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Message from the Chancellor

The Symbiosis International University always practices and preaches the concept, ‘World is One Family’ – ‘Vasudhaiva Kutumbakam’. It always promotes friendship, co-operation and understanding between foreign and Indian students. Symbiosis today is the premiere educational institute of Pune and brand equity in providing quality management education.

The different institutes that come under the umbrella of Symbiosis International University are the catalysts of change which contribute to the symbiotic growth of the University.

Research gives birth to new knowledge and answers a lot of existing questions. Such initiatives are a plethora of knowledge and contribute to the prevalent research culture in the university. I would like to congratulate the entire team of SCMS on the launch of their fifth Journal – “*Annual Research Journal of SCMS–Pune*” on the theme *Technology Adoption in Management Practices for Sustainable Development*.

This initiative taken by SCMS Pune will take it forward by leaps and bounds on the path of recognition and reputation. I wish them good luck and success in all their endeavors.

Prof. Dr. S.B. Mujumdar
(Awarded Padma Bhushan and Padma Shri by
President of India)
Founder & President, Symbiosis,
Chancellor, Symbiosis International
University

Profile of the Vice Chancellor

Dr. Rajani Gupte is the Vice Chancellor of the Symbiosis International University. A distinguished academic, she received her Doctorate degree in Economics from the prestigious Gokhale Institute of Economics and Politics, Pune. She has been actively engaged with higher education for over thirty years, both as a professor and researcher. She has taught at many foreign universities as well, including the Oakland University, Michigan US, and Bremen University for Applied Sciences, Germany.

She has been a part of the leadership team at Symbiosis for over two decades. She joined Symbiosis as a founding member of the Symbiosis Institute of International Business in 1992. She was the Director of the Institute between 2004 and 2012. Her headship led the Institute to be established as one of the top-ranking business schools in India. A capable institution-builder, Dr. Gupte has also earlier held the positions of Dean - Faculty of Management, Dean-Academics and Pro-Vice Chancellor at the Symbiosis International University.

She is an independent Director on the Boards of several subsidiaries of L& T Finance Ltd. She has been frequently invited on committees of important organizations, such as International Trade Panel - Confederation of Indian Industries (CII), World Trade Organization Committee, Govt. of Maharashtra, and Chemtech World Expo. She has also served on committees appointed by the UGC and on working groups on higher education.

Dr. Gupte is one of the ten women selected from across Asia who have attended the 'Women in University Administration programme' sponsored by the U.S. Department of State.

Dr. Gupte has been awarded for her outstanding contribution to Education by Lokmat National Education Leadership Awards 2015 and the "**Swayamsidha Puraskar 2015**" by Lions Club of Pune Elite.

For her valuable contribution in the field of Education, Dr. Gupte, has been awarded the 'Think Pure Award' by the 'Think Pure Social Welfare Foundation' in 2016, in memory of 'Late Shri Dajikaka Gadgil'.

Profile of the Principal Director

Dr. Vidya Yeravdekar is the Principal Director of Symbiosis Society, which encompasses the Symbiosis schools and institutions under the Symbiosis International University. A dream of her father, Dr. S .B Mujumdar of creating 'a home away from home ' for international students, Symbiosis today , has transformed itself into a multi-disciplinary, multinational, multi-cultural International University having students from all states of India and international students from 85 different countries. The University has institutes under 7 faculties viz. Management, Law, Humanities & Social Sciences, Health & Biomedical Sciences, Computer Studies, Engineering, Media Communication & Design.

Dr. Vidya holds a Post Graduate Degree in Medicine, a degree in Law and is a Ph.D. in 'Internationalisation of Higher Education in India'. To promote international understanding through quality education, she has brought in innovative approaches at Symbiosis International University through international collaborations with some of the top Universities in the world.

Dr. Vidya has been able to influence policy regulations for promoting and bringing in innovative approaches to higher education in India through her appointments on various governmental bodies. She has been a member of University Grants Commission (UGC), Central Advisory Board of Education (CABE) and Indian Council for Cultural Relations (ICCR). She is a member of the Governing Board of several organisations like Indian Institute of Mass Communication, Indian Institute of Corporate Affairs, Swarnim Gujarat Sports University, Yeshwantrao Chavan Maharashtra Open University, Research Committee of the Association of Indian Universities (AIU), Public Health Foundation of India and Symbiosis University of Applied Sciences, Indore. She is a Member of the State Knowledge Advisory Board of Higher Education, Government of Andhra Pradesh and Member of the Task Team of Arts Management Strategy for Karnataka. She is a member of many corporate bodies such as Mahratta Chamber of Commerce & Industries, Federation of Indian Chambers of Commerce & Industry (FICCI), Confederation of India Industry (CII), and Not for profit organisations like HK Firodiya Foundation, India International Centre (IIC), Pune International Centre (PIC) & Pune Citizens Police Foundation.

Dr. Vidya has been appointed as Director on the Board of RITES Limited under Ministry of Railways, Government of India.

Recently, Dr. Vidya has been appointed as Member of Sub-Group on Higher & Technical Education and Skill Development of Chief Minister's Advisory Council, Government of Rajasthan.

Dr. Vidya has presented papers at various National & International Conferences and has numerous research publications to her credit. She has authored a book on 'Internationalization of Higher Education in India' based on her experiences and research in this field. This book is published by SAGE

Dr. Vidya's hard work has won her numerous awards and accolades and she is now focussed on making Symbiosis International University benchmarked amongst one of the best Universities in Asia

From the Director's Desk

It gives me great pleasure to present the Fifth volume of Annual Research Journal of SCMS, Pune.

The theme for the journal this time is '*Technology Adoption in Management Practices for Sustainable Development*'. Technology has been increasingly changing managerial decision making and at the same time there has been an overall increase towards practices that could prove sustainable. Sustainable development by definition defines a development that satisfies the need of people in the present in a manner for the future generation to reap the benefits of the same.

This journal is an attempt to contribute towards building an academic knowledge base by a compilation of well researched and peer reviewed articles. The articles are well articulated and substantive and have tried to address the broad theme of the journal.

I also extend my gratitude to all authors, editors and reviewers who have provided support at all stages. I also welcome suggestions that would help us improve the quality of our Journal.

Dr. Adya Sharma
Director,
SCMS, Pune

From the Editorial Desk

Technology has been increasingly finding its way into management and organisations today are adopting them openly for better and efficient managerial decision making. Not only is the latest technology being directly adopted, the sustainability of the technology adopted is also being considered. The journal received papers relating to human communication, influence of social networking sites, risk assessment strategies, mobile applications, technological transformations and inner management development skills.

Dr. Ramaa Golwalkar and Shri Vijay Kisan Shelar tried to analyze human communication in the digital era and concluded that digital technology was controlling the communication of late adolescents and found that the late adolescent population was dependent on smartphones for their communication but they were also likely to face issues.

Dr. Dhiraj Jain in his study found that students have been spending more and more time on the internet, they use to surf the internet daily for fun and entertainment and for making new relation on these social networking sites. They were the most frequent users of SNS.

Mr. K Sanal Nair found that users of SNS were fearful about photos and other articles being downloaded , about information displayed being inappropriately used by others about intellectual rights being infringed, copied or abused by others, about identity theft, profiling or phishing and a significant concern that the SNS provider might divulge information to other parties without ones' explicit consent. He found that different demographics had a different impact on the perception towards security and privacy issues.

Amol Prasad Khedkar and Dr. Shyamkant Shrigiriwar critically studied the risk assessment tools and mitigation strategies in materials management and found that it was important to have proper control on materials planning, procurement, storage, movement and consumption which were of utmost importance of today's enterprises.

Yuvraj Sharma, Mr. Bharat Kumar Dak and Mr. Nivadit Acharya tried to understand the use of mobile applications and their impact on the day to day activities of an individual in a significant manner and how could it be useful in better managerial implications. **Ms. Renuka Kumar** tried to find whether cloud technology was better than the systems that already existed in organizations and whether they were feasible. **Varun Rajan** studied the technological transformation of transactions and concluded that automation, communication and computing have proved to be the three pillars of transformation in transactions. **Joel John** gave an introduction to smart contracts, its implications upon the functioning of certain industries and the possibilities they could bring along.

Dr. J.C.Sharmiladevi, Prof. S. Ramesh Raj and Dr. Rani Krishnamurthy did a review of literature for the existing technology for inner management and wellbeing

Dr. Yogesh Pisolkar and Dr. Navendu Chaudhary attempted to study the spatio-temporal changes in the study area and created a matrix of issues and potential strategies for sustainable development of the Tarkarli-Devbag district in costal Maharashtra.

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An Analysis of Digital Era Human Communication with specific reference to Late Adolescents in Pune

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Abstract

Indian society started experiencing Digital technology in the 90s. The computers initiated the process of media convergence which eventually culminated into smartphones. This device has impacted the human communication in variety of ways. This research paper analyses the impact of digital technology on human communication.

The research method used for this paper is combination of qualitative as well as quantitative one. A sample of 100 adolescent boys and 100 adolescent girls from Pune was taken for the quantitative data collection through survey method. The tool used for data collection was questionnaire.

The conclusion of this research is, that the digital technology was controlling the communication of late adolescents in Pune. The late adolescent population is dependent of the smartphones for their communication but they also like the face to face communication.

Key words

Digital Technology, Smartphones, Personal Communication Technology, Media Convergence, late adolescent's communication patterns, Human Communication in Digital era.

JEL Code: L 82, D 83

Introduction

It was March on 10, 1876 when Abraham Graham Bell demonstrated the functioning of the telephone. In the year 1964 Marshall McLuhan pointed out the exact position of telephone, the landline in the human life. He said "the telephone is an irresistible intruder in time and space" (McLuhan, 1964, p. 238). We wonder what would be his comment if he would have been in the cell phone age.

Analysis of socio-cultural and economic effect of media on the users and overall society is one of the major aspects of Media studies. Harold Innis was one of the early sociologies to notice that different media impact differently on the society. According to Innis, a key to social change is found in the development of communication media. He claims that each medium embodies a bias in terms of the organization and control of information. Any empire or society is generally concerned with duration over time and extension in space (Soules, 1996).

Marshall McLuhan (July 21, 1911 – December 31, 1980), a Canadian philosopher of communication theory, built upon his thinking on media effects on the theories propounded by Innis. He came up with in his outstanding contribution titled 'Understanding Media' in 1964, in which he classified in media into 'Hot media' and 'Cold media'. He elucidated that, there is a basic principle that distinguishes a hot medium like radio from a cool one like the telephone, or, a hot medium like the movie from a cool one like TV. A hot medium is one that extends one single sense in 'high definition.' High definition is the state of being well filled with data. On the other hand, hot media does not leave so much to be filled in or completed by the audience. Hot media are, therefore, low in participation, and cool media are high in participation or completion by the audience" (McLuhan, p. 25).

When these scholars had been exploring the impacts of media on the societies and cultures, the electrical technology was in its infancy. The scientists, especially physicists were experimenting on analogue techniques to record pictures, sounds with more and more clarity and their transmission. Telephone, still camera, movie camera, sound recording equipment, and radio were separately operated. With the emergence of electronics, information communication technology developed with the galloping speed. The outcome was convergence of media. The concept of convergence of media made information transmission

never before easy. All forms of information generation or gathering, storage, processing and transmission like audio, visual, textual-audio-visual can be slickly completed through one single gadget i.e. mobile phone. It has also become the major medium for entertainment as facilities like games; radio and even movies are available in it. The same can be connected to server and Internet can be accessed. In short, the convergence is nothing but blurring the distinction among various forms of communication, is transforming the mass media environment (Baran & Davis, 2000, p. 2).

James Watson rightly pointed out in his book titled 'Media Communication: An Introduction to Theory and Process', that in 1450 Gutenberg introduced the printing press to Europe. Media technology was slow to diversify until the 19th century. Steam power and the electric power accelerated the number and extent of media forms. With the development of computers in the period following the Second World War technological convergence was made possible. The 1990s saw this process dramatically speeded up with transformations brought about by digitalisation. Technological convergence has been matched, worldwide, by convergence in terms of ownership and control (Watson, 1998, p. 27)

Media convergence, thus, was one of the most significant characteristics of Post Modern Age. This technological advancement gave rise to Personal Communication Technology. People in the sixties, seventies and even the eighties of the 20th century, experienced a phone only in the latter stages of their lives. On the other hand, the young generation, post 1990s, is born and brought up in the High-Fidelity Audio Technology and Wire Free world. New media have vastly expanded the options for entertainment and information content. Human civilization is in the midst of a revolution in communication technology that is transforming social orders and cultures around the world. Each new technological device expands the possible uses of the existing technologies. New media can be combined to create media systems with a greater span that can also serve a wide range of highly specific purposes. The Cell phone technology brought this dream into reality.

Thus, the authors felt the need of analysing the human communication in this Digital Era. Hence this research paper.

Review of Literature

“Cell phones seem to prioritize communication with distant people over those sharing one’s space, and the ethics of these new behaviour are not universally agreed upon” – James Katz.

“It is not just about building the tool anymore. Now it is about what people use the tools to do. How will human behaviour shift when the appliances we hold in our hand, carry in our pockets, or wear in our clothing become supercomputers that talk to each other through a wireless mega Internet?” - Howard Rheingold.

Information Technology gave rise to the Personal Communication Technology (PCT). Cell phone is the outcome of galloping development in PCT. It is also the best example of media convergence. The cell phone gadget manufacturing companies are focusing more into converting the gadget into a complete ‘communinfotainment’ (Communication + information + entertainment) experience.

This is the age of Personal Communication Technologies (PCT) (Campbell & Park, 2008). It is evolved out of the network society of the 1990s. The main characteristic of this PCT age is the widespread adoption and use of mobile telephony. It clearly means that personal communication technologies are distinctive from other network technologies (e.g. the computer). Personal Communication Technologies are often worn on the body, are highly individualized, and are regarded as extensions of the self. It has been said that they make us individually addressable regardless of where we are (Campbell & Park, 2008).

The mobile screen has now become the ‘third screen’ in consumer lives after the TV and PC screens. Mobile phones can become mobile companions when they are able to leverage the full power of the Internet, and not just voice. Along with the boom in mobile telephony around the world, a parallel wave of innovation in wireless corporate networking promises to usher in a new world of ‘un-tethered knowledge workers’ and ‘flexible network organizations’ (Rao & Mendonza, 2005, pp. 22 - 23).

Manuel Castells in his trilogy ‘The Information Age: Economic, Society and Culture (1996, 1997, and 1998) identified it as the latest and prominent feature of social organization of the Information age. It is a synchronised and integrated network of information, production, and exchange. These networks challenge (but do not replace) the nation-state, transform (but do

not replace) stand-alone firms, and transform (but do not eliminate) human experience of space and time (Donner, 2008, p. 30). Mobile communication is definitely an integral part of personal, national, and economic life, facilitating business and increasing the conveniences of daily existence (Srivastava, 2008, p. 26).

Thomé, Härenstam, & Hagberg conducted a detailed study on ten thousand men and ten thousand women, born between 1983 and 1987, were randomly selected from the general population of County of Västra Götaland, Sweden. They concluded that because of the quick development and widespread use of mobile phones, and their vast effect on communication and interactions in work and private life, the society is experiencing cultural and social changes in positive as well as negative ways. (Thomé, Härenstam, & Hagberg, 2011). Donner (2008) also cited that Castells et al. (2007) observed the various impacts of widespread mobile use: on youth culture, on language, on politics, and on human experiences of space and time (Donner, 2008, p. 32).

Another approach, presented by Katz and Aakhus (2002) suggests an all-embracing theme of *Apparatgeist* – a universal spirit embodied in mobile technologies that, by reducing the cost of communication and by increasing individual control over the time, location, and content of communication, tends to encourage individualism and self-expression (Donner, 2008, p. 32).

It is interesting to know about the term ‘*Apparatgeist*’. It is coined by James Katz and Mark Aakhus, union of two words ‘*Appratus*’ (device: mechanical or social system to achieve human ends) and ‘*Geist*’ (mind: consciousness, spirit). This theory is designed to analyse the perception of people and how they describe their personal technology, especially the communication device. (Katz, 2003, p. 313).

The society is experiencing ‘mobile ecosystem’ due to the technological advancement. The two most important features of this ‘mobile ecosystem’ are (i) the explosive growth of MESSAGING SERVICES based on humble 160 character strings, and (ii) near addictive behaviour in the youth user segment which is now referred to as ‘Screenagers’ or ‘Generation Txtor’ or ‘Generation Y-erless’ (Rao & Mendonza, 2005, p. 25).

Based on the above literature review the researchers designed their study to analyse the digital era human communication in specific reference to late adolescents in Pune.

Methodology

Locale of Study

The present study was carried out in Pune city. It is the headquarters of Pune district and is located in the Western part of the Maharashtra State, forming a part of Pune Revenue Division.

Rationale of the study

This topic was selected because numerous studies have clearly indicated association between youth and smartphones, the communication patterns followed by the late adolescents living in the Digital age. Considering the volume and vastness of such association it was deemed necessary that the research is undertaken.

Research Objectives

For the purpose of this study the researchers set the following general as well as specific objectives:

- i. **General Objective:** to analyse the human communication patterns in Digital Era with specific reference to late adolescent of Pune city.
- ii. **Specific Objectives:** are
 - a. To analyse the effect of the smartphone as a medium of communication on the communication pattern of the late adolescent of Pune city.
 - b. To study the consequence of various communication facilities like Short Messaging Services Applications, still, video and selfi camera etc. on communication patterns like the use of language and graphic symbols as well as sound and visual clips among late adolescent of Pune city.

Nature of Study

This study was exploratory, ex-post-facto and descriptive in nature. It was exploratory because the researcher wanted to explore the Digital era communication patterns of late adolescents in Pune.

Research Approach

Both quantitative as well as qualitative approaches were employed in combination to achieve maximum accuracy while arriving at the conclusions.

Data Collection Method

The method used for data collection was the survey method.

Operational Definitions / Conceptual Framework

Following are the basic concepts used in the research:

Analysis: for the present study analysis means a systematic examination and evaluation of the data or information, to reveal the interrelationships among these pieces of information, to understand the cause and effect relationships.

Digital Era: for the purpose of this study Digital Era means a time period in the human history where the digital technology has its footprints in almost all the segments of human life and more specifically in the field of communication and information management.

Human Communication: can be defined as ‘a culturally related process wherein the communicator transmits to and receives from the receiver the information, thoughts, perspectives, emotions, feelings etc. by using oral and/or written words, gestures, sounds, music, still or moving pictures etc.’

Late Adolescents: The boys and girls from the age group 18 to 24 years.

Pune: The geographical area of Pune City which falls in the jurisdiction of Pune Municipal Corporation.

Late Adolescents in Pune: The boys and girls of age group 18 to 24 years living in the City of Pune. To avoid repetition and monotony, the researchers at times used the expression ‘young adults’ instead of ‘late adolescents’.

Sampling Method

The Universe / Population of this study is infinite.

Sampling Procedure

Pune Municipal Corporation boundary is divided into 6 Legislative Assembly Constituencies (ceomaharashtra.nic.in/). The researchers used the same as the sampling frame to get the cross-section of late adolescent population representing various educational and socio-economic strata.

Sampling Method / Scheme

Purposive sampling method was employed for the selection of the late adolescents meeting sample characteristics as - the late adolescents who were using cell phones for more than one year and residing in the city of Pune formed the final sample of the present study.

Sampling Size

Considering the time and other resources available to the researchers, they planned to take 200 late adolescents as sampling units consisting of 100 late adolescent girls and 100 late adolescent boys.

Sampling Plan for qualitative study

The researchers conducted in-depth interviews with professionals like professors, librarians, doctors, soft skill trainers, counsellors, IT professionals, lawyers, journalists, traffic police, media students, hoteliers, shopkeepers, petrol-pump owners, Auto Rickshaw Drivers etc.

Data Collection Method

The researchers used Survey method for quantitative data collection, for which they used questionnaire as a tool. Similarly, for qualitative data they employed in-depth interview schedules as tools of data collection. The data was collected within the time of frame of 19.04.2016 to 30.04.2016.

Discussion:

After the data analysis the researchers found that the late adolescents extensively use the most popular online application What's App due to easy sharing of text messages, still photographs, audio and audio visual clips, with an individual or on group for no costs.

Similarly the social networking site Facebook and FB messenger is another option which was very popular among the young adults. Now a days these Applications have extended their services even for voice calling segment, wherein the user can call and talk to another user through internet connection. It does not cost the caller or receiver any extra charges other than the usual internet pack, making interstate and international calling even easier.

Twitter is the third online social networking service which was used by these young adults. But the users kept it on the third position because of its limitations. This service enables users to send and read short 140-character messages called "tweets". Registered users can read and post tweets, but those who are unregistered can only read them. The late adolescents like Twitter for a very obvious reason. It made them easy to reach any celebrity that is the film

stars, sports persons, writers, performing or fine artists etc. and / or political leader especially the Ministers at State or at Centre to convey their comments, complaints and compliments. But most of the late adolescents were more into following their favourite celebrity to know about their day to day activities and opinions on variety of issues, and reacting to their tweets. The political leaders were followed by these young adults to keep themselves updated about the opinions of their favourite leader on a particular situation and also to seek help from them in the case of emergency.

Use of Online Messaging Services

Before the availability of 'What's app' or FB messenger kind of applications, the young adult population was using missed call for communication. This 'missed call' option is possible because the digital screen of the cell-phone displays the caller identity. Thus the receiver knows who is calling if the number is saved in the phonebook, or at least can see the number and can call back. The following messages can be conveyed through missed calls

- i. 'less balance call me back'.
- ii. to tell the receiver 'reply urgently to the MESSAGING SERVICES / emails'
- iii. to convey 'reached home safely' type communications.
- iv. just to tease their friends.
- v. to tell the receiver 'miss you'
- vi. to know the convenience of the receiver to attend the call,
- vii. for 'coming or not coming' type of communication
- viii. to prompt the receiver to call back with a hidden intention to save money.

It means maximum of the late adolescents used missed call to communicate variety of messages without verbal or text message which can be taken as an electronic improvisation of the beating the drums in ancient times. The only difference is that this improvisation is a strictly one to one i.e. interpersonal communication and not a group communication.

Use of messaging services like 'What's app' and 'FB Messenger' and SMS

The young adults sent or shared the messages through the messaging services containing following content –

- a) Sharing decent jokes,
- b) To greet their family members, relatives and friends on special occasions.

- c) To avoid unwanted conversation by sending messages.
- d) To save money on voice calling
- e) To send contact details saved in their phone book through business card messaging services to their acquaintances.
- f) To send jokes – otherwise indecent to share - through messages.
- g) To send ‘thought of the day’ every day to their contacts.
- h) To confirm the convenience of the receiver to attend the call through SMS.
- i) To conveyed their inability to attend the call by SMS.
- j) To maintain secrecy.

The late adolescent girls were more prone to use messaging services as a medium of communication than that of voice calls as compared to boys. The messaging services usage pattern was different for boys and girls. The primary purpose of sending messages for the boys was to share decent jokes and for girls was to greet on special occasions and vice versa.

It is also to be noted that more boys than the girls intended to use messages to avoid unwanted conversation whereas girls were more prone to share thought of the day than boys. The girls sent less business cards though messages than boys but were more concerned about the convenience of the receiver to talk as well as conveying inability to respond to voice call and hence using SMSs. Similarly, habit of sending messages was found more in girls than boys at the same time more girls used messaging services to maintain secrecy.

Both boys and girls were inclined to send jokes through messaging services which were otherwise indecent to share; of course, the percentage of boys was more by just 2.25%.

An entirely new language which uses minimum characters to spell any word is evolved due to Short Messaging Service called as SMS language. Since the Short Messaging Service does not allow more than 160 characters per message, this SMS language is still continued to be in practice even after the use of applications like ‘What’s app’ and Facebook messenger has almost replaced SMS.

Late adolescents’ intentions to call and talk on cell phone.

The late adolescents call and talk on cell phone just to remain in touch. They also call and talk on smart phones just as ‘time pass’. They use voice call option to discuss and take some

decision, and also 'to share news'. To elevate their mood whenever they felt depressed is another reason for these late adolescents to call and talk on smart phone. It can be said that staying connected was a felt necessity by late adolescents as they called up people to remain in touch whereas they also called and spoke to people to kill their time and nothing more. When it comes to mood elevation, girls (21%) were found using it more than boys (12.46%) and nearly 8% of late adolescent girls admitted that they keep calling out of habit as compared to about 3% boys. It can be said that girls are emotionally dependent on cell phone than boys and the percentage of habitual callers is more in girls than boys.

Use of pictures, graphics and video clips

All the young adults included as a sample in the survey were found using various forms of visuals like photographs either clicked by others or selfie, sketches, emoticons, video clips to share with their friends through What's app and on their respective Facebook page. These visuals were of various subjects, a few of them as listed by these young adults as per their preferences are –

- k) Profile pictures or selfies, photographs of some social event like marriage or college seminar, photographs of personal event like birthday celebration or old friends' get to gather etc.
- l) Capturing nature's beauty, wonder, irregularity and calamity,
- m) Places to visit type visuals
- n) Visuals of social injustice asking for help or to create awareness
- o) Photographs /clips of various Animals.
- p) Some celebrity caught on camera in some odd situation, giving some statement or making some comment which was interpreted by some news agency / pressure group as controversial, unacceptable and intolerable, or attending some social gathering and sharing some important view point or supporting some cause.
- q) Any wonderful artistic presentation by any talented established or upcoming performing or fine artist.
- r) Health related tips.
- s) Any kind of wish whether wishing a good day or wishes on a particular occasion is usually with some eye pleasing picture.

- t) Some old visuals from the archives reviving the history for the present generation.
- u) Visuals promoting a particular faith, ideology, sect or philosophy which includes sharing the visuals of a particular deity or a God man /woman.
- v) To share job opportunity/ vacancy
- w) Vocabulary, definitions, quotes from famous personalities.

Use of emoticons / emoji's either still or animated, along with the abbreviations like LOL (Lough Out Loud), ROF (Rolling On the Floor) etc. is also found to be regular practice in the messages sent by the late adolescents, to lower down the tone in the messaging conversation. All the respondents would like to add at least one visual with their message to make it more interesting.

Inferences:

The researchers tried to answer the research questions as the inferences of this study as follows –

- a. What is the effect of the smartphone as a medium of communication on the communication pattern of the late adolescent of Pune city?

The digital communication gadget like smart phone has provided the array of communication facilities to the users to use words, visuals, audio clips, emoticons and emojis with or without animation. This Digital Generation, , that is,, the late adolescents of second decade of 21st century use Graphical user interface (GUI) every now and then while communicating. This generation likes to use emoticons or animated emojis to express themselves along with the words. It has impacted on human communication in multiple ways. The human communication which started with cave paintings by prehistoric human beings got sophisticated with oral and written communication in the historic time frame. The digital technology brought the palpable shift in the human communication pattern, that is, from words to visuals.

Clicking 'Selfies' on every occasion is the current trend. Digital age has made it possible to record the moments of every individual's life. This is again a noticeable change in the society that now the commoners also have a story to tell and a history to record. Most of the smart phone users treat the practice of clicking selfies as a gesture of self-respect as against the real qualities of personality.

- b. What are the consequences of various communication facilities like Short Messaging Service Applications, still, video and selfie camera etc. on communication patterns like the use of language and animation and graphic symbols as well as sound and visual clips among late adolescent of Pune city?
- The smartphone allows the young adults to access internet and hence they are all the time tethered with their friends and family members. There is continuous connect most of the communication takes place through online messaging application software. Most of the messages are forwarded from one smartphone to another, without knowing the source of information. These forwards are so casual that no one bothers to confirm the source, and also the authenticity of the information included in the message. Thus there is enough scope to spread rumours, incorrect, non-factual piece of information in the society.
 - It is observed that the smart phone dependency of the youth is turning out to be an addiction. Mobile-addicts can be seriously affected at the psychological level but, as they don't show any physical symptoms, their disorder goes unnoticed to others. Teenagers who use mobile phones for many hours a day - talking and sending messages or missed calls - may develop psychological disorders. For them the person who was present in person became insignificant once they received a call or SMS. This behaviour actually detached them from the process of developing personal relationship.
 - Continuous use of smart phone weakens the ability to cope up with people around. The reason being the smart phones are meant to obey the orders/instructions of the user. The user becomes used to the human - machine interaction and thereby loses the knack of adjusting with fellow humans whether family members, relatives, friends or colleagues.
 - Switching off their phones causes them anxiety, irritability; sleep disorders or sleeplessness, and even shivering and digestive problems. Cell phones have not only invaded the major chunk of the daily routine but also encroached upon the life styles of youngsters individually, socially and culturally. Therefore, it was an important issue which should not be pushed under the carpet.

- The smartphone generation is so obsessed with selfies that some of them even risk their lives and some unfortunate people fall prey to this obsession by losing their lives.
- c. Whether the late adolescent of Pune city are becoming more and more authoritative rather rude, impolite and disrespectful while communicating with the elderly members of their family and also in the society?

It was observed that two third of the undergraduate boys' and half of the girls' population regularly used cell phone to communicate indecent content (sexually explicit jokes/ content) with the population of same age and also to the elder generation. The young adults are behaving in an aggressive manner rather impolite while moving in the society. Firstly, the personal technologies based on digital technology used in public space respatializes (that means rearranges or transforms the attributes related to space around) the public space. It is therefore clear that the smart telephony has extended the personal space of the user. In other words, the personal space is now encroaching the social and public space.

The elderly people have to be dependent on the young generation for their technical knowhow to understand the functions of a smart phone and/or any other gadget based on digital technology. This interaction makes the elder generation submissive vis-à-vis young adults aggressive. It is also observed that in the day to day affairs of the family, the opinions of the younger generation surpass the elders' opinions. The young generation is given preference to the elders.

Secondly, late adolescent boys and girls regularly play with their smartphone while interacting with parents or elderly members of the family. This indicates that they undermined the elders. The norm was to restrain from any other activity which distracts the attention while interacting with elders. The parents felt proud in confessing that their children did not listen to them, do not adhere to their instructions or ignore their suggestions. It can be inferred that use of smart phone has blurred the gender distinction as well as the generation gap to some extent.

Limitations of the Study:

This study was restricted to the reported and observed behaviour of late adolescents in Pune, as reported by them and observed by people around them who reported these observations to the researchers. These observations were restricted to the time frame 19.04.2016 to 30.04.2016. The Digital Technology and Personal Communication Technology both are ever developing field thus the results are restricted to the technology which was available during the data collection. The any technological developed after this time frame does not form the part of this study. The results of the study are with the specific reference to the late adolescents living in Pune. This may prove to be of help to gain a preliminary idea on how digital technology has influenced human communication in general.

Scope for Further Research:

While analysing and concluding the data received from this research, the researchers realized that there is a lot of scope for further study and investigation. The researcher with their limited sense of understanding of related disciplines suggests the scope for research on smart phone and youth in variety of ways.

Utility of the Study:

The present study can be useful for communication scholars, socio-cultural scientists, behavioural scientists, parents, teachers and professors constantly interacting with the young generation, cell phone manufacturing companies, cell phone connection service provider companies, and even for general public who is interested in upgrading their general awareness.

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Critical study of Risk Assessment tools and Mitigation strategies in Materials Management

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Abstract

Materials management has received an increasing interest and development since last few decades. In any manufacturing setup no production or assembly can run without required materials, while materials are a major constituent of the cost of products. Thus looking at the criticality in terms of material availability, service to customers & cost factors, it is important to have proper control on materials planning, procurement, storage, movement and consumption which is the key importance of today's enterprises.

Inventory management is the function of every manufacturing organization that deals with investment decisions of inventory being considered as a current asset, those decisions leads to outflow of the organizations cash.

As all organizations are focused to work on solving real life problems, reduce costs, improve products and services, and improve customer satisfaction as a major goals in mind, Inventory decisions plays an important role and touching to all the aspects mentioned above.

Stocking high level of inventory than actual requirement is usually not a good situation because organization can face challenges like inventory storage space, storage costs, obsolescence and spoilage cost. However on other side stocking fewer inventories than actual demand isn't also good situation as business may run into risks of losing sales or valued customers. Materials management also includes forecasting and strategic decisions making and few of the key performance indicator to understand inventory functions efficiency are Inventory turns (ITR), Days on hand (DOH) and On time delivery (OTD). All those indicators are purely controlled by right inventory decisions. Moreover, this paper is focused on industry trends & some recently done research outcomes from similar area.

Keywords – Materials Management, Inventory Management, Business Risk, Supply Chain risk, Materials risk, Risk Assessment, Materials management strategies.

Introduction

Materials management function includes planning, purchasing, receiving, stores, inventory control, scrap and surplus disposal (Gopalkrishnan P. and Sundaresan M, 2011).

Materials management is one department which is responsible for managing flow of materials from supplier through production to consumer. (J. R. Tony Arnold et. all 2008)

Materials management is planning center of manufacturing organization, while material management is at center of planning and success. (Donald H. Sheldon, 2008)

In February 2013, ARC Advisory group addressed analysis that shows manufacturing industry in India is expected to grow by 9.5% CAGR despite this positive economic outlook, analysis also shows that India's inefficient supply chain is costing 65 Billion USD loss every year, where demand and supply side challenges are the major constraints. In addition many other constraints like tax structure, poor distribution & infrastructure facilities and lack of technology adoption has impact on keeping more inventories. Moreover analysis also highlights that most of the challenges of India's supply chain can be met by adopting Information Technology as a key enabler.

Scope of the study

1. This research paper is focused in area of industrial segments only.
2. Study is concerned with materials management function of the organization.
3. Materials management is vast area of study which includes planning, purchasing, Inventory management, Sales and Operations planning, materials handling, part of logistics, stores. But

study is purely focused on planning parameters viz. inventory management, materials planning and sales and operations planning.

4. Risks are identified as two types of risks – Internal to organization and external to organization. For this study risks concerned internal to organization are only considered and external risks like supplier bankruptcy, Labor issues, natural calamities are not taken in the scope

Review of Literature

This paper has been divided in specific categories of explanation as mentioned below

1. Importance of Materials management in manufacturing setup where literatures related to importance of materials management with organizations goal, objective and strategy are linked in the review.
2. Average expenditure in materials management with reference to manufacturing setup.
3. Risks associated or faced by materials department for overall organizations success concerned with meeting objectives and goals.
4. Risk mitigation methods and strategies that are discussed in similar areas of literatures, reference books and different articles.
5. Finally Importance of integrated materials management is discussed in the later part of literature review.

Importance of materials management in manufacturing setup:

Economic theory makes fundamental assumption that profit maximizations is the basic objective of every firm, and profit making situation ensures that organization has supply of future capital for expansion, growth and innovation (Peter F. Drucker, 1955).

Whether business concerns are small or big, all they need is finance to fulfill their business activities, and in the modern world all the activities are very particular to earn Profit (C.Paramasivan and T. Subramanian).

Economist Milton Friedman concludes that main purpose of a business is to maximize profit for its owners, stockholder and for the company.

Most significant objective of all organization is operate at a profit, where minimum expense on resources and materials is the primary consideration, in a strict sense materials manager don't have responsibility of profit but all materials management employee must have a clear understanding of the profit (Eugene L. Magad and John M. Amos, 1989).

Eugene L. Magad and John M. Amos also mentioned that the bottom line of company's profit and loss is considerably improved by materials management by identifying and successfully implementing cost reduction programs, while author also emphasizes on Profit improvement programs and integration of sub functions to optimize company's profit objective is one of the objective of materials management team.

Thus profit is one amongst the primary goals of every organization. It is very important to understand criticality of materials management in terms of this goal. If one interlinks materials management with one of the primary goals of organization as a profit, then...

$$\text{Profit (\%)} = [(\text{Selling Price} - \text{Cost Price}) / (\text{Cost Price})] \times 100$$

From above mathematical formula it is simple to understand that cost has to be as low as possible to earn as more as profit margins. In this complex and challenging economy every organization has major focus on cost reduction, if they are successful to reduce the costs by any of the strategies available then they are well set to earn and enjoy profit margins, while they are well deserved to compete in this global competition. As cost reduction is the major focus of every organization to earn more profits, it is important to understand materials management contribution in the cost of organizations working capital.

Average expenditure in materials management.

Today, as production is becoming more & more complex in this competition, while materials cost and technology costs are increasing day by day, there is always a challenge for supply chain department to reduce the materials cost. Material cost includes around 60% and may be more of the total cost (Bernald & Treseler 1991, Stukhart 2007)

According to Author Jhamb L.C, in his famous book “Materials and Logistics Management”, Materials constitutes one of the key resources of an organization. Material cost, in the manufacturing organization, averages around 50-60% which means efficiency and effectiveness of materials function, to a large extent, virtually determines profitability and success (or failure) of the firm. Since every rupees saved contributes directly to profit, hence it is equivalent to increase in sales.

Prasanna Kumar Dey has conducted a research study on Re-engineering materials management where he studied materials planning & procurement process of Indian refineries in 2001. In his studies he examines materials average cost as average 60% of total working capital cost.

There is always a challenge of increased cost of input, and cost of input constitutes around 60% of the total cost. Meanwhile from another side there are many constraints to increase sales price due to cut to cut competition and this has left with no choice than using input resources more efficiently with controlled manner. Inventory Management is one of the scientific and analytical approaches to overcome on such challenges. (D. Chandra Bose, 2006).

According to Gopalkrishnan P. and Sundaresan M., average material expenditure is 60% of the cost and industry wise average contribution is drafted as below table

Average expenditure of materials percent (%)	Industry groups
Above 65	Cotton yarn, earthmoving equipment, sugar, wool, jute, commercial vehicles, fabrication

60-65	Cotton textiles, bread
55-60	Engineering, non-ferrous
50-55	Shipbuilding, chemicals, tyre, machine tools, cement, electricity
45-50	Pharmaceutical
40-45	Steel, newspaper, fertilizer, aircraft

citations discussed above are the literatures that support to understand that material cost lies from average 40% to 60% of total working capital and hence this is one of the critical area of every organization where cost reductions, service improvement, on time deliveries plays an important role for organizations success.

Looking at different challenges like cost reduction and focus towards profit & growth we can realize that materials management is the critical function where major focus has been given by all organizations. Major challenge of supply chain managers is mitigation of risks by intelligently positioning and sizing supply chain reserves without decreasing profits. (Sunil Chopra & Manmohan Sodhi, 2004)

Inventory Management

As defined by Tony J Arnold in book “Introduction to Materials Management” Inventories are materials and supplies carried on hand either for sale or to provide material or supplies to the production process. They are part of the planning process and provide a buffer against the differences in demand rates and production rates

Risks Associated in Materials Management:

Supply chain risk is potential occurrence of incidence or failure to seize opportunities with inbound supply in which outcome results in financial loss for the firm (Zsidisin, 2005).

Risk is also defined as negative but uncertain impact on business which is normally beyond the control ((Dr. Dawei Lu,2011). Thus generally risk can be defined as an event that may or may not occur in future, which is usually not under control and this event has direct impact on operating cost either directly or indirectly.

Subhiksha Trading services limited (Subhiksha), which was based & started in 1997 as a discount store. The store faced difficulties in payment to their vendors and is resulted as empty shelves and loss of customer, subsequently they had to close 1600 stores in 2009 and they finally closed the business, even Subhiksha management claimed on financial problems but analysts concluded that business was expanded since last three years but was following poor supply chain practices which contributed to their financial issues.

Donald J. Bowersox in his book “Supply chain logistics management, 2nd edition, p.130” emphasized that inventory decisions are highly risky throughout a supply chain. He also mentioned customer loss and dissatisfaction occurs due to improper inventory assortments, this also creates inventory shortage and affects whole cycle where marketing and manufacturing plans get disrupt, production schedules get modified and if machines and workers are idle then it adds up huge cost for the organization. On the other side Donald illustrated on inventory overstock issues like overstock increases cost in terms of storage cost, spoiling cost, insurance & taxes, obsolescence cost. It helps to understand it is very important to have tight inventory control, no less and no more inventory so the cost is at optimum.

Building reserves or stock of the inventory in an undisciplined fashion also drives up the costs and that hurts bottom line of organization (Sunil Chopra, ManMohan Sodhi, 2004)

Prasanna Kumar Dey studied materials management in Indian refineries as a case study in 2001. He mentioned common issues associated with materials management function are receiving materials earlier than requirement, receiving material later than actual requirement, damage and loss of material, inventory control, excess and surplus material. All those issues are either in combination or individually faced by organizations.

APICS (American production and inventory control society) and Protiviti (Global consulting firm) in their research paper concerned with risks associated in supply chain and some solutions,

described many risks in overall supply chain activity and some of them concerned with core areas of materials management are Information integrity and availability risks, demand supply planning risk and integration, inventory and obsolescence risks, customer satisfaction risks and service risks, process inefficiency risks. Looking at above risks it is clearly visible that there are scattered areas where risks are associated in materials management and each risk has different impact on overall performance of materials function, supply chain and hence enterprise.

Moreover this research paper is a robust foundation of understanding each risks category and top three risks associated are categorized in this research paper are as below.

1. 66% respondents in survey feel that Supply Interruption is major risk –it means we could not fulfill customer demand due to supply are improper. This can be one of the reasons because of continuous supply and demand variations and improper management of supply demand in advance.
2. 55% respondents rated - Lack of senior's effectiveness in sales and operations planning (S&OP) process. If one see point 1 and point 2 discussed here then those interlink in terms of improper supply and demand management well in advance.
3. While looking at many scenarios in complex business and large data 49% respondents highlighted Lack of timely and accurate information for strategic initiatives is one of the major risks.

Again as mentioned above in point 1, another research article focused on same approach of risk is delays in material flow are frequently happening due to one of major reason that supplier cannot quickly respond to changes in demand and is one of the major risks associated in materials flow (Sunil Chopra & ManMohan Sodhi, 2004). Materials Planning purely works on supply & demand alignment concept where primary focus is alignment of supply & demand. Anything excess creates problem. If demand is more than supply then organization cannot fulfill demand of the customer and results into loss of customer or customer's satisfaction is into trouble, on other side if supply is more than demand, then cost again hurts bottom line in terms of excess inventory, storage, handling, obsolescence, spoilage and many indirect cost factors.

Continuous demand volatility poses serious challenges in asset configuration of supply chain, responsiveness, capacity management, lead time management and moreover it triggers a bullwhip effect results into higher operating costs and unsatisfactory services and deliveries to end customer (Dr. Dawei Lu, 2011)

Suhair Shumali in his research study in 1999 focused on Materials management issues in developing countries like India, Researcher studied construction industry from Gujarat and highlights on selective inventory control techniques like ABC, XYZ, HML Analysis, while study also shows ABC Analysis is not followed in true spirit by construction industry. Later part of the study highlights on method of fixation of inventory levels like minimum order quantity, maximum order quantity, safety stock, replenishment level, reorder level and EOQ Model where researcher mentioned EOQ model was not used by construction industry due to many constraints and lack of information is one of the major constraints to fix EOQ model.

Inventory decisions are both high risk and high impact throughout the supply chain. Inventory committed to support future sales drives a number of anticipatory supply chain activities. Without the proper inventory assortment, lost sales and customer dissatisfaction may occur. Likewise inventory planning is critical to manufacturing. Material or component shortages can shut down a manufacturing line or force production schedule modification, added cost and potential finished goods shortages. Just as shortages can disrupt marketing and manufacturing plans, inventory overstocks also create operating problems. Overstocks increase cost and reduce profitability as a result of added warehousing, working capital, insurance, taxes, and obsolescence. Management of inventory resources requires an understanding of functionality, principles, cost, impact, and dynamics.

Inventory management is risky, and risk varies depending upon a firm's position in the distribution channel. The typical measures of inventory exposure are time duration, depth, and width of commitment.

For a manufacturer, inventory risk is long term. The manufacturer's inventory commitment begins with raw material and component parts purchase, includes work in process and ends with finished goods.

In below table type of risks and its drivers are mentioned in detail

Category of Risk	Drivers of Risk
Disruptions	<ul style="list-style-type: none"> ■ Natural disaster ■ Labor dispute ■ Supplier bankruptcy ■ War and terrorism ■ Dependency on a single source of supply as well as the capacity and responsiveness of alternative suppliers
Delays	<ul style="list-style-type: none"> ■ High capacity utilization at supply source ■ Inflexibility of supply source ■ Poor quality or yield at supply source ■ Excessive handling due to border crossings or to change in transportation modes
Systems	<ul style="list-style-type: none"> ■ Information infrastructure breakdown ■ System integration or extensive systems networking ■ E-commerce
Forecast	<ul style="list-style-type: none"> ■ Inaccurate forecasts due to long lead times, seasonality, product variety, short life cycles, small customer base ■ "Bullwhip effect" or information distortion due to sales promotions, incentives, lack of supply-chain visibility and exaggeration of demand in times of product shortage
Intellectual Property	<ul style="list-style-type: none"> ■ Vertical integration of supply chain ■ Global outsourcing and markets
Procurement	<ul style="list-style-type: none"> ■ Exchange rate risk ■ Percentage of a key component or raw material procured from a single source ■ Industrywide capacity utilization ■ Long-term versus short-term contracts
Receivables	<ul style="list-style-type: none"> ■ Number of customers ■ Financial strength of customers
Inventory	<ul style="list-style-type: none"> ■ Rate of product obsolescence ■ Inventory holding cost ■ Product value ■ Demand and supply uncertainty
Capacity	<ul style="list-style-type: none"> ■ Cost of capacity ■ Capacity flexibility

Reference - Research Paper by Sunil Chopra and ManMohan Sodhi, "Managing Risk to avoid supply chain breakdown", MIT Sloan Management review, Fall 2004, Vol.46. No.1.

Risk Assessment & Mitigation strategies in Materials Management

P.S. Rathai in his research titled “A Study on Inventory Management of central public enterprises in Salem” in 2012 stressed on inventory control aspects and majorly focused on purchasing methods of selected enterprises, study of lead times (administrative lead time and material delivery lead time), meanwhile P.S Rathai also studied stores management procedures and different costs associated with inventories. In a conclusion part researcher mentions that inventory management is not perfection but it is a part of improvement while proper inventory control is moreover minimizing complexities in planning, executing and controlling a supply chain. Researcher also stresses that for proper and structured inventory management it is necessary to take inventory decisions based on quantitative evaluations.

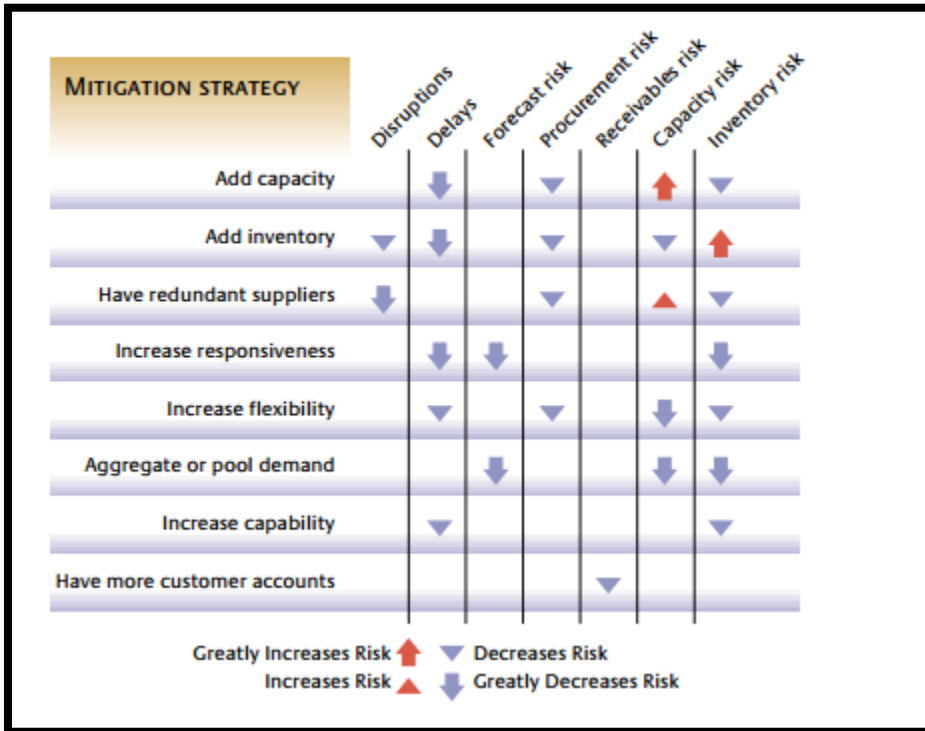


Figure Reference - Research Paper by Sunil Chopra and ManMohan Sodhi, "Managing Risk to avoid supply chain breakdown", MIT Sloan Management review, Fall 2004, Vol.46. No.1. P 4

Forecasts are never accurate, but organization dealing with multiple products and multiple customers it is important to forecast the material. Forecast inaccuracies can be result of lack of information distortion within supply chain, Forecast risks can be reduced by selectively holding inventory for those products where holding cost is relatively low and increasing responsiveness of production or delivery for the products which are expensive. (Sunil Chopra & ManMohan Sodhi, 2004).

More inventories are always a hurdle and controlling right inventory at right time has no silver bullet method defined.

Top management meets weekly to review supply and demand positions for risk assessment and this process is referred as Sales and operations planning (S&OP) or some organizations also refer it as Sales, Inventory and operations planning (SIOP). In this meeting metrics are reviewed to understand previous plans and actuals, this process helps to improve predictability, to increase proactive actions and to minimize risks (Donald H. Sheldon, 2008).

P. Gopalkrishnan in his book Purchasing and Materials Management defined the terminology titled “Materials Research” where he concluded that materials intelligence is a systematic approach of dealing with right information to right person in the defined hierarchy, and this approach is assisting profit centered goals. Author also mentions information is a power which should be considered as development activity in materials department. He also writes that information required for planning, budgeting and controlling materials function should be followed through MIS, in addition to this materials information is defined by Gopalkrishnan as network of information flow aimed at supporting materials management activities by having relevant, reliable and timely information, Further Gopalkrishnan in his another book titled Materials management an integrated approach highlighted materials management with MBO Approach, MBO that is management by objective is an approach of establishing effectiveness areas and effectiveness standards for management and those defined standards shall be measured timely with future planning approach, in the same context author expresses areas of effectiveness

in materials management as inventory levels, inventory ratio, scrap and others related to supplier management.

APICS (American production and inventory control society) and Protiviti (Global consulting firm) in their research paper concerned with risks associated in supply chain and some solutions, described many risks in overall supply chain activity and in the same paper they outline few top solutions which are concerned with integration of cross functional teams.

Amount of obsolete inventory always prevents manufacturing plant to attain their goals; on other side many plants are reluctant to present total amount of obsolete inventory available with them as their performance is being monitored based on this amount. Obsolete inventory directly affects the profit margins of organization and consequently materials management department are faced with unrealistic inventory reduction goals (Stan C. McDonald, 2009). It is also important that right information flow has to be there in overall chain of manufacturing processes, if information is duplicated or manipulated it directly has impact on organization or function of organizations performance measurement.

Information plays an important role and there shall be structured, defined and frequent communication amongst all supply chain partners. As there are multiple partners within the chain, it is difficult to understand actual requirement of end customer, the term is coined as Bullwhip effect. APICS (American Production and Inventory control society) defines Bullwhip effect as “An extreme change in the supply position upstream in a supply chain generated by a small change in demand downstream in the supply chain. Inventory can quickly move from being backordered to being excess”

Bullwhip effect can also be considered as distortion of demand along the supply chain which goes upstream in an amplified form (Abhilash Reddy Kothi, 2007).

Companies can reduce the bullwhip effect by increasing more visibility of demand information amongst partners and planning collaboratively with the effort of CPFR (Collaborative planning, forecasting & replenishment) (Sunil Chopra & ManMohan Sodhi, 2004).

Farahani and Reza Zanjirani concluded in their famous book titled “Supply chain sustainability and raw material management, concepts and processes” that “for supply chain sustainability it is

important to have stochastic models in place and decisions has to be made based on the available information than random consideration, while decision makers can be able to make some decisions related to effect of uncertainty on system performance.

Nenad Stefanovic discusses in his research paper that performance management is all about monitoring, measurement and analysis of operational performance data and collaborative decision making. He highlights that many organizations have existing KPI for supply chain performance that are backward looking, it means those are monitored and analyzed to see what has happened? How and why this happened? Further Nenad guides on a performance measurement model with help of world known SCOR model concept where he advocates that Business intelligence tools and technologies are the best options to enable to react timely, to predict what will happen (Forward looking) and this helps supply chain team to have better responsiveness and less risks. On the similar topic Kiran S. Patil in his research paper studied brief on SCOR model and its benefit for the organization, Kiran feels that current KPI, scorecard and dashboards used to measure supply chain performance are not interlinked to strategy.

Integrated Materials Management

Various functions performed by materials management department include the materials planning, Procurement or Purchasing, receiving, stores Management, inventory control, Obsolete, scrap and surplus disposal. All mentioned functions needs efficient management. This requires well-coordinated approach towards various issues, activities, decision making with respect to materials.

All the materials related activities such as material planning, purchase systems & procedure, variety reduction through standardization, codification & rationalization, reducing uncertainties in demand & supply, handling & transportation, inspection, proper storage & issue of materials to the internal customers, inventory management, vendor management & finally disposal of obsolete, surplus & scrap materials etc. taken together is termed as Integrated Materials Management

While inventory manager would like to have minimum level of inventory to show off his performance, purchasing manager would like to place bulk orders in order to lessen his work load and show discounts as reductions. Both of these acts may be little contradictory from the organizational point of view. That is if some of the functions were to be handled separately, a conflict of interests may occur.

Therefore, the conflicting objectives need to be balanced and intertwined from a total organizational viewpoint so as to achieve optimum results for the organization as a whole.

In an integrated set up, one materials manager (usually the chief) is responsible for all related functions and he is in a position to exercise control and coordinate all the activities with a view to ensure proper balance of the conflicting objectives of the individual functions.

Integration also attains the synergetic advantage in terms of eliminating water tight compartments that set in a disjointed environment of working. The resulting benefits can be seen in terms of rapid transfer of data, through effective and informal communication channels.

This is crucial as the materials management function involves handling vast amount of data. Therefore, integrating the various functions identify themselves to a common materials management department which in turn results in greater coordination and better control.

Now days, in many traditions bound companies too, even the spare part planning which hitherto was done by the operation people has been brought under the umbrella of an integrated materials Management.

Better accountability, better coordination, better performance, better adaptability to manage centralized information are some of the tangible advantages of the Integrated Materials Management besides a perceptible team spirit ,morale and cooperation are the intangible gains.

Training and development of staff and executive through rotation of people is another great advantage because of a bigger canvas produced by integration of Materials function. To carry out these functions efficiently, it is essential to have a very good supplier base, order booking process & inventory management system as well as expert Materials Management (MM) professionals.

“5ME” is an organization which is consulting manufacturing solutions concludes that Man, Material, Machines, Methods and Money are the 5M’s of efficiency in production management.

So out of five M's mentioned above, Materials has become a keen interest of industrial management to support cost reduction and increase in sales and profit for organization.

As Materials Management involves decision making at various areas, it is important to follow well-coordinated and integrated approach. For example - for keeping safety stock is simply an investment in inventories, which can also be overcome by reducing lead times, minimizing uncertainties in supply & demand, reducing variety through standardization & modification, developing reliable sources of supply. So to follow this coordinated process it needs to have proper & timely co-ordination between customer scheduling, Sales & Operation Planning, Materials Planning, Inventory managers, stores, Production, Engineering, Purchasing, distribution and finance team to co-ordinate in well manner.

Conclusion

Although there is no silver bullet method to identify, assess and mitigate risk in any manufacturing setup, but there are many strategies, tools and techniques available. Proper use of right method at right time will definitely help an organization to identify, assess, mitigate, transfer or reduce the risks.

Below are three tables being a conclusion of research paper, those three tables' shows

1. Primary risks identified in materials management function.
2. Basic methods to be used to assess the materials functions risk.
3. Mitigation strategies to be implemented to mitigate, reduce or transfer the risks.

Risks in Materials Management	Risk identification & Assessment	Risk Mitigation strategies
<ul style="list-style-type: none"> • Inconsistent flow of material / On time delivery. • Safety stock, ROP & ROQ decisions. • Lack of Integration and process approach. • Lack of Information flow within the chain. • Inventory accuracy • Excess and Obsolete materials 	<ul style="list-style-type: none"> • Forecasting models • Inventory classification techniques – (Eg. ABC, HML, FSN) • Inventory assortment model (Eg. PFEP) • S&OP Process • Utility of Quality & Lean tools <ul style="list-style-type: none"> • FMEA, Fishbone, Control charts • Utility of Data analytics / BI Tools 	<ul style="list-style-type: none"> • CPFR (Collaborative planning forecasting & replenishment) • VMI (Vendor managed Inventory) • Predictive analytics • ICT (EDI, RFID, Barcoding & scanning) • Cooperative approach (With internal stakeholder – Sales & marketing, production, purchase as well as external stakeholders – Suppliers, customers)

Research Gap

Many of the studies are conducted in different manufacturing setups and it has been identified that research is conducted mainly on improving, innovating, exploring gaps of traditional approach of materials management and inventory control, while there are very few research identified in the areas of risk assessment and risk mitigation strategies in materials & inventory area.

While there is significant trend outlined in manufacturing industries with new methods like analytics, PFEP, S&OP, extensive computerization where very few researchers have focused and it has been understood that research in above mentioned areas are becoming more popular topics for upcoming researchers.

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Abbreviations in research paper

S&OP –Sales and operations planning.

PFEP – Plan for every part

ROP – Re order point

ROQ – Reorder quantity

EDI – Electronic data interchange

RFID – Radio Frequency Identification

BI – Business Intelligence

SIOP – Sales, Inventory and operations planning

MM- Materials Management

ICT – Internet and communication Technology

SCOR – Supply chain operational reference

OTD – On time delivery

DOH – Days on Hand

ITR – Inventory turnover ratio

Information sharing on Social Networking Sites (SNS): An Empirical study

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Abstract

Objective: The main objective was to study the level of penetration of social networking sites across various demographics, the reasons for using social networking sites and the factors influencing information sharing on SNS.

Methodology: A total of 300 questionnaires were distributed among the various users of SNS. Questionnaire consisted of structured close-ended questions. Of the 300 questionnaires, 163 responses were received. This represents an effective response rate of around 54% of the total sample. Chi square test was used to analyze the significance of the results.

Findings: Students have been spending more and more time on the internet, they use to surf the internet daily for fun and entertainment and for making new relation on these social networking sites. They are the most frequent users of SNS.

Managerial Implications: Companies with application products could understand the behaviour of different users of SNS regarding fun and entertainment and accordingly develop their products. Various new applications could be designed with regard to occupation to which the user belonged to. The study could also be useful for those online advertisers who advertise their products on these SNS and could understand the likes and dislikes, time spent and which part of the day was the time spent so that they could target their products accordingly.

Conclusion: Demographics do not affect the time associated with social networking sites. The time spent on social networking sites and its use for fun and entertainment varied by gender but not by age, educational qualification and occupation. The perception that social networking sites are used for making new relation is affected by occupation but not by gender, age, educational qualification. The use of social networking sites for social purposes and marketing was not affected by any demographic factor.

Key Words: Entertainment, Information, Social networking sites

JEL Classification code: D70, D71

Introduction

Meaning of Social Networking Sites:

Social Networking Sites (SNS) are web sites that provide a basic or constructive community for people to share their daily activities with family and friends, and share their interest on various topics, and increase their circle of acquaintances.

Over these past few years, the popularity of social networking websites has been increasing rapidly. Social networking websites have gained a lot of attention among all classes of people. These websites provide an opportunity to individuals to meet new people all around the world. Majority of the social networking websites are free to use. Social networking websites are built user friendly and hence have attracted a large number of users towards them. They can be used by anyone regardless of age, location etc. The social networking websites are specially designed for adults and children both, with the main aim of creating a friendly environment for everyone where they can interact with each other whole heartedly. No restriction is imposed on anyone to join these websites. Majority of the social networking websites which are popular, are free to use. There are some which come with added options or features which may require the users to pay but there are other several add-ons which the website users can create. Social networking sites (SNS) have provided a wonderful opportunity to the current generation to interact with each other without any barriers or restriction. Users can communicate all around the world sharing their interest and creating long term relationships on these websites.

Information sharing

Social Networking is this century's most ideal communication environment, offering a range of opportunities for sharing personal information and getting in contact with other users (Datcu, 2012). A key point is that social networks allow people to present themselves in a certain way to have fun and entertainment and develop new relations. It also develops social

and professional contacts; the sharing of information and services among people with a common interest. The variables identified to study information sharing or usages were:

- Fun and entertainment
- Making new relation
- Social purpose and marketing

On the basis of the number of users the most popular social networking sites are as under as on 15 September 2013 (Smith, 2013):

Facebook was launched in 2004 targeting college, students, but when it was opened to everyone, it grew exponentially to become a top social networking site. It is the biggest social networking site in the world. Currently it has 1.5 billion users.

Twitter is pared down to short, 140-character messages which can include links to content elsewhere online. It has attracted a host of celebrity users and it has been suggested that the site could be worth \$10 billion. Twitter currently has more than 317million active users.

LinkedIn is a business-based social network and was floated on the US stock market in April, when its share price doubled in the first day. It has 238 million users

MySpace MySpace once dominated the social networking market, but declined steadily from 2008, and was sold to advertising agency Specific Media and Justin Timberlake for \$35 million. My space currently has 32.6 million users.

Review of literature

A brief review of literature was conducted before the commencement of the study.

(Acquisti, 2005) in his study revealed that participation in social networking sites has dramatically increased in recent years. Services such as Friendster, Tribe, or Facebook allow millions of individuals to create online profiles and share personal information with vast networks of friends - and, often, unknown numbers of strangers. The study showed patterns of information revelation in online social networks and their privacy implications. It analyzed the online behaviour of more than 4,000 Carnegie Mellon University students who joined a

popular social networking site catered to colleges. The study highlighted potential attacks on various aspects of their privacy, and showed that only a minimal percentage of users change the highly permeable privacy preferences. (**Hargittai, 2007**) studied the predictors of Social networking sites (SNS), usage with particular focus on Facebook, MySpace, Xanga, and Friendster. The findings suggested that the use of such sites was not randomly distributed across a group of highly wired users. A person's gender, race and ethnicity, and parental educational background were associated with use, and in most cases only when the aggregate concept of social network sites was disaggregated by service. Additionally, people with more experience and autonomy of use were more likely to be users of such sites. Unequal participation based on user background suggested that differential adoption of such services could be contributing to digital inequality. (**Kathryn Wilson, 2010**) sought to predict young adults' use of SNS and their addictive tendency towards it from their personality characteristics and levels of self-esteem. University students aged 17 to 24 years, reported their use of SNS and completed the NEO Five-Factor Personality Inventory¹ and the Coppersmith Self-Esteem Inventory. Multiple regression analyses revealed that, as a group, the personality and self-esteem factors significantly predicted both level of SNS use and addictive tendency but did not explain a large amount of variance in either outcome measure. His findings indicated that extroverted and unconscientious individuals reported higher levels of both SNS use and addictive tendencies. (**Kuan-Yu Lin, 2011**) in his study used an online questionnaire to conduct empirical research, and collected and analyzed data of 402 samples by structural equation modeling (SEM) approach. He showed that enjoyment was the most influential factor in people's continued use of SNS, followed by number of peers, and usefulness. The number of peers and perceived complementarity had stronger influence than the number of members on perceived benefits His work also ran clustering analysis by gender, which found notable difference in both number of peers and number of members between men and women. The number of peers was an important factor affecting the continued intention to use for women but not for men; the number of members had no significant effect on enjoyment for men. His findings also suggested that gender differences also produced different influences. (**Namsu Park, 2009**) revealed four primary needs for participating in groups within Facebook: socializing, entertainment, self-status seeking, and information. These gratifications vary depending on user demographics such as gender,

hometown, and year in school. His analysis of the relationship between users' needs and civic and political participation indicated that, as predicted, informational uses were more correlated to civic and political action than to recreational uses. (**Shin, 2010**) in his study examined security, trust, and privacy concerns with regard to social networking websites among consumers using both reliable scales and measures. He proposed a SNS acceptance model by integrating cognitive as well as affective attitudes as primary influencing factors, which were driven by underlying beliefs, perceived security, perceived privacy, trust, attitude, and intention. The model showed excellent measurement properties and establishes perceived privacy and perceived security of SNS as distinct constructs. His finding also revealed that perceived security moderated the effect of perceived privacy on trust. Based on the results of the study, practical implications for marketing strategies in SNS markets and theoretical implications were recommended accordingly. (**Ohbyung Kwon, 2010**) in his study emphasised two things. First, he empirically examined how individual characteristics affect actual user acceptance of social network services. To examine these individual characteristics, he applied a Technology Acceptance Model (TAM) to construct an amended model that focuses on three individual differences: social identity, altruism and one perceived construct: the perceived encouragement, imported from psychology-based research. Next, he examined if the users' perception to see a target social network service as human relationship-oriented service or as a task-oriented service could be a moderator between perceived constructs and actual use. As a result, he discovered that the perceived encouragement and perceived orientation were significant constructs that affect the actual use of social network services. (**Christy M.K. Cheunga, 2010**) conceptualised the decision to use an online social network conceptualized as intentional social action and the relative impact of the three modes of social influence processes (compliance, internalization, and identification) on intentional social action to use (collective intention). It was found that collective intention to use a social networking site was determined by both subjective norm and social identity. Further, social identity was found to be a second-order latent construct comprised of cognitive, evaluative, and affective (first-order) components. (**Quan-hasse, 2009**) examined surveys and interviews that influenced university students to disclose personal information on Facebook. Moreover, he studied the strategies students had developed to protect themselves against privacy threats. He found that personal network size

was positively associated with information revelation, and no association was found between concern about unwanted audiences and information revelation and finally, student's internet privacy concerns and information revelation were negatively associated. The privacy protection strategies employed most often were the exclusion of personal information, the use of private email messages, and altering the default privacy settings. Based on his findings, he proposed a model of information revelation and drew conclusions for theories of identity expression. **(Marlow, 2009)** in his study revealed that social networking sites (SNS) were only as good as the content their users share. Therefore, designers of SNS should seek to improve the overall user experience by encouraging members to contribute more content. However, user motivations for contribution in SNS were not well understood. This was particularly true for the newcomers, who may not recognize the value of the contribution. Using server log data from approximately 140,000 newcomers in Facebook, he predicted long-term sharing based on the experiences the newcomers had in their first two weeks. He tested four mechanisms: social learning, singling out, feedback, and distribution. **(Hinds, 2008)** investigated a particular subset of virtual communities - open source software project communities and four hypotheses were asserted which related social network structure to community success. The hypotheses, which were based on social network theory and related research, suggested that success was supported by high levels of affiliation with other communities, moderate levels of density within the network of community conversations, moderate levels of density in the communications between peripheral members and core members, and low levels of density in the communications between administrators and the rest of the community. **(Feng Fua, 2007)** investigated two paradigms for studying the evolution of cooperation—Prisoner's Dilemma and Snowdrift game in an online friendship network, obtained from a social networking site. He revealed that the empirical social network had small-world and scale-free properties. Besides, it exhibited assortative mixing pattern. Studied the evolutionary version of the two types of games on it. It was found that cooperation was substantially promoted with small values of game matrix parameters in both games. Whereas the competent cooperators induced by the underlying network of contacts dramatically inhibited with increasing values of the game parameters. **(Dhiraj Jain, 2012)** found a strong correlation between the creation of fake accounts and embarrassment created due to wrong information posted by others. People are also afraid about those who have

created fake accounts and get embarrassed due to wrong information posted by others on their profile. They found that higher the level of trust an individual had on SNS, the more likely the individual was to find the combined usability and satisfaction from SNS. **(Magnani, 2010)** in his study found support for social learning: newcomers who see their friends contributing go on to share more content themselves. It was found that one of the most interesting and still not completely understood phenomena happening Social Network Sites is their ability to spread (or not) units of information which may aggregate to form large distributed conversations. **(Zheng Xianga, 2010)** employed a research design that simulated traveller's use of a search engine for travel planning by using a set of pre-defined keywords in combination with nine U.S. tourist destination names. The analysis showed that social media constitute a substantial part of the search results, indicating that search engines likely direct travellers to social media sites. This study confirmed the growing importance of social media in the online tourism domain. It also provided evidence for challenges faced by traditional providers of travel-related information. **(Jan vom Brockel, 2009)** identified different motives for the usage and non-usage of SNSs and determined the potential contextual factors. **(Hanna Krasnova, 2010)** integrated focus group results into a theoretical privacy calculus framework and developed and empirically tested a Structural Equation Model of self-disclosure with 259 subjects. It was found that users were primarily motivated to disclose information because of the convenience of maintaining and developing relationships and platform enjoyment. Countervailing these benefits, privacy risks represent a critical barrier to information disclosure. However, users' perception of risk could be mitigated by their trust in the network provider and availability of control options. Based on these findings, it offered recommendations for network providers. **(Jain & Sadriwala, 2013)** concluded that social networking sites could be entertaining and exiting and were dependent on the age. The perception that social networking site help in developing new relations, keeping in touch with friends and making the user feel good was not affected by the demographic determinants selected and was independent of them. **(Aberer, Buchegger, & Datta, 2009)** studied a new application of threshold-based secret sharing in a distributed online social network (DOSN), where users needed a means to back up and recover their private keys in a network of untrusted servers. They proposed a trust-based delegate selection which performed very well in highly vulnerable environments where the adversary controlled

many nodes with different distributions and even with spreading of infections in the network. In fact, the number of keys lost were very low under extremely pessimistic assumptions of the adversary model. **(Harbes, 2010)** found that professional relationships and a sense of community were important for career mobility and satisfaction, and was important to foster and support these relationships early. They presented SNAG, (Social Networking and Games), a suite of mobile and Internet games to facilitate social networking within a professional community. They presented Snag'em, a game that helped conference attendees meet one another and track their new contacts. **(Dong-Hee Shin, 2010)** conducted an online survey of SNS users and validated the proposed theoretical model's ability to explain and predict user acceptance of SNS very well. The results illustrate the importance of both extrinsic and intrinsic motivation and also showed that different sets of motivations provide useful implications for theory and practice.

Research gap

While the key trends were being reviewed from the literature, it was observed that though there was a vast literature on social networking sites none of them have tried to study the behavioural pattern of information sharing or the reasons of using social networking sites and the factors which influence users for sharing information on SNS. The study was initiated with this objective in mind. This study tries to explore the factors influencing information sharing on SNS.

Objective of the study

1. To study the perception towards information sharing across various demographics in Rajasthan.
2. To study the reasons for using social networking sites and the factors influencing information sharing on SNS.

Hypothesis framed for the study

H_{01}	There is no significant difference in the length of association with SNS across the
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	demographics selected for the study.
H ₀₂	There is no significant difference in the time spent on SNS across the demographics selected for the study.
H ₀₃	There is no significant difference between the fact that the use of SNS provide fun and entertainment across the demographics selected for the study.
H ₀₄	There is no significant difference between the fact that the use of SNS helps in making new relations across the demographics selected for the study.
H ₀₅	There is no significant difference in perception that SNS are used for social purpose and marketing across the demographics selected for the study.
H ₀₆	There is no significant difference in the perception that SNS are used for purposes other than those stated above across the demographics selected for the study..

Research Methodology

The study is exploratory in nature. The respondents were frequent users of SNS who had at least one account on SNS. The study has a total sample of 163 from 200 questionnaires issued, across various occupations. The samples were randomly selected from out of the regular users of social networking sites. The advantage of a random sampling method is that the results can be analyzed occupation wise, drawing certain conclusions from each category of respondents. Both qualitative and quantitative data were collected. The instrument for data collection consisted of structured closed ended questions. The questionnaire was administered to a sample of occupation to collect data on their perceptions of using social networking sites.

Questionnaire

The study used the survey method to approach the respondents through questionnaire as an instrument for data collection. The framework was developed using the variables identified during extensive review of literature. It consisted of structured closed ended questions. The questionnaire consists of two parts such as namely (1) respondent's demographic features, (2) and the variables related to information sharing and usage of social networking sites among

various occupations. All the closed ended questions were designed to be responded on a five point Likert scale to measure.

Data Collection, Analysis, and Findings

A total of 300 questionnaires was distributed among the various occupation in the five major cities of Rajasthan (Jaipur, Jodhpur, Udaipur, Kota and Ajmer) Questionnaire consisted of structured close-ended questions. From 300 questionnaires, 163 responses were completed in all respect and were hence considered for the study. This represents an effective response rate of around 54% of the total sample. Chi square test is used to test the significance of the results.

Data Analysis & interpretation

Table 1

Demographic Profile of the respondents		Frequency	Percent
Gender	Male	105	64.4
	Female	58	35.6
	Total	163	100.0
Age	< 15 years	2	1.2
	16-25 years	112	68.7
	26-35 years	34	20.9
	36-50 years	12	7.4
	> 50 years	3	1.8
	Total	163	100.0
Education Qualification	High School	33	20.2
	Intermediate	4	2.5
	Graduation	69	42.3
	Post- graduation & above	50	30.7
	Others	7	4.3
	Total	163	100.0

Occupation	Student	94	57.7
	Government Sector Job	7	4.3
	Private sector job	28	17.2
	Professional	16	9.8
	Self Employed	15	9.2
	Others	3	1.8
	Total	163	100.0
Length of association with Social Networking sites	< 1 year	26	16.0
	1-3 years	67	41.1
	3-5 years	49	30.1
	> 5 years	21	12.9
	Total	163	100.0
Time spent on Social Networking sites	Constantly online	14	8.6
	Several times a day	39	23.9
	Daily	70	42.9
	Weekly	30	18.4
	Monthly	10	6.1
	Total	163	100.0

Interpretation

Most of the respondents were male (64.4%) , within the age group of 16-25 years (68.7%), majority of them were pursuing graduation (42.3%) or post- graduation (30.7%) , majority of the social networking sites users were students (57.7%) followed by employees of private sector (17.2%). Majority of them (41.1%) have been associated with the social networking sites for a period of 1-3 years and (43%) of the users surf the net daily.

Association between the demographic determinants and the time that the respondents have been associated with social networking sites.

Table 2(a)

		Time of association with Social Networking sites				Total
		< 1 year	1-3 years	3-5 years	> 5 years	
Gender	Male	8	43	39	15	105
	Female	18	24	10	6	58
Total		26	67	49	21	163
Age	< 15 years	1	1	0	0	2
	16-25 years	19	50	33	10	112
	26-35 years	1	10	12	11	34
	36-50 years	3	5	4	0	12
	> 50 years	2	1	0	0	3
Total		26	67	49	21	163
Education Qualification	High School	12	12	8	1	33
	Intermediate	0	2	1	1	4
	Graduation	9	33	19	8	69
	Post- graduation & above	4	19	20	7	50
	Others	1	1	1	4	7
Total		26	67	49	21	163
Occupation	Student	19	40	30	5	94
	Government Sector Job	1	4	2	0	7
	Private sector job	4	12	5	7	28
	Professional	0	6	7	3	16
	Self Employed	1	5	5	4	15
	Others	1	0	0	2	3
Total		26	67	49	21	163

H₀₁: There is no significant difference in the length of association with SNS across the demographics selected for the study.

Table 2 (b)

	Gender	Age	Education Qualification	Occupation
Tabulated value	7.81	21	21	25
Calculated Value	18.217	27.565	30.474	28.168
Df	3	12	12	15
Accept/Reject	Rejected	Rejected	Rejected	Rejected

Interpretation: As the null hypothesis has been rejected in all the cases, we conclude that there is a significant difference in the time of association with SNS across the demographics selected for the study.

Association between the demographic determinants and the time spent on social networking sites.

Table 3 (a)

		Time spent on Social Networking sites					Total
		Constantly online	Several times a day	Daily	Weekly	Monthly	
Gender	Male	13	28	41	20	3	105
	Female	1	11	29	10	7	58
Total		14	39	70	30	10	163
Age	< 15 years	0	0	1	1	0	2
	16-25	12	34	46	14	6	112
	26-35	2	4	18	8	2	34
	36-50	0	1	5	5	1	12
	> 50 years	0	0	0	2	1	3

Total		14	39	70	30	10	163
Education Qualification	High School	3	12	9	7	2	33
	Intermediate	0	2	2	0	0	4
	Graduation	9	18	31	8	3	69
	Post-graduation & above	2	7	24	12	5	50
	Others	0	0	4	3	0	7
Total		14	39	70	30	10	163
Occupation	Student	10	31	38	10	5	94
	Government Sector Job	0	1	3	2	1	7
	Private sector job	3	3	12	8	2	28
	Professional	0	3	8	4	1	16
	Self Employed	1	1	7	5	1	15
	Others	0	0	2	1	0	3
Total		14	39	70	30	10	163

H₀₂: There is no significant difference in the time spent on SNS across the demographics selected for the study.

Table 3 (b)

	Gender	Age	Education Qualification	Occupation
Tabulated value	9.49	26.3	26.3	31.4
Calculated Value	12.144	25.956	21.529	20.671
Df	4	16	16	20
Accept/Reject	Rejected	Accepted	Accepted	Accepted

Interpretation: As the null hypothesis has been rejected in case of gender, we can conclude that there is a significant difference in the time spent by the respondents on social networking sites when studied across gender. But in case of all other demographics the null hypothesis was accepted indicating that there is no significant difference in the time spent by the respondents on social networking sites across the demographics selected for the study.

Association between demographic determinants and the fact that social networking sites are used for Fun and Entertainment.

Table 4(a)

		You use Social Networking sites for (Fun & Entertainment)		Total
		No	Yes	
Gender	Male	41	64	105
	Female	24	34	58
Total		65	98	163
Age	< 15 years	0	2	2
	16-25	33	79	112
	26-35	20	14	34
	36-50	9	3	12
	> 50 years	3	0	3
Total		65	98	163
Education Qualification	High School	5	28	33
	Intermediate	0	4	4
	Graduation	34	35	69
	Post-graduation & above	21	29	50
	Others	5	2	7

Total		65	98	163
Occupation	Student	28	66	94
	Government Sector Job	5	2	7
	Private sector job	14	14	28
	Professional	6	10	16
	Self Employed	11	4	15
	Others	1	2	3
Total		65	98	163

H₀₃: There is no significant difference between the fact that the use of SNS provide fun and entertainment across the demographics selected for the study.

Table 4(b)

	Gender	Age	Education Qualification	Occupation
Tabulated value	3.84	9.49	9.49	11.1
Calculated Value	.085	22.180	16.610	15.189
Df	1	4	4	5
Accept/Reject	Accepted	Rejected	Rejected	Rejected

Interpretation: As the null hypothesis has been accepted in case of gender. We can conclude that there is no significant difference in the fact that the uses of SNS provide fun and entertainment when studied across gender. But in case of all other demographics the null hypothesis was rejected indicating that there is a significant difference in the fact that the uses of SNS provide fun and entertainment across demographics selected for the study.

Association between demographic determinants and the fact that social networking sites are used to make new relation.

Table 5(a)

		You use Social Networking sites for (Making new relations)		
		No	Yes	Total
Gender	Male	69	36	105
	Female	38	20	58
Total		107	56	163
Age	< 15 years	1	1	2
	16-25	73	39	112
	26-35	21	13	34
	36-50	9	3	12
	> 50 years	3	0	3
Total		107	56	163
Education Qualification	High School	24	9	33
	Intermediate	3	1	4
	Graduation	40	29	69
	Post-graduation & above	35	15	50
	Others	5	2	7
Total		107	56	163
Occupation	Student	61	33	94
	Government Sector Job	2	5	7
	Private sector job	15	13	28
	Professional	14	2	16
	Self Employed	13	2	15
	Others	2	1	3
Total		107	56	163

H₀₄: There is no significant difference between the fact that the use of SNS helps in making new relations across the demographics selected for the study.

Table 5 (b)

	Gender	Age	Education Qualification	Occupation
Tabulated value	3.84	9.49	9.49	11.1
Calculated Value	.001	2.491	3.215	12.429
Df	1	4	4	5
Accept/Reject	Accepted	Accepted	Accepted	Rejected

Interpretation: As the null hypothesis has been rejected in case of occupation, we can conclude that there is a significant difference in the fact that the use of SNS helps in making new relations when studied across occupation. But in case of all other demographics the null hypothesis was accepted indicating that there is no significant difference in the fact that the use of SNS helps in making new relations across the demographics selected for the study.

Association between demographic determinants and the fact that social networking sites are used for social purpose and marketing.

Table 6 (a)

		Social Networking sites are used for (Social purpose & marketing)		
		No	Yes	Total
Gender	Male	51	54	105
	Female	34	24	58
Total		85	78	163
Age	< 15 years	2	0	
	16-25	59	53	112
	26-35	20	14	34
	36-50	4	8	12
	> 50 years	0	3	3

Total		85	78	163
Education Qualification	High School	20	13	33
	Intermediate	3	1	4
	Graduation	33	36	69
	Post-graduation & above	26	24	50
	Others	3	4	7
Total		85	78	163
Occupation	Student	49	45	94
	Government Sector Job	6	1	7
	Private sector job	16	12	28
	Professional	5	11	16
	Self Employed	7	8	15
	Others	2	1	3
Total		85	78	163

H₀₅: There is no significant difference in perception that SNS are used for social purpose and marketing across the demographics selected for the study.

Table 6 (b)

	Gender	Age	Education Qualification	Occupation
Tabulated value	3.84	9.49	9.49	11.1
Calculated Value	1.512	7.427	2.542	6.675
Df	1	4	4	5
Accept/Reject	Accepted	Accepted	Accepted	Accepted

Interpretation: As the null hypothesis has been accepted in all the cases, we conclude that there is no significant difference in perception that SNS are used for social purpose and marketing across the demographics selected for the study.

Association between demographic determinants and the fact that social networking sites are used for purposes other than those stated above.

Table 7(a)

		You use Social Networking sites (Others)		
		No	Yes	Total
Gender	Male	67	38	105
	Female	48	10	58
Total		115	48	163
Age	< 15 years	2	0	2
	16-25	69	43	112
	26-35	31	3	34
	36-50	10	2	12
	> 50 years	3	0	3
Total		115	48	163
Education Qualification	High School	25	8	33
	Intermediate	1	3	4
	Graduation	44	25	69
	Post-graduation & above	38	12	50
	Others	7	0	7
Total		115	48	163
Occupation	Student	60	34	94
	Government Sector Job	5	2	7
	Private sector job	19	9	28
	Professional	15	1	16
	Self Employed	13	2	15

	Others	3	0	3
Total		115	48	163

H₀₆: There is no significant difference in the perception that SNS are used for purposes other than those stated above across the demographics selected for the study.

Table 7 (b)

	Gender	Age	Education Qualification	Occupation
Tabulated value	3.84	9.49	9.49	11.1
Calculated Value	6.457	14.305	9.590	9.416
Df	1	4	4	5
Accept/Reject	Rejected	Rejected	Rejected	Accepted

Interpretation: As the null hypothesis has been accepted in case of occupation, we can conclude that there is no significant difference in the perception that SNS are used for purposes other than those stated above across occupation. But in case of all other demographics the null hypothesis was rejected indicating that there is a significant difference in the perception that SNS are used for purposes other than those stated above across the demographics selected for the study.

Conclusion

Demographic profiles of the users do not affect the time they are associated with Social networking sites. The time spent on social networking sites by users and its use for fun and entertainment varies by gender but not by age, educational qualification and occupation. The perception that social networking sites are used for making new relation is affected by occupation but not by gender, age, educational qualification. The use of social networking sites for social purposes and marketing is not affected by any demographic factor.

Managerial implication

Companies with application products could understand the behaviour of different users of SNS regarding fun and entertainment and accordingly develop their products. Various new applications could be designed with regard to occupation to which the user belonged to. The study could also be useful for those online advertisers who advertise their products on these SNS and could understand the likes and dislikes, time spent and which part of the day was the time spent so that they could target their products accordingly.

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Emerging trends in mobile apps market and their potential impact on mobile users engagement in the global economy

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Abstract

In modern era, due to emergence of smart phones, more and more of our interaction online occurs on mobile devices. In order to grasp business opportunities, organizations are concentrating on developing mobile apps to acquire many customers and deliver highest quality engagement within a dynamic changing marketplace. The main aim of this chapter is to provide information about usage pattern of mobile apps and their impact on day to day activities of people. The data was collected from 150 respondents through a pre-tested and a well structured questionnaire. Besides that, perceptions of them towards mobile apps are also presented in order to understand the importance and selection of mobile apps in the canvas of the mind of people while using apps. In this regard statistical test using SPSS software was applied to explain the factor needed to identify and analyze the relationship between different mobile applications and user engagement. At the end of the chapter, researcher would be able to understand the use of mobile apps and their impact on day to day activities of an individual in a significant manner.

Keywords: Mobile apps, usage pattern, customer perception.

JEL classification code: J10, A10, C80.

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Introduction

Nowadays, carrying a mobile phone has become a status symbol for the young people and the use of mobile applications has helped them to almost anything possible. The main aim of research is to identify and analyze the perception of people towards mobile apps usage. The research subject is important in the context of analyzing the relationship between different mobile applications and user engagement. Relationship between these two terms will be identified in terms of the responses provided by respondents. Furthermore, the present chapter will assess the importance and selection of mobile apps in the mind of people in forms of speed, costs, installation, simplicity and integration criteria's.

Objectives of the research

- To explore the latest trends related to mobile apps and their usage
- To recognize the leading factors needed to identify and analyze the relationship between different mobile applications and user engagement.
- To assess the importance and selection of mobile apps in the mind of people while using mobile apps

Background of Research

Literature review

Concept of mobile application

A mobile app is a software program developed for small handheld devices such as such as mobile phones, Smartphone's, PDAs and so on. It is generally used for the purpose of conducting different activities with higher flexibility within stipulated time. Mobile users can download and access apps directly using their smart phones (Jeanne and Jamie, 2012). The main aim of mobile application developer enterprises is to capture more people throughout the world. In addition, easier to maintain and deploy changes across various platforms and overall look and feel of apps are the main benefits associated with the use of mobile applications. However, platform integration, loss of flexibility, security and customer design of apps related challenges also attached with the use o mobile apps (Lee, 2012).

Latest trends related to use of mobile apps throughout the world

As per one of Yahoo's report, the Indian mobile app market throws up interesting figures. It is predicted that by the end of 2016, the total number of Indians with Smartphone would be almost 400 million and it is expected to go beyond Rs. 2600 crores (Fakhruddin, 2015). In the context of overwhelmingly dominant mobile application development platform, Android is leading the market in India while Apple, the leading platform in the US. Maximum popularity among Indian's and world users are enjoying news applications and social media apps maximum (Aggarwal, 2015). Rather surprisingly, the apps downloads in India is likely to increase from 1.56 billion in 2012 to 9 billion by 2015. From the result of the joint-study which was done by Deloitte and the Associated Chambers of Commerce, it is clear that the majority of apps are downloaded by people belong to age-group 16 to 30 years. Mobile trends in India have indicated that the Smartphone craze among youth is increasing day by day with lot of features. In addition, their high engagement towards the different entertainment categories which include instant messaging apps, social media apps, music apps, mobile games, cricket, bollywood and many more also are also expected to rise (Phicomm, 2015).

As per the survey report of Sharma (2014), the India, South Korea, Germany & the United States at the top position for Google Play and Japan, the United Kingdom, USA and China lead market for the iOS in 2014. In Q3 2014, there is remarkable growth was shown in global App economy. Indian users spend over 3 hours and 18 minutes on an average each day on their devices and one-third of that time is spent on applications, Ericson report says that (Sharma, 2014). It has been noticed that India has comparatively higher Smartphone usage than the US. Apart from that, India is the only country in the world where Smartphone users showed higher engagement on multimedia over game.

Growing usage of Smartphone among youth

According to Nielsen report (2014), people are finding all about apps in all kinds of instances Apps. Over the past half-decade, they are now become an integral part of day to day life of people and they are spending an average of 30 hours per month to carry out different activities. The trend in mobile device usage and proliferation of mobile devices has transformed society into an app-driven society. As per the research of Nielsen (2014),

Android and iPhone users belong to age group 18 were spent their more 65% of times in using apps each month in the year 2011. It was tremendously increased to 26.5 during the period of 2012. As per the result of survey, 18-24 age people was spent the most time on apps which was 37 hours, 6 minutes per month (Nielsen, 2014). However, Tiongson (2015) found that people download apps every day, but many of them are never used. From the figure of mobile apps rating, increasing number of installations and number of viewers, it is clear that the amount of time they are spending on those apps will also increase in future (Tiongson, 2012). Beniwal and Sharma (2013) determined that the use of mobile phones has affected the youth to a large extent and therefore, dependency on mobile phones is increasing day by day. Further, they were described about the educational opportunities accessible to rural children by effective use of smart phones (Beniwal and Sharma, 2013).

Popular apps category

Internet surveys have shown that people spent most of their time on Whatsapp and mobile Facebook mobile applications in order to share music, video and text messaging. Statistics indicated that Google Play quarterly downloads were nearly 60% higher than iOS App Store in emerging internet market (Phicomm, 2015). From the research, it has observed that in the Asia-Pacific smart phones shipments between 2013's Q1 & 2014's Q1, India has been the fastest growing app market in term Google Play downloads. In terms of potential profitability and opportunity for growth, India comes in the top 5 mobile app markets in the world. Fakhruddin (2015) also describes some factors such as linguistic barriers, plenty of non-English speaking people in developing countries, price, convenience, secure payments and the GPRS data packages offered by the different mobile service providers which can affect growth of mobile applications. Google and Apple app store dominated the entire mobile application market and their higher contribution can be understood in terms of generating more than 50 per cent of mobile Internet traffic and paid content revenues from Smartphone's (Fakhruddin, 2015).

The importance of user of experience for mobile apps

In the contemporary era, mobile application development technology is evolving at very high speed. In the context, the research of Johnson (2015) has examined that the mobile app market is termed as such market where quality and performance of mobile app is considered as a most important factor in comparison of brand loyalty. Furthermore, the success of mobile app development project is greatly influenced by offering fluid user experience. Author further argued that user experience is becoming the most crucial feature of different elements that are working on the digital landscape (Johnson, 2015). Therefore, it is essential for adoption of user centric approach during development of mobile application.

Beniwal and Sharma (2013) has evaluated that an individual experiences several negative elements such as lots of bugs and errors, complexity in function along with unexpected behaviours as a result of poorly designed mobile app. These factors create negative image of mobile app and reduce customer loyalty. It hampers the relationship between mobile app developer and user of apps (Beniwal and Sharma, 2013). In the contrary, the investigation of Fling (2009) has found that good user experience is considered as a great tool to win the loyalty of consumers and also increasing engagement. Furthermore, it has been examined that a well design app is able to save time and money of developer. This is because it reduces supporting cost for handling different aspect of mobile application development project and other maintenance expenditures related to help desk, call centre support etc (Fling, 2009).

Johnson (2015) evaluated that a well-designed app has found very effective for increasing the traffic, transactions, and conversations through different user. These elements have played important for keeping more clients along with their positive feedback. By providing a great experience to user of mobile application, developer of mobile app is able to establish relationship with users that help in promotion of the positive word of mouth and increasing sales of mobile app (Johnson, 2015). Author further describes that this approach leads to increased customer satisfaction and loyalty. In this context, Gerber (2016) has argued that Push notifications are playing important role for engaging different users and keeping them active. It provides significant assistance to developer for transmission of information to different users about different events, locations, updates, scores along with new features.

Notifications also influence to user to click on the app and use it as per their requirement. If users download apps and forget them, developer is able to notify about the app through different notification. By sending different notifications in order to assess feedback, the user engagement can be enhanced for handling functioning and user experience (Gerber, 2016).

Assess the importance and selection of mobile apps in the mind of people

An individual selects wide range of mobile applications for different objectives. In this context, the study Neil (2014) has found that an individual always wants to download an easy-to-navigate app which is able to deliver a certain set of key functionalities along with wide range of mobile services with the help of an intuitive, entertaining user interface. They expect an app to consist right set of options and functionality that compatible with the different smart devices and Smartphone based on Android, iOS etc (*Mobile Apps: What Consumers Really Need and Want*, 2016). In the modern era, people want proactive and relevant information as well as services as per their interest. In this regard, an application must offer personalized content as per the distinct interests along with the ability to share several offers, news and product recommendations on different social networks. In this context, Fling (2009) argued that the bad experiences are also going to be shared during promotion of mobile application. Therefore, it is essential that apps must be performed with a best possible manner.

Cerejo (2012) has evaluated that content provided on apps is also influencing the decision of an individual regarding selection of mobile apps. It also affects the perception of an individual as well as popularity of mobile apps. In this context, it has been found that information architecture is termed as a most important element of mobile apps that determines a systematic arrangement of functionality and content that helps users in order to find appropriate information. It consists several factors such as navigation, search and labelling of data that are playing important role in the process of information search on certain mobile apps (Cerejo, 2012). For example: Mobile Design Pattern Gallery is term as an important tool used for primary and secondary navigation patterns which are mainly used for mobile, many of these navigation pattern are vertical rather horizontal as on desktop websites

that plays important role in order to attract an individual towards particular mobile apps (Charland and Leroux, 2011).

Albert and Tullis (2013) described that design of app is identified as most crucial segment mobile application development process that must be based on as per the certain interest and requirement of consumers. The design of mobile application is a combination of various sub elements such as visual presentation and interactive experience of mobile which is associated with the graphic design, branding as well as layout of mobile application. Therefore, it is necessary for maintaining the visual consistency with various other touchpoints and experiences by using different colors, typography as well as personality that plays important role for enhancing the experience of the users (Albert and Tullis, 2013). It supports mobile developer for managing communication with target users with the help of non-verbal medium of messaging.

The research of Truste and Harris (2011) has determined that the interactive, privacy and security of information have been addressed as most common concerns which are addressed among Smartphone users. This factor is greatly influenced decisions of users of mobile application regarding selection of best applications to meet different requirements. In this context, author further analyzed that if a mobile app provides appropriate features to users for managing their personal information that could be shared in a mobile app by asking before collecting their location data, it increases trustworthiness of users on mobile app (Truste and Harris, 2011).

Issues associated with the use of mobile apps

As per the view of Fu, Faloutsos, Hong and Sadeh (2013), while using mobile application, the customers are facing issues regarding security and privacy. It has been spotted that the mobile application is vitally different from other tools like laptop and desktops and hackers can easily access the cached information which is a subject to a security breach. This kind of issue impacts the perception of customer in negative manner thereby affecting business opportunities in a diverse manner (Fu, Faloutsos, Hong and Sadeh, 2013). Cummings, Borycki and Roehrer, (2013) had asserted that customers also face issues in using mobile phone applications as they does not find app simple and clear. In order to design application

attractive the business organizations uses various layers and categories in mobile application which creates issues for users. It is essential for organizations to focus on user friendly application development so that customers can easily access the application (Cummings, Borycki and Roehrer (2013). According to Barr-Anderson and Tate (2013), besides complex design of application the users also face issues in context to performance and battery life. It has been identified that the most of attractive applications are not useful for customers as its performance productivity is not suitable. Some of applications performance is productive but they impacts negatively on battery life. In the support of this, it can be stated that most of time customers does not uses mobile applications as it demands high ratio of internet uses that reduces the battery life of mobile (Barr-Anderson and Tate, 2013). In this regard, it is essential for mobile application developers to ensure that bugs and other issues are properly monitored and resolved by experts in order to meet the satisfaction level of users. Developers can also concentrate on testing of beta version to avoid any performance trouble in the final version and meet the expectations of customers (Kangas and Kinnunen, 2005). Khuntia and Parthasarathy (2015) critically explained that improper management of data in mobile application is also one of critical issue that impacts the experience of customers in negative way. Most of times customers get annoyed or confused during the use of mobile application as proper categories are designed by the developers (Khuntia and Parthasarathy, 2015). Few times improper management of notifications also creates negative influence on the user's perception so developers also need to focus on it in appropriate manner.

As per the above statements it can be concluded that the use of mobile application among public has become significant aspect of lifestyle. It has been spotted that the priority of youngster's are now a day's attracted towards optimistic use of mobile applications as it facilitates in meeting diverse needs (König-Ries, 2009). Youngsters prefer a mobile application that provides proper engagement towards various entertainment and lifestyle categories such as travel booking apps, music, videos, etc. It has also been witnessed that one-third of mobile usage time is on applications so business organizations and other authorities can use mobile application to create better awareness among customers.

Moreover, increased number of bugs, errors and complexity aspects in mobile application functionality is impacting behavioural aspects of mobile app user. It has also been identified that customers faces issues in use of mobile applications as they does not find app simple and clear (Holzer and Ondrus,2011). In order to overcome such kinds of negative impacts on perception of users the developers must focus on proper design and alignment during mobile application development. Mobile app market is also providing great exposure to various elements that boosts the lifestyle of individual. Now days IOS and Android operating systems are most proffered categories to use mobile applications.

Research Gap

After having an extensive review of literature, there are many considerations that included into account like the trend in mobile device, time spent by users, percentage of consumers using smart phones, device preference throughout the day, and mobile apps usage by age-group which affects the perception of consumers towards mobile applications. But the understanding of use mobile apps and their impact on day to day activities of customers were missing and it can play a crucial role in the context of analyzing the relationship between different mobile applications and user engagement. Additionally, the current research also measured the importance and selection of mobile apps in the mind of customers in forms of speed, costs, installation, simplicity, integration and many more criteria's which were not done by other researchers.

Research Methodology

Secondary data has been collected from various authentic sources to investigate the latest trends related to mobile apps. On the other side, primary information is collected from customers to know their perceptions about mobile usage in their daily life for different purposes such as entertainment, communication, news & information, search, commerce & shopping, photography and many more (Tracy,2012). The data was collected from 150 mobile users through a pre-tested and a well structured questionnaire. Purposive or judgemental sampling has been applied. The survey was created online and link sent to the respondents in India. The conceptual framework was developed using the variables identified

during literature review. By responses on a five-point Likert scale in agreement/ relevance with statements, all items were measured. Primary data was collected from people belong to different age group on the basis of their availability and interest. Descriptive statistics was applied to explore the relationship between different mobile applications and user engagement.

Solutions and Recommendations

Table 1: Demographic profile of respondents

		Frequency	Percent
Age	<20	13	8.7
	21-30	63	42.0
	31-50	55	36.7
	>50	19	12.7
Gender	Male	106	70.7
	Female	44	29.3
Education	Below graduate [Diploma and certification course]	10	6.7
	Graduate	77	51.3
	Post-Graduate	42	28.0
	PHD and above	20	13.3
Occupation	Student	12	8.0
	Service class	63	42.0
	Professional and business class	57	38.0
Monthly income	Home maker	18	12.0
	Below 20000	11	7.3
	20001-30000	61	40.7
	30001-50000	43	28.7

	Above 50000	24	16.0
	None	11	7.3

Interpretation: From the above table, it is clear that most of the respondents who have participated in the survey were male (70.7%) and belong to age group 21-30 years (42%). Most of the respondents were graduate (51.3) and they lie in service class (42.0%). On the other side, statistics indicate that participants whose monthly income between 20001-30000 (40.7%) and 30001-50000 (28.7%) were the major uses of mobile phone applications in their day to day life.

Thematic analysis

Theme 1: Use of mobile applications by different users

As per the above statics, it can be interpreted that the users of mobile applications focuses on different segments. It has been identified that the out of 150 respondents the majority of users are more attracted towards use of mobile applications in order to attain information regarding social networking. In other aspects, it can be said that 60 respondents are using social networking mobile applications to get connect with friends, family and community. Above statics also indicates that the least number of respondents has said that they prefer use of mobile applications in context with travel and utility applications as it fulfils their basic needs. Moreover, 25 respondent's percept that use of mobile applications is beneficial for optimistic experience of entertainment and music. With an assistance of mobile applications they can easily access to various movies and music sources in order to attain better satisfaction level. Rest of 35 respondents uses mobile application tools to access the information regarding health and fitness, news and banking. It clearly indicates that the mobile users are more attracted towards use of social networking mobile applications in order to meet their expectations and needs.

Theme 2: Frequent of purchased Apps and users experience about using the mobile application services

Interpretation: On the basis above table, it can be interpreted that maximum 113 out of 150 respondents have accepted that they use different kind of mobile apps occasionally for

different objective. In this context, 20 participants have selected the option “Not at All” that means they are not using any kind of mobile app. Furthermore, remaining 17 respondents have accepted that they are regularly using wide range of mobile applications as per their requirement. Therefore, it can be stated that most of participants have found that mobile apps provide wide range of benefits for handling different tasks and activities related to personal and professional requirement.

Apart from that when respondents were asked about their experience from different mobile apps, it has been mixed responses was addressed from participants. In this context, it has explored that maximum 73 out of 150 participants have accepted that they are very satisfied with user experience that has been provided by different mobile apps. In addition to that 73 respondents have selected the option “Somewhat satisfied” and the option of “Highly satisfied” has been considered by only 20 participants. Therefore, it can be stated that most of users of mobile apps have believed that different kinds of mobile apps have fulfilled their expectations and providing good experience.

On the other hand, the negative responses have been addressed. In this regard, 6 participants have determined that they have neither satisfied nor dissatisfied with services of mobile apps. In addition to that 3 participants have preferred the option “Somewhat dissatisfied” and remaining options “Very dissatisfied” and “Extremely dissatisfied” have been selected by respectively 6 and 5 participants. The reason behind negative views of people was that these users have faced several issues while using different kinds of mobile apps such as poor design of apps, highly complex, various bugs and errors, threats related to distortion of personal information, improper content etc. As per the above assessment, it can be stated that a developer of mobile apps required paying extra attention on quality of content, user interface and various other technical elements of mobile apps to assess positive views from users.

One Way ANOVA

H₀₁: There is no significance difference between mobile apps appearance factors and mobile phone user’s engagement.

H₀₁: There is a significance difference between mobile apps appearance factors and mobile phone user's engagement.

Table 2: One Way ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Usability	Between Groups	1.779	3	.593	2.689	.049
	Within Groups	32.194	146	.221		
	Total	33.973	149			
Modernity	Between Groups	3.644	3	1.215	6.195	.001
	Within Groups	28.629	146	.196		
	Total	32.273	149			
Simplicity	Between Groups	3.926	3	1.309	5.701	.001
	Within Groups	33.514	146	.230		
	Total	37.440	149			
Contrast	Between Groups	3.644	3	1.215	6.195	.001
	Within Groups	28.629	146	.196		
	Total	32.273	149			
Offer a much better experience	Between Groups	1.914	3	.638	3.910	.010
	Within Groups	23.826	146	.163		
	Total	25.740	149			
Functionality	Between Groups	2.140	3	.713	5.209	.002
	Within Groups	20.000	146	.137		
	Total	22.140	149			

Visualise and content	Between Groups	1.145	3	.382	1.750	.159
	Within Groups	31.848	146	.218		
	Total	32.993	149			
Design and outward appearance	Between Groups	2.574	3	.858	3.688	.013
	Within Groups	33.966	146	.233		
	Total	36.540	149			

Interpretation: On the basis of calculated values of mobile apps appearance factors, it can be explored that in most of the cases significance values of variables are less than alpha level or p value (0.05). It means that null hypothesis is accepted in usability; offer a much better experience and visualise and content cases. On the other side, null hypothesis is rejected and alternative hypothesis is accepted in the cases of modernity, simplicity, contrast, functionality and design & outward appearances cases. Hence, it can be said that there is a significance difference between mobile apps appearance factors and mobile phone user's engagement. From the result, it is clear that mobile apps appearance factors highly influences the involvement of smart-phone users in uses of different mobile applications in their day to day life.

H₀₂: There is no significance difference between Price and other factors and mobile phone user's engagement.

H_{a2}: There is a significance difference between Price and other factors and mobile phone user's engagement.

Table 3: One Way ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Price of application	Between Groups	1.657	3	.552	3.077	.030
	Within Groups	26.216	146	.180		
	Total	27.873	149			
Responsiveness	Between Groups	2.158	3	.719	5.095	.002
	Within Groups	20.615	146	.141		
	Total	22.773	149			
Perceived enjoyment	Between Groups	.057	3	.019	.722	.540
	Within Groups	3.836	146	.026		
	Total	3.893	149			
Battery and memory consumption	Between Groups	2.402	3	.801	3.525	.017
	Within Groups	33.171	146	.227		
	Total	35.573	149			
Easy availability (play stores)	Between Groups	1.325	3	.442	2.384	.072
	Within Groups	27.048	146	.185		
	Total	28.373	149			
Customer rating	Between Groups	2.574	3	.858	3.688	.013
	Within Groups	33.966	146	.233		
	Total	36.540	149			
Platform driven feature	Between Groups	1.960	3	.653	3.484	.018
	Within Groups	27.374	146	.187		
	Total	29.333	149			
Checking out with just a tap of a finger	Between Groups	.057	3	.019	.722	.540
	Within Groups	3.836	146	.026		
	Total	3.893	149			
Real time stock	Between Groups	2.216	3	.739	3.072	.030

checks	Within Groups	35.117	146	.241		
	Total	37.333	149			
Seamless integration between web and app	Between Groups	.863	3	.288	1.555	.203
	Within Groups	27.010	146	.185		
	Total	27.873	149			
Link with social media to attract people	Between Groups	1.914	3	.638	3.910	.010
	Within Groups	23.826	146	.163		
	Total	25.740	149			

Interpretation: The above table explores that in the most of the cases including price of application, responsiveness, battery and memory consumption, customer rating, platform driven feature, real time stock checks and link with social media, significance value of variables are less than 0.05. It means that null hypothesis is accepted and alternative is rejected. It indicates that there is no significance difference between price and other factors and mobile phone user's engagement. On the other side, alternative hypothesis accepted shows that perceived enjoyment, easy availability, checking out with just a tap of a finger and seamless integration between web and app are the major factors which are highly affect use and motivate to download and use mobile applications in their day to day life. Hence, it can be said that these factors play an important role in the context of selection of mobile apps in the mind of people.

Future Research Directions

In order to have detailed understanding about mobile application, the future research can be carried out for investing the various key elements that relates with the mobile application development. Evaluating the role of Mobile applications in digital revolution is also one of critical subject that can provide better learning regarding concept of mobile application. Moreover, the research to examine the mobile application features that helps business firms to retain existing as well as plays key role in attracting new potential customers. With an assistance of this research, researcher can easily identify the optimistic features of mobile application that provides long term sustainability to the business. On the basis of the present

study, it is found that simplicity, functionality, design and outward appearance, easy availability and customer rating were the leading factors needed to identify and analyze the relationship between different mobile applications and user engagement in the digital arena. Apart from this, on the other side, platform driven feature, link with social media to attract people and seamless integration between web and app are the main features that can be beneficial for companies in assessing the importance and selection of mobile apps. The study could also facilitate business firms to determine various advantages of mobile applications in order to meet the needs and expectations of customers in a significant manner. The research work can also assist organizations to have continuous up-gradations in mobile application as per emerging trends present in the market. This research will provide significant benefits to different organizations which are developing wide range of mobile apps as per the distinct needs of an individual user. In this context, findings of present study will help mobile developers to examine different demographic of smart phone users along with their perception about different mobile apps.

Conclusion & Management Implications

The present research has been carried to assess the emerging trends in mobile apps market and their potential impact on mobile users' engagement in the global economy. It is found that increase in number of smart phone users has significantly enhanced importance of different mobile apps through an individual is fulfilled several personal objectives such as social media, shopping, tourism etc. The analysis of primary data was being carried out through thematic analysis and one way ANOVA statistical test. From the evaluation, it is observed that majority of mobile apps users consider different mobile applications mainly for social media, music, banking and mobile gaming related activities.

In addition to that most of participants are also satisfied with different services and features of different mobile apps. Apart from the findings of different scholars and researcher own perspective, it can be interpreted that the appearance of Smartphone and increase use of mobile applications plays an important role to enhance user engagement towards the mobile apps. Therefore, it can be stated that design, quality of context, graphics, user interface etc. have also played an important role to influence an individual mobile phone users towards

mobile apps. In similar way, evaluation of secondary data has addressed that the design of mobile app is termed as most important section of mobile application development process that must be based on as per the certain interest and requirement of consumers. It is necessary for mobile application developers to maintain the visual consistency in applications by considering several features such as colours, typography and content that influences engagement of a user within mobile app etc.

As per the outcomes of present investigation, mobile app developer organization should have pay extra attention on quality of content, design & user interface, graphics, security and several other factors related to functionality of apps so as companies will be able to generate good returns from mobile apps by increasing engagement with target consumers. This investigation will support management of different companies for avoiding negative elements such as poor content quality, complex design, bugs and errors, etc. while developing mobile apps that would create adverse impact on its performance. This is because if a Smartphone app will not meet expectation of clients or target users then overall brand value of organization would be hampered. Hence, it is recommended that Smartphone application developers should emphasize on increasing security and privacy during online transactions.

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Cloud Technology and Human Resource Management

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Abstract

Human Resource Managers today cannot imagine life without the HRMS softwares (Human Resource Management System Software) to update employee databases and skype to take interviews of candidates in distant lands. Technology has penetrated so deep into almost every field that works without it seems almost impossible in the 21st century. There is hype about yet another technological breakthrough that has the potential to turn the HR world upside down. Cloud technology is here and it is here to stay. Moving from an Human Resources Information System (HRIS) to a Human Capital Management (HCM) technology and now more recently to the HRMS systems that most organizations today use, cloud technology is set to take organization and communication to a whole new level. The big question is whether this cloud technology is any better than the systems that already exist in organizations today and if it is, is it feasible?

JEL Classification Code O15

Keywords: HRMS systems, HRIS systems, cloud technology, communication

Introduction

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The IT industry has been one of the fastest growing industries in the 20th and 21st century. Not only has introduction of computers and advanced technologies helped make work easier, faster and more efficient, but it has altogether changed the face of many industries.

Technology in the field of Human Resources has seen tremendous growth over the last decade or so. Starting from the 1990s, technology in the field of HR has emerged as a separate market in itself. The initial development started with the coming of HR software that were specifically designed to make lives of HR employees easier.

The initial HR software, the HRIS system emerged in the early low-tech era, around 1980-1990s (Faruk Bhuiyan, 2014) (Rietsema, n.d.). It allowed employees of the HR department to perform all core HR functions as well as subsidiary functions like absence management, training, compensation, workflow management and reporting work through the software. This way a lot of paperwork could be avoided, thus making the working of the entire department and the organization at large much more efficient. Employees could be dealt with much faster and solving their queries became easier.

Following this, came the HCM system. This system added on to the benefits offered by the HRIS system. Through the HCM system, the department could perform analytical functions, succession planning, salary planning, position control and even performance appraisal of employees.

Developing on this software, the HRMS software was released. This software is one more step ahead of the HCM software. It not only allows the user to perform all the activities that are can be performed with the HCM software, but also provides the user with a simple solution to manage all payroll problems. It allows the user to organize time and labor efficiently. As per the figures of (Andrew Hill, 2014), the market for HRMS is around \$12 million.

Cloud technology, however, is the new buzz in the market. In September 2011, the National Institute of Standards and Technology (NIST) defined cloud computing as “a model that provides ubiquitous, convenient, on-demand network access to a shared pool of computing resources like servers, networks, storage, applications and services with minimal management effort and service provider interaction” (Majendran, 2013). Cloud technology has the potential to

transform the way business is done today and the change has already begun. The online shoe retail business Zappos, for example, have almost completely eliminated job posting. They now recruit through an online community called InsideZappos and also social media websites like Twitter or Facebook. As a result of this, their candidate pool has tripled. (Kajiwara, 2015).

Types of Cloud Solutions

In his article says that there are 3 different types of cloud technologies (Specht, n.d.). Starting from the least complicated, these are First Infrastructure as a Service (IaaS), and Platform as a Service (PaaS) and the most commonly used Software as a Service (SaaS).

First Infrastructure as a Service or IaaS is the most basic type of cloud technology. In this system, a vendor provides the user with a virtual server (usually in the form of a website) to deliver specific applications. This type of service can be public or private. Most IT companies today have resorted to installing private IaaS in their organizations that have had a great impact on the functioning of the HR department. Most information is now stored on these cloud platforms. There is no hassle of enough memory or space in the hard disk and the risk of losing data is further minimized. However, IaaS is not as advanced since the vendor has partial control over the technology.

Platform as a Service (PaaS) is a technology where a platform is provided to companies to build and develop on software solutions to ease their work, rather than focusing on hardware, operating systems and databases. This platform allows a lot of HR functions to go online like recruitment, screening and learning management. Nowadays even resumes are uploaded online and the entire recruitment process can be completed online.

Finally, the most updated version of this technology in the field of HR is the Software as a Service (SaaS) technology. This is the form of the technology where most number of people are able to interact with the technology. The server, in this case, usually provides the entire software to the user through an application which does not need to be installed or upgraded because the vendor automatically does this onto the cloud. The user has to only upload and manage information that is stored in the cloud. No upgradation or updating needs to be done by the user.

Cloud Technology Market

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The market for cloud technology is one of the fastest growing markets in today's economy. Among the different kinds of cloud technology, the SaaS market is growing the fastest followed by the IaaS market. As per predictions by an article given by the Department of Commerce, USA, the predicted market for SaaS technology is valued at around \$106 billion. The report also predicts that by 2018, the revenues from the IaaS and PaaS market will add up to around \$55 billion. The report also identifies the major players in the Cloud technology market. The country that tops that list is Canada, followed by Japan and United Kingdom. Few other countries in the top 20 include Australia (10th), France (12th), Sweden (15th) and Malaysia (20th). (Jorge Pardo, 2016)

Some of the dominant companies that hold a major market share include Amazon, Microsoft, Google, Rackspace and IBM. (Cloud Computing Services Market - Global Industry Size, Share, Trends, Analysis And Forecasts 2012 - 2018, 2011).

Amazon's AWS (Amazon Web Services) generated a whopping \$7.88 billion, which is a 69% increase from last year. The company is one of the biggest players in this market and is expected to grow even more in the coming years. Microsoft is expected to increase its revenue from cloud market by 30% by 2018, as per Morgan Stanley. A report by the Synergy Research Group also estimates the market that the IaaS and PaaS markets have grown by 51% in 2015 and predict that the worldwide IT cloud service revenue will reach around \$127 billion by 2018. (Columbus, 2016).

Benefits of Cloud Technology

Whichever form of cloud technology is used by the organization, the manner in which HR functions and procedures take place has definitely witnessed drastic change. Benefits of this technology to the field of human resources are numerous.

1. ***Fast and safe*** – With cloud technology, employees across the organization have access to information that relates to them. The HR Manager does not need to constantly update information about different departments; the department heads can do it themselves. The HR is thus left to focus on more important decisions that are specific to their department. This way work is not only done faster but with greater accuracy and perfection. Also, all

information on the cloud is relatively safe when compared to paper documents that tend to get lost and get easily be destroyed.

2. **Easy implementation** – Cloud technology is easily available through many vendors to organizations nowadays. It is easy to purchase and also implement this technology in organizations today. All it takes is a matter of seconds to set the system up and put all the information on the cloud. Any big firm, for example, does not need to worry about installing all the hardware, finding space to accommodate that hardware and frequently contacting the IT department to manage problems with the computer.
3. **Decision making** – Many SaaS softwares today, provide add-on services like graphical representation, dashboards, key indicators and other organizational options. These prove to be of great help to managers when they have to make important decisions supported by facts and figures. According to a survey of across 650 countries across North America, Europe and Asia, conducted by PWC in 2015, 44% of these companies use cloud technology and 59% see benefits of performance management. (PWC, n.d.)
4. **Better talent management** – With all the recruitment details, regular performance appraisal results, resumes and work information of the employees, the HR can assess the potential of each individual employee. They can not only figure out training required for different employees at different levels but can also plan for the individual career development. This will help the HR Department to cater to needs of employees better and in turn increase the satisfaction at workplace of the workforce. Most big vendors of cloud solutions like Oracle and SAP provide specific options of talent management as part of their cloud solutions. (Oracle cloud , n.d.)
5. **Career Monitoring** – Through cloud technology, employees can see records of their performance instantly and track their development themselves. This works as a self-motivation technique for employees. In this system, the HR department does not need to constantly keep track of every employees' development; they can do it themselves. The aforementioned cloud solutions provided by Oracle also provide facilities for career and succession planning.
6. **One big family** – A key role of HR is to ensure that all employees in the organization feel an equal part of the organization. Through cloud systems, different employees in the

organization at different levels can access all the information they need at any time through a simple user ID and password. Employees need not request or disturb the working of other departments to acquire the information they need. The entire organization feels like one big family who can share all their information with each other at any time within the organization. It takes intranet to a whole new level.

7. **Global Model** – With more and more companies expanding beyond the boundaries of their own nation, the composition of employees in every firm is becoming more and more diverse and spread across the globe. In today's multi-national scenario, maintaining records of employees in different parts of the world and solving issues in different parts of the globe becomes a tedious job. Cloud technology provides a global model to solve this problem by allowing users from any part of the globe to access information anytime. Thus, employee queries and problems can be solved within seconds regardless of which city, state or country the employee is in. One of the leading companies in cosmetics and beauty products, Elizabeth Arden, for example, opted for a HCM based cloud solution in 2011. Today, this solution has resulted in increased global mobility, efficient management performance and improved reporting and analytical skills of employees. (Andrew Hill, 2014)
8. **Economical** – Greatest advantage of all is the cost involved in setting up the technology. For traditional HRMS systems, a particular version of software and specific computer hardware is required. However, for implementing cloud technology, the firm does not require to install any hardware. All the information is accessible remotely through smartphones, tablets or laptops. The major costs associated with this technology are maintenance and troubleshooting expenses. A survey conducted by a company called the Tech Pro Research in 2013 concludes that implementation of the IaaS cloud technology reduces costs by 67% (Maddox, 2013). Expense on installation of this technology becomes a minor operating cost rather than a major capital expenditure.

Challenges

The following are a few challenges that cloud technology in HR is faced with:

1. **Scope and understanding of the cloud technology** – The cloud technology is relatively new in the market. Hence before adoption, the company will need to gather enough information about the technology to know first whether the technology can work for their form of business and if it will be profitable. The employees will also have to be trained to understand different aspects of working of this new technology and measures to be taken in case of any mishap or problem. In order to acquire this information, the firm will need to spend valuable time and resources in research and decision making, which can have a negative impact on the working of the firm. Moreover, many employees may have a negative attitude towards a sudden change in the way the entire firm functions. This may result in poor morale, reduced productivity and conflicts between the employers and the employees.
2. **Confidentiality and security issues** –Most companies opt for a public cloud rather than a private one since it is more cost-effective. However, information stored on these public domains are easily accessible to malicious hackers from across the globe. There is a high risk of theft and misuse of stolen data. This can bring down even the biggest MNCs to ashes. Even in private cloud solutions, the company needs to put in place specific mechanisms for invisibility of data to third party so as to ensure security. There have been several cases of security breach and misuse of data like the iCloud Hack, the Target Security Breach, the Sony Pictures Hack, BlueCross Bluefield and the Kaspersky Hack, where images of people, their personal data (like date of birth, addresses, family member information etc.) as well important information like credit card numbers and bank account details have also been leaked. Not only is this a threat to the private sector but government databases have also been hacked like the United States Internal Revenue Service Hack where around 100.000 accounts were hacked and social security numbers, birth dates and addresses of all these victims were stolen. (Kuranda, 2015) (Rando, n.d.)
3. **Dependence on third party** – When a company deals with a cloud service vendor, they share a lot of valuable information with that third party and depend constantly on them for managing their data. This leads to a high level of dependence on third party which can leave in organization under threat of exploitation. Furthermore, since most public service providers are located in remote locations, there is full probability that a user may not be able to delete

any data from a cloud. Due to situations like vendor lock-ins, the user may not even be able to access their information in case the vendor faces some problem.

4. **Lack of accessibility** – The cloud can be accessed through any smartphone, tablet or laptop anywhere in the world but the catch is that this technology needs the presence of Internet to work. Without Internet connection, the cloud cannot be accessed and thus becomes almost useless. This is a major drawback that hinders the growth of the technology to less developed countries where Internet is not available in large parts of the county to a large number of its people. For example, in many rural villages in India, a majority of the population does not own smartphones. Even if they do own a smartphone, they lack connectivity to the Internet.
5. **Not always all-encompassing** – Different cloud vendors provide different sets of solutions. These sets may not always be able to perform all the functions that the employee wishes to perform through them. For example, a company may implement a particular cloud package in their firm that encompasses data management, recruitment, selection and payroll. However, the software does not touch upon the aspect of training or development, thus leaving the firm searching for a second cloud package that can fulfill that need. This not only increases expenses for the firm but also leads to wastage of time and valuable resources which when applied elsewhere could have been more profitable for the firm.
6. **Costs** – Although installation of the cloud technology saves the firm huge investment costs, the cost of training all the employees in the firm to use the technology, centralizing the IT services, improving competence in vendor management and cloud operations, and introducing IT governance structures in the organization as well as compensating for the lack of productivity and possible losses that the firm may face in the short run while installation.

Conclusion

The Cloud Market is the new buzz in the world of technology and it is catching up very fast in the HR market as well. This innovation has contributed tremendously in the field of HR, from talent management, decision making, succession planning to complete payroll systems and compensation management. The market for cloud solutions in HR has grown tremendously over the last few years and huge MNCs like Oracle, SAP, Amazon, and Microsoft now hold a massive share in this developing market. The benefits of this new technology are numerous and hold

great potential in the near future. However, this new technology also faces a number of challenges. A lot of different aspects of the technology need to be worked on and many problems need to be solved before this innovation establishes itself in the market. Despite its flaws, this new idea is capturing the market like raging fire. Companies are soon moving towards a completely digitalized world where almost nothing will be stored on pen and paper and Cloud solutions are a massive stepping stone towards that digitalized world!

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Security and privacy issues: Does association has role to play?

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Abstract

Social Networking Sites (SNS) users are concerned of their Internet privacy and security and intend to achieve total anonymity while communicating online. In order to keep their information private, they need to be careful on what they submit and look at online. Hence it becomes important to study these security and privacy issues for the better management of future internet search and access. We attempt to study the behavior of users towards security and privacy issues on social networking sites across various demographics selected for the study. 200 questionnaires were distributed among the various majors in the five major cities of Rajasthan and of which only 128 responses were complete in all respects and hence were considered for the study. Cronbach alpha values were found to be 0.78 indicating the data to be reliable. F-test ANNOVA was used to find out the significance of association/ non association between the variables selected for the study. It was found that users of SNS were fearful about photos and other articles being downloaded , about information displayed being inappropriately used by others about intellectual rights being infringed, copied or abused by others, about identity theft, profiling or phishing and a significant concern that the SNS provider might divulge information to other parties without ones' explicit consent. Different demographics have a different impact on the perception towards security and privacy issues. The concern towards who one was talking to when online was less but in the other cases the concern was significantly high.

Key words: Privacy, Personal information, Security, Social Networking Sites.

Introduction

Social Networking Sites (SNS) have become very popular during the past few years, as they allow users to both express their individuality and meet people with similar interests. It has been witnessed that there is a dramatic rise in the popularity of online social networking services, with several Social Network Sites (SNSs) such as Myspace, Facebook, Blogger, You Tube, Yahoo! Groups etc. which are now among the most visited websites around the world. One serious issue while communicating online is issue of privacy of communication and the security of the ones concerned. Security and privacy related to social networking sites are fundamentally behavioral issues, not technology issues. People who provide private, sensitive or confidential information about themselves or other people, whether willingly or unwillingly, pose a higher risk to themselves and others (Pelgrin, 2010). Presently the volume of personal information available on social networking sites is increasing and has attracted malicious people who seek to exploit this information. However, since such forums are relatively easy to access and the users are often not aware of the size and the nature of the audience accessing their profiles, they often reveal more information which is not appropriate to a public forum. As a result, such commercial and social site may often generate a number of privacy and security related threats for the members (Hasib, 2008). Nonetheless, there are also many potential threats to privacy associated with these SNS such as identity theft and disclosure of sensitive information. However, many users still are not aware of these threats and the privacy settings provided by SNS are not flexible enough to protect user data (Ai Ho, 2009). One should ensure that any computer one uses to connect to a social media site has proper security measures in place. One should use and maintain anti-virus software and keep application system up-to-date. Many applications embedded within social networking sites require you to share your information when you use them. Hackers use these sites to distribute their malware. Use strong and unique passwords. Using the same password on all accounts increases the vulnerability of these accounts if one becomes compromised. Do not assume privacy on a social networking site. For both business and personal use, confidential information should not be shared. Users should only post information which are comfortable disclosing to a complete stranger. They should configure privacy settings to allow only those people who are trusted to have access to the information one posts and should also restrict the ability for others to post information to one's page. If a site's privacy policy is fake or does not properly protect one's information, he shouldn't use the site. As Security and privacy issues on social networking sites are related to behavioral issues and not technology issues. It has become very important to study the behavior of people towards these issues. The variables identified to study privacy and security issues on social networking sites were as follows:

- Concern that the information displayed specifically to someone may be inappropriately forwarded to others.
- Concern that the photos shown in one's profile may be downloaded and transmitted by others.

- Concern that the people you one only know online are not who they say they are.
- Concern that other people might reveal ones real identity and personal information online without their consent.
- Concern that your intellectual properties might be copied or abused by others (For example: articles, photos and ideas).
- Concern about online identity theft, profiling or phishing.
- Concern that the SNS provider might divulge ones information to other parties without his/her explicit consent.

Review of literature

(**Barnes, 2006**) discussed the uproar over privacy issues in social networks by describing a privacy paradox; private versus public space; and, social networking privacy issues. The discussion finally proposed privacy solutions and steps that could be taken to help resolve the privacy paradox. (**Shin, 2010**) revealed that perceived security moderates the effect of perceived privacy on trust. Based on the results of this study, practical implications for marketing strategies in SNS markets and theoretical implications were recommended accordingly. (**Matthew M. Lucas, 2008**) aimed to mitigate the risk by presenting a new architecture for protecting information published through the social networking website, Facebook, through encryption. Their architecture made a trade-off between security and usability in the interests of minimally affecting users' workflow and maintaining universal accessibility. While active attacks by Facebook could compromise users' privacy, their architecture dramatically raised the cost of such potential compromises and, importantly, placed them within a framework for legal privacy protection because they would violate a user's reasonable expectation of privacy. They built a prototype Facebook application implementing there architecture, addressing some of the limitations of the Facebook platform through proxy cryptography. (**Ralph Gross, 2005**) analyzed the online behavior of more than 4,000 Carnegie Mellon University students who joined a popular social networking site catering to colleges. They evaluated the amount of information they disclosed and studied their usage of the site's privacy settings. They highlighted potential attacks on various aspects of their privacy, and showed that only a minimal percentage of users changed the highly permeable privacy preferences. (**Gartrell & Han, 2009**) presented several of their privacy and security issues, along with their design and implementation of solutions for these issues. Their work allows location-based services to query local mobile devices for users' social network information, without disclosing user identity or compromising users' privacy and security. They contended that it is important that such solutions be accepted as mobile social networks continue to grow exponentially. (**Molva & Strufe, 2009**) pointed out that centralized architecture of existing on-line social networks as the key privacy issue and suggested a solution that aimed at avoiding any centralized control. Their solution was an on-line

social network based on peer-to-peer architecture. Privacy in basic data access and exchange operations within the social network was achieved with a simple anonymization technique based on multi-hop routing among nodes that trust each other in the social network. Similarly cooperation among peer nodes were enforced based on hop-by-hop trust relationships derived from the social network. **(Carlos Flavián, 2006)** revealed that an individual's loyalty to a web site was closely linked to the levels of trust. Thus, the development of trust not only affected the intention to buy, as shown by previous researchers, but it also directly affects the effective purchasing behavior, in terms of preference, cost and frequency of visits, and therefore, the level of profitability provided by each consumer. In addition, they analyzed that trust in the internet was particularly influenced by the security perceived by consumers regarding the handling of their private data. **(Alessandro Acquisti, 2006)** found that an individual's privacy concerns were only a weak predictor of his membership to the network. Also privacy concerned individuals joined the network and revealed great amounts of personal information. Some manage their privacy concerns by trusting their ability to control the information they provide and the external access to it. However, they also found evidence of members' misconceptions about the online community's actual size and composition, and about the visibility of members' profiles. **(Xie & Hengartner, 2009)** proposed FaceCloak, an architecture that protects user privacy on a social networking site by shielding a user's personal information from the site and from other users that were not explicitly authorized by the user. At the same time, FaceCloak seamlessly maintained usability of the site's services. FaceCloak achieved these goals by providing fake information to the social networking site and by storing sensitive information in encrypted form on a separate server. **(Cuttillo & Strufe, 2009)** suggested a new approach to tackle these security and privacy problems with a special emphasis on the privacy of users with respect to the application provider in addition to defense against intruders or malicious users. In order to ensure users' privacy in the face of potential privacy violations by the provider, they suggested approaches that adopt a decentralized architecture relying on cooperation among a number of independent parties that were also the users of the online social network application. The second strong point of the suggested approach was to capitalize on the trust relationships that were part of social networks in real life in order to cope with the problem of building trusted and privacy-preserving mechanisms as a part of the online application. **(Amin Tootoonchian, 2009)** presented Lockr, a system that improved the privacy of centralized and decentralized online content sharing systems. Lockr offered three significant privacy benefits to OSN users. First, it separated social networking content from all other functionalities that OSNs provide. This decoupling let users control their own social information: they could decide which OSN provider should store it, which third parties should have access to it, or they could even choose to manage it themselves. Such flexibility better accommodated OSN users' privacy needs and preferences. Second, Lockr ensured that digitally signed social relationships need to access social data and cannot be re-used by the OSN for unintended purposes. This feature drastically reduced the value to others of social content that users entrusted to OSN providers. Finally, Lockr enabled message encryption

using a social relationship key. This key let two strangers with a common friend verify their relationship without exposing it to others, a common privacy threat when sharing data in a decentralized scenario. (Aimeur & Ho, 2010) highlighted some privacy issues raised by the growing development of SNS and identified clearly three privacy risks. While it may seemed a priority that privacy and SNS were two antagonist concepts, they also identified some privacy criteria that SNS could fulfill in order to be more respectful of the privacy of their users. Finally, they introduced the concept of a Privacy-enhanced Social Networking Site (PSNS) and described Privacy Watch, their first implementation of a PSNS. (Katherine Strater, 2008) expanded upon previous research on users' under-utilization of available privacy options by examining users' current strategies for maintaining their privacy, and where those strategies failed, on the online social network site Facebook. The results demonstrated the need for mechanisms that provide awareness of the privacy impact of users' daily interactions. (Kevin Lewis, 2008) studied the preference for privacy itself as there unit of analysis, and analyzed the factors that were predictive of a student having a private versus public profile. Drawing upon a new social network dataset based on Facebook, they argued that privacy behavior was an upshot of both social influences and personal incentives. Students were more likely to have a private profile if their friends and roommates had them; women were more likely to have private profiles than men; and having a private profile was associated with a higher level of online activity. Finally, students who have private versus public profiles were characterized by a unique set of cultural preferences—of which the “taste for privacy” may be only a small but integral part. (Alyson L. Young, 2009) studied the strategies students had developed to protect themselves against privacy threats. The results showed that personal network size was positively associated with information revelation. No association was found between concern about unwanted audiences and information revelation and finally, students' Internet privacy concerns and information revelation were negatively associated. The privacy protection strategies employed most often were the exclusion of personal information, the use of private email messages, and altering the default privacy settings. Based on their findings, they proposed a model of information revelation and drew conclusions for theories of identity expression. (Williams, 2010) surveyed the research literature, in order to provide a current snapshot of privacy and security safeguards for social network websites. They described some of the unique features of the health care space, and recommend directions for future research in this relatively new area.

Research gap

After having an extensive review of literature, it was observed that though there was a vast literature on social networking sites and a number of studies have been done to study the behavior of the users on SNS none of them have tried to study the perception of users towards security and privacy issues on social networking sites, what do they perceive about the security

and privacy of their information and communication the kind of information they share, their perception regarding and theft of data or data leakage etc.

Objective of the study

To study the behavior of users towards security and privacy issues on social networking sites across various demographics selected for the study.

Hypothesis framed for the study

H ₀₁	There is no significant association between the occupation of the users and the perception towards the security and privacy issues on SNS.
H ₀₂	There is no significant association between the reason for using SNS and the perception towards the security and privacy issues on SNS.
H ₀₃	There is no significant association between the length of association with SNS and the perception towards the security and privacy issues on SNS.
H ₀₄	There is no significant association between the time spent on SNS and the perception towards the security and privacy issues on SNS.

Research methodology

The study used the survey method to approach the respondents through a pre-tested and well structured questionnaire. Only those respondents were chosen who had been using SNS for the past 6 months. The framework was developed using the variables identified during literature review. The questionnaire consisted of respondents' demographic features and the variables related to security and privacy issues. 200 questionnaires were distributed among the various majors in the five major cities of Rajasthan (Jaipur, Jodhpur, Udaipur, Kota and Ajmer) and only 128 responses were complete in all respects (response rate of 64.5%) and hence were considered for the study. Cronbach values were found to be 0.78 indicating the data to be reliable. F-test ANNOVA was used to find out the significance of association/ non association between the variables selected for the study.

Data analysis and Interpretation

Demographic profile (Table 1)

		Frequency	Percent
Gender	Male	83	64.8
	Female	45	35.2

	Total	128	100.0
Age	< 15 years	5	3.9
	16-25 years	88	68.8
	26-35 years	27	21.1
	36-50 years	8	6.3
	Total	128	100.0
Educational Qualification	High school	5	3.9
	Intermediate	6	4.7
	Graduation	46	35.9
	Post graduation & above	66	51.6
	Others	5	3.9
	Total	128	100.0
Occupation	Student	81	63.3
	Service(Govt. Sector)	6	4.7
	Service (private)	19	14.8
	Professional	15	11.7
	Business	7	5.5
	Total	128	100.0
Why do you use Social networking sites	Fun & entertainment	53	41.4
	Making new relations	22	17.2
	Social purposes & marketing	50	39.1
	Others	3	2.3
	Total	128	100.0
Length of association with Social networking sites	< 1 year	5	3.9
	2-3 years	37	28.9
	4-5 years	46	35.9
	> 5 years	40	31.3
	Total	128	100.0
Time spent on Social networking sites	Constantly online	22	17.2
	Several times in a day	40	31.3
	Daily	36	28.1

	Weekly	30	23.4
	Total	128	100.0

Interpretation

Most of the respondents were male (64.8%) , within the age group of 16-25 years(68.8%), majority of them were pursuing post-graduation and above (51.6%) or graduation (35.9%) , majority of the social networking sites users were students (63.3%) followed by employees of private sector (14.8%) , majority of them use social networking sites for fun and entertainment (41.4%) or social purpose and marketing (39.1%), majority of them (35.9%) have been associated with the social networking sites for a period of 4-5 years and used to surf several times in a day (31.3%) . The above also shows that SNS are mostly used by the youth between the age group of 16-35 years graduates and post graduates students were the most popular users. SNS is most commonly used for fun and entertainment and making new relations, social purpose and marketing and finally SNS are very popular since the past 5 years.

Descriptive statistics (Table 2)

	Mean	Std. Deviation
Concern that the information displayed specifically to someone may be inappropriately forwarded to others.	3.12	.838
Concern that the photos shown in one's profile may be downloaded and transmitted by others.	3.48	1.035
Concern that the people you one only know online are not who they say they are.	3.29	1.102
Concern that other people might reveal ones real identity and personal information online without their consent.	3.30	1.105
Concern that your intellectual properties might be copied or abused by others (For example: articles, photos and ideas).	3.40	1.193
Concern about online identity theft, profiling or phishing.	3.44	1.041
Concern that the SNS provider might divulge ones information to other parties without his/her explicit	3.33	1.036

consent.		
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Interpretation

From the above it was found that the mean of responses was highest with respect to their concern towards the photo shown in their profile may be downloaded and transmitted by others and their intellectual properties be copied or abused by others (For example: articles, photos and ideas). Though users were fearful of the photo and other activities being downloaded, they were motivated to share such information.

The standard deviation was highest in case that the respondents are concerned about their intellectual properties might be copied or abused by others (For example: articles, photos and ideas) and that other people might reveal your real identity and personal information online without your consent. Respondents also varied in their fear that their intellectual property might be copied or abused by others.

Association between demographics and security and privacy issues.

H₀₁: There is no significant association between the occupation of the users and the perception towards the security and privacy issues on SNS.

ANNOVA (Table 3)

		Sum of Squares	df	Mean Square	F	Sig.
Concern that the information displayed specifically to someone may be inappropriately forwarded to others.	Between Groups	19.672	4	4.918	8.695	.000
	Within Groups	69.570	123	.566		
	Total	89.242	127			
Concern that the photos shown in ones' profile may be downloaded and transmitted by others	Between Groups	5.843	4	1.461	1.381	.244
	Within Groups	130.087	123	1.058		
	Total	135.930	127			
Concern that the people you one only know online are not who	Between Groups	8.359	4	2.090	1.761	.141
	Within Groups	145.946	123	1.187		

they say they are.	Total	154.305	127			
Concern that other people might reveal ones real identity and personal information online without their consent.	Between Groups	6.567	4	1.642	1.359	.252
	Within Groups	148.550	123	1.208		
	Total	155.117	127			
Concern that your intellectual properties might be copied or abused by others (For example: articles, photos and ideas).	Between Groups	22.228	4	5.557	4.314	.003
	Within Groups	158.451	123	1.288		
	Total	180.680	127			
Concern about online identity theft, profiling or phishing.	Between Groups	11.911	4	2.978	2.916	.024
	Within Groups	125.589	123	1.021		
	Total	137.500	127			
Concern that the SNS provider might divulge ones information to other parties without his/her explicit consent.	Between Groups	21.503	4	5.376	5.764	.000
	Within Groups	114.716	123	.933		
	Total	136.219	127			

Interpretation

The null hypothesis was accepted in case of concern that the photos shown in ones' profile may be downloaded and transmitted by others, that the people known online were not who they say they are and that other people might reveal the real identity and personal information online without his consent implying that there is no significant association. In all other cases the null hypothesis was rejected indicating a significant influence of the occupation of the users on the perception towards the security and privacy issues relating to SNS.

H₀₂: There is no significant association between the reason for using SNS and the perception towards the security and privacy issues on SNS.

ANNOVA (Table 4)

		Sum of Squares	df	Mean Square	F	Sig.
Concern that the information displayed specifically to someone may be inappropriately forwarded to others.	Between Groups	12.430	3	4.143	6.689	.000
	Within Groups	76.812	124	.619		
	Total	89.242	127			

Concern that the photos shown in ones' profile may be downloaded and transmitted by others	Between Groups	24.380	3	8.127	9.034	.000
	Within Groups	111.549	124	.900		
	Total	135.930	127			
Concern that the people you one only know online are not who they say they are.	Between Groups	9.272	3	3.091	2.643	.052
	Within Groups	145.032	124	1.170		
	Total	154.305	127			
Concern that other people might reveal ones real identity and personal information online without their consent.	Between Groups	14.442	3	4.814	4.244	.007
	Within Groups	140.675	124	1.134		
	Total	155.117	127			
Concern that your intellectual properties might be copied or abused by others (For example: articles, photos and ideas).	Between Groups	19.616	3	6.539	5.034	.003
	Within Groups	161.063	124	1.299		
	Total	180.680	127			
Concern about online identity theft, profiling or phishing.	Between Groups	12.957	3	4.319	4.300	.006
	Within Groups	124.543	124	1.004		
	Total	137.500	127			
Concern that the SNS provider might divulge ones information to other parties without his/her explicit consent.	Between Groups	26.353	3	8.784	9.914	.000
	Within Groups	109.866	124	.886		
	Total	136.219	127			

Interpretation

The null hypothesis was accepted in case of concern that the people known online were not those who they say they were implying no significant association. In all other cases the null hypothesis was rejected indicating a significant influence of the reason for using SNS on the perception towards the security and privacy issues on SNS.

Reason for using SNS

H₀₃: There is no significant association between the length of association with SNS and the perception towards the security and privacy issues on SNS.

ANNOVA (Table 5)

	Sum of	df	Mean	F	Sig.
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		Squares		Square		
Concern that the information displayed specifically to someone may be inappropriately forwarded to others.	Between Groups	1.886	3	.629	.892	.447
	Within Groups	87.357	124	.704		
	Total	89.242	127			
Concern that the photos shown in ones' profile may be downloaded and transmitted by others	Between Groups	11.231	3	3.744	3.723	.013
	Within Groups	124.699	124	1.006		
	Total	135.930	127			
Concern that the people you one only know online are not who they say they are.	Between Groups	7.879	3	2.626	2.224	.089
	Within Groups	146.425	124	1.181		
	Total	154.305	127			
Concern that other people might reveal ones real identity and personal information online without their consent.	Between Groups	7.635	3	2.545	2.140	.099
	Within Groups	147.482	124	1.189		
	Total	155.117	127			
Concern that your intellectual properties might be copied or abused by others (For ex.-articles, photos and ideas).	Between Groups	35.724	3	11.908	10.187	.000
	Within Groups	144.955	124	1.169		
	Total	180.680	127			
Concern about online identity theft, profiling or phishing.	Between Groups	7.698	3	2.566	2.451	.067
	Within Groups	129.802	124	1.047		
	Total	137.500	127			
Concern that the SNS provider might divulge ones information to other parties without his/her explicit consent.	Between Groups	10.532	3	3.511	3.463	.018
	Within Groups	125.687	124	1.014		
	Total	136.219	127			

Interpretation

The null hypothesis was rejected in case of concerned that the photos shown in ones' profile may be downloaded and transmitted by others, that the intellectual properties might be copied or abused by others (For example: articles, photos and ideas) and that the SNS provider might divulge information to other parties without explicit consent implying that there is a significant influence. In all the other cases the null hypothesis was accepted indicating no significant association between the length of association with SNS and the perception towards the security and privacy issues on SNS.

H₀₄: There is no significant association between the time spent on SNS and the perception towards the security and privacy issues on SNS.

ANNOVA (Table 6)

		Sum of Squares	df	Mean Square	F	Sig.
You are concerned that the information you displayed specifically to someone may be inappropriately forwarded to others	Between Groups	1.310	3	.437	.616	.606
	Within Groups	87.932	124	.709		
	Total	89.242	127			
You are concerned that the photos shown in your profile may be downloaded and transmitted by others	Between Groups	3.456	3	1.152	1.078	.361
	Within Groups	132.474	124	1.068		
	Total	135.930	127			
You are concerned that the people you only know online are not who they say they are	Between Groups	30.639	3	10.213	10.241	.000
	Within Groups	123.666	124	.997		
	Total	154.305	127			
You are concerned that other people might reveal your real identity and personal information online without your consent	Between Groups	32.387	3	10.796	10.908	.000
	Within Groups	122.730	124	.990		
	Total	155.117	127			
You are concerned that your intellectual properties might be copied or abused by others (For example: articles, photos and ideas)	Between Groups	15.023	3	5.008	3.748	.013
	Within Groups	165.657	124	1.336		
	Total	180.680	127			
You are concerned about online identity theft, profiling or phishing	Between Groups	18.611	3	6.204	6.470	.000
	Within Groups	118.889	124	.959		
	Total	137.500	127			
Are you concerned that the SNS provider might divulge your information to other parties without your explicit consent	Between Groups	20.733	3	6.911	7.420	.000
	Within Groups	115.486	124	.931		
	Total	136.219	127			

Interpretation

The null hypothesis was accepted in case of concern that the information displayed specifically to someone may be inappropriately forwarded to others and that the photos shown in the profile may be downloaded and transmitted by others implying that there is no significant association. In

all other cases the null hypothesis was rejected indicating a significant association between the time spent on SNS and the perception towards the security and privacy issues on SNS.

Conclusions

Security and privacy issues are the most important of the concerns relating to security and privacy issues. The demographics of the respondents have a significant role to play in the perception towards the security and privacy issues. SNS are very popular among the graduates and post graduates and are more or less used for fun and entertainment, making new relations and social purpose and marketing. Most of the users have been using them for a long time and also spend a significant amount of their time on these sites. Users of SNS are fearful about photos and other articles being downloaded about information displayed being inappropriately used by others about intellectual rights being infringed, copied or abused by others, about identity theft, profiling or phishing and a significant concern that the SNS provider might divulge information to other parties without ones explicit consent. Different demographics have a different impact on the perception towards security and privacy issues. The concern towards who one was talking to when online was less but in the other cases the concern was significantly high.

Management Implications

The study could have serious management implications for the users as well as the providers. The users could be caution about the kind of information they are sharing so that any possibility of their misuse could be avoided. Any kind of controversial photographs could be avoided being posted, any issues relating to security and privacy issues could be avoided, matters involving IPRs need not be shared and the like. SNS are very user friendly and would motivate and motivate the users to share as much as information as possible. But it is for the users to avoid posting information which is controversial or could induce malicious usage. The service providers could also understand the perception of the users of SNS regarding their concern for security and privacy issues and thereby design usages so that they could attract more number of users. The companies could also understand the concern of the users and makes their product accordingly.

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Technological Transformation of Transactions

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Abstract

Automation, Communications and Computing, the three pillars that have changed the landscape of the transactions segment over the last 25 years. Add to that the Internet revolution, business and consumer transactions have seen a sea change involving finances. This research article chronicles the progress made in the sector from primarily on banking perspective. It also looks at other complementary technological innovations that have aided and abetted the ease of the transactions processes.

While regulators and public sector banks kick started the transformation process, it soon percolated down to the private and consumers segments. Of course, technology has been the main driver and its adoption has been the key to the success of process implantation.

The transactions segment has come a long way indeed. From passbooks to passwords, it has eased the process of doing business as well as conducting our daily lives. Whether it be your daily grocer, a farmer in a remote area or an aspiring entrepreneur, no more do they see transactions as a hindrance. In fact, it is a boon.

Keywords : - Technological , Transaction , Banking , Automation

JEL : 016,39 JEL : E5

Introduction

Technological change has come to touch every aspect of our life. This is especially true in the Indian banking sector where technology has transformed the nature of transactions beyond recognition. Being the backbone of the Indian economy, whether it be industry, agriculture or services, banking plays a critical role in the development of the nation. Understandably then, the adoption of technology and its accompanied innovations in the Indian banking system has changed the way businesses and consumers alike transact. Later, the Internet revolution gave a new impetus to both business-to-business (B2B) and business-to-customer (B2C) transactions relationships

It all began in the early '80s when banking regulators began to set up a slew of working groups and committees to improve the transaction process. Using technological advances, the pace of transactions gradually picked up and is now comparable to international standards. The banking revolution was a precursor to many other changes that has made life easier while performing transactions. Today, at the click of a button transactions take place at the speed of the Internet. Geographically too, technology adoption has enabled the spread of banking to every nook and corner of the country. Let's take a look at this fascinating journey that has brought the Indian transaction system at par with the world.

Objectives

- To emphasize on the role of technology in the banking sector in india
- To show the technological growth in the banking sector
- To enlist the various improvements in banking sector in India
- To show the evolution of banking sector and the significance of technology to transform the sector.

MICR leads the way

In the banking sector, the whole process of tackling transactions was kick started in 1982 with the setting up of the Working Group on introducing MICR/OCR Technology for Cheque Processing. At that time, it took nearly 3 days and 7 days respectively for local and outstation

cheque clearance. At times it would nearly take two weeks for clearing cheques from remote areas. The Working Group's recommendations included the introduction of 'item processing' (sorting and listing of cheques with the help of computers) in three phases.

- In the first phase in the four metropolitan cities viz. Delhi, Mumbai, Kolkata, Bangalore with the help of MICR technology
- In the second phase all state capitals and important commercial centers.
- In the final phase national clearing to be introduced by dividing the country into four Regional Grids with headquarters at Mumbai, New Delhi, Chennai and Calcutta

“There are the magnetic inks bar codes printed on the bottom of your bank's cheque leaves. These bar codes are known as MICR code, an abbreviation for ‘Magnetic Ink Character Recognition’. Actually, the MICR is the name given to the technology used in printing the code. In India in 1980 this unique system of MICR based cheque clearing system was introduced first time. Apart from being a security bar code to protect your transaction, the MICR code is also an indispensable part for online money transfers. Every bank branch is given a unique MICR code and this helps the RBI to identify the bank branch and speed up the clearing process.” (simplydecoded, 2012)

The introduction of MICR cheques speeded up the transfer of money for intra-bank, inter-bank, intra-city and inter-city transfers. This technology was a precursor to CTS 2010, explained later. The effect of MICR introduction was tremendous:

- Computers reduced the amount of paper work and minimized human effort.
- MICR Technology lead to faster clearing of cheques with a shift from manual handling to automation
- Enhanced security and less risk for any type crimes (forging of signatures)
- Easier identification since the first three digits (1-3) denoted the city and the 4-6 digits denoted the bank. The last three digits denoted the branch code

MICR technology was given a further fillip from the Committee on Mechanisation in the Banking Industry (1984). With respect to MICR it proposed that:

- Banks to be in readiness for the introduction of MICR Clearing at the four metropolitan cities by assessing their requirements for encoders, adopting standardised cheque forms and reorganising work procedures where necessary, and training staff down to the branch level.

These were control measures so that the transactions could be kept in one place at a particular “service branch” which increased automation so that MICR technology could be used and organized at that particular branch so all transactions would be done faster. It meant:

- Standardization of transactions
- Faster Clearing Services and a Control Mechanism to be set up
- Base for expansion to other cities
- Platform to implement MICR all over India

(Simply Decoded, 2012)

Communications and connectivity

It was the banking sector that took the next leap in the transaction sector with the introduction of BANKNET, an idea fueled by the Committees on Communication Network for Banks and SWIFT implementation (1987). BANKNET involved setting up of a X.25 based packet switching network.

BANKNET was to be implemented in two phases. In Phase I the computer systems available in the Head Offices of the Public Sector Banks in the four metropolitan cities would be connected to the four IBM Mainframe servers. In the second phase connectivity could be gradually extended to eight to ten banking intensive centers and to a hundred centers over a three-year period. The applications that were identified were:

- inter-bank fund transfers on banks' own account and on customers' account;

- inter-branch funds transfers on banks' own account and on customers' account;
- currency chest transactions;
- government transactions;
- improvements in payment systems by facilitating automated clearing services and
- any branch banking, etc.

The committee also recommended that India should join the SWIFT (Society for Worldwide Interbank Financial Telecommunication) Network for the transmission and reception of international financial messages. It also noted that BANKNET should strive to emulate SWIFT in matters of data security, encryption, and authentication and SWIFT message standards which are internationally accepted should be adopted by BANKNET.

While MICR implementation was based on introduction of multiple hardware components, BANKNET heralded the use of online software that would rapidly increase the speed of transactions. It basically meant that transactions can be done from anytime, anywhere.

Complementing with computerization

In 1988, the Committee on Computerisation in Banks further reinforced the concepts of the earlier committees with a plethora of recommendations to speed up transactions even more. It mainly recommended:

- Computerisation of the settlement operations in the clearing houses managed by Reserve Bank of India at Bhubaneshwar, Guwahati, Jaipur, Patna and Thiruvananthapuram.
- Operationalisation of MICR technology and the National Clearing of inter-city cheques at the four metropolitan cities.
- Branch level computerisation and the establishment of connectivity between branches.
- Improvements in customer service - introduction of on-line banking.
- Setting up a network of Automated Teller Machines (ATMs) in Mumbai. ATMs to be strategically located at airports, railway stations, hospitals, important commercial centers, as well as bank branches, to be used by the customers to perform a variety of functions such as

deposits, withdrawals, balance enquiries, statement of accounts etc., at any point of time during the day.

- Introduction of a single 'All Bank' credit card and advocated the need for its widespread acceptance by merchant establishments and usage by customers to reduce the load on cash and cheque transactions.

(RBI, 1998)

While these recommendations sought to gradually pave way for the use of computers by banks across the country eventually, starting with 2nd and 3rd tier cities and increasing the volume of daily transactions, the main takeaway that would revolutionise the transaction sector were “ATMs, Credit Cards and Online Banking”.

After the Committees recommendations there were various other technological innovations that entered India to drive faster and more secure transactions. These transactions were more on the consumer side as the transactions for businesses were already improved a lot by the development and implementation of various infrastructures in banks due to the successful recommendations by the various committees.

The ATM attraction

With the introduction of automation, communication and computing technologies within banks effectively speeding up the volume and reducing the time of transactions, ATMs announced the move beyond the doors of banks. The introduction of ATMs in the early 1990s marked a major change for speeding up transactions for the consumers. While foreign banks and private banks were first of the block (due to the restrictions on the number of branches imposed on them), they were soon followed by the public sector banks. ATM technology allowed to partially overcoming the handicap of reaching out to the customers at a lower initial and transaction costs and offering hassle free services.

Today, innovations in ATM technology have come a long way and customer receptiveness has also increased manifold. As public sector banks too entered the race for expansion of ATM

networks, the development of ATM networks not only leveraged the lowering of transaction costs, but also served as an effective marketing channel resource.

At first, ATMs were popular as cash dispensing machines. With the aid of bank-issued ATM Cards, one could only withdraw money from ATMs of banks where one had a banking relationship. For example, State Bank of India (SBI) customers could only take out money from SBI ATMs. However, as networking evolved banks came interconnected and inter-bank use of the ATM became the norm (with the restriction of free withdrawals from your non-bank ATMs).

The number of ATM installations in India has seen an explosive and exponential growth in India. The compounded average growth rate (CARG) was 29% in the period 2005-2010 and expected to be 34% in the period 2010-2016. In sheer numbers, it meant that the installation of base of 16,750 in 2005 increased to 60,153 in 2010 and was expected to touch nearly 175,000 in 2015. (Hota, 2013)

While dispensing cash was the first function of the ATM, technological revolutions would enable to perform various other tasks. However, from the personal banking perspective, the introduction of the ATM represented a cataclysmic change. It brought transactions out of the branch and nearer to the customer.

The future of ATM technology will see the use of machines without the cards. More banks are set to adopt a technology that allows their customers and third parties to withdraw cash from ATMs without a card. This new generation of ATMs works alongside a mobile-banking application that can be downloaded onto a mobile phone. In order to ensure that security is not compromised, a six-digit code will have to be correctly entered into the ATM machine before cash is released.

Evolution of Features and Functionalities of ATMs

1988-1994	Deposit of Cash , Withdrawal of Cash (Initial Period)
1995-1999	Mini Statement , Balance Enquiry (Early Developments)
2000-2001	Coupon Dispensing (First Extension)

2002-2004	Fulfilling Requests from customers (Cheque Book)
2004-2006	Ticket Booking-Railway and Airlines , Bill Payments , Mobile Recharges (Non – Banking Services)
2007 to date	Check Deposit with Scanning , Customized ATMs , Ubiquitous Multifunction , ATMs Biometric ATMs

ATMs were instrumental in changing transactions from a consumers' point of view. The amount of time taken for a particular withdrawal reduced drastically.

(CHAKRABORTY, 2013) (Enews, 2014)

Transforming transfers

With a network in place, it was time to shift to an electronically-based funds transfer system. The Committee for proposing Legislation on Electronic Funds Transfer and other Electronic Payments (1995) recommended that an EFT system could be introduced immediately by framing regulations under Section 58 of the RBI Act. A Model Customer Contract agreement to govern the banker-customer relationship with regard to EFT should be adopted by all banks participating in the system. It also said that as a long term measure, a new legislation was needed for regulating, defining and determining the rights and obligations of the system providers and users.

NEFT and RTGS

Gone are the days when the payment and funds transfer sources were limited to physical methods such as direct currency exchange or a written cheque method. With the emergence of internet and mobile banking and the emerging e-commerce opportunities, banks too have marched ahead with introducing the concept of electronic funds transfer, which is much more convenient and hassle free.

Today, electronic funds transfers allow you to exchange funds between individuals as well as organizations via electronic gateways which can be accessed using internet, computers and smart phones. Funds can be transferred instantly.

Electronic funds transfer is a much more preferred money transfer option as it allows customers to make money transfers at the comfort of their homes using integrated banking tools such as internet and mobile banking.

“National Electronic Fund Transfer (NEFT) and Real Time Gross Settlement (RTGS) allow individuals, companies and firms to transfer funds from one bank to another. You can check the RBI website for a list of NEFT and RTGS-enabled branches of your bank. These facilities can only be used for transferring money within the country. To opt for these, you need to fill a form providing your or the beneficiary’s details — name, bank branch where the account is held, the Indian Financial System Code, a unique code for identifying the branch, and the account number and type. You have to submit a cheque while opting for this facility. You can also transfer funds through net banking. These are third-party transfers and the option is available under the same header on your net banking home page.” (Gupte, 2011)

(Itsallaboutmoney, n.d.)

Debit Card

Indian customers shun the idea of debt. Enter the Debit Card. It signaled the movement away from the cash-based economy to an easier system for purchases. Essentially, a debit card allows you to withdraw cash or purchase goods or services by directly debiting your bank account. Not only did it keep spending habits in check but more importantly it got rid of the need to keep large piles of cash in your wallet. It is estimated that by 2017, debit cards will constitute nearly 90% of all card usage in India. (Wizbowski, 2014)

People do not like to keep lot of cash in hand because it is not secure. Debit card users can swipe for any product or service they want to buy at any time. The money will directly be deducted from the bank account.

Europay Mastercard Visa (EMV) chip technology is becoming the global standard for credit card and debit card payments. Named after its original developers (Europay, MasterCard® and Visa®), this technology features payment instruments (cards, mobile phones, etc.) with

embedded microprocessor chips that store and protect cardholder data. This standard has many names worldwide and may also be referred to as: "chip and PIN" or "chip and signature."

What is chip technology?

Chip technology is an evolution in our payment system that will help increase security, reduce card-present fraud and enable the use of future value-added applications. Chip-enabled cards are standard bank cards that are embedded with a micro-computer chip. Some may require a PIN instead of a signature to complete the transaction process. Aspects which makes EMV different than the traditional magnetic stripe card payment are mentioned here.

EMV (also referred to as chip-and-PIN, chip-and-signature, chip-and-choice, or generally as chip technology) is the most recent advancement in a global initiative to combat fraud and protect sensitive payment data in the card-present environment (J.P Morgan, n.d.)

The Cheque Truncation System advantage

“CTS 2010 is the prescribed standard by the RBI for cheques issued by all Indian banks to facilitate faster clearing. Instead of the collecting branch sending the physical cheque to the paying bank, an electronic image of this cheque with relevant information like the MICR code, date of presentation, presenting banks etc. is transmitted to the drawee branch by the clearing house, hastening the entire cheque clearing process.” (Shyam, 2013)

The CTS 2010 system further cut down the time for cheque clearing and made life much easier for transferring money. While the ATM and the modern cheque clearing systems enabled faster withdrawal and transfer of money, CTS cut down on physical paperwork.

Without sending a physical cheque, in its place an electronic image of the cheque is transmitted to the paying branch through the clearing house, along with relevant information like data on the MICR band, date of presentation, presenting bank, etc. Cheque truncation thus obviated the need to move the physical instruments across bank branches, other than in exceptional circumstances for clearing purposes. This effectively eliminated the associated cost of movement of the

physical cheques, reduced the time required for their collection and brought elegance to the entire activity of cheque processing.

As explained above, Cheque Truncation speeds up the process of collection of cheques resulting in better service to customers, reduces the scope of loss of instruments in transit, lowers the cost of collection of cheques, and removes reconciliation-related and logistics-related problems, thus benefitting the system as a whole.

With the other major products being offered in the form of RTGS and NEFT, the Reserve Bank has created the capability to enable inter-bank and customer payments online and in near-real time. However, cheques continue to be the prominent mode of payments in the country. Reserve Bank of India has therefore decided to focus on improving the efficiency of the cheque clearing cycle. Offering Cheque Truncation System (CTS) is a step in this direction.

In addition to operational transactional efficiency, CTS offers several benefits to banks and customers, including human resource rationalisation, cost effectiveness, business process re-engineering, better service, adoption of latest technology, etc. CTS, thus, has emerged as an important efficiency enhancement initiative for adopting technology and improving transactions undertaken by Reserve Bank in the Payments Systems arena.

(RBI, 2015)

The Introduction of Internet

Home banking

Banking on the Internet has revolutionized personal banking transactions as it brought the bank to your home. There is no need of waiting in lines or adjusting to bank hours any more, you can access your bank account online any time you want. It helps one to keep a tab on their money even on a daily basis. By keeping a close eye on your funds one always knows what is going on in your account.

Account Information is one of the functions provided by online banking. This provides a summary of your bank accounts. It also allows easy tracking of previous transactions. One can also enquire about their account balances and transfer money from one account to another if needed. This is also useful to check their savings account and also to pay of loans if needed. All this information is available anytime online which is a boon to all account holders. People can also ask for an E-statement which includes all transactions which have occurred during a particular period of time.

Transacting from Home

With banks and customers connected, the next logical step was to complete the triangle with service providers to make life easier for customers. Thanks to the Internet, a wide variety of utility bills and periodic payments can now also be made directly with a push of a button.

By using the “Pay Bills” facility, consumers can pay all their bills from their PC. This saves time and also travel cost to different service providers. Moreover, it serves as a link between the service providers and the consumers and benefits both of them. Telephone Bills, Electricity Bills, Internet/Landline Charges are a few common examples that can all be paid online. A standing instruction can also be made to pay these bills at a particular date on each month. Insurance Premium and credit card bills can also be paid directly to the respective insurance companies or banks. (CIBC, n.d.) , (Shodhganga)

Electronic Clearing System

“ECS is an electronic mode of payment / receipt for transactions that are repetitive and periodic in nature. ECS is used by institutions for making bulk payment of amounts towards distribution of dividend, interest, salary, pension, etc., or for bulk collection of amounts towards telephone / electricity / water dues, cess / tax collections, loan installment repayments, periodic investments in mutual funds, insurance premium etc. Essentially, ECS facilitates bulk transfer of monies from one bank account to many bank accounts or vice versa.”

ECS Credit: ECS Credit is used by organizations as a tool to pay employees or investors having their bank accounts in different locations. It was introduced by RBI and allows customer to directly get their salary, pension, dividend and interest into their bank account. The ECS credit payments can be initiated by anyone who needs to make a lot of payments to beneficiaries. The user has to give details of the beneficiaries and the transaction amount, date when it has to be done. This is known as the credit-push facility and is divided in parts of the year like quarterly half yearly or monthly.

ECS Debit: ECS Debit is used by an organization for raising debits to a large number of accounts (for instance, consumers of utility services, borrowers, investors in mutual funds etc. It is useful for payment of telephone, electricity bill water bills, cess/tax collections, loan installment repayments, periodic investments in mutual funds, insurance premium etc., It can be used by anyone who has to receive or collect huge amounts from a large number of people. It takes care of automatic debit to customer accounts on due dates. Customers don't need to keep a track of when they need to pay their bills. It also saves time and money. It is known as debit – push –facility or many to one and payment can be easily made through institutions either corporate or government. (Rajan P. , 2008) (RBI, 2012)

Business gets a boost

The transformation in the transaction sector by adopting technology has changed face of business finance. With the introduction of NEFT and RTGS, businesses were able to deal with customers and suppliers in a real time basis. It allowed the better management of inventories and eventually improve cash flow, an essential for business productivity. This holds true whether you are in the manufacturing, agriculture or services industries. Imagine you funds are cleared within the hour compared to days or weeks earlier? Another area where the reduction of transaction times has benefitted many is in the stock trading arena. While days to transfer shares in the early '80, today it is done within one day.

Customer's Delight

The consumer has been the main beneficiary of this change in transaction modes. Today, credit and debit cards have further eased transactions. At first, credit cards were limited to withdrawal of cash and for shopping at retail stores. Payments could be made later to credit card companies at fixed dates or later dates at a rate of interest.

Many Indian customers shun the idea of debt. Enter the Debit Card. It signaled the movement away from the cash-based economy to an easier system for purchases. Essentially, a debit card allows you to withdraw cash or purchase goods or services by directly debiting your bank account. Not only did it keep spending habits in check but more importantly it got rid of the need to keep large piles of cash in your wallet. It is estimated that by 2017, debit cards will constitute nearly 90% of all card usage in India. (Wizbowski, 2014)

EMV chip technology is becoming the global standard for credit card and debit card payments. Named after its original developers (Europay, MasterCard® and Visa®), this technology features payment instruments (cards, mobile phones, etc.) with embedded microprocessor chips that store and protect cardholder data. This standard has many names worldwide and may also be referred to as: "chip and PIN" or "chip and signature." Simply put, EMV (also referred to as chip-and-PIN, chip-and-signature, chip-and-choice, or generally as chip technology) is the most recent advancement in a global initiative to combat fraud and protect sensitive payment data in the card-present environment. (J.P Morgan, n.d.)

Mobile Madness

The advent and rapid growth of mobile phones in India offered another platform for banking services using the Internet medium. Nearly all banking applications on PCs and laptops soon found their way to the mobile phone. In other words, all Internet Innovations were now ported to the smartphone.

“According to 2011 figures, a mere 7 percent of Indian customers used Internet banking. Mobile banking has also been on a low-volume high-growth trajectory - the user base in 2013 was 22 million, up 74 percent over the previous year, though transaction value grew 228.9 percent over the same period.” (Mallya, 2014)

Moreover, mobile banking increases the depth and breadth for personal banking services. Especially in rural areas where the number of phones easily outnumbers computing devices. The mobile platform helps more consumers to enter as one can bank from anywhere as well as everyone has smartphones and an internet network with the emergence of 3G and 2G.

The Next Transactions

While information technology and communications technology will continue to drive customer-friendliness and ease-of-use of personal banking services, new devices would create new platforms for the delivery of these services. While the PC and laptop allowed customers to operate out of their home, the mobile aided them in banking on the move. Other innovations are also gaining ground.

Take for example, biometric ATMs. Introduced just a couple of years back, it is making rapid inroads in rural areas, where illiteracy is high. Villagers can now use their thumbprint instead of a PIN number to access their bank accounts. Add this to the Prime Minister Narendra Modi's initiative to expand the depth of bank accounts to reach every Indian as well as the Aadhar Card's biometric database, personal banking is poised for a leap in rural India.

Yet another milestone in personal banking is being crossed with the introduction of the Digital Mobile Wallet. It is essentially a mobile device that allows an individual to easily subscribe to and browse through many services, including payment cards, offers, vouchers, loyalty programs, tickets and other items they need in their daily lives. The wallet will also be able to launch an application from a retailer, bank, transport operator or another service provider.

The next step lies with Artificial Intelligence (AI). Take, the smart watch for example. Add voice recognition facilities. So in the future, you can speak into your watch and say "Transfer Rs. 50,000 to mom". The AI in your watch will translate the message into a personal money transfer service and execute the order. A few minutes later, a message from mom, "Thanks son". A far cry from the time you live in or your parents lived in.

Conclusion

It has been a technological transformation, indeed. However, the pace and momentum of change is not slowing but increasing day by day, aided and abetted by technological changes in communications and information technology. There is more to come and technology will play a crucial role in transforming transactions.

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Technology for Inner Management and Wellbeing-Yoga: Review of Literature

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Abstract

The word yoga, is understood by many as a practice related to particular geographic and religious identity. Yoga means union, and it is a technology developed for enhancing the different aspects of life and management of this technology, will help everyone experience enhanced health and well-being. By undertaking a review of literature, an attempt is made here to understand the benefits of yoga in different health/ailment conditions. This review will facilitate the emerging areas, focus areas and thrust areas related to research on yogic science and will also facilitate in understanding the thrust areas. The gaps identified at the end of this paper will facilitate in knowing the opportunities available for future aspirants in yogic science research.

Keywords: Yoga, health, well-being, technology, alternative therapy.

Introduction: What is Yoga?

The word “yoga” means union. Union means, one begin to experience the universality of who they are. Yoga is not a religion, but, a science. Yoga has nothing to do with any particular religion; it is a science for inner wellbeing. This yogic science is getting utmost importance now, like never before. With modern science and technology, humanity today possess huge power in hands, at the same time, it is of vitally important to understand, that, everyone have an inner sense, an awareness of life and that we experience life and everyone as part of ourselves.

As there are physical sciences to create external wellbeing, yoga is the science for inner wellbeing.

Yoga can be transmitted on many different levels. Can be transmitted towards one’s physical and mental wellbeing which includes health and other aspects, can be transmitted as a tool for ultimate wellbeing, where one can use this system as a stepping stone to go beyond, can use yoga to get rid of backache/ailments and become healthy or one can use yoga to get better mental focus, peace of mind and happiness in life, and above all one can use yoga as a way of climbing up to the highest possibility within themselves. Increasingly, yoga is used for health and wellbeing only in today’s world. But it can also be used as a tool for understanding and approaching the unknown dimensions of the divine (Vasudev, 2011).

Yoga is regarded as a form of mind-body medicine and part of Complementary and Alternative Medicine. (Shannahoff-Khalsa, 2004). It has been suggested that yoga creates inner, physical and emotional balance through the use of postures, combined with breathing techniques. Yoga has diverse clinical and nonclinical applications as a result of the degree of complexity and multidimensionality. Yoga is rooted in Indian philosophy and has been a part of traditional Indian spiritual practice for millennia. (Iyengar, 1966). It is a well-documented fact that Sage Patañjali is considered as the father of yoga. He is a sage, a scientist and an alchemist and prescribed adherence to eight limbs of yoga, aimed at quieting one’s mind to achieve the union of mind, body and spirit that is traditional yoga’s ultimate goal. These limbs include ‘Yama’ and ‘Niyama’ (a code of conduct for an ethical lifestyle), ‘Asana’ (physical postures), ‘Pranayama’ (breath control), ‘Pratyahara’ (withdrawal of the senses from external objects to increase self-awareness), ‘Dharana’ (concentration), ‘Dhyana’ (meditation) and ‘Samadhi’ (oneness with the object of meditation) (Feuerstein, 1998)

Regardless of its spiritual origins, yoga has become a popular route to physical and mental well-being and has been widely adapted for use in complementary and alternative medicine in Eastern society and recently in Western society. Yoga is most often associated with physical postures, breath control and meditation. Worldwide, it is estimated that yoga is regularly practiced by about 30 million people (Dangerfield, 2009). Yoga is gaining increased popularity as a therapeutic practice. Nearly 14 million Americans (6.1% of the United States of America's population) reported that yoga had been recommended to them by a physician or therapist (Macy, 2008). About half of American yoga practitioners (more than 13 million people) reported starting practice explicitly to improve their health (Barnes et al 2007).

With this backdrop, this study intends to overcome some of the conventional thoughts and stereotypes associated with yoga. A thorough and detailed review of literature has been undertaken. Research papers related to different forms and different styles of yoga are taken. The research papers are taken from popular databases like PubMed, Medline, and Elsevier and google scholar. This review helped the authors to identify the benefits achieved through yoga in different conditions and also the gaps in the existing literatures.

Is yoga a religious practice?

Because yoga as a science evolved and was developed in Indian culture, in the land of Indus—the civilization which grew on the banks of river Indus— was identified as Hindu. Slowly, people have started identifying yoga as Hindu. Yoga is a science and a technology. It is not a teaching, not a philosophy, not a religion, not a belief system, but a technology. A technology beyond any religion. But, as it is a subjective technology and evolved from one particular geographical area-India, it is being referred to as Hindu in many parts of the world, which is also fading away (Vasudev, 2011).

Why research on Yoga?

The research on yoga or yogic science is emerging, but at a very slow pace. Most studies were small and badly designed or suffers from self-selection bias. The many different styles of yoga also makes tough to understand the meaningful evidence about one style with that of the others. There are no long term studies on mortality or serious disease incidences with adequate evidence. When compared with other forms of exercise like tai chi or meditation, yogic science

research and documentation is still poor and inadequate. Researches across the world is not yet able to identify the reason in a scientific way. (Irwin, 2015)

Studying yoga is not straight but tricky, as researchers believe blinded studies are the highest quality of research, because participants involved do not know the interventions (medicine/ drugs/others) they are receiving and their biases and perceptions do not come in the outcomes. As defining yoga often becomes an issue, as yoga usually involves some combination of the following like: postures; and poses (asanas), regulated breathing (pranayama), and meditation and relaxation (samyana). But many styles mixes other elements like chanting, heating, music, etc.

To reduce inflammations with aerobic exercises, one needs to maintain vigorous levels. But with yoga even practices with minimum levels of physical activity like stretches is having large size effects. (Irwin, 2015). Researchers are yet to find out the reasons why yoga helps in back pain. The Cochrane Review Protocol offered some guesses, suggesting the improved flexibility and muscle strength, and relaxation and body awareness are the probable reasons. Western-style analytic techniques which follows a control trial design are yet to identify the benefits of yoga in stimulating digestion and wringing out toxins with only particular poses (asanas) or breathing techniques for particular outcomes.

Key studies on Yoga

Lancet 1975-“Randomized controlled trial (RCT) of yoga and bio feedback in management of hypertension”. This is the first randomized trial on yoga, and found that yoga was more effective than relaxation in reducing high blood pressure

British Medical Journal 1985- “Yoga for bronchial asthma: A controlled Study”. This is the first randomized trial on yoga for asthma, and it was one of the first to show the effects of yoga on the inner organs

JAMA 1998-“Yoga-based intervention for carpal tunnel syndrome”. This was a well-regarded randomized trial that showed the benefits of yoga for carpal tunnel syndrome compared with wrist splinting and no intentions.

Annals of Internal Medicine 2005- “Comparing yoga, exercise, and a self-care book for chronic low back pain”. This is the most important trial on yoga for lower back pain and the first high-quality trial on yoga. Based on this trial, yoga had become increasingly recognized as an effective treatment for chronic lower back pain

Journal of the American College of Cardiology 2013-“Effect of yoga on arrhythmia burden anxiety, depression, and quality of life in paroxysmal atrial fibrillation”. One of the first trials to show that yoga may have an Impact on life-threatening diseases such as atrial fibrillation.

Journal of Strength and Conditioning Research 2013-“Bikram Yoga Training and Physical Fitness in Healthy Young Adults”. This trial showed Bikram yoga can improve strength and flexibility but not aerobic capacity.

Journal of Clinical Oncology 2014-“Randomized, controlled trial of yoga in women with breast cancer undergoing radiotherapy”. This high-quality trial demonstrated yoga can have benefits for women being treated for breast cancer.

Brain, Behaviour, and Immunity 2015-“Mind-body therapies and control of inflammatory biology”. A review of the evidence on yoga and other mind-body activities and their relationship to reducing inflammation.

Review of Literature

Karen et al (2005) undertook a randomized controlled trial to find the effective treatment for chronic low back pain. The objective of their study was to identify whether yoga is more effective than conventional therapeutic exercise or a self-care book for patients with chronic low back pain. 101 adult patients with chronic low back pain were examined for the study. Their intervention includes 12 week sessions of yoga or conventional therapeutic exercise class or a self-care book. Primary outcome were back-related functional status (modified 24-point Roland Disability Scale) and bother-someness of pain (11-point numerical scale). The primary time point was 12 weeks. Clinically significant change was considered to be 2.5 points on the functional status scale and 1.5 points on the bothersome scale. Secondary outcomes were days of

restricted activity, general health status and medication use. Results of this study indicates that after adjustment for baseline values, back-related function in the yoga group was superior to the book and exercise groups at 12 weeks. At 26 weeks, back-related function in the yoga group was superior to the book group. Results suggest that yoga is an effective treatment for chronic low back pain. The study concluded that yoga was more effective than self-care book for improving function and reducing chronic low back pain, and the benefits persisted for at least several months. This study further suggests that viniyoga (a style of yoga) is a safe and effective treatment for chronic back pain and provides physicians with a rationale for recommending it to their patients.

Brown & Gerbarg (2005) intended to find the associations between emotional disorders and vagal tone as indicated by heart rate variability. A neurophysiologic model of yogic breathing was proposed. Yogic breathing is a unique method for balancing the autonomic nervous system and influencing psychologic and stress-related disorders. Many studies demonstrate effects of yogic breathing on brain functioning and physiologic parameters, but the mechanisms have not been clarified. Researchers used Sudarshan Kriya Yoga (SKY), a sequence of specific breathing techniques which includes Ujjayi, Bhastrika and Sudarshan Kriya, which can alleviate anxiety, depression, everyday stress, post-traumatic stress and stress-related medical illnesses. This mechanism contributes to a state of calm alertness including increased parasympathetic drive, calming of stress response systems, neuroendocrine release of hormones and thalamic generators. This model has heuristic value, research implications and clinical applications. Kumar et al (2016) undertook a scientific quasi experimental study to investigate the effects of Isha Hatha Yoga on core stability and standing balance in healthy persons. The study was undertaken on volunteers registered for 21 days Isha Hatha Yoga training programme, which includes Upa Yoga, Surya Kriya, Angamardhana, Bhuta Suddhi and Asanas. The study was undertaken in Isha Yoga Centre at Isha Foundation in Coimbatore, India. Single-leg stroke test scores and plant test scores before and after the programme were studied. Significant increase was observed in standing stroke test on right and left sides in plank test. The study concluded that healthy volunteers who underwent this 21 days training programme in Isha Hatha Yoga showed significant improvements in core strength and balance.

Telles et al (2010) identified that a weeks practice; of yoga helps people to overcome stress. Due to heavy rain and a rift on the banks of the Kosi River, in the state of Bihar in north India, there were floods with loss of life and property. A week of yoga practice was given to the survivors a month after the event and the effect was assessed. Twenty-two volunteers (group average age \pm S.D, 31.5 ± 7.5 years; all of them were males) were randomly assigned to two groups, yoga and a non-yoga wait-list control group. The yoga group practiced yoga for an hour daily while the control group continued with their routine activities. Both groups' heart rate variability, breath rate, and four symptoms of emotional distress using visual analog scales, were assessed on the first and eighth day of the program. Results; of ;the study indicates that, there was a significant decrease in sadness in the yoga group ($p < 0.05$, paired t-test, post data compared to pre) and an increase in anxiety in the control group ($p < 0.05$, paired t-test, post data compared to pre). The study further concludes that, a week of yoga can reduce feelings of sadness and possibly prevent an increase in anxiety in flood survivors a month after the calamity

Streeter et al (2012) explains the benefits of yoga practices in diverse, frequently comorbid medical conditions based on the concept that yoga practices reduce allostatic load in stress response systems such that optimal homeostasis is restored. As per the proposed theory hypothesized by the authors of this study, the decreased PNS (parasympathetic nervous system) and GABAergic (gamma amino-butyric acid) activity that underlies stress-related disorders can be corrected by yoga practices resulting in amelioration of disease symptoms. This has far-reaching implications for the integration of yoga-based practices in the treatment of a broad array of disorders exacerbated by stress.

Khalsa (2004) made bibliometric analysis on the biomedical journal, literature involving research on clinical application of yoga. His analysis revealed that, there is an increase in publication frequency in clinical applications of yoga involving RTC and controlled trials. Further, the analysis also indicated that yoga as a therapy is relatively novel and emerging as a clinical discipline within the broad category of mind-body medicine. Majority of studies are conducted in Indian investigators and published in Indian journals, but, in recent times, increasing contributions are emerging from United States and England.

Dayananda et al (2014) undertook a survey to study the factors influencing adherence to yoga practices on those participants who have completed 1-month Yoga Instructors' course from a yoga university. Online survey was conducted on participants using Survey Monkey web portal with response rate of 42.5%. A total of 1355 participants were approached. Demographic items and a checklist of 21 items on a 5-point Likert scale were prepared based on traditional yoga texts. A few items to assess modern lifestyle barriers were also included. One-sample proportion test with chi square statistics was used for analysis. Results of the study indicates that Irregularity in lifestyle, family commitments, and occupational commitments are perceived as significant strong barriers. Dullness, excessive talking, strictly adhering to rules, laziness, physical and mental overexertion, fickleness and wandering of mind, unsteadiness of mind, procrastination, and oversleeping are considered as significant barriers of moderate nature. This study concluded that modern lifestyle is the major challenge for yoga practitioners to adhere to regular practice of yoga. To address this, attention is required in strengthening the lifestyle management and the spiritual dimension of yoga practice as the spiritual component seems to be side-tracked.

Battle et al (2015) developed a treatment development study to evaluate whether prenatal yoga could represent a viable treatment option for antenatal depression, with a 10-week prenatal yoga program for depressed women with no prior yoga experience. Authors tested the intervention in an open pilot trial with 34 women and found that the intervention was feasible to administer and acceptable to both patients, who voiced high levels of satisfaction, and to prenatal care providers, who welcomed study recruitment and provided medical clearance for appropriate patients. Authors designed the program to be consistent with prenatal yoga classes offered in the community. Women engaged in the program by attending classes and practicing yoga at home. Classes were gentle in nature and no injuries or safety concerns were reported. Significant reductions in depression severity were observed from pre to post treatment. Researchers also collected data on a potential mechanism of change, mindfulness, observed that mindfulness was correlated with depression at baseline, and that there were increases in mindfulness over time as women participated in the trial. These findings contribute to the small but growing literature suggesting that prenatal yoga may be useful as a treatment for antenatal depression.

Sreedevi et al (2017) studied two low cost interventions-yoga and peer support on glycemic and other outcomes among women with type two diabetes in Kerala, India. Kerala leads India in terms of the number of people with Diabetes. The authors looked at low cost interventions that can empower patients and build on available resources to help manage diabetes among women. Block randomization with a block length of six was carried out with each group having at least 41 women. Yoga session consisting of a group of postures coordinated with breathing were conducted for an hour, two days a week. Results of the study indicates that there was a decline of fasting plasma glucose in the peer and yoga group and glycosylated hemoglobin. Significant decrease was observed in diastolic blood pressure and hip circumference in yoga group. Effect of yoga and peer support on glycemic outcomes was incremental.

Gaps and Discussions

The above review help the researchers to have a look at the existing studies on yoga, even though the number of studies reviewed are considerably less. Authors found that the available research evidence has continuously increased with time, but more research is clearly needed. In most of the randomized control trials, ailments like breast cancer, asthma, and depression are the most commonly-studied conditions. Despite the fact that many of these studies have found positive effects, yoga research clearly remains limited for most other conditions. Besides primary research, up-to-date systematic reviews and meta-analyses are needed for the most commonly studied conditions in order to evaluate the level of evidence and strength of recommendation for or against the use of yoga in each condition.

Several studies now suggest that prenatal yoga may be a viable treatment for antenatal depression, likely to be safe, feasible to administer, and acceptable to women and providers. However, critical questions remain unresolved. In addition to a well-designed, fully powered RCT to evaluate efficacy, future studies should examine potential mechanisms of action. Mechanisms may be conceptualized on the biologic level (e.g., decreased sympathetic nervous system arousal) and on the psychological level (e.g., increased mindfulness/ non-judgment). Further, future studies should include longitudinal designs, and evaluate not only maternal outcomes, but also associated pregnancy and infant outcomes. Prior studies with healthy, non-

depressed samples suggest that yoga may improve overall maternal health and wellbeing, as it is associated with lower lumbo-pelvic pain, better quality of life lower stress and decreased delivery pain. In addition, women with high risk pregnancies who practiced yoga are less likely to develop pregnancy-induced hypertension or pre-eclampsia and had fewer preterm births. However, no studies to date have evaluated pregnancy and birth outcomes among depressed women practicing yoga.

While most trials included yoga postures and breathing, yoga meditation and philosophy in its totality were less often used. Yoga is, by definition, a multimodal practice. Although physical exercise is now often seen as yoga's main component in Western society, meditation, breathing and lifestyle advice are all traditionally advocated to be at least equally important. In identifying yoga's effectiveness, it is important to note that studied interventions can range from the purely meditative to the purely physical in nature. In such cases, the effects of diverse interventions are hardly directly comparable, making research to determine the best balance for different medical conditions valuable. Yoga is not a standardized intervention. This diversity makes it challenging to convey the nature of 'best' practice for inclusion in medical guidelines or patient recommendations. Guidelines for designing yoga interventions and control conditions in clinical trials will increase the homogeneity of future research.

The above evidence suggests that future research might usefully explore the separate effects of yoga postures, breath control, meditation and lifestyle advice, to determine the best interventions for different medical conditions. Such researches will also convey the message that yoga is a science and it is a technology, the meticulous learning, practice and adoption of this wonderful tool will not only enhance health and wellbeing, but, it ultimately facilitates individuals and communities to understand the concept of oneness, resulting in union and aligning with the ultimate.

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Strategies to Integrate Communities and Geo Spatial Technologies for Sustainable Development along Tarkarli - Devbag Coast, Maharashtra (India)

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Abstract

Maharashtra coast is popularly known as ‘Konkan’. The Konkan with an approximately 720 km long coastline and a narrow coastal plain stretching from north to south is a distinct physiographic region of Maharashtra (India). The coast lies to the west. On the east, the Konkan is separated from upland Maharashtra by the west facing escarpment of the Sahayadri mountain range. Plateaus and hills dominate the landscape in the narrow stretch of land between the coastal plain on the east and the Sahyadri on the west.

Towards the southern end of Maharashtra’s coastline lies the Sindhudurg coastal district. This region along the Sahyadri Range on India’s west coast is internationally acclaimed for its sun and sand. Apart from the beautiful beaches and island forts, the coast is also well known for fruits — mangoes, cashew nuts and kokum—which in turn attracts a lot of tourists and traders, making this a busy stretch all through the year. The area is also notable for its unique coastal and marine biodiversity (UNDP 2011).

The Arabian Sea is slowly eroding some of the seashores in Sindhudurg district. Frequency and intensity of beach and creek erosion events has increased along the Sindhudurg coast in

general and along Tarkarli-Devbag spit in particular. Tarkarli-Devbag Spit (15°57' N to 16°1'N latitude) and (73°29' E to 73°31' E longitude) is a 6 km. long sand spit about 16 km. South of Malvan on Maharashtra coast. The spit bar is connected to main land near Tarkarli. Southern end of the bar abruptly ends in sea near Mobarwadi. The eastern edge of the spit is bordered by tidal stretch of river Karli. The western margin faces Arabian Sea. Rapidly growing tourism activities on Tarkarli-Devbag spit are creating additional stress on ecosystem services. Deteriorating ground water quality is another major threat. Community people are not realizing the importance of ecosystems services for sustainable development. An attempt is made here to study the spatio-temporal changes in the study area and create a matrix of issues and potential strategies for sustainable development of Tarkarli-Devbag.

Key Words - Erosion, Geospatial Technologies, Tourism, Sustainable Development (SD)

JEL classification code: Z32 (Tourism and Development)

Introduction

Coastal communities world-wide are faced with difficult problems of shoreline erosion control because of the high land values inherent in the shore zones. Chronic erosion as well as storm erosion can be viewed as important management problems (Pilarczyk, 1990). Beaches and dunes have very important recreational value. Beaches are generally not affected by coastal erosion. In principle coastal erosion only causes beach problems if a fixed structure such as sea wall lies behind the beach. In the dune areas there are recreational facilities such as camp grounds, structures such as hotels and restaurants in the first dune-row area, of course, endangered by erosion (Cess, 1990). Tarkarli-Devbag sand spit is a 6 km long detached type of beach about 16 km South of Malvan on Maharashtra coast. The spit bar is connected to main land near Tarkarli. The southern end of the bar abruptly ends in the sea near Mobarwadi. The eastern edge of the spit is bordered by a tidal stretch of river Karli. The western margin faces the Arabian Sea. (Pisolkar, 2008, Fig1A, B).

Fig 1A Trakarli Devbag Administrative

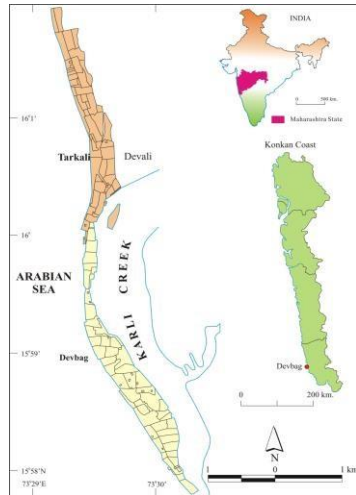
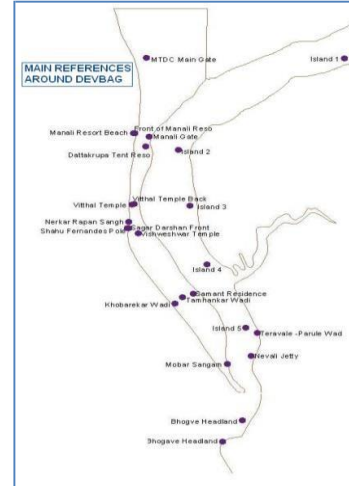


Fig1B Tarkarli – Devbag Spit



The area is showing a tendency of severe breaching and erosion of shorefront since last century Fig (2). Field visits (for last 20 years) show that encroachment and erosion by sea have accelerated after December 2004. The tendency of creek infill is a recent phenomenon as reported by the locals and supported by satellite images & the Naval Hydrographic Chart of the Karli Creek of last few years. The constructional work, along the banks of the upstream sector of river has definitely enhanced the rate of fluvial sediment supply from the catchment. In addition to this factor, the relative balance of wave, fluvial and tidal influence as well as ecological changes and overall development are also reported from other places by many authors. (Roy, 1984). The islands, plumes and shoals at the entrance of Karli creek are shaped by waves. Sand moves into the inlet by flood tide forming an extensive flood tide delta which infills most of the lower part of creek. The shoals developed some more distance inland into the creek are the results of low tide excursion of water and supply of fluvial sediments to the creek Fig 2.

The complexity of the infill has increased in last two decades leading to shallowing of creek and channelisation of the flow through narrow, elongated shoals. Water level fluctuations within the creek especially in monsoons are determined by tidal prism and fluvial discharge. The fluctuations are responsible for the creek bank cutting and retreat of spit bar from creek side. The lower part of the creek especially between Tarkarli and Mobar is subject to intense

human activity in last decade or so, in the form of recreational facilities for tourists, construction of jetties etc. The tidal creek and surrounding area is extremely sensitive to changes caused by either natural factors or human interferences. The tidal sector up to Nerur Par 30 km. upstream is ecologically very sensitive. Karli creek is facing massive sedimentation and decrease in its depth resulting in formation of sand bars, sand islands and numerous sand lenses. It produces strong currents along creek banks resulting bank cutting and collapse of creek bund (Pisolkar, 2008). Southern section of the beach near Mobarwadi (Fig 1B, Fig2 Image 1997, 2006) has been experiencing severe erosion in monsoon since long. Realizing this fact geo tubes were put by government from 2009 which has protected the beach from severe erosion for last couple of years and also length and width of the beach has increased considerably in southern part Fig 2, Image 2014.

Fig 2. Chronological Changes of Devbag Spit since 1894.



Objectives of Paper:

This paper is an attempt to highlight the coastal problems of Tarkarli – Devbag, Karli Creek Management and to suggest certain action points to integrate local people and available technologies for SD.

An attempt is made here to highlight

- i) Spatio-temporal changes in villages Tarkarli-Devbag and Karli creek.
- ii) Changing Environment
- ii) Matrix of issues and suggested strategy/plan for mitigation and adaptation with focus on community involvement

However, the authors would like to mention the limitations like data (which can be provided in given limits) while drawing readers' attention to the issue. The paper is based on the Beach and Creek Erosion problem of Devbag beach and Karli creek, a doctoral research of Dr. Yogesh Pisolkar (author), recent field surveys, interactions with communities and Gram Panchayat staff with ongoing research work, literature review and previous works. However, we have included detailed studies of each component before arriving at a final conclusion. While suggesting these approaches authors clearly want to state & emphasize on what should be implemented without adversely affecting livelihood of the people, ignoring flip sides of manner in which development has occurred in village Devbag.

Literature Review and Previous works –

Tarkarli- Devbag coast is facing coastal erosion problem for last five to six decades. There is urgency to mitigate this problem with coastal protection (Pisolkar, 2008). Coastal tourism picked up on Tarkarli–Devabag spit in last two decades (Pisolkar et al.,2013,2014,16).Coastal communities all over the world are getting affected by shoreline erosion problem. Management of these natural disasters is necessary (Pilarczyk,K 1990). There is need to develop new strategies to meet the future challenges. It is not just one factor but a host of factors in combination that need to be addressed to make our coast safe, Planning which takes care of the socio-economic and environmental issues, increasing peoples participation, capacity building are some of the measures to move from a culture of reaction to one of prevention (CEE,2009). A collaborative research project - 'Measuring, monitoring and managing sustainability the coastal dimension' - that set out to understand how societal driving forces impact ecosystems. The research was interdisciplinary, combining the social with the natural sciences. The objective was to integrate across disciplines, examines the environment-development interface, and bridges the divide between the natural and social sciences, building on the strengths and constraints of both. This Indo-European collaboration was able to initiate dialogues on many fronts, across cultures, disciplines, and stakeholders (Noronha et. al. 2003).Realizing the importance of the Sindhudurg Coastal and Marine Ecosystem (SCME), UNDP-GEF with implementing partner Ministry of Environment and Forest (MoEF) has worked on improving the conservation

prospects and sustainable community livelihoods from 2011-16 with local peoples participation (UNDP, 2011)

Method of investigation

Data Sources	Field Component	Laboratory Component
Formline map of study area published by Survey of India in 1894	Field visits, field measurements	Preparation of base map
S.O.I. Toposheet (47 H/8, 48 E/S and E/9)	Surveying and field mapping	
Cadastral map of Devbag The Naval Hydrographic Chart of the Karli Creek. (Harbour and Port division at Khar Mumbai)	Interviews with locals	Mapping of history and events
Newspaper's and other media reports		

Civic Aspects

Apart from geomorphic issues, Tarkarli - Devbag are now facing anthropogenic issues representing many coastal areas on Indian coast. In last century, majority of the people were primarily dependent on fishing for livelihood. Since 2002, coastal tourism has picked up with tourists arriving mainly from Maharashtra, from other Indian states and even abroad recently. This has added to complexity to problems created by geomorphic changes of the area.

Some important aspects are as follows:

1. The problem of erosion at Devbag is due to erosion of seaward edge of the spit due to waves as well as bank cutting from creek side. The areas prone to destruction which are very sensitive from the view point of local people are concentrated near middle part of the spit along the latitude of Vithoba Temple and the southward extent. (Pisolkar, 2008, 2013). In addition to this growing unplanned infrastructure and tourism activities is

adding fuel to already prevalent problem and is measure threat for coastal protection. Karli Creek is now extensively used for tourism activity. There are about 100 people in Mobareshwar sangh and Mahapurush Sangh engaged in boating for tourist. In addition to this private speed boat operators use Karli creek for adventure tourism activities. Collapsing of creek bunds due to waves created by speed boats is a great concern for the people along the banks.

2. Change in land use pattern infesting in increasing constructions and decreasing natural habitats (Photo Plate 1). Construction of more and more hotels closer to sea to encourage beach tourism in spite of coastal disasters (Photo Plate 2).
3. Discussions with local people suggest that more and more bore wells are dug to cater the domestic as well as tourist needs in last 3-4 years. According to local people previously salinity used to be very high from May but now it is very high from the month of March. Deteriorating water quality trend due to increasing demand of water for tourism will increase the competition for water. Already some people in Devbag (near Vithoba Temple and Mobar) and Tarkarli are in search for new water sources for drinking water. There is general awareness regarding ecosystem services but extent of knowledge base needs to be investigated.
4. Local people of Devbag, Tarkarli are shifting their livelihood from traditional trades to service sector. Majority of the community people working in the tourism especially tourist accommodation sector is not professionally trained and hence lack in providing quality services required in modern day.
5. Lack of synergy to integrate resources (both natural and human) for sustainable development.

Interrelation between geomorphic and anthropogenic aspects mentioned above have raised question mark over sustainability of fast developing tourism industry and its long term and short term impacts over local communities as well as ecosystem.

Photo Plate 1: Land Use Land Cover (LULC) is showing increasing trend infesting more and more constructions of hotels.

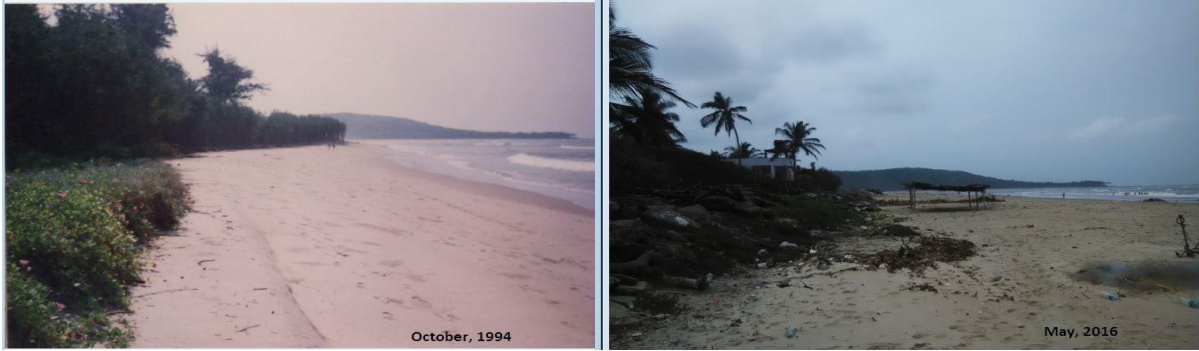


Photo Plate 2: Sea Facing Luxury(A,B), Budget(C) and Underconstruction(D) hotels on Sand dune system on Devbag Spit.



The above context leads to some conclusions like:

Localized human activities may be accelerating coastal erosion but this needs to be investigated,

Coastal erosion and unplanned tourism may adversely impact the local economy and the tourism industry in near future due to competition for resources (especially quality of water).

All human activities anyway need to be planned keeping in mind their actual and potential adverse impacts on communities and ecosystems. Hence, for the sustainable development there is urgent need for training, capacity building, education and awareness among various stake holders in villages Tarkarli and Devbag.

Efforts so Far

Villages have noticed threats due to coastal erosion and due to loss of property. People in Devabag have raised concerns as and when it was required for at least 30 years. People have been consistently passing resolutions in Gram Panchayat and following up with Government Departments like Harbour and Port Division (*Pattan Vibhag*), Central Water and Power Research Station (CWPRS), for construction of anti-erosion wall and creek bund along different sections of the beach. Subsequently Maharashtra Government built an anti-erosion wall and creek bund in certain sections. However, anti erosion wall subsides in some parts of beach owing to strong wave action during rough weather. Creek bund is also vulnerable. Dredging of Karli creek for last few years has not yielded much.

Here is a suggested matrix of issues and participatory strategy. Brief description of the strategy components is given below. However, authors would like to clearly mention that each of the components in table needs thorough research for adequate database towards implementation.

	Problems and aspects to be examined	Suggested strategies
A	Nature and extent of beach erosion and its impact	Hazard Assessment Matrix (HAM)
B	Allotment of resources during mitigation and adaptation - Prioritize response to various events	Vulnerability Assessment Strict implementation of Environment Impact Assessment (EIA) through independent expert agencies. Research on appropriate options including required modifications in structure and placement.
C	Ecosystem Services – Taken for	Identify types of ecosystems and their services to

	granted leading to unplanned exploitation	communities
D	Inadequate knowledge of local communities and their dependence on Government mechanisms Need for Environment Education (EE), Capacity Building, Training, Awareness	Awareness campaign related to environmental and socio-economic issues Decentralization of Governance
E	Inadequate synergy among Govt departments, academic institutes, Non Government Organizations- Community Based Organizations and communities	Strengthen Maharashtra Coastal Zone Management Authority (MCZMA) Evolve Regional Centre of Expertise (RCE) for sustainable coastal development

A. Hazard Assessment Matrix (HAM)

Hazards can become extreme events which could turn into disasters when population/system does not possess adequate capacity to cope up. A technique to keep track of past and present hazards in order to build up resilience is termed as HAM (CEE, 2009). There is urgency to keep records of the past events (especially destruction due to storm surges and creek bank erosion) in case of Tarkarli - Devbag coast to address the local needs of vulnerable communities and to develop Community Based Disaster Risk Reduction (CBDRR).

Hazard type	Origin/Cause	Warning signs	Speed of onset	Intensity	Frequency	Duration	Geographical extent	Magnitude of damage	Season	Recent Trend

(Source CEE, 2009)

B. Vulnerability Assessment

Vulnerability assessment is the process where we identify the problem, quantify it, and assess the risk rate in formulating development strategies to reduce the risk and vulnerabilities. Proper planning and protection strategies for Indian coast must be taken swiftly by the coastal management and policy makers to safeguard coastal ecosystem and livelihoods. In recent years, there has been much focus on coastal vulnerability assessments using various kinds of data. Most of the reported studies over Indian coast are based on remote sensing and GIS methods (Sudha R etc al., 2015). Indigenous people have been living in the same villages and have observed environmental changes for generations. In case of villages Tarkarli - Devbag people's knowledge should be incorporated with modern remote sensing and geospatial technologies to build the resilience especially regarding ecosystem services. Dredging of Karli Creek needs strict implementation of Environment Impact Assessment (EIA) through independent expert agencies. Public participation and hearing is necessary considering Karli Creek is now used for tourism activities. EIA has three core values – Integrity, Utility, and Sustainability. Hence, management of Karli creek for fishing and tourism needs proper planning and protection strategies. Remote sensing data, GIS technologies and The Naval Hydrographic Charts of the Karli Creek for last two decades can be used meaningfully with expert guidance of EIA team and local people's participation. Coastal protection measures and their present condition needs through investigation. Feeding observations to District Level Coastal Committees (DLCCs) and strengthening DLCCs & MCZMA will be first step towards improving coastal defense measures.

C. Ecosystem Services

The region benefits from its environment in various ways. According to Millennium Ecosystem Assessment (2000), the ecosystem services are grouped in four major categories, namely; Provisioning, Regulating, Supporting and Cultural. These ecosystem services are integral to the sustainability of the region especially in area such as Devbag which is still supported by traditional way of life. The following table illustrates these services in brief.

Ecosystem Services		
1	Provisional	Food- Fishery, Mad Bagayat. Raw material- Stones and wood for building, manure as fertilizer Energy - biomass fuels

2	Regulating	Waste disposal and drinking water purification, pest and disease control.
3	Supporting	Nutrient recycling, Ecosystem sustenance and primary production
4	Cultural	Intangible assets of cultural diversity, folk arts, spiritual and recreational aspects

The traditional profession that sustained Devbag and Tarkarli coast is fishery and Mad Bagayat (Horticulture). People depend on firewood for fuel source and waste disposal and water purification is nonexistent. Intangible assets such as Dashavatari plays, Koli dance and local cuisine and specialties are neither marketed nor perceived as valuable. Considerable efforts are required to assign economic value to these services in order to sustain the development in the region.

D. Education and Awareness

The region is rapidly undergoing socio-economic change. The people are not adequately educated or trained to survive or benefit from this change. Various issues regarding public health and environmental degradation must be communicated and discussed freely in the society in order to facilitate participation from all the stake holders. Various governmental and non governmental agencies provide support for programs related to public health and sanitation or waste disposal etc. Local NGOs Kille Sindhudurg Prenotsav Samiti, Malvan., Tarkarli Development Sanstha (TDS) are already working on the same with the support of UNDP, MTDC and Government of Maharashtra. People must be made aware of these programs and capacity building in terms of infrastructure and personnel should be undertaken at Gram panchayat in order to get benefits from these programs. People should be sensitized towards their local culture through promotional activities.

E. Synergistic Governance

Governance at village level is a challenge in itself. But under the onslaught of new development, constant regulatory changes and opaque policy decisions makes it even more so. Both local and state government should formulate and communicate policies that directly affect livelihood and sustainability of local population. The long winding regulatory process

is very daunting for villagers. These villagers lack both intellectual and financial support to navigate through the regulatory system and often gets short end of the developmental benefits that are grabbed by few powerful elements of the society. Strengthening of enforcement agencies such as strengthening Maharashtra Coastal Zone Management Authority (MCZMA) can produce desired effect. Evolving Regional Centre of Expertise (RCE) for sustainable coastal development can integrate the local development with the overall coastal development of the state and can benefit from increase in knowledge exchange and building expertise.

Many coastal villages along the Konkan face similar problems where coastal tourism is flourishing. Hence it is the need of the hour to design site specific strategies which will integrate local stake holders and modern remote sensing and GIS technologies keeping in mind sustainable development. We believe that present study report gaps between previous studies considering the strong potential of Integrated Coastal Zone Management (ICZM) for collective growth of communities along Tarkarli- Devbag coast. Careful implementation by policy makers and administrators integrating local stake holders will strengthen the development of the region in a more meaningful way.

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Smart Contracts: Enforcing Trust through Code

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Abstract

Shareholders believe in the fundamental ability of a corporate entity to produce long term profit and therefore invest capital towards it. Consumers believe that the produce supplied via retail outlets are of optimal quality and are therefore willing to spend money on it.. Trust therefore, is not only an emotion upon which human society is built but also a requisite for its optimal functioning. In the occurrences that this trust is broken or proven to be violated we see widespread disputes and the need for resolutions. Take for instance the massive dip in Nestlé's stock when it was proven that some of its produce had high amount of lead content in it. Markets react violently each time it detects volatility or a lack of trust in the functioning of organizations. In the age of automation, a certain amount of functions can be completely digitalized requiring little intervention from human beings. Placing our trust in machines that can function with no internal agenda's, susceptibility to human emotion or corruption through means of bribes can therefore be a means to attain the kind of utopian society we all seek to obtain over time.

Smart contracts - a means to enforce financial transactions through code that requires the occurrence of certain events taking place are one of the means to which we can obtain complete automation of agreements involving financial transactions. Where we otherwise depended on notaries, advocates and contracts - all of which are subject to time consuming processes, and heavy expenses in the case of dispute resolution, we can now rely on pieces of code that can function on basis of data relayed to it from trusted sources (Buterin, 2014). This can be as simple as an options contract that expires on a pre-set data to release of funds to a farmer on basis of remote satellite imagery of his crops. Using a blockchain, smart contracts and possibly artificial intelligence, organizations of the future will function with increased levels of transparency, performance optimization and faster decision making. As reference points we have looked at Nick Szabo's original writing on what a smart contract is, publicly available reports from leading audit firms, interviews and a number of books citing use cases for the emergent form of

technology. This paper aims to provide an introduction to smart contracts, its implications upon the functioning of certain industries and the possibilities they bring along

Introduction

A contract can be defined as an agreement with specific terms between two or more parties pertaining to the occurrence of an event, a financial transaction or trade (Legal Information Institute, n.d.). It has to be built upon mutual consent, capacity to fulfill, consideration of variables and ramifications if the said terms are not met. In the traditional sense, a contract is usually a legal document that allows an individual to seek third party resolution making if the terms of a contract are not met. Given the speed, efficiency and cost involved in hiring advocates and relying on the courts of a land, this can greatly hinder the pace of innovation and business. Although contracts have gone digital, and we often use PDF's instead of the traditional paper, their functionality has basically remained the same. In the age of blockchain (decentralized ledger that function on a peer to peer basis) based currencies and constant connectivity to the internet, such issues can be avoided through a smart contract.

A smart contract is a digitally signed, computable agreement between two or more parties. A virtual third party—a software agent—can execute and enforce at least some of the terms of such agreements. According to Nick Szabo (Gord, 2016) - a pioneer that first framed the phrase, a smart contract is a set of promises, specified in digital form, including protocols within which the parties perform on these promises. Here, a promise can be in regards to delivery of a certain amount of goods, rent every month or even the provision of a service. The specification in digital form refers to the use of code that will be enforce the rules upon which the contract has been made. In the case of a rental agreement, this can be a case where in an automatic transfer of funds is initiated from the wallet of the person residing in an apartment to that of an owner. Failure to initiate transfer due to lack of funds could possibly even result in a remote lock down of the house through a lock and key mechanism that is connected to the internet. Or, consider the case of an uber ride enforced through a smart contract. The funds could be locked automatically from the account of the traveler at the time the GPS coordinates of the rider matches with the

cab. Once the GPS coordinates of the rider matches with that of the destination, the smart contract would automatically release the funds to the cab owner. Such forms of trustless transactions that happen with the assistance of the internet are indicators of where businesses and financial transactions are headed in the future. Where we once relied on third parties to enforce trust and optimal release of funds, technology would step in to provide security, speed and efficiency for day to day transactions.

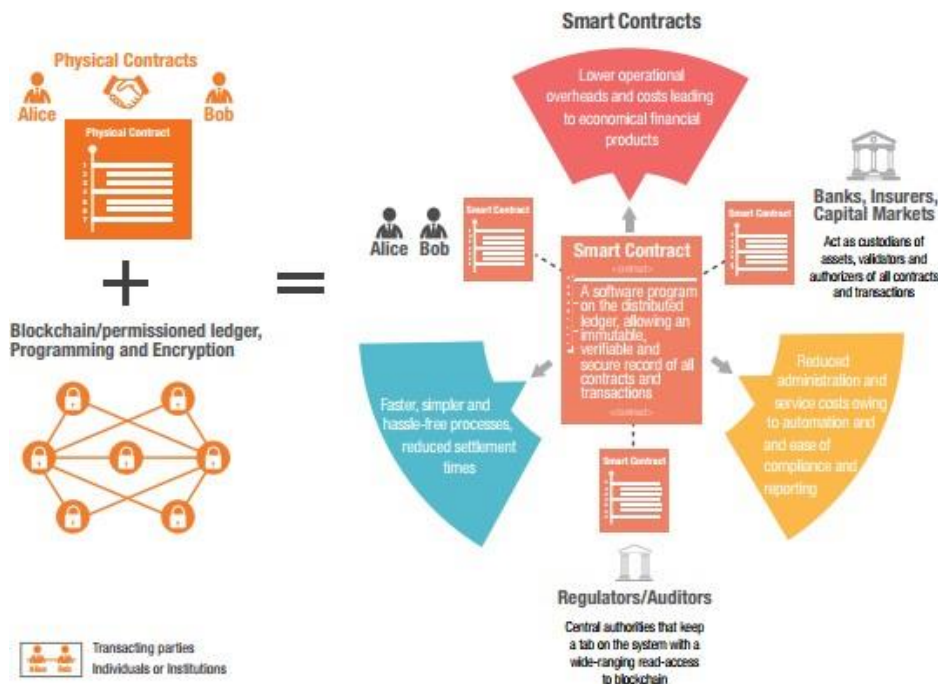


Image: A visual Comparison of traditional contracts with smart contracts

(Morrison, 2016)

While smart contracts are not legally accepted in countless nations around the globe, the level of trust and admiration they have obtained from technocrats round the globe have resulted in countless projects. The reason for this can be traced down the lack of understanding regulators possess, the lack of expertise they have over the subject matter and the lethargic fashion in which policy changes are made. The DAO(decentralized autonomous organization) for instance is an

example of a project that raised over 150 million dollars in smart contracts for the purpose of creating a decentralized crowdfunding platform with an entirely new approach to corporate governance that relied on the utility of a blockchain for voting and decision making. There are countless other examples of smart contracts being used for purposes ranging from medical insurance to in-game purposes. A few of them are discussed below.

1. Education

A major issue associated with conventional CV's and recruitment platforms like LinkedIn is the lack of ability to verify if stated claims are true or false. Even in the age of digitisation, conventional colleges rely largely on physical certificates and documents to convey grades to third parties. In the age of MOOC's (massive open online courses), online education is one of our last hopes of democratizing education and ensuring people from all walks of life have access to good quality education and in extension, opportunities. However, the cost of verifying claims made by applicants and ensuring produced certificates are from the right sources largely hinder the pace at which applications are processed in various colleges or organizations seeking to employ people. This can be resolved effectively through means of implementing smart contracts at different points. APPII (Allison, 2016), a UK-based technology start-up, is testing out a way of encapsulating verifiable recruitment-data within transparent, tamper-proof automated contracts run on the Ethereum blockchain. The smart contracts allow for the verification of the career profile (curriculum vitae or resume) of students and workers by their former, and current, employers and education providers. The system has been built on Ethereum by London based blockchain consultancy Applied Blockchain and aims to go live in the summer.. Given the scale at which education, employment and recruitment functions in nations like India, such systems can drastically reduce the costs, time and inefficiencies involved in the sector.

2. Loans

While talks of financial inclusion have been abundant in emerging economies, their progress have been largely hindered due to the pace at which humans function. Cost overheads in terms of labor, infrastructure and document verification added with the little income generated from those at the bottom of the pyramid give little incentive for private organizations to bother with setting up shop in remote parts of the world (Narasimhan, 2014). Smart contracts provide a framework to tackle this issue by drastically reducing the labor requirements for providing n number of financial services, making technology and inclusive part of the process and activating capital from remote parts of the globe through blockchain based currencies.

Consider the case of a micro loan requirement by an individual in a remote part of the globe. Assume that he is willing to provide collateral in terms of land ownership. Once an individual verifies the document and takes possession of the same on behalf of the bank, he can initiate a loan whose repayment conditions can be contractually enforced through code. Assume the individual deposits money in a quarterly fashion and over the course of the loan it is fully repaid. The code can deliver a text message to his personal phone number with an access code that can be submitted to the bank for receiving the collateral documents back from a central location.

By enabling the loan disbursement process to happen through a smart contract, banks can reduce the number of employees required to handle such loans, provide faster services, store documents pertaining to ownership at a central location and reduce infrastructure requirements and even have added sources of revenue. Consider the case of Credit Suisse that has been looking at the possibility of providing loans as a syndicate (Suisse, 2016) in collaboration with other banks. In the future, with the use of smart contracts, individuals could even look at trading mortgage backed loans on a blockchain. Unlike earlier where banks used to individually label the creditworthiness of these mortgages, individuals could look up the attached document and verify their worth and the value of the loan. Such systems could possibly even avert the kind of recession we saw in 2008

3. Internet of Things

Developments in the kind of hardware we use in our day to day operations have provided new ways for us to collect data and utilize it for the improvement of our lives. Simply put, the internet of things is the concept of basically connecting any device with an on and off switch to the Internet (and/or to each other). This includes everything from cellphones, coffee makers, washing machines, headphones, lamps, wearable devices and almost everything (Morgan, 2014). This also applies to components of machines, for example a jet engine of an airplane or the drill of an oil rig. This is particularly important in the case of blockchain and smart contracts as these internet of things can be used largely to rely upon for data from the sensors they possess. Consider the following use cases.

Cash on Delivery through a smart Contract

Consider a purchase that has to be made from an e-commerce firm. The rise of cash on delivery as a payment method has helped organizations like Flipkart garner market dominance over the course of the last decade. However, this has its inadvertent flaws. The lack of upfront payments gives individuals the ability to call off the order while the order is in transit. This puts the seller in an iffy position where ‘in he has to bear the cost of shipment if the individual chooses to call the order off during the time of transit. This can be circumvented through means of using the tracking mechanism available on most shipment platforms. Assume a smart contract is able to verify the shipment status of a purchase from the API’s (application programming interface) available with shipping platforms such as FedEx. Consider the fact that the said smart contract can be used to set up an escrow which is released upon time of delivery of the goods. Those making an order will have to put funds into the smart contract and initiate it with the seller. Assuming the buyer wishes to cancel order while the order is mid-way he has the ability to do so by means of calling the contract off. In such a case the contract can be released after deducting the amount used for shipping and a premium for the labor costs involved. Alternatively, if the produce is delivered effectively the funds can be automatically released post the shipment status saying “delivered”. This hedges both the buyer and the seller from risks and requires no third party to be involved. Additionally, if done on a blockchain, this stands as viable proof of the trade

made on the blockchain. Assume a use case where in both parties do not trust a third party shipping agent either. Then a GPS can be used to track the coordinates of the produce. Considering the buyer enters his GPS location for place of delivery, the smart contract can be released once the GPS coordinates match with the point of delivery. While this might have little to no implications for the average retail consumer, its implications can be huge in the B2B sector which is rife with issues regarding delay of payments. Assuming a penalty is charged for each day of delay in ensuring delivery, a seller has an added incentive to deliver the produce on time. Add an added bonus for each day the seller is able to deliver the produce in advance through a smart contract and verify it through a GPS and one would be able to bring forth much higher speeds to present day industrial processes.

Car leasing

With millennials choosing to go more with rentals and less with ownership, cars connected to the internet provide a wide array of opportunities to integrate trust, transparency and blockchain based records. Consider this (DocuSign, 2015) example of a collaboration between DocuSign - a digital contract enabler and Visa - a global pay processing entity to build a car leasing prototype on top of a blockchain. Their vision is one where in cars are able to track distance driven, drivers financial status, financial records, driving records and the overall condition of the car on a blockchain. This proof-of-concept makes it easier and faster for customers to get out the door in their new car by bringing together smart contracts and payments so that customers can electronically sign all pertinent documents and seamlessly pay in one fully digital experience."

With all details stored on a blockchain - both a driver and the owner of the car will be able to verify the condition of the car or the eligibility of the driver to own the car. Considering payments - an individual will be able to lock up a certain amount of funds in a smart contract. The odometer positioned in the car can automatically relay the distance travelled and the smart contract could reduce funds from it. If the individual drivers lesser distance than earlier assumed, then the surplus funds and the security deposit could be given back to the drivers account. This has the added benefit of transparency in the sense that someone looking to

lease a car could now instantly verify how far the car has been driven, how often and by whom.

Conclusion

Smart contracts have the power to fundamentally disrupt how proof of ownership, transactions and legal enforcement of trade is facilitated. By reducing the amount of trust we put upon human operators and enforcing it through code, business can function fundamentally faster and produce substantially higher levels of profit through process automation. However, this transition towards smart contracts would take years, maybe decades to go mainstream and integrate with developing economies. Even as it stands right now, smart contracts have their susceptibility to being corrupted through a hack or leakage of funds. Additionally, individuals stand to hold no legal rights in the event that an issue occurs during the functioning of a contract. The removal of human parties to enable trust can turn to be a costly mistake if there is a technical glitch as with the case of an ethereum focused crowdfund. Due to a hack that was initiated against the system, individuals lost tokens worth millions of dollars and the community eventually collapsed and lost faith in the system. As it stands right now, smart contracts are utopian systems built for technocrats. Their integration towards existing systems can be slow, painful and excruciating. However, as they turn mainstream, they will bring along with them - a brand new way of building businesses. One, built upon trust, transparency, speed and efficiency.

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**Assessing Tourism Potentiality Cultural Heritage Site – A Case of
Darasuram Temple Kumbakonam Taluk, Tamil Nadu
(UNESCO World Heritage Site)**

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Abstract

Historical environments that provide connections with people and the environment are also very important symbols of continuing human values. Historic environments are an awe-inspiring indication of a community's creativity. Details of the social and economic structures of past civilisations lie in this environment. The development of tourism activities all over the world for appreciating natural beauty, historical cities, different societies, interesting local traditions, and archaeological remains has led to the development of opportunities for interaction between the past and the present (Kaya & Aytakin 2009; Topay 2013).

From ancient civilizations to the present, Darasuram kumbakonam has mirrored the social, economic, and social qualities of the encompassing area and being an image of its old Dravidian heritage. This region ought to be passed on to future eras of humankind; to advance the security of this site, special exercises ought to be arranged that utilize it in the most ideal way. In this study, I assess the potential for the overseers of the antiquated city of Darasuram inside kumbakonam to set up present day preservation approaches, parity its protection and use inside the structure of social tourism, and decide issue regions and opportunities. This structure is proposed to build up a coherence of forward-looking tourism. With regards to the locals and the information got from studies led in the prompt region, and by assessing research thinks about and the writing this will guarantee its assurance, equalization, and maintainability, and also leading scene plan and creating tourism activities in the area.

Key words - Tourism, Heritage, Kumbakonam, Culture, Temple

JEL Code: L83, R10, Z12

Introduction

Tourism and travel industry is the world's largest and most diverse industry. Many nations rely on this dynamic industry as primary source for generating revenues, employment, private sector growth and infrastructure development. Tourism is low capital, labour intensive business with high economics multiplier. It is a business particularly suited for part-time and seasonal employment and thus encourages first time entrants and women in the labour force. But as tourism has emerged as a key sector of the world economy, it has become a major force in global trade. Tourism development is encouraged particularly among the developing countries around the world.

Tamil Nadu has an ancient civilization. It is located in the southern most part of the Country. It has a long coastline of more than 1000 kms abutting the Bay of Bengal and Indian Ocean. The State is endowed with a multiplicity of cultures and regional variation in climate and in flora and fauna. It encompasses hills and dales, beaches, backwaters, mangrove forests, dry farm land, rivers, lakes, tanks and an irrigated delta. Its history and ancient culture is revealed in the many monuments dotting the length and breadth of the State, its temples and forts. Wild life and bird sanctuaries, tribal habitations, hill resorts and a wealth of talent among its people in terms of dance, music and the arts is an important feature. Tamil Nadu is also a modern State with infrastructure facilities for trade, industry and commerce and highly skilled and educated population. It is the policy of the State Government to promote the State as a Tourism Destination for the people of the Country and the World under the branding "Enchanting Tamil Nadu".

Tamil Nadu was ranked second in India in the domestic tourist arrivals next to Andhra Pradesh and also Second in foreign tourist arrivals next to Maharashtra in 2012. In 2014, Tamil Nadu stands first in India in domestic tourist arrivals as well as foreign tourist arrivals.

Table -1 Share of Top 10 States/UTs of India in Number of Domestic Tourist Visits - 2014

Share of Top 10 States/UTs of India in Number of Domestic Tourist Visits - 2014			
Rank	State/UT	Domestic Tourist Visits in 2014	
		Number	Percentage Share (%)
1	Tamil Nadu	327555233	25.6
2	Uttar Pradesh	182820108	14.3
3	Karnataka	118283220	9.2
4	Maharashtra	94127124	7.3
5	Andhra Pradesh	93306974	7.3
6	Telangana	72399113	5.6
7	Madhya Pradesh	63614525	5.0
8	West Bengal	49029590	3.8
9	Jharkhand	33427144	2.6
10	Rajasthan	33076491	2.6
Total of top 10 States		1067639522	83.3
Others		214312733	16.7
Total		1281952255	100.0

Source: State/ UT Tourism Departments

Figure-1 Source India Tourism Statistics at a Glance 2014 Ministry of Tourism

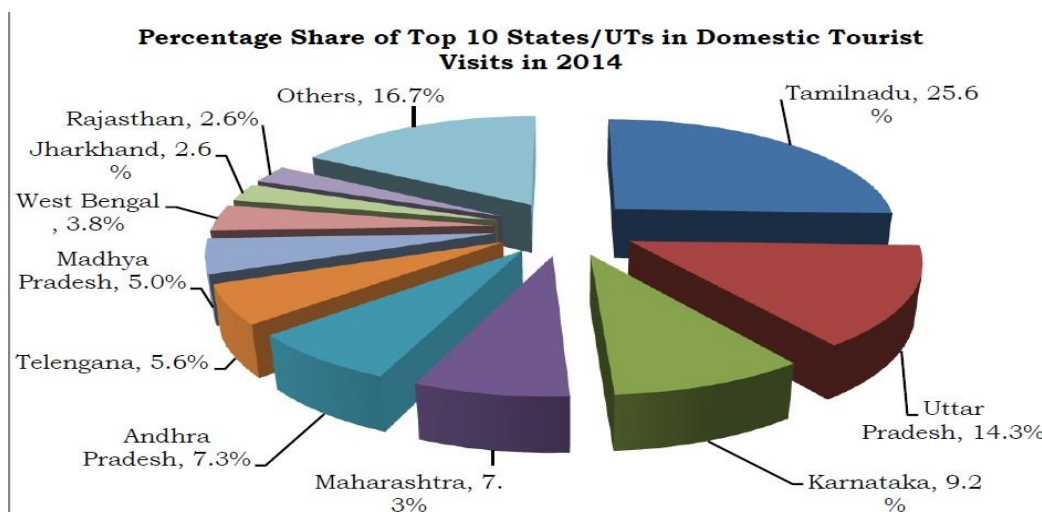


Figure -2 Source India Tourism Statistics at a Glance 2014 Ministry of Tourism

Table-2 Share of Top 10 States/UTs of India in Number of Foreign Tourist Visits – 2014

Share of Top 10 States/UTs of India in Number of Foreign Tourist Visits in 2014			
Rank	State/UT	Foreign Tourist Visits in 2014	
		Number	Percentage Share (%)
1	Tamil Nadu	4657630	20.6
2	Maharashtra	4389098	19.4
3	Uttar Pradesh	2909735	12.9
4	Delhi	2319046	10.3
5	Rajasthan	1525574	6.8
6	West Bengal	1375740	6.1
7	Kerala	923366	4.1
8	Bihar	829508	3.7
9	Karnataka	561870	2.5
10	Haryana	547367	2.4
Total of Top 10		20038934	88.8
Others		2528716	11.2
Total		22567650	100.0

Source: State/ UT Tourism Departments.

Figure -3 Source India Tourism Statistics at a Glance 2014 Ministry of Tourism

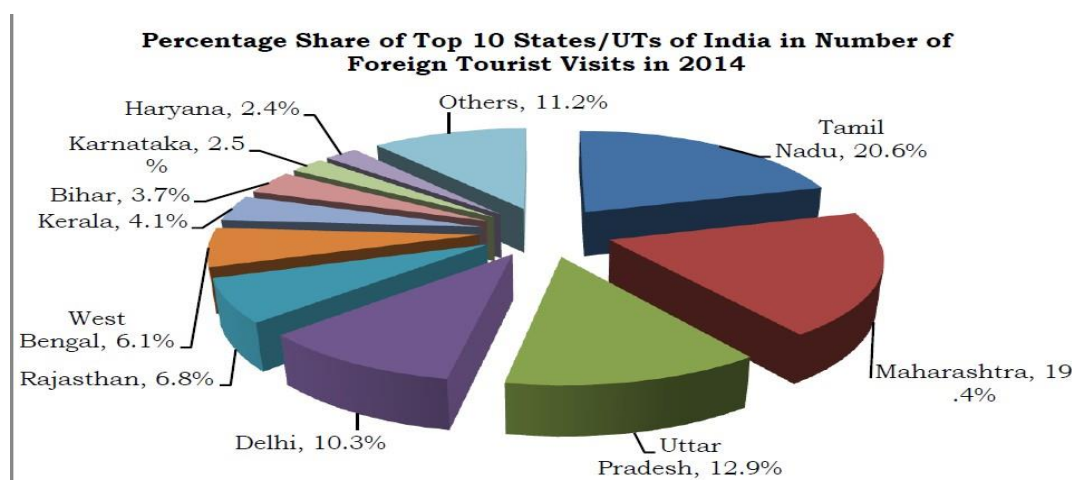


Figure -4 Source India Tourism Statistics at a Glance 2014 Ministry of Tourism

Methodology

The main site of this study is darasuram, in the township of kumbakonam, which includes the ancient city and its circumventions. The coordinates of this research area are 10.9493° N, 79.3550° E, as shown in Figure 1. The methodology of the proposed study based on extensive field surveys and desk research work. Frequent visits were made to the study sites

during both the peak and low seasons to collect relevant data to know the views and opinion of visitors, tourism entrepreneurs and other stakeholders. In addition, available primary sources and secondary sources comprising of available books, journals, periodicals specifically prepared by government and non- governmental organization has also been consulted. At the cessation of the stage is the tourism orchestrating proposal, which is denoted to amend

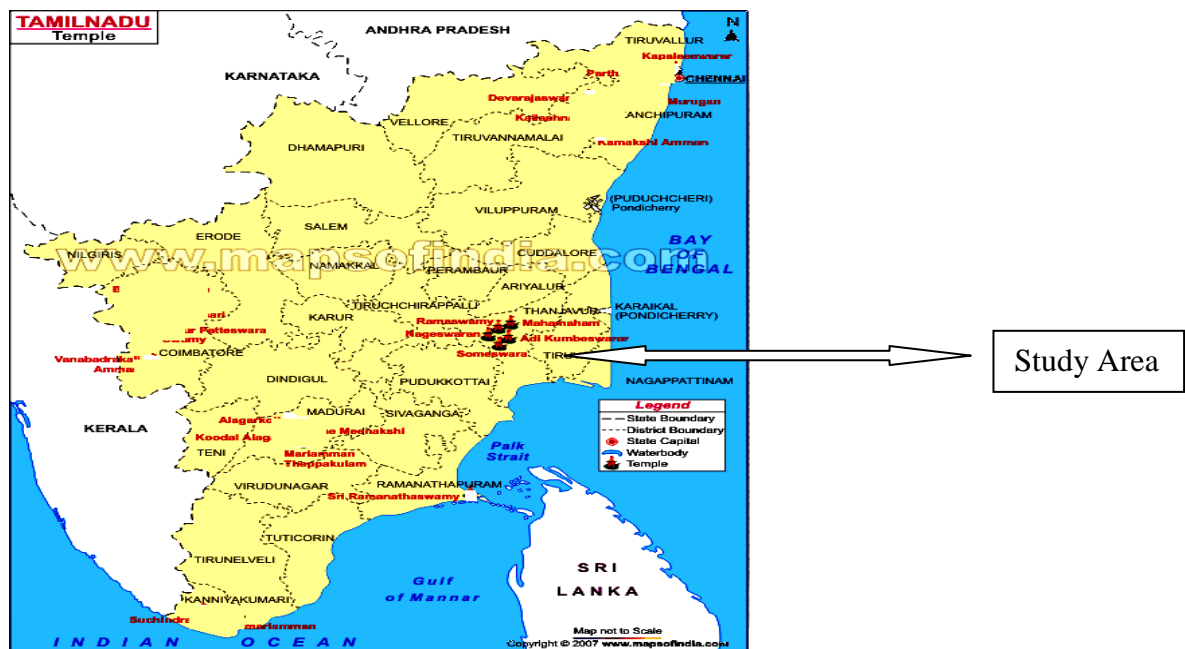


Figure 5. The location of the ancient city of Darasuram and its surroundings in Kumbakonam

Objective of the study

This study reveals that although the natural and cultural landscape of the antediluvian city of Drasuram in kumbakonam has potential for tourism activities, the site has not reached its potential; the preservation of valuable historical and cultural sites should be undertaken at the national and international levels and promoted to a wider audience. I withal propose goals for the development of tourism activities in the archaic city of by studying the socioeconomic plan for the region and discussing how to ascertain its efficacious use.

Potential and Prospects in Tourism Sector in Darasuram Kumbakonam

Kumbakonam, additionally spell as Coombaconum in the records of British India, is a town and a special grade municipality in the Thanjavur region in the southeast Indian state of Tamil Nadu. It is found 40km (30miles) from Thanjavur and 273km (170miles) from

Chennai and is the home office of the Kumbakonam Taluk of Thanjavur region. The town is limited by two streams, the Kaveri River toward the north and Arasalar River toward the south. As indicated by the 2011 registration, Kumbakonam has a populace of 140,156 and has a strong Hindu dominant part; however it likewise has sizeable Muslim and Christian populaces. Kumbakonam is known as a "temple town" because of the pervasiveness of various sanctuaries here and is noted for its Mahamaham festival which pulls in individuals from everywhere throughout the globe

Kumbakonam goes back to the Sangam period and was ruled by the Early Cholas, Pallavas, Medieval Cholas, Later Cholas, Pandyas, the Vijayanagar Empire, Madurai Nayaks, Thanjavur Nayaks and the Thanjavur Marathas. It rose to be a noticeable city between the seventh and ninth hundreds of years AD, when it served as a capital of the Medieval Cholas. The town achieved the peak of its thriving amid the British Raj when it was a noticeable focus on European instruction and Hindu society; and it gained the social name, the "Cambridge of South India". In 1866, Kumbakonam was formally constituted as a region, which today includes 45 wards, making it the second biggest region in Thanjavur locale.

Description of attraction

Table-3

Nageswaran Temple	Constructed as a chariot, the Nageswaran temple is an important Shavaite temple. A piece of genius Chola architecture, it is an important Shavaite temple. The temple is a marvellous example of the Chola's architectural prowess as the constructed the temple in a way so that it will only let in sunlight during the month of March-April.
Adi Kumbeshwara Temple	Believed to have been constructed in the 7th century A.D by the Cholas, Adi Kumbeshwara Temple is one of the grandest and the oldest Shiva temple in the town. The temple has a magnificent architecture with the trademark style of the Cholas. It is dedicated to Lord Shiva and houses a unique Shiva lingam.
Sarangapani Temple	One of the three major shrines of Lord Vishnu and one of the Divya Desams, the Sarangapani temple is a giant temple with twelve

	storey high tower was constructed in its present form by the Nayak Kings in the 15th century. The largest temple in the town, it's designed in the form of a chariot
Religious Institutions	Kumbakonam is home to the famous Maharaja Kala Shre Govindha Theekshidar Veda Kavya Pada Salai, which is engaged in training youth in Vedic literature and other religious activities. Sankaramadam, Govinda Kudi and Ahobila madam are other major institutions in Kumbakonam
Environmentally sensitive areas	These include the numerous holy tanks and riverfront areas and include the renowned Mahamaham tank (famous for its Mahamaham festival held every 12 years during which devotees throng to Kumbakonam to take a holy dip in the tank), Porthamarai Theertham, Paga Theertham and Ghats of River Cauvery and Arasalar.
Minor Heritage areas	These include the traditional settlements of various social groups. The traditional houses are linear and endowed with architectural features including the Columnar Thinai, Madam, Muttrum etc.

Gap Analysis

The ancient city of kumbakonam holds cultural and conventional worth, and its tourism potential is high. Be that as it may, it has been arduous to survey its conceivable outcomes for advancement, because of an inability to draw in an adequately high number of tourists to the old city. It is paramount to set out the variables that ought to be considered at the formative level.

Unfortunately, there is still a gap between the practice and theory of cultural heritage management. In practice, there is a consequent delay in shifting to a more holistic approach, where orchestrating and management is concerned, most certainly by local regimes. In theory, there is a lack of research to identify and design innovative approaches, and to document and disseminate best practices for the management cultural heritage facilities in this area. Whether local, national or international, regimes share the responsibility for the auspice of these facilities for present and future generations. Thus, it seems only fitting that due attention is paid to their congruous management. The lack of opportune management at

heritage sites causes physical and gregarious impacts, these places lose their sense of spirituality; they shift from being sacred to secular places.

A SWOT (strengths, weakness, opportunities, threats) analysis of the ancient city and the strengths and weaknesses of the area have revealed opportunities and threats in the current environment. As a result of this analysis, a number of planning and design proposals have been developed, as shown in Table 1.

Table 4. A SWOT analysis of the ancient city of Darasuram and its surroundings.SWOT analysis of the area.

<p>Strength</p> <p>Rich in history and, cultural Resources. Areas in this region of were a component of major Dravidian civilizations since ancient times. The area is a component of pilgrimage tour since Centuries. The famous annual festivals ceremonies Tourism products. There are many tourist itineraries in the region. Easy transportation</p>	<p>Weaknesses</p> <ul style="list-style-type: none"> Lack of Protection and preservation of identified heritage resources including the archaeological sites spread around the temple. Inadequate provision of Health, recreation facilities, open spaces and other amenities for pilgrimages Poor traffic management and inadequate provision for parking lots, particularly around temple areas. Lack of recreational activities.
<p>Opportunities</p> <p>It has the right mix of Heritage resources, natural environs, cultural events and spiritual ambience to develop as an exclusive spiritual destination where high-end pilgrims come for physical and spiritual rejuvenation.</p> <p>Variety of craft (bronze, silk,</p> <p>Its status as a world heritage site ensures international and national interest, and potential for investment</p>	<p style="text-align: center;">SWOT Threats</p> <ul style="list-style-type: none"> Lack of urban reforms causing lacuna in implementation mechanism. <p>Limited local community involvement and pride in heritage preservation</p>

the foreigners. Most of the “North-Indians” do not understand the local language very

well. Though the sign boards are provided in English and Tamil a desideratum for English/Hindi sign boards, English/Hindi verbalizing guides are expected.

- The Non-availability of hygienic food as noted above was an eminent quandary faced by the tourists. Foreigners perceived it to be a major quandary. Beggars were a major quandary.
- Sanitation facilities were additionally among the highest quandaries just like the jams but with unequal replications. Non-availability of peregrinate information was withal a prominent issue for many of the tourists especially for the foreigners followed by the north Indians.
- Lack of Protection and preservation of identifying heritage resources including the archaeological sites spread around the temple
- Inadequate provision of Health, recreation facilities, open spaces and other amenities for pilgrimages
- Too much litter and garbage at the pilgrimage sites, clean toilets were destitute, and that touts and beggars were too truculent and spoiled the experience at the tourist sites.
- Poor traffic management and inadequate provision for parking lots, particularly around temple areas.

The ancient city of Drasuram as a cultural heritage and archaeological site is of paramount importance to the national and international people. Areas with cultural and natural heritage help trace the history of a region. Transferring the area to future generations is necessary to shed light on the history of humanity. In addition to increasing the national and international recognition of landscape planning and tourism activities for ‘protection–use’, it is necessary to ensure a balanced use of this site.

Discussion and suggestions

- Directional boards and signs should be placed at sundry corners of the temple so that FIT (Free Individual Tourists) tourists may eschew facing quandaries in proceeding further by guiding themselves. Furthermore, at all the ingressions the detailed map of the temple in an immensely colossal size should be placed so that devotees / tourists without any avail can guide themselves.

- Street Lighting at the main ingress to the temple.
- Public accommodation facilities at different locations path.
- Develop/engender light and sound show exhibiting the history, culture and tradition of temple
- Creating the heritage museum inside the temple involute.
- Strengthening of connecting link road in and around kumbakonam.
- Promote utilization of sustainable technology (alternative energy, recycling, etc.).
- Encourage companies to provide information to tourists on cultural activities that subsist in the destination, and to establish cognizance programs for the care of heritage and reverence for local customs.

Use of technologies in preservation of cultural heritage

The diversity of languages, national cultures and confessions is unique historical and cultural heritage of Tamil culture. It deserves to be represented in the world information space. This rich heritage must be processed, analyzed and prepared for introduction into the world information space. Now a day's electronic resource, it will unite electronic collections of different establishments of education, science and culture. Digitized museum exhibits, rare books, and manuscripts, unique architectural structures will enable any person to get acquainted with either cultural heritage of Drasuram and culture of separate nations or its individual manifestations, which satisfy personal, educational or scientific interest

Conclusion

The tourist facilities have additionally contributed to regional economic development by enhancing the tourism product, reaching to distant tourism markets, and connecting visitors to local businesses that accommodate their desiderata. They bring maxima into the community in several ways, and provide opportunities for businesses and civic enterprises to cooperate in community enhancement initiatives. Local and municipal regime plays a paramount role with deference to pilgrimage tourism for the region. Besides, the orchestrating, development, promotion, marketing and implementation of these products and accommodations can sustain cultural tourism as an economic activity that can ameliorate standards of living for people on the region. This paper addresses the critical shortages of resources, infrastructure and skills among tourism stakeholders, business, practitioners, communities, etc., and offers some

strategies as recommendations to ameliorate the regional market with incipient cultural products and accommodations. This analysis may be the commencement point for further research about pilgrimage and heritage tourism development, marketing and promotion on the region of kumbakoanam.

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