk storage capacity, increase the accuracy, processing speed continually up. Data mining is included with various parameters like association, classification, sequence, clustering etc. as well as also make fruitful applications and new trends in current era just as retail marketing, banking sector, telecommunication etc. Data mining is very strong concept in games, business, science, engineering, human rights and many more fields. There are many tools and techniques to use the data in the form of data mining with good pattern in java, JavaScript and graphics user interface as well as environment of data mining in statistical computational. The real life examples are also showing the trend of data mining in current era and future goals.

KEYWORDS**Data Sets, Data Analysis, Artificial Intelligence, Business, Technology etc.****INTRODUCTION**

There is huge amount of data available in industries. This data is not useful until it changed into useful information. It is urgent to analyse this huge amount of data in database and generate a new information from whole data.

Database is interrelated data, so data mining is based on the database that examine the large pre-existing database in order to create a new information. In other words, data mining is a identified pattern of database which recognized in sorting with strong relationship. Data mining is also known as knowledge discovery in data (KDD). It is a software tool for analysing the data from data base. This analysis data is find from different modes and also find the identification of relationship between the data.

Different levels of analysis are available:

- **Artificial Neural Networks:** It includes non-linear predictive models, which learn through training, and re-creates neural networks.
- **Genetic Algorithms:** It optimization techniques that use process such as genetic combination, mutation, and natural selection.
- **Decision Trees:** These decisions generate rules for the classification of a dataset. Specific decision tree methods include classification and regression trees.
- **Nearest Neighbor Method:** A technique that classifies each record in a dataset based on a combination of the classes of the k records most similar to it in a historical dataset (where $k \geq 1$). Sometimes called the k -nearest neighbor technique.
- **Rule Induction:** The extraction of useful if-then rules from data based on statistical significance.
- **Data Visualization:** It includes graphics tools are used to illustrate data relationships.

Data mining have five main elements:

- It can extract, transform, and load the transactions of data onto the data warehouse system.
- It can store and manage the data in database system.
- It provides data access to business analysts and information technology professionals.
- It is also analyze the data by application software.
- This data is in a useful format, such as a graph or table.

Data mining has six types of relationships:

- **Anomaly Detection:** It includes identification of unusual data records.
- **Association Rule Learning–** This rule is useful to find the relationships between variables. For example, a supermarket might gather data on customer purchasing habits. Using association rule learning.
- **Clustering:** It is the task of discovering groups and structures in the data without using known structures in the data.

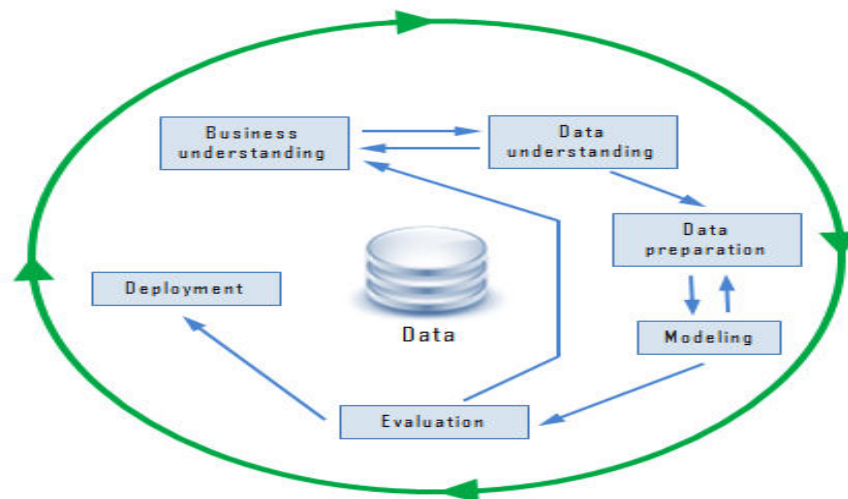
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- **Classification:** It is the task to generate the knowledge about structure of new data set. For example, an e-mail program might attempt to classify an e-mail as "legitimate" or as "spam".
- **Regression:** It shows minimum errors in models of database.
- **Summarization:** It contains summary and report of visualization of data sets.

PROCESS OF DATA MINING

Data mining process defined as a process of discovering hidden data sets and values by analyse large amount of data from database.

Figure-1: Standard Process for Data Mining (SP-DM)



Sources: Authors Compilation

There are six different phases for process the standard process for data mining. These are given below:

Business Understanding: It includes many steps:

- Need of business objective,
- Access the situation,
- Define data mining goal,
- Established the project plan.

Data Understand: It includes:

- Collect the data,
- Describe the data,
- Explored the data,
- Verify the data.

Data Preparation: This include the modelling uses:

- Select the data,
- Clean the data,
- Design a model,
- Integrate into data.
- Formatted data

Modelling: It describes:

- Select the modeling techniques,
- Testing techniques,
- Modeling tools to create a model,



- Accessed models.

Evaluation: It Shows:

- Evaluate the test results,
- Review the report for steps,
- Decision to use data mining.

Deployment: It Uses:

- Organize the results,
- Present the results,
- Generate a report for final result,
- Review result.

APPLICATIONS OF DATA MINING

Data mining is used in many areas. Data mining system is available in current era. There are many applications for using data mining in different fields. These are given below:

Banking /Financial Data Analysis

Data analysis is very important in banking and financial industry. There are some fields to use the data mining:

- Design of data mining and its construction for multi-dimensional data analysis and data mining.
- Data mining is also useful for loan payment and customers credit policy analysis.
- Classification of customer's target.
- Detection of money for fraud credit card usage and other financial crimes.
- Identification of stocks trading rules.

Retail / Marketing Industry

It collects the large amount of data for sales, customers; purchase goods, transportation services etc. these all things are helpful in data mining concept:

- Design and construction of data is based on data mining benefits.
- Customers, products, times, sales defined characteristics.
- Analysis of sales campaign
- Customers answer prediction.

Telecommunication Industry

In the present era, telecommunication is very huge field has many type of services like cellular phone, internet, fax, data transmission. So data mining is very helpful part of this industry.

- Multi dimension analysis telecommunication data,
- Fraud pattern analysis,
- Identify for useless pattern,
- Mobile telecommunication services,
- Use of visual tools for telecommunication data analysis.

Biological Data Analysis

In this industry, data mining is very important part of bioinformatics:

- It helps in semantics integration of heterogenous, distributed generic etc.
- Discovering of structure pattern and search pattern and analysis the network and its resources.
- Path analysis.
- Visual tools for data analysis.

**Scientific Applications**

- It is useful for climate, ecosystem modeling, chemical engineering etc.
- Data warehouse and processing of data.
- Graph data mining.
- Visual aids for specific information.

Intrusion Detection

Intrusion means any kind of action that threatens integrity of network resources. Data mining technology applied in many fields.

- Development of data mining algorithm.
- Association, aggregation and correlation are used for select the attributes.
- Stream data analysis.
- Distributed data mining.
- Visual and query tools.

Insurance and Health Care

- Claim analysis for medical.
- Identification of risky customers for detection of wrong behavior.
- Identify the customers for new policies.

There are so many examples of data mining in real world. These are given below:

- **Games** – has used stored data from datasets.
- **Business**- included the mobile phone services and industries.
- **Sciences and Engineering**- has been used widely area like genetics, education, medicine.
- **Human rights**- this includes the records of crimes, prisons etc.
- **Medical data mining**- is related to patient records as well as doctors and medicine records.
- **Spatial data mining**- is based on Geographic Information Systems (GIS).
- **Sensor data mining**- is used for Wireless sensor networks can be used for facilitating the collection of data.
- **Visual data mining**- in this field change the data from analog to digital and then generate the datasets.
- **Music data mining**- is includes the music and its classifications like genres in different pattern.
- **Pattern mining**- pattern is associated to rules.
- **E-commerce**- is related to online shopping, education, etc.
- **Crime agencies**- keeps records related to the crimes
- **Supermarkets**- keeps the records of products and customers.

TOOLS OF DATA MINING

Many tools are given for data mining concept which are very useful. Some tools are given below:

1. **Orange** - It build with python language. It is easy to use because of free open source software. It's based on data analytics, bar chart, trees etc.
2. **Weka** – It made in java programming language. It is based on algorithms.
3. **Rattle GUI** - Is a free and open source software with R statistical programming language.
4. **Apache** - Is used with hadoop platform totally based on algorithms.
5. **SCaViS** - It is useful for data analysis developed in java platform.
6. **Rapid Miner** - This tool is based on machine language and text mining, data mining and business analysis.
7. **R** – This is language based environment for graphics.
8. **ML-Flex** - This is used with HTML reports for results.



9. **NLTK** - It means Natural language toolkit. It is useful for libraries and programs for symbols. This software is made in python language.
10. **ELKI** - This software is a research project and it is developed in java language.
11. **UIMA** - It means unstructured information management architecture. This tool discovered by IBM.
12. **KNIME** - This tool is called Konstanz information Miner. It is user friendly software based on analysis process.
13. **Chemicalize.org** - It is applied for chemical structure and web search engine.
14. **Vowpal Wabbit** - It is effective for open source learning system library.
15. **Graph Lab** - This is profitable for graphic based analysis and is made in C++ language.
16. **GNU Octave** - This is beneficial for numerical experiments like MATLAB.
17. **Mlpy** - This tool is developed in python language. It is totally based on scientific library and search.
18. **MALLET** - It implemented in java language is based on clusters and classification of analysis of documents in static manner.
19. **Shogun** - Shogun software is open source software developed in C++ programming language. This tool is applied for numerous algorithm.
20. **Scikit_learn** - This is developed in python language. And useful for regression and cluster algorithms.
21. **Lattice Miner** - This analysis software is applied for nested lines diagrams in drawing.
22. **Dlib** - Is created in C++ programming language. It is also free and open source software designs for contract and component based software engineering.
23. **KEEL** - KEEL means knowledge extraction based on evolutionary learning under developed Spanish national project.
24. **Pandas** - This is beneficial for data structure.
25. **Mining Mart** - This tool is based on relational database with MYsql, PLsql AND Oracle.
26. **OpenNN** - This OpenNN is created for neural networks and is created in object oriented programming language.
27. **AdaM** - Is an algorithm development and mining system profitable for remotely sense and scientific data.
28. **DataMelt** – It is created for mathematics calculations.
29. **AdaMSoft** - This software is open source tool developed in java programming language for solutions of data management methods.
30. **Rosetta** - This program is based on set theory and analysing tabular data.

FUTURE

Data mining is based on the technology of research for businesses, sciences and engineering in various research fields. These fields are based on machine learning, artificial intelligent, pattern, computing, datasets in database. These areas are available with huge amount of data sets, which are now available for industries and science field of research.

Currently, data mining applications are working in various fields such as education, business, medical, retail, scientific field and so many other fields.

The given databases are sufficient with size and quality, but now new technology create new aspects by the capability of databases. These are:



- Data mining is defined with automated perception of trends and behavior in large database.
- Data mining tools are automated discovery of previous hidden pattern.

Researchers and healthcare practitioners are drowning in a sea of gathered data from database, continues to swell.

Today, scientific researchers can find new factors, new attributes, new features, and new targets for future. Data mining techniques are useful for existing software and hardware platforms and next it will implemented on new system from existing system and it will upgrade with new product development.

CONCLUSION

The use of data mining is fairly for new developments of datasets. Presently, data mining is works in simple numeric and categorical data. However, in coming days, data will be more reliable and complex for every industry. The new research of data mining will result a new analysis and methods will new characteristics of data. Also new tools will generate to more suitable for every platform and easy to use for every system. Therefore, latest technologies are developed day by day and it will make more suitable for databases.

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EFFECT OF COMPUTER ASSISTED LEARNING ON EXAMINATION ANXIETY AMONG STUDENTS OF FAZILKA DISTRICT IN PUNJAB

Aditi Gagneja⁷

ABSTRACT

Modern day education is completely different from the traditional methods of imparting instructions in which teacher is the supreme authority in the class and in most of the cases imparts education using lecture method. The students were directed in the sense that the main emphasis was on completing the syllabus and not on concept clarity. Students were prepared for the examination and not for the life. Therefore, there was always a fear in their mind regarding their exams, as they do not know the logic behind what they have learnt in the class from their teacher. However, this type of methodology for imparting education is an outdated phenomenon. Today, the modern teacher uses latest technology oriented methods for imparting education to his students especially the computers become an integral part of the modern day education system. Now, the students have more concept clarity and this result in reducing their exam anxiety largely. Therefore, this study was taken in hand to know the impact of computer assisted learning on examination anxiety among students. For this study, a representative sample of 100 students from a school of Fazilka district was taken. Stratified Randomization technique was used for the selection of sample. A pre-test post-test experimental design was used to compare examination anxiety of these students. T-test was employed for the analysis of data. The results showed that there is significant difference between the examination anxieties among students w.r.t. various demographic variables like gender, locality and stream. Therefore, the study concludes that the teacher should use more of these technologies in education to reduce examination anxiety among their students.

KEYWORDS

Computer Assisted Learning, Examination Anxiety etc.

INTRODUCTION

Examinations are an integral part of our education system, which intends to measure the overall performance of students with regard to their academic achievements during the academic session. These are the only medium with the help of which teacher can access what their students have learnt from their classroom experiences. Students too from these examinations can evaluate themselves on academic grounds and can make them able to move to the next level of class. In the nutshell, we can say that we cannot isolate our education system from the examinations, which constitutes an integral part of it.

However, it is often found that the students often feel tension of these exams and found to be fearful from these. There persists a huge amount of anxiety in them w.r.t. these exams. It is a matter of surprise that which system is meant to measure their performance and through which they can go to the next level and can judge themselves, they are found to be fearful from that system. We often heard about students committing suicide due to exam pressure and exam anxiety or go into depression due to the influence of these. Therefore, the student life, which is a dream for every student and an unforgettable experience, become a panic for someone for the whole life.

Now the question arises why student feel pressure or anxiety of exams and why they are not able to free themselves from the terror of these. It is because of the methods that are adopted in our educational system to impart instructions to the students. Our educational system stresses mainly on imparting theoretical knowledge to the students and the teacher imparts these mainly through lectures. For the whole year, they cram various thoughts, ideas, theories, formulas and theorems. Nevertheless, they do not have the knowledge regarding their practical use or of the base of these formulas or theories. This results in making themselves a slave of these formulas and theories and they want to get rid of these as soon as possible. Therefore, during their exams, they tried to cram these formulas and this result in making them feel stressed or anxious and those students who are not able to handle this stress or anxiety took those steps, which are unwanted.

Therefore, it is necessary that some solutions should be thought of to make students feel free from the anxiety of these exams. One of the solutions of this problem is teach them using innovative technologies especially the computers. When they are given practical knowledge of the concepts and formulas and when everything is being displayed on the screen in front of them and when they see everything happening in front of their eyes, they can get basic knowledge of these concepts and if then their exams were taken by the teacher, they don't feel anxiety because now they know how to use these concepts in their real life and this can make them successful in their personal life too.

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**REVIEW OF RELATED LITERATURE**

Chei-Chang Chiou (2015) compared the effect of different concept mapping on students' learning motivation and academic achievement. A pretest-posttest control group experimental design was employed. The participants were 151 students from the Department of Accounting Information at a private university in central Taiwan who were taking an advanced accounting course. An effect size and analysis of covariance were used to analyze experimental results. Experimental results showed that the two computer-assisted concept-mapping techniques (construct-on-scaffold and construct-by-self) are more beneficial to students' learning motivation and academic achievement than traditional paper-and-pencil concept mapping and textbook exercise methods. In addition, traditional paper-and-pencil concept mapping is better than the textbook exercise method. However, no significant differences existed between the two computer-assisted concept-mapping techniques.

Birjandi P. and Pahlavani P. (2014) investigated the effectiveness of computer-aided argument mapping (CAAM) on the improvement of writing achievement of Iranian learners of English. To this end, after administrating a language proficiency test and an essay-writing test, 90 students were chosen as the participants of this study. Next, the participants were categorized randomly into three groups as control, experimental 1, and experimental 2. During the course, as the both experimental groups did their writing tasks with the CAAM software (in person/in pairs), the control group did their assignments with pen and paper. Finally, a posttest of essay writing was administered for all participants. Using SPSS version 19 and One-way ANOVA statistical procedure, the results showed a statistically significant difference between those who received the technique of CAAM and those who wrote their assignments in traditional way. In addition, there was a statistically significant difference between the participants in the both experimental groups. In other words, collaborative learning in a computer hands-on learning environment was effective on writing achievement.

Isiaka A.G. et al (2014) examined the effects of two modes of computer-assisted instructional package on solid geometry achievement amongst senior secondary school students in Minna, Niger State, Nigeria. In addition, the influence of gender on the performance of students exposed to CAI (AT) and CAI (AN) packages were examined. This study adopted a pretest-posttest experimental design with 3 x 2 factorial design and a sample of 120 Senior Secondary class Two (SSII) students (60 male and 60 female). Computer-Assisted Instructional package of two modes; Animation with Text (AT), and Animation with Narration (AN) were employed as treatment instruments and a Solid Geometry Achievement Test (SGAT) was used as test instrument. A trial test was carried out and a reliability co-efficient of 0.78 was obtained using the KR-21. Analysis of Variance (ANOVA) and t-test was used in analyzing data collected. The study revealed that, there were significant differences in the post-test mean scores of CAI(AT), CAI(AN) and the control group ($F = 11.468$, d.f. = 119, $p < 0.05$) and the Scheffe's post-hoc test revealed a significant difference between CAI(AN) and the lecture method groups, favoring CAI(AN), there was no statistically significant difference in the post-test mean scores of male and female students taught using CAI(AT) ($t = 0.660$, $df = 38$, $p > 0.05$) and CAI(AN) ($t = 1.455$, d.f. = 38, $p > 0.05$). Based on these findings, it was therefore recommended that mathematics teachers should be encouraged to use CAI (AN) for meaningful and effective teaching and learning of mathematics.

Ladan M. et al (2014) carried out this study with the aim of investigating the effect of Computer-Assisted Instruction (CAI) on, creativity and academic performance of the students at the sixth grade elementary schools in Kerman. For this reason of 1761 boy students at 6th grade elementary schools in Kerman by cluster sampling method one primary school has been selected. Then randomly two classes of this school were chosen. 31 students who were selected by random sampling was divided into two groups 15 of them in traditional education and training and the others students in Computer-Assisted Instruction (CAI) group. At first a pretest by using the Torrance creativity questionnaire (1986) and cognition O'Neal and Abedi (1996) questionnaire after two months of traditional and Computer-Assisted training and education [6], post- test were examined. The scores of math exam were used for academic performance. The data was analyzed by using SPSS19. Research findings obtained by using (t-independent test) for measuring academic performance between two groups and Covariance analyzing method for measuring the effectiveness of the components of creativity and Meta cognition showed that computer-assisted instruction in creativity and meta-cognition has a significant impact but on students' academic performance, a significant difference could not be seen.

Nguyen V.H. and Henriette V.R. (2014) investigated the effect of Computer Assisted Language Learning (CALL) on performance in the Test of English for International Communication (TOEIC) listening module. Two groups of participants enrolled in the same major, had equivalent general English background and attended the TOEIC listening class twice a week with the same teacher – the researcher in 7 weeks at the College of Finance and Customs, in Vietnam. There were 25 students in the treatment group and the control group. The quasi-experimental method, questionnaire and post-test were used in this study. The material input was designed with the application of CALL introduced into the treatment group only whereas the control group still learned with the current textbook only. The results showed that there was difference in the performance on TOEIC listening test scores between two groups. The students in the treatment group used listening strategies more effectively than the students in the control groups. Moreover, CALL instruction and teaching method increased the students' TOEIC listening scores significantly.

Yi-Horng Lai (2014) conducted this study to synthesize existing research comparing the effects of CAI versus (traditional instruction) TI on students' achievement in Taiwan. In spite of claims regarding the potential benefits of using CAI in education,



research results comparing the effects of CAI and traditional instruction in Taiwan are conflicting. Some studies all reported significant gains for CAI over traditional instruction. However, some studies had found no significant differences between CAI and traditional instruction. In an effort to lend data to this debate, this study provides the first meta-analysis of CAI verse traditional instruction in Taiwanese schools. The results from this study suggest that the effects of CAI in instruction are positive over traditional teaching in Taiwan. Students' learning achievement in language subject area was significant different from mathematics subject area, but learning achievement in sociology, science, and computer subject area were insignificant different from mathematics subject area. Students' learning achievement with multimedia type CAI was significant different from with web-based type CAI, and students' learning achievement with web-based type CAI was better than with multimedia type CAI.

Alhassan D. S. et al. (2013) determined the effectiveness of Computer- Assisted Instructional package (CAIP) on achievement and retention in geometry among junior secondary schools in Minna Metropolis. Two research questions were raised and two null hypotheses were tested. The study adopted the pre-test-posttest - control group design. Simple random sample of eighty students were drawn from four junior secondary schools in Minna Metropolis. The researcher developed computer assisted instructional package on geometry, which was used as treatment instrument for experimental group while control group were exposed to traditional teaching method. The instrument for data collection was Geometry Achievement Test. A 40-items multiple-choice objective type achievement test covering ten selected topics in Geometry was used. A reliability coefficient of 0.75 was obtained using Pearson's product moment correlation coefficient(r).The t-test statistics was used to analyze the hypothesis. The findings revealed that experimental group performed better than the control group. It was recommended that government should organize seminars, workshops and symposium for teachers on the development of computer assisted instructional package to enhance learning among students.

Arslanyilmaz, A. (2013) described a prototype for a computer-assisted task-based language instruction (CATBI) tool designed and developed for Turkish as a Foreign Language, and to report on the effectiveness of the CATBI tool. More specifically, this work discusses an experimental study that examined the role of teaching approach in foreign language development by comparing CATBI to computer-assisted form-focused language instruction (CAFFI) on language production in terms of accuracy, lexical complexity, and fluency. For a duration of 7 days, two intermediate-level Turkish as a Foreign Language classes consisting of 28 high school students participated in this experiment. The classes were randomly assigned to two treatment groups: an experimental group with CATBI and a control group with CAFFI. Statistical analyses revealed that students in the CATBI group produced significantly better and more fluent language than students with CAFFI. However, no significant effects were found in terms of accuracy and lexical complexity of the language produced. Based on these results, it was concluded that CATBI is more effective than CAFFI in enhancing language production in general and fluency in particular.

Manca, S. and Ranieri, M. (2013) attempted to provide a critical overview of current studies focusing on the use of Facebook as a technology-enhanced learning environment, with the aim of exploring the extent to which its pedagogical potential is actually translated into practice. Only empirical studies published in peer-reviewed academic journals with a specific focus on Facebook as a learning environment had been considered for the review. The authors conducted a comprehensive literature search that identified 23 relevant articles that were subsequently analyzed according to a simplified list of guidelines. These articles were further analyzed and recoded through a set of emerging categories. The results showed that pedagogical affordances of Facebook had only been partially implemented and that there were still many obstacles that might prevent a full adoption of Facebook as a learning environment such as implicit institutional, teacher and student pedagogies, and cultural issues.

Nisha, V and Kumar, K. B. (2013) examined the effectiveness of CACT when employed as an adjunct with EBRT in the management of children with Reading, Spelling and Arithmetic disorder. 10 children between the ages 8 and 15 years meeting at least one of the ICD-10 criteria for Reading, Spelling and Arithmetic disorder were sequentially assigned to either EBRT + CACT, or only EBRT. The training for both the groups was conducted in 8-12 sessions, spread over 2 months. Pre- and Post-assessment was conducted using NIMHANS SLD index. It was found that the adjunct intervention relative to EBRT was superior in augmenting various academic skills. However, these differences did not reach statistically significant level owing to smaller sample size. The use of CACT along with EBRT resulted in significant improvement in spelling ability of the group undergoing the same. The CACT seems to have therapeutic potential in developmental disorders when combined with EBRT.

RESEARCH GAP

No student can escape himself from the examination conducted by his school and at the same time, he cannot escape himself from the anxiety created by the exams. However, several methods can be adopted to reduce this anxiety. The use of computers in teaching-learning process is such a method to achieve this objective. From the analysis of above review of literature related to computer assisted learning, it is found that many researches have conducted regarding the impact of computer assisted learning on several variables, but no such research work is found on the impact of computer assisted learning on examination anxiety of the students. So, the investigator got tempted for the study in order to evaluate the effectiveness of computer-assisted learning in reducing examination anxiety among the students.



OBJECTIVES

The above study was taken in hand with in view of the following objectives:

- To evaluate the effect of computer-assisted learning on examination anxiety among students.
- To evaluate the effect of computer-assisted learning on examination anxiety among male students.
- To evaluate the effect of computer-assisted learning on examination anxiety among female students.
- To evaluate the effect of computer-assisted learning on examination anxiety among students of urban area.
- To evaluate the effect of computer-assisted learning on examination anxiety among students of rural area.
- To evaluate the effect of computer-assisted learning on examination anxiety among arts stream students.
- To evaluate the effect of computer-assisted learning on examination anxiety among commerce stream students.
- To evaluate the effect of computer-assisted learning on examination anxiety among science students.

HYPOTHESES

The above study was taken in hand with in view of the following hypotheses:

- There is significant effect of computer-assisted learning on examination anxiety among students.
- There is significant effect of computer-assisted learning on examination anxiety among male students.
- There is significant effect of computer-assisted learning on examination anxiety among female students.
- There is significant effect of computer-assisted learning on examination anxiety among students of urban area.
- There is significant effect of computer-assisted learning on examination anxiety among students of rural area.
- There is significant effect of computer-assisted learning on examination anxiety among arts stream students.
- There is significant effect of computer-assisted learning on examination anxiety among commerce stream students.
- There is significant effect of computer-assisted learning on examination anxiety among science students.

Focus Area

The present paper focuses on the study of the effect of computer-assisted learning on examination anxiety among students of Fazilka district Punjab.

Data Collection Work

Primary data had been used in present study on students taken from Government Senior Secondary School, Khuikhera of Fazilka district with the help of standardized tool. Students' Examination Anxiety Test developed and validated by Dr. Madhu Aggarwal and Miss Varsha Kaushal was used to collect data on students regarding their examination anxiety.

Statistical Techniques

For the analysis of data from different angles, various types of statistical techniques such as mean, standard deviation and t-value were used.

RESEARCH METHODOLOGY

Research Design

An experimental pre-test post-test design was used in the present study. First of all, the students were taught some topics of science with traditional method like lecture method a test of those topics was taken along with examination anxiety test and the scores were recorded and after that the same group of students were taught the same topics of science with the help of power point presentations including graphics, animations and sound and after the completion of course, they were again tested on the bases of their achievement scores and on examination anxiety and again the scores were recorded to see significant difference between the scores on examination anxiety test.

Sample Design

The research was concerned a representative sample of 30 students of class XI of Government Senior Secondary School, Khuikhera of Fazilka District. According to the objectives of the study, this sample was further divided into several parts based on various demographic variables like gender, locality and stream.

Time

As far as the time of the present study is concerned, it can be said that the effect of computer-assisted learning on examination anxiety among students was done in the month of January 2016. The period was divided into two segments. In the first segment of 15 days, the students were taught with lecture method and in the second segment of 15 days, they were taught with computer based instruction method.

Sampling Plan

In carrying out a data firstly selected the parameters and then study the effect of computer-assisted learning on these selected parameters.

Parameters of the Study

In the present study, the analysis of effect of computer-assisted learning was done with reference to the following parameters:

- Overall students taken as a sample
- Male students
- Female Students
- Urban Students
- Rural Students
- Arts Stream Students
- Commerce Stream Students
- Science Stream Students

FINDINGS AND DISCUSSION

The major findings of this research and the analysis of data is shown the following tables:

Table-1: Showing Effect of Computer Assisted Learning on Examination Anxiety of Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
29.18	16.1	4.67	3.42	1.06	12.34	Significant at 1% Level

Sources: Primary Data

From the analysis of the table, it is clear that computer assisted learning clearly helps in reducing examination anxiety among the students as the mean scores obtained by the sample of students selected for the above study shows a significant decline in post-test as compared to pre-test. The t-Value also shows significant difference at 1% level between the scores obtained on examination anxiety test in pre-test and post-test format. This means that computer assisted learning is successful in reducing the level of examination anxiety among the students.

Table-2: Showing Effect of Computer Assisted Learning on Examination Anxiety of Male Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
30.59	17.33	4.82	3.48	1.53	8.67	Significant at 1% Level

Sources: Primary Data

From the analysis of the table, it is clear that computer assisted learning clearly helps in reducing examination anxiety among the male students as the mean scores obtained by the sample of male students selected for the above study shows a significant decline in post-test as compared to pre-test. The t-Value also shows significant difference at 1% level between the scores obtained on examination anxiety test in pre-test and post-test format. This means that computer assisted learning is successful in reducing the level of examination anxiety among the male students selected for the present study.

Table-3: Showing Effect of Computer Assisted Learning on Examination Anxiety of Female Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
27.77	14.87	4.34	3.20	1.39	9.28	Significant at 1% Level

Sources: Primary Data

From the analysis of the table, it is clear that computer assisted learning clearly helps in reducing examination anxiety among the female students as the mean scores obtained by the sample of female students selected for the above study shows a significant decline in post-test as compared to pre-test. The t-Value also shows significant difference at 1% level between the scores obtained on examination anxiety test in pre-test and post-test format. This means that computer assisted learning is successful in reducing the level of examination anxiety among the female students selected for the present study.

Table-4: Showing Effect of Computer Assisted Learning on Examination Anxiety of Urban Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
31.72	17.53	4.92	3.44	1.55	9.15	Significant at 1% Level

Sources: Primary Data

From the analysis of the table, it is clear that computer assisted learning clearly helps in reducing examination anxiety among the urban students as the mean scores obtained by the sample of urban students selected for the above study shows a significant decline in post-test as compared to pre-test. The t-Value also shows significant difference at 1% level between the scores obtained on examination anxiety test in pre-test and post-test format. This means that computer assisted learning is successful in reducing the level of examination anxiety among the urban students selected for the present study.

Table-5: Showing Effect of Computer Assisted Learning on Examination Anxiety of Rural Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
26.64	14.67	4.18	3.02	1.33	9.00	Significant at 1% Level

Sources: Primary Data

From the analysis of the table, it is clear that computer assisted learning clearly helps in reducing examination anxiety among the rural students as the mean scores obtained by the sample of rural students selected for the above study shows a significant decline in post-test as compared to pre-test. The t-Value also shows significant difference at 1% level between the scores obtained on examination anxiety test in pre-test and post-test format. This means that computer assisted learning is successful in reducing the level of examination anxiety among the rural students selected for the present study.

Table-6: Showing Effect of Computer Assisted Learning on Examination Anxiety of Students of Arts Stream

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
26.22	15.00	4.11	3.04	1.62	6.93	Significant at 1% Level

Sources: Primary Data

From the analysis of the table, it is clear that computer assisted learning clearly helps in reducing examination anxiety among the students of Arts stream as the mean scores obtained by the sample of students of Arts stream selected for the above study shows a significant decline in post-test as compared to pre-test. The t-Value also shows significant difference at 1% level between the scores obtained on examination anxiety test in pre-test and post-test format. This means that computer assisted learning is successful in reducing the level of examination anxiety among the students of Arts stream selected for the present study.

Table-7: Showing Effect of Computer Assisted Learning on Examination Anxiety of Students of Commerce Stream

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
30.04	16.30	4.45	3.11	1.72	7.99	Significant at 1% Level

Sources: Primary Data

From the analysis of the table, it is clear that computer assisted learning clearly helps in reducing examination anxiety among the students of Commerce stream as the mean scores obtained by the sample of students of Commerce stream selected for the above study shows a significant decline in post-test as compared to pre-test. The t-Value also shows significant difference at 1% level between the scores obtained on examination anxiety test in pre-test and post-test format. This means that computer assisted learning is successful in reducing the level of examination anxiety among the students of Commerce stream selected for the present study.

Table-8: Showing Effect of Computer Assisted Learning on Examination Anxiety of Students of Science Stream

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
31.28	17.00	4.73	3.42	1.85	7.72	Significant at 1% Level

Sources: Primary Data

From the analysis of the table, it is clear that computer assisted learning clearly helps in reducing examination anxiety among the students of Science stream as the mean scores obtained by the sample of students of Science stream selected for the above study shows a significant decline in post-test as compared to pre-test. The t-Value also shows significant difference at 1% level between the scores obtained on examination anxiety test in pre-test and post-test format. This means that computer assisted learning is successful in reducing the level of examination anxiety among the students of Science stream selected for the present study.

CONCLUSIONS AND IMPLICATIONS OF STUDY

Concluding Remarks

Hypothesis-I: As far as Hypothesis-I, that "There is significant effect of computer assisted learning on examination anxiety among students" is concerned, it is found that this hypothesis is accepted as after the treatment given in the form of computer assisted learning, there is significant decline in the examination anxiety of students. Therefore, it can be concluded that computer assisted learning proves to be helpful in reducing examination anxiety among the students.

Hypothesis-II: As far as Hypothesis-II, that "There is significant effect of computer assisted learning on examination anxiety among male students" is concerned, it is found that this hypothesis is accepted, as after the treatment given in the form of computer-assisted learning, there is significant decline in the examination anxiety of male students. Therefore, it can be concluded that computer assisted learning proves to be helpful in reducing examination anxiety among male students.

Hypothesis-III: As far as Hypothesis-III, that "There is significant effect of computer assisted learning on examination anxiety among female students" is concerned, it is found that this hypothesis is accepted, as after the treatment given in the form of computer-assisted learning, there is significant decline in the examination anxiety of female students. Therefore, it can be concluded that computer assisted learning proves to be helpful in reducing examination anxiety among female students.

Hypothesis-IV: As far as Hypothesis-IV, that "There is significant effect of computer assisted learning on examination anxiety among urban students" is concerned, it is found that this hypothesis is accepted, as after the treatment given in the form of computer-assisted learning, there is significant decline in the examination anxiety of urban students. Therefore, it can be concluded that computer assisted learning proves to be helpful in reducing examination anxiety among urban students.

Hypothesis-V: As far as Hypothesis-V, that "There is significant effect of computer assisted learning on examination anxiety among rural students" is concerned, it is found that this hypothesis is accepted, as after the treatment given in the form of computer-assisted learning, there is significant decline in the examination anxiety of rural students. Therefore, it can be concluded that computer assisted learning proves to be helpful in reducing examination anxiety among rural students.

Hypothesis-VI: As far as Hypothesis-VI, that "There is significant effect of computer assisted learning on examination anxiety among students of arts stream" is concerned, it is found that this hypothesis is accepted, as after the treatment given in the form of computer-assisted learning, there is significant decline in the examination anxiety of students of arts stream. Therefore, it can be concluded that computer assisted learning proves to be helpful in reducing examination anxiety among students of arts stream.

Hypothesis-VII: As far as Hypothesis-VII, that "There is significant effect of computer assisted learning on examination anxiety among students of commerce stream" is concerned, it is found that this hypothesis is accepted, as after the treatment given in the form of computer-assisted learning, there is significant decline in the examination anxiety of students of commerce stream. Therefore, it can be concluded that computer assisted learning proves to be helpful in reducing examination anxiety among the students of commerce stream.



Hypothesis-VIII: As far as Hypothesis-VIII, that "There is significant effect of computer assisted learning on examination anxiety among students of science stream" is concerned, it is found that this hypothesis is accepted, as after the treatment given in the form of computer-assisted learning, there is significant decline in the examination anxiety of students of science stream. Therefore, it can be concluded that computer assisted learning proves to be helpful in reducing examination anxiety among the students of science stream.

CONCLUSION

In the nutshell we can conclude that computer assisted learning is of great significance in reducing examination anxiety among students. It is the need of the hour and the teachers should incorporate this technology oriented learning process while imparting instructions to their students. By the use of this technology-oriented methodology, the teachers can make their students feel free and in this way, they can be successful in reducing suicidal tendencies and mental breakdown among their students.

IMPLICATIONS

The current study is mainly concerned with the analysis of effect of computer-assisted learning on examination anxiety among students of Fazilka District Punjab. As the study reflects significant effect of computer assisted learning in reducing examination anxiety among students, so provides important analysis to judge the effectiveness of modern day teaching methodologies. The study will be helpful to the academicians and researchers for further study in this respect.

FUTURE AREAS OF RESEARCH

- Effect of Computer assisted learning on some other problem or some other behavioural aspect of students can be done.
- A comparative study of traditional method of teaching and computer assisted learning effectiveness can be done.

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WIRELESS NETWORK: A SURVEY ON ENERGY EFFICIENCY IN AODV AND DSR PROTOCOLS

Suresh Chandra Wariyal⁸ Dr. Manoj Kumar Pandey⁹

ABSTRACT

As the time changes, the demand for larger data-rate wireless communications that are of many medium has been increasing rapidly. Machine consumption power is increasing with the increase of higher capacity wireless links to meet increasing demands. Although technology of silicon is progressing very fast, the power of consumption of processor is also increasing but the improvement in technology of battery is very much slow. In addition, the reductions of machine sizes are also imposing a study of relationship between people and their working environment on the battery capacity available. There are various sensor nodes are generally battery-powered and can function without having somewhat long period. To recharge the batteries and sometimes to change them is very tedious and even impossible for these sensor nodes. As a result, routing protocols related to energy saving in wireless networks is required for increasing the life of network. The research present a relative study of various routing protocol and analysis of these routing protocol is presented in the paper. AODV, BATMAN, DSR, Proactive, Reactive and OLSR routing protocols have been projected to enhance the performance. Different routing protocols have their different behavior for improving and maintaining the performance of routing as well as to determine the route. The packet travel from source node to destination node by using the routing protocol, which initially transmits the packet to the closest node and after that node, sends the packet to subsequent node. The survey of paper uncover that what effects are given by various routing protocols for packet length, number of nodes and mobility.

KEYWORDS

Routing Protocols, AODV, DSR, OLSR, Proactive, Reactive etc.

INTRODUCTION

Low cost, less power and varied functional sensor nodes that are small and communicate without having to worry in short distance comes under the modern advancement in wireless communications. These various types of small sensor nodes purposely used for sensing, data processing, and communicating components, leverage the idea of sensor networks. Sensor networks represent an important enhancement over conventional sensors. A network, which is a type of sensor, is combination of a huge amount of sensor nodes that are heavily organized and deployed either within the phenomenon or extremely close to it. The arrangement of sensor nodes require not be prearranged and this permits on demand deployment in remote environments or catastrophe release actions. This also means that sensor network algorithms and protocols have to acquire self-organizing capabilities. One more distinctive aspect of sensor networks is the supportive attempt of sensor nodes. Sensor nodes closely carry out straightforward computations and send only the needed and partially processed data. Various proactive and reactive routing protocols are presented at conclusion end [1], [2], [3], [4], [5], [6].

RELATED WORK

Two protocols AODV and DSR are presented in this paper as well as in this paper, various types of energy efficient routing protocols based on less power consumption, performance, throughput and network delay are explained[17].

MATERIALS

Various resources are to be used to increase the efficiency of energy [17] [18].

A. Routing

To establish path and to forward the packets from source node to the sink node is done by the Routing process. Two-step need to be followed, selection of route for different source-destination pair and ultimately send data packets to the correct and required destination. Numbers of routing tables, protocols and data structures are used to get these two steps. Four approaches that are proactive, reactive, hybrid and location based routing protocols are going to be discussed to meet the energy efficient routes as well as the paper emphasis on finding the most energy efficient route.

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B. Classification

There are various routing protocol is defined below:

1. Proactive Routing:

The routes are continuously evaluated by proactive protocols, which are the part of network so there is no time delay (time delay due to discovery of route) and the packets can immediately be sent to the destination. A path, which is shortest i.e. shortest path, can be discovered without having any delay; on the other hand, these protocols are not appropriate for extremely crowded networks that are of ad-hoc type. For the get rid of the inadequacy of proactive protocols various amendment have been proposed and use in ad-hoc networks. Between all pair of nodes, the proactive protocols use the unicast routing methods without considering whether entire paths are actually used or not. The proactive protocol is of two types that are link state proactive protocol and distance vector proactive protocol. In the link state proactive protocol every node preserves an outlook of the network topology and it maintain the cost of each and every outgoing links and use the technique of flooding for periodically broadcast its link cost. In distance vector proactive protocols, every node retains a routing table, which contains cost (of every node), next node, destination node, total number of node etc.

2. Reactive Routing

It is in addition known as demand routing, which is more efficient in comparison to proactive routing. Most of the present work as well as modifications have been made for making this type of routing more and more improved. The key concept behind this type of routing protocol is to search a path between sources and sink whenever that path is required while in the proactive type of protocols all the routes are maintained without concerning its state of use. Therefore, we do not need to worry about the routes or paths that are not being used presently. On demand, routing is a kind of reactive routing. Route maintenance does not required during the discovery of route in the case of on demand routing. If we compare between reactive protocols with proactive protocol with the factor of time delay then it was observed that reactive protocol occupies larger time delay.

3. Hybrid Routing

The hybrid approach combines both the reactive and proactive routing, each of these routing methods have some pros and cons. The best part of hybrid routing is to combine the advantages of both or the better part of these routing techniques used in isolation. Examples of hybrid protocols are Hazy Sighted Link State, Zone Routing Protocol.

4. Location based Routing

Location based routing is entirely dissimilar from all methods detailed above, which obtain an entirely varied method that utilize the global information of the nodes. As all the above methods contribute to general characteristics of finding topology information with the assistance of routing messages and then in the continuation need to discover other routes by the help of routing tables. In this routing mechanisms every nodes of the network is having a GPS fixed or installed in it. Therefore, by localization technology or GPS system, each node knows its global position and it does not require any kind of discovery of route and route maintenance algorithms.

5. Better Approach to Mobile Ad Hoc Network (BATMAN)

As its name implies, it is a better approach, which sends the OriGinator Message (OGM), with the size of 52 bytes. The BATMAN encloses the information of the IP address of the next node and sequence number is as well amplified. The identification of whether the connection is unidirectional or bidirectional is shown by its variation in nodes sequence number and if the node varies within the range then the connection is bidirectional.

6. Optimized Link State Routing algorithm (OLSR)

In [9] [22] OLSR generates the various links between the nodes as provided by the source to sink. At first, the OLSR dispatch the HELLO message to inspect its neighbor. Whenever the packet is being transmitted, there is the need to change in the routing table. The information of Topology control packets is the tool to manage the routing table. The route to send data from source end to sink is selected by using the shortest path algorithm when the traffic is reduced.

7. Energy Efficient Routing

Energy of nodes is important and based upon limited power supply of battery as well as the nodes can be in motion and uncontrolled way so most of the time failures of routes are possible. The energy efficient routing method is only the result of above condition. By sensible flooding the route discovery in reactive protocols can be achieved for energy efficiency [9].

Here Table-1 and Table-2[1] [3] [4] [7] gives the summary about performances of three routing protocols in which “1” denotes the best performance and “3” denotes the worst performance

TABLE I. **NODES = 100, PACKET LENGTH = 50,000 BYTES.**

Protocols	Packet Delivery Ratio(PDR)	End to End Delay	Routing Load	Through H-put
BATMAN	2	3	3	3
OLSR	1	1	1	2
DSR	3	2	2	1

Sources: Authors Compilation

TABLE II. **NODES = 100, MOBILITY 30(M/S).**

Protocols	Packet Delivery Ratio(PDR)	End to End Delay	Routing Load	Through Hput
BATMAN	2	2	3	2
OLSR	1	1	2	1
DSR	3	1	1	3

Sources: Authors Compilation

METHODS

A. Energy efficient routing protocols

Following energy efficient routing protocol have been discussed in this section.

B. Ad Hoc On Demand Distance Vector (AODV)

The AODV protocol uses two message scheme route request (RREQ) messages and route reply (RREP). The route request (RREQ) message is used to flood the network in order to determine the paths needed by a source node. The mediator node, which receives the message, replies by using route reply (RREP) message. The sequence number (route to destination) must be greater than or equal to the one enclosed in the RREQ. At the receiver end, the RREQ may send a route reply (RREP). Otherwise, it rebroadcasts the RREQ. Source IP address and broadcast ID is the RREQ's identification request number that keep track about messages. Therefore, in the case of AODV method if RREP comes from the destination end, it may begin to forward data packets to the destination.

1) Advantages and Disadvantages

To set up the routes on demand is the key advantage of AODV protocol and target sequence numbers purposely used to get the most recent route to the destination. In AODV protocol, the delay factor in the case of connection setup is very much less. To avoid unwanted load in the network the HELLO messages supporting the routes maintenance are range limited.

The disadvantages of AODV protocol is that middle nodes can lead to inconsistent routes if the source sequence number is aged and the middle nodes have a higher but not the latest destination sequence number, thus having out of date entries. The other disadvantage of AODV protocol that a single route request can lead to heavy control overhead when there are multiple Route Reply packets.

C. Dynamic Source Routing (DSR)

For wireless mesh a network that is dependent on a process called source routing known as Dynamic Source Routing (DSR) in [3] [5] is a routing protocol. The DSR routing protocol is as like to AODV protocol in that it forms a route on-demand when a transmitting computer requests one. Each mediatory node that transmits a route request packet appends its individual address identifier to a list carried in the packet. The sink node produces a route reply message, which comprises the catalog of addresses received in the route request, and broadcasts it back along this path to the source end. In DSR the Route maintenance is done by the acknowledgment that nodes generate when they can validate that the subsequently node effectively received a packet. The acknowledgments can be link-layer and network-layer specified by the DSR protocol. However, it uses source routing instead of relying on the routing table at each intermediate device. Packet will resend if the packet is not capable to identify the successful reception.

The node produces a route error message, which identifies the challenging link, when a limited amount of retransmissions is unsuccessful. When a node needs a route from a source to a sink, which it does not have in its route cache, it transmits a Route Request message, which is flooded all over the network.

D. Energy Dependent DSR (EDDSR)

The DSR protocols that assist nodes from sudden and sharp fall of battery power is known as EDDSR [8], which is energy dependent. In comparison to the Least Energy Aware Routing (LEAR) and minimum drain rate, (MDR) EDDSR provides better power utilization. With a smaller amount power supply and residual energy information of node EDDSR avoids use of node, is helpful in detection of route. MDR and EDDSR are better than the DSR in terms of lifetime of node, shows with help of ns-2 simulator. EDDSR use route cache, which make EDDSR more effective than MDR.

E. Location Aided Routing (LAR)

For wireless mobile Ad-hoc networks LAR [4] (Location Aided Routing) protocol is most essential and globally acceptable routing protocol. Flooding source node broadcast the route request to its neighbors. These source nodes test there identification with sink node. As soon as the message is found at the destination-end target is achieved otherwise source node again sends the message to it neighbors. So, broadcast moves outwards from source. When each node received the message then broadcast is terminated. The basic purpose of LAR is to decrease the flooding overhead by the help of location information of nodes. Global positioning system is the tool to achieve the Location information of node. There might be the chances of error during the location information obtained from GPS but at the same time, it is also observed that as the technology change the chance of error is reduced considerably. As the result, GPS computed coordinates and genuine coordinates are similar. Various nodes move in 2-Dimensional plane assumed in LAR. There are two concepts of LAR Expected Zone and Request Zone. In the case of expected zone, the destination node found calculated by the assistance of its location information and speed. To reduce the size and increase the accuracy, additional information like direction of movement can be helpful in expected zone. Request zone comprise expected zone in addition to other areas around the expected zone. Route request can be forwarded by those nodes only which belong to this request zone. Therefore, to amplify the efficiency of protocol a restriction on flooding is applied.

F. Classifying by the protocol operation

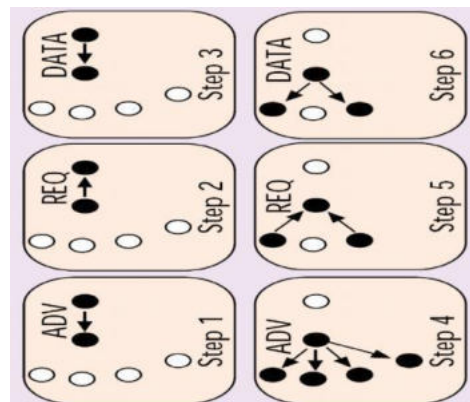
In [8], (i)Multipath based(ii)Query-based(iii)Negotiation-based(iv)QoS-based(v)Coherent-based are different energy efficient based routing methods are as follows

1) Flat-Based Routing

To perform the sensing task each sensor nodes performs the similar way and co-operates with other nodes. The network includes a huge amount of such type of nodes and a Base Station (BS) sends queries to certain areas and waits for responses from the sensors situated in the preferred regions.

There are some points need to considered in the case of Flat-Based Routing (i) Every node normally plays the equal responsibility (ii) To carry out the sensing task, Sensor nodes collaborates (iii) Data-centric routing (iv) Sensor Protocols for Information via Negotiation (SPIN) (v) To completely describe their collected data, nodes assign a high-level name (vii) Do negotiation of data about data (metadata) before data transmission [16].

Figure-1: Works well in Time-Driven Fashion



Sources: Authors Compilation

SPIN offers more energy savings than flooding; Metadata cooperation approximately halves the redundant data. However, there is no delivery guarantee of data.

2) Rumor Routing

When the number of query is huge and number of events is small then rumor routing is used. When a node perceives an event then number of action performed (i) Insert the event to events table (ii) An agent is Generated which encloses the local event information (iii) The whole networks is travelled by agent. (iv) For an event a node generates query (v) Response of the query can be given when the node know the route (vi) The best result can get in the case when the number of events is small.

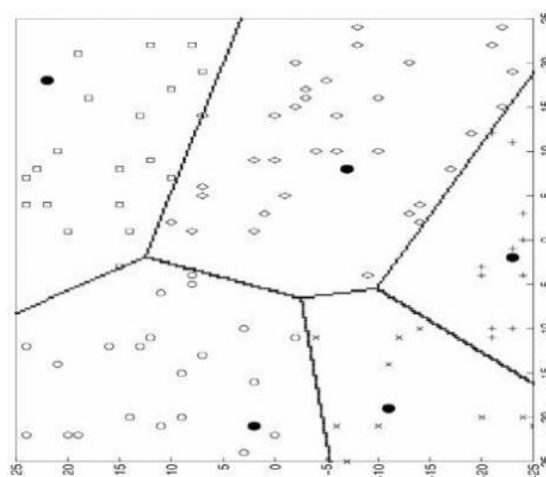
3) Energy-Aware Routing

Instead of one best possible path Energy-Aware Routing, keep a set of paths and the selection of path based on a certain probability. As the Energy-Aware Routing uses the multiple paths at different times, the energy of any single path will not diminish quickly.

4) Hierarchical-based Routing

In the case of Hierarchical-based, routing nodes will play varied tasks in the network. To send and process the information, higher energy nodes can be used. To lesser energy consumption within a cluster, hierarchical-based routing is a proficient approach. The only purpose of low energy nodes is to perform the sensing job.

Figure-2: Hierarchical-based Routing

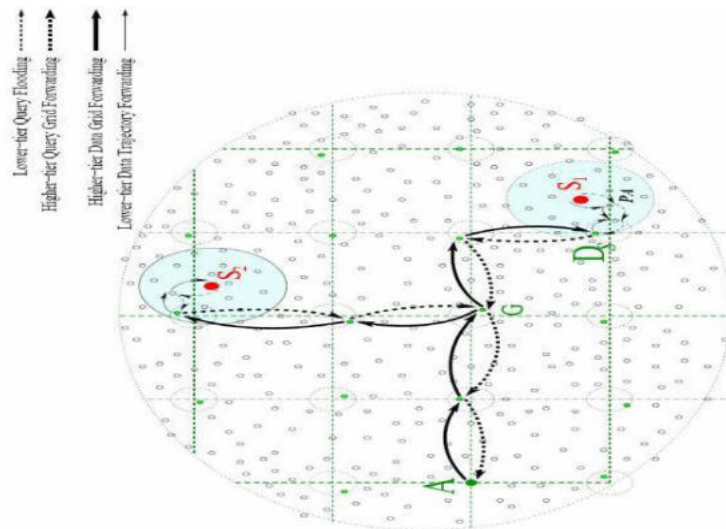


Sources: Authors Compilation

5) Two-tier Data Dissemination

To propagate data each data source proactively constructs a framework of grid type structure. Base station floods a query to the propagation point of its local cell. The propagation end will forward the query to the source end on the higher-tier. Source returns the data through the reverse path to the Base Station.

Figure-3: Two-tier Dissemination



Sources: Authors Compilation

6) Location-Based Routing

In Location-Based Routing all Sensor node are tackled by means of their locations. To route data in the network sensor nodes positioned are exploited. The GPS is a tool to gather the information or by interchanging the concern coordinates of it is nearby for estimation purpose.

7) Geographic Adaptive Fidelity (GAF)

In GAF, the area of network is partitioned into fixed size regions to form a virtual grid. The size of cluster is based on the required communication direction and transmitting power. Within each region, nodes will choose one sensor node to continue awake for a certain amount of time, and afterward the remaining go to sleep mode.

G. Classifying by the protocol operation

Multipath based: It is technique, which maintains several paths from destination end to originator end. Several numbers of benefits like Enhancement of the system lifetime, fault tolerance. As well as destination link broadcast a query for data and in response to the queries made, the destination node sends the data that matches the query.

Negotiation-based: To remove repeated and redundant data the negotiation-base methods use high-level data descriptors.

QoS-based: Certain QoS metrics like energy, delay and bandwidth has to be satisfied by the network when delivering data to the BS.

Coherent and Noncoherent based: The data is sent for further processing by the aggregators after smallest amount of processing, in coherent routing. In noncoherent data processing routing, nodes will individually process the unprocessed data before it is delivered to other nodes for more advance processing [19] [20].

Further research on the following aspects is desired.

Energy-Efficient Transmission in Downlink

Role of Traffic Statistics

Tradeoff between EE and SE [21]

RESULTS AND DISCUSSIONS

In the above discussion, we have used two type of protocol that is proactive and reactive protocol that are used to find the path from source to destination. The comparison between BATMAN, DSR and OLSR need to perform by using the parameter like packet delivery ratio, end-to-end delay, routing load and throughput. When the given parameters are used with different protocols, gives difference performance. As well as, with the variation of number of node, packet length and mobility different type of variation is done.

Table-III: Overall Performance of Protocols

Maximum Number of nodes with Maximum Packet length	OLSR>DSR>BATMAN
Maximum Number of nodes with Maximum Mobility	OLSR>BATMAN>DSR

Sources: Authors Compilation

The table below shows the classification of the various protocols, which was enclosed in this survey. The survey also emphasize various characteristics like Data centric, Hierarchical, Location Based, QoS, Network flow, Data Aggregation. These factors are used in various Routing Protocols as defined below:

Table-IV: Classification of Routing Protocols in Sensor Networks

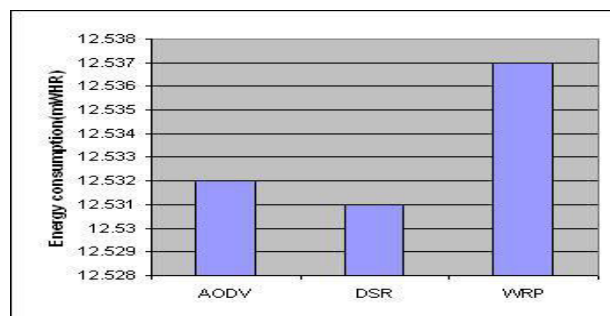
Routing Protocol	Data Centric	Hierarchical	Location Based	QoS	Network Flow	Data Aggregation
SPIN	Yes					Yes
Rumor Routing	Yes					Yes
GBR	Yes					Yes
CADR	Yes					Yes
COUGAR						Yes
ACQUIRE	Yes					
LEACH	Yes	Yes	Yes			Yes
GAF		Yes	Yes			
GEAR				Yes		
SAR			Yes	Yes		

Sources: Authors Compilation

Employing ADHOC Routing Protocols

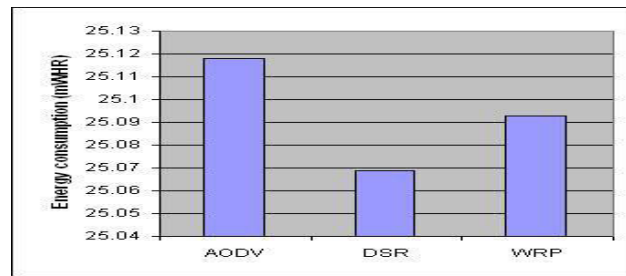
From below Figure, It is observed that from DSR, WRP and AODV routing protocols DSR performed in the best way in the case of energy consumption. WRP protocol performs worst in the case of energy consumption in the case of low traffic network. For high traffic network, WRP performs well. In the case of AODV, one thing that might be accountable for that is the conflicting path created by the intermediary nodes in the network. [1], [4], [10], [11]

Figure-4: Energy Consumption by the Nodes (50 nodes, 10 sources)



Sources: Authors Compilation

Figure-5: Energy Consumption by the Nodes (100 nodes, 40 sources)



Sources: Authors Compilation

Simulation 1: Impact of number of nodes

Simulation number of nodes is changeable and measured 20,40,60,80 and 100 and additional network parameters are measured as in the table 5.

Table-V: Network Parameters

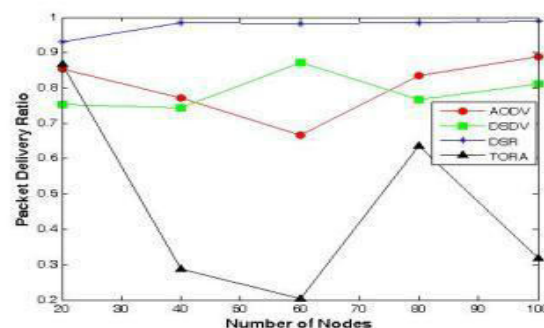
Parameter	Values
Routing Protocol	AODV, DSDV, DSR and TORA
Simulation Time	500 Seconds
Traffic Type	CBR
Maximum Connections	10
Transmission Rate	4 Packets per Second
Packet Size	512 byte
Pause Time	50 Seconds
Number of Nodes	20, 40, 60, 80 and 100
Network Area	1000m X 1000m
Maximum Speed of Nodes	20 m/s
Mobility Model	Random Waypoint
Interface Queue	50PacketDrop-tail Priority
Primary Energy of Node	40 J

Sources: Authors Compilation

With the enhancement in amount of nodes the routing overheads enhance which is shown in the below graph. As well as the figure 6 to figure 10 an assessment between the routing protocols as a function of number of nodes. When we compare between DSR and DSDV protocol then DSR has more better packet delivery ratio than DSDV protocol but largely DSDV has better performance [12],[13],[14],[15].

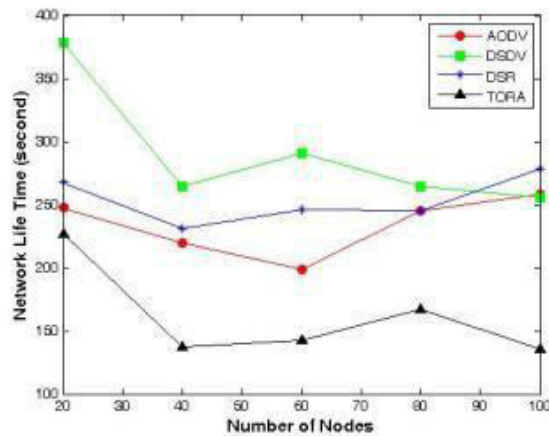
AODV and DSR have average performance while the TORA has low performance.

Figure-6: Packet Delivery Ratio versus Number of Nodes



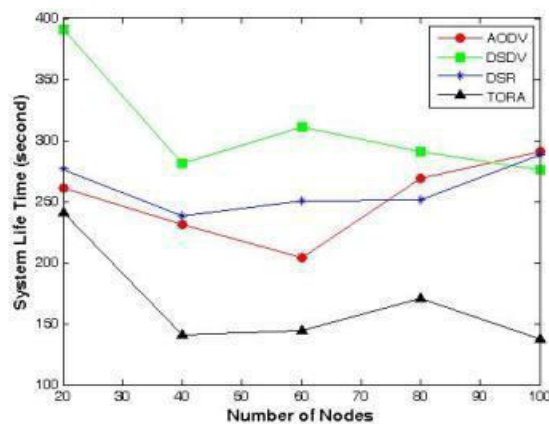
Sources: Authors Compilation

Figure-7: Network Life Time versus Number of Nodes



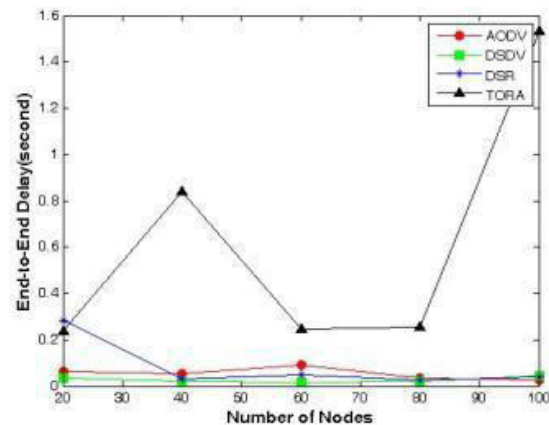
Sources: Authors Compilation

Figure-8: System Life Time versus Number of Nodes



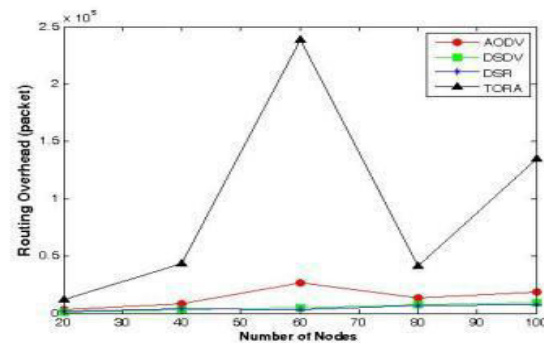
Sources: Authors Compilation

Figure-9: End-to-End Delay versus Number of Nodes



Sources: Authors Compilation

Figure-10: Routing Overhead versus Number of Nodes



Sources: Authors Compilation

Simulation 2

In this simulation pause time is varying and considered 0, 10, 20, 50, 100, 250 and 500 second. In [18], [19], [20] the network parameters we have used in this simulation shown in the table 6.

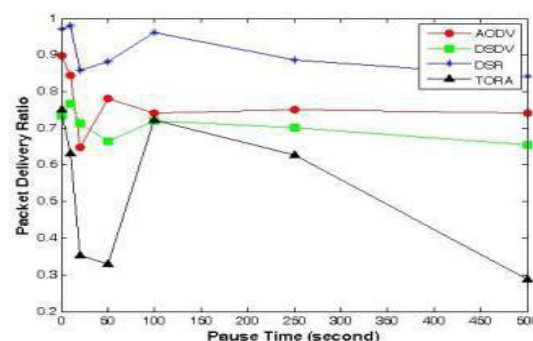
Table-VI: Network Parameters

Parameter	Values
Routing Protocols	AODV, DSDV, DSR and TORA
Simulation Time	500 Second
Traffic Type	CBR
Maximum Connections	10
Transmission Rate	4 Packets per Second
Packet Size	512 byte
Pause Time	0, 10, 20, 50, 100, 250 and 500 second
Number of Nodes	50
Network Area	1000m X 1000m
Maximum Speed of Nodes	20 m/s
Mobility Model	Random Waypoint
Interface Queue	50 Packet Drop-tail
	Priority
Primary Energy of Node	40 J

Sources: Authors Compilation

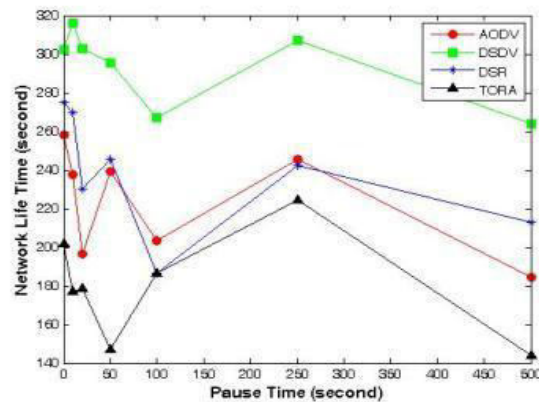
We simulated this network under various routing protocols and outputs are shown in Figs. 11-15.

Figure-11: Packet Delivery Ratio versus Pause Time



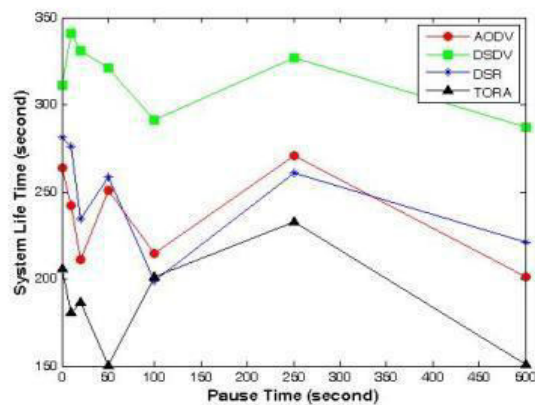
Sources: Authors Compilation

Figure-12: Network Life Time versus Pause Time



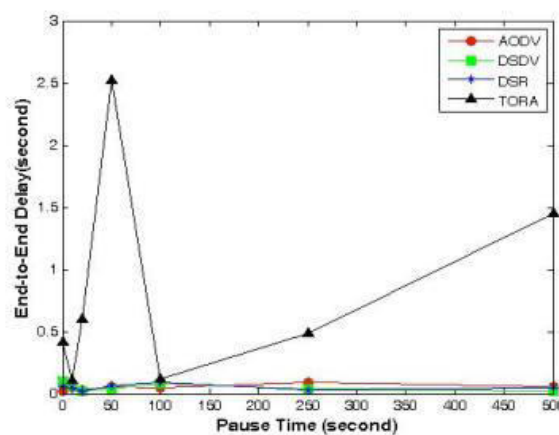
Sources: Authors Compilation

Figure-13: System Life Time versus Pause Time



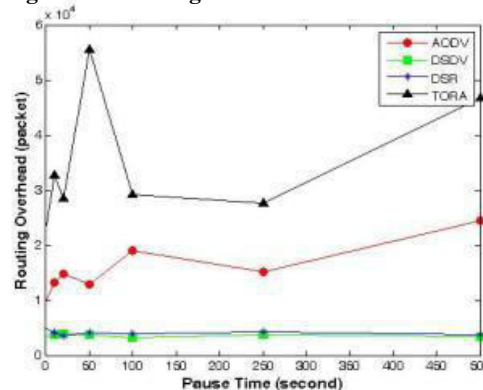
Sources: Authors Compilation

Figure-14: End-to-End Delay versus Pause Time



Sources: Authors Compilation

Figure-15: Routing Overhead versus Pause Time



Sources: Authors Compilation

All the Figures 11-15 above show an assessment between the routing protocols as a function of pause time and then the following conclusion have reached.

Routing Protocol	Performance
DSR	In case of Packet Delivery Ratio DSR has better performance
DSDV	In case of Network Life Time and System Life time DSDV has better performance
AODV, DSDV, DSR	In case of End-to-End Delay AODV, DSDV and DSR have relative performance
DSDV	In case of Routing Overhead DSDV has better performance

CONCLUSION AND FUTURE WORK

The research paper describes the conventional protocols with their modification that incorporates energy efficiency. The research paper also emphasizes the significance of energy efficient routing protocols and that concludes that in the wireless network there is not a particular protocol, which can give the best performance. Numbers of factors have also been explained to compare and increase the routing efficiency. As the network, parameter changes the performance of the protocol also change. Energy of node and the mobility of the node are used as the prime concern alternatively. The network environment and the type of network have discussed concerning the performance and suitability subsequently. Various energy efficient protocols have been discussed with their comparisons in the research paper.

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OPPORTUNITIES AND BARRIERS OF USING INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) BY SMALL AND MEDIUM SIZE ENTERPRISES (SME'S) IN INDIA

Pramod Kumar Mishra¹⁰ Dr. Devendra Kumar Pandey¹¹ Dr. Anil Vashisht¹²

ABSTRACT

The small and medium size enterprises (SMEs) are facing very tough completion. Information and communication technology (ICT) are contributing for this, in developing countries like India. Government and non-government organisation are contributing to support small and medium size enterprise to identify and solve this problem. They are helping to implement the e-commerce and information and communication technology (ICT) in their enterprise.

Adoption of ICT is still in its infancy level In Indian SEMs. There are some opportunity and barriers to adopt of ICT in small and medium size enterprise. Implementing ICT in their industries, they can face global competition and organisation can grow rapidly. This paper is based on the study conducted of SME's enterprise faced barriers and opportunity to implement ICT.

KEYWORDS

Small and Medium Size Enterprise (SMEs), Information and Communication Technology (ICT) etc.

INTRODUCTION

The prospect of implementing Information and Communication Technology (ICT) in small and medium size enterprise create ability to face the competition as well as increase the productivity of the firm. SMEs are facing global competition now days. Government and Non-Government organisations are taking initiative steps to encourage SMEs to adopt information and communication technology in there enterprises in India. One of the big factors, I have seen in SMEs by adoption of ICT is that, the mangers of these enterprises are not confidant. Second factor is lake of skilled person in these enterprises.

Through explicit learning in the new technologies. The MSME Act comes in existence in 2006. According to 2014 report, 14.38 Lakhs MSME are working in India. If we will implement ICT in their firm then enterprise can transfer, collect and manage a lot of information and reduce time, distance barriers and new business and opportunity can grasp by the SMEs.

Implementing ICT new venture is create and SMEs can modify existence ventures. The successful adoption of ICT tools SMEs can enhance productivity in electronics and machinery sectors. This paper address of a particular issue value creating process for SMEs, and barriers in adopting ITC tools in SMEs.

ICT TOOLS CLASSIFICATIONS

The SMEs are facing the very tough global completion in business that is why the adoption of ITC has increased by these enterprises. ITC tools has been classified and distinguished on different way, where each tools has their own importance for the firm and manger in their SMEs. There are following tools.

Integration Tools

There are following tools are included in this (WAN, LAN, Database, Data Modelling support System, Group working, EDI, ERP, Internet, CAD, DSS etc.)

Knowledge Management Tools

These tools are used to solve the problem, make the relation between organisation, integration among the individual and among the organisation. Tools are (Lotus Notes, Software agents, Groupware).

Process Tools

There are dedicated software which is use to concur in the transformation of input into output.

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The main ICT tools and their related advantage are as follows:

Table-1

ICT Tools	Advantages
Dedicated Software, Workstations	It is used to bring complex analytical method
Artificial Intelligence, CAD, EDI, Search Engine	It is used to reduce the human labour
EDI, Internet, Intranet, Video Conferencing	In very large distance this tools can transfer data and information very fast.
CAD / CAM, EDI	This tool is use in Mechanical device, enterprise development interference.
Artificial Intelligence, Groupware, Shared Databases	It is Used to capture Knowledge and Experience
Videoconferencing, Audio Conferencing, Search Engine	It is used for Graphics, Sound and Video
Groupware Technology, Shared Databases	Multiple task can we complete through the simultaneously through this tool
Artificial Intelligence, CAM, Sensors, Internet-based Applications	Tracking system, input and output based application
Artificial intelligence, Dedicated software, Groupware Technology	Unstructured in reutilization process.

Sources: Authors Compilation

ICT AND VALUE CREATING PROCESS FOR SMEs

Implementation of information and communication technology (ICT) by small and medium size enterprise (SMEs) can improve the performance of Organisational and inter Organisational process. ICT tools are useful in firm relationships, industry automation, logistic and supply chain and inventory system. There are three main value creating process in which ICT creates affects these are, marketing and customer relation, logistic and networking, innovation, and knowledge management.

Marketing and Customer Relations

The availability of internet facility and use of internet reduce time and geographical region for any enterprise. It creates the situation that products and services are available online and easy way. ICT enable to SMEs to easily access and promote their good in global market. It is also dealing of great amount of information in different ways just like text, graphics, sound and video. The new intelligent software also uses to identify the particular customer profile and type of purchasing he wants. Such type of the information is organized and store in database. Web technology and online trading facilities is providing for the customers. Customer can purchase products on lower prices, customer choice also increase and brand facilities available.

Networking and Logistic

The main impact of networking process is electronic integration effect, electronic communication effect and electronic brokerage effect. In it, real time data is provided, Tracking of supplier and identifying the supply channel is its findings.

Innovation and Knowledge Management

Different types ICT tools are supporting knowledge management just like groupware, video conferencing, internet and intranet. These tools are interconnecting and exchanging knowledge and information's between firms. SMEs can use such type of digital tools to make interactive communications.

ICT ROLE FOR INTERCONNECTING SMEs

If ICT would be adopted and implemented in the firms then process level definitely increases. The implementation of ICT in SMEs can create following positive effects:

- It creates good relationship among SMEs; also integrate economic operation along global supply chain.
- It also provides new opportunities of networking with firms in global condition.
- It also expands the business boundaries.
- It manages the relation with the end-market. New way and service offered to create value.

**BARRIERS TO ADOPT ICT BY SMEs**

There are many reasons that why SMEs are not implementing and adopting ICT tools in India. The barriers are explained below:

Requirements' of use this tool in business: Most of the SMEs managers think that tools of ICT are not very useful for their firms. According to Indian SMEs survey that 48% of small and medium size enterprise are not using internet facility in their firms. Another reason is that lack of skill person to use the e-business model in firms. Other reason of insufficient amount, security in sufficient customer access.

Lack of availability of IT skilled person: In India, skilled person take higher salary and small and medium firm is not capable to hire that person on big salary also these firm also not capable to provide training to their existence employ due to in sufficient of money and facility. Most of the operation is done by SMEs on the day-to-day basis.

Very High Cost of Managing and Purchasing of ICT Tools: Budget is a major concern for SMEs. These industries are not able to afford such costly technology. ICT tools are sophisticated, SMEs cannot afford it.

Network Infrastructure Issue: ICT tools are totally depending on internet facility available in that particular region. Different type of lease line, broadband internet services is providing by the BSNL, AIR TEL, and VODA Phone etc. The speed and cost is also important for implementing ICT Tools in SMEs.

Security and Trust: Security and trust is play very important role to do not adopt and implement ICT tools by SMEs. ICT providing payment system, online banking, online purchasing tools but SMEs do not believe on those tools.

CONCLUSION

The adoption of ICT tools in SMEs, they can improve shared database system, integrated information system, logistic and supply chain management system, inventory system, customer service management, fulfilment of order manufacturing flow management, demand management, product development. Government can play an important role to adopt ICT in SMEs. Only then, SMEs can survive and face the challenges in global market. Indian government should provide infrastructure and ICT tools on less cost for SMEs.

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**USES OF GIS TECHNOLOGY IN URBAN LANDUSE ANALYSIS**Sachin Kumar¹³ Shakti Singh¹⁴ Mohit Kumar¹⁵ Ajay Kumar¹⁶**ABSTRACT**

Urban Land use study is important for urban planning and management. Urban areas are facing serious problem of land use management because the knowledge of land use pattern helps to develop strategies to balance the conservation & developmental pressure on urban land resources. This study demonstrates the potential of geospatial technologies as a Decision Support System (DSS) in analyzing the cohesiveness of Industrial area Phase 1 in Chandigarh city. The study was carried out by using Google earth imagery of 2010 using on screen visual analysis of land use pattern. The land use features were prepared in Arc GIS vector form, which is used for identifying the various classes of urban land use. The result show that Industrial Area Phase 1 being planned industrial Sector has 46.71 percent under Industrial purpose and in this area under built up is only 16.58 percent and rest 30.13 percent is open areas within built up land. Area under Commercial is 7.79 percent and Residential is 11.8 percent, Public and Semi Public is 13.18 percent, and Public Utilities is 3.65 percent, and area under Road and Open Spaces is 4.82 percent and 6.3 percent respectively. It shows the different type of land use in this sector. It is observed that greens area is degraded and in some part of study area, the drainage system is not good. These give the hygienic condition in the city and it will be a cause of environment pollution and harmful for groundwater. It is also observed that in the study area there is no land for expansion the roads in the future and the administration must take this in account while future planning. Thus, this technology is very useful in current scenario as well as future development.

INTRODUCTION

The modern technology of remote sensing which includes both aerial as well as satellite based systems, allow us to collect a lot of physical data easily, with speed and on repetitive basis, and together with GIS helps us to analyze the data spatially, offering possibilities of generating various options (modeling), thereby optimizing the whole planning process. These information system also offers interpretation of physical (spatial) data with socio-economic data, and thereby providing an important linkage in the total planning process and making it more effective and meaningful. (Ravindra Kumar Verma¹, et. al.).

The use of the study is to shows the use of GIS technology in planning of U.T. Chandigarh. With the help of this technology different land use and land cover patterns have been categorized namely; built up areas, agriculture land, waste land, forest, open spaces, water bodies and transportation etc. The use of this technology saves money, time and gives the result with more accuracy by updating database from time to time. There has been a strong interest in using earth observation data in urban areas for several decades (Tuyahov et al., 1973; Jensen, 1983; Haack et al., 1997). In an early attempt to relate remotely sensed reflectance to socio- economic parameters, Forster (1983) devised a classification scheme for Landsat imagery that could be applied to urban areas to produce a residential quality index. Remote sensing data have also been used in attempts to estimate population (Lo, 1986 and 2001), quantify urban growth, and land use (Mesev et al., 1995; Stehanov et al., 2001). Welch (1982) conducted a resolution analysis of satellite sensors and demonstrated that 0.5 to 10 m spatial resolution is necessary to adequately characterize urban infrastructure in most of the cities/towns. Jensen and Cowen (1999) have identified a hierarchy of urban/suburban attributes that can be measured using remote sensing data. The current/near future high resolution satellite data from Cartosat-1/2, Cartosat-3, RISAT, ASTER, LANDSAT ETM in optical, microwave, infrared, thermal will begin to meet urban needs.

Urbanization is an index of transformation from traditional rural economy to modern industrial post-industrial one. It is a progressive concentration (Daveis, 1967) of population in urban unit. In the 21st century, the majority of the world's population is living in urban areas for the first time in the history (Miller, 2003). In 1892, the famous city planner Patrick Geddes had leased an observatory in Edinburgh to set up the "Civic Observatory and Laboratory" with a goal "Outlook Tower" as it came to be known – to give visitors insight into the plan, function and inner working of the city of Edinburgh (Geddes, 1915). More than a century later urban historians can still learn from Geddes' idea of taking a view from above city/town for effective Urban planning (Jensen and Keys, 2003).

METHODOLOGY USED

A. Satellite Data: Google Earth satellite data of the year 2010 have been used for the study purpose. In this study satellite, imagery is used for preparation of base map by downloading and mosaicking the images from Google Earth and for marking elevation point for generating contours.

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B. Secondary Data

- Survey of India (SOI) Toposheets on 1:50,000 scale. SOI Toposheets no. 53B/13, 53B/14 were used in study. As name suggests Toposheet gives the information about the topographical condition of the surface. In addition, Toposheet contains information about roads, railways, settlements, canals, rivers, electric poles, post offices etc. SOI Toposheets were used for demarcating the study area boundary.
- Reports and other related material (Census Reports, General, Thesis, Books and Internet etc.).

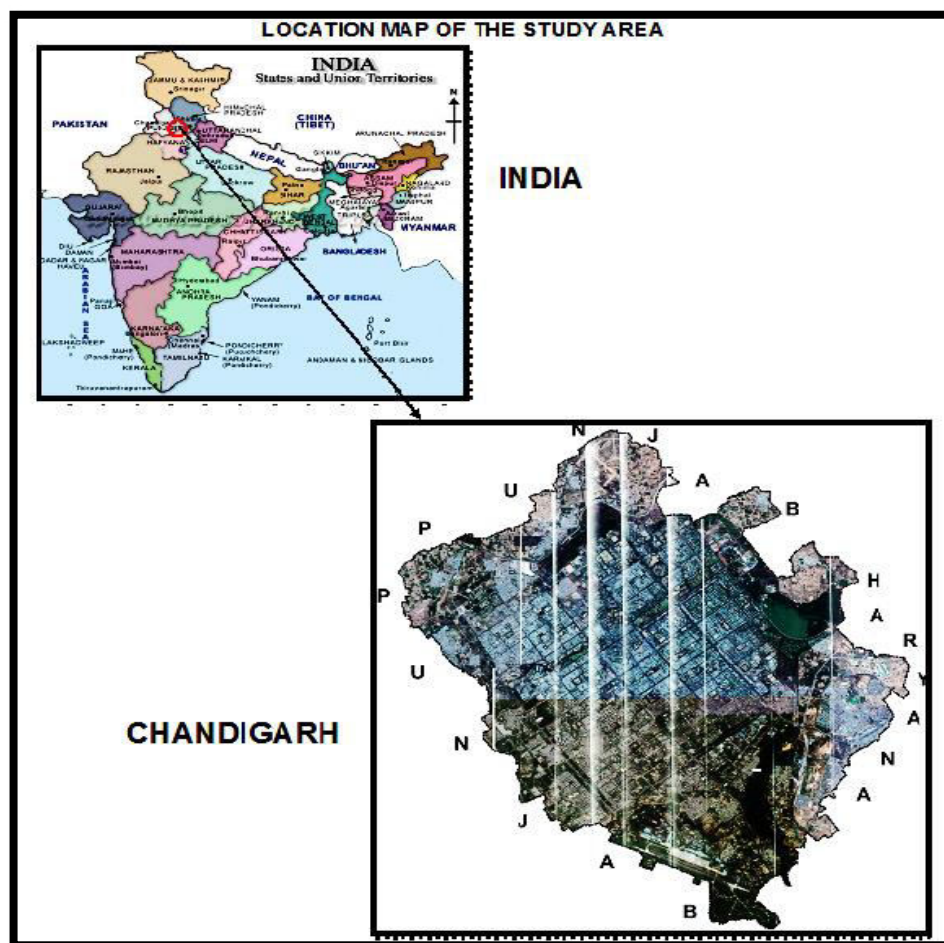
STUDY AREA

General Description

Chandigarh is located in the foothills of the Shivalik range and is a union territory of India that serves as the capital of two states, Punjab and Haryana as shown in location map. It covers an area of approximately 114 km². In addition, shares its borders with the states of Haryana in the east and Punjab in the north, west and south.

Our study area Industrial Area Phase 1 is situated in East South area of Chandigarh. Total area of this sector is 2.78 km². The exact cartographic co-ordinates of this Sector are 30°41'N 76°47'E 30°42'N 76°48'E. It has an average elevation of 330 meters (1082 ft.).

Figure-1: Location Map of Chandigarh



Sources: Authors Compilation

RESULTS

Land use analysis of Industrial Area Phase1

The total area of the Industrial Phase-1 is 685.66 acres in which different land uses categorized as industrial, residential, commercial, open spaces, public and semi-public and open spaces, etc. Further, this industrial area categorized into sub land uses as industrial built up and industrial open spaces within built up etc. These categories shown in detail below table:

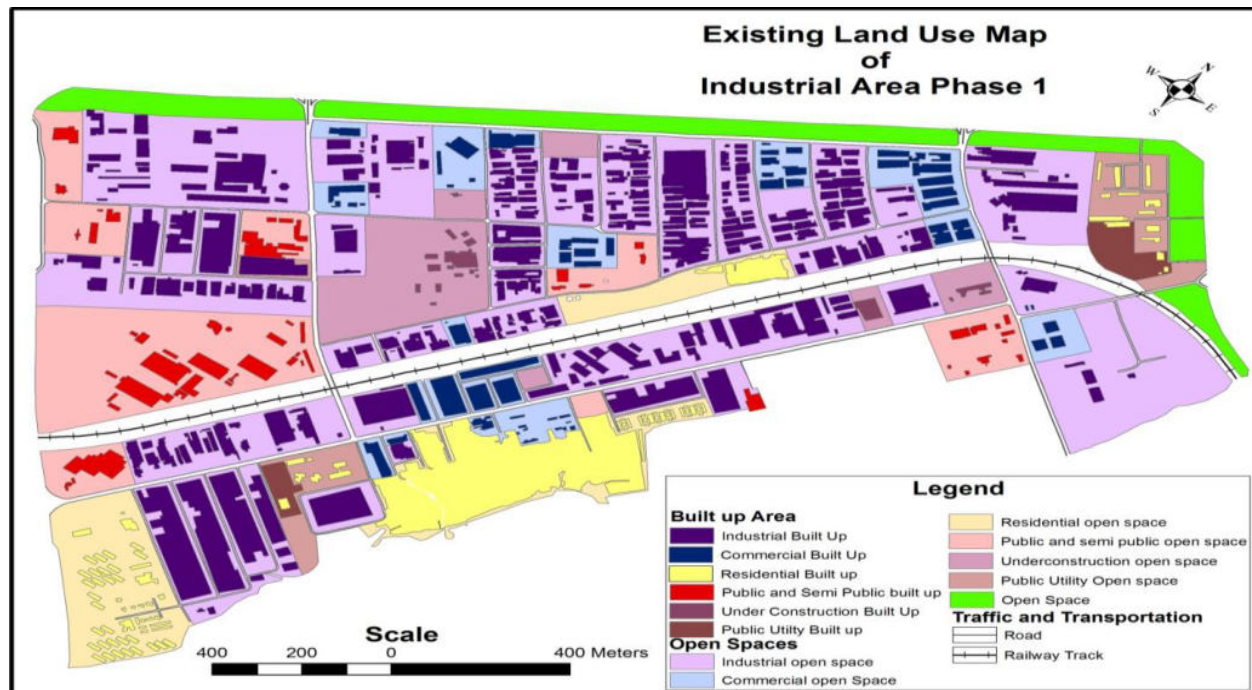
Table-1: Exiting Land uses of Industrial Area Phase-1

S. No.	Land Uses	Area in Acres	Percent
1	Industrial	320.1	46.71
	Industrial Built Up	113.62	16.58
	Industrial open space within Built Up	206.48	30.13
2	Commercial	53.42	7.79
	Commercial Built Up	18.66	2.72
	Commercial open Space/parking, pavements etc.	34.8	5.07
3	Residential	80.9	11.8
	Residential Built up	41.07	5.99
	Residential open space within Built Up	39.83	5.81
4	Public and Semi-Public	90.33	13.18
	Public and Semi Public built up	14.15	2.06
	Public and semipublic open space within Built Up	76.18	11.12
5	Public Utilities	25.11	3.65
	Utility Built up	7.10	1.02
	Utility Open space within Built Up	18.01	2.63
6	Under Construction	39.59	5.78
	Under Construction Built Up	2.80	0.41
	Under construction open space within Built Up	36.80	5.37
7	Open Spaces	43.17	6.3
8	Area Under Roads	33.03	4.82
	Total Area	685.66	100

Sources: Authors Compilation

- **Industrial:** In industrial area phase1, total area of industrial is 320.1acres (46.71%). This land use category contains both built up and open spaces within built up. In total area 113.62 acres is built up and rest of area 206.48 acres is under open space within built up.
- **Commercial:** This category has included multiplex, automobile show room and shops etc. The total area under this category is 53.42 acres (7.79%). Out of this total area 18.66 is built up and 34.8 is open within built up (parking, pavements).
- **Residential:** Total residential area is 80.09 acres (11.8%) in which residential built up area is 41.07 acres and open spaces within built up area is 39.83 acres. New colony is included in this residential area, which is, looks a slum.
- **Public and Semi-Public:** In industrial area, public and semi-public area is 90.33 acres (13.18%). Public and semi-public includes Police station, Post Office, religious places, defense area and roadways workstations (HR, CTU, PTU). Out of total area 14.15 acres is built up and rest of 76.18 acres is comes under open spaces within built up area.
- **Public Utilities:** This land use includes the water works, power station etc. The total area of public utility is 25.11 acres (3.65%) in which 7.10 acres is built up and rest 18.01 is under open spaces within the built up.
- **Under Construction:** The total area of under construction is 39.53 acres (5.78%) in which 2.80 acres is built and rest of 36.80 is comes under open spaces.
- **Open Spaces:** In industrial area 43.17 acres (6.3%) is open spaces. This open space divides the residential sector and industrial sector.
- **Area under Roads:** In industrial area 33.03 acres (4.82%) area comes under road.

Figure-2: Existing Land use Map of Industrial Area Phase 1



Sources: Authors Compilation

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ROLE OF INFORMATION TECHNOLOGY (IT) IN THE GROWTH OF IRON & STEEL INDUSTRY

Pooja Pal¹⁷

ABSTRACT

This paper investigates the role of information technology (IT) in the growth of Indian Iron & Steel Industry. The purpose of the study is to find out the implementation of technological changes in the Iron & steel industry in India. The reasons for making the technological changes are evaluated and examined by studying the processes like Blast furnace, direct reduced iron, Corex, HIs melt, ITmk3 and carbon capture & storage. Through the Corex effective and environment friendly production of hot metal from iron ore and coal without resorting to coke making was done. HIs melt become a technology of choice for future iron process seems particularly relevant for high alumina and high phosphorous Indian iron ores and therefore positioned to become a technology of choice for future Iron making. ITmk3 uses low-grade Iron ore and non-coking coal to produce high purity iron nuggets in a rotary hearth furnace. The process is relatively less energy intensive, less capital intensive and more environments friendly. The conclusion is that Information Technology has an impact on the growth of Iron & Steel Industry in terms of increase in production, efficient use of resources and helps in reduction of carbon emission.

KEYWORDS

Information Technology, Iron and Steel etc.

INTRODUCTION

India is the fourth largest steel producer in the world. In 2014 -15, crude steel production reached to a level of 1665 million tonnes (MT) and showed a growth of 1% over 2013 (Ministry of steel, 2015). The Per capita finished steel consumption in 2014 is estimated at 217 kg for world and 510 kg for China. The projected Indian steel demand to grow by 6.2% in 2015 and by 7.3% in 2016 as compared to global steel use growth of 0.5% and 1.4% respectively (World steel Association, 2015). Chinese steel usage is projected to decline in previous years by 0.5%. China remained the world's largest crude steel producer in 2014 (823 MT) followed by Japan (110.7 MT), the USA (88.2 MT) and India (86.5 MT) at the 4th position. The raising per capita steel consumption needs estimated infrastructure investment of nearly a trillion dollars, a projected growth of manufacturing from current 8% to 11-12%, increase in urban population to 600 million by 2030 from the current level of 400 million, emergence of the rural market for steel currently consuming around 10 kg per annum buoyed by projects like Bharat Nirman, Pradhan Mantri Gram Sadak Yojana, Rajiv Gandhi Awaas Yojana among others. However, based on the assessment of the current ongoing projects, both in Greenfield and brownfield (Planning Commission, 2011). National Steel Policy 2005 is currently being reviewed keeping in mind the rapid developments in the domestic steel industry (both on the supply and demand sides) as well as the stable growth of the Indian economy since the release of the Policy in 2005. Apart from a large domestic market, India's steel industry has also benefitted from indigenous availability of key raw materials such as iron ore.

The iron & steel industry has to consolidate the gains made in the last two decades, to sustain and further add to the rapid growth generated by positive changes in the economic environment and policy shift towards liberalization. The enormous push to the Indian steel industry might be through the focused efforts by enhancing efficiency in all areas of operation- from mining of raw materials to finishing of the final products. It comes through the improvement of operational efficiency of steel production by benchmarking to best practice levels globally and by the use of continuous and concerted R&D efforts to add to the body of existing knowledge and adapting such knowledge for application in India's steel industry.

During 2010-11, domestic Crude Steel Production was approximately 70 million tonnes and is expected to reach a level of 140 million tonnes by the end of the 12th Plan, i.e., 2016-17, if growth forecasts are realized. To sustain the industry's competitive growth, there is an urgent need for adoption of modern and state-of-the-art technologies in both existing and new plants. This should also be accompanied by development of indigenous technology and innovative products by pursuing appropriate Research & Development (R&D) programmes (Planning Commission, 2011).

IRON MAKING PROCESS

In India iron and steel industry can be divided into two types i.e., Integrated producers and secondary producers/mini-steel plants. Integrated producers convert iron ore into steel. The major players of integrated producers in India are Steel Authority of India Limited (SAIL), Tata Iron and Steel Company Limited (TISCO) and Rashtriya Ispat Nigam Limited (RINL). In addition,

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secondary producers are those who make steel by melting scrap or sponge iron. The largest secondary producers are Essar Steel, Ispat Industries, and Lloyds steel. These producers use different process for the production of Iron and Steel. To understand the emission potential different process, it is necessary to understand what these processes are and how it works. Here is a brief review of iron & steel making process:

Blast furnace: The blast furnace is a tall cylindrical counter current shaft furnace lined with refractory brick. The iron ore feed material, along with coke and limestone, are charged into the top of the furnace. These materials pass down through the furnace in the opposite direction to the reduction gases. As the material moves downward, the oxygen content of the iron ore the reducing gases that are passing up through the bed progressively remove feed material. Heat and reducing gases are generated by the combustion of the coke with preheated air. This preheated air at around 1000-1200oC is introduced into the lower region of the vessel through tubers. Molten iron and slag collect in the bottom of the vessel and are tapped periodically. The iron produced from the blast furnace contains about 94% iron with greater than 4% carbon. In post-liberalization era, a large number of Mini BF's, mostly stand-alone units based on Chinese Technology, have been set up in India. Several energy efficient blast furnaces have achieved much higher hot metal productivity.

Direct Reduced Iron (Sponge Iron): The DRI is produced in India by two different process, namely the coal based and the gas-based process. Numerous standard as well as customized technologies are available for both the processes. India is having 3 large sized gas based DRI Plants. Among the gas-based plants, Essar Steel Limited and Ispat Industries Limited are using Midrex technology whereas Vikram Ispat Limited uses HYL III technology.

A revolutionary and challenging new alternative suitable for Indian conditions is non-coking coal gasification by the well-established coal gasification process of Lurgi and use of the synthesis gas (syn-gas) thus generated as reductant in shaft furnace to produce gas based DRI. Some of the coal based plants (Jindal Steel & Power Ltd, Raigarh, Tata Sponge and others) have also taken a number of initiatives to improve efficiency and address the environmental issues so much so that today, these plants can be considered as the benchmark in coal based sponge iron route with regard to environment efficiency, productivity, process efficiency, energy efficiency or waste reduction. Production of DRI using natural gas requires approximately 12 GJ/t crude steel, India is the largest producer of sponge iron in the world with the coal-based route accounting for 76% of total sponge iron production in the country.

Other Iron Making Processes: There are many more possible processes for iron making but are not so common. These are COREX, Hismelt, FINEX, and ITmk3.

COREX: It is a proven smelting-reduction (SR) process developed by Siemens for the cost-effective and environment friendly production of hot metal from iron ore (lumps & pellets) and coal without resorting to coke making. In India, JSW Steel has successfully adopted the Corex process (C-2000 Module) in Karnataka.

Hismelt: Hismelt or High Intensity: Unlike Blast Furnace using hot blast of air and COREX/FINEX processes using oxygen, this process uses oxygen enriched hot air blast. The process seems particularly relevant for high alumina and high phosphorus Indian iron ores a therefore positioned to become a technology of choice for future iron process seems particularly relevant for high alumina and high phosphorous Indian iron ores and therefore positioned to become a technology of choice for future Iron making.

FASTMET/FASTMELT Process

This process envisages reduction of ore-coal composite pellets in Rotary Hearth Furnace (RHF). Various carbon sources such as coal, coke breeze and carbon bearing wastes can be used as a reductant in this process. The DRI product with high degree of metallization can be charged in conventional iron & steel making furnaces or can be smelted in Electric Iron Furnace (EIF) to produce hot metal directly from the Hot DRI adopting the FASTMELT Process. This process may be attractive for small to medium iron producing units.

FINEX process

The limitations of the COREX process with respect to use of iron ore fines directly has led to development of FINEX process at Pohang, POSCO. The process has been successfully demonstrated at 1.5 MTPA level in South Korea.

The unique feature of Finex process is the direct use of iron ore fines and non-coking coal to make liquid iron. However, the Melter Gasifier, which melts the reduced iron as well as generates the gas for use in the fluidized beds –appears to need inputs largely in lumpy form requiring compaction of reduced ore at the high operating temperature and reducing atmosphere. While it has been possible to avoid use of coke in Melter gasifier like that in Corex plant, the process needs either lumpy coal or coal briquettes. Briquetting calls for use of binders and suitable processing technology to get strength levels of coke. The Finex plant at

Pohang reportedly uses coal injection thereby lowering need of high strength briquettes. Similarly, the reduced iron to be charged in the melter gasifier is also in the form of lump/ briquettes. Thus, while need for agglomeration(pelletizing) of ore and use of coke are avoided, these are functionally substituted by alternative, major processing steps requiring substantial additional cost apart from operating and maintenance difficulties. Further, like Corex gas, Finex gas is also of high calorific value and needs to be utilized gainfully to make the process economically viable.

ITmk3: This process Developed by Kobe Steel, Japan, the process uses a rotary hearth furnace to turn green dry pellets made from low grade iron ore fines and pulverized coal into solid iron nuggets of superior quality (97% Fe) DRI, suitable for use in EAF, BOF and foundry applications. The process is relatively less energy intensive, less capital intensive and more environment friendly. It is claimed that the process is more energy efficient (consuming 30% less energy compared to BF-BOF route), more environment friendly with 40% less emissions and involves less capital and operating cost compared to other technologies, making it attractive for steel plants in the small and medium segments.

STEEL MAKING PROCESS

Globally, steel is produced via two main routes: the blast furnace-basic oxygen furnace (BF-BOF) route and electric arc furnace (EAF) route. Variations and combinations of production routes also exist. The key difference between the routes is the type of raw materials they consume (Ministry of Steel 2011).

Basic oxygen furnace (BOF): The basic oxygen furnace (BOF) is charged with molten iron and scrap. The term “basic” refers to the magnesia (MgO) refractory lining of the furnace. Oxygen is injected through a water-cooled lance, resulting in a tremendous release of heat through the oxidation of carbon in the molten iron, with the CO providing vigorous mixing of the charge as it leaves the vessel. Aside from the oxygen, there is no fuel source needed to provide additional thermal energy about 32% of steel be produced using the BF-BOF route in 2012.

Electric arc furnace (EAF): It use scrap and sponge iron as raw material to produce steel. To a large extent, the integrated mills and the mini mills differs only in the technology for making molten steel. After the casting unit, both integrated steel plants as well as mini steel plants use the same steel processing method

Electric induction furnace (EIF): These are formed between the electrodes and the metal being heated, which is thus a component of the electric circuit and is heated by the radiation from the arcs. Direct arc furnaces are used to produce high carbon steels and low alloyed steels. In India, most of the electric arc furnaces are using Direct Arc furnaces. India is the largest producer/user of induction furnaces for production of steel. There are 1,074 operating Induction Furnace units with total capacity of over 24.4 million tonnes, accounting for 32% of total steel production in the country.

Table-1: Technology Used by Indian Companies

Technology	Companies Using the technology
Blast Furnace	SAIL, RINL, Tata Steel, JSW, JSPL, Bhushan Steel
Corex Technology	C-2000 Module JSW Steel, ESSAR Steel
Midrex Technology	JSPL, Angul (Orissa)
Finex Technology	POSCO's venture in Orissa. SAIL Bokaro Steel Plant
HISMELT Process	JSPL recently signed an agreement with Rio Tinto for the transfer of the existing demonstration plant to JSPL site to take the development forward.
FASTMET/FASTMELT Process	Kobe Steel and Nippon Steel
ITmk3 Process	SAIL has entered into an agreement with Kobe Steel under JV to set up a 0.5MTPA facility in Alloy Steel Plant, Durgapur
BOFs	Bokaro Steel Plant, JSW Steel Bhilai (SAIL)
Electric Arc Furnace (EAF)	JSPL, JSW (ISPAT Dolvi), ESSAR Steel and Bhushan Steel
Rolling & Finishing Mills	JSW Steel, ESSAR Steel and Bhushan Steel, Tata Steel
Colour Coating Plants	Uttam galva, JSW Steel, Bhushan Steel, Sree Precoatd Steel (Essar), National Steel etc. Galvalume Lines

Sources: Authors Compilation

Technological Innovations: Some other technological innovation done by Indian iron & steel industry like Stamp Charging & Partial Briquetting of Coal Charge (PBCC), Tall ovens/batteries, Leak Proof Doors, Coke Dry Quenching (CDQ) etc may be considered for extensive adoption for enhancing productivity, improving quality and reducing pollution. SCOPE 21, a revolutionary coke production process, which is being developed by Nippon Steel, is expected to reduce energy consumption significantly and boost production efficiency. Currently, Level-II computerized controlled battery heating and automation system was used for all coke ovens to improve coke quality and reduce energy consumption in coke making. This also facilitates



adherence to pollution control norms besides reducing coke rate in Blast Furnace technology is available with only a few select countries: CETCO, Netherlands, CODECO, Germany, Rautarukki, Finland and Amano, Japan. A version of this technology has also been developed in-house by RDCIS, SAIL for optimization of heat consumption during coal carbonization and has been implemented in BSP, SAIL and DSP, SAIL.

Tata steel plant in Jamshedpur, India, provides the electric power to the various integrated plants. It has a centralized load dispatch centre (LDC). However, Honeywell provided them a fully integrated and automated industrial Energy management system (EMS) solution with all the necessary interfaces to meet the requirements. With this Tata steel, now have a fully renovated and modernized load dispatch centre with improved capabilities. Another technology for pelletizing plant i.e., Circular Pelletizing Technology (CPT) has been developed by Siemens Metals Technologies. This iron ore agglomeration facility is based on the travelling-grate pelletizing process, which has a circularly designed induration furnace. These systems are helps in increasing the efficiency and have a low environmental impact in terms of waste materials. The first CPT plant was currently under construction in Orissa.

CONCLUSION

India iron and steel industry from the last two decade done enormous efforts for the advancement of technology. Our major producers like SAIL, TISCO and RINL are using the appropriate technology for the improvement. But for the better results advanced technology have to use like SAIL is using ITmk3 Process, JSW Steel & ESSAR Steel Corex technology, JSPL Midrex technology, POSCO's & SAIL Bokaro Steel Plant Finex technology, JSPL HISMET process, Kobe Steel and Nippon Steel FASTMET/FASTMELT Process. This advanced technology increased the production of steel and help in using the resources efficiently with a minimum cost.

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ANALYSIS OF COMMUNITY REVENUE BANJAR-JADID AND BANJAR-KADIM LANDS WITH RECORD OF RIGHTS (ROR) DATA AT CADASTRAL LEVEL USING GEO-SPATIAL TECHNOLOGY STUDY IN HISSAR DISTRICT OF HARYANA

Garima¹⁸ Samiksha¹⁹ Virender Sihag²⁰

ABSTRACT

Land, which is, used for common purpose the land in village such as school, playground, grazing land, toilet etc. GIS Techniques help in updation, modification of the cadastral data as per the present day requirement integrated with musavisi, Cadastral Data (spatial data) and RoR (Record of Rights - Jamabandi) data. This paper presents the mapping and allocation of community land and use of community land at village level of district Hissar. Interpret the cadastral data, musavi and RoR data was used in banjarkadim and banjarjadid category of community lands. This information can be used in land precision farming, agriculture lands, forest areas, dairy farming and aquaculture etc. The resulted data will help in future construction of buildings, recreational centre such as, marriage places, any tourism places, Stadium, playgrounds.

KEYWORDS

RoR, GIS, Cadastral Data, Community Land, Musavie etc.

INTRODUCTION

Community land is reserve for community purpose. It is used for common propose of public land. It cannot be sold. Community land use area, which would be helpful for management of property, and planning, distribution of the fund for public programmers. The government usually maintains these maps, and they are a matter of public record. Cadastral map have their genesis in systems to manage the land ownership records concerned with the private alienated lands. Cadastral map are provides the detailed information about real property within a specific land. It will highlights specific landmarks, which people can use to orient themselves within the map including building and natural features such as lakes, current and rocks. Classification as community land does not prevent the land from being used for business or commercial purposes. Geo-Informatics has been described as "the science and technology dealing with the structure and character of spatial information, its capture, its classification and qualification, its storage, processing, portrayal and dissemination, including the infrastructure necessary to secure optimal use of this information". The advantages of RS and GIS techniques in cadastral mapping are available in digital format, updating and modification are easy, Land use/cover information can be generated, and details of parcel of land can be depicted.

Banjar- Jadid: The word "Banjar-Jadid" is substituted for "khali" The field which have been rendered unfit for cultivation due to "Reh", "Sem" or "Kaller" etc. successively for three harvest and a similar entry harvest has to be made in the four harvest also.

Banjar-Kadim: If the Banjar- jadid entry persists, further for succeeding harvests. It shall be changed in to Banjar-kadim in the eight harvests.

Advantage of banjar jadid, banjar-kadim community land identification through Geoinfirmatics techniques are as follows:

- Community land mapping will helpful in future plan such as any development in village, institution construction, quarrel dispute between two caste group and communism (solved out the problem).
- When the area of Banjar-kadim and banjar - jadid lands will help in future construction of buildings, recreational centers such as community centre, marriage place or any tourism place.
- With the help of the map, it is possible plan the route network.
- People will be aware about their Panchayat properties.
- Planning for the progress of any village, or plan development in term decentralization these mapping area help for large scale planning.
- Panchayat land under illegal consultancy person or under illegal activity this will fruitful to find out accuracy in land management.
- Entertainment institutions such as stadium, playground, can also developed in area where the land is under Banjar kadim.
- They can authorized the land under forest department.

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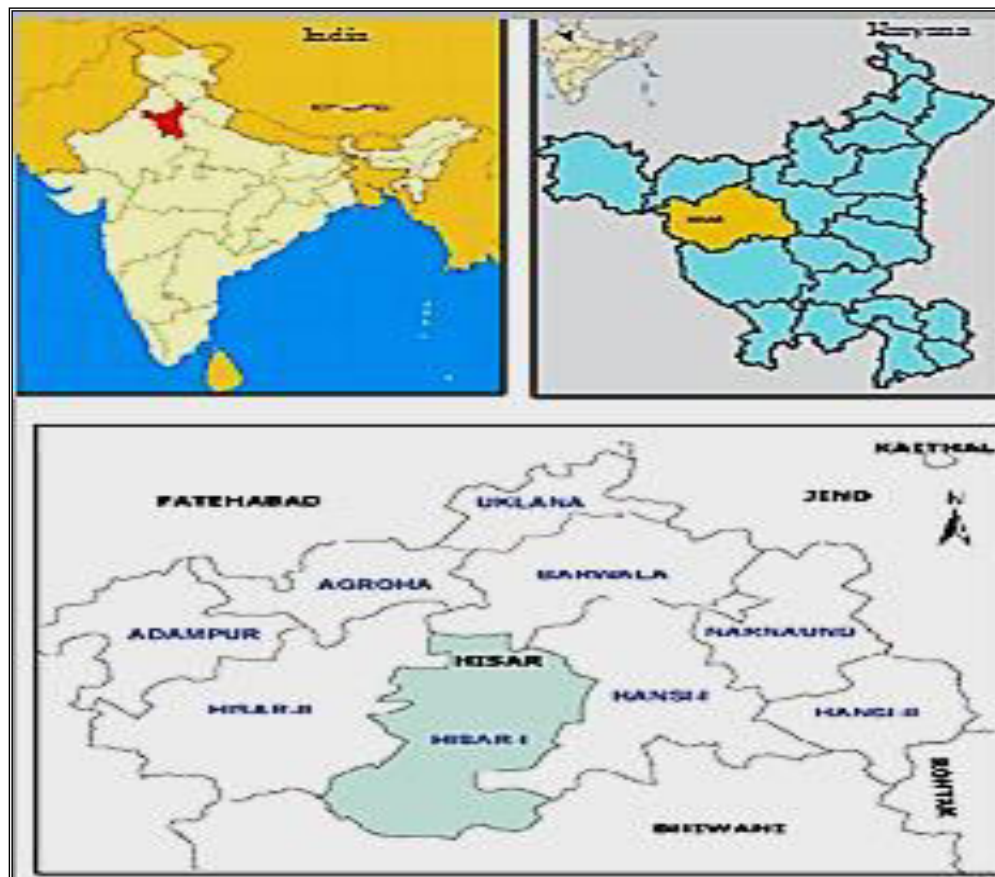
LOCATION AND EXTENT OF STUDY AREA

I have study in Hissar district banjarkadim and bajarjadid community land, cadastral data mussavi, RoR data used in these study so all data are provide easily. Therefore, I select this area.

The study area for this project is the Hissar district, which occupies the west central part of Haryana state. It is situated between 28°53'45" to 29°49'15" N latitudes and 75°13'15" to 76°18'15" E longitudes. Hissar district is administratively divided in nine block Agroha, Adampur, Barwala, Bass, Hansi-I, Hansi-II, Hissar-I, Hissar-II, Narnaund, Uklana Mandi.

The population of this district according to 2011 census is 17, 43,931. Most of the people in Hissar district are engaged in agricultural activities for their livelihood. The main source of the drinking and irrigation is canal and tube well water. The location Map of the study area is shown in Figure1.

Figure-1: Location Map- Hissar District



Sources: Auhors Compilation

DATA USED

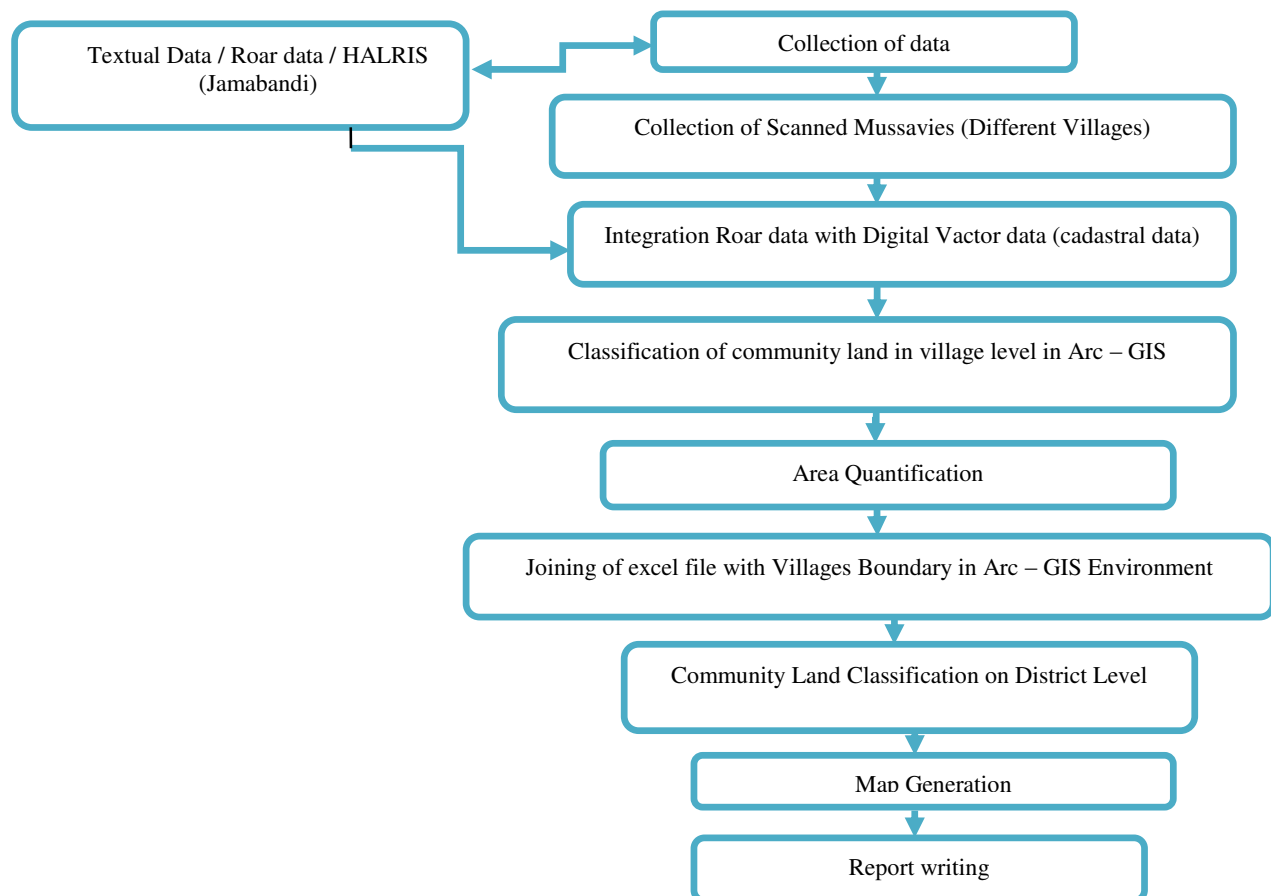
Ancillary Data

Mussavies, Cadastral Data (Vector Data), ROR (Record of Rights), Hissar District Boundary, Technical Report and other related materials such as google earth, excel files containing the community land details.

Methodology

Methodology show in the below flow chart.

Figure-2



Sources: Authors Compilation

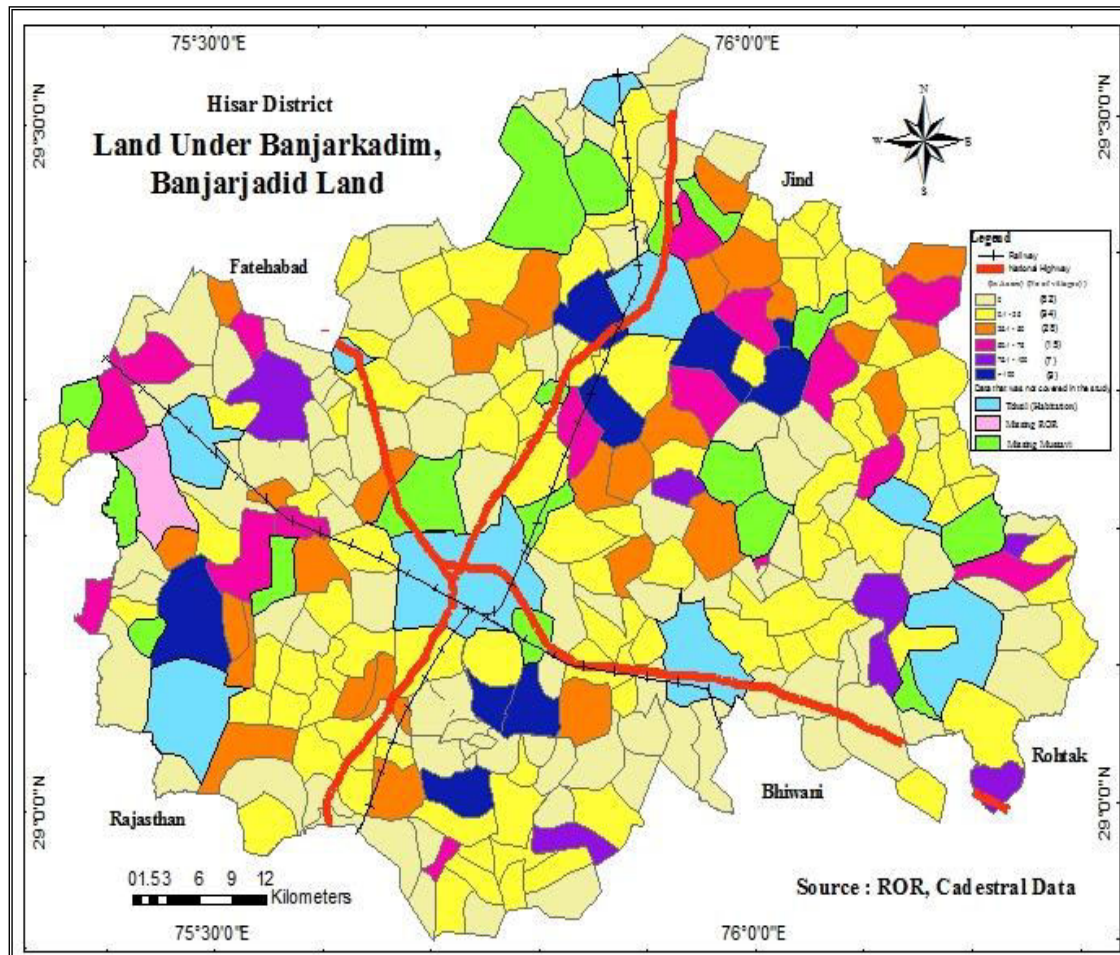
RESULT AND DISCUSSIONS

The Banjar-kadim and Banjar-jadid land category has been further divided in following six major categories:

- 1 category: 82 villages do not show any Banjar-kadim and Banjar- jadid lands. This type of land is not incorporated under in the panchayat land in these villages.
- 2 Category (0.1 to 25 Acre): 94 villages have been identified under this category. This type of category of lands is well distributed in all tehsils.
- 3 Category (25.1 to 50 Acre): 28 villages have been identified under this category and maximum area is covered in Barwala tehsil.
- 4 Category (50.1 to 75 Acre): 15 villages falls under this category and maximum areas are covered in Adampur and Barwala tehsil.
- 5 Category (75.1 to 100 Acre): 7 Villages namely Bhattol Jatan, Singhwa khas, Singhwa Rago, Kanwari, Kalirawan, Dharam Kheri and Thurana in Hisar district are covered under this category.
- 6 Category (Above 100 Acre): 9 Villages (Biana Khera, Rajli, Mirka, Ladwa, Dhaya, Badhawar, Gianpura, Khedar, and Dhobhi) are placed under this category in the study area and shown in the map 1.

In the present study, some of the data pertaining to Banjar-kadim and Banjar - jadid land lands could not be identified at village level due to the non-availability of RoR data or mussavies, as these records may be either damaged or misplaced from concerned departments.

Map-1: Banjar Kadim and Banjarjadid land Hisar District



Sources: Authors Compilation

CONCLUSION

The present study has been carried out to define the capability of geo informatics technology in delineation of the community land features. In the present exercise, an attempt has been made to integrated Roar data with cadastral. The study has concluded that the total 817457.3 acre of land (235 villages) occupied. In the present exercise, an attempt has been made to integrate Roar data with cadastral data. Out of 275 total villages in Hissar district, about 235 village data was integrated, while the rest of the village data could not be studied because of the non-availability of RoR data or the data was damaged or found to be missing. The study concludes that the total 817457.3 acre of land (235 village) occupied in the study area. It was observed that total area of banjar kadim 5872 and banjar jadid area 29.6-acre banjar kadim covered in area 921.3 acre in Dobi village (Hb. No 25) while in Ramayana village (Hb. No.116) it was found to be 0.03acre only.

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SPATIAL DISTRIBUTION OF WATER RESOURCE UNDER COMMUNITY LAND IN HISSAR DISTRICT

Garima²¹ Samiksha²² Dr. Sultan Singh²³

ABSTRACT

All land other than road owned under council care control and management was classified as community land. Community land mapping will helpful in future planning such as the development of the village. The main advantage of geo informatics utility in the cadastral mapping is in updating and modification of cadastral data as per the present requirement. Hissar district administrative divided in nine blocks. Total number of village in Hissar district is 275 villages according to revenue department. Methodology comprised collection of musavies, vector data integration with RoR data and calculation of village wise area of different categories Water Body (Ponds, Well, Uprhanponds, Waterworks). Vector data joined with excel data and Ponds, Well, Uprhanponds, Waterworks land maps were prepared total land covered area in Hissar district was 817457.8 acre and water body covered area in 6071.09 acre. The integration of spatial and non-spatial information would greatly aid in village level planning, which will enrich the utility of cadastral maps in the present day context.

KEYWORDS

Roar, GIS, Cadastral Data, Community Land, Musavie etc.

INTRODUCTION

Community land is reserve for community purpose. It is used for common propose of public land. It cannot be sold. Community land use area, which would be helpful for management of property, and planning, distribution of the fund for public programmers. The government usually maintains these maps, and they are a matter of public record. Cadastral map have their genesis in systems to manage the land ownership records concerned with the private alienated lands. Cadastral map are provides the detailed information about real property within a specific land. It will highlights specific landmarks, which people can use to orient themselves within the map including building and natural features such as lakes, current and rocks. Classification as community land does not prevent the land from being used for business or commercial purposes. Geo-Informatics has been described as "the science and technology dealing with the structure and character of spatial information, its capture, its classification and qualification, its storage, processing, portrayal and dissemination, including the infrastructure necessary to secure optimal use of this information". The advantages of RS and GIS techniques in cadastral mapping are available in digital format, updating and modification are easy, Land use/cover information can be generated, and details of parcel of land can be depicted.

ADVANTAGE OF STUDY

Water Body (Ponds, Canal, Well, Uprhanponds, waterworks) community land identification through Geoinformatics techniques are useful to government and to common people as following:

- Community land mapping will helpful in future plan such as any development in village, institution construction, quarrel / dispute between two caste group and communism (solved out the problem).
- With the help of the map, it is possible plan the route network.
- People will be aware about their Panchayat properties.
- Planning for the progress of any village, or plan development in term decentralization these mapping area help for large scale planning.
- Panchayat land under illegal consultancy person or under illegal activity this will fruitful to find out accuracy in land management.
- Fixing, rain harvest, irrigation, farming, agriculture land, and forest use this type of land.

LOCATION AND EXTENT OF STUDY AREA

I have study in Hissar district Water body community land, cadastral data musavies, Roar data used in these studies. The study area for this project is the Hissar district, which occupies the west central part of Haryana state. It is situated between 28°53'45" to 29°49'15" N latitudes and 75°13'15" to 76°18'15" E longitude s. Hissar district is administratively divided in nine block Agroha, Adampur, Barwala, Bass, Hansi-I, Hansi-II, Hissar-I, Hissar-II, Narnaund, Uklana Mandi. The population of this district

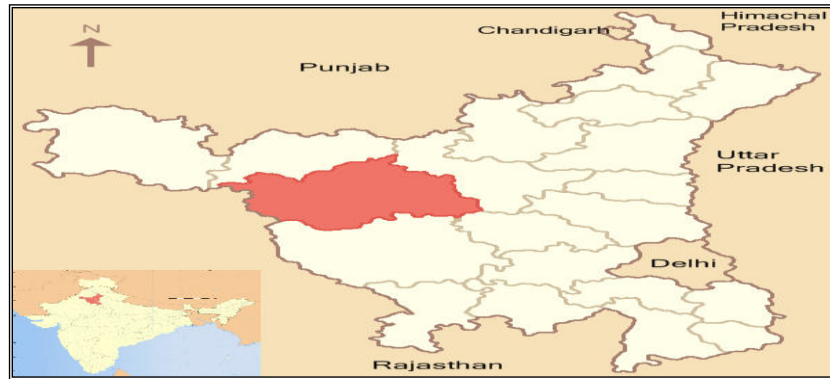
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according to 2011 census is 17, 43,931. Most of the people in Hissar district are engaged in agricultural activities for their livelihood. The main source of the drinking and irrigation is canal and tube well water. The location Map of the study area is shown in Figure-1.

Figure-1: Hissar District



Sources: Authors Compilation

MATERIAL AND METHODS

Data Used

Ancillary Data: Mussavies, Cadastral data (vector data), ROR (Record of Rights), Hissar District Boundary, Technical Report and other related materials such as google earth, excel files containing the community land details.

Methodology: The following has been steps were adopted:

- Collection of cadastral data, mussavi and Roar – Jamabandi data.
- Data processing (creation of geodatabase, shapefile etc), integration of cadastral data with jamabandi data.
- Development of classification scheme as per Roar.
- Preparation of different village wise community land maps.
- Area quantification (acre).
- Integration of Roar data (excel format) with that of Hissar district administrative boundary.
- Preparation of village maps with community land details.
- Report writing.

RESULT AND DISCUSSION

The study area has concluded that the total area 817457.8 acre of land 235 villages and total area water body is 6071.09 acre. Water bodies (Pond well, water works and uprahan ponds) show in Figure-2.

Figure-2: Water Body



Sources: Authors Compilation

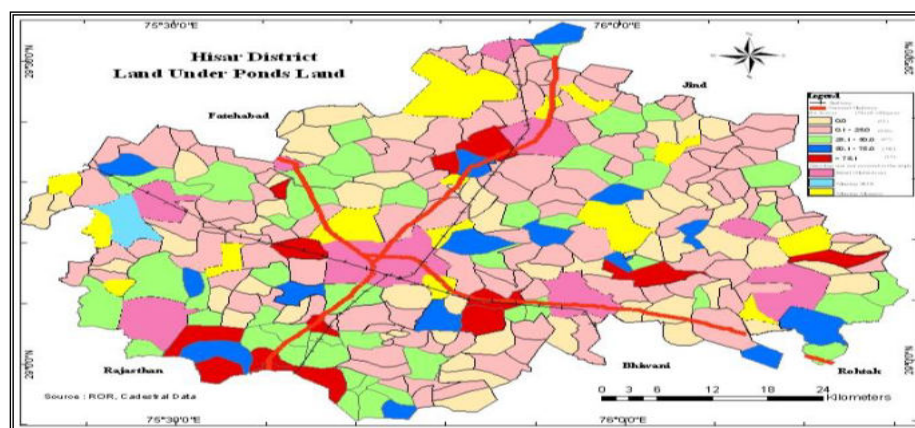
Ponds Area

An attempt has been carried out to identify the Canal land in the study area. The Canal land category has been further divided in six major categories as follows:

- 1 Category: 51 villages do not have the canal Land.
- 2 Category (0.1 to 125Acre): 108 villages have been identified under this category.
- 3 Category (25.1to 50 Acre): Canal land areas, which consist of 25.1 to 50 Acre and 47 Villages, have been identified under this category in Hissar district.
- 4 Category (50.1 to 75 Acre): 16 villages have been identified under the canal land.
- 5 Category (Above 75.1 Acre): 13 villages have been identified under this category in Hissar district and shown in map1.

It was observed that in the study area, some of the data pertaining to Pond could not identified at village level, due to the non viability of Roar data or mussavies were either damage or founded to be missing.

Map-1: Land under Ponds Land of Hissar District



Sources: Authors Compilation

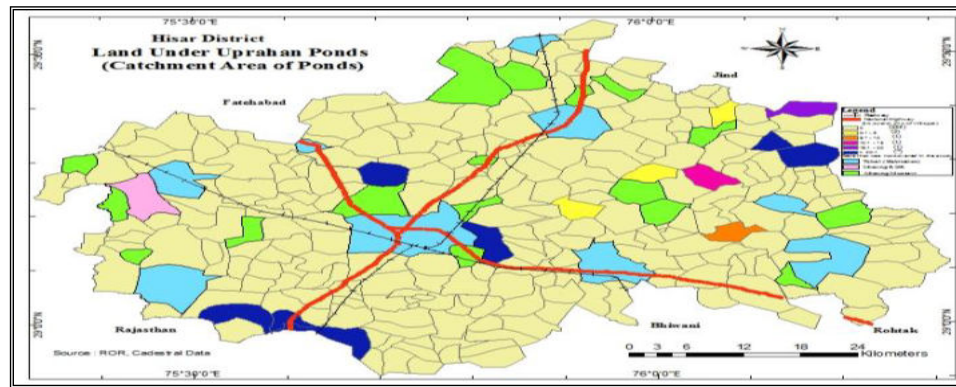
Uprahan Ponds (Catchment Area of Ponds)

An attempt has been carried out to identify the Uprahan Ponds in the study area. The Uprahan Ponds has been further divided in following six major categories as:

- 1 Category: Uprahan Ponds are not available in 222 villages out of total 235 villages in Hissar district.
- 2 Category (0.1 to 5 Acre): 3 villages have been identified in Hissar district.
- 3 Category (5.1 to 10 Acre): Only 1 village namely Pali has been identified under this category in Hissar district.
- 4 Category (10.1 to 15 Acre): Only 1 village namely Lohari Rago has been identified under this category in Hissar district.
- 5 Category (15.1 to 20 Acre): Only 1 village namely Koth Kalan has been identified under this category in Hissar district.
- 6 Category (Above 20.1 Acre): 7 villages have been identified with more than 20.1 acre community land in Hissar district and shown in map2.

In the present study, some of the data pertaining to Uprahan Ponds (Catchment Area of Ponds) could not be identified at village level due to the non-availability of Roar data or mussavies, as these records may be either damaged or misplaced from concerned departments.

Map-2: Land under Uprahan Land of Hissar District



Sources: Authors Compilation

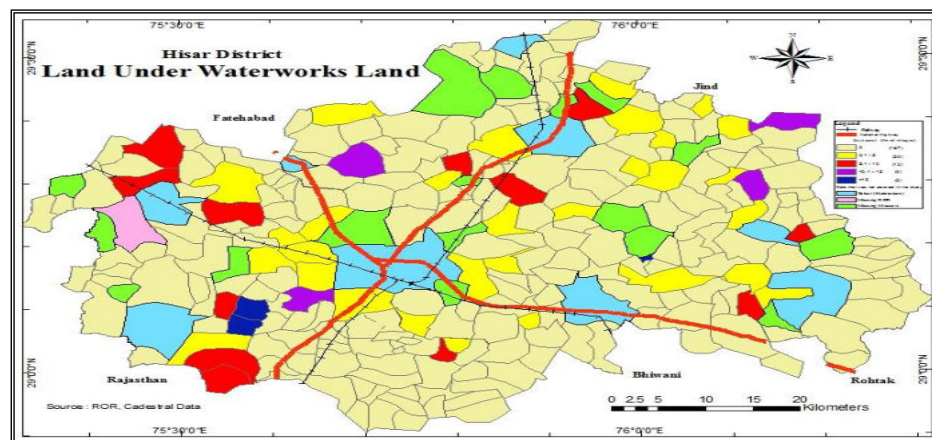
Waterworks Area

An attempt has been carried out to identify the Waterworks land in the study area. The Waterworks has been further divided in following five major categories as:

- 1 Category: Community land of this category is not available in 187 villages out of total 235 villages in Hissar district.
- 2 Category (0.1 to 5 Acre): 30 villages have been identified under this category in Hissar district.
- 3 Category (1 to 10 Acre): 12 villages have been identified under this category in Hissar district.
- 4 Category (10.1 to 15 Acre): 4 villages have been identified under this category in Hissar district.
- 5 Category (Above 15.1 Acre): 2 villages have been identified with more than 15.1 acre community land in Hissar district and shown in map3.

In the present study, some of the data pertaining to Waterworks land could not be identified at village level due to the non-availability of Roar data or mussavies, as these records may be either damaged or misplaced from concerned departments.

Map-3: Land under Waterworks Land of Hissar District



Sources: Authors Compilation

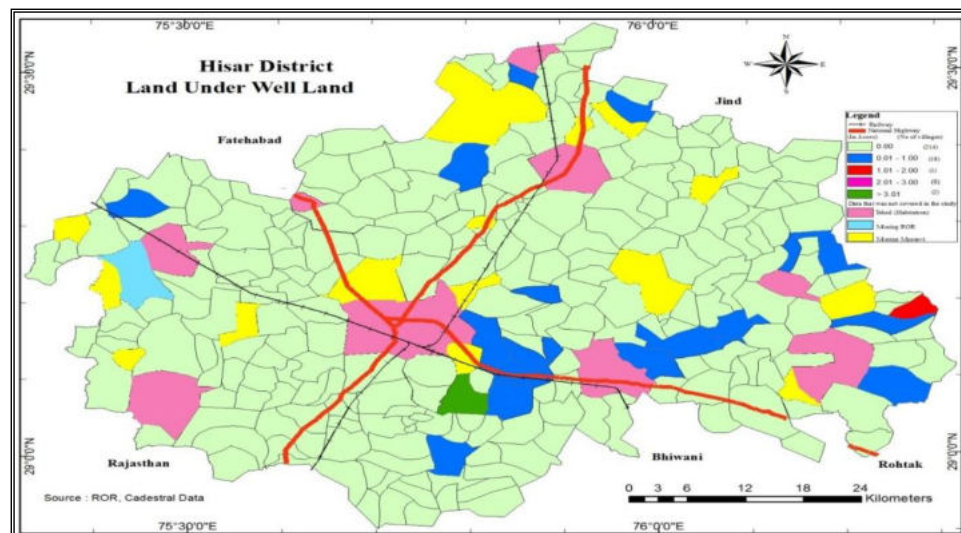
Well Area

An attempt has been carried out to identify the Canal land in the study area. The Canal land category has been further divided in six major categories as follows:

- 1 Category: 214 villages do not have the canal Land.
- 2 Category (0.1 to 1Acre): 18 villages have been identified under this category.
- 3 Category (1.01 to 2 Acre): Canal land areas, which consist of 1.01 to 2 Acre and 1 Villages, have been identified under this category in Hissar district.
- 4 Category (2.01 to 3 Acre): 0 villages have been identified under the canal land.
- 5 Category (Above 3.01 Acre): 2 villages have been identified under this category in Hissar district.

It was observed that in the study area, some of the data pertaining to Canal could not identified at village level, due to the non viability of Roar data or mussavies were either damage or founded to be missing.

Map-4: Land under Well Land of Hissar District



Sources: Authors Compilation

CONCLUSION

In the present exercise, an attempt has been made to integrate Roar data with cadastral data. Out of 275 total villages in Hissar district, about 235 village data was integrated, while the rest of the village data could not be studied because of the non-availability of Roar data or the data was damaged or found to be missing. The study area has concluded that the total area 817457.8 acre of land 235 villages and total area water body is 6071.09 acre. Ponds area covers 28.10 acre in Jewra village (Hb. No. 132) while in Alipur village (Hb. No.150) it was found to be 0.41 acre only. Uprhanponds covered an area of 134 acre in Neoli Kalan village (Hb. No. 169) while in Chanot village (Hb.No.112) it was found to be 0.66 acre only. Well area covers 2 acre in Ghuskani village (Hb. No. 64) while in Balak village (Hb. No.130) it was found to be 0.02 acre only. Waterworks area covers 54.78-acre area in Ralwaskhurd village (Hb. No.52) while in Neoli Khurd village (Hb. No.45) it was found to be 0.12-acre area only.

RECOMMENDATIONS

- The integration of spatial and non-spatial information would greatly aid in village level planning, which will enrich the utility of cadastral maps in the present day context.
- Vector layers generated at cadastral level can be overlaid on high-resolution satellite data to estimate area under various lands and change detection over a selected temporal period.

**LIMITATIONS OF PROJECT**

- The available mussavies are very old and are in shabby state. Hence the digitization process of the mussavies are itself is very difficult and cannot be digitized properly.
- The study is based on the large-scale mapping at 1:2640 inches. Hence, the whole village data at a glance is not possible.
- The study may not be the up to date and does not show the very latest data, as the digitized mussavies are very old.
- Some of the Roar data is not in perfect attach with the Jamabandi data, as the mussavies are very old or in damaged condition.
- Some plot numbers are missing and does not matches with the area of Jamabandi and cadastral data. The reason mainly attributed because, some of the mussavies are in damaged condition.

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SPATIAL TEMPORAL ANALYSIS OF BETI BACHO YOJANA

Garima²⁴ Samiksha²⁵ Virender Sihag²⁶

ABSTRACT

Beti Bachao, Beti Padhao (*Save girl child, educate girl child*) is a Government of India scheme that aims to generate awareness and improving the efficiency of welfare services meant for women. The result of the paper is found that sex ratio (0-6) age group is very low as compare to 2001 and 2011 population in the state. Ambala, Bhiwani, Sonipat, Jhajjar, Rewari, and Kurukshetra there are decrease in sex ratio percentage. It is necessary to more emphasized in those districts. To improve the sex ratio.

KEYWORDS

BBBP, GIS etc.

INTRODUCTION

The Beti Bachao Beti Padhao (BBBP) Scheme will be implemented through a national campaign and focused multi pectoral action in 100 selected districts, covering all States and UTs. Some of them are below table-1:

Table-1

State	District
Haryana	12
Punjab	11
Uttarakhand	2
Chandigarh	1
Himachal Pradesh	1
J&K	5

Sources: Authors Compilation

The districts of Haryana where the scheme will be launched are Mahendergarh, Jhajjar, Rewari, Sonapat, Ambala, Kurukshetra, Rohtak, Karnal, Yamuna Nagar, Kaithal, Bhiwani and Panipat.

This is a joint initiative of Ministry of Women and Child Development, Ministry of Health and Family Welfare and Ministry of Human Resource Development.

WHY NEED SCHEME?

According to census, the present status of the child sex Ratio (0-6 years) in India was 927 girls per 1,000 boys in 2001, which dropped drastically to 918 girls for every 1,000 boys in 2011. The practice of aborting female foetus has become more rampant with the availability of modern diagnostic tools for sex determination of the unborn. With the social biases favoring the male child on consideration of economic advantages and the deep-rooted attitude of labeling the girl child as more of a liability, the sex ratio in the country has been skewed. Therefore, it has been rightly stated that women's disempowerment begins even before birth. Concomitantly, the fact remains that empowerment of women leads to all round progress and emancipation from backwardness of beliefs and unscientific practices in the society. In addition, towards driving this home among the rural folks confined to superstitious beliefs and practices, the new media and communication methods need to be fully utilized. The 'Beti Bachao, Beti Padhao,' campaign has been launched to achieve this objective, of bringing about the awareness and the change.

OBJECTIVES OF THE SCHEME

To prevent Gender biased sex selective elimination: Focused intervention targeting enforcement of all existing Legislations and Acts, especially to Strengthen the implementation of Pre-Conception & Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994 (PC&PNDT Act) with stringent punishments for violations of the law.

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To ensure survival & protection of the girl child: Article 21 of the Constitution defines 'protection of life and liberty' as a legitimate right of its citizens. The difference in mortality rates of girls and boys indicates the difference in access to various health care and nutrition services as well as the preferential care and treatment given to boys. The access to various entitlements, changes in patriarchal mind-set etc. are to be addressed in order to ensure equal value, care for and survival of the infant and young girl child. Further implementation of various legislative provisions for the protection of the girl child and women has to be ensured to create a nurturing and safe environment for the girl child.

To ensure education & participation of the girl child: The access and availability of services and entitlements during the various phases of the life cycle of the Girl Child has a bearing on her development. Essential requirements related to Nutrition, Health Care, Education and Protection have to be fulfilled to enable every girl child to develop to her full potential- especially the right to quality early childhood care, elementary and secondary education. Right to Education (RTE) Act, 2010 provides children the right to free and compulsory education until completion of elementary education in a neighborhood school. Further, Sarva Shiksha Abhiyan (SSA) is a flagship programme for achievement of Universalization of Elementary Education (UEE) in a time bound manner, as mandated by 86th amendment to the Constitution of India making free and compulsory Education to the Children of 6-14 years age group, a Fundamental Right. Denial of these entitlements is a violation of children's rights, which will have a lasting lifelong negative impact. This will also adversely affect upon future human development.

STUDY AREA

Haryana 12 districts have been taken as the study area. Haryana came into existence on 1 November 1966 as a newly created state carved out of the Indian Punjab state based on language. It is located between 27°39' to 30°35' N latitude and between 74°28' and 77°36' E longitude. There are total 21 districts. Out of 21 districts only 12 districts area under the **Beti Bachao, Beti Padhao** Yojana there are - Mahendergarh, Jhajjar, Rewari, Sonapat, Ambala, Kurukshetra, Rohtak, Karnal, Yamuna Nagar, Kaithal, Bhiwani and Panipat.

Map-1: Location of Study Area



Sources: Authors Compilation

Material and Methods

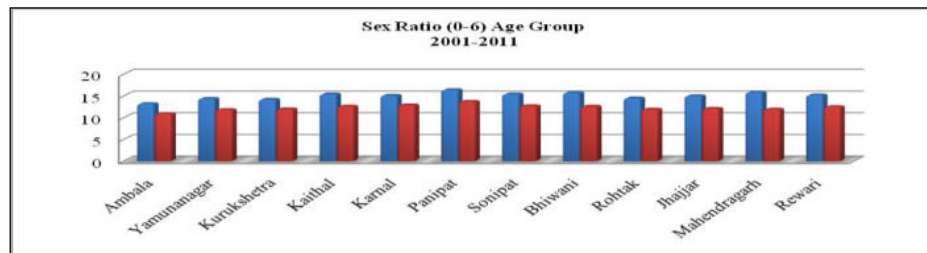
The present research study is based on the secondary data. Sex ratio (0-6) age group data of population were taken from census, Haryana statistical abstract etc. all data were incorporated into GIS format. Analysis part was shown with the help of Maps, graphs and tables.

Table-2

District	Sex Ratio (0-6)	
	2001	2011
Ambala	13.2	10.9
Yamunanagar	14.4	11.8
Kurukshetra	14.2	12
Kaithal	15.4	12.6
Karnal	15.1	12.9
Panipat	16.4	13.7
Sonipat	15.4	12.7
Bhiwani	15.7	12.6
Rohtak	14.5	11.9
Jhajjar	15	12.1
Mahendragarh	15.8	11.9
Rewari	15.2	12.5

Sources: Authors Compilation

Figure-1: Sex Ratio (0-6) age group 2001-2011

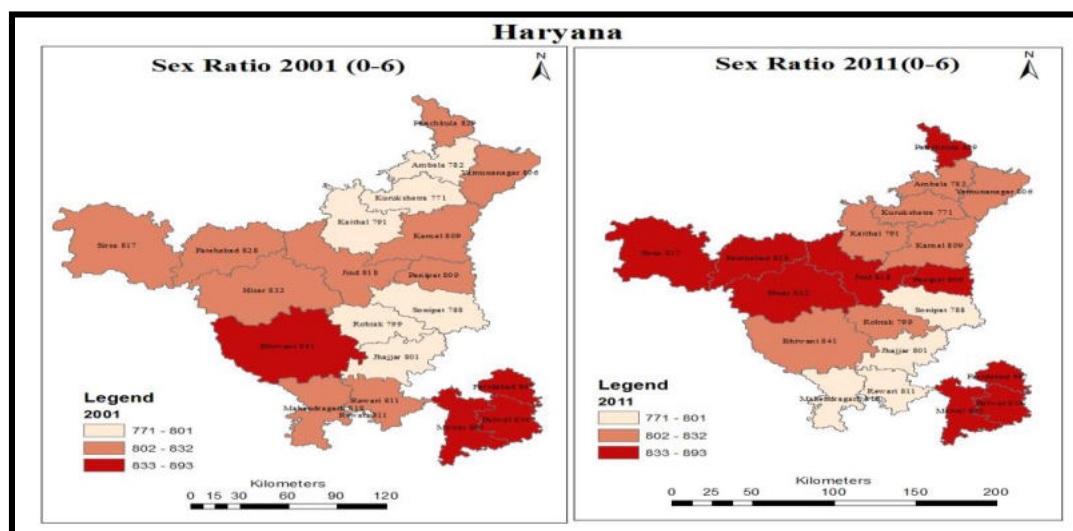


Sources: Authors Compilation

RESULT AND DISCUSSION

Status

Map-2: Sex Ratio Map (2001-2011)



Sources: Authors Compilation

The above map show the compare between 2001 and 2011 sex ratio (0-6) age group .it is clearly show in the map that district Bhiwani, Mehendergarh and Rewari has got more decrease compared to 2011sex ratio. On the other hand, Sonipat, Jhajjar shows lower sex ratio in 2001 as well as 2011 data.

Table-3

Sex Ratio (0-6)			Sex Ratio (0-6)		
District	2001	2011	District	2001	2011
Ambala	782	807	Sonipat	788	790
Yamunanagar	806	825	Bhiwani	841	831
Kurukshetra	771	817	Rohtak	799	807
Kaithal	791	821	Jhajjar	801	774
Karnal	809	820	Mahendragarh	818	778
Panipat	809	833	Rewari	811	784

Sources: Authors Compilation

Table above 2 and 3 shows the 12 district wise sex ratio (0-6) and sex ratio (0-6) percentage difference of Haryana state .Here wide gap found in Ambala, Bhiwani, Sonipat, Jhajjar and Rewari district. In Kurukshetra district as the above table shows that, there are decrease in sex ratio percentage. It is necessary to more emphasized in those dist. To improve the sex ratio above graph shows the compression between 2001 and 2011 sex ratio (0-6) age group. Through the graph, it is clearly shows that sex ratio is decrease especially in Bhiwani and Panipat district.

Targets

The Central Government has released Sex Ratio at Birth (SRB) figures for 2013-14 and targets set for 2014-15 and 2015-16 for 100 critical districts covering all states / UTs identified under the 'Beti Bachao, Beti Padhao' Programme. Here the table reproducing the figures for 12 districts of Haryana.

Table-4

S. No.	State	District	HMIS	2014-15	2015-16
1	Haryana	Karnal	736	746	756
2	Haryana	Mahendragarh	792	802	812
3	Haryana	Rewari	805	815	825
4	Haryana	Kurukshetra	819	829	839
5	Haryana	Jhajjar	827	837	847
6	Haryana	Sonipat	832	842	852
7	Haryana	Bhiwani	869	879	889
8	Haryana	Ambala	871	881	891
9	Haryana	Kaithal	893	903	913
10	Haryana	Rohtak	899	909	919
11	Haryana	Yamunanagar	903	913	923
12	Haryana	Panipat	926	936	946

Note: Haryana Review January 2015

CONCLUSION

From the above discussion, it is found that sex ratio (0-6) age group is very low as compare to 2001 and 2011 population in the state. The main reason of low sex ratio may be their social cultural, economic and thoughts that girl child is considered as burden. It is needed that people must change their though to avoid theses anomalies.

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**AN EMPIRICAL ANALYSIS OF DIVIDEND PAYOUT'S AMONG IT COMPANIES**Ashwath Jain²⁷ Dr. Kushalappa S.²⁸**ABSTRACT**

Cash dividends are a distribution of the corporation's net income. Dividends are analogous to withdrawals by the owner of a sole proprietorship. As such, dividends are not expenses and do not appear on the corporation's income statement. Corporations routinely need cash in order to replace inventory and other assets whose replacement costs have increased or to expand capacity. As a result, corporations rarely distribute all of their net income to stockholders. Young, growing corporations may pay no dividends at all, while more mature corporations may distribute a significant percentage of their profits to stockholders as dividends. Before dividends can be distributed, the corporation's board of directors must declare a dividend. The date the board declares the dividend is known as the declaration date and it is on this date that the liability for the dividend is created. Legally, corporations must have a credit balance in Retained Earnings in order to declare a dividend. Practically, a corporation must also have a cash balance large enough to pay the dividend and still meet upcoming needs, such as asset growth and payments on existing liabilities. The current study aims at analyzing the dividend payout position at various IT companies under study. The entire study is based on secondary data.

KEYWORDS**Dividend, Payouts, Profit, Returns etc.****INTRODUCTION**

Dividend payouts are the fraction of net income a firm pays to its shareholders in the form of dividends. The part of the earnings not paid to investors, is left for reinvestment to provide for future earnings and growth. Investors seeking high current income and limited capital growth or provide growth in future earnings, prefer companies with high Dividend payouts. However, investors seeking capital growth may prefer lower payouts because capital gains are taxed at a lower rate. High growth firms in early life generally have low or zero payouts. As they mature, they tend to return more of the earnings back to investors.

The term dividend refers to that part of the profits of a company, which is distributed amongst its shareholders. It may be defined as the return that a shareholder gets from the company, out of its profits, on his shareholdings. According to the Institute of Chartered Accountants of India, dividend is "a distribution to shareholders out of profits or reserves available for this purpose."

Cash dividends are a distribution of the corporation's net income. Dividends are analogous to withdrawals by the owner of a sole proprietorship. As such, dividends are not expenses and do not appear on the corporation's income statement. Corporations routinely need cash in order to replace inventory and other assets whose replacement costs have increased or to expand capacity. As a result, corporations rarely distribute all of their net income to stockholders. Young, growing corporations may pay no dividends at all, while more mature corporations may distribute a significant percentage of their profits to stockholders as dividends.

Before dividends can be distributed, the corporation's board of directors must declare a dividend. The date the board declares the dividend is known as the declaration date and it is on this date that the liability for the dividend is created. Legally, corporations must have a credit balance in Retained Earnings in order to declare a dividend. Practically, a corporation must also have a cash balance large enough to pay the dividend and still meet upcoming needs, such as asset growth and payments on existing liabilities. As the dividend has information content, regular dividend payment with greater stability induces the investors to buy the shares of such companies, of course the investors who expect regular income. Since such investors are more interested on cash dividend, an attempt is made in this study to analyses the cash dividend payouts among the selected IT companies.

OBJECTIVES

The main objective of the study is to analyze the dividend payouts among IT Companies. The specific objectives are;

- To compare the dividend payouts of IT companies.
- To study the relationship between dividend payouts and stock returns of selected companies.
- To offer meaningful suggestions to the investors based on the study.

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SCOPE OF THE STUDY

The study analyzes the cash dividend payouts of Ten IT companies, all ten companies are listed in BSE. The study period is from March 2006 to March 2015.

METHODOLOGY USED

The study is purely based on secondary data collected from various sources like, books, journals and websites. The sample size is ten, the sample is selected randomly. The yearly dividend payouts have been collected for each of the companies under study from March 2006 to March 2015.

LITERATURE REVIEW

Ruey-Shii Chen, Shu-Fung Huang and Chun-Chieh Hsieh (2008) in their research on the topic “An Empirical Research on the Relationships among Cash Dividend, Earnings Persistency, and Stock” found that cumulative abnormal returns for firms with cash dividend might not more than the firms without cash dividend, announcements of cash dividends create significant cumulative abnormal returns after control over changes of stock dividends and the cumulative abnormal returns in firms with low P/E ratio and with announcements of cash dividends are more significant after control over changes of stock dividends.

Zhao Bing-Sheng and LiYu-zhi (2009) made a research on the topic “Research on the Cash Dividend Influencing Factors Applied the Data-mining Technique: A Validating Study Based on Listed Companies in China” and found that the co relationship between corporate characters portfolio and dividend policy, which may provide reference for corporate dividend policy and investor’s optimism of investment portfolio. In addition, the empirical analysis reveals the dividend policy affected factors, as well as the corporate character with different dividend payout level.

Ye Young, Wang Xun and Huang Lei (2011) made a research on the topic “An Empirical Research on Distribution of Cash Dividends”. The main objective of their study was to examine their relationship between consideration and cash dividends. From their study, they found that the cash dividend distribution policy differed from the policy that is before the reform. The split-share structure reform is conducive to the interest selection of two types of shareholders to be consistent.

Xiangzhong Huang (2012) conducted a research on the topic “The Long-run IPO Performance, Frequency of Cash Dividend and Signal Effect: Evidence from China”. The main objective of the study was to analysis of the long-run performance of IPOs after cash dividend. From the study, he found that the two times of cash dividend within three years after listed is a vital boundary to distinguish different firms. Firms initiating more than two times of cash dividend have better long-run performance. In addition, the frequency of cash dividend has positive correlation with the long-run performance of stocks.

Skanthavarathar Rajesh (2012) had undertaken the research on the topic “Cash Dividend Announcements and Impact on the Share price of listed Companies in Colombo Stock Exchange in Sri Lanka”. The main objective of the study was to examine the degree of impact of dividend announcement on share prices and to find out the any significant differences between manufacturing and non-manufacturing sector related to dividend announcement and share prices. From the study, he found that the CSE responds quickly or slowly to announcement of dividend and CSE responses vary according to manufacturing versus non-manufacturing sector. It announces the average abnormal dividend and gives the positive to the investors.

DATA ANALYSIS AND INTERPRETATION

Table-1: Analysis of Dividend Payout to Net Profit Ratio of Selected IT Companies

Company / Year	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Average
T C S	80.35	33.97	33.72	44.66	36.24	69.88	29.21	30.38	29.95	24.31	41.267
Infosys	42.01	35.49	26.45	31.86	53.46	24.71	23.11	42.55	17.15	51.13	34.792
Wipro	36.17	26.71	30.52	31.48	30.4	17.98	19.7	28.61	30.74	35.28	28.759
HCL	11.7	22.54	42.58	42.93	25.57	47.08	76.67	47.7	80.84	152.38	54.999
Oracle	531.63	--	--	--	--	--	--	--	--	15.88	273.755
Mindtree	26.65	23.07	14.66	7.4	8.12	6.64	12.67	7.27	7.57	--	12.672
Tech Mahindra	25.67	17.38	9.82	11.15	7.32	5.76	4.94	20.5	40.8	47.21	19.055
Mphasis	60.79	65.93	66.21	58.45	17.45	8.42	8.76	15.81	31.25	47.68	38.075
Hexaware Technologies	89.22	99.74	56.13	50.55	47.02	16.21	39.07	--	18.17	18.39	48.277
Cyient	32.85	21.93	27.22	17.56	11.79	8.75	11.76	12.62	7.99	12.25	16.472

Sources: Authors Compilation

It is found in the Table 1 that Oracle had paid dividend only during 2006 and 2015 and the recent dividend announce by it is extremely high, i.e., 531.63%. However, the dividend payout is very irregular in this company. Among the average dividend payout ratios of other IT companies, HCL has highest dividend payout ratio of 54.999% and Mindtree has lowest dividend payout ratio.

Table-2: Correlation of Dividend Payout to Net Profit Ratio between various Companies under Study

	TCS	Infosys	Wipro	HCL	Mindtree	Tech Mahindra	Mphasis	Hexaware	Cyient
TCS	1	-0.0353	-0.03817	-0.52581	0.35786	-0.2304	0.07481	0.258915	0.420885
Infosys		1	0.536173	0.035591	0.190253	0.192005	0.093277	0.23122	0.13649
Wipro			1	0.100977	0.34491	0.622996	0.632784	0.256561	0.46474
HCL				1	-0.58753	0.631055	-0.15287	-0.68973	-0.50604
Mindtree					1	0.161797	0.645055	0.893027	0.833869
Tech Mahi						1	0.254285	-0.21885	-0.0824
Mphasis							1	0.644608	0.779076
Hexawar								1	0.815493
Cyient									1

Sources: Authors Compilation

Among the Correlation coefficient between dividend payout ratios of various companies under study Twenty-six correlation coefficient are positive and ten are negative. Since, there is more number of positive correlation coefficients. It can be concluded that the dividend payouts of companies under IT industry are related to each other.

Table-3: T-Values between Dividend Payout to Net profit Ratios of Companies under Study

	TCS	Infosys	Wipro	HCL	Mindtree	Tech Mahi	Mphasis	Hexaware	Cyient
TCS	#DIV/0!	-0.2831	-0.3058	-5.8139*	3.2834*	-1.9466	0.6018	2.2202	4.0919*
Infosys		#DIV/0!	5.8210*	0.2851	1.5792	1.5948	0.7528	1.9542	1.1127
Wipro			#DIV/0!	0.8161	3.1270*	8.1454*	8.4430*	2.1971	4.7422*
HCL				#DIV/0!	-7.1781*	8.3893*	-1.2522	-10.5247*	-5.4419*
Mindtree					#DIV/0!	1.3292	8.8378*	35.2797*	21.8959*
Tech Mahi						#DIV/0!	2.1749	-1.8388	-0.6784
Mphasis							#DIV/0!	8.8230*	15.8574*
Hexaware								#DIV/0!	19.4761*
Cyient									#DIV/0!

Sources: Authors Compilation

Note: *Indicates significant at 5%

Table-3 shows that among the 36 t values, 18 t values are significant at 5% level of significance and remaining 18 are not significant.

Table-4: One-way ANOVA

Source of Variation	d.f.	Sum of Squares	Mean S.S	Variance Ratio(F)
Between Co's	10-1=9	14241.23	1582.359	3.748665
Error	97-9=88	37568.03	422.1127	
Total	98-1=97	51809.26		

Sources: Authors Compilation

The critical value of F ($V_1=9$, $V_2=88$) d.f. at α 0.01 is 2.63. Since the calculated value of the test statistic $F=3.086966$ is more than critical value, it is clear that there is significant difference in the net profit dividend payouts among the companies under study.

It is found in the Table 5 that Oracle had paid dividend only during 2006 and 2015. However, Compared to all other companies in the year 2015 it has highest dividend payout ratio, i.e. 501.56%. Among the average dividend payout ratios of other IT companies, Hexaware Technologies has highest dividend payout ratio of 67.176% and Cyient has lowest dividend payout ratio of 12.403%.

Table-5: Dividend Payout to Cash Profit Ratio of IT Companies under Study

	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Average
T C S	74.93	32.09	31.73	42.02	33.84	64.47	26.82	27.58	27.44	22.2	38.312
Infosys	39.08	32.03	23.94	29.13	47.96	21.69	20.65	37.91	15.26	43.74	31.139
Wipro	33.03	24.29	27.15	27.16	27.05	16.08	16.7	24.9	27.28	30.82	25.446
HCL	10.81	20.14	36.05	34.53	20.3	37.59	59.94	41.06	66.4	126.43	45.325
Oracle	501.56	--	--	--	--	--	--	--	--	13.68	257.62
Mindtree	22.38	19.56	12.38	5.62	5.14	5.13	4.94	5.44	5.95	--	9.615556
Tech Mahindra	21.22	15	7.91	8.41	6.1	4.9	4.46	16.72	23.86	40.36	14.894
Mphasis	57.36	60.65	57.68	49.23	15.36	7.54	7.53	12.54	22.42	34.31	32.462
Hexaware Technologies	79.45	91.26	51.29	46.74	39.52	14.1	25.41	293.03	16	14.96	67.176
Cyient	26.75	17.48	20.85	13.94	8.94	6.62	7.34	7.94	5.95	8.22	12.403

Sources: Authors Compilation

Table-6: Correlation between Dividend Payout to Cash Profit ratio of Companies under Study

	TCS	Infosys	Wipro	HCL	Mindtree	Tech Mahindra	Mphasis	Hexaware	Cyient
TCS	1	0.011843	0.032435	-0.53985	0.427217	-0.21127	0.183212	-0.11223	0.491558
Infosys		1	0.540185	-0.01562	0.249979	0.326805	0.123126	0.297667	0.177981
Wipro			1	0.070497	0.521425	0.631588	0.609363	0.079244	0.521898
HCL				1	-0.65264	0.681105	-0.25833	-0.25709	-0.52415
Mindtree					1	0.44921	0.798291	0.049421	0.882038
Tech Mahi						1	0.203488	0.01843	-0.0126
Mphasis							1	-0.06047	0.861192
Hexawar								1	0.053658
Cyient									1

Sources: Authors Compilation

Among the Correlation coefficient between dividend payout ratios of various companies under study, 26 correlation coefficients are positive and ten are negative. Since, there is more number of positive correlation coefficients. It can be concluded that the dividend payouts of companies under IT industry are related to each other.

Table-7: T-Values between Dividend Payout to Cash profit Ratios of Companies under Study

	TCS	Infosys	Wipro	HCL	Mindtree	Tech Mahi	Mphasis	Hexawar	Cyient
TCS	#DIV/0!	0.094756	0.259756	-6.09506*	4.18078*	-1.76911	1.516602	-0.90931	5.18541*
Infosys		#DIV/0!	6.10205*	-0.12499	2.133129	2.92705*	1.000172	2.61285*	1.470427
Wipro			#DIV/0!	0.566792	5.72903*	8.40580*	7.7542*	0.637957	5.73811*
HCL				#DIV/0!	-9.0949*	10.1639*	-2.21442	-2.20226	-5.7815*
Mindtree					#DIV/0!	4.50217*	17.6062*	0.396338	31.7840*
Tech Mahi						#DIV/0!	1.698225	0.147493	-0.10084
Mphasis							#DIV/0!	-0.48556	26.6676*
Hexawar								#DIV/0!	0.430504
Cyient									#DIV/0!

Sources: Authors Compilation

Note: *Indicates significant at 5%

Table-7 shows that among the 36 t values, 16 t values are significant at 5% level of significance and remaining 20 are not significant.

Table-8: One-way ANOVA

Source of Variation	d.f.	Sum of Squares	Mean S.S.	Variance Ratio (F)
Between Co's	10-1=9	26088.72	2898.747	3.086966
Eerror	98-9=89	83573.47	939.0278	
Total	99-1=98	109662.2		
Total	99-1=98	109662.2		

Sources: Authors Compilation

The critical value of F ($V_1=9$, $V_2=89$) d.f. at $\alpha 0.01$ is 2.63. Since the calculated value of the test statistic $F=3.086966$ is more than critical value, it is significant. Thus it can be concluded that there is significant difference in the dividend payout to net profit ratios among companies under study.

FINDINGS AND CONCLUSION

- It is found in the study that in the IT Industry, HCL has highest dividend payout to net profit ratio with more consistent dividend payout ratio, Hexaware Technologies has highest dividend payout to cash profit ratio and Mindtree and Cyient have lowest dividend payouts.
- It is clear from the study that among the IT companies, the correlation coefficient of dividend payout to net profit and dividend payout to cash profit between various companies in majority of the cases is positive. It indicates that most of the IT companies announce dividend every year.
- The results of the ANOVA test indicate that there is significant difference between the companies in the dividend payout to net profit ratio and dividend payout to cash profit ratio.

Information Technology is one of the very attractive industries for investment. Present and future is depending highly upon this industry and thus it has a very bright future. The dividend payouts among the IT companies under study shows the result that all most all the companies (except Oracle) have the habit of announcing dividend regularly. The payout to net profit and cash profit will be less than fifty percent in most of the companies and only few companies like Hexaware Technology have been paying more than fifty percent dividend. Therefore, this is one of the best companies for those investors who expect a regular income in the form of dividend from their investment.

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HUMAN CAPITAL MANAGEMENT (HCM) PRACTICES CREATING VALUE THROUGH PEOPLE: A CASE STUDY

G. Sreelakshmi²⁹

ABSTRACT

There is a growing consensus that effective management of the human resources is critical to an organization's success, the last three decades have witnessed the spread of HCM practices throughout the public and private sectors. A growing body of evidence suggests that HCM practices can be used to improve job satisfaction, organizational commitment, innovativeness and performance. These casual pathways, which influence behavioural outcomes. HCM focuses on building the human capital that drives the organization towards success. The analysis of the relevant literature shows that the workforce that is properly and continuously trained and developed through effective capacity building leverages the organization to achieve a competitive advantage and the bottom line. HRM function is concerned with employment relationships i.e., planning, recruiting, developing, motivating, evaluating and retaining a vibrant workforce. This paper recommends HR strategies and practices that managers can adopt to drive optimum value from employees, and this is possible from selecting right people in right number through employee empowerment, capacity building, and employee motivation for improved organizational rewards. This article explores the strategic role of the human resources of an organization.

KEYWORDS

Human Capital Management, Competitive Advantage, Capacity Building, Competence etc.

INTRODUCTION

The proper management of people and the adoption of appropriate human resource policies, practices and strategies enhance organization's performance and profitability. The manager's responsibility is to understand the fundamental issues of people management, the acquisition, development, motivation and maintenance, of an effective workforce to create and deliver value. Every business organization is mainly concerned with providing superior value to the market place, which in turn enhances the profitability level of the enterprise. The market place value is a consequence of energizing and focusing organizational employees to create and deliver value. The organization employees constitute the human resources that drive the business operations, contributing significantly to enterprise performance and the bottom line. Of all the resources available to the manager, i.e., money, materials, machinery, methods the most vital and strategic of them is the human resources, which gives the organization, sustained competitive advantage. The human resource is being transformed from specialized, stand-alone function to a broad corporate competency in which HR and line managers build partnerships to gain competitive advantage and achieve organizational goals through unique talents, innovation, superior performance, intelligence and individual talents.

Through human resources, knowledge and capacity building assist in the creation of resilient workforce that would be helpful for continuous learning, prepare to reinvent itself in order to face the challenges and take more responsibility to achieve corporate objectives.

OBJECTIVES

- To explore and analyses the strategic role of HRM and capacity building.
- To discuss HR strategies for managing people to create value in the organization.

THE ROLE OF HRM AND CAPACITY BUILDING

The HR is a strategic asset that must be properly managed and evaluated. The HR function focuses on building the human capital that drives organizational activities. The two key roles of HR function according to Armstrong (2005) are:

- Ensuring that management deals effectively concerning the employment relationships and development of people, between management and the workforce.
- Creating a conducive environment that enables people to make the best use of their capacities and to realize their potential to the benefit of both the organization and themselves.

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According to Ulrich (1998), traditional, transactional and administrative roles or responsibilities of the HR function have shifted the HR professional as a strategic business partner. In this new role, HR can deliver value in the organization in four ways:

- HR should become a partner with senior and line managers in executing business strategy and helping to improve planning from the boardroom to the market place.
- HR should become an expert in the way work is organized and executed, and to deliver administrative efficiency to ensure cost reduction and quality products and services.
- HR should become a champion for employees, by representing their interest to senior management, and working to increase employee commitment towards the organization.
- HR should become a change agent, by shaping processes and culture that together improve an organization's capacity for a change.

REVIEW OF LITERATURE

To satisfactorily perform this new mandate, and to drive the transformation process to create value in the organization, the HR professional needs to be properly and continuously trained and developed. Capacity building is a central process in achieving effective performance in the organization. For organization to achieve high efficiency and effectiveness in its operations, the workforce, according to Sanusi (2002:6) "must be well-trained and equipped and should be made to see itself as a partner in progress with the industry. Thus enhanced efficiency and productivity of the workforce can only be delivered and sustained through capacity building, training, retraining and commensurate reward for performance".

Dacri (N. d.) notes that job specific training and interpersonal skills training are essential in a world experiencing rapid changes that require people to work in a collaborative team environment.

Human resource capacity building "is the long-term investment on the workforce or the human capacity in the organization in the form of training and development to enhance the creative potential of the employees" (Inyang, 2008:53). A re-engineering process is aimed at achieving corporate excellence. One of the important elements of capacity building is human development, especially, the provision of knowledge, positive attitude or job skills that will enhance employee's current or future performance. Trained, developed and skilled human resource constitutes the human capital.

Chinsman (1999:6) notes that, "human acquisition of knowledge, skills and abilities that sustain economic productivity amounts to human capital". This is the capital required for efficient transformation of activities in the organization and the nation.

According to Yesufu (2000:323), "the nation, in order to survive in the modern world, must devote a high proportion of its resources to developing its human resources in terms of numbers, quality and mix. The mix in particular, must be continuously watched, analyzed, planned, and adapted in order to ensure optimum overall economic and social development.

Human resources adequately trained to unleash their creative potentials for the dual benefits of the organization and themselves. In fact, planned training and development help to change the behavior of employees by giving them additional specific knowledge, skills or attitudes they need to perform and face the challenges of their job. Capacity building is also necessary in facilitating the attainment of enterprise goals through the optimum use of labor of the organization.

HUMAN RESOURCES MANAGEMENT (HRM) SYSTEM

Managing people in an organization is an important function of HRM. Sims (2002:2) defines HRM as "the philosophy, policies, procedures, and practices related to the management of an organization's employees". Inyang (2001:8) considers HRM as "a set of organization-wide and people-oriented functions/ activities deliberately designed to influence the effectiveness of employees in the organization". Storey (1995) says HRM as a distinctive approach to employment, which seeks to achieve a competitive advantage through strategic deployment of highly committed array of culture, structure and techniques. The human resource is, one significant resource and a source of distinctive competence in the organization, which must be planned to enhance organizational survival and growth (Inyang, 2000; Oribabor, 2000).

A distinctive competence gives an organization a competitive advantage, i.e., a competitive edge over the competitors in the industry. This concept is used interchangeably with core competencies, which include the particular skills, and resources a company possesses as well as the way these resources are used to produce outcomes (Fiol, 2001).

Valuing, training and retaining employees bring a powerful competitive advantage for an organization as shown in figure 1.

Figure-1: Competitive Advantage through People

HRM Distinctive Competencies Capabilities	Efficiency Quality Innovation Customer Responsiveness Performance Effectiveness	Value Creation	Increased Profit
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Sources: Authors Compilation

From the above figure, human resources and the capabilities that embed in the human capital of an organization constitute the distinctive competencies, which drive superior efficiency, quality service, innovation, customer responsiveness, performance and effectiveness. Value is then created through these processes; ultimately result into increased profit to organization.

THE RESPONSIBILITIES OF HRM

Modern management practices place HRM as a core management function. The performance of the several activities is instrumental to the survival of the organization. These diverse functions grouped into four major interrelated activities to form the core responsibilities of the HRM and develop the necessary skills and competence level, to ensure organizational effectiveness and efficiency to achieve goals.

Acquisition (Human Resource Planning)

The acquisition function involves forecasting future needs for employees of various types, comparing this need with the present work force and determining, the number and types of employees to be recruited in the organization. Acquisition then includes recruitment, selection, placement and socialization of employees.

Development

This involves providing employees with additional training to enhance performance and avoid human obsolescence. This function can be considered along four dimensions:

- **Employee Training** - to enhance skill development and attitude change.
- **Organizational Development** – which seeks to change the nature of the organization, or some sub-unit of the organization to bring about total organizational improvement.
- **Management development** – which is concerned with knowledge acquisition and enhancement of the top manager's conceptual abilities.
- **Career Development** – organizational effort to match long-term individual and organizational needs.

Motivation

Individual employees' needs and desires are different and quite varied. Manager must recognize and apply appropriate motivational techniques to elicit/stimulate performance, and enhance job satisfaction. Hence, issues of performance appraisal, job satisfaction, work environment, reward system are important issues to consider.

Maintenance

This function is concerned with providing benefits, services, safe and conducive working conditions, industrial harmony. The HRM practices are valuable to any company's success. Thus to be successful in a global market place, they need to select and retain talented employees, undertake employee training and development programmes and dismantle traditional bureaucratic structures that limit employee's ability to be innovative and creative.

STRATEGIES FOR MANAGING HR IN ORGANIZATION

The management of HR in an organization comprises all the people-related activities that are carried out within the organization; these include salary administration, performance appraisal, career planning and so on, according to Templer and Cattaneo (1995). The organization must develop appropriate HR policies to effectively manage people to create value. Some of the strategies to be adopted to drive optimum value from the workforce are:



Proper Selection of the Right People

The management responsibility here involves ensuring, that the right number and right kind of people at the right place and right time, and have the capability and competence to work effectively and efficiently so as to achieve the objectives of the organization

A serious organization must always set very high standards to ensure that only the right people are brought into the service, and appropriately placed in existing positions. According to Adeyeye (2008, 492), "recruitment must be based only on standard-based, merit-driven, well-structured and articulated plans, that secure the strategic and operational needs of the business. This is a critical issue in harnessing people skills to achieve results.

Performance Management

An efficient system of managing performance must be established. This is necessary to identify critical success factors of each job, performance standards/targets and effective monitoring of performance. Employees must be focused on the things that are important to the business. "Performance management is a systematic approach to the management of people, using performance goals, measurement, feedback and recognition as a means of motivating them to realize their maximum potential" (Alo, 1999:89).

Recognition and Appreciation

Recognition and appreciation of a job well done gingers the individual's self-image and self-recognition to optimum-heights. Such good radiance should be communicated to not only the individual but others as well. It goes for criticisms of undesirable acts. Where recognition is seen as fair and honest and expected to yield optimum value, it must be properly timed to reinforce the linkage between that act and the renewal.

Staff Empowerment

Staff empowerment means allowing employees to participate in decision-making, expressing confidence in their ability to perform at high levels, designing their jobs so they have freedom, setting meaningful and challenging goals, applauding outstanding performance, and encouraging people to take personal responsibility for their work. Imhanlahimhin (2007: 45) defines empowerment "as the equipping and strengthening the capacity of employees in order to perform their assigned functions much more satisfactorily in the tripartite interest of the organization, themselves and the larger society or market".

Empowering the employee is not only a sign of recognition but it grants the employee a greater degree of independence of action and freedom from close supervision. It imposes a greater measure of responsibility and therefore challenges his ability. When well empowered, employees put in their optimum value.

Training and Development (Capacity Building)

To harness people skills to achieve optimum results, the training and development function must be carried out on a continuous basis. There must be adequate investment on the employees in the form of training, career development, self-development, mentoring, coaching and counselling. "The market-driven worker requires continuous knowledge empowerment, only possible through deliberate, sustained and continuous training" (Adeyeye, 2008: 492). Such capacity building effort helps the employees to improve their performance, develop the potentials to handle future challenges and more on developing the abilities, behaviour, and performance of individual employees and managers.

Strengthen Employee Capacity

Organisation should be equipped with needed skills and performance equipment. If the worker has been prepared for the role expected of him, it becomes the link between his efforts and the outcome desired (expectancy perceptions). He regards the job as within his competence and puts in his best for optimum results.

Michlitsch (2000:31) aptly notes, "When skills are greater than challenges, boredom produces uninspired, non-productive employees. When challenges are greater than skills, anxiety interferes with performance. It takes the right combination of skills and challenges to develop and inspire a workforce of competent and productive employees".

The employee's capability can be strengthened through selection process, adequate training, and development, job simplification, job enlargement and job rotation. These activities help to change the characteristics of the workforce, increase ability and ensure a higher degree of match between the employee's ability and the job, which results an optimum performance leading to increased productivity and profit.



Self-Commitment

Another important strategy to get the optimum value from an organization's human asset is to introduce participative management. Employees should be involved in planning, goal setting and strategic reviews for the organization. Getting involved in certain decision-making, shareholding and a sophisticated aspect of management would ensure their commitment, loyalty and optimum value.

Employee Motivation

This is an important management process, which must be handled properly to get the best from the employees. According to Ejere (2010: 177), "No organization can hope to achieve high level of performance without a well-motivated workforce". Motivation refers to those factors that pre-dispose employees to act in one way rather than another, in the workplace. The manager must create the right environment to motivate employees. By this, the employees are able to realize their personal interests and aspirations within the context of the organizational objectives. Motivation comes from challenge, recognition for achievement, making people feel important, and enabling them to make a meaningful contribution. Workers is then the "task of creating and sustaining the desire and willingness of employees to perform their allotted tasks with utmost efficiency for the achievement of the objectives of the organization" (Ajuogu, 1997:143).

Organizational Rewards

Since managers desire efficiency to bring out productivity and employee job satisfaction, they are expected to offer employees adequate organizational rewards. These are the material and psychological payoffs for doing something. The two types of organizational rewards that an employee can receive in exchange for this contribution of time and efforts are:

- **Extrinsic Rewards:** Money (wages and salary), fringe benefits, promotions, recognition, status symbols and praise.
- **Intrinsic Rewards:** These represent those rewards that are related directly to performing the job means, a sense of accomplishment, self-esteem, autonomy, personal growth and self-actualization.

Both intrinsic and extrinsic rewards can be used to motivate performance, increase employee's commitment, loyalty and productivity.

Building a Sense of Share Purpose

The ability to manage people for productivity enhancement is the creation of shared purpose. All employees of an organization must be allowed to contribute to the determination of the organization's purpose. This stems from the organization culture and represents a uniform way of thinking, perceiving and valuing both organizational goals and the processes used to reach the goals. Human resources management process must be designed to embed corporate ambition and instill organizational values, which bond people to the organization. The processes should be reviewed to give meaning to employee's work by recognizing individual accomplishment, commitment to sharing information and knowledge and foster individual initiative. Communication and sharing of information are powerful tools in the development of shared purpose in employees and will achieve control through internalized behaviour, development of personal values and interpersonal relationship that encourages self-monitoring and foster team spirit. This facilitates corporate goal attainment.

Creating a Learning Organization

A learning organization harnesses the full brainpower, knowledge and experience available to it, in order to evolve continually for the benefits of the stakeholders. This implies putting in place processes that will harness individual knowledge and skills for the competitive advantage. The individual should be encouraged to take responsibility for his/her personal development for future employment prospects while the organization on its part determines the competencies required for survival and develop them through adaptive training in employees. Creating a learning organization is tantamount to accepting and embracing the emerging concept of knowledge management, which is technology-driven, and requires the organization to pool and retain the available knowledge for the benefit of the enterprise.

CONCLUSION

The effective management of people in an organization is a driving force in the transformation process that enhances the achievement of a competitive advantage, which sets the enterprise ahead of others. Since the human resources of the organization create value, the manager needs to understand the fundamental issues concerned with acquisition, development, motivation and maintenance of an effective workforce to deliver results. The appropriate HR strategies that can be adopted to drive optimum value from employees of an organization range from proper selection of the right people through employee empowerment,



training and development, employee motivation through improved organizational reward system by increasing enthusiasm, commitment, and drive of the work force. The proper management of human resources of an organization helps to bring the best in the employees, to create value for the enterprise.

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IMPACT OF ICDS SERVICES PROVIDED BY ANGANWADI CENTRES IN ASSAM: A CASE STUDY OF JORAHT DISTRICT

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INTRODUCTION

Delivery of services under ICDS scheme is managed in an integrated way through Anganwadi centres, its workers and helpers. The services of Immunization, Health Check-up and Referral Services delivered through Public Health Infrastructure under the Ministry of Health and Family and Welfare UNICEF has provided necessary equipment for the ICDS scheme since 1975. World Bank has also assisted with the financial and technical support for the programme. The cost of ICDS programme averages \$10–\$22 per child a year. The scheme is centrally sponsored with the state governments contributing up to 1.00 (US\$ 0.02) per day per child. Furthermore, the (GOI 2008) adopted the World Health Organization (WHO) standards for measuring and monitoring the child growth and development, both for the ICDS and the National Rural Health Mission (NHRM). WHO developed these standards through an intensive study of six developing countries since 1997? They are known as New WHO Child Growth Standard and measure of physical growth, nutritional status and motor development of children from birth to 5 years age.

There are six dimensions or services of ICDS scheme, which are provided by AWCs.

- Supplementary Nutrition,
- Immunization,
- Health Check-Up,
- Referral Services,
- Non-Formal Preschool Education,
- Nutrition and Health Education.

STATEMENT OF PROBLEMS

The AWWs are faced some problems, which are mention below:

- Inadequate Salary,
- Inadequate Infrastructure,
- Work Overload,
- Excessive Record Maintenance.

OBJECTIVES OF THE STUDY

- To study the job satisfaction of the AWWs in the study area.
- To offer suggestive measures in order to improve the services provided to the Angawadi workers.

REVIEW OF LITERATURE

Lalit Kant et al (1984) as cited in Rani and Devi (2004) conducted a study on “profile of Anganwadi Workers and their knowledge about ICDS”. The profile of 96AWWs of Inderpuri project in Delhi and their knowledge about ICDS was accessed through a questionnaire. Majority of them neither told full form of ICDS nor enumerated all services being provided and listed out of their job responsibilities and hence it was recommended for continuous training and evaluation.¹

Dongre *et al.* (2007) conducted a study on “Perceived Responsibility of Anganwadi Workers and Malnutrition in Rural Wardha” to find out the nutritional status of under six children attending ICDS scheme and to study Anganwadi Workers’ perceived workload and operational problems. A cross-sectionals survey was undertaken among six ICDS beneficiaries of all 20 Anganwadi of primary Health Center, Anji. Out of 2442 children, 1543 (63.1%) were examined and weighted by a team of trained personnel. Nutritional status of children was assessed by survey. Participatory methods like Venn diagram and seasonal calendars were used to collect qualitative data regarding AAWs perceived workload and food security with malnourished children. In the study overall, prevalence of underweight and severe underweight among children under six was found to be 53% and 15% respectively and among below three years it was 47% and 15% respectively. Among the three significantly perceived responsibilities, record

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keeping got the highest priority followed by preschool education and supplementary food distribution. Other activities like growth monitoring, immunization and examination of malnourished children got relatively poor emphasis.¹

Kumari, P.S. (1991) as cited in Bhavya M.S. (2007) conducted a study on a sample of 115 Anganwadi workers belonging to both urban and rural centers, 8 supervisors and 345 beneficiaries. The tools used were a job involvement scale. A work involvement scale, a job stress scale and rating scales to assess job performance. Urban and rural differences were highlighted in the study and it was found that the urban Anganwadi workers showing had better job and work involvement and experiencing less job stress.²

Kariyil and Sunny (2009) stated in the study entitled "A study on Redesigning the Anganwadis in Kerala" that 90% of the workers had an educational background of matriculation and above. 92% of the workers had undergone refresher training. AWWs mentioned that inadequate public cooperation hinders the smooth functioning of the centers. Exhaustive tasks and lack of time stagnated their creativity for discharging their duties in a better way. Majority of the key personnel (community leaders) appreciated the activities carried out by AWWs; they were happy with the prevailing conditions and claimed that the AWC prepared the children for Standard I. They also expressed the need to discontinue certain tasks like providing health services, conducting surveys, organizing a number of meetings, maintaining a number of registers, undertaking house visits and panchayat related tasks.³

Sharma and Pandey (2009) conducted a study on "Impact of ICDS training on Service Delivery by Anganwadi Workers: A Study" in two districts of Uttar Pradesh, namely Muzaffarnagar and Saharanpur. 100 AWWs were selected for the purpose of the study. It was found that AWWs who had attended the JTC (Job Training Course) had significantly better composite skills for communicating with children than those who had not. The AWWs who received Job Training did not exhibit significant gain on the composite skill of delivery of supplementary nutrition and its constituent set of two skills of maintaining hygiene and distribution of supplementary nutrition according to norms as per schematic pattern of the scheme than their counterparts who did not attend JTC.⁴

Vaijayanti (2010) of Akshara Foundation, a Bengaluru based public charitable trust with mission to ensure that every child is in school and learning well, conducted a study on "Analyzing the ICDS Anganwadi centers in Bengaluru". Akshara Foundation has prepared a school readiness kit to be used by Anganwadi in Bengaluru. The initiatives cover all government run Anganwadis in the Bengaluru Urban District. For the purpose of the study Akshara Foundation has developed 68 indicators that help to access the status of Anganwadi Centers related to infrastructure, process and use of the Akshara school preparedness kit supplied to the Anganwadis. These indicators have been collected through observation discussion with Anganwadi Workers and helpers and as well as through crosschecking documents maintained in the Anganwadis. The assessment is conducted in 1524 centers of Bengaluru. The findings of the survey are 46% of the Anganwadi Centers do not have own building. 30% of the centers reported that there is need for a spacious room to run the Anganwadi. Nearly 30% of the centers have damaged or leaking roofs. Around 24% of the Anganwadi have damaged floor and 32% of them have damaged walls. In 64% of the centers, wastebaskets were not found. 98% of the cooks maintain cleanliness and 43% of the centers did not have space to store food supplies. 99% of the Anganwadi Workers maintained the staff attendance register. 98% of them maintained stock register and account register and 95% of them maintained the health register. Only 31% of the Anganwadis reported that they are maintaining the 'Learning Progresses of children. All centers have the Akshara school readiness kit, 97% of the workers are trained to use the kit, 98% of the workers are using the kit and said the kit as effective TLM and children were found using the kit.⁵

RESEARCH DESIGN

Research Design is the arrangement of condition for collection and analysis of data in manner that aims to combine relevance to the research purpose with the economy in procedure. Research design is important primarily because of the increased complexity in the market as well as marketing approaches available to researchers. A research design specifies the methods and procedures for conducting a particular study.

RESEARCH METHODOLOGY

Nature of Research: The research to be conducted will be an experimental research as the research relies on observation of functioning of Anganwadi workers in child development. The research will be totally based on first hand data to be collected from the Selenghat block of Jorhat District. Which would be capable of being verified by experiment. Data to be collected would be classified based on certain set variables considering the objective of the study. Hypotheses have been set and will be tested at appropriate stages to prove and disprove these hypotheses. Hence, empirical research will be conducted.

Portfolio to be considered: For the purpose of study, employed interview with AWWs and data collected from various books as a principal method of data collection using a pretested semi-structured interview schedule.

Manner of Selecting Sample Unit: Then samples will be selected deliberately keeping in mind the targeted groups, which will consist of Anganwadi supervisors, Anganwadi workers, Anganwadi helpers and students etc.

Size of Sample: 60 numbers of workers of Anganwadi centre will be selected on a purposive stratified sample basis. The total number of size of respondents has been 60 numbers are considered as a sampled size.

Type of Data to be collected: Data to will collected in such a way so that it reflects the real conditions and problems of Anganwadi.

Sources of Information: The research will be based on primary data and secondary data. It will be primarily based on primary data. Secondary information will also be collected from journals, periodical, mass media etc. In addition to that, collection of materials from internet will also be availed.

Data Collection: Data will be collected by putting direct questions to the targeted respondents. Personal interview has been conducted wherever possible. Questionnaire with both close and open and ended question has been framed in advance and has been circulated among the AWWs for carrying out the research work. It has been in a structure form and for this purpose; definite and pre-determined questions are framed.

Analysis of Data: Data collected by primary and secondary method has been followed by appropriate analysis with the help of statistical tools and software packages. Correspondence analysis has been made between personality type and demographic variables are made to get the desired result. The following statistical tools and software packages may be used for data analysis -

Statistical Tools: Data so arrived has been analyzed by different statistical units like those that Chi-Square Test has been incorporate.

DATA ANALYSIS AND INTERPRETATION

Table-1.1: Educational Qualification

S. No.	Factors	Number of Respondents	Percentage
1	Up to V std.	6	10
2	V-X std.	30	50
3	H.S.	18	30
4	Graduate	6	10
5	P.G.	Nil	Nil
Total		60	100

Sources: Field Study

It reveals from the table-1.1 that 10 percent of the respondents have their educational qualification up to Vth std., while 50 percent of them have their educational qualification up to X std. Moreover, it is also seen that 30 percent of the respondents have their educational qualification up to H.S and 10 percent of them have their educational qualification up graduate and there is no any Post Graduate respondents in the study area. Hence, It is analyzed that majority of the respondents have their educational qualification up to X Std., only in the study area.

Table-1.2: Age of the AWWs

S. No.	Factors	Number of Respondents	Percentage
1	Below 25 years	12	20
2	26-30 years	30	50
3	Above 30 years	18	30
Total		60	100

Sources: Field Study

It reveals from the table-1.2 that 20 percent of the respondents are belongs from the age of less than 20 years while 50 percent of them have 20-30 yrs. Moreover, it is also seen that 30 percent of the respondents have their age above 30 years. Hence, It is analyzed that majority of the respondents are belongs from the age of 20-30 years in the study area.

Table-1.3: Satisfaction of Level of Honorarium

S. No.	Factors	Number of Respondents	Percentage
1	Yes	00	00
2	No	60	60
Total		60	100

Sources: Field Study

It reveals from the table-1.3 that no respondent are satisfied with their level of honorarium while 100 percent of the respondents are unsatisfied with their level of honorarium. Hence, it is analyzed that majority of the respondents are unsatisfied with their level of honorarium in the study area.

Table-1.4: Work Load

S. No.	Factors	Number of Respondents	Percentage
1	Satisfied	00	00
3	Dissatisfied	60	100
Total		60	100

Sources: Field Study

It reveals from the table-1.4 that 0 percent of the respondents are satisfied with their workload and 100 percent of the respondents are dissatisfied with the workload. Hence, it is analyzed that majority of the respondents are dissatisfied with their workload in the study area.

Table-1.5: Awareness of Nutritional Services among teaching staff

S. No.	Factors	Number of Respondents	Percentage
1	Aware	12	20
2	Do not aware	48	80
Total		60	100

Sources: Field Study

It reveals from the table-1.5 that 20 percent of the teaching staff are aware of the nutritional services while 80 percent of the teaching staff are unaware of the nutritional services. Hence, it is analyzed that majority of the teaching staff are unaware of the nutritional services in the study area.

Table-1.6: Training Status

S. No.	Factors	Number of Respondents	Percentage
1	Trained	24	40
2	Untrained	36	60
Total		60	100

Sources: Field Study

It reveals from the table-1.6 that 40 percent of the respondents are trained while 60 percent of them are untrained. Hence, it is analyzed that majority of the respondents are untrained in the study area.

Table-1.7: Details of Knowledge of AWWs regarding Different Services Provided

S. No.	Factors	Number of Respondents	Percentage
1	Immunization	18	30
2	Nutrition and Health Education	24	40
3	Supplementary Nutrition	6	10
4	Growth Monitoring	9	15
5	Referral Services	3	5
Total		60	100

Sources: Field Study

It reveals from table-1.7 that 30 percent of the respondents have the knowledge of AWWs regarding immunization ,40 percent of them have the knowledge of AWWs regarding nutrition and health education, 10 percent of them have the knowledge of AWWs regarding supplementary nutrition and 15 percent of them have the knowledge of AWWs regarding growth monitoring. Moreover, it is also seen that 5 percent of the have the knowledge of AWWs regarding referral services. Hence, it is analyzed that majority of the respondents have the knowledge of AWWs regarding nutrition and health education in the study area.

Table-1.8: Problems of inadequate honorarium

S. No.	Factors	Number of Respondents	Percentage
1	Yes	60	100
2	No	0	0
Total		60	100

Sources: Field Study

It reveals from the table 1.8 that 100 percent of the respondents face the problem of inadequate honorarium while there are no respondent who do not face the problem of inadequate honorarium. Hence, it is analyzed that majority of the respondents face the problem of inadequate honorarium in the study area.

MAJOR FINDINGS

- 10 percent of the respondents have their educational qualification up to Vth Std., while 50 percent of them have their educational qualification up to X std. Moreover, it is also seen that 30 percent of the respondents have their educational qualification up to H.S. and 10 percent of them have their educational qualification up graduate and there is no any Post Graduate respondents in the study area.
- 20 percent of the respondents are belongs from the age of less than 20 years while 50 percent of them have 20-30 yrs. Moreover, it is also seen that 30 percent of the respondents have their age above 30 years.
- 100 percent of the respondents are unsatisfied with their level of honorarium.
- 100 percent of the respondents are dissatisfied with the workload.
- 20 percent of the teaching staff are aware of the nutritional services while 80 percent of the teaching staff are unaware of the nutritional services.
- 40 percent of the respondents are trained while 60 percent of them are untrained.
- 30 percent of the respondents have the knowledge of AWWs regarding immunization ,40 percent of them have the knowledge of AWWs regarding nutrition and health education, 10 percent of them have the knowledge of AWWs regarding supplementary nutrition and 15 percent of them have the knowledge of AWWs regarding growth monitoring
- 100 percent of the respondents face the problem of inadequate honorarium while there are no respondent who do not face the problem of inadequate honorarium.

CONCLUSION

Children are most important assets of the country because they will be tomorrow's youth and provide the human potential required for a country's development. The national policy for children enunciated on August 1974 has placed high priority on early childhood care and education and has emphasized on its integration into ICDS programme.

END NOTE

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SPATIAL DISTRIBUTION OF GOVERNMENT HEALTH FACILITIES USING GIS TECHNIQUES: A CASE STUDY OF ROHTAK DISTRICT IN HARYANA

Garima³² Samiksha³³ Virender Sihag³⁴

ABSTRACT

The paper present the spatial distribution of Government Health facilities in Rohtak District of Haryana State by using Remote Sensing and GIS Techniques. For the mapping base layer contains village boundary has been used and the list of existing health facilities has been provided by Haryana State Health Resource Centre (HSHRC). By using these Health facilities data and base layer service area has been demarcated through ArcGIS. In Rohtak district, there are 116 public health sub centers (PHSC), 22 Public Health Centers (PHC) and 5 Community Health Centers (CHC).

KEYWORDS

Health Facilities, GIS etc.

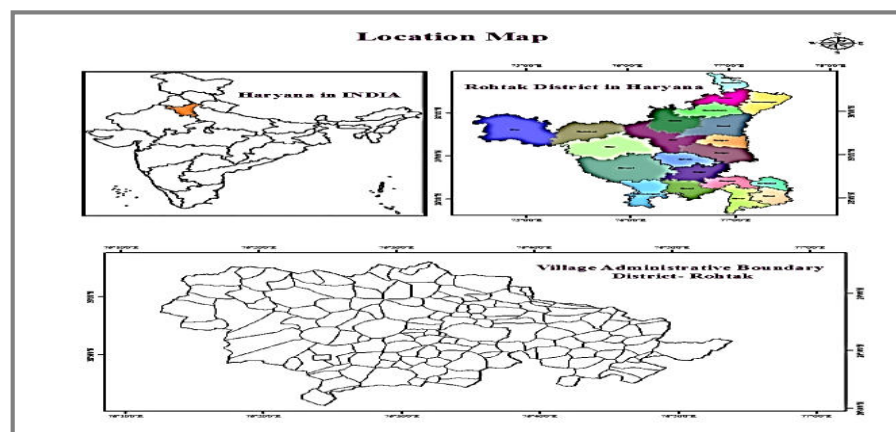
INTRODUCTION

The establishment of Government health facilities is a responsibility of both the central and state government in India. The central Govt. has launched one of the major health care programmes named as National Rural Health Mission (NRHM). Under NRHM, health facilities such as Public Health Sub Centre (PHSC), Public health Centre (PHC) and Community Health Centre (CHC) have been established at Village, Block and District level respectively. In Rohtak district of Haryana state, there are 116 PHSC, 22 PHC and 5 CHC health facilities at each level of administrative structure in a hierarchical pattern. All these facilities have been monitored and evaluated by State Rural Health Mission (SRHM) and Haryana State Health Resource Centre (HSHRC). However, it is a tough task for these institutions to manage, analyze and planning with huge dataset in a simple form. GIS (Geographical Information System) is most reliable and significant tool to be used for better monitoring, evaluation of health care system. GIS can be defined as the science and technology related to the gathering, storage, manipulation, analysis and visualization of georeferenced data (Burrough, 2001).

STUDY AREA

The district Rohtak has been taken for the mapping of Health facilities up to the village level. Rohtak administrative division show in Figure 1. The district headquarter is one of the eight identified priority towns in National Capital Region. Thus, the location plays a vital role for the development of the district. Due to proximity to National capital, the developmental activities are taking place very rapidly. The district has witnessed rapid industrialization, urbanization, diversification in agriculture and change in occupation structure. The district is situated on the National Highway No. 10, from Delhi to Hissar.

Figure-1: Administrative Division Rohtak District



Sources: Authors Compilation

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Figure-2: Location Map of Study District

Rohtak	
Tehsil	Blocks
Meham	Meham
Rohtak	Lakhan Majra
	Rohtak
	Kalanaud
	Sampla

Sources: Census of India

MATERIAL AND METHODS

For the mapping of health facilities, a list containing detail health facilities was collected from HSHRC. Administrative village boundary of Rohtak was collected from Survey of India (SOI). The GPS location of Health Service centre such as SC, and CHC were collected through field based GPS survey.

Step for Data Analysis

The geo-referenced administrative boundaries shapefile was used to locate and incorporate thematic features for location of Settlements, Health Centers, Polyline features for transport network and Polygon features for Service Area demarcation of SC, PHC, and CHC. Separate Layers were created for each feature. Geo-data base has been created with relevant quarry.

RESULTS & DISCUSSION

Spatial Distribution of SC, PHC and CHC in Rohtak district of Haryana state, there are 116 PHSC, 22 PHC and 5 CHC health facilities at each level in a hierarchical pattern. The Table below shows their distribution

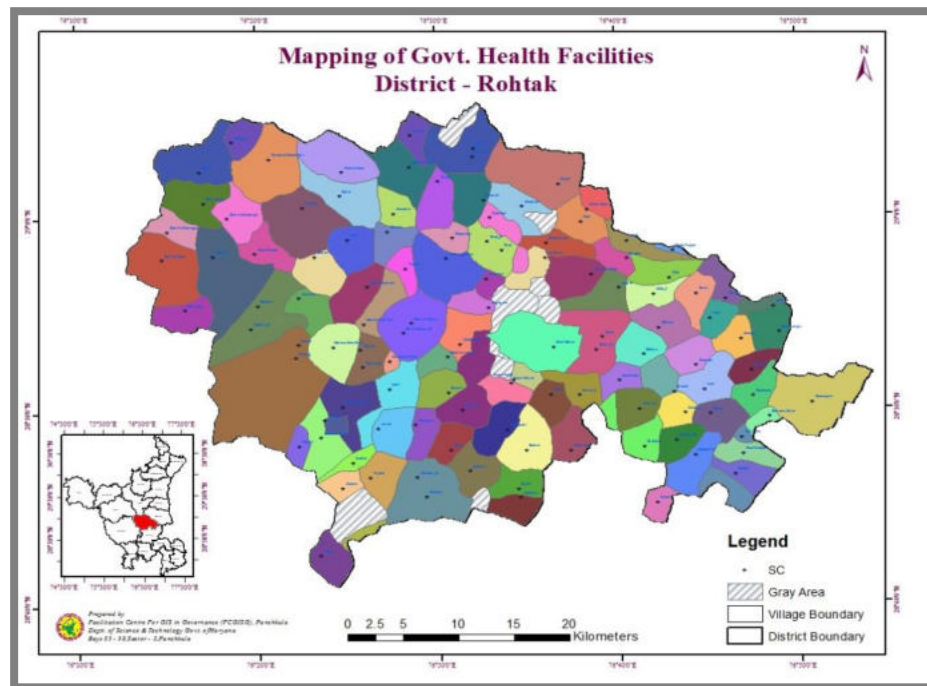
Table-1: List of Public Health Sub Centre (PHSC)

Health Facilities	Unit (Number)	Description
Total CHCs	5	Chiri, Kalanaur, Kiloikhas, Sampla, Maham Rural
Total PHCs	22	Pilana, Kahnaur, Baland, Banyani, Kalanaur, Mokhra, Bahelba, Mehama, Gurawar, Samar, Gopalpur, Lakhan Majra, Chiri, Sanghi, Kharawar, Sampla, Hassangarh, Pakasma, Bhalot, Kilo, Ghilora Kalan, Farmana Badshahpur, Madina
Hospitals	3	GH Mehama, Mahila (50 Beds) Asharam (10 beds) Rohtak (100 beds)
Bed Streanah	100	In each GH
Sub Centers (SCs)	116	As show in map
School of Nursing	26	11 ANM training Centers 13 GNM training Centers 2 B.Sc.

Sources: Authors Compilation

The map-1 shows the spatial distribution of Primary Health Sub Centers (PHSC) with their service area and location. There are 116 PHSCs.

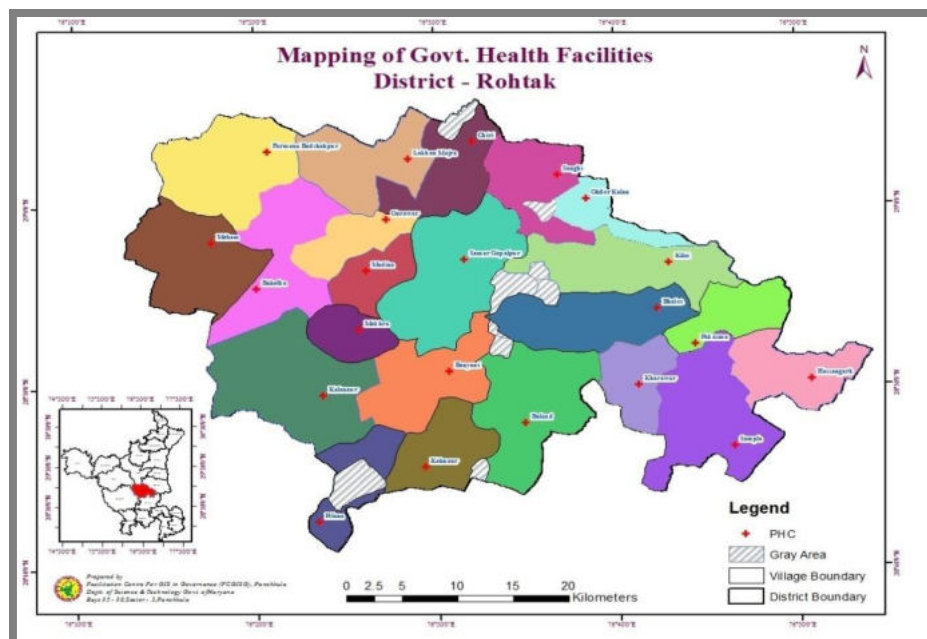
Map-1: Distribution of Primary Health Sub Centers (PHSC)



Sources: Authors Compilation

The map-2 shows the spatial distribution of Public Health Centers (PHC) with their service area and location. There are 22 Public Health Centre's

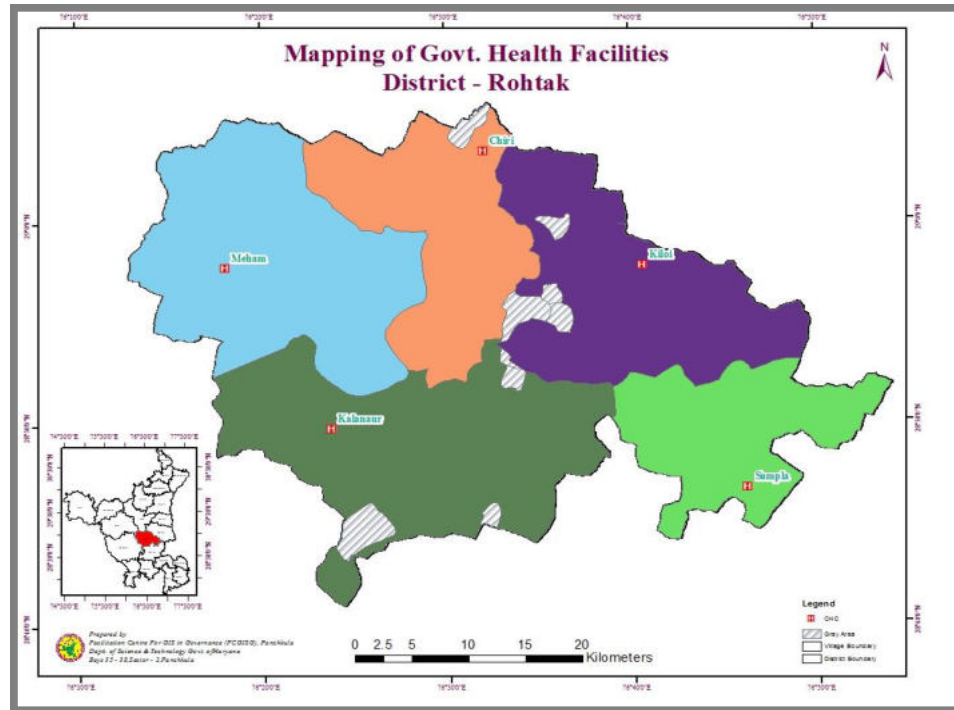
Map-2: Distribution of Public Health Centers (PHC)



Sources: Authors Compilation

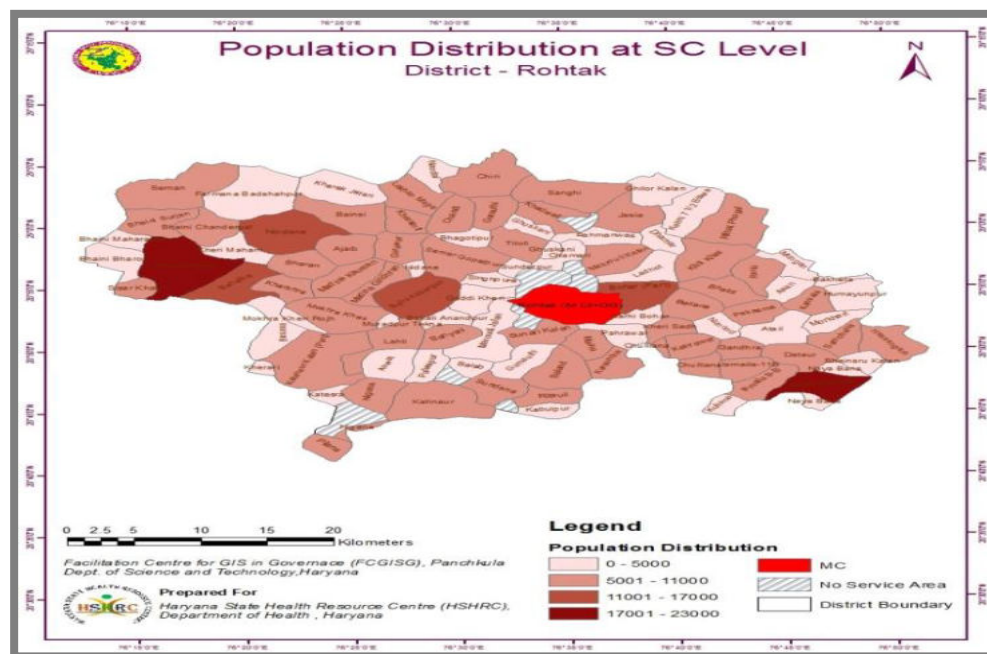
The map-3 shows the spatial distribution of Community Health Centers (CHC) with their service area and location. There are 5 Community Health Centers Chiri, Kalanaur, Kiloikhas, Sampla and Meham.

Map-3: Distribution of Community Health Centre (CHC)



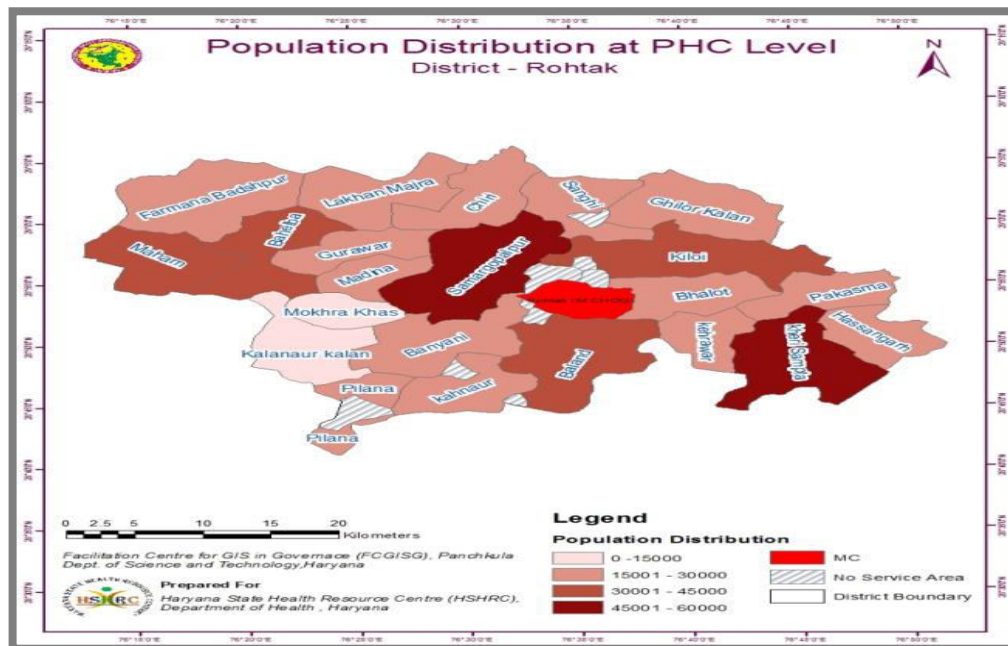
Sources: Authors Compilation

Map-4: Population Distribution at SC Level



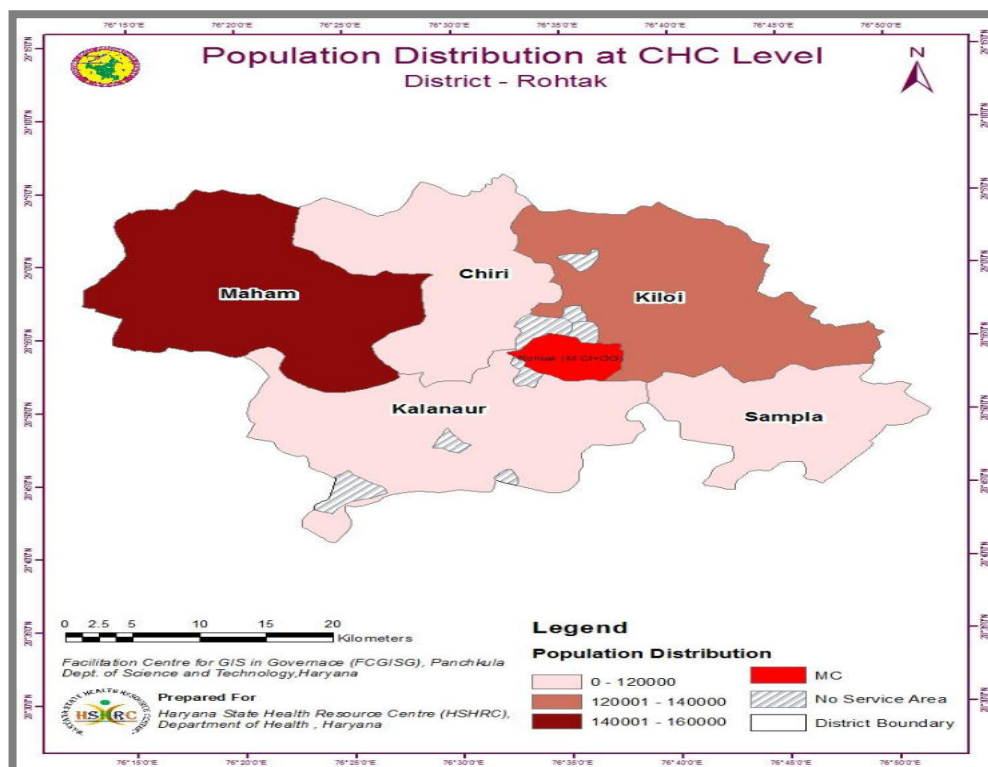
Sources: Authors Compilation

Map-5: Population Distribution at PHC Level



Sources: Authors Compilation

Map-6: Population Distribution at SC and PHC Level



Sources: Authors Compilation



The maps also show Health Service Gray areas. This will give ideal visualization to the authorities to extend their services in those gray area zones. This type of mapping will help in health administration as it gives bird's eye-view of various levels of services and villages covered. The textual or table format cannot give easy and clear idea about the status. The gray areas could be identifiable only after mapping of various levels of services. The maps indicate the high level of public access to health facilities in the district with 116 SCs, 22 PHCs & 5 CHCs besides district, sub-district and urban health centers. However, the distribution patterns of health facilities are not uniform. Some centers cover more population and some cover less population as per standards of CHC, PHC & SC Map4, 5 & 6.

CONCLUSION

In district Rohtak, the public access level of health facilities at village level is high which directly influences the efficiency of health facilities to the citizens. It is found that in service area and their population served; there is huge difference as some facilitate centre serve more population than they could manage and some centre are not serving even the threshold required. Which cause inefficient delivery of services, increase in time spent per patient, lack of recourses like equipment's and the work force etc. moreover, it is also observed that Health facilities are not equally distributed.

ACKNOWLEDGEMENT

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MAPPING OF GOVERNMENT HEALTH FACILITIES & ASSESSMENT OF PREGNANCY RATE AT VILLAGE LEVEL USING REMOTE SENSING AND GIS TECHNIQUES: A CASE OF PANCHKULA DISTRICT IN HARYANA

Garima³⁵ Samiksha³⁶ T. P. Babu³⁷

ABSTRACT

The paper presents the spatial distribution pattern of Government Health facilities in Panchkula District of Haryana State Remote Sensing and GIS Techniques used for mapping for better Health care planning and data management at each health facility level. For the mapping, base map of Panchkula district contains village boundary Shape file has been collected from Survey of India (SOI) and Haryana State Health Resource Centre (HSHRC) has provided the list of health facilities, while exact locations of these facilities were collected through field based GPS survey. By using these Health facilities data and base map, service area of each facility such as district hospital, sub divisional hospital community health centers, public health centers and public health sub centers has been demarcated. Organization of census data as per health administrative boundaries such as CHC, PHC & SC helped in health facility planning. It also helped in estimating expected requirements to facilitate pregnancy cases in the district. This type of mapping is of its first kind in Haryana State. In Panchkula, there are 46 public health sub centers (PHSC), 10 Public Health Centers (PHC) and 2 Community Health Centers (CHC).

KEYWORDS

Health Facilities, GIS, Mapping, Pregnancy Rate etc.

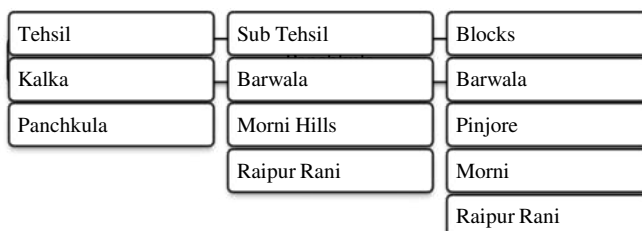
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STUDY AREA

The district Panchkula has been taken for the mapping of Health facilities up to the village level. Panchkula is located at Longitude 76°86'E and Latitude 30°69'N, the district lies in a region where earth quack's of moderate to high intensity have been felt in the past, as it is situated at Himalayan boundary fault zone which is prone to earthquakes. Panchkula district administrative division show in Figure 1.

Figure-1: Administrative Divisions



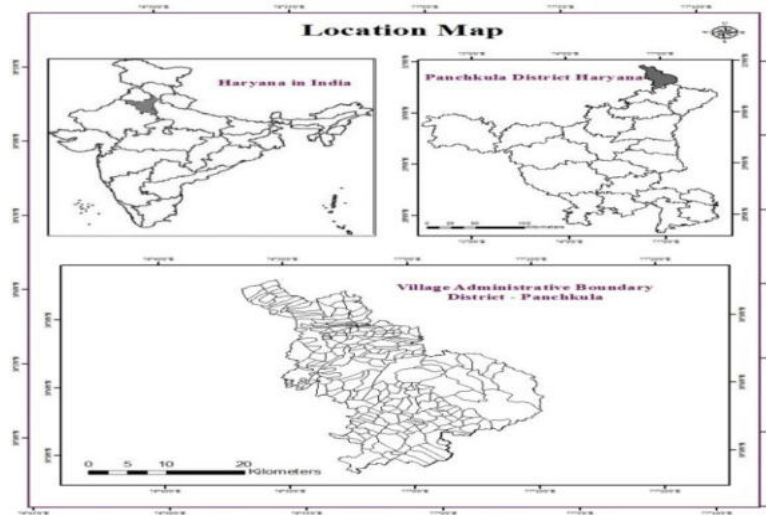
Sources: Authors Compilation

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Figure-2: Location Map of Study District



Sources: Authors Compilation

MATERIAL AND METHODS

For the mapping of health facilities, a list containing detail health facilities of Panchkula district was collected from HSHRC. Administrative village boundaries of Panchkula was collected from Survey of India (SOI). The GPS location of Health Service centre such as SC, PHC and CHC were collected through field based GPS survey.

Steps for Data Analysis

The administrative map Shapefile of Panchkula, which was already geo-referenced, used in ArcGIS 10.0. Then digitization was carried out using Point features for (Settlements Location, Health Centers Location), Polyline features for (Roads, Rail-track) and Polygon features (Service Area demarcation of SC, PHC, CHC health service centers) and separate Layers were created for each features.

Database Creation

For creating database following data has been used:

- The Shapefile of administrative map of Panchkula District.
- List of detailed health facilities with Health Service centre names as shown in table 1.
- Estimated Pragency at block and village level.

Formulae Used

Target Total Population is Estimated on the basis	As per the information received from the District based on the annual survey done by ANMs.	
	Calculated through the Exponential growth formulae	(Past Year Population)*[1+Exp. Rate/100]
Estimated Number of Eligible Women	17%Population	
Estimated Number of Pregnant Women	$[(CBR/1000)*Population*1.1]$	
Estimated number of Infants	$(CBR/1000)*Population$	

RESULTS AND DISCUSSION

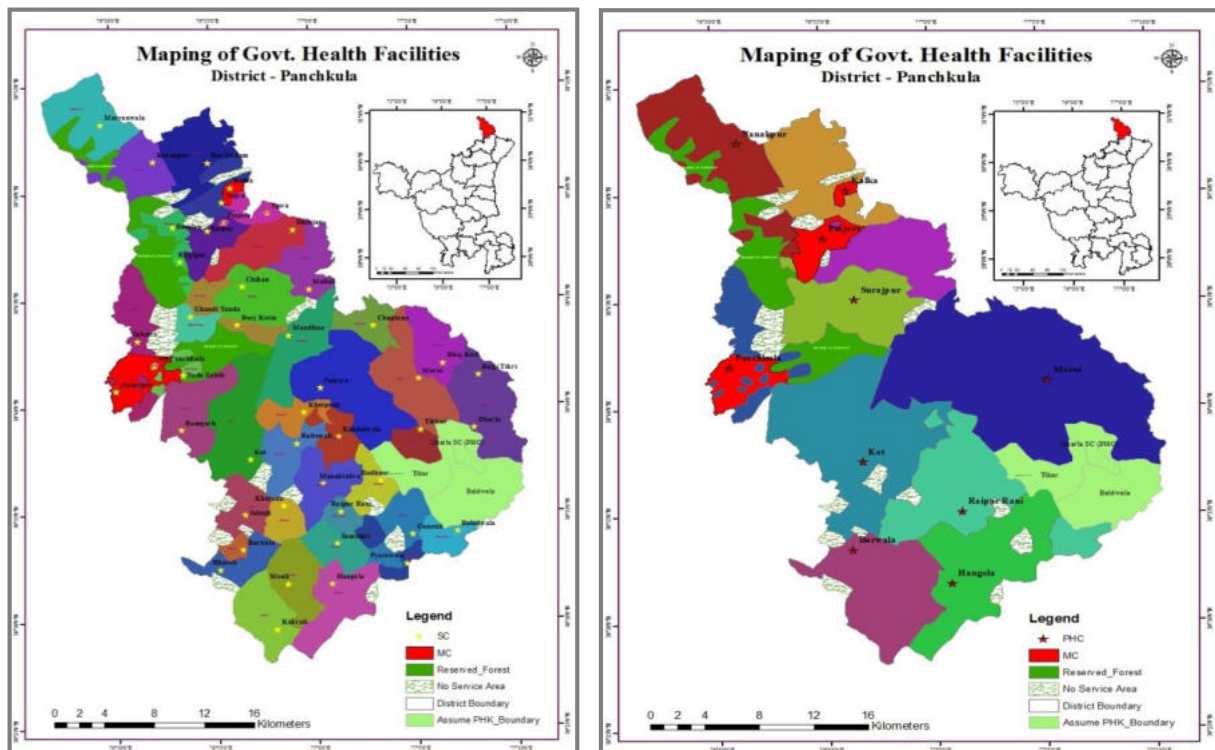
Spatial Distribution of SC, PHC and CHC in Panchkula district of Haryana state, there are 46 PHSC, 10 PHC and 2 CHC health facilities at each level in a hierarchical pattern. The Table below shows their distribution:

Table-1: List of Public Health Sub Centre (PHSC)

Health Facilities	Unit	Description
	(Number)	
Total C.H.C.s	02	Kalka and Raipur Rani
Total P.H.C.s	10	Barwala, Hangola, Kalka, Kot Morni, Nanakpur, Old Panchkula Pinjore, Raipur Rani, Surajpur
Government Hospital	150	
Unani Dispensaries	11	
Total Number of Bed	322	In all institutions
Sub Centers	46	Kakrali, Hangola, Mouli, Samlehri, Bhareli, Barwala, Jalouli, Khatauli, Ganouli, Baladwala, Raipur, Rani, Badhaur, Rattewali, Kot, Khetprali, Ramgarh, Mallah, Pinjore, Tipra, Marranwala, Basolan, Bhorian, Chikan, Burj, Chaplana, Bhoj, Koti, Rajji, Tikri, Bar, Godam, Karanpur, Tagra, Kotia, Chandi, Tanda, Abheypur, Nada, Sahib, Kalka, Pyarwa Kandi, Kandaiwala, Manaktabra, Dharla, Mandhna, Palasra, Tikkar, Morni, Ratpur, Rajjipur, Old Panchkula
Ayurvedic Dispensaries	13	
Government and Voluntary Dispensaries	14	

Sources: District Panchkula Web Portal

Map-1 & 2: Distribution of SC and PHC



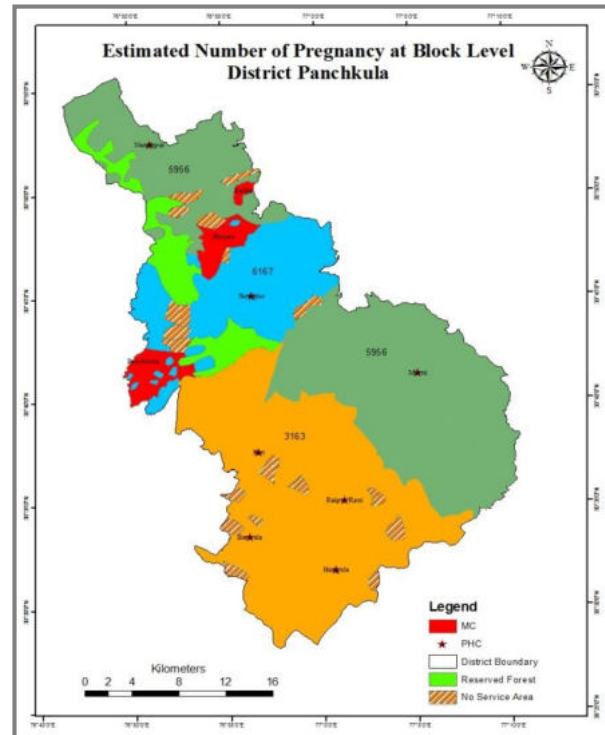
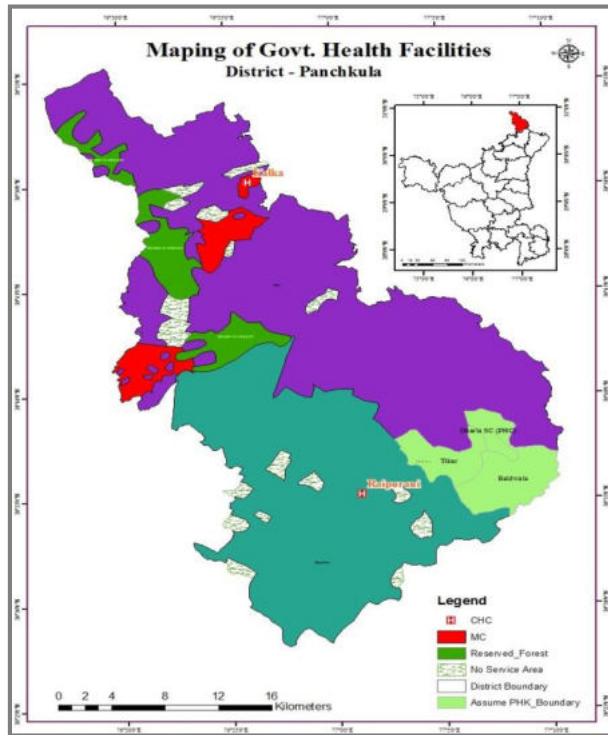
Sources: Authors Compilation

The map-1 above shows the spatial distribution of Public Health Sub Centers (PHSC) with their service area and location. However, some of area mainly (South –Eastern part of the district) have no any PHSC Centre because the villages on that sides are very small with very less population to have any sub centers location.

The map-2 above shows the spatial distribution of Public Health Centers (PHC) with their service area and location. There are ten Public Health Centre Barwala, Hangola, Kalka, Kot Morni, Nanakpur, Old Panchkula Pinjore, Raipur Rani and Surajpur.

Map-3: Distribution of CHC

Map-4: Distribution of Estimated Number of Pregnancy at Block Level



Sources: Authors Compilation

The map above shows the spatial distribution of Community Health Centers (CHC) with their service area and location. There are two Community Health Center 1 is Kalka second is Raipur Rani.

Table-2: Estimated Pregnancy at Block and Village Level

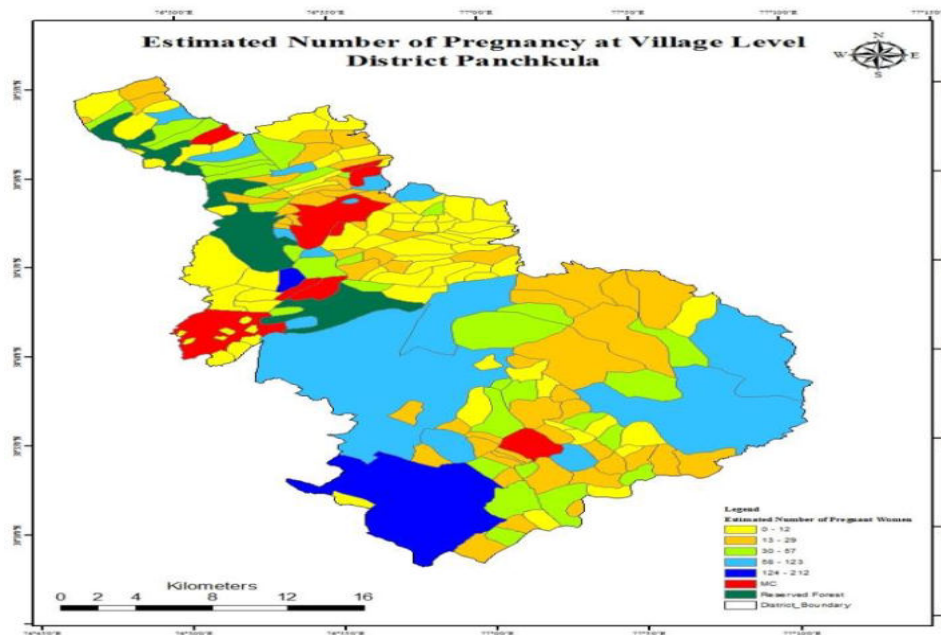
Name of Districts	Name of Block	Estimated Population for 2014-15	Crude Birth Rate	Estimated number of Eligible Couple	Estimated number of Pregnant Women	Estimated number of Infants
Panchkula	Kalka	261554	20.7	44464	5956	5414
	Raipur Rani	137567	20.9	23386	3163	2875
	Panchkula	254824	22	43320	6167	5606

Sources: Authors Compilation

At Village level estimated number of Pregnant Women at village level show in below map-5. The above table shows that Panchkula block have high crude Birth rate (225), estimated number of eligible couple are 43320 or estimated number of Pregnant Women are 6167, estimated number of Infants are 5606 which is higher due to the facilities availability are high at Panchkula block.

The map-5 shows that estimated number of pregnant women out of population is high at Chandi Mandir (212/9051), Barwala (195/8307) and Nala Dakrog (1/64) and Fatehpur Viran (1/56). Villages have the lowest rate. It is estimated that no of eligible couple are 17% (as per standard norms) of the total population and loses are the 10% of the total pregnancies. It is found that in cities loses are less then villages.

Map-5: Mapping of Pregnancy at Village level Village Level



Sources: Authors Compilation

CONCLUSION

As the central government supported the programme has been initiated in the state; there is continues improvement in the health profile of Haryana state. In district Panchkula, the penetration level of health facilities at village level is very high which directly affects the efficiency of these health facilities at ground level. However, these facilities are not equally distributed as per the government norms standard being provided under NRHM guidelines.

It is found that in service area and their population served; there are huge difference as some facilitate centre serve more population than they could manage and some centre are not serving even the threshold required which cause inefficient delivery of services, increase in time spent per patient, lack of recourses like equipment's and the manpower etc. moreover, it is also observed that Health facilities are not equally distributed.

ACKNOWLEDGEMENT

Authors are thankful to Haryana State Health Resource Centre (HSHRC) Panchkula, Haryana for taking keen interest and providing financial assistance for the project. We would like to place on records the heartfelt thanks to Panchkula district Health Coordinator, NHRM for providing related data of health services in Panchkula. I am grateful to my husband and all my family members for their constant encouragement. I love my cute daughter, Parissa who did not trouble me during my paper preparation.

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POPULATION DISTRIBUTION IN COMMUNITY HEALTH CENTRE AND PRIMARY HEALTH CENTRE USING GIS TECHNIQUES: CASE STUDY OF PANCHKULA DISTRICT IN HARYANA

Garima³⁸ Virender Sihag³⁹ Samiksha⁴⁰

ABSTRACT

This paper describe the population distribution pattern of Government Health Facilities in Panchula District of Haryana State using Remote Sensing and GIS Techniques. The data used for mapping includes secondary data (base map of Panchula district containing village boundary was collected from Survey of India (SOI), secondary data such as list of govt. health facilities available in Panchula and district demographic data census 2011,) were collected from Haryana State Health Resource Centre (HSHRC) & Census Dept. respectively. By using these Health facilities data and base map; service area of each facility such as Public Health Sub Centre (PHSC), Primary Health Centre (PHC) and Community Health Centre (CHC) have been demarcated using ArcGIS 10.0 Software. The paper reveals that in district Panchkula penetration level of health facilities is high up to village level. In Panchkula, there are around 51 public health sub centers (PHSC), 8 Primary Health Centers (PHC) and 2 Community Health Centers (CHC). Furthers, the paper shows the population distribution within the service area of CHC and PHC.

KEYWORDS

Health Facilities, GIS, Census 2011 etc.

INTRODUCTION

Haryana state is progressing in their health facilities with better health infrastructure. The health facilities have been penetrating both in rural and urban area since the central support programme like NRHM (National Rural Health Mission) and NUHM (National Urban Health Mission) initiated. Community Health Centre is the Nodal Health Facilitate Centre in District as per the hierarchy of Health Service Centre established under the Nation Rural Health Mission. To cater the need of health facilities govt. has established their health centre up to a group of villages. As per the "NRHM" guidelines, there should be one Public Health Sub Centre (PHSC) for every 5000 population in plain areas & for 3000 population in hilly areas, one Primary Health Centre (PHC) for every 30000 population in plain areas & for 20000 populations in hilly areas and one Community Health Centre (CHC) for every 80000 to 1.20 less population. Furthers, each PHC & CHC should covered six Sub Centers and four Primary Health Centers in their service area respectively.

In Panchula district of Haryana state, there are 51 PHSC, 8 PHC and 2 CHC health facilities at each level of administrative structure in a hierarchical pattern. All these facilities have been monitored and evaluated by State Rural Health Mission (SRHM). However, it is a tough task for these institutions to manage, analyze and planning with huge dataset.

Geographical Information System (GIS) is a most reliable and significant tool used for better monitoring, evaluation of health care system. GIS can be defined as the science and technology related to the gathering, storage, manipulation, analysis and visualization of geo-referenced data (Burrough, 2001). GIS is being used extensively in the health sector for a couple of decades. It is widely used to examine spatial patterns of health services and in planning the location of new health facilities centre (GARY HIGGS, March 25, 2005) The spatial Analysis offered by GIS can help one understand the spatial pattern of health facilities of an area, population pressure and unequal distribution of health service centers. The first-step towards integration of GIS technology into HMIS (Health Management Information System) starts with the preparation of geo-database and mapping of health facilities.

Study Area

Panchkula is a planned city in Panchkula District, Haryana, India. It is a satellite city of the Union Territory of Chandigarh. Panchkula is located at Longitude 76°86'E and Latitude 30°69'N

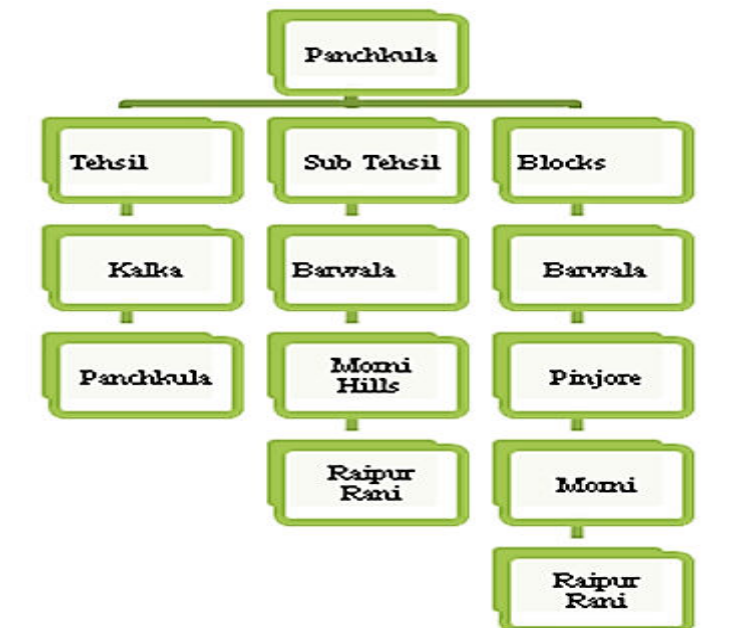
The district comprises 2 tehsil-Kalka, Panchkula. These are further divided into 3 sub divisions: Barwala, Morni Hills, Raipurani and 4 blocks: Barwala, Pinjore, Morni and Raipur Rani. Morni hills constitute the highest point of the district as well as of Haryana.

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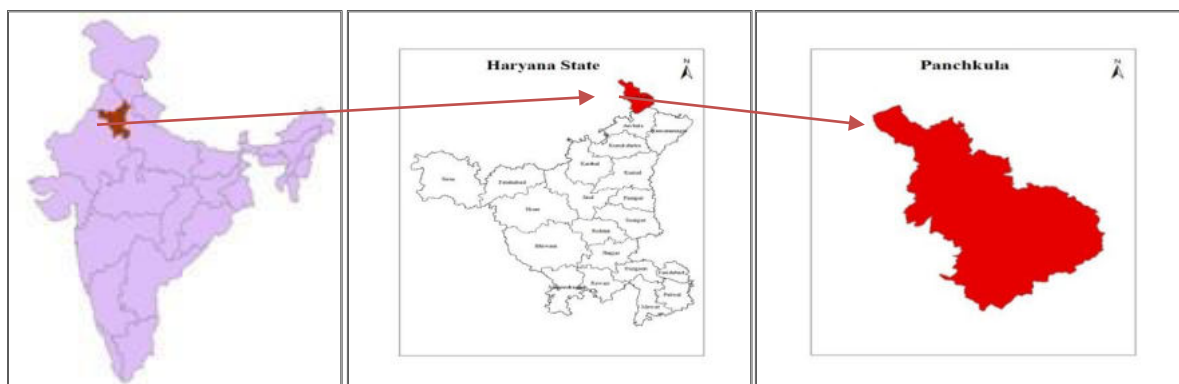
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Figure-1: Administrative Structure



Sources: District Administration

Figure-2: Location Map



Sources: District Administration

MATERIAL AND METHODS

For the mapping of health facilities, a methodology were framed which includes following steps:

Data Used

The secondary data were used for mapping of health facility centers & their service area. Political boundaries map, list of health facilities centre with service area of PHC and CHC and demographic details of Panchkula district as per Census 2011.

Database Creation

For creating database following data has been used:

- The administrative map Shape file of Panchkula District.
- List of health facilities centers of PHC & CHC.

- Demographic details of Panchkula district as per Census 2011.

Data Analysis Steps

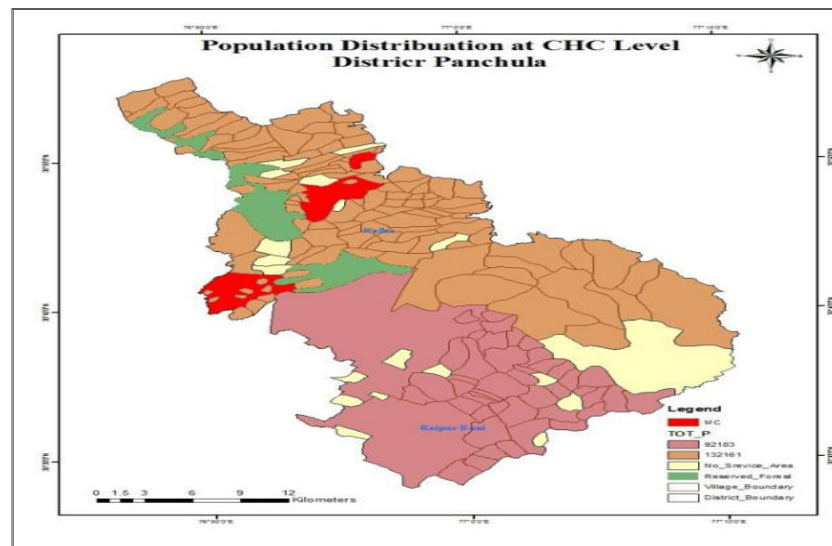
The administrative map Shapefile which is already geo-referenced used in ArcGIS 10.0. Then digitization was carried out using that village boundary and separate layers of PHC & CHC were created. Further, census 2011 data were attached with the service area layer of PHC and CHC.

RESULTS AND DISCUSSION

Community Health Centre (CHC)

There are two CHC in the district i.e. Raipur- Rani and Kalka. The total population served by CHC is 224344. Out of total, male are 121150 and female are 103194. The average population covered by a CHC is 112172. Kalka serves the maximum population whereas Raipur Rani covers minimum population.

Map-1: Distribution of Population at CHC Level Panchkula

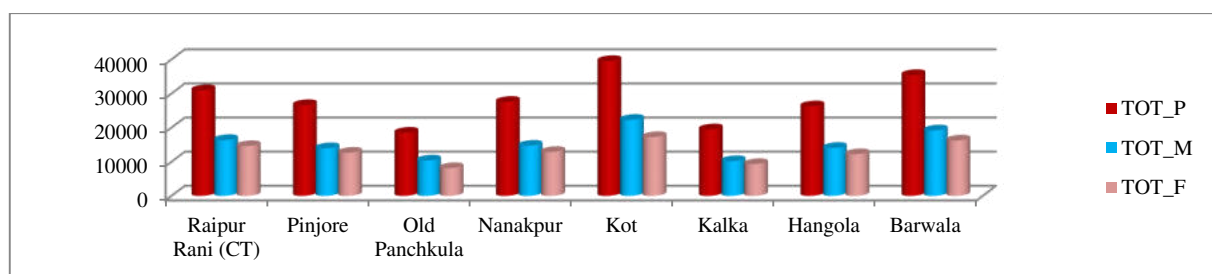


Sources: Authors Compilation

Public Health Centre (PHC)

In Panchkula district, there are eight PHC. Each PHC serves around 28,672 populations, which is below the standard health norms in which one PHC should serve 30,000 populations. Here the graph shows the population distribution at PHC level. Kot covers the maximum population whereas Old Panchkula covers minimum population.

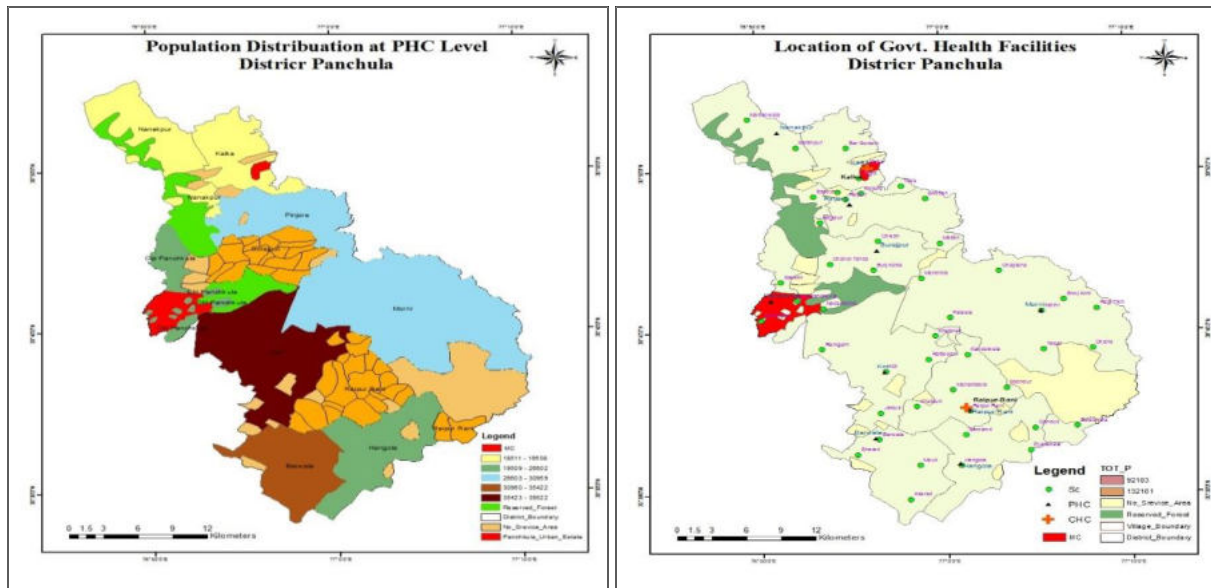
Graph-1: Population Distribution at PHC Level



Sources: Authors Compilation

Map-2: Distribution of Population at PHC Level

Map-3: Location of Health Facilities in Panchkula District



Sources: Authors Compilation

The above map3 show the location of health facilities exist in the panchkula district. major problem observed in Morni hill areas due to th rechibaly and demography condition, scattered and around 5to 10 houes in a village that not fullfill the requirement to construct a sub centre for three to four villages. As per the “NRHM” guidelines, there should be 1 Public Health Sub Centre (PHSC) for every 3000 population in hilly areas, one Primary Health Centre (PHC) 20000. So people in hill areas not get good health facilities.

CONCLUSION

As the central govt. supported programme has been initiated in the state there is continue improvement in the health profile of the state. In district Panchkula, the penetration level of health facilities at village level is very high which directly affects the efficiency of these health facilities at ground level. However, these facilities are not equally distributed as per the govt. norms standard being provided under NRHM guidelines. It is found that in service area and their population served; there are huge difference as some facilitate centre serve more population than they could manage and some centre are not serving even the threshold required which cause inefficient delivery of services, increase in time spent per patient, lack of recourses like equipment's and the manpower etc.

ACKNOWLEDGEMENT

Authors are thankful to Health Coordinator, NHRM for providing related data of health services in Panchkula. I am grateful to my husband and all my family members for their constant encouragement. I love my cute daughter, Parissa who did not trouble me during my paper preparation.

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**CUSTOMER BASED PROFILING OF ON-LINE ADVERTISEMENTS:
A MODEL PROPOSED E-SYSTEM TO INCREASE THE EFFECTIVENESS OF
E-MARKETING IN CURRENT BUSINESS SCENARIO**

Dr. Deepak Jain⁴¹

ABSTRACT

Both in past and in the present, various e-services providers are in process of exploring out the surfer profiles for proposing offer related to products & services. However, in most of the cases, the profile construction methodologies they adopt have problems. These methodologies often require a net surfer to spend a certain amount of time for construction and updating the surfer's profiles. Moreover, these methodologies stores only information about the proposals that the surfer claims to be interested in and many times outlier data is collected when the user is filling the form half-heartedly and even sometimes closes the popup window if he /she does not identifies the importance of the form.

The surfer will receive advertisements or proposals throughout his life whenever he / she logged on to internet. The main disadvantage of the online advertisement is that the advertisements are popped up on the system without knowing the profile of the surfer. Dynamically or static advertisements are continuously displayed on the user system even without knowing the gender or age of the surfer.

This propose system for e-marketing is based on searching and mining information on the World Wide Web, using user profiles and then clustering the profiles which will help to reduce the displaying of useless online ads for surfer surfing the net.

In other words, the user profile will itself help the system to display correct advertisements as per surfer profile. All the information needed to cluster a user profiles is acquired through monitoring the surfer during the use of the system. The user profile is created by a single mobile agent and this same mobile agent which is dynamically created when the surfer log in and the life of the mobile agent remains until the user logged out and this mobile agent helps in the clustering of the users having some common taste. Based on the information collected, advertisements matching the clusters will be flashed on their screen that will help the advertisers in reducing the cost and increasing the relevance of placing the e-advertisements on internet. This will also help the surfer to make a strong decision in purchasing same product, which he / she surfer is looking to purchase.

The model proposed will not only increases the validity of e-advertisement placement on internet but also increases the possibility of sales of related product categories. The success of model is directly proportional to the number of surfer surfing the net and the time spend by the each surfer.

KEYWORDS

Web mining, Mobile agent, Web log, Propose System, Search Engine, Surfer etc.

INTRODUCTION

The successful promotion of a product requires a positive message to be received by the potential customers. For many products, advertising is the most popular means of conveying that positive message. Advertising is not a new concept. It has a history of about 3000 years ago, and origin in the ancient Greek city. Thebes, an advertisement was written on papyrus plant calling for information regarding a runaway slave; this was not necessarily the first advertisement, but merely one of the first examples, which has survived. It is certainly a very innovative one.

We have two types of media: Print media and electronic media. Print media includes newspapers, tabloids, magazines, mailers, circulars, etc.; whereas, electronic media including television, internet (e-mails), mobiles, radio, Satellite Television etc.; and the list need not be exhaustive.

As there is requirement of speedy and reliable source of information provider, so internet was identified as the solution of the same. With the significant growth in the number of Internet users all over the world, expenditure on Internet advertising increased tremendously over the past few years.

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The Internet has the capacity to reach a global audience faster than any other medium. The multiple forms of online advertising tools developed by advertisers over time were aimed at creating exciting, interactive, eye-catching advertisements that could draw consumer's attention. There are different types of online advertising some of them include display advertising or banners, sponsorship, e-mail advertising / opt-in e-mail advertising.

Another form of advertising that is emerging as a new trend in online advertising is Video Advertising. The Interactive Advertising Bureau (IAB) and Price waterhouse Coopers LLP (PwC) announced that Internet advertising revenues reached almost \$5.9 billion for the third quarter of 2008, representing an 11 percent increase over the same period in 2007. While double-digit annual growth continues, the quarter-to-quarter curve remains relatively flat compared to recent past performance. The Q3 results of year 2008 published in the IAB Internet Advertising Revenue Report shows a rise of 2% compared to Q2 results of year 2008.

Set against strong economic headwinds in the U.S. economy, Q3 '2008' \$5.9 billion represents nonetheless the second-highest quarter results ever. For the first nine months of 2008, revenues totaled \$17.3 billion, up from \$15.2 billion in the same period a year ago and surpassing the record set in the first nine months of 2007 ^[1]

BACKGROUND

Both in past and in the present, various e-services providers are in process of exploring out the surfer profiles for proposing offer related to products & services. However, in most of the cases, the profile construction methodologies they adopt have problems. These methodologies often require a net surfer to spend a certain amount of time for construction and updating the surfer's profiles. Moreover, these methodologies stores only information about the proposals that the surfer claims to be interested in and many times outlier data is collected when the user is filling the form half-heartedly and even sometimes closes the popup window if he /she does not identifies the importance of the form.

The surfer will receive advertisements or proposals throughout his life whenever he / she logged on to internet. The main disadvantage of the online advertisement is that the advertisements are popped up on the system without knowing the profile of the surfer. Dynamically or static advertisements are continuously displayed on the user system even without knowing the gender or age of the surfer.

In other words, we can say useless advertisements are flashed in-front of the surfer, and it is seen that most of the time e-advertisement on the sites are either common to all or some time useless for the surfer surfing the net. Current systems cannot decide surfer profile, leading people to ignore such online advertisements because that advertisement does not have any relevance to be viewed.

Example: whenever you logon to Rediff.com, a popup of advertisement flashed that has no or little relevance to male users as compared to female users because the advertisements are related to leather ladies bags, nighties, games laptop etc. It must be noted that every user has different taste for buying product / service because of their demographic and personal characteristics. Even then, they have some basic thing in common.

Need is to design a system that can identify and judge the profile of the user and can take decisions for displaying the advertisements accordingly. Requirement is to construct a web profile of the surfer by taking into account the user's behavior while he is accessing all the sites. Profiles of such surfer are then clustered and advertisements suiting the profile of particular cluster are shown, which increases the possibility of purchases (revenue generator). It must be noted that logged time (time since surfer is using internet connection or logged on internet) should be sufficient to undertake the clustering activities i.e. identify and creating clusters of profiles.

THE PROPOSE SYSTEM

The architecture of the proposed system uses a set of agents having specific functions and goals. All of these agents co-operate with each other to reach the goal of the system. The main aim of the proposed system is to cluster the internet surfer according to their profiles, and based on it, the new system makes suggestion of Advertisements to be flashed on the screen, which is likely to be useful for the surfer of identified cluster. In other words, the system tries to compose the user profile without questioning the user about their preferences. This makes the system much more applicable in practical system since there is no interference of the user.

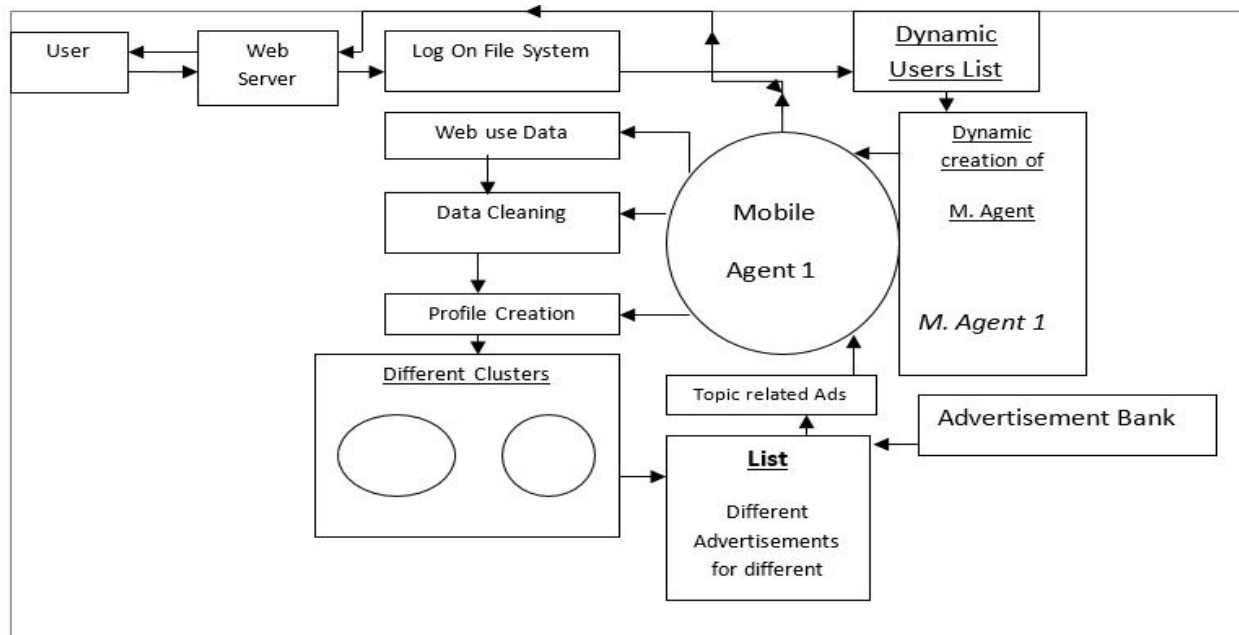
In this system whenever a surfer logged on internet, an entry is made in the log file, and a list of users is created dynamically who have logged in recently and a mobile agent is created for every user. This mobile agent is responsible for monitoring the user action in order to create the corresponding user profiles. Once the user profile is created again this mobile agent will be responsible for clustering logged users into cluster, and displaying the advertisements according to the cluster. Profiles that come

under the particular cluster from the list box, relative advertisements to those cluster are delivered to the user one by one on search engines, which have the capability to display the advertisements one by one fetched from a remote database.

The mobile agent should make profiles from those URL where users have logged in and has spend some time for reading the article on some product. The time for log in and out is maintained with log file system. The mobile agent should make a list of the products from the user web page that he / she clicks and must be stored in its database and also keeps on updating the same by reading the user's other web pages when he surfs on the net.

It must also be noted that users needs and desires are changing constantly, that raises the requirement that the cluster process should be made dynamically to understand those changes also. As need changes, database need to be updated, and information related to changes in cluster must be send to server for displaying advertisements.

Figure-1: General Architecture of the System



Sources: Authors Compilation

STEPS INVOLVED IN PROPOSED SYSTEM

Data Collection Process: Data required for creating cluster of profiles is collected from the user visiting internet through questions flashed either on visiting web pages or before logging off the internet, then there is great chance of receiving outlier data from the users because surfer simply fill the answers just to finish the survey. In that case, the aim of conducting the survey is not achieved. The purpose behind data collection can be achieved if the user actively participates in such evolution. The proposed system can help to overcome the above-said situation. In the proposed system, mobile agent collects the data from server, proxy, and special log systems by monitoring the accessed pages and navigation paths.

Log System: The log system^[2] was developed in 2003^[3] and based on a preliminary log system introduced in 2002, which allows storing of only some basic properties of actions performed by users and was only aimed on general usage statistics. The major improvement towards the new log system was the ability to capture distinct and recurring user sessions, which is also the basis of user's profiles construction. The web access log contains raw access data, which needs to be cleared from noise and filtered before it can be used for user profiles extraction.

Profiling System: The proposed system tries to compose the user profile without questioning the surfer about their preferences. This makes the system much more applicable in practical system since there is no interference of the surfer. Within this system, whenever a user logged on internet, a surfer entry (logged in entry) is made in the log file, creating a comprehensive list of users logged on internet recently. For each surfer, a mobile agent is created. Mobile agent is responsible for monitoring the surfer action in order to create the corresponding user profiles. Once the user profile is created, mobile agent will be responsible for clustering subscribed surfer's into cluster according to their profiles created by mobile agent.



The profile of the user consists of the most common web page (s); products / services which surfer had surfed, which is read by mobile agent.

Clustering Process: The mobile agent hands the profile to the clustering process. Cluster includes profiles of the users who are searching or reading the web pages or products / services. Clustering of profiles is done depending upon the characteristics of the web pages and products / services viewed. The clustering process is a dynamic in nature because the taste and preferences of the same user changes with time. So, there can be more than one cluster for the profile. The dynamic clustering process will stop working as the user log out for the site or the surfer don't change his search for the another web-pages or products / services categories.

Mobile Agent: A program assists people and acts on their behalf. Mobile agent is not bound to the system where its execution begins. It can transport itself from one system in a network to another, and resume its execution. It can bring its state to a new remote host ^[4].

Some of the Advantages are:

- Reduce Network load.
- Overcome network latency.
- Encapsulate protocols.
- Execute asynchronously and autonomously.
- Naturally heterogeneous.
- Robust.

There are number of mobile agent system like Aglets, Grasshopper and Voyager. For every user accessing the web, one mobile agent is there for each of them. This agent is responsible for monitoring the user action in order to create the corresponding user profiles. Once the user profile is created, mobile agent will help in clustering subscribed user into cluster, according to their profiles. Mobile agent will then select advertisements from the list box, and all the selected advertisements relative to clusters are delivered to the user one by one to make this search for the product easy and help in selecting the best for surfers.

Advertisements Bank and List

Advertisements are placed on search engines and websites to have large viewership. They can be of static or rotating type. These advertisements are usually placed to create awareness and promote sales. Advertisements bank consists of different types of advertisements of different companies.

Some of different types of online advertising include display advertising or banner ads, sponsorship, e-mail advertising / opt-in e-mail advertising, search, classifieds, auctions, rich media, skyscraper advertisements, pop-up / pop-under advertisements (interstitials), floating advertisements, and search engine advertising etc. Video advertising is also emerging as a new trend in online advertising.

Out of the above, banner advertisements are most popular and used. Proposed system is also designed keeping in mind the use of banner advertisements as a most popular form of e- advertisements. Banner advertisements can be in the standard size of 468x60 pixels. It can also appear in any size as desired by the advertisers. The advertisements list will group all banner advertisements depending upon the product / service categories. Mobile agent will then assign a particular category of the advertisements to a particular cluster of profiles.

SCOPE OF STUDY

The scope of the study is limited to the Jammu and Katra region only.

SIGNIFICANCE OF STUDY

The study is going to be a great practical contribution to the body of knowledge as this area has not yet been explored. The study may help the advertisers in reducing their e-advertising cost and increases the relevance of advertisements flashed on internet as per customer profile. The said research has many applied aspects.

Findings may be forwarded to the companies involved in B2B and B2C activities for necessary implementation.

OBJECTIVES OF STUDY

The purpose of this study is to justify the importance of proposed concept based on customer's opinion towards the nature and usefulness of advertisements flashed on the screen while surfing on internet. Accordingly, the study has following objectives:

- To identify surfer's opinion w.r.t. advertisements flashed on screen while surfing the internet.
- To identify whether the advertisement flashed on screen are in accordance with surfer's characteristics or not.
- To identify the frequency of visits made by surfers daily and monthly.
- To understand the background of visiting surfers.
- To correlate level of satisfaction w.r.t. advertisement flashed and background of surfers.

DATA COLLECTION METHODS

Questionnaire Development

Questionnaire contains multiple-choice questions. A five point Likert Scale was used starting from "Always" and ending on "Never" was used in questionnaire and the respondents were asked to mark their responses on point scale.

Sampling Design

Non-probability convenient sampling

Sample Size

A sample of 300 customers was surveyed, available at different cyber cafes and universities campuses.

Sampling Area

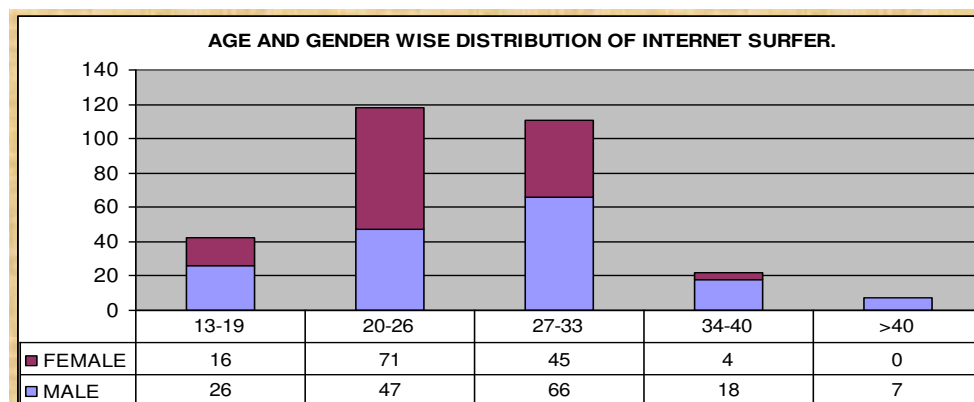
- Within JAMMU City: Gandhi Nagar, Gole Market, Nanak Nagar, Railway Station Road, Jammu University Campus, Tallab Tillo, Panjtirthi etc.
- Within Katra Region: Shri Mata Vaisho Devi University Campus, Main Katra Market etc.

Sampling Unit

Data were collected from customers surfing at different cyber cafes ranging in age from 13 and above.

GRAPHICAL REPRESENTATIONS & INTERPRETATIONS

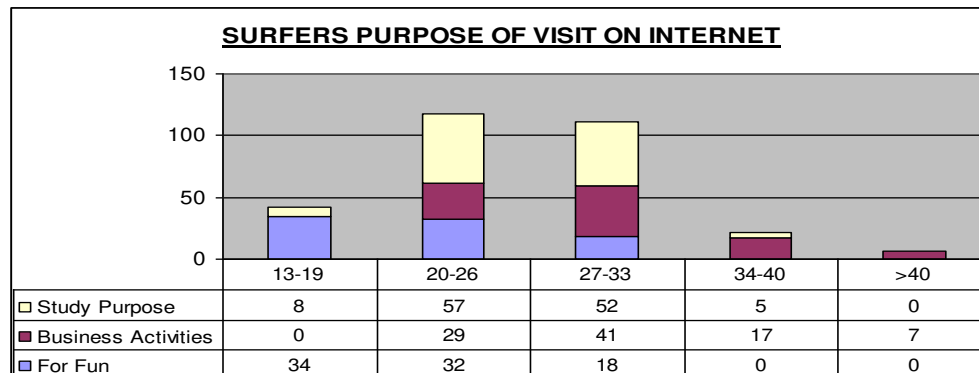
Graph-1



Sources: Authors Compilation

From the graph, it is clear that 39.3% and 37% of surfer's are in age group of 20-26 and 27-33 respectively. Overall, 54.67% are males and 45.33% are females.

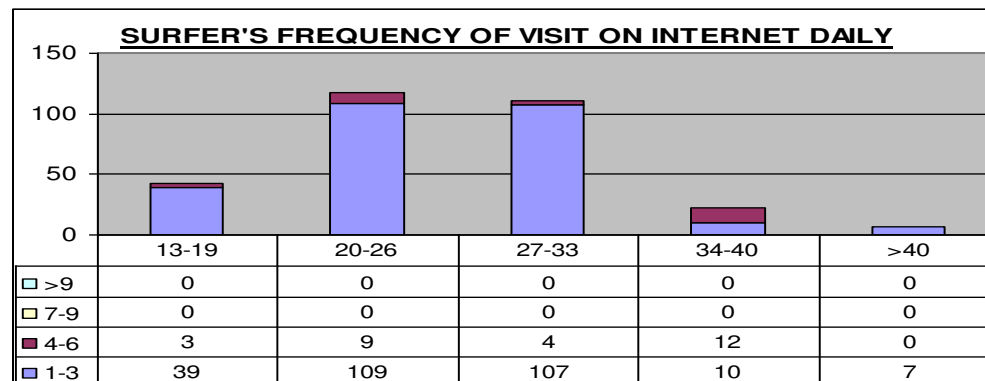
Graph-2



Sources: Authors Compilation

From the graph, it can be identified that 48.3% visit internet for study purpose, 24.57% visit internet for business activities and remaining 27.11% visit internet for entertainment in age group 20-26. Similarly, 46.84% visit internet for study purpose, 36.9% visit internet for business activities and remaining 16.2% visit internet for entertainment in age group 27-33. Overall, 28% of surfers access internet for fun, followed by 31% for business activities and 41% for study purpose.

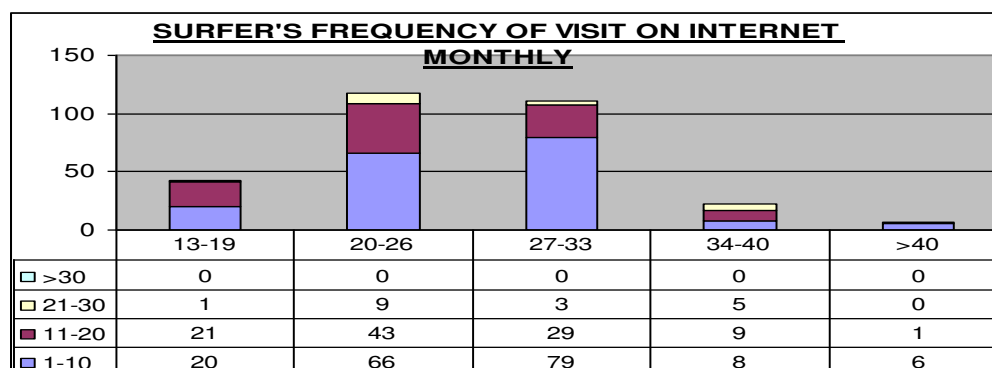
Graph-3



Sources: Authors Compilation

Graph reveals that 91% of total surfers (i.e. 300) access internet in range of 1-3 times daily. 9% of surfers access internet in range of 4-6 times. None of the surfers are in range of 7-9 times or above to it.

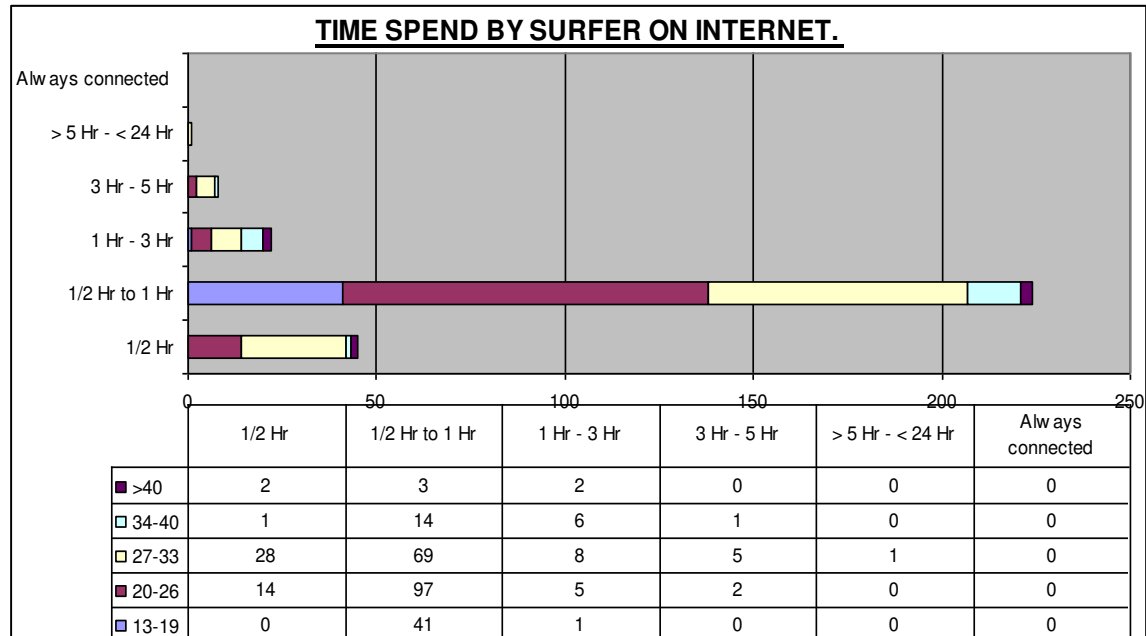
Graph-4



Sources: Authors Compilation

Graph reveals that 60% of total surfers access internet in range of 1-10 times monthly. 34% of surfers access internet in range of 11-20 times. Whereas, 6% surfers access internet in range of 21-30 times monthly.

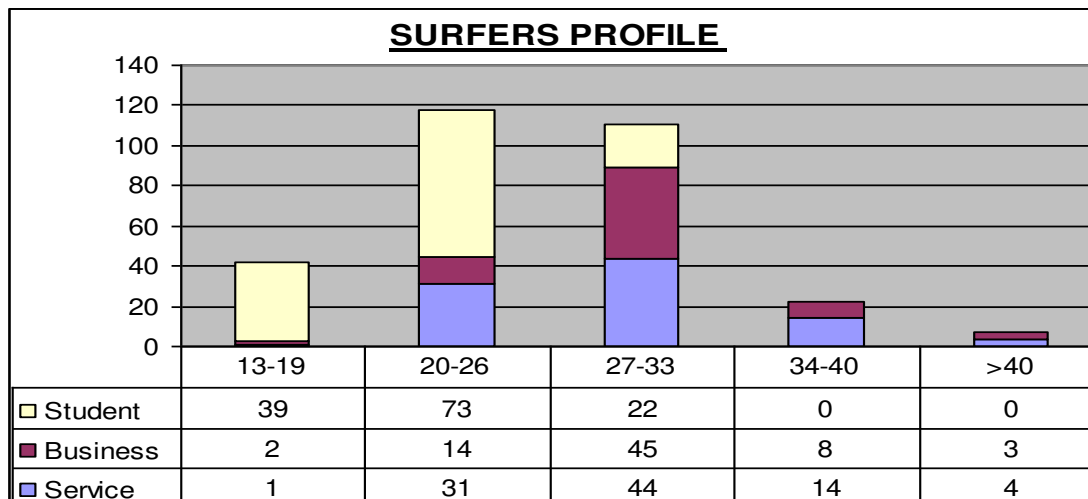
Graph-5



Sources: Authors Compilation

Graph shows that 15% of surfers access internet for just half an hour whenever they access internet. 74.66% of surfer access internet for at least 1 hr. Only 10.33% access internet more than an hour whenever they login on internet.

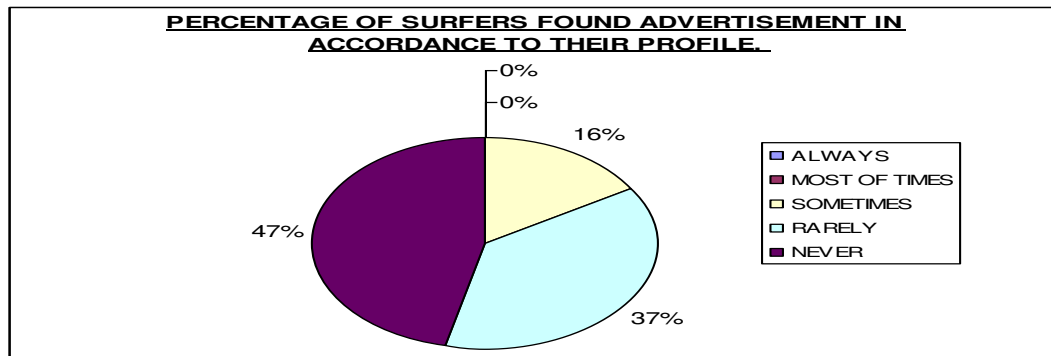
Graph-6



Sources: Authors Compilation

Graph shows that 31% of surfers are servicemen, 24% have business and remaining 45% are students of any degree / diploma courses.

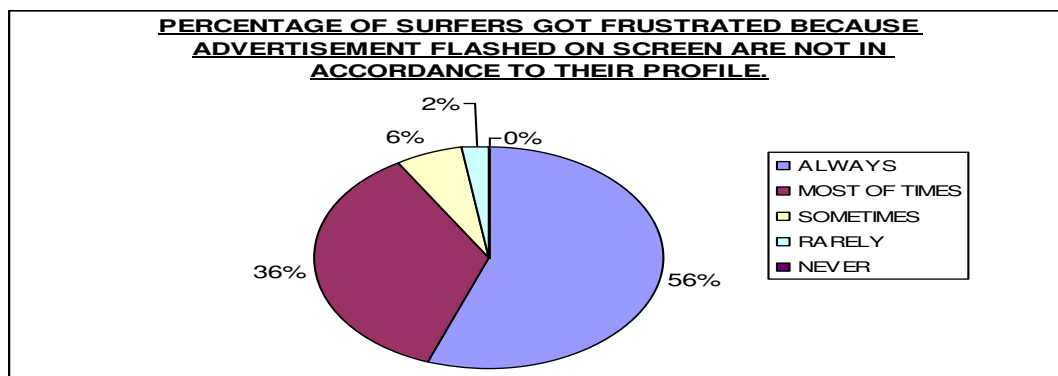
Graph-7



Sources: Authors Compilation

Graph shows that 47% of surfers never find advertisements in accordance of their profile; whereas, 37% of surfers rarely identified the same. Not even a single surfer responded in favour of the argument.

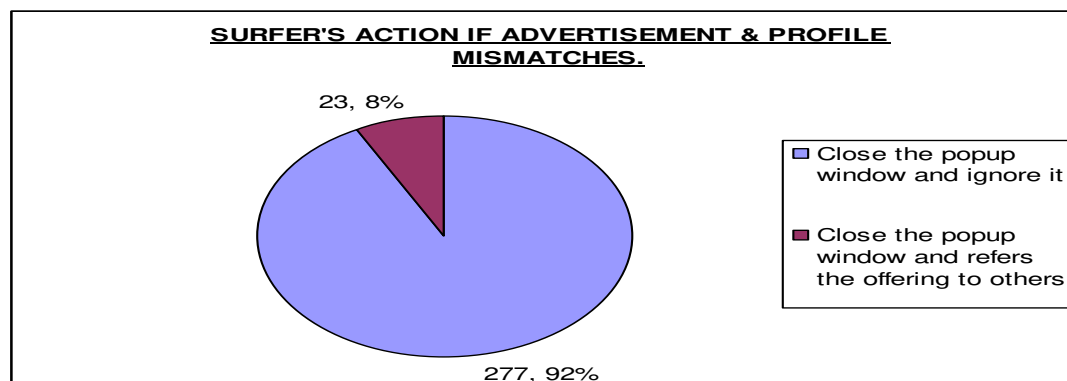
Graph-8



Sources: Authors Compilation

Graph shows that cumulative of 92% of surfers become frustrated if advertisements are not in accordance of their profile. Not even a single surfer responded against the argument.

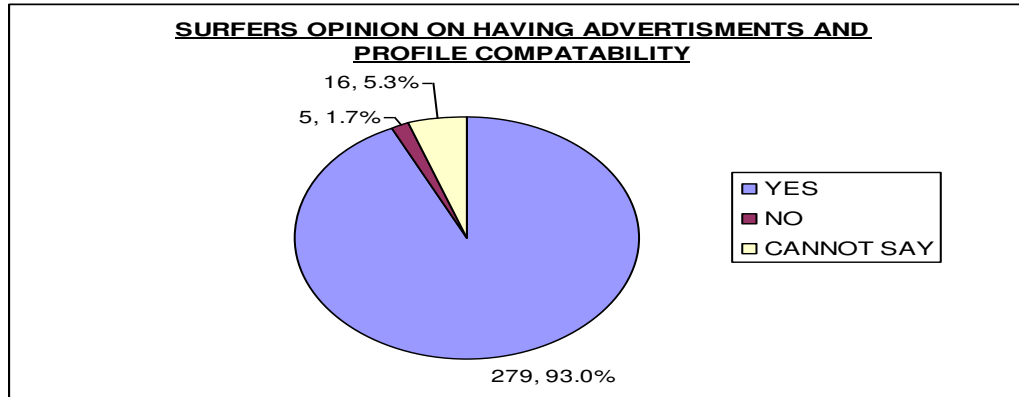
Graph-9



Sources: Authors Compilation

Graph shows that cumulative of 92% of surfers closes the window and ignore the message if advertisements are not in accordance of their profile. Only 8% of surfer will refer the offerings to others in case offering does not match with their respective profile.

Graph-10



Sources: Authors Compilation

Graph shows that 93% of surfers responded that there must be the compatibility between profile and advertisement flashed on screen else the purpose of e-advertisement fails. 1.7% of customers responded against the statement. 5.3% of surfers are not able to clearly explain their views.

FINDINGS

Graphical representation had made things clear that if the profile and advertisements does not match with each other, then it is wastage of funds. On contrary, it creates frustration among the surfers.

SUGGESTIONS

- Companies involved in e-commerce must understand the relevance of concept and try to emphasis on bringing the match between the profile of surfer and advertisements flashed on his / her screen.
- If mismatch continues, it frustrated the prospective customers and later on affects brands.

So, need arises to have a system that can understand the situation and creates match and then display advertisements suiting the surfer profile.

Suggestion for companies involved in e-business is to implement the suggestive model as soon as possible to be successful in long run and to reduce down cost for the client.

LIMITATIONS OF PROPOSED SYSTEM

- Maximum bandwidth will be utilized.
- Need heavy investments, we are looking for investors.

CONCLUSIONS

The optimization utilization of this architecture is in proportional to the number of surfer surfing the net and the time spend by the each surfer. More the time spend by surfer on internet, more the advertisements assigned to a particular cluster can be visualized by the user. When the number of surfers is in large quantity then more clusters with same profile will be formed and clusters with most common profile will receive a particular set of advertisements suiting the profile of surfers in cluster.

As discussed above that the clustering process is a dynamic process, so, whenever the surfer searches for different web pages and product categories, the database must be updated immediately so that the surfer will receive more advertisements of the other products and of other related products. This will helps in the promotion of different product categories on the same media and at same time.



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