



WORKFORCE DIVERSITY MANAGEMENT: A STUDY OF ITES COMPANIES AT GURGAON

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ABSTRACT

Success of a truly global company is a direct result of their diverse and talented workforce. Diversity is more than a moral imperative or a business necessity rather it is a business opportunity. "Work, workers and workplaces are not what they used to be or where they used to be", says Peter F. Drucker in his book, "Management Challenges for 21st century" which provides insightful and timely information for individual and organizations alike as they work towards common goals in the next one hundred years. Among the eight new assumptions, workforce diversity is placed at the third position in terms of importance. Management being a social discipline deals with the behavior of PEOPLE and HUMAN INSIGHT. Hence, workforce diversity is the biggest challenge and at the same times the biggest opportunity for the 21st century managers. Diversity refers to any perceived difference among people on various criteria. "Diversity Management" is a strategy to promote the perception, acknowledgement and implementation of diversity in organizations. One of the main advantages of a strong diversity management program is that it tends to encourage the development of latent skills and talents among employees. Implementing a diversity management program successfully is not an overnight task. However, successful diversity management policy and program will eventually make a huge difference in the communication among employees and the general productivity of the organization. This research paper is an attempt to compare two organization on various parameters of diversity.

KEYWORDS

Workforce Diversity, Leadership Development, Discrimination, Employee Engagement, Sustained Development etc.

INTRODUCTION

The workforce is our greatest asset and the workforce diversity is the primary concern for most of the businesses today. Organizations need to recognize and manage workforce diversity effectively in order to beat the competition and flourish. The world's increasing globalization requires more interaction among people from diverse cultures, beliefs, and backgrounds than ever before. People no longer live and work in an insular marketplace; they are now part of a worldwide economy with competition coming from nearly every continent. Workforce diversity is a complex phenomenon. The management of workforce diversity as a tool to increase organizational effectiveness cannot be underscored, especially with current changes sweeping across the globe. Maximizing and capitalizing on workplace diversity has become an important issue for management today. Multiculturalism, as the new paradigm for business for the 21st century, is a political ping-pong term greatly misused and highly misunderstood. Since for many it is also a valuable concept, it has come under fire from diverse segments of the population, who due to their social position view the world differently.

The terms diversity, workforce diversity and diversity management can be defined as follows:

Diversity is generally defined as acknowledging, understanding, accepting, valuing and celebrating differences among people with respect to age, class, ethnicity, gender, physical and mental ability, race, sexual orientation, spiritual practice, and public assistance status.

Workforce Diversity means the Similarities and differences among employees in terms of age, cultural background, physical abilities and disabilities, race, religion, sex, and sexual orientation.

Diversity Management is defined as the systematic and planned commitment by the organizations to recruits, retain, reward and promote a heterogeneous mix of employees.

One of the major obstacles in discussions surrounding diversity is its very definition. A simple definition of diversity is that "It includes all characteristics and experiences that define each of us as individuals." A common misconception about diversity is that only certain persons or groups are included under its umbrella, when in fact, exactly the opposite is true. Diversity includes the entire spectrum of primary dimensions of an individual, including Race, Ethnicity, Gender, Age, Religion, Disability, and Sexual

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orientation (referred to by the Diversity Task Force as “REGARDS”). Secondary dimensions commonly include communication style, work style, organizational role/level, economic status, and geographic origin (e.g., East, Midwest, and South). From the above definitions, we can say that diversity refers to the co-existence of employees from various socio-cultural backgrounds within the company. Diversity also includes cultural factors such as race, gender, age, colour, physical ability, ethnicity, etc. The broader concept of diversity would also include age, national origin, religion, disability, sexual orientation, values, ethnic culture, education, language, lifestyle, beliefs, physical appearance and economic status (Wentling and Palma- Rivas, 2000). Demographic changes (women in the workplace, organizational restructurings, and equal opportunity legislation) will require organizations to review their management practices and develop new and creative approaches to managing people. With the increasing richness of diversity in the world and in the workforce, we need to expand our outlook and use creative strategies to be successful. Employees can provide this resource. This study identifies best practices that work in organizations that are doing just that. These practices can be adopted in any workplace.

Today, to reach our potential as organizations and society, that attitude has to shift to one of *inclusion*. Managing diversity is an on-going process that unleashes the various talents and capabilities which a diverse population bring to an organization, community or society, so as to create a wholesome, inclusive environment, that is “safe for differences,” enables people to “reject rejection,” celebrates diversity, and maximizes the full potential of all, in a cultural context where everyone benefits. Multiculturalism, as the art of managing diversity, is an *inclusive* process where no one is left out. Diversity, in its essence, then is a “*safeguard against idolatry*” the making of one group as the *norm* for all groups. Therefore, one of the dangers that must be avoided in grasping a proper understanding of multiculturalism is *bashism*. *Bashism is the tendency to verbally and/or physically attack another person or group based solely on the negative meaning given to group membership - due to biological, cultural, political or socioeconomic differences (such as gender, age, race/ethnicity, political party, class, education, values, religious affiliation or sexual orientation) - without regard for the individual*. In an age of cultural pluralism, multiculturalism is needed to manage diversity effectively. Multiculturalism is nothing more than the art of managing diversity in a total quality manner. It is the only option open to educators, leaders and administrators in an ever-increasing culturally pluralistic environment. In the business world the process of multiculturalism is best maintained through managing diversity - an intrinsic approach to business ethics and human interrelations that acknowledges and respects the contributions which the various racial/ethnic groups, as well as women, have made to society, and incorporates these contributions in an overall program of human resources management which meets the needs of an ever-changing society and its demands on business, and is sensitive to the personal and social development of all entities concerned.

REVIEW OF LITERATURE ON WORKFORCE DIVERSITY

A study of existing literature gives the chronological sketch of the evolution of this idea of diverse workforce in organizations. While many organizations have embraced diversity, others still consider it merely an issue of compliance with legal requirements. Diversity has increasingly become a ‘hot-button’ issue in corporate, political, and legal circles. Effective diversity management has historically been used to provide a legally defensive position; that is, a firm with a diverse workforce could argue that they were not guilty of discrimination because of the *prima facie* case based on their workforce demographics representing the demographics of the local community. The demographic differences like sex, age, and were conventionally related to team level outcomes (Williams and O'Reilly, 1998). Women are a category of people who have faced serious discrimination from times immemorial. According to a 2003 report by the United States Census Bureau, the average male worker with a full-time, year-round job earned \$54,803 per year, about 32 percent more than his average female counterpart, who brought in \$37,123 (encarta.msn.com, 2004). The society's world over are becoming multicultural, and at organization level, the rate of innovation are dependent in part upon the abilities of organizations to effectively manage a diverse workforce both within and across organizational boundaries (Barker and Hartel, 2004; Dass and Parker, 1996; Kandola et al., 1995, Strauss and Mang, 1999). Individuals and groups need to overcome stereotypes or prejudices and recognize that actual dissimilar other have unique and valuable information that can support group processes and performance (Hartel, 2004). Experience and recent research indicate that when recognized and valued, diversity enhances individual productivity, organizational effectiveness, and sustained competitiveness. In order "to maximize the utilization of its human capital, organizations must go beyond merely creating a more diverse workplace.

In recent years, the view of diversity has dramatically changed to a more proactive concept. Many business leaders are now beginning to believe that diversity has important bottom-line benefits. Theories and techniques of diversity management have been developed and enthusiastically supported by a growing number of chief executives, training specialists, diversity consultants and academics (Saji, 2004). Diversity requires a type of organizational culture in which each employee can pursue his or her career aspirations without being inhibited by gender, race, nationality, religion, or other factors that are irrelevant to performance (Bryan, 1999). Diversity can improve organizational effectiveness. Organizations that develops experience in and reputations for managing diversity will likely attract the best personnel (Carrel et al., 2000). Managing diversity means enabling the diverse workforce to perform its full potential in an equitable work environment where no one group has an advantage or disadvantage (Torres and Bruxelles, 1992). Diversity in the workforce can be a competitive advantage because different viewpoints can facilitate unique and creative approaches to problem-solving, thereby increasing creativity and innovation, which in turn leads to



better organizational performance (Allen et al., 2004). Organizations that value diversity will definitely cultivate success and have a future in this dynamic global labour market (Jain and Verma, 1996). Potential benefits of this diversity include better decision-making, higher creativity and innovation, greater success in marketing to foreign and domestic ethnic minority communities, and a better distribution of economic opportunity (Cox, 1991; Cox and Blake, 1991). The organization should link concerns for diversity to human resource management decisions around recruitment, selection, placement, succession planning, performance management, and rewards (Cascio, 1998).

According to one study (Watson et al., 1993), culturally diverse groups relative to homogeneous groups are more effective both in the interaction process and job performance; these benefits occur after a diverse group has been together for a period. Organizations with a diverse workforce can provide superior services because they can better understand customers' needs (Wentling and Palma-Rivas, 2000). As globalization is increasing, diversity will help organizations to enter the international arena (Cascio, 1998). Diversity enhances creativity and innovation (Adler, 1997; Jackson et al., 1992), and produces competitive advantages (Coleman, 2002; Jackson et al., 1992). Diverse teams make it possible to enhance flexibility (Fleury, 1999) and rapid response and adaptation to change (Adler, 1997; Jackson et al., 1992). Hiring women, minorities, disabled, etc. will help organizations to tap these niche markets (Mueller, 1998) and diversified market segments (Fleury, 1999). As all the segments of society have a stake in the development and prosperity of society as a whole, creating and managing a diverse workforce should be seen as a social and moral imperative (Mueller, 1998). As the economies are shifting from manufacturing to service economies, diversity issues will gain importance because in a service economy effective interactions and communications between people are essential to business success (Wentling and Palma-Rivas, 2000).

Best Practices in Achieving Workforce Diversity

Changes in the size, composition and distribution of population are closely associated with the demographic structure of workforce. On the other hand, the workforce participation rates vary according to the stages of economic development, across cultures, age groups, and between sexes. Diversity issues are now considered important and are projected to become even more important in the future due to increasing differences in the population of various countries. Companies need to focus on diversity and look for ways to become very inclusive organizations because diversity has the potential of yielding greater productivity and competitive advantages. Managing and valuing diversity is a key component of effective people management, which can improve workplace productivity. Changes will increase work performance and customer service.

It is argued that, the goal of Workforce Diversity is four fold:

- To identify, attract, and retain the best people of each group;
- To create a workplace where that talent can perform at its best to maximize shareholder value;
- To assess and understand the diversity of the marketplace and ensure we are responding to customers as they are, not as we want them to be; and that they see themselves in the client's vision, actions and workplace; and
- To use external contributions to eliminate disadvantage / increase the diversity of the talent pool.

Workforce Diversity is gut wrenching, culture change work that also has the potential to be highly rewarding. To achieve success and maintain a competitive advantage, we must be able to draw on the most important resource – the skills of the workforce. Organizations that promote and achieve a diverse workplace will attract and retain quality employees and increase customer loyalty. For public organizations, it also translates into effective delivery of essential services to communities with diverse needs. Leaders and managers within organizations are primarily responsible for the success of diversity policies because they must ensure that the policies are effective. Leaders and managers must create a strategic plan to develop diversity initiatives throughout the organizations. Leaders and managers within organizations must incorporate diversity policies into every aspect of the organization's functions and purpose. They also recognize the impact that diverse clients will have upon the success or failure of an organization, as businesses must compete to satisfy these clients. Diversity is more than a moral imperative; it is a global necessity. Moreover, diversity is an essential component of any civil society. The following best practices shows that if the organizations are committed to healthy work culture, diversity management is the biggest tool in their hands:

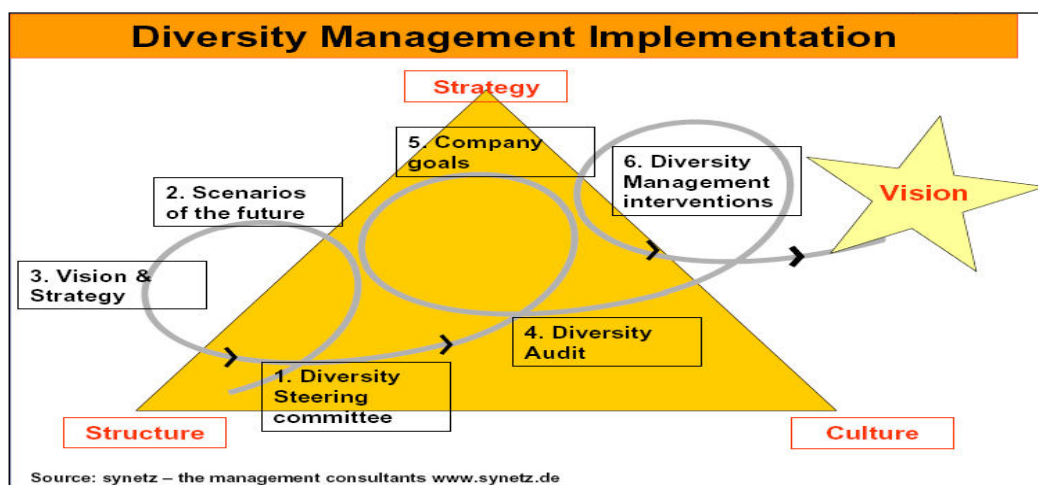
- Today's managers are responsible for both leading employees and responding to the needs of customers who are more ethnically and culturally diverse, older, and in greater need of child and elder care. Leaders in both the public and the private sectors are focusing more attention on the issue of diversity.
- Whether the goal is to be an employer of choice, to provide excellent customer service, or to maintain a competitive edge, diversity is increasingly recognized and utilized as an important organizational resource.
- Aligning diversity with the mission and business of the organization increases employee satisfaction and retention; improves competitiveness and productivity; increases responsiveness; and adds value to the customer.
- Leadership and management: The leaders of the best practices organizations understand that they must support their employees in learning how to effectively interact with and manage people in a diverse workplace. They recognize that they should encourage employees to continue to learn new skills in dealing with and managing people.

- Commitment: Commitments represent the values that define the spirit of the organization - diversity is one of these core commitments. The diversity commitment states: "We are committed to foster a diverse workforce and recognize and value every individual's unique skills and perspectives." These commitments are shared and reinforced on a daily basis.
- Employee involvement: Employees' views and involvement are key to the success of diversity initiatives in every organization. Therefore, organizations must view employee participation as a necessary part of the diversity initiative, in order to develop and maintain effective diversity policies.
- Strategic planning: Managing diversity should be a comprehensive, holistic process for managing these differences that people brings for the productive well-being of all, especially the firm and its mission.
- Sustained investment: Workforce diversity management is the best tool for the companies so that they can easily enter in a changing market situation. It is helpful in large-scale business transformation. It is a tool for total quality management.
- Diversity indicators: Beyond the challenge of creating a humane working environment where management and staff of diverse backgrounds and experiences learn to appreciate each other, lies the additional one of changing the structural arrangements
- Accountability, measurement, and evaluation.

Today's diverse population pool and workforce is simply not going to go away, but increase. This is the direction of the future—multicultural, multiethnic, multilingual communities. In addition, effective leaders, concerned with the bottom line—the maximizing of profit, whether material or nonmaterial—are recognizing this new direction. The art of managing diversity is thus of great concern to all persons charged with the responsibility of overseeing the work of others. A holistic model of managing diversity recognizes its two dimensions: the primary or Horizontal (mainly biological, usually visible: age, gender, race, ethnicity, sexual orientation, disabilities), and the secondary or Vertical (psychosocial- spiritual, usually invisible: values system, worldviews, mindsets, ethics, paradigms, core intelligences). These differences have the potential of giving rise to conflicts, but if managed well can result in a synergetic unity, where the effect of all working together is greater than the sum total of all the parts working independently. Organizations, however, that try to force today's reality into yesterday's management styles will seriously jeopardize the viability of their enterprise. Hence, we are calling it greatest challenge as well as great opportunity. All human organization have "differences," since no two humans are alike. Diversity goes beyond this. "Diversity Management" is a strategy to promote the perception, acknowledgement and implementation of diversity in organizations and institutions. At the University of Vienna, diversity management is based on the idea that diversity opens up alternative ways of perceiving, thinking and acting and thus enriches the life of the academic community.

Companies that successfully manage cultural diversity will have advantage over other companies in hiring people. Organizations that manage workforce diversity issues gain an insight into markets consisting of minority groups and women. Groups of people from diverse backgrounds can be more creative than groups with homogeneous backgrounds. Heterogeneous groups can produce better decisions through a wide range of perspectives and more thorough analysis of problems and issues. Ability to manage diversity increases the flexibility and adaptability of an organization. More quick response to environmental changes provides a competitive advantage. Some other benefits of workforce diversity management are it helps the companies to provide high quality services to the customers. The process of implementing Diversity Management is crucial. It can be seen as an organizational learning process. In the following, six major steps are described in detail:

Figure-1



Sources: Authors Compilation



Critical Analysis of Workforce Diversity

Diversity of the workforce in organizations has its benefits but there are a few disadvantages of workforce diversity. Many people feel threatened by working with people of a different age, sex, or culture. First, there is an increase in the cost of training. This increase comes from costs associated with seminars, programs and lectures given to promote diversity in the corporation. These types of training are given to all levels of staff within the organization. They teach employees how to accept the personalities and ideas or thoughts of others. These programs also teach one how to deal with conflicts and prejudice in a professional and civil manner. A disadvantage of diversity in the workplace is an increase in conflicts. Conflicts arise when two or more individuals or groups do not see eye to eye on a particular situation. About diversity, conflicts arise largely due to ignorance. Prejudice feelings or derogatory comments cause a lack of acceptance. This can produce negative dynamics such as ethnocentrism, stereotyping and culture clashes (White, 1999). The most common conflict comes from one feeling superior. If management ignores such conflicts, the company's performance may suffer and if conflicts can be managed and controlled creativity and performance can be increased.

Increases in labour turnover and absenteeism are another disadvantage in having a diverse workplace. Research has shown that the turnover rate for African Americans in the US workforce is 40 percent greater than whites. Another study by Corning Glass stated that between the years 1980 - 1987, the turnover rate for women in a professional job was two times higher than males. Women also have a 58 percent higher absentee rate than men do. Mismanaged diversity can have long-reaching effects on employee satisfaction and productivity. Employees who perceive themselves as valued members of their organization are harder working, involved, and innovative. Unfortunately, minority-group members often feel less valued than majority-group members due to stereotyping, ethnocentrism, and prejudice. Mismanagement of diversity in the form of denied access or unfavourable treatment can have negative consequences, such as inhibiting workers' abilities and motivation. This leads to lower job performance. Therefore, when an organization ignores the existence and importance of workforce diversity, conflict can emerge and neither the corporation nor its employees will realize their potential.

A Small Study on Perception of employee's towards "Workforce Diversity in their Organization"

A small study was conducted in the month of March- April'2016, to find out the perception of employee's in Indian organizations towards various factors affecting workforce diversity. The survey was conducted in five major organizations (IT, ITES, etc.) in Gurgaon, India offices. Primary data based on 120 observations were analyzed to examine the reactions and perceptions of male and female employees across categories about workforce diversity status in Indian organizations. In the first phase, the problem areas were identified and a survey was conducted for identifying the factors on which the diversity management should be based. These factors were considered as the challenges being faced by the corporations in developing strategic initiative. From the survey, the following points were identified as key factors for analysis:

- Workforce Demographics,
- Leadership Development,
- Managing Diverse Workplace Culture/Climate,
- Developing Learning and Growth Strategies,
- Handling Diverse Customer/Community,
- Geographical Diversity,
- Socio Economic Diversity

Based on the above factors a questionnaire was developed. Following were the objectives of conducting the study:

- Understanding the feeling of the people in different organization in India
- Understanding key factors that people give more importance
- Understanding the way how companies have implemented the strategy or taking care of the diversity internally
- Understanding the factors, which are to be improved / implemented in Indian organizations and the challenges on the way?

India probably has all the world's religions. Many times, it is noticed that the culture is very much related to the religious background of the people. People from different geographical area with different cultures, languages, and socio economical background shall be working in the same organization. These aspects are to be well analyzed and a suitable work culture should be created in the organization.

According to this study, the five most significant advantages "companies with active diversity policies" themselves ascribe to diversity are:

- Strengthening cultural values within the organization.

- Enhancing corporate reputation.
- Helping to attract and retain highly talented people.
- Improving motivation and efficiency of existing staff.
- Improving innovation and creativity amongst employees.

KEY FINDINGS OF STUDY

Table-1: Ethnicity Aspects in an Organization

Basis	Frequency	Percentage	Cumulative Percentage
Own Ethnic Group	8	6.67	6.67
Diff. Ethnic Group	16	13.33	20.00
Any Ethnic Group	96	80.00	100.00
Total	120	100.00	0

Sources: Authors Compilation

As it appears in Table-1, 6.67% of people want to work with the people of own ethnic group and 13.33% people are open to be work with the people of different ethnicity but rest of the 80% believe that people of different ethnicity help them in getting new ideas. This is clearly showing the growth of workforce diversity. Although some people are still not comfortable in open atmosphere, but their percentage is too low. Moreover, the open attitude increases the flow of fresh ideas and enhances the overall culture of the organization.

Table-2: Equal Opportunity Employer

Equal Opportunity Employer	Frequency	Percentage	Cumulative Percentage
Yes	100	83.33	83.33
No	20	16.67	100.00
Total	120	100.00	0

Sources: Authors Compilation

The above Table-2, shows that 83.33% people think that the organization is an equal opportunity employer but 16.67% people think that the organization is not an equal opportunity employer.

Table-3: Recruitment Strategy and Culture

Requirement Strategy and Culture	Frequency	Percentage	Cumulative Percentage
Yes	110	91.67	91.67
No	10	8.33	100.00
Total	120	100.00	0

Sources: Authors Compilation

As it appears in Table-3, Recruitments are based on requirements of experience and skills instead of ethnicity as represented by 91.67% of the people. A very small part of the sample felt otherwise. This belief leads to the job satisfaction prevalent in the organization.

Table-4: Gender Mix in Work culture

Gender Mix in Work Culture	Frequency	Percentage	Cumulative Percentage
Yes	115	95.83	95.83
No	5	4.17	100.00
Total	120	100.00	0

Sources: Authors Compilation

The above Table-4, shows that in an organization 95.83% respondents believe that women and men are provided with equal opportunities but 4.17% respondents believes that the equal opportunities are not provided to men and women. This says a lot about being fair in the dealing with people, in terms of growth prospects.

Table-5: Language Barriers

Language Barriers	Frequency	Percentage	Cumulative Percentage
yes	30	25.00	25.00
no	90	75.00	100.00
Total	120	100.00	0

Sources: Authors Compilation

As it appears in Table-5, 75% people believe that language is not a barrier for the growth in the organization but the rest of the 25% people feel that language is a barrier in the growth of the organization.

RESULT ANALYSIS

Companies can succeed at diversity if the initiative to create, manage and value the diverse workforce has the full support of the top management. The following are the conditions, which would make workforce diversity a success in any organization:

- The organization should assign this work to a senior manager. The organization should link concerns for diversity to human resource management decisions around recruitment, selection, placement, succession planning, performance management, and rewards.
- The organization should create such a working environment as will increase the motivation, satisfaction, and commitment of diverse people.
- Performance standards must be clearly and objectively established, effectively communicated, and used on objective criteria without any bias. They identify desirable and undesirable behaviour that must be based upon performance feedback discussions involving a diverse workforce.
- The strategy (diversity or otherwise) must be based on the will of the human resources, strength, and culture of the organization. Managers must understand their firm's culture first and then implement diversity strategies according to that culture.
- Training and development programs will improve the skills in dealing with the day-to-day diversity dilemmas. This will help managers to be aware on how power relations make an impact on stereotypes of groups and on perceptions of individuals and the expectations.
- Communicating intercultural' it will help in managing a diverse workforce. An individual will be able to understand how cultural and ethnic differences shape the conflict process and coming up with conflict resolution strategies. There will be able to negotiate outcomes with cultural differences in mind.
- Mentoring programs, involvement of experienced advisors and helps others for a period of years. This mentor should be able to advise employees overall concept of workforce diversity and the reasons why diversity should be managed in the workplace.
- Assessment of ones beliefs about work values, being able to identify work values of others from different cultural backgrounds and examination of the leadership assumptions from a multicultural perspective. Creation of the support system, to reduce isolation and discrimination. This can be done through the encouragement of a formal system and informal networks.
- The rationale for diversity training programs is often misunderstood at all levels. Therefore, it is important to first communicate what diversity is and what the organization hopes to achieve by managing it more effectively.

Results indicated the prevalence of gender and category (racial) discrimination in Indian organizations. Male employees rated female employees less qualified, less competent, and less productive than females rated themselves. General category employees perceived that minority and socially disadvantaged employees were less competent and productive. Almost all employees believed that minority, socially disadvantaged, and disabled employees were provided with comparatively less organizational support in terms of working facilities, promotions, and salary increases. Even females of the general category believed that they had less chance of receiving working facilities, promotions, and salary increases than males from the general category. Further, each category of employees believed themselves to be more important than others. Females from all the categories valued diversity more highly than males. Females from the general category and both males and females from minority, disabled, and socially disadvantaged categories placed higher value on employers' efforts to promote diversity compared with general category males.

CONCLUSION

The extent to which managers recognize diversity and its potential advantages and disadvantages defines an organization's approach to managing the diversity. No organization in this world of globalization would survive without workforce diversity. Diversity is not a case of representation of different nationalities or ethnicities. It is a process of creating greater wealth through increased creativity and productivity. Consistent internal communication and employee education is vital to gain support of all the



stakeholders. It is the duty of the management to critically evaluate the benefits of workforce diversity in their organization. On the other hand, the management should put in place conditions, which would enhance the workforce diversity in their organizations, more especially in their strategies formulation on the diversity of the workforce. Hence, with the diversity of the workforce, the organization would be internally and externally competitive. Although, the process of diversification of organizations has six stages: denial; recognition; acceptance; appreciation; valuing; and utilization. It is believed that organizations should put in place strategies to enhance workforce diversity. In terms of organizational learning, organizations are still stuck on the problem of getting people to value diversity and have not yet determine the ways to utilize and exploit it. It is the approach to diversity, not the diversity itself that determines the actual positive and negative outcomes. Managing diversity in organizations is dependent upon the acceptance of some primary objectives to which employees are willing to commit, such as the survival of the firm. In today's fast-paced work environment a successful organization is one where diversity is the norm and not the exception. Finally, creating a diverse workforce takes time and even longer to reap the benefits. The management and leaders must not lose focus and interest in creating a diverse workforce – due to the lack of immediate returns.

Becoming World Citizens

Competence in the context of actual pluralism will mean being able to participate effectively in a multicultural world but in exchange, the effective managing of diversity will empower managers and employees to develop what Troy Duster calls, “*bicultural competence*.” It means being ‘*bicultural*’ as well as bilingual. It will mean knowing how to operate as a competent actor in more than one cultural world; knowing what is appropriate and what is inappropriate, what is acceptable and unacceptable in behaviour and speech in cultures that differ quite radically from one’s own. Competence in a pluralist world will mean being able to function effectively in contexts people had previously only read about, or seen on television. It will mean knowing how to be ‘different’ and feeling comfortable about it; being able to be the ‘insider’ in one situation and the ‘outsider’ in another. Unfortunately, the beaches of time are strewn with wreckage from the many ships of people that set sail for ports unknown in search of power and unwilling to share it, but who ran into the gale winds of greed and the coral reefs of corruption, and ended their journey drowning in seas of racial despair. Life is a journey we as humans have to take. The going may not be smooth, the set course will not always take us through sunny, tropical waters; and occasionally the storms at sea may deviate us from our desired destination in the 21st century. But how one runs the good ship of the corporation—how one treats the crew (the labour force), how one develops the product (the services), and how one maintains the course (vision, values, mission)—will determine a successful docking at the port of the global economy of the 21st century, or a shipwreck on the beaches of time as a result of exclusion. Managing diversity, then, may very well be part of an on-going process which enables executives, managers, and the workforce to become *world citizens*—persons who are able to transcend their own racial/ethnic, gender, cultural and socio-political reality and identify with humankind throughout the world, at all levels of human need. They are thus a *transcending* people who know no boundaries, and whose operating life-principle is compassion. This is the principle that should be modelled in corporation at all levels, in the process of living diversity. The challenge is great but so is the reward.

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**E-COMMERCE: THE RISE OF E-COMMERCE IN INDIA****Dr. Shailendra Yadav³****ABSTRACT**

The growing penetration of technology such as internet connections, broadband and services like 3G & 4G, laptops, smartphones, tablets and dongles, coupled with increasing acceptance of the idea of virtual shopping, is set to drive the e-commerce eco-system. The e-commerce story in India would surely witness a new world of digitalization in the coming decade, with a host of start-ups emerging to compete with existing players in order to draw benefits from the new and existing markets. Over the last decade, the internet has transformed the way people buy and sell goods and services. Online retail/virtual retail or e-commerce is transforming the shopping experience of customers. The sector has seen unmatched growth especially in the last two years. The acceptance of technology is enabling the e-commerce sector to be more reachable and efficient. Banks and other players in e-commerce network are providing a secured online platform to pay smoothly via payments gateways. Indian consumers have matured over the years and increased their acceptance for various payment approaches such as net banking, mobile banking and prepaid wallets. E-commerce horizon has thus broadened owing to acceptance of online shopping as a safe shopping medium. This paper presents the concepts and definitions of e-commerce as well as worldwide internet users, e-commerce in India, and the future prospects of e-commerce in India.

KEYWORDS**Internet, E-commerce, Smartphone, Wi-Fi, Tablets, and Technologies etc.****INTRODUCTION**

From a buzzword to a current-day reality, e-commerce in India has been experiencing remarkable growth, successfully changing the way people transact. People today can shop literally everywhere within minutes, be it their workstations or homes, and most importantly, at any time of the day at their leisure. The online market space in the country is burgeoning in terms of offerings ranging from travel, movies, hotel reservations and books to the likes of matrimonial services, electronic gadgets, fashion accessories and even groceries.

India is home to 3,311 e-commerce hubs, 1,267 rural hubs, 391 export hubs and 2,217 import hubs [7]. To capitalize on the anticipated growth potential, a host of investors, including venture capital (VC) and private equity (PE) firms are closely eyeing opportunities in e-commerce start-ups. At the same time, the sector is witnessing a swathe of consolidation owing to various mergers and acquisitions. However, industry experts believe this is just the start of the e-commerce wave in India. The growing penetration of technology facilitators such as Internet connections, broadband and third generation (3G) services, laptops, smartphones, tablets and dongles, coupled with increasing acceptance of the idea of virtual shopping, is set to drive the e-commerce eco-system. The e-commerce story in India would surely witness a new world of digitalization in the coming decade, with a host of start-ups emerging to compete with existing players in order to draw benefits from the new and existing markets.

CONCEPTS AND DEFINITIONS

The term e-commerce, it is generally used in the sense of denoting a method of conducting business through electronic means rather than through conventional physical means. Such electronic means include 'click & buy' methods using computers as well as 'm-commerce', which make use of various mobile devices or smart phones. This term takes into account not just the act of purchasing goods and/or availing services through an online platform but also all other activities, which are associated with any transaction such as:

- Delivery,
- Payment facilitation,
- Supply chain and service management.

E-commerce has defied the traditional structure of businesses trading with consumers bringing to the fore various business models which has empowered consumers.

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Electronic commerce or e-commerce refers to a wide range of online business activities for products and services. It also pertains to “any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact.”

A more complete definition is: E-commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals.

Some of the common business models, which are facilitated by e-commerce, are as follows:

B2B: E-commerce has enabled various businesses to build new relationships with other businesses for efficiently managing several of their business functions. B2B e-commerce could comprise of various models, which may include distribution services, procurement services, digital/online market place like services etc. IndiaMART.com is one such B2B online market place, which provides a platform for businesses to find other competitive suppliers. On the other hand, Ariba provides procurement services by providing access to digital electronic market.

B2C: Direct dealings between businesses and consumers have always existed; however, with the emergence of e-commerce such transactions have gained further momentum. In a traditional B2C model, the distribution channel typically starts with manufacturer and goes through a distributor/wholesaler to retailer, who interacts with the end customer. However, in an online model one finds the manufacturer or the intermediary directly trading with the consumer.

- Traditional B2C model,
- Online B2C model,
- Retailer,
- Manufacturer/Retailer,
- Manufacturer,

Most sellers of products or services in the physical medium have begun providing their goods/ services on the internet as well and it is by virtue of this model that e-tailing has become very popular with internet users where a near virtual shop is created with images of products sold. This not only provides cost benefits to the sellers as brick and mortar type of investments are considerably reduced, but the seller is also able to provide benefits to the consumers in terms of discounts and free additions (such as free delivery)

C2C: Traditionally consumers have had dealings with other consumers, but only few of those activities were in a commercial sense. E-commerce has made it possible to bring together strangers and providing a platform for them to trade on. For example, portals such as eBay and Quikr enable consumers to transact with other consumers.

C2B: This relatively new model of commerce and is a reverse of the traditional commerce models; here consumers (i.e. individuals) provide services/ goods to businesses and create value for the business. This type of transaction can be seen in internet forums where consumers provide product development ideas or in online platforms where consumers provide product reviews, which are then used for advertisement purposes.

B2B2C: A variant of the B2C model wherein there is an additional intermediary business to assist the first business transact with the end consumer. This model is poised to do much better in a web based commerce with the reduced costs of having an intermediary. For instance, Flipkart, one the most successful e-commerce portals provides a platform for consumers to purchase a wide variety of goods such as, electronic goods, apparels, books and music CDs. In fact, the growth of this model is evident from the surge in the number of e-commerce players adopting this model in recent times-fashionandYou, Jabong to name a few. Further, apart from businesses providing intermediary services such as that of Flipkart many online platforms tie up with payment gateway facilitators who provide a platform for the processing of payments.

INDIA'S PROSPECTS IN E-COMMERCE

1. **Opportunity for Retailers:** A retailer can save his existence by linking his business with the on-line distribution. By doing so, they can make available additional information about various things to the consumers, meet electronic orders and be in touch with the consumers all the time. Therefore, E-Commerce is a good opportunity.
2. **Opportunity for Wholesalers/Distributors:** In the world of E-commerce, the existence of the wholesalers is at the greatest risk because the producer can easily ignore them and sell their goods to the retailers and the consumers. In such



a situation, those wholesalers can take advantage of E-Commerce who is capable of establishing contractors with reputed producers and linking their business with the online.

3. **Opportunity for Producers:** Producers can take advantages of e-commerce by linking themselves with on-line, by giving better information about their products to the other links in the business chain and by having a brand identity.
4. **Opportunity for People:** As more people are being linked with E-commerce, the demand for center providing internet facility or cyber cafe is also increasing. Hence, the people who wish to take advantage of it can establish cyber and have their benefits.

ESSENTIAL FACTORS FOR GROWTH OF E-COMMERCE IN INDIA

- **Customer Convenience:** By providing Cash on delivery payment option service to customers.
- **Replacement Guarantee:** Should be Offers 30 day replacement guarantee to their customers.
- **Reach:** Enabling mobile-capable sites and supporting M-Commerce services.
- **Location Based Services:** Since customers these days are always on the move, promoting the right product at the right time and location becomes an integral aspect
- **Multiple Payment Option:** standard credit cards, debit cards and bank payments option should be there.
- **Right Content:** Getting the right content and targeting customers with crisp and relevant information is of utmost importance to users on the move.
- **Price Comparison:** Providers offering instant price comparison are highly popular amongst the price conscious customers.
- **Shipment Option:** Low cost shipment should be there. The convenience of collecting orders post work while returning home should be there.
- **Logistical Challenges:** In India, the geographical spread throws logistical challenges. The kind of products being offered by providers should determine the logistics planning.
- **Legal Challenges:** There should be legal requirement of generating invoices for online transactions.
- **Quick Service:** Timely service provided by the company.
- **Terms and Condition:** T & C should be clear & realistic.
- **Quality:** The product quality should be same as shown on the portal.
- **Customer Care Centre:** A dedicated 24/7 customer care center should be there.

LITERATURE REVIEW

Internet economy will then become more meaningful in India. With the rapid expansion of internet, Ecommerce, is set to play a very important role in the 21st century, the new opportunities that will be thrown open, will be accessible to both large corporations and small companies (Waghmare, 2012). Karoor (2012) explained that Ecommerce encapsulates many of the dynamics of 21st century of India. The potential huge, wit, and energy of the entrepreneurs in the sector are impressive. Online commerce in India is destined to grow in both revenue and geographic reach. Ruckman (2012) suggested that Internet research becomes an increasingly important tool during the purchasing process; more marketers are seeing the advantages too. It is a win-win situation. Marketing departments are investing more into online marketing today because it's:

- Attractive to a significant segment of the demographics for most customer profiles. It can effectively reach the target customer.
- Faster and less expensive to conduct direct marketing campaigns.
- Measurable, which means that successes are identifiable and repeatable.
- Open 24-hours a day.
- Cost-effective, in the long run.

Melody and Robert (2001) remarked that the Internet could provide timely information to customers because of its ability for instant communication, and its availability 24 hours a day, 7 days a week (Lane, 1996). On-line marketing offers more choices and flexibility (Lamoureux, 1997) and, at the same time, eliminates huge inventories, storage costs, utilities, space rental, etc., (Avery, 1997). People tend to associate Internet marketing with direct marketing because companies participating in online marketing usually shortened the supply chain [Edwards, et al., 1998] and reduced commission and operating costs.

OBJECTIVES & RESEARCH METHODOLOGY

The main objective of this paper is to discuss an insight in to the concept of e-commerce and its present and future situation in India and the worldwide internet users. The data collected for the study was purely based on the secondary sources from various published books, journals, magazines and from various online sources.

WORLDWIDE INTERNET USERS

Around 40% of the world population has an internet connection today (view all on a page). In 1995, it was less than 1%. The number of internet users has increased tenfold from 1999 to 2013. The first billion was reached in 2005 whereas, the second billion in 2010 and the third billion in 2014. The table and chart below show the number of global internet users per year since 1993:

Table-1: The Global Internet Users

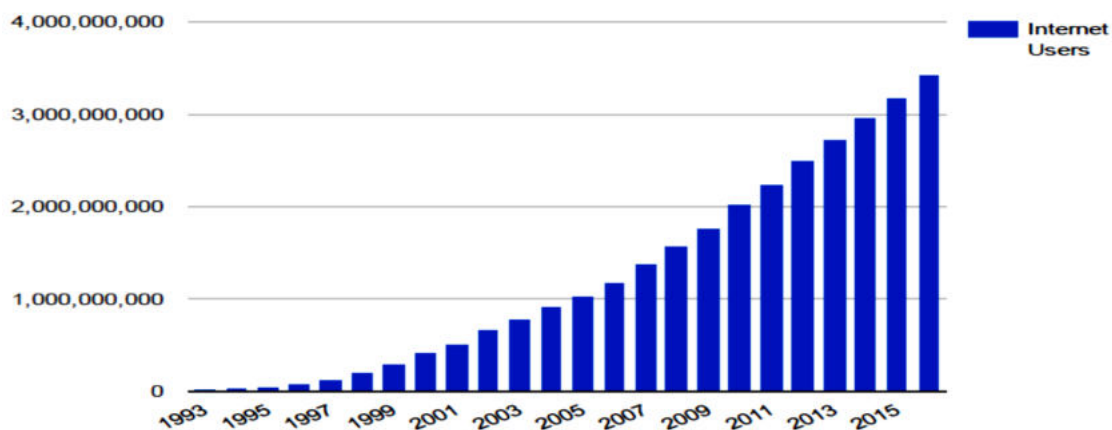
Year	Internet Users**	Penetration (% of Pop)	World Population	Non-Users (Internet less)	1Y User Change	1Y User Change	World Pop. Change
2016*	3,424,971,237	46.1 %	7,432,663,275	4,007,692,038	7.5%	238,975,082	1.13 %
2015*	3,185,996,155	43.4 %	7,349,472,099	4,163,475,944	7.8%	229,610,586	1.15 %
2014	2,956,385,569	40.7 %	7,265,785,946	4,309,400,377	8.4%	227,957,462	1.17 %
2013	2,728,428,107	38 %	7,181,715,139	4,453,287,032	9.4%	233,691,859	1.19 %
2012	2,494,736,248	35.1 %	7,097,500,453	4,602,764,205	11.8%	262,778,889	1.2 %
2011	2,231,957,359	31.8 %	7,013,427,052	4,781,469,693	10.3%	208,754,385	1.21 %
2010	2,023,202,974	29.2 %	6,929,725,043	4,906,522,069	14.5%	256,799,160	1.22 %
2009	1,766,403,814	25.8 %	6,846,479,521	5,080,075,707	12.1%	191,336,294	1.22 %
2008	1,575,067,520	23.3 %	6,763,732,879	5,188,665,359	14.7%	201,840,532	1.23 %
2007	1,373,226,988	20.6 %	6,681,607,320	5,308,380,332	18.1%	210,310,170	1.23 %
2006	1,162,916,818	17.6 %	6,600,220,247	5,437,303,429	12.9%	132,815,529	1.24 %
2005	1,030,101,289	15.8 %	6,519,635,850	5,489,534,561	12.8%	116,773,518	1.24 %
2004	913,327,771	14.2 %	6,439,842,408	5,526,514,637	16.9%	131,891,788	1.24 %
2003	781,435,983	12.3 %	6,360,764,684	5,579,328,701	17.5%	116,370,969	1.25 %
2002	665,065,014	10.6 %	6,282,301,767	5,617,236,753	32.4%	162,772,769	1.26 %
2001	502,292,245	8.1 %	6,204,310,739	5,702,018,494	21.1%	87,497,288	1.27 %
2000	414,794,957	6.8 %	6,126,622,121	5,711,827,164	47.3%	133,257,305	1.28 %

Note: *Estimate for July 1, 2016

** Internet User = individual who can access the Internet at home, via any device type and connection.

Sources: Internet Live Stats (www.InternetLiveStats.com)

Chart-1: Internet Users in the World



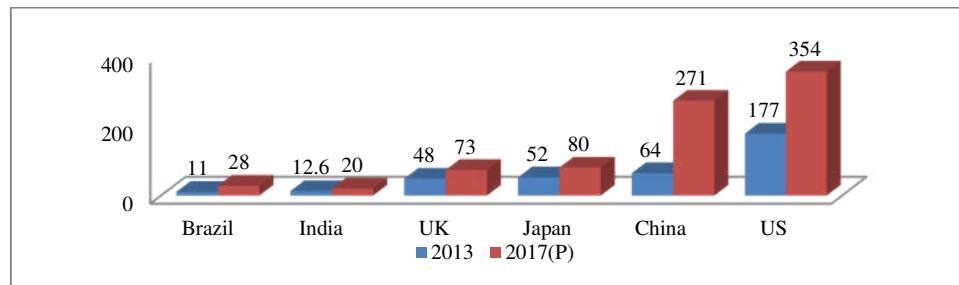
Sources: Authors Compilation

E-COMMERCE IN INDIA

In India, online travel accounts for majority of the sales of the largest segment, B2C. Indian customers are less skeptical in purchasing services such as train and airline tickets online. This enables e-sellers to avoid logistics and delivery issues linked with physical goods. As per 2011 statistics, the online travel sales division captured the biggest pie and accounted for 81.4 per cent of the entire market.

Online travel sites such as Indian Railway Catering and Tourism Corporation (IRCTC) and makemytrip.com have been the most influential and successful in this regard, as these portals save buyers from the travails of waiting in queues. Today, almost 40.0 per cent of the total IRCTC bookings are done online. According to an e-Marketer report titled “BRIC Travel Markets in Transition: Trends Influence Overall Ecommerce”, India is expected to register a CAGR of 30.6 per cent for online travel sales, surpassing the rate forecast for South Korea (19.8 per cent), Brazil (18.2), China (14.1), Russia (9.8), Australia (7.4) and the US (7.2) during 2011-16.

Chart-2: E-Commerce Market In India and Selected Countries (In \$ Billion)



Sources: Compiled from A.T. Kearney and PWC Report

Note: P=Projections

Table-2: E-commerce Players in India

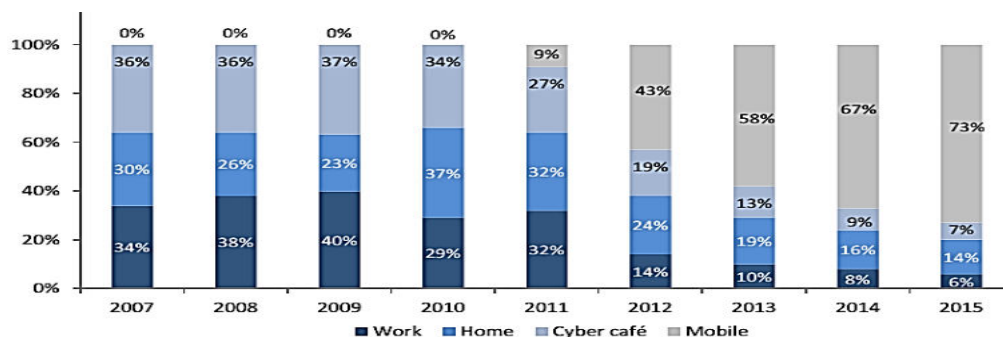
Travel	Real Estate	Fashion	Furniture	Health	Education
- MakemyTrip - Goibibo - Yatra - IRCTC - Cleartrip	- MagicBricks - CommonFloor 99acres - Housing	- Amazon - Flipkart - Jabong - Myntra - YepMe - Zovi - FashionandYou	- FabFurninsh - Pepperfry - Urban Ladder - Zansaar	- Healthkart - LensKart - PorteaMedical	- EduKart - Meritnation - Edureka - Toppr - Embibe

Sources: Authors Compilation

MOBILE SHOPPING

Mobile phones are proving to be an important factor in the e-commerce ecosystem owing to its easy compatibility with the Internet. India has more than 900 million mobile users, of which around 300 million use data services. This number is expected to touch 1200 million by 2015. In addition, more than 100 million mobile users are expected to use 3G and 4G connectivity in the coming few years of the total 900 million mobile users, a meager 27 million are active on the Internet. Moreover, only 4.0 per cent of the active mobile internet users buy products through mobiles. However, mobile shopping is on an upward trend and is expected to increase five-fold to 20 per cent in the medium term.

Chart-3: The Growing Scenario of Internet Usage through Mobile Phones



Sources: World Bank, IAMAI, Aranca Research



CONCLUSION

The changing consumer lifestyles, supported by the younger population base of India, have given a boost to the e-commerce business. More than half of the total 1.2 billion population of India falls under the 'below 25 years of age' bracket. In addition, 65.0 per cent of India's population, representing the working age group of 15 to 64 years, would aid the further growth of e-commerce, driven by their rising disposable income. Notably, discretionary spending in India is expected to jump. In addition, the growing inclination towards purchasing online is reflected in a trend for higher value online transactions. Shoppers are ready to shop for values exceeding \$500, which earlier hovered in the range of \$40-100. There are various segments that would grow in the future like Travel and Tourism, electronic appliances, hardware products and apparel. There are also some essential factors which will significantly contribute to the boom of the E-Commerce industry in India i.e. replacement guarantee, M-Commerce services, location based services, multiple payment option, right content, shipment option, legal requirement of generating invoices for online transactions, quick Service, T & C should be clear & realistic, the product quality should be same as shown on the portal, dedicated 24/7 customer care center should be there.

The Indian Government has approved projects for providing broadband connectivity to the local and village level government bodies (i.e. the Gram Panchayats). The Government's plan is to enable broadband connectivity at the rural levels. [8] This is further likely to boost e-commerce in India.

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**DIGITAL WALLET: THE COMPLETE FUTURE PAYMENT SOLUTION****Dr. Subodh Kesharwani⁴ Dr. Ritesh Saxena⁵ Vivek Kumar⁶****ABSTRACT**

This paper explores the concept of digital wallet, its evolution and necessity in the present information age. The paper endeavours to understand the competition in the market, which is becoming highly aggressive, due to the rapid rise in the penetration of smart phones. By presenting a SWOT analysis and insight in to the competitive scenario of digital wallets, an effort is made, to understand the dynamics of this large and diverse market and how to differentiate the strategy to increase customer reach and sustain customer engagement. The future of digital wallet lies in developing compatible capabilities with other e-commerce / m-commerce partners. Thus, an attempt is made through this paper to extract the opinion of regular customers/users to deduce suggestions for its successful operations.

INTRODUCTION

With the advent of information technology and digitalization, the concept of value was transferred from physical objects like coins and or currency notes to plastic cards with magnetic strip carrying unique personal information for identification. The plastic card enabled access value through a global network of automatic teller machine (ATM) and EFTOPS devices.

However, the plastic card could not fully address the problem of safety and security. It only lessened them largely and brought forth some related problems like loss of cards, fraudulent usages and so on.

Internet provided full freedom from physical presence and added a new dimension to human mobility and ability to identifying themselves an access their items of value from any geophysical location that is connected to the network. These access devices include personal computer, mobile phone, smart phone, personal digital assistance (PDA's), games consoles and internet appliances. Mobility, connectivity and access have become a necessary element for human and business transactions in virtual space. Therefore, the digital wallet has made its appearance, which is omnipresent. The digital wallets are free from the constraints of physical world, which is the pre-requisite for today's business environment

HISTORY AND BACKGROUND

With the passage of time, the methods of payments have evolved and graduated to provide us a speedy, effective and efficient means for exchange of value that is safe, secure and mobile keeping a pace with the macroeconomic environment. A chronological process of evolution is traced that had started reportedly begun with Barter.

Barter was the initial form of exchanging goods and services in an agrarian society. The exchange mechanism in barter is limited in scope and use, as it does not provide for an accurate valuation of goods that are being exchanged. Barter is also limited to the local conditions of the specific society.

The problem experienced by barter exchange was somewhat lessened by the use of coins. Coins were made of precious metal, which encapsulated the values of the coins. They were means of value substitution and provided an improved means of exchange. The major problem with use of coin was the difficulty of its weight (heaviness) and its recognition for cross border transactions.

The recognition of identity, exchange of value, even during the absence of bearer was posing a fundamental issue, which were addressed by promissory notes. Promissory notes, promises to pay the holder a particular value for which it is settled in currency. It does not require the physical presence of the holder as the value may be transported without him through a negotiable instrument, multiple times, before an expiry date. Cheques are also a form of promissory note, which is routed through a financial institution and is still a very popular payment instrument in circulation.

Bills of exchange are another type of promissory note, which is strengthened for trust by introducing a third party into the loop. The mechanism facilitates the exchange of value without any existing relationship or physical meeting using the third party intervention. This expands applicability of the instruments even for international trade. However, this risk taking activity undertaken by the third party or financial institution involves a transaction cost.

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The existing means of authentication are device dependent. The need to move on to network dependent authentication, brought plastic cards into existence. The credit/debit cards are where payments are electronically effected. The instrument has gained sufficient popularity as it provides a security solution, often complimented by signature or PIN number for authentication, through which currency conversion may be performed in real time.

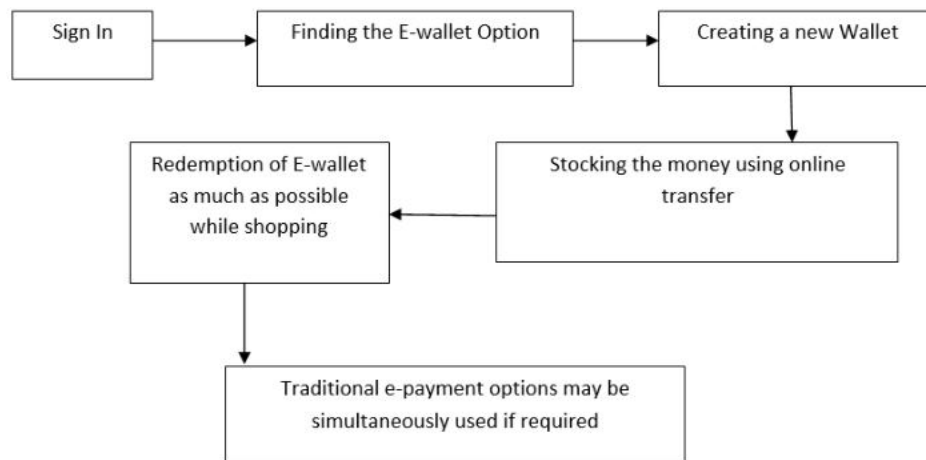
Plastic cards had limitations in terms of value and capacity. Cards that stored value cards with greater storage capacity are known as Smart Cards. The values may be held and dispensed in transaction through smart cards. However, the lack of smart card reading devices at every internet access point hinders its usages.

Electronic payment instruments are the latest form of payment instruments, where digital instructions are provided to the financial institution to effect a transaction (credit or debit). However, an effective and efficient security layer is necessary to be built in for safe and secure payment option and to protect the fraudulent practices.

Digital wallet is much the same as the physical wallet only with the difference of its virtual presence and security parameters. It is an online-prepaid account where money is stocked, to be used when required. A digital wallet is based on encryption software that substitutes for analog wallet during monetary transactions. One may buy a horde of products varying from grocery to travel tickets without swapping a credit/debit card. Most of the online e-marketing sites provide digital wallet as an alternate payment option alongside the traditional methods of virtual payment options. Some of the popular wallets are Google, Visa, and MasterCard, Verizon, Apple, AT&T, PayPal and Square.

“A digital wallet spares the cumbersome activity of typing a 16 digit PIN number. Most of us now own smart phones and experts say that number will continue to rise. More and more of these phones are equipped with NFC (Near field Communication) chip, which is a vital component to the mobile digital wallet infrastructure. It was estimated that around half of the smart phones could have NFC by the end of 2015.” [Source: USA today]

Figure-1: Working of a Digital Wallet



Sources: Authors Compilation

DIGITAL WALLET OVER TRADITIONAL WALLET

Digital wallet has a number of advantages over its traditional counterpart in terms of easy handling, safety, security and efficiency. The comparison of digital and traditional wallet is as follows:

Table-1: Comparison of Traditional and Digital Wallets

Traditional Wallet	Digital Wallet
It is used for safekeeping of cash, credit/debit/loyalty cards.	A prepaid account used for e-payment.
Risk of safety.	Multilayer security mechanism.
Difficult to carry.	Highly convenient. It works through apps.

Sources: Authors Compilation

SIGNIFICANT DIGITAL WALLET PLAYERS

Table-2: Significant Digital Wallet Players

Types of Digital Wallet Players	Examples
Mobile Platform provides	Google , Apple
Merchants/ Retailers	Walmart, Target, Starbucks
Payment Providers	Visa, Master card, Discovery
Mobile Network operations	Sprint, Varizon, T-mobile
Banks	US Bank, Bank of America
Software start-ups	Square, ISIS

Sources: Authors Compilation

Figure-2: Significant Digital Wallets - By Types



Sources: FNB – E-wallet – www.fab.co.za as on 17-10-2015

TYPES OF DIGITAL WALLET

Wallets as on today may be classified into two broad **function based** categories.

Client Side Wallets: The user maintains the client side wallets him/her self. The user may download and install a program and then enters his/her relevant payment and shipping information. All these pieces of information may be stored onto personal computer that is checked out vis-à-vis a compatible website.

Server Side Wallets: In a server side wallet, the digital wallet maintained by a company that supports the digital wallet. The server side wallets have an edge over client side wallet in terms of standardization. Since, an independent company develops the wallets; it offers a greater degree of standardization and security mechanism. For example a V-me account which is a server side digital wallet works with Visa card, Master card, Discovery and many more.

RESEARCH METHODOLOGY

The present paper has used both primary and secondary data to understand the present scenario of DIGITAL WALLET in India. A SWOT analysis has been undertaken with the help of published material through internet, magazines and newspapers.

Telephonic interviews have been conducted with 18 sample respondents. This source has been used for professionals who refused to meet in person due to their busy schedule. WhatsApp has been used with 26 respondents for a quick snapshot of their knowledge regarding digital wallet. The focus here has been to cover youngsters who have maximum craze to make quick payments without any hassle and are always short of time. 48 respondents were asked to fill an online questionnaire via e- mail. This data has been collected to investigate about digital wallets in a formatted manner. In addition, it helped in collecting data in a systematic and organized layout. Thus, the total sample size turned out to be 92. This sample has been randomly chosen from Delhi-NCR region. This sample seemed sufficient as the people in the age group dominated it 18-30 years who may be maximum users of digital wallets. However, the same set of primary survey could be done on an enlarged sample from different set of cities. The output obtained from various sources has been presented in the segment “Findings and Interpretation” in this paper.

TECHNOLOGIES EMPLOYED WITH DIFFERENT WALLET TYPES

Technologies employed for the above functionalities of wallets are as follows:

Table-3: Technologies Employed for Various Digital Wallet Types

Technology	Strength	Weakness	Notable Deployments
NFC	- New technology. - Easy product Integration. - By 2015, more than 25% of the phones will be NFC enabled.	- Not available on all phones. - Users have not yet accepted it as a standard payment method.	- ISIS Mobile Wallet - Google Wallet - Orange Wallet - Boku mobile Wallet
Cloud	- Low upfront cost. - No consumer device required. - Leverage existing payment terminals.	- Limited Provider choices - Strong association with online channels. - Trust issues could inhibit adoption.	- PayPal (Home Depot, Hollister, Jos. A bank) - Lemon Wallet
QR Code	- Low upfront cost - Works on almost all OS and devices. - Leverage existing imaging solutions at POS.	- Generally weaker security. - Lack of standards. - Not recognized form of payment. - Easily erasable and damageable.	- Starbucks - LevelUp - Dunkin Donuts - Apple passbook.

Sources: Electronic Wallet: Past, Present and Future – Brent Clark, www.gpayments.com, as on 18 October 2015

Figure-3

Wallet Name	NFC	QR Code	Other
Allied wallet	✓		
PayPal			✓
Bank of America mobile wallet		✓	
Paydiant mobile wallet			✓
Boku Mobile Wallet	✓		
Ericsson Wallet Platform			✓
Firethorn Pay			✓
FIS Mobile wallet			✓
Google Wallet	✓		✓
Isis Mobile Wallet	✓		
Lemon Wallet			✓
Level UP		✓	
Apple's Passbook		✓	✓
Square		✓	✓

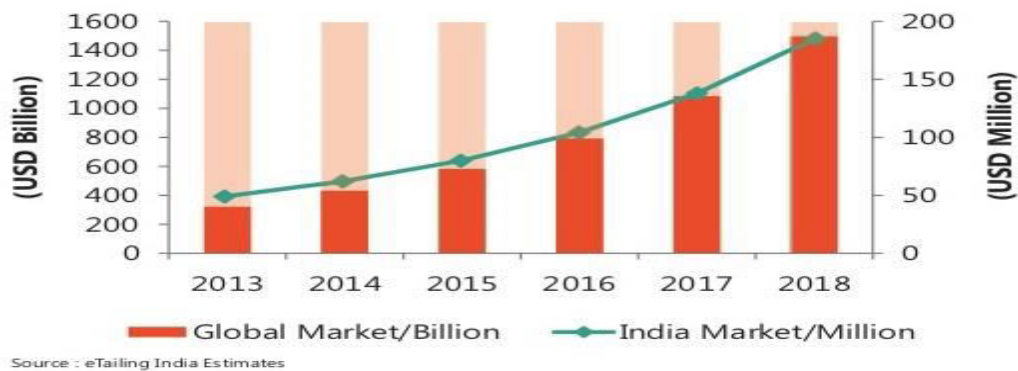
Sources: Electronic Wallet: Past, Present and Future – Brent Clark, www.gpayments.com , as on 18 October 2015

COMPETITIVE SCENARIO

The digital wallet market is extremely crowded and confusing, especially for the consumers. This makes the entire scenario highly competitive. This is especially true for NFC based wallet, because only few wanders are equipped to except that form of payment. The obstacle to NFC, in addition to business model wrangling and no holds barred competition means that it will be a while before one can ditch the old wallet in favour of a digital one. [Source: Wired]

In US PayPal dominates the market followed by the Google Wallet and Master Card, PayPass Wallet. In Europe EE Master Card, PayPal and Visa are the key players. E-server Global Master Card, MFS Africa, Western Union and World Remit are some of the key vendors in the African market. Asia Pacific market is dominated by DIMOCO, PayOne, Monitise and Freedom Pay etc.

Figure-4: IG-3 Digital Wallet: Competitive Scenario



The global market for mobile wallet is projected to reach USD 1497.2 billion by 2018. Whereas, the Indian market for mobile wallet is projected to reach USD 185.4 million by 2018.

Sources: Authors Compilation

SWOT ANALYSIS

Table-4: Showing SWOT Analysis

Strength - Liquidity - Time saver [Count the change crisis] - Security [Wipe data when stolen] - Mobile [Access data anywhere] - Light [No need for physical wallet] - Interactive [Easy/ fun to use/ share] - Attractive Discounts - Comprehensive [Track Report]	Weakness - Fragile[its not paper] - Exhaustible [Battery / Software problem] - Cyber Breach [Wireless data access] - Identity theft [Easy steal the phone] - Untouristy [Tourists of other cultures] - Untraditional [takes time to adapt]
Opportunities - Promising (Next form of payment) - New markets (Emergence of apps etc.) - Interactive marketing - Implementation (NFC technology) - E-wallet (Cell phone industry shift) - New and improved security measures - Call carriers (Can be as deal brokers) - Personalized fair information practice	Threats - Consumer privacy and data secrecy - Consumer freedom - Laws and Regulations (Not ready) - Personal Phone (Friendship crisis) - Unwanted electronic advertisement - Payment - Data scrapping - Limits phone usage (Personal information) - Tracked (You ; When, where)

Sources: Authors Compilation

CONSUMER ANGLE IN DIGITAL WALLETS

In a quest to make headway into the market, the digital wallet companies will need to educate the consumer to adopt and use their products. The companies may be bringing in significant investments in their technology and advertising efforts. However, making the consumer adoption and retention is a critical success factor that may yield a substantial return on their investment (ROI). According to a Gallup analysis, there are three types of consumers.

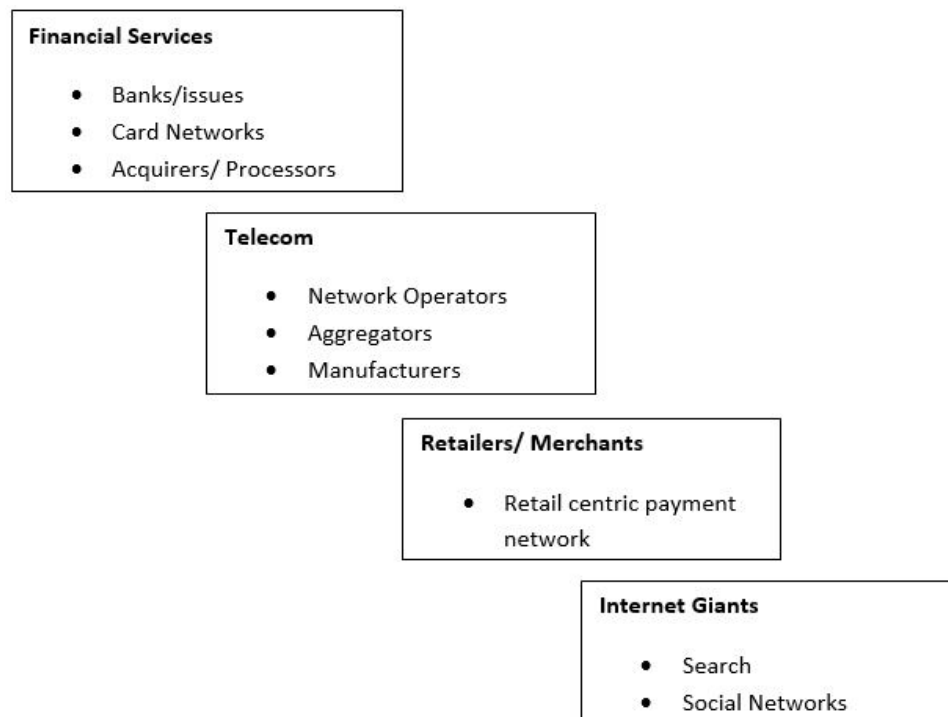
Fully Engaged: Customers are emotionally attached and rationally loyal. They will go out of their way to locate a favoured product or service, and they would not accept substitutes. True brand ambassadors, they are companies most valuable and profitable customers.

In Different: Customers are emotionally and rationally neutral. They have a take-it-or-leave-it attitude towards company's products or services.

Actively Disengaged: Customers are emotionally detached from a company and its products or services. They will readily switch brands.

STAKE HOLDERS IN DIGITAL WALLET MARKETS

Figure-5: Stake Holders in Digital Wallet Market



Sources: Authors Compilation

DIGITAL WALLETS: THE INDIAN SCENARIO

India is standing at the cusp of digitally innovative payment solutions. With the rapid rise of smart phones users, app based shopping and payment solution, is gaining popularity. There are many active digital wallet players in India like Pay tm, Mobiwik, PayU, Oxigen etc. These are the first entrants into the digital payment solution market, whose success story has motivated many more to test the waters. Many of such players are in the process of collaboration with the existing players, in order to leverage the experience gained by these first entrants. Some of the second line innovators who are expected to launch their products are as follows:

Snapdeal: Launched its payment gateway Klickpay, this year. It is an online support payment option Snapdeal's web portal. Snapdeal seems to be in the process of floating its unique digital wallet solution soon.



Quicker: Quicker has updated its services to include buy (and pay) through quicker. It seems Quicker is also in the process of launching its own digital wallet services for cash replacement.

Book My Show (BMS): Book My Show is an online ticketing platform for movies, events and more. BMS has a payment solution by the name "Quick Pay" that stores payment card details, supported by 2-factor authentication during payments. Quick Pay may soon be converted into a full-fledged wallet solution.

Paytm: Paytm has recently introduced its much-awaited completely dedicated mobile wallet app. It may be used for various activities like transfer money, request money, store money and make online payments. Attractive discounts may be redeemed, offered by different merchant partners. Paytm credits are a prime source of payment for Uber in India.

Quick Wallet: Liv Quick technology Pvt. Lt. has pioneered to bring one of its complete wallet solutions in India. The add on offered by the company are check in at partner merchants, handles billings, offers loyalty points. The wallet stores the transaction details and may initiate payments via QR-code scan or NFC.

FUTURE OF ELECTRONIC WALLET

The future of digital wallet envisages, it as a personalized portal for each individual. Following are some of the functions that are expected from the digital wallets.

Online shopping from mobile electronic devices: Digital wallet ought to make purchases through mobile digital devices (smart phones) hassle-free. The digital wallet also must update the mobile devices by minimizing the clicks required for online purchases from these devices.

Bill Payment: Future wallets are to be used for all kinds of bill payment on behalf of the user. The payment of electronic bills/invoices may be scheduled at different intervals of time, for payment on or before the due date.

Price Comparison Shopping: the user at any internet access point may undertake comparative shopping (Shopping of various products offered on P line/off P line by different vendors). The price, vis-à-vis feature comparison may be possible from device, while shopping at any geophysical location.

Loyalty Redemptions: The digital would offer real time reporting of loyalty points accrued by the customer, under different loyalty schemes. This will provide a competitive edge for buyers as well as sellers and may lead to convergence of loyalty points, adding to the popularity and acceptance of the product.

Wireless Purchases at Physical Stores: The consumers may carry out the purchasing at physical stores, while the wallet is safely installed on an infrared or blue tooth device. The software will retrieve the consumer's personal information (credit card no etc.) from the network and transmit the same to the point of sale unit.

Personal Information Access: All the personal information would be stored in the digital wallet like driving details, medical, insurance, investment, reporting etc. In fact, this will act as one single personal portal containing all relevant information of the consumer.

Pre-emptive Purchasing: The future digital wallet may pre-empt the purchasing based on the information of past purchasing processes, habits and may act as a reminder.

Person to Person Payments (P2P): The Wallet enabled systems once installed on mobile devices would make person-to-person payment in the physical world possible with greater speed and security.

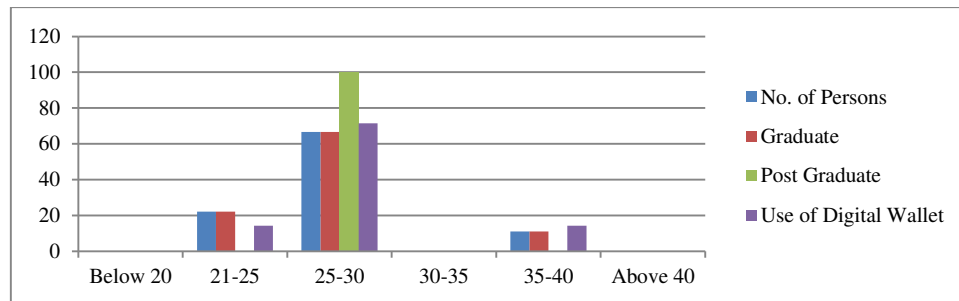
Customized for Internet Appliances: The digital wallet will be able to access plug in functionality, specific to the device it will run on. For example: A wallet plugged in on an internet fridge may be able to detect item which need to be re-stocked and pay for these at the supermarket. Similarly, a wallet plugged in on a set top box may pay for the cable and satellite TV charges.

FINDINGS AND DATA INTERPRETATION

This segment presents the output through three sources; telephonic interviews, WhatsApp and e-mail. The WhatsApp interview focused on finding relationship between education, job profile (Government/Private) and use of digital wallet with the different age groups. Around 33% respondents were in private job, 44% were in Government job and around 23% were student category.

WhatsApp

Graph-1: Showing Percentage Distribution of Respondents Obtained through WhatsApp

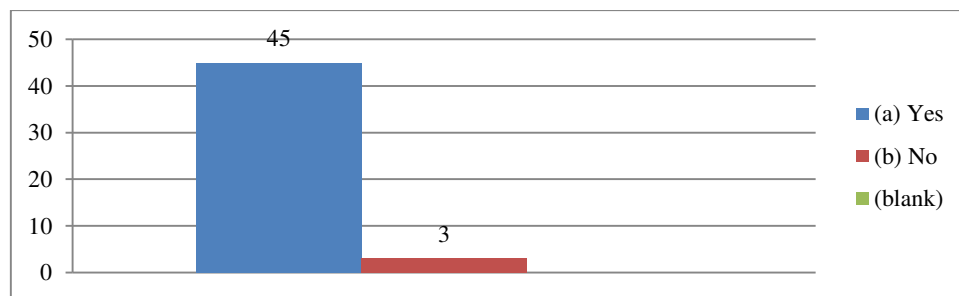


Sources: Authors Compilation

Graph-1 shows percentage distribution of 26 respondents who were contacted through WhatsApp. People in the age group dominated this group of respondents 25-30 years. It was depicted that respondents with a higher educational background had a greater tendency to use digital wallet. Job profile however did not make much difference in using wallet.

E_mail

Graph-2: Showing Responses Regarding Knowledge of Digital Wallet

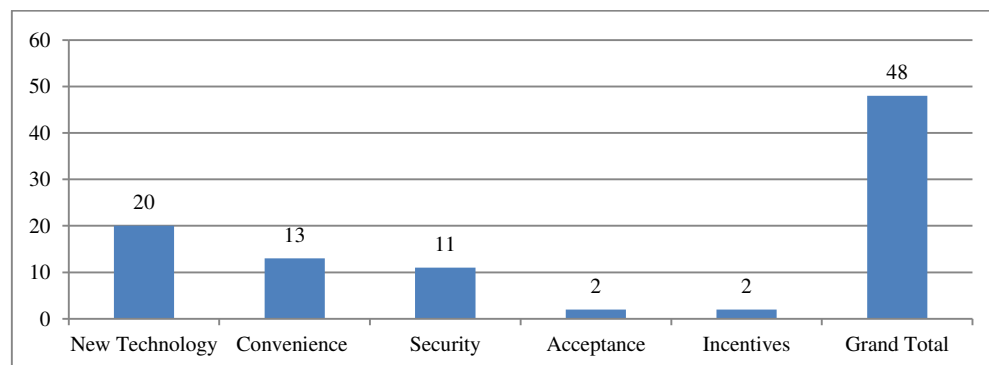


Sources: Authors Compilation

48 respondents were sent a questionnaire related to digital wallet consisting of 10 questions. Out of 48 respondents, 13 were female and 35 male. Data was dominated by the age group 18-30 years. Their responses have been interpreted with the help of graphs below:

As presented in graph-2 above, maximum respondents (45) had awareness regarding digital wallet. This shows that digital wallet may be a popular source for making payment by these respondents.

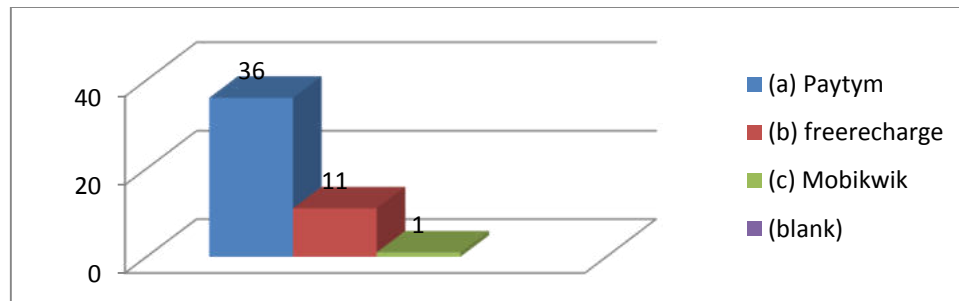
Graph-3: Showing reasons behind use of Digital Wallet



Sources: Authors Compilation

Graph-3 above shows probable reasons for using digital wallet by respondents. It has been found from the analysis that people use digital wallet more because of the fascination for a technological novelty and convenience of usage. 11 respondents however also gave security as a major reason for using wallet, which may be contradictory with its issues where safety / security may be one of the fear factors for not using wallet.

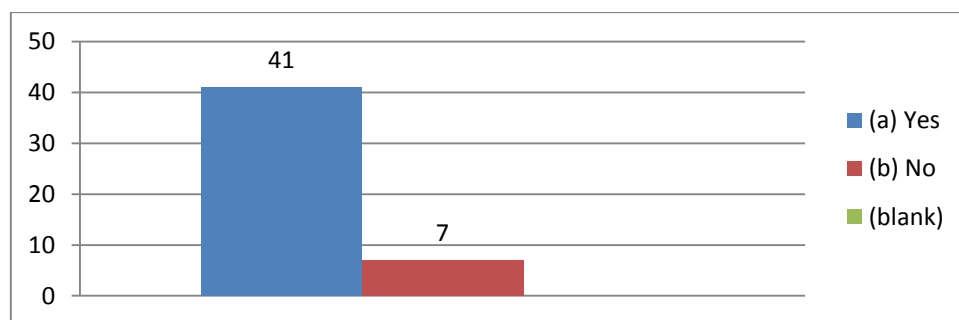
Graph-4: Graph showing Examples of Digital Wallet



Sources: Authors Compilation

The above graph-4 shows distribution of respondents using various modes of digital wallets. Paytm has been found to be the most popular one among respondents. Mobikwik was the least popular one.

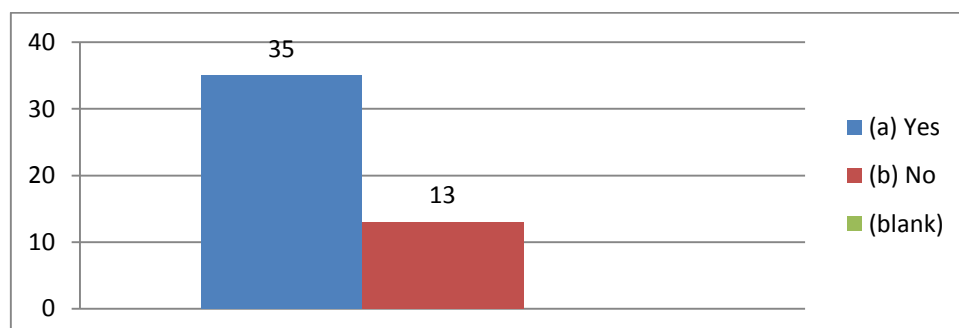
Graph-5: Showing User-interface Satisfaction



Sources: Authors Compilation

Graph-5 shows that 41 respondents were satisfied and happy with the way wallets were available for use.

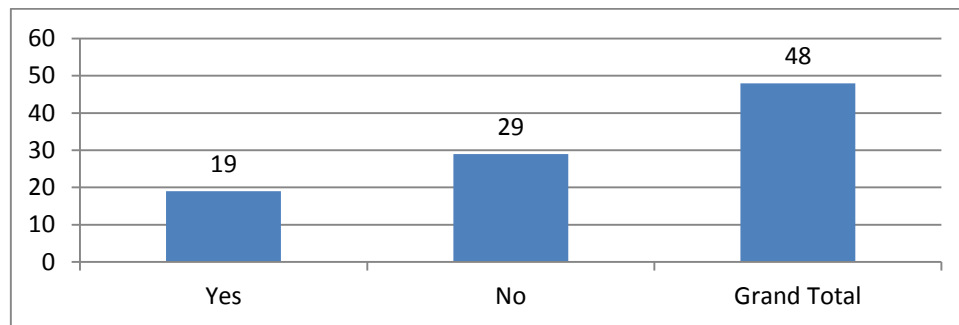
Graph-6: Showing Comparison between Wallet Offers and Website Offers



Sources: Authors Compilation

The above graph shows that 35 respondents strongly felt digital wallets to be better in terms of offers as compared to websites.

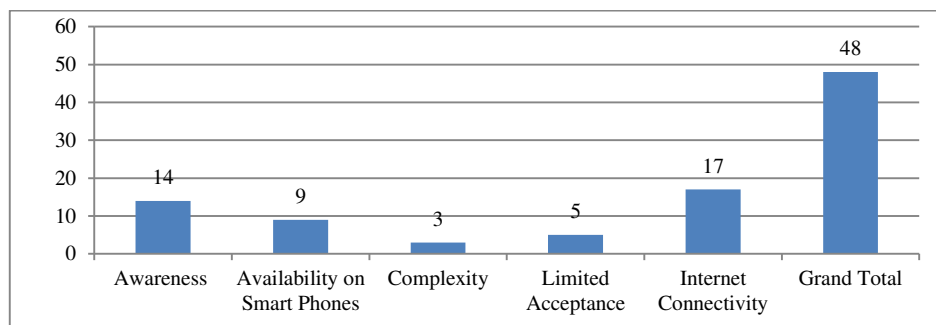
Graph-7: Showing Acceptance by Local Vendors



Sources: Authors Compilation

The above graph shows that there were not even 50% local vendors who accepted digital wallet as a mode of payment.

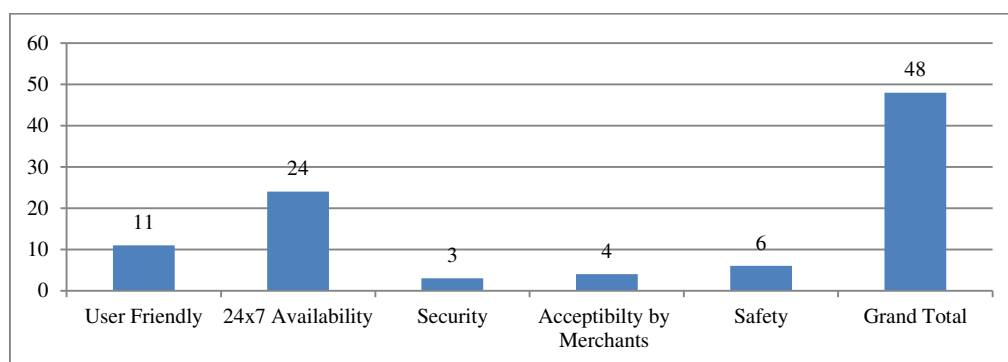
Graph-8: Showing Major Issues regarding Usage of Digital Wallet



Sources: Authors Compilation

From Graph-8, it can be deduced that (lack of) awareness and internet connectivity problem are the issues, while using digital wallets. The unavailability of Smart phones may be one of the other major reasons, as the same is not available with everyone.

Graph-9: Showing Popularity Reasons of Digital Wallets



Sources: Authors Compilation

Graph 9 depicts that the most common reasons for the popularity of digital wallet has been it is round the clock availability. Other reasons could be its easy use and customer friendliness.

Telephonic Interview Excerpts

18 respondents were contacted over telephone due to their busy schedule and non-availability on email. These respondents were majorly in the age group 35-40 years and most of them were working in reputed organizations whether private or public. Their



responses however were very quick over digital wallet, which reflected their active usage and knowledge about them. The major issues, which they faced, were related with internet connectivity and vendor acceptance.

CONCLUSIONS

It may be said that Digital Wallet has been accepted worldwide as a mode of payment. In the present analysis and survey, it has been observed that Indian customers use it because of novelty of technology and convenience. However, it has also been found that Paytm is the most popular mode of digital wallet. Men use it more frequently as compared to women. Free charge was observed to be more popular than Paytm among females. Most of the users though were satisfied with friendliness of the product. However, the major challenge lies in the acceptance of wallet payments by local vendors. The significant reason among all for increasing popularity of digital wallet was found to be its 24x7 availability

The electronic wallet is going to be the virtual reality of future business transactions. It would be an online representation of the customer in a virtual space, which may be accessed from any internet access point and will undertake almost all e-commerce/m-commerce transactions on behalf of the consumer.

However, building customer engagement and sustaining retention is the key to the success and popularity of digital wallets, which will win digital wallet companies a greater share of the pie and profitable returns on their investment.

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THE RISE AND BIG FALL OF YAHOO: MISSING OUT SOME BIG TICKET OPPORTUNITIES

V. Hemanth Kumar⁷ V. Narendhra⁸ B. Masthan Baba⁹

ABSTRACT

“YAHOO!”- The name that does not need special introduction. The name, which is strongly penetrated into the minds of the web users. It has persuaded many people from all over the world to start their journey in Dot.net with its web portal, search engine and messenger. From the inception, the company has seen many difficulties. The company has two big opportunities to acquire another major IT giant Google, but was not successful. Now the organization itself is been acquired by another techie Verizon. Over a decade back the company has reluctantly rejected the big offer from Microsoft and now it is been sold for one tenth of its old offer. Our study focuses on the reasons and consequences of this acquisition, the situations that were responsible for the fall of this IT major and how the Company has miserably failed in tapping key opportunities.

KEYWORDS

Opportunity, Leadership, Decision Making, Organization etc.

INTRODUCTION

Yahoo Inc. also popularly known as Yahoo. It is a multinational technology company, which is, head quartered in Sunnyvale, United States of America. It is one of the popular sites of United States. ^[1] It is globally known for its web portal, search engine Yahoo search, Yahoo mail, Yahoo news, Yahoo finance, Yahoo answers, advertising and video sharing. ^[2] With over seven billion views per month, it was the fourth most visited website globally for highest read news and media, as of June 2015. ^{[3][4]} Yahoo was founded by Jerry Yang and David Filo in January 1994 and was incorporated on March 2, 1995. ^[5] From then the company grew very fast in 1990's. Yahoo was the most popular starting point for web users. ^[6] The company has also made high profile acquisitions. The company was having 10400 full time employees as of 2015, down from 11,700 employees in 2012. ^[7]

The rise of Yahoo: From the inception, yahoo grew rapidly throughout the 1990s and diversified into many markets. Yahoo stock doubled in price in the last month of 1999. ^[8] On January 3, 2000, at the peak of the dot-com boom, Yahoo stock closed at a high of \$118.75 per share. Few days later, shares in Yahoo Japan became the first stock in the history of Japan to trade at over ¥100,000,000, reaching a price of 101.4 million yen (\$962,140 at that time) ^[9] On June 26, 2000, Yahoo and Google signed an agreement which would tap the Google engine to power searches made on yahoo.com. ^[10] It was the twist of the millennium, and Dot.com craze taken the internet company's valuation well over US\$100 billion in the year 2000. ^[11]

Key Acquisitions of Yahoo: From 1997 to 2015, the company has acquired 114 companies from all over the world. Among them the key acquisitions are:

Table-1

S. No.	Date	Company	Value (in US\$)	Derived Product
1	April 1,1999	Broadcast.com	5,700,000,000	Yahoo!MusicRadio ^[12]
2	December,1998	Hyperparallel	8,100,000	Yahoo! Search ^[13]
3	May 27,1999	Encompass	130,000,000	Yahoo! ^[14]
4	May 28,1999	Geocities	3,600,000,000	Yahoo! Geocities ^[15]
5	June 2,1999	Online Anywhere	80,000,000	Yahoo!TV ^[16]
6	June 30,2000	VivaSmart	8,900,000	Yahoo! Shopping ^[17]
7	August 31,2000	E Groups	432,000,000	Yahoo! Groups ^[18]
8	February 12,2002	HotJobs.com	436,000,000	Yahoo! Hot Jobs ^[19]
9	June 14,2003	OvertureServices	1,630,000,000	Yahoo!SearchMarketing ^[20]
10	September 17,2007	Zimbra	350,000,000	Zimbra ^[21]
11	May 17,2013	Tumblr	1,100,000,000	Tumblr ^[22]
12	July 31,2015	Polyvore	160,000,000	Polyvore ^[23]

Sources: Authors Compilation

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Yahoo got an opportunity to acquire Google for US\$1 million in 1998 and the offer came from Google founders Sergey Bin and Larry page. Nevertheless, Yahoo was not ready to execute the offer ^[24] and today considering email and other services yahoo is nowhere in the internet landscape. Google and its parent company, Alphabet are valued at nearly US\$500 billion. In 2002, the founders of Google again approached Yahoo to raise funds for Google's expansion. Investing US\$3 billion that time in Google would have got Yahoo a majority of stake in Google. However, Terry Semel refused the offer, as they were very confident in building a search engine that would strongly compete with Google ^[25].

Though Yahoo missed several big opportunities, it was one of the companies that defined internet. In addition, it was pioneer of Dot.com era and was valued over US\$100 billion.

REVIEW OF LITERATURE

Management: Management is the process of designing and maintaining an environment in which individuals working together in groups efficiently accomplish selected goals (Harold Koontz, Heinz Weihrich). All managers carry out the managerial functions of planning, organizing, staffing, leading and controlling. Management applies to any kind of organization and it applies to managers at all organizational levels.

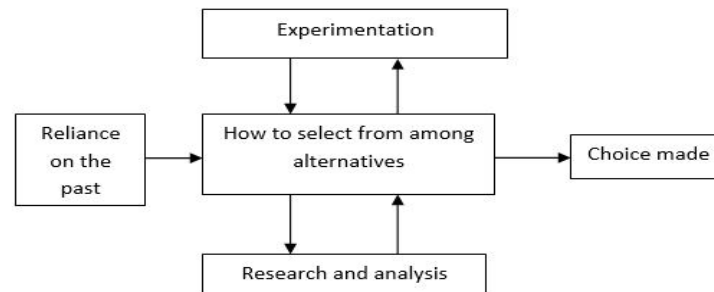
Organization: Organization implies a formalized intentional structure of roles or positions (Harold Koontz). To list some characteristics which makes an organization a healthy organization are ^[26]

- Effective sharing of goals,
- Team work,
- High employee morale,
- Leadership,
- Handles poor performance,
- Understanding risks,
- Adapts to opportunities and changes,
- Clearly defined structure.

Decision Making: A decision-making is defined as the selection of a course of action from among alternatives (Heinz Weihrich). The characteristics of good decision include ^[27]

- Good decisions positively impact others,
- Good decisions are replicable,
- Good decisions tap opportunities,
- Good decisions include others,
- Good decisions are executable,
- A Good decision is systematic,
- Good decisions are accountable.

Figure-1



Sources: Bases for selecting from among alternative courses of action – “Essentials of Management by Harold Koontz, Heinz Weihrich”.



Leadership: Leadership is defined as influence, that is, the art or process of influencing people so that they will strive willingly and enthusiastically towards the achievement of group goals (Harold Koontz, Heinz Weihrich). The characteristics of a good leader include honesty, delegate, and communicative, confident, committed, positive attitude, creative, intuitive and inspiring ^[28]. The big fall of Yahoo: Missing out big-ticket opportunities.

Management Decisions: Jerry Yang and David Filo founded Yahoo in the year 1994. Since then the company was having good management control. The management of 1990's did their best to take lead in the Dot.net era. Yahoo has acquired key companies and proved its existence strongly. However, things were worsened after 2000. Slowly they started losing key leadership in the internet market and the competitors have dramatically overhauled the company. To note few are:

- Yahoo mail lost to Gmail,
- Yahoo answers lost to Quora,
- Flickr lost to Instagram,
- Yahoo search lost to Google search.

Few key missed opportunities and management decisions lead to the fall of Yahoo. Among them, few are Missed Opportunity to buy Google:

In 1998 and 2002, the company had big opportunity to buyout Google. However, the management ideas were different and they were planning to have their own search engine. In addition, the two times the company has rejected the offers from Google. Later Google with its trending innovations has become a dominating competitor for Yahoo. In February 2016, the valuation of Google had crossed more than US\$500 billion.

Missed Opportunity to buy Facebook: In 2006, Yahoo was almost nearer to acquire the popular social networking site Facebook for US\$1 Billion. However, Yahoo lowered its offer to US\$850 Million due to flattering stock price, which made Facebook CEO Mark Zuckerberg walk away from the deal. ^[29] Facebook market valuation in April 2016 was US\$350 billion (Paul R. La Monica). ^[30]

Rejecting Microsoft Buyout Offer: In 2008 Yahoo's board rejected the US\$44 Billion buyout offer from software giant Microsoft, who were eager to compete with Google. In 2016, the same Yahoo was sold to Verizon for one tenth of Microsoft's offer US\$4.4 billion.

Acquisition Mistakes: Some acquisitions did not favour Yahoo in the market, which includes acquiring Flickr, Tumbler and Broadcast.com. Despite putting huge investments acquiring them, the company did not get any benefit.

Reducing the stake in Alibaba: In 2005, Yahoo purchased 40% stake in Chinese e-commerce site Alibaba for US\$1 billion, which is considered one of the smartest investments in the history. October 2014, Alibaba was worth more than US\$230 billion ^[31] and is still growing. Therefore, the stake of Yahoo in Alibaba should be worth US\$92 billion. However, in 2012, Yahoo sold a 20% stake back to Alibaba for US\$7.6 billion. Further, in 2104 they sold more. ^[32] Today Yahoo owns 15% of Alibaba, which is worth US\$35 billion. That asset alone is as much as Yahoo's internet business.

Lack of Leadership at the Top: Since 2009, there were 5 CEO changes in Yahoo, who were all professionals and experts in running core businesses of bigger MNCs, but could not stop fall of Yahoo. In addition, none of their decisions worked in the Yahoo's descent. CEOs of Yahoo worked from 2009 were:

- Marissa Mayer (2012)
- Ross Levinsohn Interim (2012)
- Scott Thompson (2012)
- Tim Morse Interim (2011–2012)
- Carol Bartz (2009–2011)

Poor Decision Making: Starting from losing two opportunities to buy Google, Facebook, rejecting Microsoft's buyout offer, acquiring companies, selling the majority stake in Alibaba and choosing managerial people, the company clearly displayed the poor decision-making.

CONCLUSION

From the analysis, we can call it irony or any other but Yahoo is responsible for its own ruin. The company has attempted to reinvent itself since it lost its importance. However, nothing had worked out in the favour of the company. Yahoo was one of the



companies that defined internet. The company with its internet services such as Web Mail and Messenger attracted web users from across the world towards internet. The company has miserably failed to cope up with the severe competition in the fast growing internet market and failed to grab the opportunities that came across in its way. Yahoo tried very hard to revitalize its business but finished with sad ending.

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**WEB BASED TESTING AND WEB ATTACKS: A REVIEW**Kumar Gaurav¹⁰ Dr. Mayank Singh¹¹**ABSTRACT**

Web based applications are the necessity of modern day life. Therefore, vulnerabilities in these web applications should be tracked beforehand it goes public to benefit the users. There are several testing techniques available using either black box or white box testing. Further, an attempt is made to elucidate the web attacks. This paper attempts to review the literature on web based testing methods and major web attacks.

KEYWORDS

Web Testing, Testing Techniques, Web Attacks etc.

INTRODUCTION

Testing in common phrase can be interpreted as the process of revealing errors. It is essential to test web-based system before it goes public to detect errors such as security of web application, functionality of the site, its accessibility to handicapped users and fully able users, as well as readiness for expected traffic and number of users and the ability to survive a massive spike in user traffic. Web based applications are the necessity of modern day life. Therefore, vulnerabilities in these web applications should be tracked beforehand it goes public to benefit the users. This paper attempts to review the literature on web based testing methods and major web attacks.

TESTING TECHNIQUES

Reviewing literature reveals two types of testing techniques viz. black box and white box testing. Black-box methods are specification based such as equivalence partitioning, boundary value analysis, random testing and functional analysis-based testing. White-box testing methods are code based such as statement testing, branch testing, path testing, predicate testing, dataflow testing, mutation testing and domain testing. Web applications are complicated and ever evolving so their testing becomes a concern and challenge. Moreover, failure of web applications is a costly affair so testing them is critical and essential.

Testing the Non-functional Requirements of a Web Application

Web applications have to satisfy various non-functional requirements either explicitly or implicitly. The main requirements include performance, scalability, compatibility, accessibility, usability, and security. For verifying each non-functional requirement, testing activities with specific purposes will have to be designed. The following is list of the verification activities that can be executed to test the main non-functional requirements of a Web application:

Performance Testing: Performance testing objective is to verify specified system performances (e.g. response time, service availability). It is executed by simulating hundreds or more, simultaneous users' accesses over a defined time interval. Access information are recorded and then analyzed to estimate the load levels exhausting system resources. For Web applications, system performances is paramount as Web users don't like to wait too long for a response to their requests, also they expect that services are always available. Such testing is everlasting in order to tune the system adequately. Failures uncovered by performance testing are primarily due to running environment faults (such as scarce resources, or not well-deployed resources, etc.), even if any software component of the application level may contribute to inefficiency.

Load Testing: It is the simplest form of testing conducted to understand the behaviour of the system under a specific load. Load testing will result in measuring important business critical transactions and load on the database, application server, etc. are also monitored. By such testing information is recorded and, when the tasks are not executed within predefined time limits, failure reports are generated. Failures found by load testing are mainly due to faults in the running environment.

Stress Testing: It is performed to find the upper limit capacity of the system and to determine how the system performs if the current load goes well above the expected maximum. Stress testing differs from performance and load testing because the system is executed on or beyond its breaking points, while performance and load testing simulate regular user activity.

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Compatibility Testing: Compatibility testing uncovers failures due to the usage of different Web server platforms or client browsers, or different releases or configurations of them. The large variety of possible combinations of all the components involved in the execution of a Web application does not make it feasible to test all of them, so that usually only most common combinations are considered. Therefore, just a subset of possible compatibility failures might be uncovered. Both the application and the running environment are responsible for compatibility failures.

Usability Testing: It focuses on verifying to what extent an application is easy to use. Usability testing addresses on testing the user interface: issues concerning the correct rendering of the contents (e.g. graphics, text editing format, etc.) as well as the clearness of messages, prompts and commands are to be considered and verified. Usability is a critical issue for a Web application and issues like the completeness, correctness and conciseness of the navigation along application are to be considered and verified too. This type of testing should be a continuing activity carried out to improve the usability of a Web application; techniques of user profiling are usually used to reach this aim. The application is mainly responsible for usability failures.

Accessibility Testing: It can be considered as a particular type of usability testing with aim to verify that access to the content of the application is allowed even in presence of reduced hardware / software configurations on the client side of the application (such as browser configurations disabling graphical visualization, or scripting execution), or of users with physical disabilities (such as blind people). Generally, in web applications accessibility rules are to be followed, so this testing is done to ensure compliance of rules.

Security Testing: It is performed to verify if the application is secured on web as data theft and unauthorized access are more common issues and below are some of the techniques to verify the security level of the system are Injection, Broken Authentication and Session Management, Cross-Site Scripting (XSS), Insecure Direct Object References, Security Misconfiguration, Sensitive Data Exposure, Missing Function Level Access Control, Cross-Site Request Forgery (CSRF) etc.

Testing the functional requirements of a Web application

This type of testing has the responsibility of uncovering failures of the applications that are due to faults in the implementation of the specified functional requirements, rather than to the execution environment. For this purpose, risk arising from the running environment should be avoided, or reduced at minimum. Most of the methods and approaches used to test the functional requirements of 'traditional' software can be used for Web applications too. Likewise traditional software testing, testing the functionality of a Web application has to rely on the following basic aspects:

- **Test models**, representing the relationships between elements of a representation or an implementation of a software component;
- **Testing levels**, specifying the different scopes of the tests to be run, i.e., the collections of components to be tested;
- **Test strategies**, defining heuristics or algorithms to create test cases from software representation models, implementation models or test models;
- **Testing processes**, defining the flow of testing activities, and other decisions regarding when testing should be started, who should perform testing, how much effort should be used and similar issues.

Web Application Attacks

Buffer Overflows: in this type of attack, an application attempts to insert data into an available buffer without first checking the size of the buffer. By inserting larger values than expected, attackers can attempt to overflow the buffer and write their own malicious code into adjacent areas of the stack or heap, which can subsequently be executed by the attacker with the privileges of the web server user. Examples include the Eeye June 1999 IIS 4.0 IISHack vulnerability (MS99-019), which exploited insufficient bounds checking in .HTR, .STM and .IRC file requests and provided remote system level access.

Sample Code: Where the code is badly written and application is not intended for production use. Examples include various early Apache test-cgi scripts (CVE- 1999-0070) or the IIS 4.0 Showcode. asp (CAN-1999-0736) that failed to restrict use of ".." in the request file path, allowing any file on the host's file system to be viewed.

Input Validation Attacks: Such attacks occur when user input is inadequately validated. An attacker can pass commands that will mistakenly be executed by the web server.



Format String Attacks: These attacks crop up when application code attempts to display unfiltered user-passed variables. Non-type safe argument passing to certain C functions such as printf() results in the user data being analyzed as a format string parameter, potentially allowing execution of hostile code. Examples include rpc.statd from the July 2000 Linux nfs-utils package.

Canonicalization Attacks: Canonicalization of filenames is important for computer security. **Canonicalization** (sometimes **standardization** or **normalization**) is a process for converting data that has more than one possible representation into a "standard", "normal", or canonical form. This can be done to compare different representations for equivalence, to count the number of distinct data structures, to improve the efficiency of various algorithms by eliminating repeated calculations, or to make it possible to impose a meaningful sorting order. Equivalent forms of a canonical file name may be handled differently by a web server with unexpected results and thus result in attack.

Encoding Attacks: These result from incorrect handling of various forms of character encoding by the web server, such as two or three byte Unicode or double hex encoding. Such attacks enable attackers to sidestep regular expressions filters. Examples include the MS00-0078, MS00-086 and MS01-026 Unicode and Double Decode vulnerabilities, which affected IIS 4.0 and IIS 5.0 in 2000 and 2001.

Privilege Escalation: Most computer systems are designed for use with multiple users. Privileges mean what a user is permitted to do. Common privileges include viewing and editing files, or modifying system files. Privilege escalation means a user receives privileges they are not entitled to. These privileges can be used to delete files, view private information, or install unwanted programs such as viruses. It usually occurs when a system has a bug that allows security to be bypassed or, alternatively, has flawed design assumptions about how it will be used. Privilege escalation occurs in two forms:

- **Vertical privilege escalation**, also known as *privilege elevation*, where a lower privilege user or application accesses functions or content reserved for higher privilege users or applications (e.g., Internet Banking users can access site administrative functions or the password for a smartphone can be bypassed).
- **Horizontal privilege escalation**, where a normal user accesses functions or content reserved for other normal users (e.g. Internet Banking User an accesses the Internet bank account of User B).

Attackers can exploit application or OS behaviour to execute code with higher than expected privileges.

Form Tampering: The Web Parameter Tampering attack is based on the manipulation of parameters exchanged between client and server in order to modify application data, such as user credentials and permissions, price and quantity of products, etc. Usually, this information is stored in cookies, hidden form fields, or URL Query Strings, and is used to increase application functionality and control. One example involves changing item prices in poorly developed e-commerce shopping cart applications (CVE-2000-0101 to CVE-2000-0110).

User Created Content: In a user-generated content attack, backdoors or malicious server side includes are uploaded into vulnerable web applications to assist in attacks. From the study of Imperva, it can be noted:

- **Web 2.0 has come home to roost:** As we point out, the main driver of today's Internet is also its Achilles Heel: user-generated content – Worse, the current web landscape won't make things better anytime soon. Approximately 77% of Web applications utilize PHP, which is especially vulnerable to Remote File Inclusion (RFI) attacks. In the case of militarysingles.com, users upload photos. This episode highlights how savvy hackers bypass simple checks and filters to execute malicious code on servers, in turn infecting other machines or stealing data. Many in the security community have yet to notice.
- **Social networking and the public sector don't mix:** In addition to the Web application security concerns, the fact that hackers targeted Military Singles should not be overlooked. Consideration should be paid to the fact that hacktivists are increasingly using social engineering techniques to infiltrate targets.
- **The need for enterprises to pay closer attention to password encryption:** Strong password policies are not enough. In addition, enterprises must use of a special form of encryption known as "salted digests." A salted value should increase the cost of guessing the password so that financially motivated hackers will not make such an investment.

New Web Attacks: A variety of activities eventually began to stem the tide of web server vulnerability announcements. These included code review, advances in secure development practices, continued vulnerability research and the release of commercial automated web application testing and code auditing tools. However, as security researchers forced one door closed, the volatile nature of web development opened another. This period coincided with the explosion in popularity of blogging, web-based forums and web services, so the hacking arms race continued. As attackers became increasingly financially motivated, attention soon



expanded from attacks against web servers to attacks against third party web applications and hosted content. The proliferation of database-driven applications built by web developers resulted in rich vulnerability pickings. Consequently, further classes of web application vulnerabilities developed, including:

Cross-site Scripting (XSS): A vulnerable web site can be forced to return attacker-supplied code to a victim's web browser. Non-persistent (reflected) XSS attacks exploit web site elements that echo client supplied data, such as search forms.

SQL Injection: In an SQL injection attack, an application accepts user input containing string literal escape characters, and inserts it directly into a back-end SQL statement without correct filtering, such as via PHP's `mysql_real_escape_string()` function. This results in arbitrary SQL command execution and remote exploitation. Examples include the Jun 2004 vulnerabilities in Oracle Applications 11.0 and Oracle E-Business Suite 11.5.1 through 11.5.8 that allowed remote attackers to execute arbitrary SQL procedures and queries through multiple SQL injection vectors (CVE-2004-0543).

Remote Malicious File Inclusion (RFI): An application will improperly trust user submitted input files or references to external objects (such as remote URLs), and then evaluate and execute the malicious contents. RFI vulnerabilities are particularly common in PHP applications, especially where `register_globals` is enabled. Examples include the May 2006 vulnerability in PHP Nuke 7.5 forums, where un-validated input to the forums admin page allowed remote malicious code to be included and executed (CVE-2006-2828).

Cross-site Request Forgery (CSRF): Cross-site request forgery, also known as a one-click attack or session riding and abbreviated as CSRF is a type of malicious exploit of a website whereby unauthorized commands are transmitted from a user that the website trusts.

Access Control Weaknesses: Developers who fail to programmatically enforce strict access control can allow attackers to perform unauthorized actions or view supposedly restricted material. Examples include the February 2002 vulnerability in Lotus Domino that allowed password protected nsf database files to be accessed by a request containing a maliciously constructed filename of a particular length (CVE-2001-1567).

Data Confidentiality Failures: In these cases, user credentials and other confidential data are not protected by correctly implemented proven cryptographic standards. An example is the August 2004 vulnerability in phpGroup-Ware 0.9.16.001 where admin headers and setup passwords were found to be transmitted in sniffable plaintext cookies (CVE-2004-2578).

Poor error handling: Failure to correctly handle unexpected errors can crash an application, reveal internal configuration information or bypass security systems. Examples include the February 2002 vulnerability in Real System Server and Proxy Server, which failed to correctly handle URL errors and allowed remote attackers to deny service or possibly execute arbitrary code (CVE-2003-1117).

SUMMARY AND CONCLUSION

New methods and tools emerge quickly in the web application-testing arena. The methodology and tools one select depend on the characteristics of the application and the development parameters, such as language and software. The use case for the application can also have an influence. In this article, common web application vulnerabilities are demonstrated. The key is to mitigate these vulnerabilities is to sanitize user's input before processing it.

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DEVELOPING A SPEECH BASED HIGH PERFORMANCE COMMAND EXECUTION SYSTEM FOR TIGRIGNA LANGUAGE

Hussien Seid¹² Redaei G. Wahid¹³

ABSTRACT

Recent studies indicate the facts that providing an additional speech based input channel to supplement the more common input modes can significantly contribute to the speech to text; especially for illiterate, visually impaired and physically handicapped people who are even not able to handle the mouse and keyboard but can speak. In order to develop a system that enables a machine to understand and respond to human speech and called as speech to text conversion. Thus, in this study the possibility of developing Tigrigna speech input interface with localization to command and control a computer application particularly Microsoft word is explored. The prototype speech input interface developed in this experiment has two subsequent systems namely speech command recognition and command execution system (or communication interface). In this study, 50 command words used to command and control Microsoft word were randomly selected, translated to Tigrigna and isolated utterances of these words were captured from 40 speakers (20 female and 20 male) in the age range of 20-50 from three different Tigrigna accents namely Raya, Meqelee and NCT. The recorded dataset was classified as training (about 75%) and testing datasets (25%). Finally, five HMM based isolated Tigrigna word recognizers with vocabulary size 10, 20, 30, 40 and 50 command words were trained and evaluated for experimentation. In this study, the performance evaluation results found are 98.98%, 98.76%, 99.17%, 99.38%, and 99.5%.

KEYWORDS

Command and Control, Speech Recognition, HMM, Tigrigna, Microsoft Word etc.

INTRODUCTION

Most sophisticated machines or computers are worthless unless men can use them properly. This basic argument simply presents the main terms that should be considered in the design of HCI: functionality and usability (Norman 1990). Despite the functionality that a machine may have, its value would only be visible when it becomes possible to be efficiently utilized by the user. These ways that peoples are used to communicate with computers to utilize their functionalities are usually called communication channels, modes or interfaces. The quality of an interface mainly relies on number and diversity of its inputs and outputs that enable users to interact with the computer (Myers 1998). Each of the different independent single channels may be good at performing one task but not for another; thus, the concept of multimodality where individual modalities can be combined together to gain the supplementary advantages was arise (Ibid). The key strength of multimodal interfaces is their ability to provide redundancy to accommodate different people and different circumstances. One good application of multimodal systems is to address and assist disabled people, who need other kinds of interfaces than ordinary people (Karray, et al. 2008).

The definition of these channels is inherited from human types of communication, which are his senses: Sight, Hearing, Touch, Smell, and Taste (David, Roe and Wilpon 1994). The devices that rely on audition are more advanced devices that usually need some kind of speech recognition (Adams, et al. 1999). These devices aim to facilitate the interaction as much as possible and therefore, are much more difficult to build. However, despite all the difficulties recent studies has indicated the fact that providing an additional speech based input channel to supplement the more common input modes has lots of advantages; especially for non-literates, visually impaired as well handicapped individuals who are not able to handle the mouse and keyboard but can speak.

Thus, for centuries people have fascinated to develop machines that can understand and properly respond to human speech as humans do so naturally (Roe and Jay G. Wilpon 1994.). However, due to advances made in 1960s and 1970s in the areas of digital signal processing, pattern matching & classification and computer hardware technology, the dream of providing a speech-enabled human-computer communication has become a reality; so that, nowadays modestly priced automatic speech recognition systems are commercially available even for personal computer environments (Karl, Pettey and Shneiderman 1992).

Speech recognition also known as Automatic Speech Recognition (ASR) is the process of converting a speech signal to a sequence of words or characters, by means of an algorithm implemented as a computer program (Anusuya and Katti 2010). Furthermore, the resulting sequence of characters can be used to perform various tasks such as controlling a machine, accessing a database, or executing various operations (Ibid). However, in this study, the possibility of using the resulting characters to command and control a computer was explored.

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If an efficient and reliable speech recognition machine could be developed, and supported by high quality speech producing techniques, it would become possible to produce computational applications that do not require a keyboard and a screen (W. Holmes 2001). This would allow incredible miniaturization of known systems facilitating the creation of small intelligent devices that can interact with a user by speech (Ibid).

Due to the credible effect of using speech input interface the allure of voice interaction with machines remained and became stronger as technology became more advanced and complex (Karl, Pettey and Shneiderman 1992). Moreover, speech input interface has many advantages over the most commonly used input modalities. It allows humans to communicate with computer using the natural means of communication that they use in their day-to-day life; it is particularly appealing when the human's hands or eyes are otherwise occupied; it is potentially very helpful to those who are not able to handle the mouse and keyboard like non-literates, visually impaired as well handicapped peoples. It is also very helpful in an environment where only a limited keyboard and mouse is available. Moreover, Karl, Pettey and Shneiderman (1992) also suggested that, besides its naturalness, using speech input interface in parallel with the most commonly used input modality will result an overall time reduction of 21.23% as compared to mouse alone for pointing and selecting commands.

However, despite all its advantages, the accuracy of automatic speech recognition remains one of the important research challenges after years of research and development due to the complex nature of human speech (Anusuya and Katti 2010). After all, the design of speech recognition system requires careful attentions to the following issues: definition of various types of speech classes, speech representation, feature extraction techniques, speech classifiers, and database & performance evaluation (Ibid).

Furthermore, (Tachbelie 2003.) indicated the fact that Microsoft Word is most widely used to create and process documents in Ethiopia. However, it does not support speech-enabled command and control for Tigrigna language as it does for English. Hence, Tigrigna speakers are being deprived of using such an important technology. Thus, the experiment was conducted for Microsoft word in the aim of solving weighty existing problem.

AN OVERVIEW OF TIGRIGNA LANGUAGE

Tigrigna is the native language for the Tigray and Eritrean people. It is one of the widely spoken languages in Ethiopia and Eritrea. Ethiopian and Eritrean immigrants living in these areas also speak it in some parts of the world especially in the Middle East, Europe and North America. According to the office, population and housing census commission of Ethiopia (2014) there are about 4.5 million speakers of Tigrigna. They make up approximately 96.6% of the inhabitants of the Tigray Region, and are 6.2% of the population of Ethiopia as a whole. In addition, Tigrigna speakers are approximately 50% of the population in neighboring Eritrea at about 2.25 million peoples. So that, the total number of Tigrigna speakers in Tigray and Eritrea was 6.75 million. At the present Tigrigna is the second most widely spoken Semitic language next to Amharic in Ethiopia (Abera 2012).

Although all Tigrigna-speaking communities can communicate without much difficulty, Tigrigna comprises various accents with remarkable phonetic differences. From what the researcher have experienced through this study, some English words and their corresponding Tigrigna interpretations as well their possible pronunciation from different Tigrigna accents are presented in Table-1.

Table-1: Sample Tigrigna Words and their Possible Pronunciation from Different Accents

English word	Tigrigna meaning	Megele Accent	NCT accent	Raya Accent
Now	Hzi (ሕዚ)	Khezi (ኸዚ)	Hji (ሕጂ)	Khezi (ኸዚ)
Close	Eitso (ዕጾ)	Eitsey (ዕጾይ)	Eitso (ዕጾ)	Eitseyo (ዕጾዮ)
Window	Meskot (መስኮት)	Meshkot (መሸኮት)	Meskot (መስኮት)	Moskot (ሞስኮት)
Of	Nay (ናይ)	Lay (ላይ)	Nay (ናይ)	Lay (ላይ)
To	Nab (ናብ)	Lab (ላብ)	Nab (ናብ)	Dab (ዳብ)
Table	Senterezh (ሰንጠረዥ)	Senterezh (ሰንጠረዥ)	Senterej (ሰንጠረዥ)	Senterez (ሰንጠረዥ)

Sources: Authors Compilation

RESEARCH METHODOLOGY

Data Collection

In this experimental study, 50 command words used to command and control Microsoft word was selected randomly. Then, these selected command words were given for linguistic experts in a printed format and translated to Tigrigna language. Furthermore, these Tigrigna command word should be transliterated to Latin as the development tool used (i.e. HTK) does not support Tigrigna scripts directly. Hence, in this experiment, these words were transliterated using the representation used by (Abera 2012). A few

entries of these selected English command words and their equivalent Tigrigna word as well their transliterations are depicted below.

Table-2: Sample Tigrigna Words and their Possible Pronunciation from Different Accents

Bold	አድምቆ	Admigo
Insert	አላቱ	Aeitu
Font	አቀማምጣ ፊደላት	Aqemamita_fidelat
Save	አቀምጥ	Aqemit
Underline	አስምር	Asmir
Edit	አስተካክል	Astekakiel
Blank document	ባዶ ወረቀት	Bado_weregeet
Save as	ብኻለእ ሹም አቀምጥ	Bkalie_shum_aqemit
Redo	ደጊምካ ስራሕ	Degimka_sirah

Sources: Authors Compilation

Modeling and Programming Techniques

The modeling technique used to build the prototype recognizers developed in this experiment is Hidden Markov Models (HMMs). HMM provides a simple and effective framework for modeling time-varying spectral vector sequences (Gales and Young, 2008). Gales and Young indicated that HMM is the best and more appropriate approach to develop speaker independent small vocabulary isolated word recognition. Supporting this idea, (Huang and Deng, 2010) said that HMMs have gain popularity because of their ability to estimate parameters from a large amount of data automatically, their simplicity as well computational feasibility.

To develop HMM, HTK (Hidden Markov Model toolkit) was used. HTK is a general-purpose toolkit; it is primarily designed for building HMM-based speech processing systems, in particular recognizers. Thus, much of the infrastructure support in HTK is dedicated to this task. In addition, this toolkit is preferred since it has been used in many related works and had achieved considerable results. Finally, to develop the required communication interface, C# programming language was used. This is because, to build a high performance application, C# might be the best route with its memory management capabilities than others; in addition it has good string manipulation feature and it is more user friendly (Barker and Phillips 2007). Moreover, C# was preferred over others because the researchers are more familiar with.

The developed speech input interface system needs to be evaluated so that we can analyze how robust it is. The speech input interface developed has two basic sub-systems namely command word recognition system and command execution system or communication interface. Thus, evaluation has been made for both the recognizer and the system as a whole using both the prepared test dataset and live audio. As HTK has already been used to build the recognizer and has evaluation tools, it was also used to evaluate the overall performance of the developed prototype isolated Tigrigna word recognizers and the speech input interface system.

Data Recording

The list of selected Tigrigna command words were given for the speakers in a printed format and isolated utterances of these Tigrigna commands were recorded from 40 speakers (20 female and 20 male) in the age range of 20-50 from three different Tigrigna accents i.e. Raya, Meqele and Northern & Central Tigray. Thus, a total of 2,000 utterances were recorded. The records were taken from different environments.

About 50% of the record was taken from CSIT PG Lab room, which is noisy, 32.5% from dormitory, which is less noisy, and the rest 17.5% was taken from AMU video conference room, which is noise free. This is because the researcher believes that taking a training data from different environment will make the model more environments adaptive. The composition of the dataset is presented in table 3.

Finally, the recorded dataset was classified into two as training and test sets. About 75% of the recorded data was used for training purpose and the remaining 25% speech data was used to test the recognizers' performance.

Though HTK has its own recording tool (i.e. HSLab), the tool used was Praat which is a speech analysis and synthesis program, at a sampling rate of 16 KHz. Praat was preferred over HSLab since the quality of speech data recorded by Praat is better than that of HSLab (Tachbelie 2003.).

Table-3: Composition of the recorded Dataset

Gender	Number of Speakers	Accent	Environment
F	3	Raya	CSIT PG Lab Room
	2		Dormitory
	1		AMU video conference
M	2	Raya	CSIT PG Lab Room
	3		Dormitory
	1		AMU video conference
F	4	Mekele	CSIT PG Lab Room
	1		Dormitory
	1		AMU video conference
M	3	Mekele	CSIT PG Lab Room
	2		Dormitory
	1		AMU video conference
F	4	NCT	CSIT PG Lab Room
	2		Dormitory
	2		AMU video conference
M	4	NCT	CSIT PG Lab Room
	3		Dormitory
	1		AMU video conference

Sources: Authors Compilation

TIGRINA COMMAND WORD RECOGNIZER

HMM for Isolated Word Recognition

The general working principle of any isolated word recognizer is as shown below. The concept presented here is taken from (S. Young, G. Evermann, et. al. 2005).

Let each spoken word be represented by a sequence of speech vectors or observation O , defined as:

$$O = o_1, o_2, \dots, o_t, \dots, o_T$$

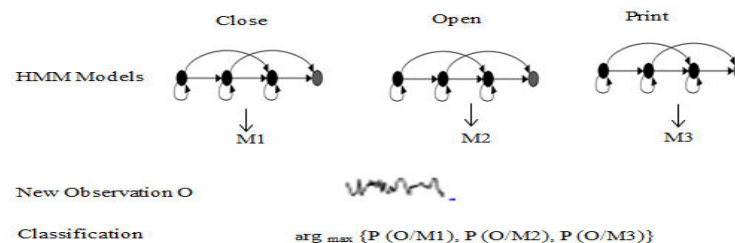
Where o_t is the speech vector observed at time t . The isolated word recognition problem can then be regarded as that of computing $\arg \max \{p(w_i / O)\}$,

Where w_i is the i^{th} vocabulary word. This probability is not computable directly but using Bayes' Rule, which is given as, follows:

$$P(w_i / O) = \frac{P(O / w_i)P(w_i)}{P(O)}$$

Since $P(O)$ is constant for a given input, the concern is on maximizing $P(O / w_i) * P(w_i)$. Thus, for a given set of prior probabilities $P(w_i)$, the most probable word depends only on $P(O / w_i)$. Given the dimensionality of the observation sequence O , the direct estimation of $P(o_1, o_2, \dots / w_i)$ from examples of spoken words is not practical. However, if a parametric model of word production such as a Markov Model is assumed, and then estimation from data is possible since the problem of estimating $P(O / w_i)$ is replaced by the much simpler problem of estimating the model parameters. To build isolated word recognition using HMM, a separate HMM is required to train for each word in the vocabulary using different examples. Then to recognize unknown word, the probability of each model generating that word is computed and the most probable model identifies the word. This idea is depicted in Figure-1:

Figure-1: Using HMM for Isolated Word Recognition



Sources: Authors Compilation

Tigrigna Speech Input Interface

The prototype Tigrigna speech input interface developed has two subsequent systems i.e. speech command recognizer and command executor (or communication interface). The first sub-system performs recognition thereby the speech command uttered by the users of the system is converted to its equivalent transcription; then, the second sub-system will take the recognized command as an input and send it to MS word for further execution.

Since the aim was to develop a speech recognizer used as a speech input interface for MS word, it needs to be speaker independent, more accurate so that commands will never be executed wrongly and environment adaptive so that it could be used everywhere. To meet these requirements to the best, six different HMM based speakers independent small vocabulary isolated Tigrigna word recognizers were designed, developed and evaluated.

HMM

Defining the structure and overall form of a set of HMMs is the first task towards building a recognizer. The definition of a HMM must specify the model topology, the transition parameters and the output distribution parameters. But note that the parameter values set in this HMM definition are not important as the purpose of the prototype definition is only to specify the overall characteristics and topology of the HMM; and the actual parameters will be computed later by the training tools.

Though HTK can support both Ergodic, Left to Right, Discrete and Continuous probability density HMMs, in this research, a Left to Right with Continuous probability distribution HMMs were defined for individual words in the dictionary.

Though there is no requirement to determine the number of states required in HMM definition, present the fact that usually the more the number of states the better the performance will be (Frikha, Massaoud, et al., 2005). Thus, to determine the optimal number of states, 10 HMMs with 14, 16, 18, 20 and 22 numbers of states was developed and evaluated using 10 command words that was objectively selected to contain both the shortest, medium and longest words in the dictionary. The list of these recognizers and their corresponding performance is depicted in table-4

Table-4: List of HMM Models Developed to Determine the Optimal Number of States and their Performance

Number of States	HMM Type	Performance
14	Left to right no skip	92%
16	Left to right no skip	92.68%
18	Left to right no skip	94%
20	Left to right no skip	98%
22	Left to right no skip	98.2%
14	Left to right one skip	93.5%
16	Left to right one skip	93%
18	Left to right one skip	95.5%
20	Left to right one skip	98.55%
22	Left to right one skip	99%

Sources: Authors Compilation

Finally, the left to right with one skip HMM and with 22 numbers of states was selected and adopted to all models developed in this experiment.

HMM Initialization

Before starting the training process, the HMM parameters must be properly initialized with training data in order to allow a fast and precise convergence of the training algorithm. HTK offers two different initialization tools: HInit and HCompv. However, the most commonly used tool to initialize parameters of HMM models is HInit; which performs a more detailed initialization using a Viterbi style of estimation.

Alternatively, HCompV is used as an initialization stage for flat-start training where there is limited training data and recognition in adverse noise environments is needed. HCompV will set the mean and variance of every Gaussian component in a HMM definition to be equal to the global mean and variance of the speech training data. However, (Yifiru 2003) presents the fact that a recognizer initialized using HInit performs better than that of HCompV for live audio. Thus in the course of developing this recognizer HInit was used.

RECOGNIZER EVALUATION

The final task of recognizer development process is performance analysis that helps us to identify how robust the developed system is. This requires two subsequent tasks namely recognition and analysis. Recognition or classification is a means of testing the performance of the system using a test data. The second and final task is analysis thereby results output from the recognizer is compared against the reference transcription file that contains the correct transcription of all the test data provided to the system. These subsequent tasks and the tools used to do so are presented as follows:

Recognition

HTK provides a single recognition tool called HVite, which uses the token passing algorithm to perform Viterbi-based speech recognition. HVite takes as input a word network that describes the allowable word sequences, a task dictionary that defines how each word is pronounced, and a set of HMMs or acoustic models. HVite can perform recognition both using live audio and pre-recorded speech corpus. However, since the developed recognizer is supposed to be used as speech input interface recognition and performance evaluation was carried out using both types of data.

Performance Analysis

This is the last stage of recognizer development process where the performance of the system is measured. Since the recognition were performed using both pre-recorded test data and live audio, two different performance analysis mechanisms were used. First, results gained from the ASR system for the pre-recorded test data was compared against the correct results prepared as reference transcription file using the HTK tool HResults. The comparison is based on a Dynamic Programming based string alignment procedure. As it has already been described, for many reasons the number of command words selected to conduct the experiment was only fifty, however the total number of commands used to command and control Microsoft word are hundreds of commands. Thus, considering vocabulary size as one factor that can affect the system's performance, five different models with vocabulary size of 10, 20, 30, 40 and 50 was trained and evaluated. The list of commands in the first four was randomly selected from the dictionary. In preparing the test dataset both speakers whose speech was taken to develop the recognizers and those whose speech was not used were considered. Table 5 depicts performance of all the recognizers developed in this experimental study.

Table-5: Performance Evaluation using pre-recorded test Data

Model Name	Vocabulary size	Accent	Performance
Model 1	10	All	98.98%
Model 2	20	All	98.76%
Model 3	30	All	99.17%
Model 4	40	All	99.38%
Model 5	50	All	99.5%
Model 6	20	NCT	99.75%

Sources: Authors Compilation

This clearly indicates the effect of accent variation over the system's performance. Moreover, besides the effect of accent variation over the system's performance the experimental results clearly indicate the feasibility of developing isolated Tigrigna word recognizer.

CONCLUSION

This study was focused on exploring the possibility of using Tigrigna speech to command and control a computer in general and MS word in particular. For getting speech to command insights literature on basics of ASR systems, application areas of speech recognition, basics of human-computer interaction, state of the art of HCI, Hidden Markov Model and its application in speech recognition and other related works were reviewed. For developing the speech recognition system, fifty command words were randomly selected and used to command and control Microsoft word. Later these words were translated to Tigrigna and transliterated to Latin as the development tool used (i.e. HTK) does not support Tigrigna scripts. Since speech recognition development process requires a speech corpus, isolated utterances of these words were recorded from 40 speakers from three different Tigrigna accents. Considering vocabulary size as one factor that can determine system's performance, five HMM based isolated Tigrigna word recognizers with vocabulary size of 10, 20, 30, 40 and 50 was defined, initialized, trained and finally evaluated. These command words were randomly selected from the dictionary. In the study, recognizer evaluation was done as the final task required in the process of developing a speech recognition system. Further, Recognition was performed through the HTK tool HVite using both live audio and pre-recorded test data. Finally, performance analysis thereby results gained from the



recognizer were compared against the correct reference transcription file was made. The performance results gained through the HTK analysis tool HResults using the pre-recorded test data were 98.98%, 98.76%, 99.17%, 99.38%, 99.5% and 99.75%.

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IMPACT OF STRESS ON EMPLOYEES WORKING IN IT, MANUFACTURING AND SERVICE INDUSTRIES IN BENGALURU URBAN: A STUDY

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ABSTRACT

Workplace center is causing stress to both the individual employee and organization. The stress that emerges because of employee at work found to be costly to the organization. Stress is a mismatch between individual capabilities and organizational demands and hence a perfect blend of individual capabilities and organizational demands becomes more important. Stress not only influences deeply on mental state of an individual but also on physique. Required strategies has to be developed by the management to deal stress levels at the workplace. While designing the strategies the management has to consider the major stress drivers like job insecurity, target oriented job characteristics, working on deadline, frequent organizational changes, excessive workload, inconvenient work schedule. These stressors as should be positively dealt at work place since they are not only capable of increasing pressure on worsening condition of an individual leading to dangerous problems not only like physique, mental, emotional but also create imbalances in the normal life.

KEYWORDS

Stress, Coping, Workplace stress, Dimensions, Workload, Insecurity etc.

INTRODUCTION

Globalization led increased competition across the globe led the corporate world to face new challenges and made them realize that their own employees can provide them a sustainable competitive advantage. This realization emerged on account realization of management about significance of stress management.

Modern era is known as “era of anxiety and stress” (Coleman 1976). Coping, resilience and vulnerability are the three effective dimensions of stress management. Stressful events are part of everybody life and a select category of individuals develops stress induced pathologies, elucidating the biological basis of individual differences in stress vulnerability.

The existing western literature focused on employee’s liability and statutory compliances to be maintained at the workplace. India has largest workforce in the age range of 15-59 years and likely to increase from 749 million to 962 million over 2010 to 2020 (Resmi et al, 2014) with such huge work force data and to control India unfortunately still does not have any laws to deal with emotional stress at work.

Meaning and Definition

Stress is a critical phenomenon. It is a very subjective experience. It is depended upon the previous experience, temperament and environmental conditions. It is a part of daily life and changes according to the influence of situations.

Father of stress thesis Hans Selve (1956) defined stress as a general reaction of body to any demand mode upon it. These demands one known as “stressors” and can be either pleasant situation or factor.

Schuler (1980) defines “stress is continuously charging condition in which an individual is confronted with an opportunity, demand or resources related to what the individual desires and for which result is perceived to be both uncertain and vital”.

Lepiine et al. (2004) defines, “stressors which deviates an employee from achieving the goals. They may be red tapism, organizational power and politics, role ambiguities”.

STATEMENT OF PROBLEM

Bengaluru is one of the fastest growing urban area in the Asia. It is an industrial center. IT industry, manufacturing and service industries are prominent along with SEZ in the country. The IT industry has highly contributed to the growth of Bengaluru, which is nicknamed as “silicon valley”, and attracting everybody to settle and work and migration now days has become a common feature. Employees from different states and within the state are making Bengaluru as their abode and settled here. The experiences of stress at the workplace is an important area of investigation, since the ITES potential effects on the well-being and

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productivity of the individuals. The significance of research into stress processes has been made very clear by increasing evidence of the negative consequences of stress on physique and mental health conditions. Clear understanding effects of stress on employees assist the organizations to chalk out suitable strategies combating ill effects of stress. The stress level among the ITES employees, service sector and manufacturing sector is high and it is certainly bound to effect the performance of employees. These stress level differ from one to another person. The employees who are working in ITES and manufacturing and service sectors on account of busy target finishing, continuous updating of information levels through training conducted very frequently, heavy workload etc. are put to different levels of stress which has to be administered properly. Against this background researcher has made a moderate attempt to study the stress level of employees of three sector.

OBJECTIVES OF STUDY

The specific objectives of the study are as follows:

- To study the awareness of diseases caused by stress.
- To study the reasons for attrition.
- To study the reasons for procrastination.
- To study impactness of travelling and working and stress sustained.

Hypotheses

- Employees are not aware of different diseases caused by stress.
- There are no reasons behind attrition.
- There exist a set of reasons for procrastination.
- Daily travelling from a far off place causes severe stress.

RESEARCH METHODOLOGY

A well-drafted questionnaire was administered and used as a schedule for the purpose of data collection. From three areas in Bengaluru (1) Electronic City, IT industry, (2) Peenya Industrial Area, Bangalore North, manufacturing sector and (3) Bengaluru Central for service sectors, were chosen and random sampling technique was applied in collecting the necessary data. Before collecting the data the purpose was well explained and many of employees voluntary came forward and provided the required information. The collected data was presented in the form of Likert different scale and chi-square, ANOVA, contingency tables of quantitative metrics were applied, and a scientific touch was given to the data and accordingly tested.

REVIEW OF LITERATURE

Weiss M. (1983) investigate the sources of job stress that is linked to job satisfactory, job related tension and anxiety and reduced productivity and effectiveness. In his attempt, he has tried to reduce sources to stress so that he can prevent the deleterious health consequences. Further, the researcher suggested that that potential of social support alleviates the consequences of stress.

Taheer, A.Y. (2013) said that majority of the bankers of Pakistan claim that they are highly stressed because of their jobs that not only affect their performance in banks but also equally affect their health and personal life. They also declare that the organizational politics and bureaucracy are the main reasons of stress in their banks.

Karthik (2013) highlighted that employees performance at work is influenced by stress that can be either positive or negative. The employees perform better if they face low to moderate amount of stress. Therefore, it aims at reducing the level of stress rather than eliminating stress.

Cox et al. (1990) expressed clearly that there is a large body of evidence to suggest that the management of the implementation of any intervention in key its success.

Karsh et al. (2001) have argued that the study of the implementation process is crucial both for understanding of future research results and for understanding the variance in outcomes.

Proctor et al (1998); Melchior et al. (1996) expressed that training and support among employees can affect positively on stress levels. The researchers said that training and education often lead to innovations, which bring about changes in work organization.

Cox et al. (2007) with their approach and primary prevention and adoption proactive strategy rather reactive approach, expressed that using evidence based problem solving has been identified as a necessary organizational intervention for work related stress.



Singh, A.P., and Singh, S. (2009) in their study they have emphasized on the phenomenon of job satisfaction in the organization. According to them job substitution is directly related to stress and work culture than any organization provides. They have identified findings that result 16% of stress, thirdly eliminates that causes 11% of stress.

A study by Lamb B. (1984) exposes all exercise can be useful for treating anxiety, decreasing aggression or compactness, increasing self-confidence and self-esteem and revealing frustration.

ANALYSIS AND INTERPRETATION OF DATA

The results of the analysis of the collected data are presented under different heads.

Table-1 reveals that two thirds of the total sample of respondents are males the remainder 96 are females. Out of 300 sample respondents, 120 are married and others are unmarried. Further, it is revealed that 30 out of 300 samples are from families, which have less than 3 members. The family size of 250 sample respondents is 3 to 6 members. The family size of remaining 20 sample respondents are above six. As there are more sample respondents belonging age group below 25 years, they are not married and are living with their elder family members and parents. Therefore, the family size of most of the respondents fall in the family group of 3-6 members. There is a growing tendency of micro families in Bengaluru and hence 20 respondents who are leading independent units of family. This is particularly in Bengaluru becoming popular since they wanted to be very near to work place. Further table-1 reveals that 50 out of 300 samples have school education only. There are 100 graduates 60 postgraduates and 30 the remaining house technical qualifications. It is revealed that 150 samples out of 300 here experience less than 3 years 85 respondents 3 years to 6 years, 45 respondents 6 to 9 years and the rest 20 respondents 9 years and above. 50% of the sample respondents belongs to 3 years below experience since new small and medium scale industries and ITES are established in the outer skirts and far off places of Bengaluru. The middle aged and aged persons do not like ITES job and hence we have only 20 respondents who are 9 years and above experience. Monthly income details are also provided in the table. There are 175 respondents or 58.33% earn less than Rs. 15,000 per month. The monthly income of 100 respondents are Rs. 15,000 to 30,000. The balance 25 respondents earn a monthly income of Rs. 30,000 and above. There are 100 respondents who travel every day above 10 km, 90 respondents between 3 to 6 km, 40 respondents less than 3 km every day. The preferred mode of majority of respondents (60%) is private service and the next preference as BMTC. There are many commuter complaints against BMTC most probably may not be solved in the near future. 250 respondents live in rented houses and only 50 in own house. Out of 300 respondents, 170 i.e., 56.67% live in outskirts, 80 in slum, 30 underdeveloped and 20 nearby villages. There is a practice of approaching money lender for financial assistance and 120 respondents got loan to the extent of Rs. below 20,000, 80 respondents assisted by friends Rs. below 25,000, 70 obtained loan from relatives who are close to the extent of below Rs. 50,000 and 30 got assistance from their parents below Rs. 30,000. Finally, the table reveals data about the age of respondents and there are 180 respondents (60%) fall in the category of <25 years 70, between 25-35 years and 50 >35 years.

Table-2 reveals that respondents awareness of diseases caused by stress. Out of 300 respondents 180 strongly agreed that he stated factors in the table leads to stress. Out of 180 who have strongly agreed 44 expressed that feeling of fever, 38 severe back pain, 36 development of procrastination, 32 giddiness and 30 headache. 70 out of 300 said agree about the factors stated in the table leads to stress. 20 said they are suffering from giddiness, 15 feeling fever etc., 50 out of 300 might have stood either neutral (iv), disagree(15) and strongly disagree (25). ANOVA fails to accept the null hypothesis and only accepts the alternative.

Table-3 reveals data about reasons for attrition. Out of 300, 190 i.e., 63.33% strongly agreed over the factors mentioned in the table leads to attrition. A high rate of attrition is danger from the point of view of success of organization. 90 or 30% have agreed over the variables influencing the attrition in organizations under study. Only 20 strongly disagreed might be new to the field.

Reasons for procrastination is provided in the table-4. Table-4 shows clearly the drivers of procrastination out of 300 sample respondents 170 i.e., 56.67% strongly agree over the factors influencing procrastination and 85 or 28.33% agree over the factor affecting the procrastination. 45 respondents might have stood neutral (10), do not agree (15) and strongly do not agree (20). ANOVA fails to accept the null hypotheses and accepts the alternatively.

Table-5 speaks about travelling impacting stress levels of respondents. Out of 300 sample respondents 190 the respondents said that highly impacts, and 75 impacts and only 35 gave negativeness to travelling do not influences stress levels? The contingency table accepts the null hypotheses.

LIMITATIONS

The major limitation of data collection is transportation from one area to another. Because of peak hour, traffic many a times the scheduled area was not approached. As usual, the second limitation is finance and coverage is only Bangalore. To make any generations a deep in-depth study is essential.

CONCLUSION

As a problem issue extraordinarily circulated across global level, unawareness has been already created about the dangers of workplace stress. Workplace stress is costly and becoming more so. It has multiple causes and these are belonging to complex combination of physical, social and psychological elements.

Stress affects different people in a different manner. A comprehensive approach is needed to tackle all kinds of stress generated in the workplace. Whether employee are skeptical about nature of stress in the workplace or not, the changing legal and policy context clearly places growing responsibility upon them to contribute to its prevention and management changed political ideologies backed by inexperience's are forcing the employees to deliver things at a quick and faster rate is creating many problems, which has to be systematically and scientifically addressed.

Table-1: Demographic Profile of Employees

S. No.	Variables	Respondents	Percentage
A. Gender	Male	204	68.00
	Female	96	32.00
B. Marital Status	Married	120	40.00
	Unmarried	180	60.00
C. Family Size	<3 members	30	10.00
	3 to 6 members	250	83.33
	>6 members	20	6.67
D. Education status	School	50	16.67
	Degree	160	53.33
	Post graduation	60	20.00
E. Experience	Technical	30	10.00
	< 3 years	150	50.00
	3 years to 6 years	85	28.33
	6 years to 9 years	45	15.00
F. Monthly Income	> 9 years	20	6.67
	< Rs. 15000	175	58.33
	Rs. 15000 - 30000	100	33.33
	Rs. 30000 and above	25	8.34
G. Distance Travelled daily	<3 km	40	13.33
	3 to 6 km	90	30.00
	6 to 10 km	100	33.33
	Above 10 km	70	23.34
H. Mode of transportation	Own	27	9.00
	BMTC	50	16.67
	Private	180	60.00
	KSRTC	25	8.33
I. Living conditions	Tempo/Van/Auto Pickup	18	6.00
	Own	50	16.67
J. Living Area	Rented	250	83.33
	Slum Area	80	26.67
	Outskirts	170	56.67
	Under developed	30	10.00
K. Loan other than banks	Village (nearby)	20	6.66
	Money lender below 20000	120	40.00
	Friends below 25000	80	26.67
	Relatives close below 50000	70	23.33
L. Age group	Parents below 30000	30	10.00
	< 25 years	180	60.00
	25 - 35 years	70	23.33
	> 35 years	50	16.67

Sources: Primary Data

Table-2: Awareness of Diseases Caused by Stress of Sample Respondents

S. No.	Stress Factors	SA	A	N	DA	SDA	T
1.	Severe Back pain	38	13	3	4	4	62
2.	Headache	30	12	1	3	6	52
3.	Development Procrastination	36	10	2	2	5	55
4.	Giddiness	32	20	3	5	7	67
5.	Feverish feeling	44	15	1	1	3	64
Total		180	70	10	15	25	300

Sources: Primary data

Note: SA - Strongly Agree, A - Agree, N - Neutral, DA - Disagree, SDA - Strongly Disagree, T - Total

Hypotheses

H0	Employees are not hurt by any diseases	Reject
H1	Employees are hurt by diseases	Accept

ANOVA Table

Source of Variation	SS	d.f.	M-S	F-ratio	5% F limit (From F-ratio)
Between the sample	4050	(5-1)=4	4050/4 =1012.5	1012.5/10.1 =100.24	F(4,20) =2.87
Within the Sample	202	(25-5)=20	202/20 =10.1		
Total	4252	(25-1)=24			

Sources: Authors Compilation

ANOVA Analysis

The above ANOVA table reveals that the F calculated value being 100.24 higher than TV = 2.87 @ 5% level of significance with V1 = 4 and V2 = 20, fails to accept the null hypotheses and accepts the alternative.

Table-3: Reasons for Attrition

S. No.	Responsible Factors for Attrition	SA	A	SDA	T
1.	Unpleasant working conditions	43	25	6	74
2.	Impact of working in shirts	35	15	3	53
3.	Working continuously	36	18	3	57
4.	Existence of supervision	34	14	4	52
5.	Impacts of severe orders	42	18	4	64
Total		190	90	20	300

Sources: Authors Compilation

Hypotheses

H0	There are no reasons for attrition in the study area	Reject
H1	There are some reasons behind attrition in the study area	Accept

Chi-square Table

Calculated value: 100.24, d.f. = (r-1) (c-1) = (5-1) (3-1) = 8, 5% level of significance, TV = 15.507

Analysis of Chi-square

The chi-square table reveals that the calculated value being 100.24 greater than the TV = 15.507 @ 5% level of significance with d.f. = 8 rejects the null hypotheses and accepts the alternative.

Table-4: Reasons for Procrastination

S. No.	Drivers of Procrastination	SA	A	N	DA	SDA	T
1.	Over confidence	38	18	3	4	5	68
2.	In the pretext of trivial issue, postponing	28	14	2	2	3	49
3.	Unpleasant working conditions	34	16	1	3	4	58
4.	Heavy work on computers	37	20	2	4	5	68
5.	Too much ego	33	17	2	2	3	57
Total		170	85	10	15	20	300

Sources: Authors Compilation

Hypotheses

H0	There are no reasons for procrastination in the study area	Reject
H1	There are reasons for procrastination in to study area	Accept

ANOVA Table

Source of Variation	SS	d.f.	M-S	F-ratio	5% F limit (From F-ratio)
Between the sample	3770	(5-1) = 4	3770/4 =942.5	942.50/4.6 =204.89	F (4,20)
Within the sample	92	(25-5) = 20	92/20 =4.6		
Total	3862	(25-1) = 24			

Sources: Authors Compilation

ANOVA Analysis

The above ANOVA table reveals that the F calculated value being 204.89 higher than TV = 2.87 @ d.f. V1 = 4 and V2 = 20, with 5% level of significance fails to accept the null hypotheses and accepts the alternative.

Table-5: Impact of Travelling on the job

Impactness	Yes %	No %	Total
Highly impacts	190	20	210
Impacts only	75	15	90
Total	265	35	300

Sources: Authors Compilation

Hypotheses

H0	Travelling everyday impacts on stress
----	---------------------------------------

Contingency Table = d.f. = 1 calculated value = 3.11898, t.v. = 3.841

Decision: since the calculated value of χ^2 is less than the TV = 3.841, at 5% level of significance with d.f. = 1 accepts the null hypotheses. Therefore, it is concluded that travelling everyday affects the stress levels.

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SUITABILITY ANALYTICS AND CLOUD COMPUTING ADOPTION MODELLING FOR EDUCATIONAL INSTITUTIONS

Alemseged Kassahun¹⁵ Dr. DP. Sharma¹⁶

ABSTRACT

The recent financial calamity and growing needs have challenged organizations, particularly educational institutes in providing the necessary latest Information Technology infrastructure support for educational, research and developmental activities. Universities in most developing countries have been facing critical challenges of fast obsolescing ICT infrastructure and technologies. They still use traditional IT infrastructures environment for previously mentioned educational processes and activities. Cloud computing has been evolved as a new paradigm that promises modern solutions in terms of latest technological support with economy, bendable computing competences, real time availability and high reliability of services with limitless and scalable computing power. In cloud computing, resources are not ownership based rather they are rented, transferred and owned by external cloud services providers. In this research detailed need based analysis has been done on demand driven benefits of cloud computing in terms of scalability of infrastructure, real time availability of services in anytime anywhere over any computing and communication device with promised cost effectiveness in higher educational institutions. To achieve the objectives; recent literatures on cloud computing in general and its deployment mechanisms in particular were studied and critically analyzed for suitability and best fit modeling based on selected parameters in higher educational institutions like University. Traditional ICT infrastructure and service practices used by higher education institutions were analyzed using technical opinion analysis, risks and suitability factors. For the functional suitability, a hybrid cloud-computing model has been designed as a most suitable prototype both for confidential and public information. Finally, it is proposed for higher education institutions in order to assure optimum utilization of ICT resources with previously mentioned promising features.

KEYWORDS

Cloud, Hybrid, Scalability, SaaS, PaaS, IaaS etc.

INTRODUCTION

Information technology (IT) has become pervasive in organizations and an inevitable key success factor in business. Organizations can create, communicate and collaborate faster, more efficient and reliable than ever before. Likewise, Educational institutions throughout the world have become highly dependent on information technology for their teaching-learning, service delivery and business requirements. Procuring and maintaining a wide range of hardware and software require substantial, ongoing investment and the skills to support them.

In the late 1960's, a computer scientist John McCarthy once brought the concept of utility computing into the technology world, predicting that the life cycle of technology will not only stick as tangible products. In fact, he took the conceptual leap to predict that computer resources will be provided like nowadays water and electricity as a service [6]. In legacy, computing systems maximum IT budget is spent on fast obsolescing purchase of hardware, software and systems. Cloud Computing ensures a new model in which capital expenditure can be reduced up to certain level. Several studies indicate that by adopting Cloud computing model the capital expenditure can be used as operational expenditure. It also reduce the cost to dramatic level with promised scalability, demand based availability with up to date versions of the technologies.

Cloud computing, a new computing paradigm has already originated during the fourth season of 2007. In fact, cloud computing is an extension of grid computing, distributed computing, and parallel computing. Its foreground is to provide secure, quick, convenient data storage and net computing service centered by internet [10].

The U.S. National Institute of Standards and Technology (NIST) has defined cloud computing as "A model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (i.e. networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" [8].

Cloud Computing is a model comprising of facilities that are commoditized and delivered in a manner similar to traditional utilities such as water, electricity, gas, and telephony. In such a model users access services based on their requirements without

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regard to where the services are hosted or how they are delivered [2]. Cloud computing mainly characterized by virtualization and dynamic expandability, on the cloud IT resource such as; software, hardware, operating system and net storage can be virtualized. The cloud service users need not to care how to buy servers, software's, solutions and so on. Users can buy the computing resource through internet according to their own needs based on strong policies.

Cloud computing offers all its advantages through different delivery models; such as Software as a service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). In SaaS, Enterprises host applications in the cloud that many users access through Internet connections. The service being sold or offered is a complete end-user application. Where as in PaaS, delivery model developers can design, build, and test applications that run on the cloud provider's infrastructure and then deliver those applications to end-users from the provider's servers. Finally, in IaaS, System administrators obtain general processing, storage, database management and other resources and applications through the network and pay only for what they used. Cloud computing has also different deployment models namely; Private cloud, Public cloud, Hybrid cloud and Community cloud.

The main intent of this study is to examine the current ICT service delivery strategies to support Higher Education Institutions, to consider cloud computing in their service delivery and propose a Cloud Computing model that could be used as a baseline for implementation of Cloud Computing in higher educational institutions.

The remaining part of this paper is organized as follows. Section 2, 3, 4 and 5 provides a foundation information about cloud computing and some related works on the area. Section 6 and 7 highlights the impact of IT on Education and barriers of the sector. Section 8 presents opportunities and challenges of Cloud implementation in education. Section 9 presents the analysis done on traditional IT approaches and the cloud. Section 10 discusses the proposed model and finally a conclusion remark is given in section 11.

RELATED WORKS

In the research [7] claimed using Cloud Computing would improve collaboration and communication in the learning environments. Conversely, the study clearly stated that the Cloud Computing has some drawbacks: need for Internet connection and trust in the cloud service providers (CSP) service availability, privacy of the data, and security.

In the research [13] built Open-source software (OSS) for e-learning based on Cloud Computing in China. The research proposes the EduCloud platform to launch an e-learning environment on a public Cloud, using IaaS and SaaS to overcome resource limitation and lack of e-learning scalability.

The effectiveness of using IaaS and PaaS in educational fields, specifically in teaching advanced Computer Science courses is realized by [11].

Reference [5] deliberated the suitable Cloud application used to construct a collaborative learning environment. They illustrated benefits of using Cloud Computing, such as solving the network storage when dealing with massive resources. Additionally, the scholars have focused on reasonable construction of the learning environment to utilize all the needed educational tools accessible via Cloud Computing.

Essential Features of Cloud Computing

Both theoretically and in practice cloud computing has been becoming consistent in a remarkably short period. When looking in the clouds, the following core characteristics can be defined.

Scalability/Elasticity: The service can scale capacity up or down as the consumer demands at the speed of full automation (which may be seconds for some services and hours for others). Scalability is a feature of the underlying infrastructure and software platforms. Elasticity is associated with not only scale but also an economic model that enables scaling in both directions in an automated fashion.

On Demand Self-Service: The process for adding capacity in the traditional model typically involves budgeting, acquisitions, facilities planning, staffing, training, and more, with lead times often running into the months or even years. In contrast, a self-service capability enables the owner of an application to obtain the necessary computing resources or at least the potential to use certain computing resources with a simple request, no more than a few minutes before the need [3].

Virtualization: Over the past 10 to 20 years a variety of forms of virtualization have worked to decouple individual applications from particular pieces of infrastructure. This has been most successful with processors, less so with networks and storage, and least of all with applications.



Ubiquitous Access (Services and More): All capabilities can be accessed from anywhere using any device (at least to the capabilities of that device) or application.

Reliability: Reliability denotes the capability to ensure constant operation of the system without disruption, i.e. no loss of data, no code reset during execution [4]. Reliability is an important factor to support data-center applications in a cloud, and is applicable to both hardware and software-based solutions [4].

Cloud Computing Service Models

Infrastructure as a Service: IaaS is unique form of service obtainable in the domains of cloud computing. The distinctive feature that differentiates this service from the other two is the control presented to the end-user. The ultimate principle of IaaS is based on the sympathetic that, the IT resources relevant to storage and database, or the hosting environment of VMs is managed and controlled by the cloud service provider. The end users utilize cloud services, but are incapable of accessing the infrastructures that host the services. IaaS offers virtual machines and other related hardware and software systems through a service Application Program Interface (API). Hence, an end user can use the resources based on pay-per-use and the IaaS service provider controls the maintenance and is responsible for running the system [9]. IaaS saves the costs associated with IT infrastructure since it provides enhanced virtualization capabilities via service interfaces.

Units Platform as a Service (PaaS): PaaS delivers the whole set-up needed to develop and run applications over the internet. PaaS that control the behaviour of a server-hosting engine, which executes and replicates the execution according to user requests (e.g. access rate), utilize dedicated APIs. In PaaS, the cloud provider manages and controls the cloud platforms for a particular type of application and the users cannot access the infrastructure lower than the platform. Thus, it can be realized that PaaS is supplied in the same way as utility services like electricity or water are delivered. The end-users simply tap and extract the services without worrying the intricacies behind the scene. In addition, like a utility, PaaS is based on a subscription model so user only pay for what they use [9].

Software as a Service (SaaS): Software as a Service (SaaS) is also referred to as Service or Application Clouds that implement unambiguous business process functions using a cloud infrastructure or platform. This service is the most commonly used service today [2]. For SaaS, the cloud provider itself, who is either a third party service provider or a vendor, conducts the installation, management and maintenance of software facilities. Consequently, it is not necessary for the cloud provider to physically own the infrastructure that runs the software; they can either rent or lease it. In addition, even though the end users can access the applications, they do not have access to the cloud infrastructure. The main gain from SaaS is its ease of accessibility. SaaS is usually available on demand and via the Internet and can thus be configured remotely. Thus, this service is highly cost-effective and location independent. In addition, organizations do not have to invest in costs related to maintenance or updates, since the provider [2] already covers them.

Cloud Computing Deployment Models

Public Cloud: Public clouds are clouds that are accessible and available publicly for any organization and individual users. Public clouds use the basic concept of cloud computing where user can use the resources based on pay-per-usage model [9]. Public cloud functions based on the fundamental principle of cloud computing. A cloud provider sells or rents the cloud services to multiple unrelated clients. The clients on the other hands do not worry about the maintenance and security of their data, since it is the vendors' responsibility to maintain and protect the data in public clouds [12].

Private Cloud: Private clouds are clouds that are accessible only within a private network and are tailored in accordance with cloud computing principles. In private cloud, hosting services are provided to particular number of people behind the firewall [9]. A private cloud, controlled by the client if managed properly can benefit the organization in an incredible fashion. The principal idea of private cloud is to ensure the security of the data and allow access only to the subscribers of the cloud facilities [12] [9]. Thus, peace of mind with data security and appropriate maintenance are the characteristic benefits of private clouds. However, adopting the private cloud facilities requires careful analysis of the need and the current IT infrastructure of the organization; for, organizations with less sensitive data, migration to private clouds may result in high cost and redundancy [12]. Educational institutions like government organizations prefer to use intranet based project management over cloud in order to reduce the paper and transportation cost with effective time utilization [13].

Community Cloud: These are public clouds organized around a group of competing/cooperating businesses in a particular vertical market, such as financial services. Community cloud can be able to provide industry-specific capabilities (such as governance, auditing, and security) these can be thought of as a sort of shopping mall for cloud services, virtually (and perhaps physically) co-located to help all achieve a critical mass for customers interested in that vertical.

Hybrid Cloud: This cloud is normally known as the combination of private and public cloud, where a vendor has its own private cloud and forms a connection with public cloud or vice versa. A hybrid cloud exhibits the characteristics of both public and private clouds. It achieves maximum cost reduction through outsourcing which is a feature of public clouds, and maintains high degree of control over sensitive data, which is a feature of private cloud [4].

Impact analysis of Information Technology on Education

Educational institutions to simplify different business and educational processes have used IT. The most usual applications are like student information management systems, curriculum management, admission process management, graduation and certification management and so on. Apart from the obvious use of technology in the organized segment of the education sector, technology has also penetrated into the unorganized segment like, Training programs, private tuitions and vocational training. Implementation of Information communication Technology in Education sector has so many benefits from different views; some of the impacts of technology on various aspects of education is presented in Table-1.

Assessment of Barriers of the Current Education Ecosystem

As per the assessment made the barriers can be summarized in two categories as Technological and Socio Economic challenges. TABLE II summarizes some of the core challenges of the education sector.

Table-I: The Impacts of Technology on Various Aspects of Education

Tools and Methodologies	Collaboration Services	Distribution Services	Administration Services
E-books and Netbooks	Emails	Online Programs	Learning Management Systems (LMS)
Virtual Learning Environment (VLE)	Epals	Virtual Classes	Student Information System (SIS)
Different Computer Types	Social networking tools	Tele-education	Admission System
Knowledge Management			

Sources: Authors Compilation

Assessment of Cloud computing opportunities and Barriers in the education sector

Cloud computing has been presents salient opportunities for the education sector from different angels. Following are some of the opportunities:

- The Cloud offers an opportunity to reduce IT costs,
- The cloud reduces management burden for schools,
- The cloud offers collaboration in education,
- E-books replacing textbooks thus reducing Students' burden,
- Opening up research options.

Regardless of various advantages that the Cloud has to offer to the education sector, there are still few challenges that need to be overcome to leverage its complete potential in the sector.

- Security and Privacy Challenges,
- Governance, Service Level Agreements and Quality of Service,
- Cloud integration and interoperability,
- Cross-cloud composition, collaboration, and orchestration of applications.

Table-II: Some of the Barriers of the Education Sector

Technology Challenges	Socio-Economic Challenges
High start-up cost of adoption of new technologies	Increasing cost of Education
Complexity in maintenance of technological products	Cut down in Education budgets due to recession
Underutilization of technology resources	Limited reach of education
	Poor quality of education in parts of the world

Sources: Authors Compilation

Analysis of Traditional IT Approaches vs. the Cloud

Here the study presents the comparative analysis results of private IT, Managed Services, and Cloud-based IT with respect to various aspects of IT infrastructure development by having a lesson from different sources.

The Proposed Model

The hybrid cloud could be the group of services offered by public and private Cloud. Example: Enterprise Resource Planning (ERP), LMS, Documents and intra and inter office Email. However, Keeping in view of current global financial crisis focusing in major cuts in the Higher Education; Public and Private collaborative Cloud services will help to overcome learning and resource availability issues. The proposed hybrid cloud-computing model for Higher Education Institutions provides different confidential and non-confidential data/information services after implementation based on three-tier architecture.

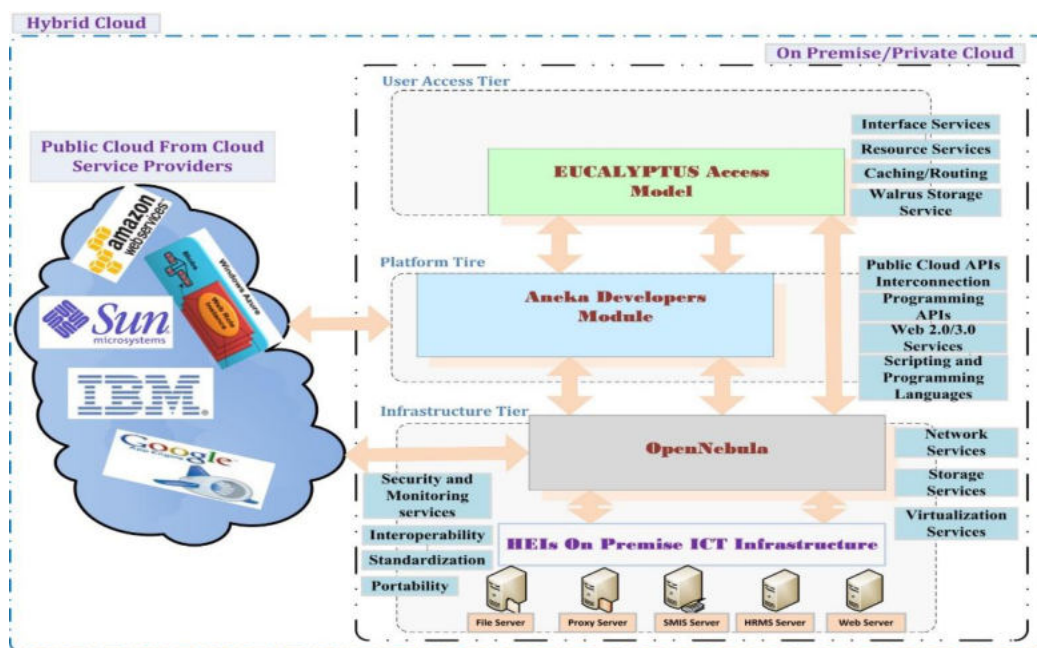
User Access Tier: This layer performs user access operations (i.e. Authentication, proxy, Data storage), Cloud controller is the entry-point into the cloud, and Eucalyptus open source cloud provides architecture to manage such services.

Table-III: Analysis Result on Internal IT Managed Services and Cloud-Based IT

IT Approach	Private IT	Managed Services	The Cloud
Attributes			
Up-front Capital Investment	Significant	Moderate	Negligible
	Private IT	Managed Services	The Cloud
Ongoing Costs	Moderate	Significant	Based on usage
	Private IT	Managed Services	The Cloud
Expansion Time	Significant	Moderate	None
	Private IT	Managed Services	The Cloud
Elasticity	Limited	Moderate	Flexible
	Private IT	Managed Services	The Cloud
Need for Expertise	Significant	Limited	Moderate
	Private IT	Managed Services	The Cloud
Reliability Assessment	Varies	High	Moderate to high

Sources: Authors Compilation

Figure-1: The Proposed Hybrid Cloud Implementation Model for Higher Education Institutions



Sources: Authors Compilation



This allows enterprise products and support.

Platform Tire: This layer would be intermediate layer, which facilitate developers to use programming APIs, scripting and programming languages, Web 2.0/3.0 and interconnecting public cloud APIs. The Cloud layer represented as Platform as a Service (PaaS). Aneka cloud platform gives to developers the ability to run their own programming applications and deployed on the Cloud.

Infrastructure Tier: This layer is Infrastructure as a Service (IaaS) layer, which would support Virtualization and VM management and development platform. The Open Nebula open source cloud is used for managing virtual infrastructure for heterogeneous data centers to build public, private and hybrid cloud resources. Open Nebula combines network, storage, virtualization, security and monitoring services to deploy multi-tier technologies. It also emphasizes on interoperability, standardization and portability.

CONCLUSION

The study reviewed and analyzed the existing case studies and researches in the area of the world paramount of Educational Institutions; it clearly indicates that the sector needs solutions that can be contemporary cost effective, easy upgradable, scalable and able to tolerate disaster by effective security management & promise reliability of services in un- interrupted manner. The comparative cost benefit analysis of various adoption strategies and their success stories indicates that virtualized cloud resources that can be made available over a networked connection saves high capital costs.

Furthermore the analysis indicates that Operational costs are also reduced considerably, since it does not require high investments on servers and other owned IT infrastructure and is managed by service providers/vendors rather than educational institutions themselves. Based on types of services i.e. public and private (confidential) in educational institutions a converged model of Private and Public cloud was critically analyzed based on selected parameters mentioned in the table III and concluded that a Hybrid Cloud Model is most feasible to be integrated in the proposed framework.

The new blue print of Hybrid Cloud Computing has been proposed as a revolutionary most fit future generation technology for educational institutions in developing, developed and under developed countries seeking fast IT up-gradation and alignment with modern ICT infrastructure

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ICT ENABLED SERVICES: A STUDY OF USER SATISFACTION FOR ICT SERVICES IN HIGHER EDUCATION INSTITUTES

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ABSTRACT

"Business" of an Educational Institution is greatly dependent on its student customers. It greatly influences the institutions current position and where it wants to be in future. ICT facilities is one of the factors, which is greatly influencing students in their decision for taking admission. Provision for ICT infrastructure in Higher Education has been mandatory by educational governing bodies like AICTE and UGC in India. Professional Higher Education attracts more in-depth knowledge of the subject. This education is expensive too. Students need to pay for ICT facility as part of their course fee. The purpose of this research is to identify the areas related to ICT infrastructure, facilities with students are satisfied, and with those, they still face a problem. By identifying the problematic area, and their underlying causes, needful remedies can be developed. It has been found that situation is much better now in select areas under study but still more need to be done as today's students are not only students but they are customers of educational institutions.

KEYWORDS

Student, Satisfaction, Higher Education, Pune, Information, Technology, Infrastructure etc.

INTRODUCTION

Today's world is Customer's world. Even students are a customer of the educational institution at every level. In India where in the past decade there has been a rush in establishing Professional educational institution for courses like engineering, Management, etc., its becomes very hard for a student to decide which institution to choose. This has leads to BRAND creation in educational system too. Price I., Matzdorf F., Smith L., Agahi H, (2003)¹ BRAND is created by a combination of two very important forces namely "Reputation Pull" and "Facilities Pull". ICT facilities is one of the critical factors the modern student looks at while deciding which educational institution to opt for.

Computer's advent has revolutionized our academic world. Computers have helped in getting to the core objectives of education that is "Knowledge for All". Emails, databases, file sharing, help sharing our knowledge resources. There has been a drastic reduction in costs, availability of resources to all, optimum usage of storage space coupled with data redundancy and consistency. The Internet, which is network of networks, and GOOGLE have spearheaded the academic revolution.

In developed countries the educational institutions have well-equipped ICT infrastructure. India, being a developing country is still lacking behind. Some reasons for this are attitude of Management of educational institutions, lack of adequate funds to develop and maintain ICT infrastructure, high costs for procurement of latest ICT infrastructure.

Government of India (1992)² the government of Late Prime Minister Rajiv Gandhi introduced a new National Policy on Education in May 1986 which called for "special emphasis on the removal of disparities and to equalize educational opportunity". Since then, Institutions are being encouraged to generate resources using their capacities to provide services to the community and industry. They have been equipped with up-to-date learning resources, library and computer facilities.

AICTE and UGC, since then have, through various regulations have insisted that educational institutions, especially higher education ones, should provide minimum level of ICT infrastructure for their students. Whether these rules have been actually implemented are still a matter of debate.

In this paper the researcher has tried to study the satisfaction levels of student users in one of the most lucrative higher education destination of India i.e. Pune. Pune has today become the Oxford of the East.

This study is based on data collected from various Professional Higher Education Institutions in Pune region, which have been running courses duly approved by AICTE, New Delhi. Certain common ICT services / facilities have identified and response from students have been sought from them.

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**LITERATURE REVIEW**

The literature Review work has been divided into 2 sections:

ICT Facilities provided by colleges in India and Internationally

St John's college University of Cambridge (n.d.)³, the college offers various IT services to its students like computer rooms, equipped with scanners and printers, and a number of public access points, Managed Cluster Service(MCS) for file storage, high-speed network connections to all rooms on the main site and most external hostels. Additionally, the college provides a Help Desk service and limited disaster recovery service to help users get data back should their own computers fail.

Reading College (n.d.)⁴, the website states that Reading College UK provides PCs to students throughout the college. Every classroom has a dedicated PC and digital projector, and most of them are equipped with a smart board. At certain places iPads, laptops and touchscreen PCs are also available.

City College Brighton & Hove (n.d.)⁵, UK states that at its Resource Learning Center it has provided access a wide range of resources like eBooks, DVDs, over 3,000 videos available as streamed media. This is accompanied by a number of workstations, and five multi-functional devices which function as printers (both black and white and colour), photocopiers and flatbed scanners to name a few.

Computer Services Centre IIT Delhi (n.d.)⁶, India's premier institution IIT Delhi through its state-of-the-art Computer Services center provides high level computing through PADUM: Hybrid High Performance Computing Facility. Apart from this, it offers software like MATLAB, etc. Besides this, it provides email facility also. It also provides repository of software, which are needed by students and faculty members. Apart from this IIT Delhi also provides Wi-Fi network, Storage space on servers, Home directories, Internet, email, encryption services, Cloud computing and storage, VPN, etc. It also has a documented and publically available ICT usage policy.

IIT Bombay (2016)⁷, as per the brochure of the institution, IIT Bombay's computer center provides computational facilities to users in the institute. For this, individual Accounts are created on the high-end computational server to all faculty members, students and staff. The campus-wide fiber optic network provides a high-speed backbone. Apart from classrooms and laboratories, connections are provided to all faculty houses and individual rooms in the hostels. Its Application Software Cell (ASC) develops and implements software applications used in IIT Bombay, such as academic software for admissions, course registration, grading and scholarships, accounting and payroll, administrative and HR software, and for a variety of other applications such as the library, estate and hostel management, security and hospital administration, etc. at a very low cost.

IIM Ahmedabad (2016)⁸, IIM Ahmedabad has provided a state-of-the-art computer network with more than 2000 nodes with a fiber optics backbone connecting every building on the campus. All workplace on the campus including student rooms in dormitories, faculty offices, classrooms, management development center, computer lab, and administrative offices has network connectivity.

The Institute has Wi-Fi high level of security using username password based authentication. A Firewall is also placed to provide higher security. A storage server with VPN based access and username password based authentication has been provided for accessing data outside the campus but its access is currently for teaching staff only. The campus network is supported by a large server farm with more than 30 high-speed servers. These provide services like Internet access, and file/print services. The E-mail facility is managed through Google, which provides us web, based email client, and built in chat facility, Google docs, Google apps, Google sites and few other facilities as well.

Individual students have their own home pages. Student dormitory has a high-speed shared network printer with web-based print billing software.

Software packages are available to the students and faculty for their academic and research work. These packages include several language processors, statistical, math programming, simulation, project management, CASE, and ERP packages. All this is accompanied by high internet bandwidth. Every classroom is equipped with a projector, a PC, and a DVD player with some of them equipped with ISDN based video conferencing capability. IIMA website includes payment gateway and offers access to a large repository of IIMA case studies and research reports.

Studies regarding Student Satisfaction with regards to IT Infrastructure

Stanford University (2012)⁹, Stanford University IT services department frequently conducts user satisfaction surveys which includes staff and students. This is done with the aim of Finding out how clients rate services and support provided by IT



Services, Ascertain factors that contribute to client satisfaction or dissatisfaction; and provide a platform to users for giving suggestions to influence IT Services priorities and potential initiatives. This study covered both Telecommunication and Network services. Some of the factors under study are Problem Resolving, Wireless network (Signal strength, availability, etc.), overall network performance, and condition of various machines (PCs, etc.), overall services offered, and overall performance of IT department. It was found that there are drastic improvements in all but few factors, which signals a good sign. Respondents voted Reliability of Network as the best. Some of the low scoring factors are Wireless signals in residential areas, E-mail quota and University Mobile App performance to name a few.

Mehdipour Y., Zerehkaf H. (2013)¹⁰. The researchers conducted study based on Students Satisfaction of Osmania University (OU) in Hyderabad City with a sample size of the study is 900 students randomly selected using survey method. This study is a general study and not specifically concentrates of ICT services. The only ICT factor that does form a minor part of the research is Computer Labs are adequate, for which the result was satisfactory.

OBJECTIVE OF STUDY

The primary objective of this study is to collect and analyze valid and reliable information on the satisfaction level patterns of student users with regards to using ICT enabled services provided by the institutions providing higher professional education and identify factors where satisfaction is high and those where dissatisfaction is high.

SCOPE OF STUDY

The study is limited to user satisfaction and utilization of ICT enabled services as provided by institutes and colleges of higher education professional courses in Pune region of the state of Maharashtra.

Further, this study is limited to only those institutions and colleges, which have been approved by AICTE as per the list published by AICTE for the academic year 2014-2015. Only those colleges have taken for study, which have been established prior to 2009. The courses covered are engineering, Management (including MBA and MCA), Architecture and Pharmacy.

IMPORTANCE OF STUDY

The implementation of ICT infrastructure, tools and facilities have greatly affected the education system in the positive direction. Internet and e-learning software have greatly helped the students in the academics and research. ICT has penetrated is continuing to grow in the public and private sectors academic institutions at all levels of education starting from school to higher education level. There is a great need for further bring improvements in the implementation of ICT in educational sectors by finding the various factors which have a defining role as a success factor in its implementation. It is very important to find whether the efforts taken in implementation of ICT in colleges and institutions is going in the right direction and is helping the students in their academics and research and is giving the students the *Value for their Money* which they have paid as fee.

It is also important that the management of the higher education institutions understand the underlying issues with which the issues are facing with respect to the ICT infrastructure and services.

Owing to the increasing globalization, the talent nurturing of Indian students is also under great pressure and student's skill sets need to be at par with the global standards. ICT provides the platform for higher education Institute especially the ones providing professional education to progress from a theory centric to practical centric system.

ICT provides tools to automate the academic process especially in the area of record keeping, examination system, research, knowledge management. It also provides monitoring tools to understand gap in the throughput of the processes and students from the desired goals in form of numerical and graphic reports. Thus, ICT provides assistance in streamlining the Academic processes for the betterment of the society and in particular student and academic in particular. The outcome and information from this study can be utilized in determining the various needs and expectations of the students about the ICT infrastructure, tools and services as provided by the higher professional education and bridging the gaps to attain the ultimate goal of shaping the careers of these professionals of tomorrow.

RESEARCH METHODOLOGY

This is a descriptive research and is related to the study of satisfaction and dissatisfaction trends about the ICT infrastructure, services and tools implemented by University/ Institutes providing professional higher education in Pune region. Owing to the descriptive nature of this study, study primary data has been collected and analyzed. The source of primary data has been collected by using the survey method using Structured Questionnaire.

A total of 8 closed questions (1 for each factor) sought rankings for Satisfaction or dissatisfaction with select ICT services offered by higher education institution. These factors are:

- Communication facilities (email, SMS, alert messaging, etc.),
- ICT Security policies and Security facility,
- Administration software,
- Maintenance / Technical support,
- Storage and Backup utilities,
- Internet services through wired network,
- Academic application software,
- Internet services through Wi-Fi.

A standard five-point Likert scale with ranking from 1 to 5 has been defined as Strongly Dissatisfied =1; Dissatisfied =2; Neutral =3; Satisfied =4; Strongly Satisfied = 5 has been created.

These questionnaires were circulated in paper or electronic form. The collected data was analyzed using SPSS and Ms. Excel software.

The secondary data has also been used from both published as well as unpublished sources. The scope of research is limited as described earlier in this paper.

The data collection is undertaken by obtaining a stratified disproportionate sampling technique for sample calculation and selection purpose. A stratified sampling technique in this particular study involves the selection of student respondents based the type of course the student is studying.

In order to know the number of Institutes / Universities in Pune region the researcher has extensively used the data provided by AICTE on its web portal in its Report section pertaining to List of Approved Institutions.

The sample is divided into 3 strata's viz. Management (MCA, Hotel Management and MBA), Engineering (BE, ME, B. Arch and M. Arch), and Pharmacy (B. Pharma and M. Pharma). For reasons of confidentiality, individual institutional data cannot be published. The population, sample size and actual respondent number details are as following:

Table-1

College Type	Target Number Responses	Actual Number Responses
Management + Hotel Management + MCA + Architecture	116	165
Pharmacy	16	51
Engineering	252	219
Total	384	435

Sources: Authors Compilation

Note: *The sample size has been calculated with Confidence= 95% and Degree of Accuracy/Margin of Error being at 0.05.

As per calculations derived from the AICTE web portal annual college intake report, the total population of students in Pune region (limited to the scope), is estimated at 144529 (Student population as per Academic Year 2014-15 intake). Thus, calculated sample size of students for this population is 384 (calculated with Confidence= 95% and Degree of Accuracy/Margin of Error being at 0.05). This value is then divided among the various strata in ratio of number of colleges in each respective strata. The actual number of respondents is 435 students, which makes the result even more realistic.

In terms of statistical validity, the total sample has Cronbach-Alpha values of .859 indicating a very high level of internal consistency. It is worth noting that values of 0.7 and above are normally considered significant.

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

The researcher with respect to 435 students has collected the primary data from the Institutes providing professional higher technical education with courses approved by AICTE. For the purpose of the study, the researcher has selected students from various departments of Institutes pursuing AICTE approved institutes only. Another prerequisite for the institute to make it to the list is that the said course must be AICTE approved and conducted by that institute particular institute for a minimum of 8 years.

Table-2: Satisfaction-Dissatisfaction Trends for ICT services

Factor Name	Strongly Dissatisfied (1)	Dissatisfied (2)	Neutral (3)	Satisfied (4)	Strongly Satisfied (5)	Total	Weighted Average	Rank
Communication facilities (email, SMS, alert messaging, etc.)	1 (0.2)	9 (2.1)	57 (13.1)	192 (44.1)	176 (40.5)	435 (100)	4.23	1
Internet services through wired network	39 (9)	13 (3)	110 (25.3)	234 (53.8)	39 (9)	435 (100)	3.51	2
Academic application software	1 (0.2)	60 (13.8)	111 (25.5)	254 (58.4)	9 (2.1)	435 (100)	3.48	3
Internet services through Wi-Fi	57 (13.1)	147 (33.8)	29 (6.7)	198 (45.5)	4 (0.9)	435 (100)	2.87	4
Maintenance / Technical support	51 (11.7)	131 (30.1)	88 (20.2)	153 (35.2)	12 (2.8)	435 (100)	2.87	5
ICT Security policies and Security facility	51 (11.7)	41 (9.4)	290 (66.7)	47 (10.8)	6 (1.4)	435 (100)	2.81	6
Storage and Backup utilities	51 (11.7)	183 (42.1)	39 (9)	147 (33.8)	15 (3.4)	435 (100)	2.75	7
Administration software	49 (11.3)	132 (30.3)	217 (49.9)	34 (7.8)	3 (0.7)	435 (100)	2.56	8

Sources: Authors Compilation

Note: Scale on 1 to 5 (where Strongly Dissatisfied =1; Dissatisfied =2; Neutral =3; Satisfied =4; Strongly Satisfied = 5)

Table-2 shows the different most commonly implemented / offered ICT services offered by professional higher educational institutions and their ranking according to point of view of the respondents. From the responses of students, average value is calculated with regard to each observation. These observations are then ranked based on average value.

Table-2 shows the various statements for assessment of the satisfaction and dissatisfaction level for various ICT services available in colleges from student's responses and their ranks. It is observed that for each statement average scale is in-between 1 to 5 i.e. in-between Strongly Dissatisfied to Strongly Satisfied. It is seen that highest average value (weighted average) for ICT services is 4.23 for *Communication facilities (email, SMS, alert messaging, etc.)* with **RANK 1**. This depict Strong Satisfaction levels among the Student Respondents This is followed by 3.51 for *Internet services through wired network* which is at **RANK 2** and depict Moderate Satisfaction levels among the Student Respondents.

Academic Application software (3.48) at **RANK 3**, *Internet services through Wi-Fi* (2.87) at **RANK 4**, *Maintenance / Technical support* (2.87) at **RANK 5**, *ICT Security policies and Security facility* (2.81) at **RANK 6**, *Storage and Backup utilities* (2.75) at **RANK 7** and finally *Administration software* (2.56) at **RANK 8** on an average point out towards Neutral (can't say). This leaves this discussion in an indecisive state.

Ignoring the neutral responses and combining responses for *Strongly satisfied* with those for *Satisfied* responses and like-wise combining responses for *Strongly dissatisfied* with those of *dissatisfied*, Researcher has able to get a better picture for individual services.

Table-3: Satisfaction and Dissatisfaction (%) Excluding Neutral Responses

ICT service	Dissatisfied (%)	Satisfied (%)
Academic Application Software	14	60.1
Internet Services through Wi-Fi	46.9	46.4
Maintenance / Technical Support	41.8	38
ICT Security Policies and Security Facility	21.1	12.2
Storage and Backup Utilities	53.8	37.2
Administration Software	41.6	8.5

Sources: Authors Compilation

It was found that Academic application software is in-fact in a much better state as satisfied respondents (60.1%) far exceed the dissatisfied respondents (8%). This means users are largely satisfied with it. The case is much different when it comes to the other ICT services which earlier showed indications of Neutral (can't say).



Internet services through Wi-Fi, Maintenance / Technical support, ICT Security policies and Security facility, Storage and Backup utilities, Administration software are the areas where dissatisfaction exists and exceeds Satisfaction percentage. Of this Administration, software is the worst ones where the difference between dissatisfaction (41.6%) and Satisfaction (8.5%) is the highest.

CONCLUSION

The researcher has attempted to study the satisfaction levels for some of the commonly available ICT services in higher education professional institutions. As discussed earlier, ICT has become one of the critical factors for a student to select and take admission in a particular educational institution.

The research will help a particular educational institution in identifying the ICT services, which might drive away the prospective students. Feedback and remarks from respondents also suggest that Wi-Fi. Its absence or restriction to use by institute's staff only and Wi-Fi range is a big problem. We need to stress that, like IITs and IIMs, other colleges also need to provide free licensed software to their students along with File Storage facility. Controlling authorities like AICTE, DTE, and UGC should make these facilities mandatory apart from PCs and internet facility. This will bring these institutions at par with IITs and IIMs.

FURTHER STUDY

This study leaves enough gap for further study. Demographic segregation needs to be given emphasis. Further, the researchers feel that there could be contrasting gaps between student's responses based on Course the institutes are offering which is important to study. Another area of study is the reasons for low satisfaction levels for Wi-Fi facilities.

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CORPORATE SOCIAL RESPONSIBILITY, THE COMPANIES ACT OF 2013 AND CHALLENGES AHEAD

Sindhu N.¹⁹ Dr. E. A. Parameswara Gupta²⁰

ABSTRACT

Corporates across the globe are being called upon to take responsibility for the ways their operations impacts society and national environment. They are asked to exhibit systematically character and principle to the ways in which they conduct their business. The logic behind character and principle is that corporates in these days should embrace typically considered voluntary, which are in nature of the inclusion and environmental concern in business operations and interaction with stakeholders.

The idea of assisting the poor, vulnerable and disadvantaged was cited in several ancient literature. In the reindustrialization era philanthropy, religion and charity were the key drivers of CSR. The industrial families at that period showed a strong favourable attitude towards CSR.

The companies Act 2013 has brought out important changes in the provisions relating to corporate governance e-management, compliances and enforcement. Disclosure Norms, Auditors, Mergers, and Acquisitions. These changes have far-reaching implications that are set to significantly change the manner in which corporate bodies operate in India. This paper encapsulates the major changes in CSR spending challenges and provisions CSR under the Act.

KEYWORDS

Philanthropy, Key Drivers, Mainstream, Companies Act 2013, CSR Activities, Challenges etc.

INTRODUCTION

Over the last a few years, CSR is assuming vital significance and has been in focus of many deliberations and research. CSR in India is known from ancient time as social duty or charity, which through different ages has changed its nature in broader aspect and now known as CSR. Now-a-days corporates use CSR as a strategy to distinguish itself from its competitors. It is understood that investment in CSR leads to, enhancement of the brand image and reputation of the business; improve customer sales and customer loyalty etc.

India became the first country to include the provisions on CSR in company law and make CSR expenditure compulsory for corporate based on prescribed criteria. CSR now-a-days catching the attention global corporate giants, stakeholders, employees because of increased need and awareness of environmental and ethical issues. The concerned socio economic issues like environmental damage improper treatment of employees and producing unwanted goods and service leads the customer into inconvenience or danger over assuming greater significance than before at present (Ramachandra 2010). CSR not only covers the different activities that a company undertake in order to utilize their profit to enable social and environmental development, but also includes the methods that a company employs in order to earn these profits including socially responsible investments and transparency to various stakeholders among others.

In India, there is a growing realization that business cannot succeed alone and social progress is necessary for sustainable growth. An ideal CSR practice has both ethical and philosophical dimensions particularly in India where there exist a wide gap between sectors of people in terms of income and standards as well socio-economic status.

CSR is a company's responsibility towards the society and environment in which it operates. CSR in India is functioning as a self-regulatory mechanism whereby a business organization ensures its active compliance with the law, ethical standards and business norms. The main objective of CSR is to create positive impact on the environment, investors, consumers, employees, communities and society.

There are arguments for and against CSR. However, CSR is become a part of every day's operations of a business. CSR is not a cost center but an effective management tool with multi-dimensional benefits. (Gupta and Nidhi, 2009). They further state that CSR offers a new way to look at the relationship between business and society that does not treat corporate overall growth and social welfare separate.

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In this competitive scenario majority of the companies, use CSR as a marketing tool and to build brand name for them as a mark of identification in the open market. Company Act of 2013 clarifies regarding purpose, quantum on money to be spend etc.

CSR DEFINED

According to the founder of Infosys Narayana Murthy, "social responsibility is to create maximum shareholders value working under the circumstances where it is fair to all its stakeholders, workers, the community, government and the environment."

Mohammed Ghose et al. (2014) has defined "CSR is nothing but how the business takes responsibility for the purpose of social, economic environment impact and it may produce from its operations or products. It is also includes the labour standards employee relations and human rights".

Slaughter (1997) has described the socially responsible behaviour as "Actions that go beyond the legal or regulatory minimum standards with the end of some perceived social good rather than the achievement of profit."

OBJECTIVES

- To study CSR status in India.
- To study the major provision affecting CSR
- To understand issues and challenges in the implementation of CSR
- To know the major limitations of companies Act.

RESEARCH METHODOLOGY

The present study is based on secondary data and data gathered from various sources like journals, magazines, articles and media reports. The available data used extensively in this study.

LIMITATIONS

The present study is based on the secondary data and hence the strength and weakness of secondary data also becomes part and parcel of the entire study

PROVISION OF CSR UNDER COMPANIES ACT 2013

2% Clause

The 57-year Companies Act of 1956 has been replaced by the new Companies act of 2013. The present legislation applies to any company during any fiscal year with:

A net worth of Rs. 500 crores or more,

A turnover of Rs. 1000 crores or more.

A net profit of Rs. 5 crores or more, which includes a requirement to spend at least 2% of annual net profits on CSR activities.

As per the revised companies Act 2013 there are only 16000 companies out of 95000 companies registered in India are to meet the criteria. CSR spending has wide appreciation by all and Rs. 22000 crores is to be spent on national priorities every year.

Penalty: There is a provision for penalty in clause 134(8), which states that where a company fails to meet any of the provisions stated in clause 134(8) it would attract a minimum fine of Rs. 50000, which may be extended up to Rs. 25 lakhs, along with the imprisonment of the defaulting company officer for a maximum period of 3 years.

REVIEW OF LITERATURE

Ramachandran (2010) has stated that the basic objective underlying CSR is maximization social benefits from business and whereby organizations consider the interest of society by taking responsibility for the impact of their activities on customer's employees, shareholders, communities and the environment in all spheres of their operations.

Bowen (1953) viewed that CSR is no panacea that will care the society of all its ills. A welcome development needs to be encouraged and supported. The position of greater influence and far reaching scope and consequences of corporate decisions obligate business to consider social consequences and responsibilities.

Singhaprakdi et al., (1996) observed that little research has been conducted concerning marketer's perception regarding the importance of ethics and social responsibility. An instrument for measuring of the perceived role of ethics and social



responsibility was developed. Evidence that the scale is valid was presented through the assess of scale reliability, as well as content and productive activity.

Androif and McIntosh (2001) argued that the foundation of CSR consist of four specific areas i.e., environment, work place, community and market place. Corporations can take responsibility by developing programs, monitor and change the effects of their operations within each specific area. Thus, socially responsible corporations step up to their obligations regarding these areas and try to improve the conditions and behave appropriately.

Deresky (2003) viewed that corporate decisions have on issues such as poverty lack of equal opportunities, the environment, consumer concerns, employee safety and well-fare are another most quoted in the literature regarding CSR in MNCs.

Hemingway and Maclagan (2004) observed the role of individual personal values as factors explaining the formulation, adoption and implementation of CSR policies in organization. While CSR is almost commonly explained in terms to strategic commercial interest of the organization, this is not always the case. It was suggested that where individual managers can exercise influence; they might initiate or change specific projects in order to address their personal moral concerns.

Kumar and Khan (2004) suggested some factors to be considered by MNCs to improve the positive attitude of people towards their such as MNCs should show priority in establishing their units in backward areas rather than already developed areas, they should invest more of their profits in India, they should use the labour force which is available in India to reduce problem of unemployment, they should not follow unfair means for avoiding the taxes and they should not enter into political affairs of the country to force the government to formulate the policies in their favour. It was concluded that being a technically and economically developing country, it might not be adequate for India to depend on their own industries for economic as well as technological developments.

Crowther et al., (2005) found that the corporations have not changed their behaviour and the managers of these corporations are still driven by the desire to create value for shareholders above all else. In such circumstances, CSR was introduced in corporate reports and practices, because of low enforcement and especially for the public image of the corporation.

Ricks (2005) viewed that there exist scant research as to how consumers perceive and react to philanthropy.

Porter and Kumar (2002), Smith (1994), Standard (1992) have stated that corporate philanthropy is no longer a simple matter of donating money to a deserving cause. It is increasingly expected to serve long-term business interest.

Bawa (2004) reported that there is a lot of anecdotal evidence of price consciousness of Indian previous empirical research has shown Indian consumers to be quality consciousness.

The study by Gan (2006) reveals that existence of strong link between corporate philanthropy and improved image of the organization.

Wailes and Grant (2008) argued that the Australian context has produced a limited transfer of CSR in a largely instrumental and legitimating form.

Wonderley et al. (2008) opines that CSR has become a much-discussed subject in the business world. Further, they reveal that interest has become one of the main tools for CSR information disclosure, allowing companies to publicize more information less expensively and faster than ever before. They further report that corporations are increasingly concerned with communicating ethically and responsibly to the diversity of shareholders through the web.

Turan and Mentis (2013) explore website design and content feature of Istanbul Stock Exchange (ISE) listed firm. The analysis indicated that use of design features and the type and extent of the corporate information contempt do not defer much among the studied industries. They further, stated that some statistical differences based on Corporate Governance Ratings (CSRs) and Turkish firms seems to be in their early stages of using ICTs in corporate governance practices.

Specified CSR Activities – Schedule VII

Schedule VII of companies Act, covers the following activities, which can be undertaken by the companies as a part of their CSR initiatives:

- Eradication of extreme hunger and poverty.
- Promotion of education.
- Promoting gender equality.



- Ensuring environmental sustainability.
- Reducing child mortality and improving material health by providing good hospital facilities and low cost medicine.
- Providing with hospital and dispensary facilities with more focus on clear and good sanitation to combat human immune deficiency virus, acquired immune deficiency syndrome, malaria and other diseases.
- Ensuring environmental sustainability
- Protection of national heritage, art and culture.
- Employment enhancing vocational skills.
- Measures for the benefit of armed forces veterans, war widows and their dependents.
- Training to promote rural sports, nationally recognized sports, sports and Olympic sports.
- Contribution to Prime Minister's national fund or any other fund set up by the central government for socio-economic development and relief and welfare of the scheduled castes, the scheduled tribes, other backward classes, minorities and women.
- Contributions or funds provided to technology incubators located within academic institutions, which are approved by the central government.
- Rural development projects.
- Slum area development.

CHALLENGES IN IMPLEMENTATION OF CSR

Issues and Challenges in Implementing CSR is Listed Below:

Restricted Scope: Schedule VII of CSR rules specifically lists activities, which may be included by companies in their CSR policies, along with a role "such other matters as may be prescribed. The already recommended activities being circulated by many agencies, individuals, and are being accepted by many corporate as the preferred activities for CSR. This regulates that resources must be spent on chosen areas and discourages other critical areas. Further Sec. 135(1) stipulates that each company compulsorily constitute a committee to decide on the projects and programs. Schedule VII greatly influences the committee and restricts the freedom of the committee.

Restrictive Geographic Scope: Sec 135(5) of the Act recommends, "The Company shall give preference to the local area and areas around it where it operates for spending the CSR resources. However, this is good idea to welcome in the process of building a strong community business relationship but it may skew resources allocating by destroying the principle of "inclusive development" in the underdeveloped areas where there is no industrialization activities.

Identification, implementation, and monitoring large-scale Projects: As per the regulation every time that comes under preview of restrictions and gets the amount of profit, need to spend 2% of their profits every year. This is going to be a major hurdle and may stain on the company's management to search for, select and implement additional projects, monitor its ongoing CSR activities. Spending of large sized amount requires dedication and commitment to identify implement and monitor the large-scale projects.

Duplication of CSR Projects: In order to avoid duplication and over investment coordination of CSR projects across companies becomes essential. If coordination is effectively followed, the duplication and over investment may be prevented. This is so because the rule says that the CSR spending must be preferred in local areas where the company operates.

Contribution to prime ministers national relief fund and such other funds as set by government: Schedule VII recommends, "Contributions to PM's national relief fund and such other funds established by the central government or state government as one of the activities to be undertaken up under CSR. This may end up is misuse of funds. As per the submissions of Prime Minister's Office to the Central Information Commission, the Prime Ministers National Relief Fund itself is not a government body and is not every answerable to either houses of parliament. Such donations undermine the CSR activities and resources raised are not accountable and may raise many questions to be answered.

Foreign Exchange Violations: The movement of capital in a globalized world and thus ownership holding of a company, it might be difficult for many development organizations receiving CSR donations from Indian companies to track their ownership and there many at times it leads to clear violation of exchange rules and attracts litigation.

Rule 5 of the Act: Rule 5 of the Act says that a private company need not have an independent Director on the CSR committee, which is contrary to Sec. 135.



CONCLUSION

The task of companies has increased with the introduction of CSR rules and regulations. Corporates are not only required to spend money but also required to disclosure and other statutory requirements. CSR is about how companies can manage the business process to produce an overall practice impact on society. The companies are now-a-days have realized the significance of societal contribution and are taking responsibility to improve the society, environment and follow inclusive growth.

There are several companies in India involved in diverse issues as healthcare, education rural development, sanitation, microfinance and women empowerment. The analysis of several surveys in India suggest though many companies in India have taken on board the universal language of CSR. CSR seem to be in a confused state. There is a need to increase the understanding and active participation of business in equitable social development as an integral part of good business practice.

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IMPACT OF E-TRAINING ON ORGANISATIONAL EFFECTIVENESS IN INFORMATION TECHNOLOGY SECTOR

Meghana C. Mohan²¹

ABSTRACT

Training employee is the most vital responsibility of the organization, which can equip them to have an edge over the market competition. Most of the employees come equipped with knowledge, skill and attitude needed to start a work, but for adapting in to the organizations need extensive training. One of the emerging trends in training is Electronic training (E – Training). E - Training has developed into a revolutionary way of learning. The main change is due to the technological advancement and acceptance of new technology. The study aims to find the effects of E- Training on organizational effectiveness.

INTRODUCTION

E-Training refers to delivering of learning or training program by electronic means. E-Training involves the use of computer or any other electronic device to provide training or educational material. The continuous efforts of technology giants in the world over have brought in user-friendly training or learning technologies at affordable prices, which were unheard in the past. The business and product life cycle have compressed substantially in the ever-changing world of business. When business cycles are shortened, organizations cannot afford to send their employees away from work for several weeks or months to undergo classroom training. Under these conditions, organizations by deploying the E-training solutions can help employees to learn and perform simultaneously. Therefore, we can expect the need for finding the impact of E-training on individual level and organizational level.

E-Training with sufficient self-motivation to keep on track with the training programs can be highly useful for the employees. If the correct impact of E- training on different areas of employee development can be assessed properly it can bring more organizational effectiveness.

RESEARCH METHODOLOGY

The research intends to find the impact of E-training on organizational effectiveness. The research adopts a new E- training framework to understand the impact of the amount of E-training on employee development and how in turn it can bring in more effectiveness that is organizational. In this study E-training is the independent variable, employee development intervening variable and organizational effectiveness dependent variable.

Data for this study is collected from IT Companies in Ernakulam District of Kerala, especially from Kakkanad area as the major players of IT Sector situate in those areas.

OBJECTIVES OF STUDY

The objectives of the study are:

- To understand the effectiveness of E-training on Employee development.
- To understand the effectiveness of Employee development on Organizational effectiveness.
- To propose a framework showing the effect of E-training on employee development and organizational effectiveness.

METHODS OF DATA COLLECTION

Data was selected from the selected sample by administering pre-tested questionnaires. Secondary data was gathered from published materials like books, journals, research papers, records of relevant government organizations etc. Personal discussions with selected executives and employees were conducted to check the reliability of data collected through questionnaires.

To find the feasibility of the research pilot study was conducted. Series of discussion with experts who are involved in IT sector from Info park, SEZ, DIC, Kinfra and the information gathered from the review of literature formed the basis for the study, tool selection , sample units and hypotheses. Pilot study was conducted by taking 40 sample units from the classified strata of managers. The result of the pilot study was properly studied and necessary changes are incorporated in questionnaire.

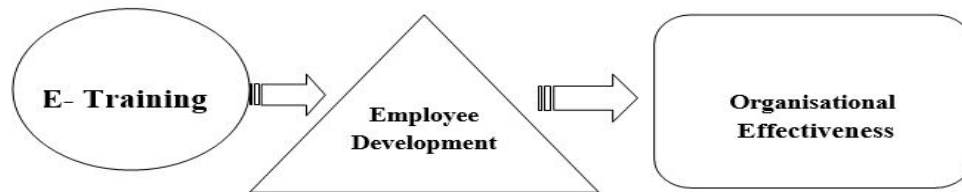
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Primary Data Sources

Primary data was collected from 312 respondents from the organizations in the IT sector under study. Data was collected from 26 IT firms from the selected area of study in Kakkanad, Ernakulam. The data collected consists of 26 Human Resource Manager, 143 Software Managers and 143 Software Engineers.

E-TRAINING FRAME WORK OF STUDY

Figure-1



E-Training Frame Work of the Study

Variables in the Study



Sources: Authors Compilation

EFFECTIVENESS OF E-TRAINING AND EMPLOYEE DEVELOPMENT

The respondents were asked to answer a set of fifteen questions in the five point Likert scale regarding various aspects of employee development. The response are scored as 1 for 'strongly disagree', 2 for 'disagree', 3 for 'not sure', 4 for agree and 5 for 'strongly agree'. The total score of each of 15 questions for all 312 respondents is found. The study has this score to compare the effectiveness of the E- training, which is classified because of the number of training the respondents received. To understand the relationship between E - training and employee development the researcher set the following hypothesis. One Way ANOVA was used to test the significance of the effectiveness of E- training on Employee Development. The following table-1 gives the mean, standard deviations and F value for employee development.

Table-1: ANOVA - Means and Standard Deviations and F-Value for Employees Development

Variable	Number of E Training Participated	N	Mean	Standard Deviation	F	P
Employee Development	Up to 10	120	88.45	17.85		
	11 to 20	146	88.54	10.79		
	21-30	26	122.65	9.81	61.675	<0.001
	31-40	13	123.62	10.43		
	Above 40	7	125.00	9.92		

Sources: Authors Compilation

From the table 1, the mean score of employee development for the respondents who had attended 10 or less E-training is 88.45, for those who had attended E-training between 11 to 20, the mean score of employee development is 88.54 and for the respondents with E-training between 21 to 30 the mean score is 122.65, between 31-40 the mean score is 123.62. Finally, the mean score of the respondents who received more than 40 E- training it is 125.00. This indicates that employee development

increases as the number of training increases. In addition, the one-way ANOVA is conducted to test the significance of effectiveness of the E – training. It is found that E training has significant effect on Employee development ($F= 61.675$, $p<0.05$) at 5 percent level.

E training and Different Variables of Employee Development

The study tries to analyses the improvements in different variables of employee development by taking them separately and conducting one way ANOVA for each of them. Each variable was analyzed by taking the number of E- training modules attended and their effect on employee development.

F-Value for Number of E-training Participated

Skill development – F value 81.017, p value (< 0.001), Confidence building – F value 41.076, p value (< 0.001), Competency – F value 31.831, p value (< 0.001), Employee satisfaction – F value 91.212, p value (< 0.001), Career development – F value 33.138, p value (< 0.001), Performance development – F value 91.212, p value (< 0.001). The p value is 0.001 which is less than 0.05 for all variables. Thus, the null hypothesis is rejected and it can be concluded that there is significant effect of E- training the variables.

IMPACT OF E-TRAINING ON ORGANIZATIONAL EFFECTIVENESS

One Way ANOVA was used to test the significance of the effectiveness of E- training on Organizational effectiveness. The research also evaluate the effectiveness of E training on the various factors of organizational effectiveness such as Organizational performance, Objective accomplishment, Effective work culture, and Change management separately.

Table-2: ANOVA - Means and Standard Deviations and F-Value for Number of E-training Participated

Variable	Number of E-training Participated	N	Mean	Standard Deviation	F	P
Organizational Effectiveness	Up to 10	120	61.17	12.78		
	11 to 20	146	61.78	9.94		
	21-30	26	92.31	9.92	91.212	0.001
	31-40	13	96.92	7.51		
	Above 40	7	100.00	0.00		

Sources: Authors Compilation

From the table-2, the mean score of Organizational effectiveness for the respondents who had attended 10 or less E-training is 61.17, for those who had attended E- training between 11 to 20, the mean score of employee development is 61.78 and for the respondents with E- training between 21 to 30 the mean score is 92.31, between 31-40 the mean score is 96.92. Finally, the mean score of the respondents who received more than 40 E-training it is 100.00. This indicates that Organizational effectiveness increases as the number of E-training increases. The one-way ANOVA is conducted to test the significance of effectiveness of the E-training. It is found that E training has significant effect on Organizational effectiveness ($F= 91.212$, $p<0.05$) at 5 percent level.

Impact of E-Training on Different Variables of Organizational Effectiveness

In this section, the researcher tries to assess the impact of e-training on various factors of organizational effectiveness separately. One way ANOVA is used for testing the significance.

F-Value for Number of E-training Participated

Organizational Performance: F value 91.212, p – value (<0.001),
 Objective Accomplishment: F value 91.212, p – value (<0.001),
 Effective Work Culture: F value 91.212, p – value (<0.001),
 Change Management: F value 91.212, p – value (<0.001)

TO UNDERSTAND THE RELATIONSHIP BETWEEN EMPLOYEE DEVELOPMENT AND ORGANIZATIONAL EFFECTIVENESS

Pearson Correlation is used to identify the relationship between Employee development and Organizational Effectiveness, which were interval-scaled and ratio-scaled. Furthermore, correlation coefficients reveal magnitude and direction of relationships, which are suitable for hypothesis testing.

Table-3: The Correlation between Employee Development and Organizational Effectiveness

Variables	Correlation	Lower bound	Upper bound	Z	p
Employee development and organizational effectiveness	0.971	0.969	0.973	71.509	<0.001

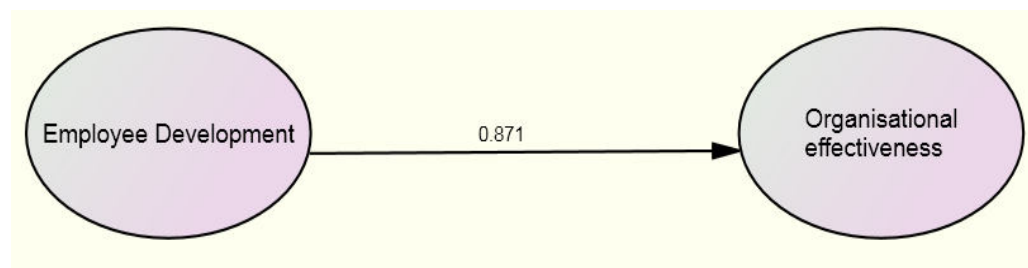
Sources: Authors Compilation

From the table.3, correlation between Employee development and Organizational effectiveness is 0.971, which indicate that there is significant positive relationship between Employee development and Organizational effectiveness and this is significant at 5 percent level as the p value is .001, which is less than 0.05. Hence, the test concludes that there is significant positive correlation between Employee development and organizational effectiveness.

To propose a framework showing the effect of E-training on Employee development and Organizational Effectiveness.

In order to propose a model showing effects of E-training and impact of employee development and organizational effectiveness, Confirmatory factor analysis (CFA) is used.

Figure-2: Framework of Employee Development and Organizational Effectiveness



Sources: Authors Compilation

In order to determine, how well our proposed framework accounts for the correlations between the variables in the data set we conduct a model fit test. For this purpose, we use chi square test as a test of goodness of fit for the proposed model.

Analysis is made to find that there is no difference between the patterns observed in these data and the framework specified. The result of the analysis is shown in the table-4.

Table-4: Chi Square Model fit Indices for CFA (Confirmatory Factor Analysis)

	χ^2	DF	P	χ^2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Recommended			>0.05	<3	>0.90	>0.90	>0.90	>0.90	>0.90	<1	<0.5
	1.656	1	.198	1.656	.995	.984	.998	.999	.999	.000	.046

Sources: Authors Compilation

From the **Chi square** test of model fit, it is clear that value of chi square is 1.656 and the recommended value is < 3. Therefore, the Chi square value (1.656) is acceptable. While considering p value of Chi square the recommended value is > 0 .05 and our value is 0.198, which falls within this limit. Therefore, it is also significant and the degree of freedom is one.

The recommended GFI (Goodness of Fit) is greater than 0.90 and the value we got is .997 that also greater than 0 .90. Similarly, the recommended values for AGFI (Adjusted Goodness of Fit), NFI (Normed Fit Index), TLI (Tucker – Lewis Index) and CFI (Comparative Fix Index) are greater than 0.90. The calculated values are 0.984, 0.998, 0.999 and 0.999 respectively. For RMR (Root Mean Residual) the standard value is <1 and for RMSEA (Root Mean Square Error of Approximation) is <0.5.The values are .000 and .046 for RMR and RMSEA.

FINDINGS

In this research, the aim was to establish the E - training framework through which employee development can be done to attain a holistic organizational effectiveness. The study states that there is a constructive effect of E- training on organizational performance. E - Training is helpful to both the employees as well as to the organization. It also helps to meet the new change and challenges in this new global environment. E - Training is the most feasible and convenient mode of training as the training is



possible anywhere at any time. Despite of the variation between the turnover and size of the organizations, the study proved that all the organizations are highly benefited after adopting E –training into their system.

CONCLUSION

Proper evaluation and studies must be done by every organization to make full utilization of the highly powerful means of training such as E-training to bring in organizational effectiveness. Employees find programs that nurture their personal and job accomplishment skills very useful and motivating. E-training helps in building a strong bond between the organization and employee as it can cater to individualized needs of both employee and organization. This helps in bringing more efficiency among the employee groups and in return helps in increasing the total efficiency of the organization.

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INFORMATION SECURITY IN ERP BASED E-GOVERNANCE FOR UTTARAKHAND: THREATS AND SOLUTIONS

Ashish B. Khare²² Dr. M. K. Sharma²³

ABSTRACT

E-governance provides several e-Services to its citizens so that they can interact with the government in a more efficient manner. Enterprise Resource Planning (ERP), when implemented in the e-governance domain, combines all the government services together into one single integrated system platform with a central database. This system serves the information needs of all the departments across boundaries, while allowing them to communicate with each other in better and transparent way. The government has become more reliant on technologies that have the potential to create seamless, responsive, and citizen-centric government for the benefit of citizens, departments, vendors, employees, etc. However, this technological approach has become increasingly vulnerable to risks that are based on loss of confidential data. Government agencies at all different levels need to protect the information systems that they develop operate and rely on. Information security requires a combination of business, management, and technical measures in an on-going process. For this the security and privacy should be addressed in the design phase and periodically reviewed. This paper contributes to the ERP based e-governance for Uttarakhand in understanding the possible threats and risks, explaining and analysis of the techniques and issues involved in improving e-governance model security. The benefits of ERP can be implemented in public sector to improve the efficiency of the government, but at the same time security issues have to be addressed to provide seamless information without any breach in confidentiality.

KEYWORDS

e-Governance, ERP, PKI, STEGANOLOGY etc.

INTRODUCTION

The main function of an e-governance system is to provide access to government services anywhere and anytime over accessible open networks. These open networks lead to issues of security and privacy in the management of the information systems. In developing e-governance services, the exposure of users towards information to use self-service channels must be taken into account, as per the complexity, requirements and category of the service. (Layne and Lee, 2001) described a four-stage growth model to develop a fully functional e-governance. Based on technical, organizational and managerial feasibilities, the four stages of a growth model developed for e-governance are:

- Cataloguing (Information),
- Transaction,
- Vertical integration (Interactive),
- Horizontal integration (Strategic, interactive) or transformation.

The stages are arranged in terms of complexity and different levels of integration. The first stage is “*cataloguing*” because efforts are focused on cataloguing government information and presenting it on the web. The second stage “*Transaction*,” where e-governance initiatives are focused on connecting the internal government system to on-line interfaces. However, the critical benefits of implementing e-governance are actually derived from the integration of underlying processes across different level of government. This integration may happen in two ways: vertical and horizontal. *Vertical integration* refers to local and central administration connected for any functions or services of government, while *horizontal integration* refers integration across different functions and services within.

ENTERPRISE RESOURCE PLANNING

The Key potency of ERP systems is integration. It not only integrates all the functions of a different but also connects different departments of an organization to develop an integrated system. The success of ERP depends upon the coordination between technology and management. ERP software not only uses cutting edge technology but also embeds the best of the breed management practices from the leading edge companies such as Intel, Compaq, Microsoft, GM, Philips, to name a few (Jha and Saini, 2009). It serves the information needs of all the departments across boundaries, while allowing them to communicate with each other seamlessly.

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The objective of the integration is to provide efficient services to citizens, administrators and comparators by implementing ERP Based e-governance solutions to enable organizational processes and workflows. Key objectives of such a project are as follows:

- Better service delivery to the citizens with best efficiency and transparency.
- Data sharing across different departments for better work function.
- Assist the decision making process of decision makers by providing the right information at right time in a better comparative way.
- Transparency among departments in revenue collection and distribution.
- Technology implementation to create sense of achievement amongst employees and citizens.

INFORMATION SECURITY IN ERP BASED E-GOVERNANCE

Any information on the open network is under threat. The threats in e-business and e-governance are mostly the same; however, the domain of e-governance is vaster in comparison to e-business. Most businesses deal only with a subset of the population, and they can choose how and the when they do it. However, the government must deal with everyone (Stibbe, 2005). Therefore, in order to service the massive number of users and transactions, and sensitivity of this field, like citizen's private information or government's secret information, and other issues, securing governmental networks is more important than businesses (Conklin and White, 2006). A barrier frequently cited is the need to ensure adequate security and privacy in an e-governance strategy (Daniels, 2002; James, 2000; Joshi et al., 2001; Lambrinoudakis et al., 2003; Layne and Lee, 2001; Sanchez et al., 2003). (Bonham et al. 2001 and Gefen et al. 2002) agree that one of the most significant barriers for implementing e-governance application is computer security, privacy and confidentiality of the personal data.

The proliferation of multiple devices like digital television, mobiles, smartcards, biometrics and other new technologies, present their own challenges and demand support for trusted services, authentication, integrity and confidentiality. With several agencies frequently involved in the development of e-governance integrated with other functional projects, the information security infrastructure is invariably the element most open to compromise and the one that frequently presents the greatest risk to e-governance projects (Omari, 2006).

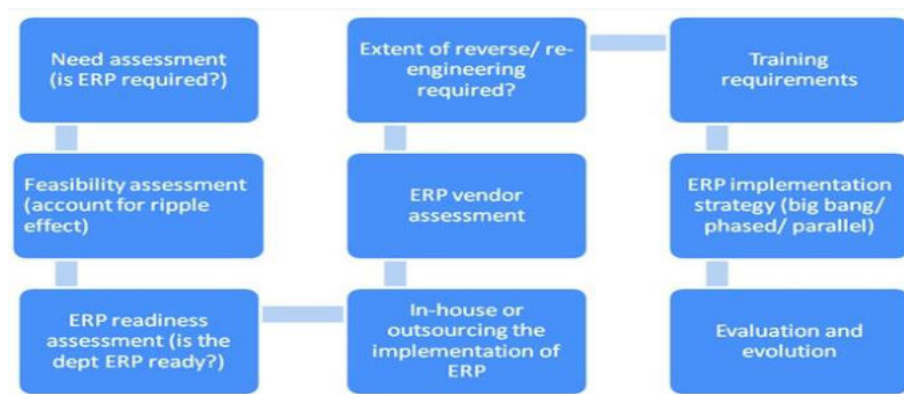
ERP BASED E-GOVERNANCE TECHNOLOGICAL ENVIRONMENT

ERP enabled e-governance environment can be very complex one and may comprise of MIS, GIS. In order to support the MIS and GIS applications, various other IT Management solutions are required. The list of such necessities is given as: a) RDBMS, b) Application Server for MIS/GIS, and c) Web Server.

Apart from IT Management Applications specified in above section, it requires Server Side Infrastructure components such as: a) Database Server, b) Application Servers, c) Web Servers, and d) Domain Server.

It allows multiple access medium for users including PCs, laptops, mobile, PDA's etc., thus providing diversity in user environment. Because of this diversity and increase in number of users, it poses many information threats. Increasing dependence on technologies connected over open data networks dictates effective management of information security to ensure successful outcomes. (Alfawazand Mohanak, 2008). Nine stepped approach for implementing ERP enabled e-governance is depicted in figure 1.

Figure-1: Nine Stepped Approach for Implementing ERP enabled e-Governance [10].



Sources: Authors Compilation



INFORMATION SECURITY THREATS

E-governance security requirements can be understood after examining the overall process, beginning with the consumer and ending with the e-governance server (Mazumdar, 2009). Thus, the threats can be categorized as follows:

Threats at client end: Some common threats at client end could be encryption cracking, system failure or unavailability of information system, corruption / loss or damage of back up media, denial of service attacks and theft of credentials.

Threats for data in transit: Common threats for data in transit could be loss of decryption keys, system failure, corruption / loss or damage of back up media, cross-site scripting, query string manipulation, network eavesdropping, impersonation, cookie manipulation, HTTP header manipulation, inability to identify actual user.

Threats at server end: at the side of end user the threats may be any of the following (i.e. inability to identify actual user, denial of service attacks, loss of decryption keys, encryption cracking).

INFORMATION SECURITY CHALLENGES

Whenever data is shared over a network, there are chances of threats to the information. These threats can be like defacing of websites, virus attacks, malware, bots, hacking into servers, Denial-of-service attacks, key-loggers, phishing and spoofing. In ERP based e-governance we have to secure all the resources, which include data, information, hardware, software, networks etc. Although emerging IT solutions provide fascinating opportunities for supporting the design and implementation of an e-governance infrastructure, use of these technologies, still faces security challenges for sensitive information, critical transactions and national security. (Joshi, et al., 2001). The potential for unauthorized access to confidential data and exposure of critical infrastructure to new vulnerabilities is always a challenge in interconnectivity of heterogeneous environments of e-governance environments.

Challenges with respect to information security in the ERP based e-governance scenario arise due to the following factors:

- Too much dependency on information systems.
- Complexity in controlling and managing enormous amount of information.
- Increased use of remote access.
- High quantity of information sharing over networks.
- Highly sensitive citizens and business data to be taken care of.
- National security a great concern and cannot be compromised.
- Consequences of security breach can be harmful

TECHNIQUES FOR OVERCOMING INFORMATION SECURITY CHALLENGES

In an open environment such as Internet in order to provide seamless communication and protect the network from vulnerabilities, there is always a need to define security standards. These standards among other things can help to obtain:

- Realistic and integrated security framework.
- A good look at all components of IT infrastructure.
- Security from internal threats inside the system.
- Upgraded network performance.
- Decrease in multi-level complexities in network threats.
- Secure Communication between internal and external entities.
- Porting of legacy applications to new platforms.

The basic principle of Information Security is to preserve confidentiality, Integrity and availability of information. However, other needs of Information security such as authenticity, accountability, non-repudiation and reliability are also involved and are crucial (ISO/IEC 17799:2005). Other properties such as Security mechanisms and practices are the technologies that provide the security services. Firewalls and Digital Signatures are some of the security mechanism that helps to implement security practices.

The Information assurance can be achieved through design and implementation of such a technical infrastructure that is capable of handling the large amount data and provide secure transactions over a heterogeneous network. Such architecture can be achieved keeping in mind the following three techniques, which are discussed here briefly.

**ISO 27001**

ISO/IEC 27001 is the known standard providing necessities for an information security management system. An ISMS is a systematic approach to manage crucial and sensitive organizational information so that it remains defeated from vulnerabilities. It comprises of people, processes and IT resources by integrating a risk management process. It can help small, medium and large businesses from any sector to keep its information assets secure from threats. It provides support on designing, implementing and auditing Information Security Management Systems (ISMS) to protect the basic requirement of Information security with confidentiality, integrity and availability of the information. ISO 27001 requires that management:

- Examine the organization's information security risks, keeping an account of the threats, vulnerabilities and impacts;
- Design and implement a consistent and complete suite of information security controls and/or other forms of risk treatment (such as risk avoidance or risk transfer) to address those risks that are supposed to be unacceptable; and
- Adopt an ongoing management process to ensure that the information security controls continue to meet the organization's information security needs from time to time.

Public Key Infrastructure (PKI)

Trust in electronic environment can only be assured implementing integrity and confidentiality of the content of documents along with authentication process of the sending and receiving parties in such a manner that ensures that both the parties cannot deny the transaction. PKI can be understood as a set of hardware, software, people, policies, and procedures used to create, manage, share out, use, stock up, and revoke digital certificates (Joel Weise). A PKI enables users of an unsecure public network to exchange data and digital money with the use of a public and a private cryptographic key pair that is obtained and shared through a trusted certifying authority. The PKI can provide confidentiality, integrity, non-repudiation and authentication for the users over a public network. The concepts of one's identification, their declaration and identity are carried out with digital signatures inside an electronic environment. These Digital signatures, which are a form of electronic signatures, are created and verified using Public Key Cryptography, is based on the concept of a pair of keys (public and private), generated by a mathematical function. The owner securely holds the private key, which is used to digitally sign a document, while the public key is made known to everyone on the network for verifying the digital signature. However, knowing the public key one cannot judge the private key belonging to its owner. Thus, by giving digital signatures to the users in government, authenticity of communication can be well established, especially in electronic transactions that happen in E-governance and other service delivery.

A public key infrastructure consists of:

- A certificate authority (CA) that issues and verifies digital certificate. A certificate includes the public key or information about the public key,
- A registration authority(RA) that acts as the verifier for the certificate authority before a digital certificate is issued to a requestor,
- One or more directories where the certificates (with their public keys) are held,
- A certificate management system.

Challenges of PKI

- Controller of Certifying Authorities (CCA) has to ensure the standards, which are prescribed, should be fully implemented. The fulfillment of these standards, practice and procedures are to be audited on periodic basis.
- The private key, which is used to create digital signature should be in the safe hands of only the subscriber or else anyone holding the private key can misuse it.
- Several larger applications, especially in banking and insurance sector are still in process to adapt towards Digital Signature Certificate (DSC) based secure transaction with citizen-based services.
- Interoperability is the major issue. The certificates issued by different licensed CAs are not acceptable to some applications due to lack of uniformity as per certificate norms.
- Some of the application providers feel that DSCs are complex and inconvenient to use and dissipate.

Considering how a PKI can support an e-governance application, an in-depth study into the specific threats that exist in the environment must be studied and the requirements for different security mechanisms that a PKI can enable must be identified.

STEGANOLOGY

Cryptosystems are of great importance in current scenario, but techniques of cryptanalysis should be kept advancing as the computing power is increasing day by day. The technique of digitally hiding and later detecting information is attracting more



attention. This technique is known as Steganology, and is being accepted in modern computing because of its well-proved ability in hiding the desired information. It is already regarded as a powerful balance to cryptology and a promising technique for future applications to ensure e-governance security. Unlike cryptology, which renders the encrypted information fully meaningless, steganology keeps the host media visually unchanged after hiding the secret information. (Kahn, 1995) defined steganography as “the art and science of communication in such a way that hides the existence of the communication. In contrast to cryptography, where the enemy is allowed to detect, intercept and modify messages without being able to violate certain security premises guaranteed by a cryptosystem, the goal of steganography is to hide messages inside other naive messages in such a way that does not allow any enemy to even detect that there is a second message present.”

CONCLUSION

ERP based e-governance can help to provide significant success in improving accessibility, lower costs, reducing corruption, extending help and access to all groups of citizens. In implemented phase of experimentation, e-governance initiatives in Uttarakhand have reached thousands of people belonging to most sections of society. Improved access to information and services will provide economic and social development opportunities, facilitated participation and communication in policy and decision-making processes and empowerment of the weakest groups. This ERP based e-governance will lead to a sense of ownership and building of social capital, which in turn will constitute transparent citizen centric e- governance.

Potential key factors in success of this ERP based e-governance in state of Uttarakhand are security methods and practices, security and privacy legislation, total management commitment, management style of work, senior management and user awareness, skills and training, management change and information security infrastructure.

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CLOUD COMPUTING: A PROPOSED ARCHITECTURE FOR HIGHER TEACHER EDUCATION INSTITUTIONS

Laithangbam Pushparani Devi²⁴ Sanasam Bimol²⁵ Masih Saikia²⁶

ABSTRACT

Technological development has a great impact to the growth of higher education system. All the educational organization like university, college or institutions, and training institutions including statutory bodies like UGC, NCTE are already individually adopted information technology to bring transparency and control. Teacher training institutions throughout the world have also become highly dependent on ICT (Information Communication Technology) for their teaching-learning delivery and management of academic activities. ICT service use stakeholders particularly teacher, student and research scholar needs up-to-date software and hardware for their teaching and learning process and research activities. Procuring and maintaining a wide range of hardware and software required substantial financial investment. Due to budgetary constraints for higher teacher training institution, have facing problems in providing necessary ICT support infrastructure for teaching-learning and research activities. Use of Cloud computing has benefits accessing of up-to-date software, hardware and tools for faculty, administrators, staff, students on demand pay per use basis. Furthermore, cloud computing reduces intuitions ICT infrastructure complexity and cost. The objective of this paper is to propose a cloud computing architecture for higher teacher training institutions to find alternatives use of ICT infrastructure.

KEYWORDS

Cloud Computing, Higher Education, Teacher Training Institute, Teacher, Student etc.

INTRODUCTION

Cloud computing is becoming one of the buzzword in the industrial sector and has become popular in educational sector and among the computer and PDA users. The concept of cloud computing is that a vast computing resources somewhere resides out there that will connect to them and use them on demand pay per use basis when needed. Many expert, Researcher and Scholar defined the cloud computing in their different concepts and views but the National Institute of Standards and Technology (NIST) definition is a generally accepted standard: "Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction" [1]. In more simple way, Cloud computing is a new technology where dynamically scalability, flexibility and authorized resources are provided as a service on demand over the internet and access them on pay per use basis. Cloud computing is a new technology that can be utilized in educational institutions management activities and provides the desire facility to deal with presenting the information in dynamic situation. Teacher training college or institute with well-equipped ICT infrastructure is become more important to exchange various resources among them and volume of data to the statutory bodies. Statuary bodies are demanded volume of data to college or institute in order to track the existing education system and maintain the desired data efficiently. This paper proposed a Cloud computing architecture to bring and tie all the higher teacher education college or institute through common information system platform without losing control over individual information system, so that data demanded by statutory bodies in their desired standard format can be supplied by the system. Cloud computing is an excellent alternative especially for shortage of budget in order to use ICT effectively without spending any more capital for the computers and network devices [2]. Cloud Computing provides user-computing resources on demand pay per use basis and reducing the energy consumption and management cost. It appears that a new solution to ICT infrastructure adoption problem in higher learning teaching education by establishing open and flexible network teaching platform and reduce the hardware input [3]. It also provides the benefits of sharing and availability of information and reliability of information technology resources and outsourcing of IT maintenance services. The three main Cloud computing services are Software as a service (SaaS), Platform as a service (PaaS) and Infrastructure as a Service (IaaS) [4,5,6,7].

A. Software as a Service (SaaS): It includes the ICT working environment tools such as software web applications etc., without buying/downloading and installing in specific machines. Application Clouds allow a thin client to interact with services that are completely hosted on an external infrastructure. The user is able to fully access the vendor's application in the cloud via internet. Examples of SaaS cloud service providers are; GoogleApps, Oracle on Demand, SQL Azure, Salesforce.com etc. [5, 6]

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B. Platform as a Service (PaaS): The vendor provides tools and resources allowing the customers to create and/or acquire applications to meet their specific needs. It helps users saving investment on hardware and software. Platform-as-a-Service provides no constraint on choice of development software and avoids the possibility of lock-in. Examples of PaaS services are; Force.com, Google AppEngine, AppJet, Etelos, Qrimp, and Windows Azure Platform [4, 6, 8].

C. Infrastructure as a Service (IaaS): This model usually includes tangible as well as intangible components used in availing ICT services, such as virtual computers, traffic monitoring and re-directing, basic network components etc. This is the most prominent benefit of cloud computing as the organizations invest the most in establishing infrastructure. The service provider manages the entire infrastructure, while the client is responsible for the deployment aspects and bears all the cost of servers, networking equipment, storage, and back-ups. The users just need to pay for cloud service. Examples of IaaS service providers are; Amazon Elastic Compute Cloud (EC2), Clever, Eucalyptus, GoGrid, FlexiScale, Linode, Nimbus, Open Nebula, PerfCloud, RackSpace Cloud, and Terremark [6, 7].

The cloud computing can be classified into four model based on deployment location where the cloud is hosted. They are define as by NIST [1, 4]

A. Private Cloud: The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party, and may exist on premise or off premise. This is designed to control over their data than they can get by using a third-party hosted service such as Amazon's Elastic Compute Cloud (EC2) or Simple Storage Service (S3).

B. Community Cloud: The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, and policy and compliance considerations). It may be managed by the organizations or a third party, and may exist on premise or off premise.

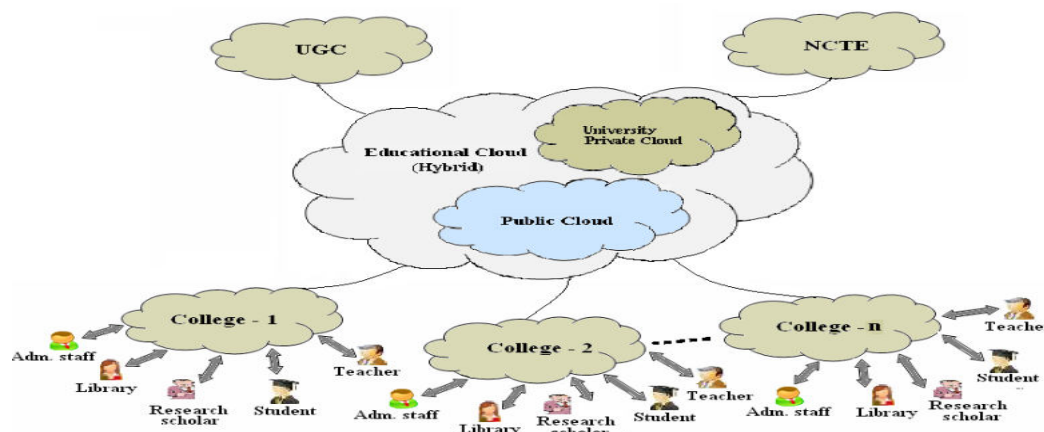
C. Public Cloud: The cloud infrastructure is made available to the public or to a large industry group, and is owned by an organization selling cloud services. This type of cloud is an organization rents cloud services from cloud provider on-demand basis. Services provided to the users using utility computing model.

D. Hybrid Cloud: The cloud infrastructure is a composition of two or more clouds (private, community or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing).

PROPOSED ARCHITECTURE

The three main types of cloud computing development approached used in proposed architecture are Private cloud, Public cloud and Hybrid Cloud. The Cloud-computing service that will let universities and colleges build custom private clouds that can be integrated into public cloud services. This proposed architecture has consists two main apex bodies which monitor of higher education and Teacher education i.e. UGC, and NCTE and then University and Teacher training Institute or College shown in figure-1.

Figure-1: Proposed Architecture of Cloud Computing for Higher Teacher Education



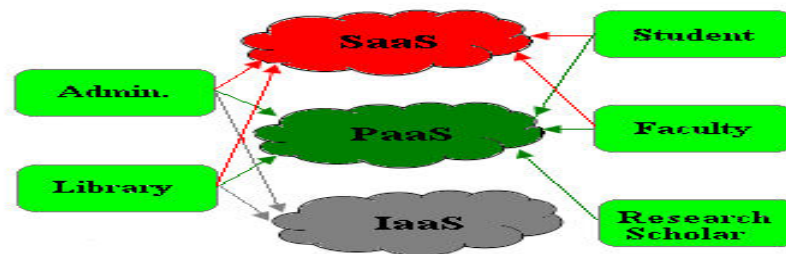
Sources: Authors Compilation

The UGC and NCTE these two-government statutory bodies, which monitor the higher education and teacher education, process running through various universities and their affiliated colleges. This two apex bodies will prepare the guidelines for higher education and teacher education courses and curriculum that make sure all university and institute or college will follow the same.

University is another body consists in this framework where the proposed cloud computing architecture has to be implemented. This level consist user interface. Educational cloud (hybrid cloud) is the combination of university private cloud and selected public cloud. The access system will be provided to government bodies UGC and NCTE as well as affiliated institutes as per their requirement. The two apex bodies is considering in this proposed model that higher education is provided through university department under their supervision and provide all the guideline of higher education and teacher education.

Institute or College will consist in this proposed architecture as they are conducting higher teacher training education. The institutes or college affiliated to the university and approved by UGC and NCTE which providing higher teacher education. At this level various IT service users stakeholder such as student, teacher, research scholar, administration staff and library etc. will access the cloud technology based system through the institute or college level as shown in the figure 2.

Figure-2: Cloud Service Delivery Model across Various Users through Institute or College



Sources: Authors Compilation

These stakeholders can be assigned the various service model of cloud. Faculty and student need to access Google documents for their project preparation that comes under the PaaS model. In addition, they need to word processor or other software for their project then they need to access over the net that comes under the SaaS. Similarly, other stakeholder linkage of their service delivery is shown in above the figure 2.

ANALYSIS AND DISCUSSION

The proposed architecture is to be developed by various researchers and technical staff of university. Proposed cloud based system will have to be developed in similar way of traditional approach computing where organization or individual data can keep by making use of a data center or their own servers. It will also allow the inter-networking of colleges or organizations as and when they will implement cloud-computing system based on data standard. The internet facility is mandatory in this proposed architecture, as all the systems should provide an interface to exchange the data in specific data standards format through internet. Statutory bodies and higher teacher education institutions could interface with their roles and responsibility. At the same time, the stakeholder could use other application software that is specific to their needs in any time without installing to their local computer or server. All higher teacher education institutions of India to bring them together to make a more robust system that makes information exchange between various systems and statutory bodies simple, easy and fast can use this framework.

An educational hybrid cloud model needs to be deployed which combines the local infrastructure as a private cloud with selected public clouds. The educational cloud (Hybrid Cloud) combines university private cloud and public clouds and has an interface from universities private cloud to public cloud service providers. Every resource can be placed at educational cloud by Statuary bodies or higher education institutions and it will be available to all hosted institutions. A powerful educational cloud (Hybrid Cloud) could have developed by using Aneka middleware on top of Open Nebula, which utilizes the current universities IT, infrastructure (Private Cloud). Using Open Nebula gives the ability to manage the local infrastructure and establish the first step toward hybrid cloud solution by interfacing with a remote cloud site. Since different higher institutions IT infrastructure is heterogeneous including their workstations and servers, Aneka is suitable to deal with such heterogeneity to maximize resource utilization in powerful manner. The Aneka platform is one of the best solutions as it was built on the service-oriented architecture, which gave extensibility to integrate different types of clouds.

The proposed cloud computing architecture three types of cloud services such as SaaS, PaaS and IaaS offered as shown in figure 2. The three tier of cloud services allow users to use computer applications without having to purchase, install and run software on their local computers or servers. The service providers for cloud computing like Amazon, google Microsoft, Sun, GRID Lad,

Aneka etc., can provide these services in real time by managing the entire infrastructure at some remote location. The proposed framework architecture should be able to implement these services for the users of higher teacher education for carrying out required activities of administrative staff, Student, Researcher, and Library.

Table-1: Cloud Computing: Solution to Problems of ICT Use

Problems	Solutions
Inadequate Infrastructure	On demand availability, On-line delivery
Lack of access in new application software	On demand availability, Self-service
Lack of maintenance and technical support	Service provider regular activities
Power, Space, Cost constraints	Utility billing, Resource elasticity
Provisioning overhead, Unclear value of IT	Self-service, Utility billing

Sources: Authors Compilation

Users using a web browser over the Internet access software. SaaS provide either very expensive or rarely found software to all stakeholders of higher teacher education institutions to meet their needs. Educational clouds can build a virtual computing lab equipped with original licensed software, which can be accessed, by students and faculties for developing various computer applications, projects, presentations, research paper resources, and digital collaboration related to their teaching and learning. The user needs software and development environment for developing various computer applications and projects in various programming languages using the different development toolkits. PaaS provided desktop support to secure, update, monitor, configure and troubleshoot the computers without overhead associated with installing and maintaining on premise management infrastructure. The platform built according to the requirement and can be used to satisfy the needs of students, faculties, researchers and administrative staff with specific platform for specific task. It also provided research environment for the research scholars to do their research work on the same platform so that their work can be combined for future studies. IaaS provides general cloud infrastructure and manages and controls over operating systems, storage, processing, and networks. The user required infrastructure for hardware and software to run the various software and platforms provided by IaaS. Different operating systems can be provided to satisfy the infrastructure need of all stakeholders of higher teacher education institutions.

Cloud computing is an approach to ICT infrastructure operations for organization to transform their data centers, including the network. Using Cloud may have considerable potential in improving the IT application and infrastructure to higher education institutions. Cloud base system dynamically can help to solve the ICT resources problems as presented in table-1.

In this proposed model of cloud technology based is particularly designed for higher teacher training institute. This proposed model will be mainly useful to bring the present non-uniformity of teacher training college in terms of syllabus and curriculum into uniformity throughout all universities and institutes or colleges which has running the teacher education. It also will help to improve the effectiveness and efficiency of higher teacher education system. At the same time, it will also helpful for reducing ICT infrastructure cost and time and takes care of the reliability and security aspect for a stakeholder. A cloud-based technology ensures the maintainability, growth and compliance to the statutory bodies and their norms and regulations. Higher education related various stakeholders benefit in terms of easy, efficient and fast communication to the higher teacher education institutions in India.

ADVANTAGES OF THE PROPOSED ARCHITECTURE

A. Reduced Costs and Increased Efficiency: Using this shared pool of configurable computing resources will be less reliant upon internal systems and ultimately reduce hardware and software expenditure by allowing the facility of pay per use. The user institute/college has to pay only for the resources, which they are using, and thus it does not put any financial burden on any part to the institute, government or student. The Shared Services Advisory Group has estimates shared services can generate 20-30% cost reduction in the public sector.

B. Reduced Maintenance Cost and Resource Cost: Cloud computing could will help training college to reduce the operation and maintenance cost. In particular, maintenance cost is important in IT infrastructure. With cloud computing, academic staff can focus on their own research, instead of dealing with the complexity of high performance computing systems. Colleges can reduce or eliminate IT capital expenditures and decrease ongoing operating expenses by paying only for the services they used and potentially by reducing IT staff.

C. Scalability of Service and Reliable Exchange of Data: In a single moment, any stakeholder of the institute/college can store data, and there is no limitation on storage space. In addition, user's capacity to store data increase to a larger extent means that resource allocation can be scaled up or down depending on user requirement demand. Reliable and secure exchange of data is ensured, as data centers are equipped with ultra-modern and dedicated equipment's. It also ensured eliminates network redundancy and redundant storage.



D. Reduces the Communication Traffic and Works on Low Bandwidth: Overall communication traffic between data centers and user systems on the network is reduced drastically, because automated transfer of information from one system to another. Data transfer between systems is ensured even in case of low bandwidth as data exchange is on the cloud where actual data transfer happens between data centers which always has strong connectivity with high bandwidth.

E. Single Version of Data Available and Quality of Service: Stakeholder of college or institute or statutory bodies the data communicated or shared will be exactly same as the source copy of data maintained by organization. Availability of the services is one of the most important that desired by cloud user. 24x7 is the availability that is needed by system user without failure with quality of service.

F. Extensible to Other Upcoming Devices: Proposed model will ensure the exchange of data support of upcoming and future devices like PDA, tablet, smart phone etc.

CONCLUSIONS

Within this present global economic crisis, use of cloud computing is becoming a necessity not an option for higher learning institutions. Cloud technology, on-demand services can reverberate positively with the current higher education tight budgets across the nation and other parts of the world. One main conclusion that we can draw from this paper is that cloud computing may have considerable potential in improving the ICT application and infrastructure to higher education institutions. From the points of advantages provided by cloud, there is a great advantage of ICT infrastructure maintenance and data recovery burden is kept away from the educational institutions and removal of software license costs, hardware costs respectively. This distributed computing technology that offers scalability of storage, computational platform provides great flexibility to the educational institute and there are seemingly endless benefits gained in spite of to be considered.

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COMPUTER ASSISTED LEARNING AND EMOTIONAL INTELLIGENCE OF STUDENTS: A REALITY CHECK OF EFFECTIVENESS

Aditi Gagneja²⁷

ABSTRACT

The effectiveness of computers and computer related technology can be seen everywhere whether it is the field of science, industry or agriculture etc. The field of education is not an exception in this case. In the field of education, the students, especially in their adolescent age, have to face many difficulties and one of the main difficulties is their emotional disturbance. Therefore, it becomes the responsibility of every person associated with the process of education is to solve this problem, so that their emotional intelligence can be maintained and it is the teacher who can perform this duty well. With the use of computer-assisted learning, this type of problem can be solved largely. Therefore, this study was taken in hand to know the effect of computer assisted learning on emotional intelligence of students. For this study, a representative sample of 100 students from a school of Fazilka district was taken. Stratified Randomization technique was used for the selection of sample. A pre-test post-test experimental design was used to compare emotional intelligence of these students. t-Test was employed for the analysis of data. The results showed that there is significant difference between the emotional intelligence among students in the pre-test and post-test w.r.t. various demographic variables like gender, locality and school type. Therefore, the study concludes that the teacher should use more of these technologies in education in order to enhance emotional intelligence among his students.

KEYWORDS

Computer Assisted Learning, Emotional Intelligence etc.

INTRODUCTION

The real meaning of education is to bring about the desired changes in the personality of the students and education can be called successful if it is successful in achieving this very objective. All the activities, which are designed by our academicians and policy makers, are directed towards this very objective. The introduction of computer-assisted learning in the field of education is also called such a strategy in order to benefit the students in developing their overall personality level. It is the type of technology, which took the help of computers, power point presentations, CDs and other computer related material to impart education to the students. This type of change is necessary in the field of education keeping in mind the changing scenario of education and changing needs of the society. Now education doesn't mean imparting instruction to the students and to develop his rote memory rather now the aim of education is to develop overall personality of the students and to make them a picture of dignity who have the power of understanding and who don't accept the things as they are rather now they can question and use their power of logic while accepting the things and computer assisted learning is very helpful in all these things.

Today the aim of education is not to develop only the literary aspect of the child's personality rather it is also directed towards the overall development of his personality and to solve various problems of his personality. In the adolescent, the main problem of the students is that they lack emotional intelligence and so often, they show lack of emotional maturity and emotionally disturbed behaviour. Emotional Intelligence (EI), often measured as an Emotional Intelligence Quotient (EQ), describes an ability, capacity, or skill to perceive, assess, and manage the emotions of one's self, of others, and of groups. Today education aims at in increasing this EQ of students in order to make them more emotionally competent and computer assisted learning is a powerful tool in achieving this objective. The aim of education with the help of computer-assisted learning is to help these children to overcome this difficulty and to maintain and increase the level of their emotional intelligence.

Characteristics of Emotional Intelligence

It is a non-cognitive and non-physical capacity of the organism.

- It is an internal or psychophysical process, which motivates the organism to perform its activities properly.
- It is neutrable.
- It energizes the organism to accomplish the required tasks.
- Level of emotional; intelligence is neither genetically fixed nor does it develop only in early childhood and develop it throughout life.

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Difference between Emotional Intelligence and General Intelligence

- Intelligence is the aggregate or global capacity of an individual to act purposefully, to think rationally and to deal effectively with his environment. Whereas emotional intelligence is the capacity or ability to understand one's own emotions, emotions of others and act appropriately based on these emotions.
- IQ refers to the cognitive aspect of the organism. To measure the intelligence quotient, there is a specific mathematical formula, i.e. $M.A. / C.A. \times 100$. However, there is no specific formula like general intelligence to find out the level of emotional intelligence until today. Since EQ delineates to the non-cognitive and non-physical aspects of the organism.
- Intelligence refers to the cognitive abilities of the organism. However, emotional intelligence refers to the non-cognitive and non-physical capacities of the organism. Therefore, emotional intelligence is nurturable and general intelligence is inherited and not nurturable.
- Level of general intelligence is genetically fixed, whereas emotional intelligence is neither genetically fixed nor does it develop only in early childhood and develops throughout life

REVIEW OF RELATED LITERATURE

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

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

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

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

terms of accuracy and lexical complexity of the language produced. Based on these results, it was concluded that CATBI is more effective than CAFFI in enhancing language production in general and fluency in particular.

Bahdor G.K. et al. (2011) in their research paper examined the relationship between manager's Emotional Intelligence (EI) level and effective delegation in industry. In order to test and discuss this relationship, some perception from past and relevant researches and texts are required. This paper also describes the core and practical concept of Emotional Intelligence and delegation, followed by the importance of effectiveness in work place. The literature review could provide better understanding of concepts and the main variables of dependent and independent variables in this research. Lastly, the past researches, which have been done on emotional intelligence and its relation to delegation and effectiveness, would be highlighted.

Laura Guillén, Elizabeth Florent-Treacy (2011) examined the effects of emotional intelligence on getting along and getting ahead leadership behaviors at work. Results from an analysis of a dataset derived from a 360° leadership behavior survey completed by 929 managers indicated that emotional intelligence has a significant effect on collaborative behaviors at work, and collaborative behaviors directly affect the inspirational side of leadership performance. Further, getting along behaviors were found to fully mediate the relationship between emotional intelligence and getting ahead behaviors. Theoretical and practical implications are discussed.

Marc A. Brackett, Susan E. Rivers, and Peter Salovey (2010) in their article presented an overview of the ability model of emotional intelligence and includes a discussion about how and why the concept became useful in both educational and workplace settings. They reviewed the four underlying emotional abilities comprising emotional intelligence and the assessment tools that had been developed to measure the construct. A primary goal was to provide a review of the research describing the correlates of emotional intelligence. They described what was known about how emotionally intelligent people function both intra- and interpersonally and in both academic and workplace settings. Scientific findings on emotional intelligence support the notion that emotions are functional when the information they provide is attended to, interpreted accurately, integrated into thinking and behavior, and managed effectively.

RESEARCH GAP

Every adolescent has to face almost same type of difficulties in his adolescent age and it is not possible to solve these problems without proper help and guidance of the teacher. The teacher can use various types of methods and methodologies to cope with the problems of the students. Lack of emotional intelligence among adolescents is one such kind of problem that the students face during this age. The use of computers in teaching-learning process is such a method to solve this problem of adolescents and to maintain and enhance its level. From the analysis of above review of literature related to computer assisted learning, it is found that many researches have conducted regarding the impact of computer assisted learning on several variables, but no such research work is found on the impact of computer assisted learning on emotional intelligence of the students. So, the investigator got tempted for the study in order to evaluate the effect of computer-assisted learning on emotional intelligence of the students.

OBJECTIVES

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

- i. To evaluate the effect of computer-assisted learning on emotional intelligence of students.
- ii. To evaluate the effect of computer-assisted learning on emotional intelligence of male students.
- iii. To evaluate the effect of computer-assisted learning on emotional intelligence of female students.
- iv. To evaluate the effect of computer-assisted learning on emotional intelligence of students of urban area.
- v. To evaluate the effect of computer-assisted learning on emotional intelligence of students of rural area.
- vi. To evaluate the effect of computer-assisted learning on emotional intelligence of government school students.
- vii. To evaluate the effect of computer-assisted learning on emotional intelligence of private school students.

HYPOTHESES

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

- i. There is significant effect of computer-assisted learning on emotional intelligence of students.
- ii. There is significant effect of computer-assisted learning on emotional intelligence of male students.
- iii. There is significant effect of computer-assisted learning on emotional intelligence of female students.
- iv. There is significant effect of computer-assisted learning on emotional intelligence of students of urban area.
- v. There is significant effect of computer-assisted learning on emotional intelligence of students of rural area.
- vi. There is significant effect of computer-assisted learning on emotional intelligence of government school students.
- vii. There is significant effect of computer-assisted learning on emotional intelligence of private school students.

Focus Area: The present paper focuses on the study of the effect of computer-assisted learning on emotional intelligence of students.

Data Collection Work: Primary data had been used in present study on students taken from various Government and Private, Rural and urban senior secondary schools of Fazilka district with the help of standardized tool. Sevenfold Emotional Intelligence Scale (SFEIS) standardized and cross-validated by Khera, Ahuja & Sarbjit Kaur (2002) was used to collect data on students regarding their emotional intelligence.

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

RESEARCH METHODOLOGY

Research Design: An experimental pre-test post-test design was used in the present study. First, the students were given a pre-test on emotional intelligence and their scores on this test were recorded. After that they were taught their different subjects with the help of computer assisted technology using power point presentation, CDs, DVDs, internet and other computer related material and after an experimental treatment of 25 days, they were given a post test on emotional intelligence and again their scores were recorded to see significant difference between the scores on emotional intelligence scale.

Sample Design: The research was concerned a representative sample of 100 students of class XI of various Government, Private, Rural and Urban senior secondary schools of Fazilka district. According to the objectives of the study, this sample was further divided into several parts based on various demographic variables like gender, locality and school type.

Time: As far as the period of the present study is concerned, it can be said that the effect of computer-assisted learning on emotional intelligence of students was done in the month of July 2016. In this month, first, they were given a pre-test on emotional intelligence and in the last week of July after an experimental treatment of 25 days, they were given a posttest on emotional intelligence in order to see significant difference between the scores obtained by the students on these two tests.

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

PARAMETERS OF STUDY

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

- Overall students taken as a sample,
- Male students,
- Female Students,
- Urban Students,
- Rural Students,
- Government School Students,
- Private School Students.

FINDINGS AND DISCUSSION

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

Table-1: Showing Effect of Computer Assisted Learning on Emotional Intelligence of Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
82	104	4.82	4.12	0.634	34.70	Significant at 1% Level

Sources: Primary Data

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

Table-2: Showing Effect of Computer Assisted Learning on Emotional Intelligence of Male Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
80	100	4.62	4.38	0.90	22.22	Significant at 1% Level

Sources: Primary Data

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

Table-3: Showing Effect of Computer Assisted Learning on Emotional Intelligence of Female Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
84	108	4.19	3.99	0.818	29.34	Significant at 1% Level

Sources: Primary Data

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

Table-4: Showing Effect of Computer Assisted Learning on Emotional Intelligence of Urban Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
88	103	3.64	3.21	0.686	21.86	Significant at 1% Level

Sources: Primary Data

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

Table-5: Showing Effect of Computer Assisted Learning on Emotional Intelligence of Rural Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
76	105	3.88	3.38	0.727	39.89	Significant at 1% Level

Sources: Primary Data

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

Table-6: Showing Effect of Computer Assisted Learning on Emotional Intelligence of Government School Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
81	100	4.12	3.89	0.80	23.75	Significant at 1% Level

Sources: Primary Data

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

Table-7: Showing Effect of Computer Assisted Learning on Emotional Intelligence of Private School Students

Mean		SD		SE _D	t-Value	Significance Level
Pre	Post	Pre	Post			
83	108	3.29	3.22	0.65	38.46	Significant at 1% Level

Sources: Primary Data

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

CONCLUSIONS AND IMPLICATIONS OF STUDY

Concluding Remarks

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

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

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

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

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

Hypothesis-VI: As far as Hypothesis-VI, that "There is significant effect of computer assisted learning on emotional intelligence of government school students" is concerned, it is found that this hypothesis is accepted as after the treatment given in the form of computer assisted learning, there is significant rise in emotional intelligence of government school students. Therefore, it can be concluded that computer assisted learning proves to be helpful in increasing the level of emotional intelligence of government school students.

Hypothesis-VII: As far as Hypothesis-VII, that "There is significant effect of computer assisted learning on emotional intelligence of private school students" is concerned, it is found that this hypothesis is accepted as after the treatment given in the form of computer assisted learning, there is significant rise in emotional intelligence of private school students. Therefore, it can be concluded that computer assisted learning proves to be helpful in increasing the level of emotional intelligence of private school students.



CONCLUSION

In the nutshell we can conclude that computer assisted learning is of great significance in enhancing the level of emotional intelligence of students. In this fast changing world, the students often feel lack of emotional intelligence and sometimes they fail to express their emotions properly and to understand other's emotions. Therefore, this technology oriented learning process will make them more confident and they can understand their own emotions as well as of others. Therefore, the teachers should incorporate this technology oriented learning process while imparting instructions to their students. So, that their students can become more confident and outspoken and can save themselves from several type of emotional problems.

IMPLICATIONS

The current study is mainly concerned with the analysis of effect of computer-assisted learning on emotional intelligence of students. As the study reflects significant effect of computer assisted learning in increasing the level of emotional intelligence of students, so provides important analysis to judge the effectiveness of modern day teaching methodologies. The study will be helpful to the academicians and researchers for further study in this respect.

FUTURE AREAS OF RESEARCH

- Effect of Computer assisted learning on some other problem or some other behavioural aspect of students can be done.
- A comparative study of the effect of computer-assisted learning on the level of emotional intelligence of college students can be done.

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**IMPACT OF ENTERPRISE RESOURCE PLANNING IN SUPPLY CHAIN MANAGEMENT**Davinder Saini²⁸**ABSTRACT**

The dynamic and competitive nature of the today's market has led to sudden advancement in the living standard of customers, increment in the population, rapid advancement in the global media and last but not the least is rise in the use of information technology (IT). Seeing this level of volatile globalization, managing the supply chain networks has become very complex and has become a challenging task. To survive and stay ahead in today's competitive world, companies get pushed to their limits in search for organizational skills and technologies. Amongst those Supply chain Management (SCM) and Enterprise Resource Planning (ERP) are the two most primarily used terms. In order to stay and survive in the competition; companies are forced to speed up their production, reduce their cost and improve performance. Supply chain management is the term used in managing this accurate information's in and out and ERP is the technology used for achieving the same. With the advent of globalization, ERP software has emerged as a major area of interest for many business organizations. The agenda of this study is to observe and show that ERP systems in its current state have a modest role to play in obtaining supply chain integration and management. Through major development in the field of communication and IT solutions, we can expect a time shift where many solutions could be available for better interfacing of ERP systems and in turn which can help in achieving much better supply chain management system. It is the best hope that it will focus some light on ERP and SCM integration.

KEYWORDS

Supply Chain Management (SCM), Enterprise Resource Planning (ERP), Information Technology (IT) etc.

INTRODUCTION

For survival in today's dynamic environment, organizations have to speed up, quality and flexibility and reduce their costs, in such circumstances to make up the performance of organizations, their competition is necessary. In order to achieve such purpose, access to accurate and important information within and outside the organization and efficient use of them play the key role. In order to achieve this purpose, information technology tools, information systems, and effective use of Information technology is so important and ERP tool is such an example of above said words.

It has been two decades since the internal operations are being streamlined, manufacturing boost up, quality of the products are being improved, the costs of manufacturing are being reduced but now the companies are now focusing on the reduction of logistics by mean of putting right supply chain strategies for the excellence of organizations. Industries here in India spend approximately 14% of GDP on logistics as compared to 10-11% that in Europe and 9% in United States of America as has been shown (Sunil Giri et al., 2014). Thus, it is implied that there is so much left towards betterment for SCM in India as well in other countries also. It would not be wrong to say that by proper integration between suppliers, customer this logistics cost can be optimized, and ERP tool helps in establishing and maintaining such integration.

All above said improvements and advancements that has happened already in manufacturing, waste reduction, engineering, operations or those which are supposed to happened like in logistics can be considered as a byproduct of well decision making process which has been made effective only with the integration of ERP tool and SCM practices.

SUPPLY CHAIN MANAGEMENT AND ROLE OF ERP

In order to understand the relation between supply chain management and enterprise resource planning, we need to first understand what SCM and ERP are. On the following discussion, we have tried to make an understanding of SCM and ERP.

Supply Chain Management

Supply chain is a network of firms to deliver product or service to the final customer, linking flow from raw material supply to final delivery, as has been shown (Bhardwaj & Jawalkar, 2015). Supply Chain Management can be understand as a network of organisations (Small, medium and OEMs) connected in a hierarchy allowing exchange or flow of materials, information and money. All such kinds of flow or exchange may be facilitated with some real time information systems.

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SCM definitions by various researchers and scholars are illustrated in Table 1.

Table-1: Definition of Supply Chain Management

Authors	Definition of SCM
Ellram (1991)	A network of firms interacting to deliver product or service to the end customer, linking flow from raw material supply to final delivery.
Berry <i>et al.</i> (1994)	SCM aims at building trust, exchanging information on market needs, developing new products and reducing the supplier base to a particular OEM (original equipment manufacturer) to release management resources for developing meaningful, long-term relationship.
Kopczak (1997)	The set of entities, including suppliers, logistics services providers, manufacturers, distributors and retailers, through which materials, products and information flow.
Tan <i>et al.</i> (1998)	SCM encompasses materials/supply management from the supply of raw materials to final product it focuses on how firms utilize their suppliers processes, technology and capability to enhance competitive advantage. A management philosophy extends traditional intra-enterprise activities by bringing trading partners together with common goal of optimization and efficiency.

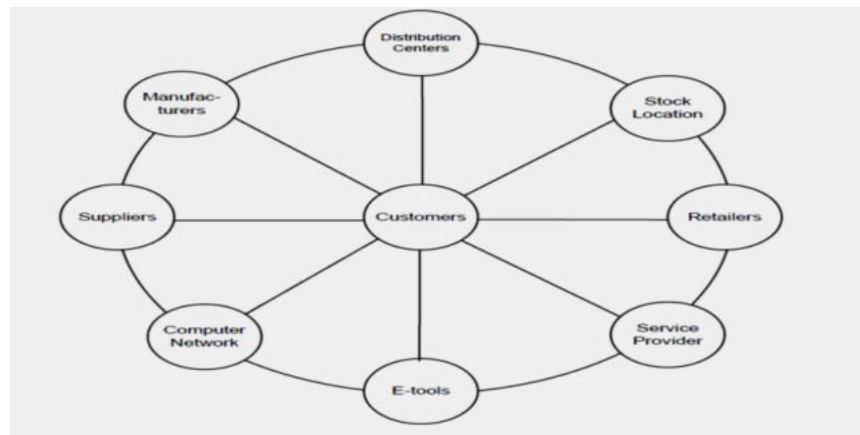
Sources: Authors Compilation

All above definitions drawn by scholars and researchers are directing or stating that SCM is basically like a small universe system in which various persons, departments, organizations, sellers and customers are catering or facilitating some parts, products or services to each other and for smooth flow of all these, a very strong information flow is necessary which can ensure a real time and authenticate flow of information. This flow of information within concerned parties can be made possible in an efficient way using IT tools such as an ERP system.

SCM Network Along with its Entities Integrated by IT

The network circle that represents the complex layout of SCM is shown in figure 1 (E-tools is the representation of tool like ERP). IT plays a crucial role in order to make it real and live.

Figure-1: SCM Complex Representation along with Integration of IT



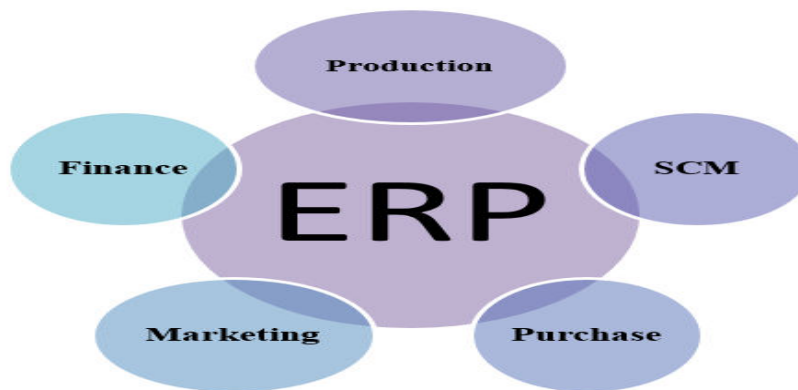
Sources: Prashant R. Nai et. al, 2010

Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) took its start in the late 1980's and then properly extended in the 1990's whereas the large area of focus was the huge scale business organizations. These systems are considered as complex, they are expensive, and they are powerful while these systems were also considered as the key platform for simplifying the complex operations.

ERP system or tool is basically a real time system which has all the information of any organization starting from bottom up to the top like B.O.M (bill of material), part price, raw material price, inventory (On-line inventory, ware house inventory, finished goods inventory, consumable and non-consumable goods, direct and in-direct material), forecasting generation as well as all finance related activities. Thus it would not be wrong to call it as BLOOD STREAM of any organization. ERP system gets integrated itself with every department of an organization as shown in figure 2 below:

Figure-2: ERP System Integration with all Departments of an Organization



Sources: Authors Compilation

The figure 2 shows the in-depth integration of an ERP system within an organization and its departments.

In the seven principles of SCM, Anderson et al (1996) pointed out that it is necessary to develop a supply chain wide technology strategy that supports multiple levels of decision-making and gives a clear view of the flow of products, services, and information. An ERP tool very well does this.

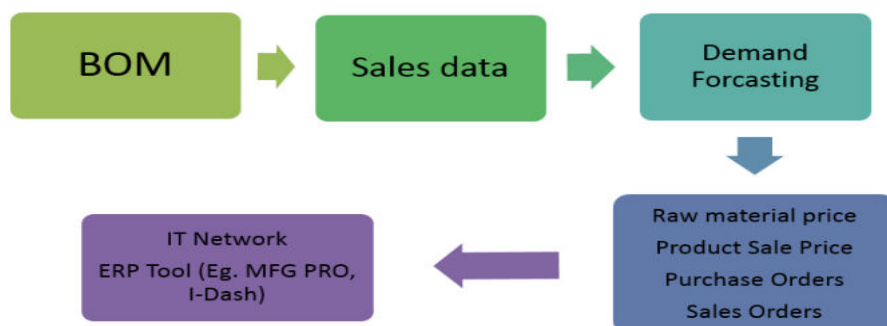
It is also interesting that the ERP system is also growing in the business pipelines where the businesses are starving to make improvements in their supply chain management based operations. ERP is also considered as an extension of the Market Requirement Planning (MRP), which is being launched during the 1970's, and the manufacturing Resource Planning (MRP II) which was introduced in the next decades of 1980's.

Integration and Benefits of ERP into SCM

Here under this discussion, we will understand the how ERP system is being integrated with nerves of SCM and the benefits of the same to the organization as well as to the decision makers for future planning and forecasting.

ERP implementation is like a big bang effect, which changes the activity of the whole organization, and proper understanding of the system and co-operation for implementation of the system between the members of the organization are very important because humans are prone to change but a change as big as an implementation of ERP is not very easily acceptable. The prerequisite homework for ERP integration is illustrated in figure 3.

Figure-3: Information and Data needed for Installation of an ERP system

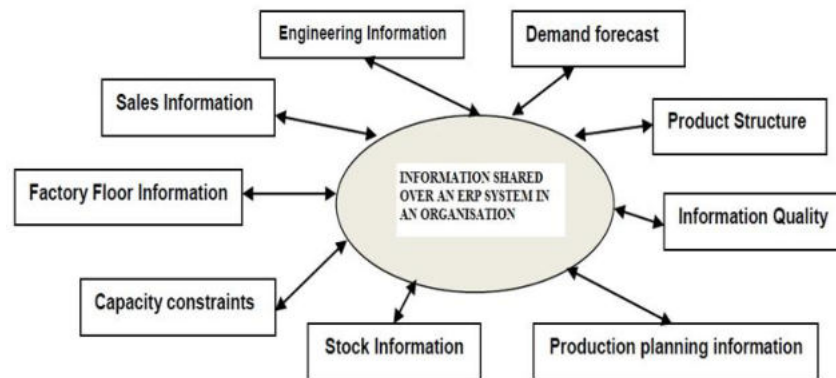


Sources: GKN Driveline India Ltd, 2015

In order to make handy huge information, initially we need to put all the information over the ERP module and this calls the help from various department of an organization as said earlier. The quick developments in information technology such as database management systems, network communication protocols, electronic exchange of data and internet, and the flow of accurate and immediate information have been made possible (Zhang *et al*, 2004).

Various information that we can access over an ERP system are shown in figure 4.

Figure-4: Information and Data Shared over an ERP Module



Sources: Seyed Ali Nemati et al., 2013

Benefits of ERP on SCM

- **Improved SCM Network:** With the implementation of ERP, an organization can monitor all the status and activities of all suppliers, plants, storage facilities and all the members of the supply chain, which makes it easy for communication throughout the network. This in turn helps in effective tracking and management of all processes, right from ordering, through manufacturing and shipping of finished goods to the customers (Chopra and Meindl, 2007).
- **Minimized Delays:** Many supply chains which are not configured with the ERP systems have already placed complaints over poor business relationships and as well as loss in business. Some of the general complaints are late shipments from vendors, slow down or crashes on production lines, logistical errors in distribution channels. These all have negative impacts on organization and therefore results in negative impact with the customers who are the main force of attraction for a supply chain. With the implementation of ERP all, the activities can be coordinated and executed ensuring higher levels of on time delivery across the chain.
- **Enhanced Collaboration:** ERP helps organization to have a control over all the suppliers and distributors. This creates the ability to know what they are doing all the times. ERP bridges the gap between supply chain partners. With ERP, all the members across the network can share vital information like demand, forecasting reports, inventory levels, and status of production, transportation plans and many more in real time. This type of available real time information makes the supply chain process to run flawlessly (Stevenson, 2007).
- **Reduced Costs:** An ERP can help to reduce expenses in many ways. It can help improve inventory management facilitating just in time model or quick response models, which eliminates the strain about the availability of raw materials, and therefore the need for storing the raw goods can be eliminated.

ERP aids in High Level Decision Making

This is the most important and big advantage of implementing an ERP system module in to an organization. Since we get all data and current information in a very handy way, so by observing the sales and demand pattern on real time basis, high-level decision makers can present their expertise opinion and views on coming business projects. The basic fundamental characteristics of information are accuracy, relevancy and timeliness. The available information has to be reliable, and relevant for the decision makers to make decision at the right time. In the changing business environment, the time available for organization to react to the change in market trend is very little (Fisher, Raman and McClelland, 2000). To stay stable with the changing trends an organization should be up on its toes. Any technology that will help this gathering of information will enhance the chances of organization to stay alive in the market.

With the implementation of ERP system, the organization will be able to function as a single entity and caters to the needs of organization as a whole. The strength of an ERP system is integration and automation and that is why implementation of ERP will help in improving accuracy and in better decision making. For example, resource management is one of the biggest problems often encountered by the managers and through the information systems, it is possible to address the problems and move the required resource with in shortest possible time. Therefore, the process is not stopped and the time is saved.

**CONCLUSION AND FUTURE PERSPECTION**

The following broad conclusions could be framed from the discussed literature on SCM & ERP:

- In order to survive in such a volatile globalized environment in the current industrial era, adoption of best in class IT tools is very necessary.
- Through updating the in-house facilities with time and technology, any organization can fight in such a competitive world.
- ERP tool is one of the technologies, which not only reduces waste, increase productivity but also helps in decision making which is a very vital part of a business.
- Even though many organizations have already adopted the ERP tool or are on to the installation phase, still few organizations are reluctant towards using them.
- The main reason could be, perhaps they are considering it costly, laborious or difficult.
- In order to survive and move ahead in the business, organizations must need to give a definite try to use these tools

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ASSESSMENT OF NET SHORELINE MOVEMENT ALONG THE SOUTHERN PART OF ODISHA COAST DURING PHALINE CYCLONE PERIOD

Ajay Kumar²⁹ Shakti Singh³⁰ Sachin Kumar³¹ Sanjay Kumar³² Kalyan Singh³³

INTRODUCTION

Shoreline is the boundary between land and sea, which is dynamic in nature. Beaches/ seashores are ephemeral environment between land and sea with unique and fragile ecosystems, which change position continuously due to dynamic conditions. Shoreline change may occur due to both natural and the man-made processes. The coastal zone is one of the nation's greatest environmental and economic assets. The present research aims at studying the shoreline changes along Odisha and Andhra Pradesh State coast using modern techniques including remote sensing and geographical information system (GIS). Dynamic Land/Sea polygon analysis was performed to obtain the shoreline changes at different times between 2013 and 2014. From the multi-date shoreline maps, the rate of shoreline change was computed using Net Shoreline Movement and End Point Rate. Further, the shoreline was classified into eroding, accreting, and stable regions through GIS analysis. The eroding, accreting, and stable coastal stretch along Odisha and Andhra Pradesh is observed as 26.50 %, 8.01 %, and 65.49 %, respectively. During the Phailin Cyclone 2013, the central and left section of the Cyclone showed high erosion. Sediment transport paths derived from the grain size analysis of beach sediments collected during different seasons help to identify the major sediment source and sinks. Point Gopalpur acts as the major sink for sediments whereas Boxipalli and Haripur are found to be the major sources for the sediment supply along the Odisha coast. Shoreline change study using satellite data and GIS analysis confirms that Odisha coast is stable in nature.

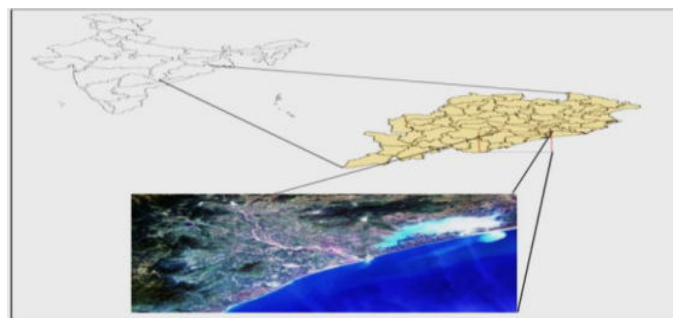
OBJECTIVES OF STUDY

- Assessment of shoreline change due to Phailin Cyclone.

STUDY AREA

Orissa is a state on the eastern seaboard of India, located between 17.49° and 22.36° North latitudes and between 81.36° and 87.18° East longitudes. It spreads over an area of 1,55,707 sq. km. and is broadly divided into four geographical regions, i.e. Northern Plateau, Central River Basins, Eastern Hills and Coastal Plains. It has 480 km coastline. Its population was 4,19,47,358 as per the 2011 census. Administratively, the state is divided into 30 districts, 58 sub-divisions, 314 blocks (administrative units in descending order of geographical area and population) and 103 urban local bodies. The average density of population comes to 269 per sq. km. with significantly higher density in the coastal areas compared to the interior parts. It is surrounded by West Bengal in the North East, Bihar in North, Andhra Pradesh on the South East, and Madhya Pradesh in the West and Bay of Bengal in the East. The area is divided into two natural divisions: The Coastal Plain & North Western Plateau. Mahanadi is a very large river crosses through the state and its big delta merges into the deltas formed by the Brahmani and the Baitarani. The deltas are fertile and are provided with irrigation facilities.

Figure-1: Map showing the Study Area



Sources: Authors Compilation

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DATA AND METHODOLOGY

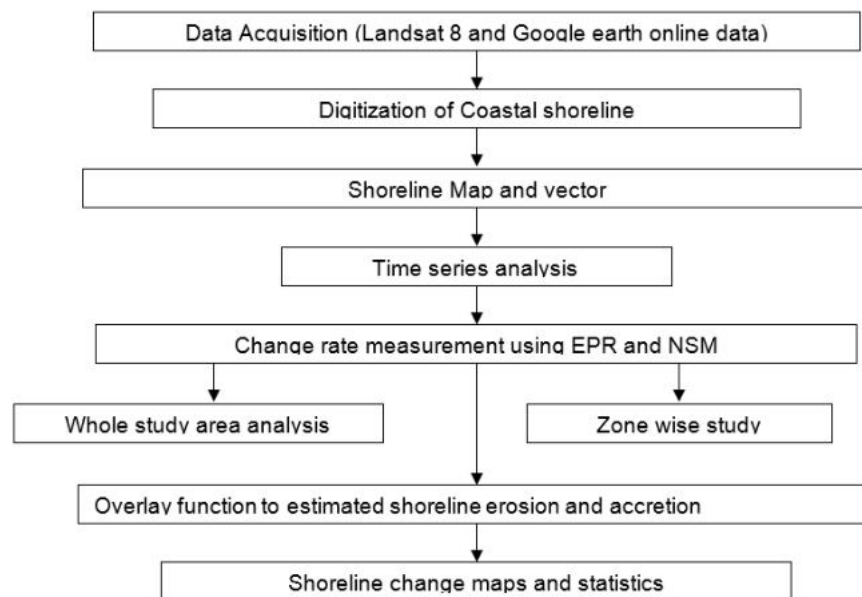
For the study, Google earth of Odisha State were acquired for two Epochs; May 2013 and April 2014. Both 2013 and 2014 were obtained from Google earth data obtained online via internet. For this study, we used mainly coastal data because at the time of shoreline changes analysis has to need the adjacent area of water and land.

Table-1: Source of Data

Satellite / Source	Sensor	Spatial Resolution (m)	Year
Google Earth	Quickbird	0.6	May,03,2013
Google Earth	Quickbird	0.6	April, 04, 2014

Sources: Authors Compilation

Figure-2: Flow Chart of Methodology



Sources: Authors Compilation

RESULT AND DISCUSSION

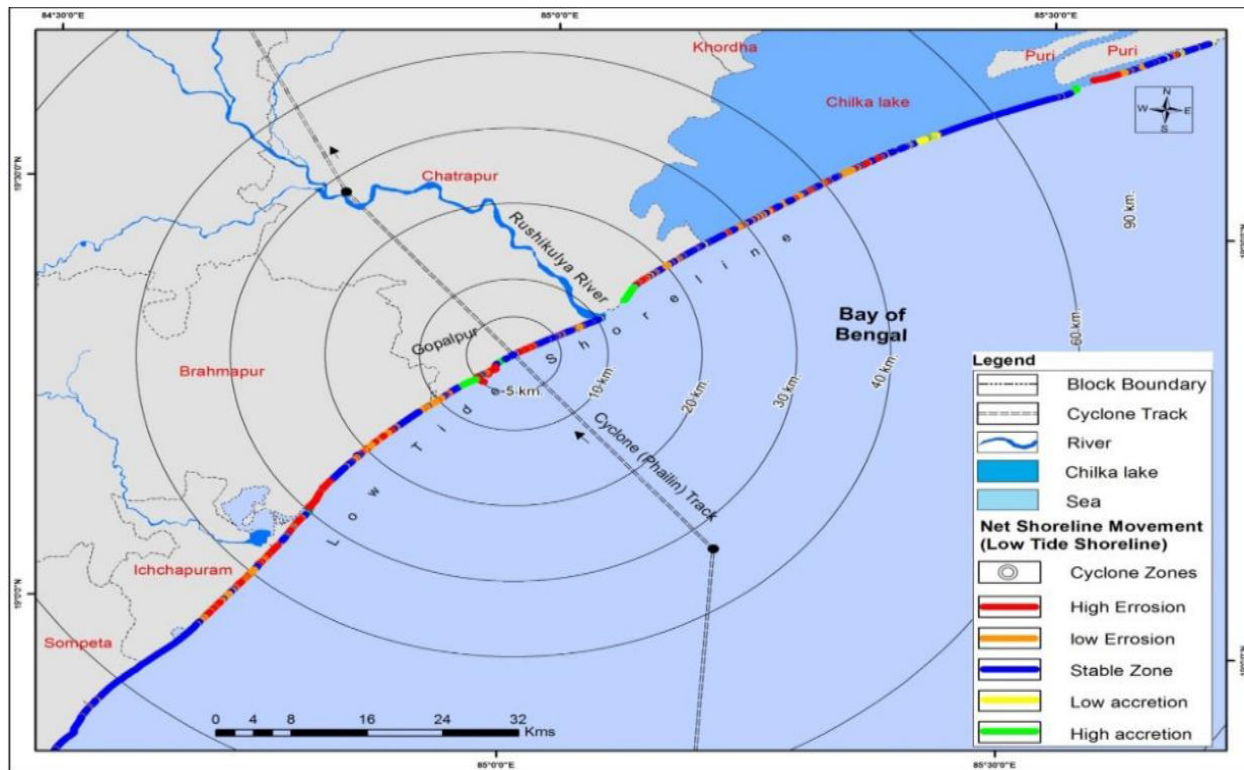
Results of the study reveals that the maximum coast are stable , however the low and high erosion in the entire study area corresponds to 60 km length representing nearly 38% coast is under erosion. This indicates the significant threat faced from the cyclone. There is stretch just south to the landfall point in Gopalpur district showing the high erosion and area just north of the landfall point showing no change to accretion (Figure 3&4 and Table 3). This indicate the cyclone in the northern hemispheres having anticlockwise rotation results maximum impact in the northern parts i.e. the left side of the cyclone.

Table-2: Showing the Low Tide Shoreline Change

Zone	Area (Km.)	Area (%)
High Accretion	6.63	4.16
Low Accretion	5.12	3.22
Stable Zone	87.22	54.77
Low Erosion	32.08	20.14
High Erosion	28.19	17.70
Total	159.24	100

Sources: Authors Compilation

Figure-3: Map Showing the Shoreline Change Rate



Sources: Authors Compilation

CONCLUSIONS

The current study is an attempt to assess the shoreline change due to Phailin cyclone based on the high-resolution Quickbird satellite data available on Google Earth temporal images. The data and method used in the study effectively quantifies the significant changes in the shoreline due to cyclonic event.

Higher erosion observed up to 60 km in the southern (left side) parts and beyond 60 km in the northern parts (left side) from the cyclone landfall point. Overall, the 20-60 km zone on the right side has shown the maximum erosion sites that indicates the higher impact of cyclone energy on shore in this region.

The study can be further improved by selecting the satellite data immediately after and before cyclone have clear picture on the shoreline change.

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IMPACT OF ANNOUNCEMENT OF DIGITAL INDIA CAMPAIGN ON FOREIGN INSTITUTIONAL INVESTMENT IN INDIA

Chandini B. V.³⁴ Dr. Kushalappa S.³⁵

ABSTRACT

The Prime Minister of India Narendra Modi launched digital India on 2nd July 2015 - with an objective of connecting rural areas with high-speed Internet networks and improving digital literacy. The present research is an attempt to study the impact of announcement of digital India campaign on the flow of FII in the Indian capital market. Foreign investment refers to the investments made by the residents of a country in the financial assets and production process of another country.

The foreign investment is necessary for all developing nation as well as developed nation but it may differ from country to country. For meeting the study the researcher has taken the FII data of 24 months to covering 12 months before the announcement and 12 months after the announcement of digital India campaign.

KEYWORDS

Announcement, Digital India, Foreign Institutional Investment, Indian Capital Market etc.

INTRODUCTION

The Prime Minister of India Narendra Modi launched digital India on 2nd July 2015 - with an objective of connecting rural areas with high-speed Internet networks and improving digital literacy. The vision of the program is to transform India into a digitally empowered society and knowledge economy. Foreign investment refers to the investments made by the residents of a country in the financial assets and production process of another country.

The foreign investment is necessary for all developing nation as well as developed nation but it may differ from country to country. The developing economies are in a most need of these foreign investments for boosting up the entire development of the nation in productivity of the labour, machinery etc. The foreign investment or foreign capital helps to build up the foreign exchange reserves needed to meet trade deficit or we can say that foreign investment provides a channel through which developing countries gain access to foreign capital, which is needed, most for the development of the nations in the area of industry, telecom, agriculture, IT etc.

The foreign investment also effects on the recipient country as if it effects on its factor productivity as well as effects on balance of payments. Foreign investment can come in two forms: foreign direct investment and foreign institutional investment. Foreign direct investment involves in direct production activities and in a long and medium term nature. As far as the FIIs concern, it is the short-term nature and short-term investments. FIIs invest in financial markets such as money markets, stock markets and foreign exchange markets.

From September 14, 1992, FIIs and overseas corporate bodies (OCBs) were permitted to invest in financial instruments, with suitable restrictions. Right from 1992, FIIs have been allowed to invest in all securities traded on the primary and secondary markets, including shares, debentures, and warrants issued by companies that were listed or were to be listed on the stock exchanges in India and in schemes floated by domestic mutual funds.

Foreign Institutional Investors (FIIs) registered with SEBI are eligible to purchase shares and convertible debentures issued by Indian companies under the Portfolio Investment Scheme (PIS). In the Budget 2011-12, the Government of India, for the first time, permitted Qualified Foreign investors (QFIs), who meet the KYC norms, to directly invest in Indian equity mutual fund (MF) schemes and in MF debt schemes that invest in infrastructure. It was for the first time that this new class of investors was allowed to directly participate in the Indian capital market.

In January 2012, the Government expanded this scheme to allow QFIs to directly invest in Indian equity markets. In the budget 2012-13, Government announced its intention to permit QFIs to invest in corporate bonds in India. The Securities and Exchange Board of India has introduced a new class of foreign investors in India known as the Foreign Portfolio Investors ("FPIs") effective from June 2014. This class has been formed by merging the following existing classes of investors - Foreign Institutional Investors ("FIIs"), Qualified Foreign Investors ("QFIs") and sub-accounts of the FIIs.

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OBJECTIVES OF STUDY

The following are the objectives of the study:

- To study the influence of announcement of digital India campaign on FII Indian equity market.
- To find out the impact of digital India campaign announcement on Indian bond market.

SCOPE OF STUDY

In this study, an attempt is made by the researcher to know the impact of the announcement of Digital India Campaign on FII flow in Indian capital market. The study covers gross purchases, gross sales and the net purchases/sales of both equity and debt by the foreign institutional investors.

The study period is 24 months covering 12 months prior to the announcement of Digital India program and 12 months after the announcement of the program? The aim of the study is to find out whether the announcement of this program has improved the flow of FII in India.

METHODOLOGY

The entire study is based on secondary data extracted from various secondary sources like; e-journals, books and websites. The study period is from July 2014 to June 2016. The FII data of 24 months have been collected from money control website and then they are processed by using various statistical tools to meet the objectives of the study.

LIMITATIONS OF STUDY

- Even though there may be plenty of factors that affected the flow of FII, it is assumed that the announcement of digital India program is the sole factor affected the flow of FII in India during the study period.
- Accuracy of the study depends upon the accuracy of the secondary data obtained, as the entire study is based on secondary data.

RESULTS AND DISCUSSION

Table-1: Descriptive Statistics of Gross FII Equity Purchases, Sales and Net Purchase/Sales during the Pre and Post Announcement of Digital India Campaign

Description	Before the Event			After the Event		
	Mean (Rs. in crores)	Average Growth (%)	Std. Div.	Mean (Rs. in crores)	Average Growth (%)	Std. Div.
Gross Purchases	95388.28	1.57	12078	83954.10	0.72	10492
Gross Sales	89371.80	0.50	13786	84592	1.74	13806
Net Purchase/Sales	6016.48	-74.80	6483	-638.20	-624.21	10496

Sources: <http://www.moneycontrol.com/india/stockmarket/foreigninstitutionalinvestors/03/50/activity/FII>

Table-1 shows the descriptive statistics of FII equity purchases, sales and net purchases/sales in India around the announcement of Digital India Campaign. It is found that the mean investment in equity during pre-announcement period is Rs. 95388.28 crores and during the post-announcement period, it is Rs. 83954.1 crores. The average growth rate in FII equity investment during the pre-announcement period is 1.57% and it has come down to 0.72% during the post announcement period.

Descriptive statistics of FII equity sales shows the fact that during pre-announcement period the mean FII equity sales is Rs. 89371.8 crores and during the post-announcement period, it is Rs. 84592 crores, indicating a decrease in the FII equity sales during post-announcement period. The average growth rate in gross sales in equity FII during pre-announcement period is 0.5% and it has increased to 1.74% during the post announcement period.

Descriptive statistics of net FII equity inflow shows that the mean net-investment in equity during pre-announcement period is Rs. 6016.48 crores, whereas during the post-announcement period, it is Rs. -638.2 crores. It shows that the FII equity purchases were overtaken by the sales and thus resulted in negative FII inflow. The growth in net purchases will be -74.8% during the pre-announcement period and it has come down to -624.21%.

Table-2: One-Way ANOVA for the FII in equity during the pre and post announcement of Digital India Campaign

Gross FII Equity Purchases						
Source of Variation	SS	D.f.	MS	F	P-value	F crit.
Between Groups	7.84E+08	1	7.84E+08	3.974043	0.058751	4.300949
Within Groups	4.34E+09	22	1.97E+08			
Total	5.13E+09	23				
Gross FII Equity Sales						
Between Groups	1.67E+08	1	1.37E+08	0.676541	0.419607	4.30095
Within Groups	4.46E+09	22	2.03E+08			
Total	4.59E+09	23				
Net FII Equity Purchases / Sales						
Between Groups	2.66E+08	1	2.66E+08	3.422917	0.077775	4.30095
Within Groups	1.71E+09	22	77626326			
Total	1.97E+09	23				

Sources: <http://www.moneycontrol.com/india/stockmarket/foreigninstitutionalinvestors/03/50/activity/FII>

One way ANOVA for the equity FII in India during the post and pre announcement is shown in Table 2. With regard to Gross Purchase of FII in equity, the test shows that the calculated F value (3.97404) at 5 percent level of significance is lower than the critical value (4.300949) and therefore it could be concluded that there is no significant difference in the FII equity purchases in India during the pre and post announcement of Digital India Campaign.

The test for gross equity FII sales shows the fact that the calculated F value at 5 percent level of significance is (0.676541) lower than the critical value (4.30095). This says that there is no significant difference in the FII equity sales during pre and post announcement of Digital India Campaign.

Even for net equity purchases by FIIs, the ANOVA test shows that the calculated F value (3.422917) is lower than the critical value (4.300949) and therefore indicating an insignificant difference in the net FII purchases between pre and post announcement period of Digital India Program.

Table-3: t-Test Result for the FII Equity Purchases during Pre and Post Announcement of Digital India Campaign

Description	Gross Purchases		Gross Sales		Net Purchases / Sales	
	Variable 1	Variable 2	Variable 1	Variable 2	Variable 1	Variable 2
Mean	95388.28	83954.1	89371.8	84592.3	6016.478	-638.201
Variance	2.45E+08	1.5E+08	2.02E+08	2.073E+08	46154883	1.09E+08
Observations	12	12	12	12	12	12
Pearson Corr.	-0.21004		-0.31277		-0.30835	
Hyp. Mean Difference	0		0		0	
D.f.	11		11		11	
t Stat	1.816807		0.717881		1.634088	
P(T<=t) one-tail	0.048283		0.243899		0.065254	
t Critical one-tail	1.795885		1.795885		1.795885	
P(T<=t) two-tail	0.096566		0.487797		0.130528	
t Critical two-tail	2.200985		2.200985		2.200985	

Sources: <http://www.moneycontrol.com/india/stockmarket/foreigninstitutionalinvestors/03/50/actsivity/FII>

It is clear from Table 3 that there is a weak negative correlation (-0.21004) for FII equity purchases between pre and post Digital India campaign announcement, it is also negative for (-0.31277) gross FII equity sales and net FII equity purchases (-0.30835). It indicates that there is inverse relationship between the flow of FII in equity during the pre and post announcement period.

The calculated T-value for gross purchase of equity by FIIs is 1.81687, which is higher than the critical value (@5% level of significance), it is concluded that there is a significant difference in the inflow of FII in equity during pre and post announcement period digital India campaign.

With regards to gross sales, the calculated t value is 0.717881 and for net purchases it is 1.634088 and thus values are lesser than the critical value of 1.795885 (at 5% level of significance), there is no significant difference in gross sales and net purchases of equity by the FIIs during the pre and post announcement of digital India program.

Table-4: Descriptive Statistics of Gross FII Debenture Purchases, Sales and Net Purchase / Sales during the Pre and Post Announcement of Digital India Campaign

Description	Before the Event			After the Event		
	Mean (Rs. in crores)	Average growth (%)	Std. Div.	Mean (Rs. in crores)	Average growth (%)	Std. Div.
Gross Purchases	30399.59	26.09	8549	20090.48	17.78	7959
Gross Sales	18877.85	8.47	7043	19807.44	3.12	4316
Net Purchase/Sales	11521.74	-35.84	9647	283.05	644.67	6773

Sources: <http://www.moneycontrol.com/india/stockmarket/foreigninstitutionalinvestors/03/50/activity/FII>

Table-4 shows the descriptive statistics of FII debenture purchases, sales and net purchases/sales in India around the announcement of Digital India Campaign. It is found that the mean FII investment in debenture during pre-announcement period is Rs. 30399.59 crores and during the post-announcement period, it is Rs. 20090.48 crores. The average growth rate of FII in debenture during the pre-announcement period is 26.09% and it has reduced to 17.78% during the post-announcement period.

The mean FII debenture sales during pre-announcement period are Rs. 18877.85 crores and during the post-announcement period, it is Rs. 19807.44 crores. It indicates that after the announcement of Digital India campaign, FII sales transactions have increased. The average growth rate in gross sales in debenture FII is 8.47% and it has come down to 3.12% during the post announcement period.

The net FII debenture inflow shows the fact that during pre-announcement period, it is Rs. 11521.74 crores and during the post-announcement period, it is Rs. 283.05 crores. It indicates that after the announcement of Digital India campaign, net FII inflow transactions have decreased. The growth in net purchases will be -35.84% during the pre-announcement period and it has increased to 644.67%. It is due to a huge amount of investment by the FIIs in the month of October 2015 and compared to the previous month, there was growth of 8912.84% in net purchases of debentures by the FIIs.

Table-5: One-Way ANOVA for the FII Debenture Purchases during Pre and Post Announcement of Digital India Campaign.

Gross FII Debenture Purchases						
Source of Variation	SS	d.f.	MS	F	P-value	F crit.
Between Groups	6.38E+08	1	6.38E+08	10.01644	0.004488	4.30095
Within Groups	1.4E+09	22	63661912			
Total	2.04E+09	23				
Gross FII debenture sales						
Source of Variation	SS	d.f.	MS	F	P-value	F crit.
Between Groups	5184742	1	5184742	0.126493	0.725484	4.30095
Within Groups	9.02E+08	22	40988291			
Total	9.07E+08	23				
Net FII debenture purchases/sales						
Source of Variation	SS	d.f.	MS	F	P-value	F crit.
Between Groups	7.58E+08	1	7.58E+08	12.6371	0.001774	4.30095
Within Groups	1.32E+09	22	59970136			
Total	2.08E+09	23				

Sources: <http://www.moneycontrol.com/india/stockmarket/foreigninstitutionalinvestors/03/50/activity/FII>

One way ANOVA for the FII debenture investment in India during the post and pre announcement is shown in Table 5. It is clear from the ANOVA test that the calculated F value at 5 percent level of significance is (10.01644) higher than the critical value (4.30095) and therefore it can be concluded that there is significant difference in the FII debenture purchases in India during the pre and post announcement of Digital India Campaign.

It is crystal clear from the ANOVA test that the calculated F value for FII debenture gross sales at 5 percent level of significance is (0.126493) lower than the critical value (4.30095) and therefore it could be concluded that there is no significant difference in the FII debenture sales in India during the pre and post announcement of Digital India Campaign.

It is true from the ANOVA test for net FII purchases in debenture that the calculated F value at 5 percent level of significance is (12.6371) much higher than the critical value (4.300949) and therefore it could be concluded that there is significant difference in the net purchase of debentures by the FIIs during the pre and post announcement period of Digital India Campaign.

Table-6: T-test Result for the FII in Debentures during Pre and Post Announcement of Digital India Campaign

Description	Gross Purchase		Gross Sales		Net Purchase/Sales	
	Variable 1	Variable2	Variable 1	Variable 2	Variable 1	Variable 2
Mean	30399.59	20090.48	18877.85	19807.44	11521.74	283.0467
Variance	52224839	75098985	57519765	24456816	74023860	45916412
Observations	12	12	12	12	12	12
Pearson Correlation	-0.07967		0.134566		0.427751	
Hypothesized Mean Difference	0		0		0	
d.f.	11		11		11	
t Stat	3.047704		-0.37981		4.651122	
P(T<=t) one-tail	0.005546		0.355658		0.000352	
t Critical one-tail	1.79588481		1.795885		1.795885	
P(T<=t) two-tail	0.011093		0.711317		0.000704	
t Critical two-tail	2.20098516		2.200985		2.200985	

Sources: <http://www.moneycontrol.com/india/stockmarket/foreigninstitutionalinvestors/03/50/activity/FII>

It is clear from Table 4 that there is a weak negative correlation (-0.07967) for FII debenture purchases between pre and post Digital India campaign announcement, it is positive for (0.134566) gross FII debenture sales and net FII debenture purchases (0.427751). The calculated T-value for gross debenture purchases by FIIs is 3.047704, which is higher than the critical value (@5% level of significance), it is concluded that there is a significant difference in the inflow of FII in debenture during pre and post announcement period of digital India campaign. Similar result is found with net purchase of debentures (4.651122) and thus found that there is significant difference in the net purchases of debentures by the FIIs during the post and pre announcement period. About gross sale of debentures, the calculated t value is -0.37981 is lesser than the critical value of 1.795885 (at 5% level of significance), it is concluded that there is no significant difference in gross sale of debentures by the FIIs during the pre and post announcement of digital India program.

FINDINGS AND CONCLUSION

In an attempt to find out the impact of the announcement of Digital India Campaign on FII flow in India, the researcher has identified the following major findings:

- It is found in the study that the mean investment in equity during pre-announcement period (Rs. 95388.28 crores) is higher than the post-announcement period (Rs. 83954.1 crores). The average growth rate in FII equity investment during the pre-announcement period is 1.57% and during post announcement period it is 0.72%. This infers that the growth of FII in equity purchases have come down after the announcement of the program.
- It is clear from the study that during the pre-announcement period of the program, the mean FII equity sales will be Rs. 89371.8 crores and it higher than the mean FII equity sales of after the announcement (84592 crores) The average growth rate in gross sales in equity FII has increased to 1.74% from 0.5% during the post announcement period.
- The study reveals the fact that during the post announcement period; FII equity purchases were overtaken by the sales and thus resulted in negative FII inflow. The mean net-investment in equity during pre-announcement period is Rs. 6016.48 crores, whereas during the post-announcement period, it is Rs. -638.2 crores. The growth in net purchases has come down -74.8% to -624.21% during the post announcement period.
- It is found that the mean FII investment in debenture during pre-announcement period is Rs. 30399.59 crores and during the post-announcement period, it is Rs. 20090.48 crores. The average growth rate of FII in debenture has come down to 17.78% from 26.09 during the post-announcement period.
- It is crystal clear from the study that the mean FII debenture sales during pre-announcement period are Rs. 18877.85 crores is higher than the post-announcement period (Rs. 19807.44 crores) and the average growth rate has come down to 3.12% from 8.475 during the post announcement period.
- It can be inferred from the study that the net FII debenture inflow during the pre-announcement period is Rs. 11521.74 crores and it has come down to Rs. 283.05 crores during the post announcement period. But interestingly, due to 8912.84% increase in net inflow in the month of October 2015, the average growth rate in net FII equity inflow has increased from -35.84% to 644.67% during the post announcement period.



- Digital India is a program to prepare India for a knowledge future. Honourable Shri Narendra Modi, Prime Minister of India has laid emphasis on National e-governance and has given its approval for Digital India-A program to transform India into digital empowered society and knowledge economy. The Digital India vision provides the intensified impetus for further momentum and progress for e- governance and would promote inclusive growth that covers electronics services, products, devices, manufacturing and job opportunities. In this study an attempt is made to identify the role of Digital India Campaign in the flow of FII in India. As per the descriptive statistics and the average growth rate calculated for pre and post announcement period FII flow, it is true that the program has failed to attract the FIIs. Finally, as the majority of the T-values and F values are lesser than the critical values, it can be concluded that the role of Digital India Campaign is insignificant in the FII in India.

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REACTION OF INDIAN STOCK MARKET FOR THE ANNOUNCEMENT OF DIGITAL INDIA CAMPAIGN

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ABSTRACT

Digital India is a program to prepare India for a knowledge future. The prime minister of India, Narendra Modi has laid emphasis on national e-governance plan and has given its approval for digital India. The vision of digital India is to transform the country into a digitally empowered society and knowledge economy. It would ensure that government services are available to citizens electronically. The present research is an attempt to study the reaction of Indian capital market for the announcement of very innovative digital India campaign. It is an event study and the date of announcement of the campaign by the prime minister is considered as the event date. The researcher has taken stocks of twelve different industries to study their reaction in the capital market for the announcement.

KEYWORDS

Announcement, Abnormal returns, Digital India, Stocks etc.

INTRODUCTION

Digital India is a Programme to prepare India for a knowledge future. Hon'ble Shri Narendra Modi, Prime Minister of India has laid emphasis on National e-governance plan and has gave its approval for Digital India – A programme to transform India into digital empowered society and knowledge economy. Digital India is an ambitious programme of Government of India projected at Rs 1,13,000 crores. Prime Minister Narendra Modi launched it on 2 July 2015. The initiative includes plans to connect rural areas with high-speed internet networks. Digital India consists of three core components. These include: The creation of digital infrastructure, Delivery of services digitally, Digital literacy. This will be for preparing the India for the knowledge based transformation and delivering good governance to citizens by synchronized and co-ordinated engagement with both Central Government and State Government. This programme has been envisaged by Department of Electronics and Information Technology (DeitY) and will impact ministry of communications & IT, ministry of rural development, ministry of human resource development, ministry of health and others. This programme will also benefit all states and union territories. The existing/ ongoing e-Governance initiatives would be revamped to align them with the principles of Digital India. The vision of Digital India is to transform the country into a digitally empowered society and knowledge economy. It would ensure that government services are available to citizens electronically. It would also bring in public accountability through mandated delivery of government's services electronically. The Digital India vision provides the intensified impetus for further momentum and progress for e-Governance and would promote inclusive growth that covers electronic services, products, devices, manufacturing and job opportunities. Digital infrastructure will focus on providing high speed secure Internet. Governance and services on demand will stress on integrating services across departments and jurisdictions and making services available in real time for both online and mobile platform. Digital empowerment of citizens will pay emphasis on universal digital literacy and availability of digital resources/services in Indian languages.

Digital India offers multiple benefits to India. The various benefits of Digital India program are: creation of Digital Infrastructure and Electronic Manufacturing in Native India, Digital Empowerment of Native Indian People, Delivery of all Government Services electronically (E-Governance), A Digital Identification which will verify the end user, A Mobile for worldwide access to all services, A Bank account for Immediate Benefit Transfers of subsidies and payments, The program also aims to eliminate all electronics imports from foreign countries by 2020 and make India an electronics manufacturing super power, help in decreasing crime if applied on whole, help in getting things done easily, help in decreasing documentation, will ostensibly create a lot of jobs, will be a boost to industry; both large and small enterprises. Digital India without a doubt is a very commendable project and deserves full support. As far no disadvantages could be noticed as it's an initiative we are talking about. However, the initiative also lacks many crucial components including lack of legal framework, absence of privacy and data protection laws, civil liberties abuse possibilities, lack of parliamentary oversight for e-surveillance in India, lack of intelligence related reforms in India, insecure Indian cyberspace, etc.

The present research is an attempt to study the reaction of Indian capital market for the announcement of very innovative digital India campaign. It is an event study and the date of announcement of the campaign by the prime minister is considered as the

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event date. The researcher has taken stocks of seven different industries to study their reaction in the capital market for the announcement.

OBJECTIVES OF THE STUDY

The following are the objectives of the study:

- To study the reaction of stock market for the announcement of Digital India Campaign.
- To compare the reaction of different industries for the announcement.
- To know whether the campaign has attracted the investors for investment in the stock market.

SCOPE OF THE STUDY

The current study deals with the impact of Digital India Campaign on the Indian capital market. The study is intended to find out whether the campaign has improved the performance of the stocks traded in Indian capital market. To find out the reaction of the capital market, the researcher has studied the price behaviour of various companies belongs to twelve different industries. It is an event study and the event window is 41 days, including returns of 20 pre-announcement days, 20 post announcement days and the day of the event. The day of event is on July 2nd, 2015.

METHODOLOGY USED

The entire study is based on secondary data extracted from various sources like books and websites. The study period is the event window and the event date is July 2nd, 2015. Seven industries were taken for the study and the sample size is thirty percent of the total active stocks of each industry. The various industries under study are: Information Technology, Iron and Steel, Pharmaceutical, Banking, Automobile, Finance and Telecom Industry. Various descriptive statistics, One Way Anova and T test statistics have been used in the study to make the conclusion very effective.

TECHNIQUES OF ANALYSIS:

Daily returns for each sample company has been computed for the estimation period and also for the event period as:

$$R_i = LN\left(\frac{P_1}{P_0}\right)$$

Where, P1 = Closing price of the security and P0 is the opening price of the security

$$R_m = LN\left(\frac{MP_1}{MP_0}\right)$$

MP1 = Closing market price of the security and MP0 is the opening market price of the security.

Daily-expected Return

$$E(R_{it}) = \alpha + \beta \times R_m + \epsilon_t$$

In the Equation $E(R)$ is the expected return of a particular company on day t ,

α and β are calculated as follows

$$\beta = \frac{n \sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2}$$

$$\alpha = \bar{y} - \beta \bar{x}$$

Abnormal Returns

Daily abnormal return on a particular day t is the excess of the actual return on the day t over the expected return on that day.

$$AR = R_{it} - E(R_{it})$$

Where, R_{it} is the actual daily return for the share of a company i at time t , and $E(R_{it})$ is the expected return on the same day in the absence of an acquisition.

The study period used in this analysis is a 41 working days. In this, the day of Digital India announcement is designated as 0. Trading days prior to the announcement are numbered event days -1, -2 and so on. The event days following the announcement are numbered +1, +2 and so on. First, the average excess returns (AAR) for each relative day t are calculated across the securities. Daily average cumulative abnormal returns (CAAR) are the sum of the average excess returns over event time.

Average abnormal return (AAR's) for each relative day is calculated by:

$$AAR_t = \sum_{i=1}^N \frac{AR_{it}}{N}$$

Where, i = the number of securities in the study, N = Total number of securities, t = the days surrounding the event study.

Cumulative Average Abnormal Returns (CAARs) are derived by summing the AARs over various time intervals. For Example, CAARs for a time interval t_1 to t_2 are derived as follows:

$$CAARs = \sum_{t=t_1}^{t_2} AAR_t$$

LIMITATIONS OF STUDY

The following are the limitations of the study:

- The entire study is based on secondary data and thus the study is not free from the limitations of secondary data.
- The study assumes that all other factors remains constant and based on that the results are drawn.

DATA ANALYSIS AND INTERPRETATION

Table-1: AAR and CAAR around the Announcement of Digital India Campaign for Automobile industry

DAY	AAR	CAAR	DAY	AAR	CAAR
-20	0.003379	0.003379	0	0.013251	0.013251
-19	0.009099	0.012478	1	0.002146	0.015397
-18	-0.0172	-0.00473	2	0.005642	0.021039
-17	-0.0066	-0.01133	3	0.014831	0.03587
-16	0.020915	0.009585	4	-0.03174	0.004134
-15	-0.02685	-0.01726	5	0.013253	0.017386
-14	0.005111	-0.01215	6	0.001735	0.019121
-13	0.004788	-0.00736	7	0.019339	0.03846
-12	0.004781	-0.00258	8	0.014441	0.0529
-11	0.017187	0.014606	9	0.01943	0.07233
-10	0.018678	0.033284	10	0.010086	0.082416
-9	0.01076	0.04404	11	0.009406	0.091822
-8	0.015215	0.059255	12	0.011929	0.10375
-7	0.005843	0.065098	13	-0.01398	0.089771
-6	-0.01794	0.04716	14	0.02167	0.111441
-5	0.014582	0.061742	15	0.002205	0.113646
-4	-0.0067	0.055045	16	-0.01016	0.103482
-3	-0.01372	0.041321	17	-0.02802	0.075463
-2	0.00783	0.049151	18	0.005382	0.080845
-1	0.023017	0.072168	19	0.017426	0.098271
0	0.013251	0.085419	20	0.014507	0.112778
Average	0.0036		Average	0.0049	

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

According to Table-1, there are 14 positive average abnormal returns and 6 negative average abnormal returns during pre-announcement period and there are 16 positive average abnormal returns and 4 negative abnormal returns during the post

announcement period. The Average abnormal return on the date of event is positive and it is higher than the average of average abnormal returns of pre and post announcement period.

Table-2: AAR and CAAR around the Announcement of Digital India Campaign for Banking Industry

DAY	AAR	CAAR	DAY	AAR	CAAR
-20	-0.01166	-0.01166	0	-0.00337	-0.00337
-19	-0.00472	-0.01638	1	0.006064	0.002694
-18	-0.0236	-0.03998	2	0.024077	0.026771
-17	-0.01264	-0.05262	3	0.016732	0.043503
-16	0.020628	-0.03199	4	-0.01054	0.032963
-15	-0.03307	-0.06506	5	-2.3E-05	0.03294
-14	0.001838	-0.06322	6	0.006275	0.039215
-13	0.005556	-0.05767	7	0.024844	0.064059
-12	0.01415	-0.04351	8	0.000955	0.065015
-11	0.009014	-0.0345	9	0.00553	0.070545
-10	0.008611	-0.02589	10	0.014159	0.084704
-9	0.005719	-0.02017	11	-0.00136	0.083342
-8	0.035462	0.015292	12	-0.01729	0.066048
-7	0.010346	0.025638	13	-0.02458	0.041473
-6	-0.01577	0.009866	14	0.015739	0.057211
-5	0.001994	0.01186	15	0.001016	0.058227
-4	-0.01468	-0.00282	16	-0.02091	0.037315
-3	-0.02031	-0.02314	17	-0.03498	0.002336
-2	0.005802	-0.01733	18	-0.00049	0.001845
-1	0.026516	0.009183	19	0.001066	0.002911
0	-0.00337	0.005813	20	0.02016	0.023071
Average	0.00046		Average	0.00132	

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

It is clear from Table 2 that there are 12 positive average abnormal returns and negative average abnormal returns during pre-announcement period. Even during post announcement period, there are 12 positive average abnormal returns and 8 negative abnormal returns. The Average abnormal return on the date of event is negative and it is lesser than the average of average abnormal returns of pre and post announcement period. The post-announcement average of average abnormal returns is higher than the average of pre-announcement period.

It is found in Table 3 that during the pre-announcement period, there are 13 positive average abnormal returns and 7 negative average abnormal returns during pre-announcement period. During post announcement period, there are 14 positive average abnormal returns and 6 negative abnormal returns. The average abnormal return on the date of event is positive and higher than the average of average abnormal returns of pre and post announcement period. The post-announcement average of average abnormal returns is higher than the average of pre-announcement period.

Table-3: AAR and CAAR around the Announcement of Digital India Campaign for Finance Industry

DAY	AAR	CAAR	DAY	AAR	CAAR
-20	-0.0066	-0.0066	0	0.010155	0.010155
-19	0.016293	0.009694	1	0.025496	0.035651
-18	-0.01868	-0.00899	2	0.017962	0.053613
-17	0.000942	-0.00805	3	-0.00314	0.050473
-16	0.009495	0.001448	4	0.00302	0.053493
-15	-0.02745	-0.02601	5	0.001122	0.054615
-14	0.007647	-0.01836	6	0.012701	0.067316
-13	-0.00409	-0.02245	7	-0.00625	0.06107
-12	0.01031	-0.01214	8	0.008589	0.069659
-11	0.007251	-0.00489	9	-0.01605	0.053611
-10	0.007756	0.002868	10	0.018783	0.072394
-9	0.004628	0.007495	11	0.012914	0.085309
-8	0.01571	0.023205	12	0.027353	0.112661

-7	-0.00395	0.019256	13	-0.00693	0.105733
-6	0.009185	0.02844	14	0.014758	0.120491
-5	0.001111	0.029551	15	0.007161	0.127652
-4	-0.00258	0.02697	16	-0.00677	0.12088
-3	-0.01153	0.01544	17	0.001708	0.122588
-2	0.007981	0.023421	18	-0.00405	0.118541
-1	0.001079	0.0245	19	0.01066	0.129201
0	0.010155	0.034655	20	0.019521	0.148722
Average	0.0012		Average	0.0069	

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

As per Table 4, it is fact that during the pre-announcement period, there are 11 positive average abnormal returns and 9 negative average abnormal returns during pre-announcement period. During post announcement period there are 12 positive average abnormal returns and 8 negative abnormal returns. The average abnormal return on the date of event is positive and higher than the average of average abnormal returns of pre and post announcement period. The post-announcement average of average abnormal returns is higher than the average of pre-announcement period.

Table-4: AAR and CAAR around the Announcement of Digital India Campaign for IT Industry

DAY	AAR	CAAR	DAY	AAR	CAAR
-20	0.00418	0.00418	0	0.016029	0.016029
-19	-0.0063	-0.00212	1	0.006051	0.02208
-18	-0.02024	-0.02236	2	0.024074	0.046154
-17	0.000972	-0.02139	3	-0.00139	0.044763
-16	0.009239	-0.01215	4	-0.01104	0.033719
-15	-0.02619	-0.03834	5	0.013682	0.047401
-14	-0.05096	-0.0893	6	-0.00543	0.041975
-13	0.001692	-0.08761	7	0.005997	0.047972
-12	0.000135	-0.08748	8	-0.00506	0.042915
-11	0.012758	-0.07472	9	0.016355	0.059269
-10	-0.00387	-0.07859	10	0.003247	0.062517
-9	-0.00451	-0.08309	11	0.021783	0.084299
-8	0.0269	-0.05619	12	0.013792	0.098092
-7	0.004825	-0.05137	13	-0.00428	0.093807
-6	-0.0013	-0.05267	14	0.027187	0.120994
-5	-0.00186	-0.05453	15	0.000499	0.121492
-4	0.004189	-0.05035	16	0.006869	0.128362
-3	-0.01586	-0.0662	17	-0.01744	0.110923
-2	0.005322	-0.06088	18	-0.01464	0.096288
-1	0.019369	-0.04151	19	-0.00067	0.095616
0	0.016029	-0.02548	20	0.009374	0.10499
Average	-0.0021		Average	0.0044	

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

According to Table-5 there are 13 positive average abnormal returns during pre-announcement period and 7 negative average abnormal returns during pre-announcement period. During post announcement period, there are 15 positive average abnormal returns and only 5 negative abnormal returns. The average abnormal return on the date of event is positive and higher than the average of average abnormal returns of pre and post announcement period. The post-announcement average of average abnormal returns is higher than the average of pre-announcement period.

Table-5: AAR and CAAR around the Announcement of Digital India Campaign for Telecom Industry

DAY	AAR	CAAR	DAY	AAR	CAAR
-20	-0.00482	-0.00482	0	0.009931	0.009931
-19	0.004565	-0.00026	1	0.009871	0.019802
-18	-0.02996	-0.03022	2	0.022061	0.041864
-17	-0.00545	-0.03567	3	0.008941	0.050805
-16	0.026051	-0.00962	4	-0.01683	0.03397

-15	-0.02633	-0.03594	5	0.000685	0.034655
-14	0.010857	-0.02509	6	0.000419	0.035073
-13	0.008052	-0.01703	7	0.021738	0.056811
-12	0.009948	-0.00709	8	0.011598	0.068408
-11	0.015855	0.008768	9	0.003525	0.071934
-10	0.008607	0.017375	10	0.023886	0.09582
-9	0.015838	0.033214	11	0.000757	0.096577
-8	0.021511	0.054724	12	0.019225	0.115802
-7	0.015971	0.070695	13	-0.0271	0.0887
-6	-0.00692	0.063774	14	0.032154	0.120854
-5	0.010531	0.074305	15	0.005119	0.125972
-4	-0.00932	0.06499	16	-0.01806	0.107909
-3	-0.01544	0.049555	17	-0.02969	0.078217
-2	0.008021	0.057576	18	0.004411	0.082628
-1	0.031153	0.088729	19	0.01331	0.095938
0	0.009931	0.098661	20	0.014288	0.110226
Average	0.0044		Average	0.0050	

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

Table 6 reveals the fact that there are 16 positive average abnormal returns during pre-announcement period and 4 negative average abnormal returns during pre-announcement period. During post announcement period, there are 15 positive average abnormal returns and only 5 negative abnormal returns. The average abnormal return on the date of event is positive but lesser than the average of average abnormal returns of pre and post announcement period. The post-announcement average of average abnormal returns is lesser than the average of pre-announcement period.

Table 7 reveals the fact that there are 12 positive average abnormal returns during pre-announcement period and 8 negative average abnormal returns during pre-announcement period. During post announcement period, there are 14 positive average abnormal returns and only 6 negative abnormal returns. The average abnormal return on the date of event is positive but lesser than the average of average abnormal returns of pre and post announcement period. The post-announcement average of average abnormal returns is higher than the average of pre-announcement period.

Table-6: AAR and CAAR around the Announcement of Digital India Campaign for Iron & Steel Industry

DAY	AAR	CAAR	DAY	AAR	CAAR
-20	0.002202	0.002202	0	0.008106	0.008106
-19	0.006236	0.008438	1	0.023044	0.03115
-18	-0.02123	-0.01279	2	0.038883	0.070033
-17	-0.00473	-0.01752	3	0.022289	0.092322
-16	0.053044	0.035521	4	-0.03936	0.052963
-15	-0.03305	0.002467	5	-0.00681	0.046157
-14	0.009842	0.012308	6	0.017277	0.063434
-13	0.033315	0.045623	7	0.050181	0.113615
-12	0.017094	0.062717	8	0.012989	0.126604
-11	0.028066	0.090783	9	0.023579	0.150184
-10	0.035212	0.125995	10	0.020573	0.170757
-9	0.025061	0.151056	11	0.008056	0.178812
-8	0.046282	0.197339	12	0.012087	0.1909
-7	0.020278	0.217616	13	-0.01291	0.17799
-6	0.000267	0.217883	14	0.053945	0.231935
-5	0.021207	0.239091	15	0.009966	0.2419
-4	0.002022	0.241112	16	-0.01658	0.225324
-3	-0.00913	0.231986	17	-0.02546	0.199861
-2	0.033334	0.26532	18	0.010584	0.210445
-1	0.046809	0.312129	19	0.032614	0.243059
0	0.008106	0.320235	20	0.012773	0.255832
Average	0.0156		Average	0.0124	

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

Table-7: AAR and CAAR around the Announcement of Digital India Campaign for Pharmaceutical Industry

DAY	AAR	CAAR	DAY	AAR	CAAR
-20	0.004088	0.004088	0	0.004966	0.004966
-19	0.006026	0.010114	1	0.009044	0.014011
-18	-0.01433	-0.00422	2	0.032107	0.046117
-17	-0.00289	-0.00711	3	0.006977	0.053094
-16	0.026478	0.019372	4	-0.01919	0.033903
-15	-0.02056	-0.00119	5	0.004246	0.038148
-14	-0.00037	-0.00155	6	4.18E-05	0.03819
-13	0.023683	0.022129	7	0.019694	0.057884
-12	0.001501	0.02363	8	0.013129	0.071013
-11	0.001501	0.025131	9	0.020989	0.092003
-10	0.021964	0.047096	10	0.015999	0.108002
-9	0.011391	0.058487	11	0.018447	0.126449
-8	0.015477	0.073964	12	0.017497	0.143946
-7	0.008226	0.08219	13	-0.01853	0.125412
-6	-0.00367	0.078517	14	0.024729	0.150142
-5	0.00388	0.082397	15	-0.00038	0.149765
-4	-0.00748	0.074915	16	-0.00634	0.143427
-3	-0.01294	0.06198	17	-0.01501	0.128414
-2	0.01313	0.07511	18	-0.00046	0.127955
-1	0.02463	0.09974	19	0.017293	0.145248
0	0.004966	0.104706	20	0.024507	0.169755
Average	0.004987		Average	0.008239	

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

The results of One Way ANOVA test conducted for the AAR of various industries around the Digital India Campaign is shown in Table 8. Among the calculated F values of seven industries, all the F values are less than the critical value of 4.09128 at 5% level of significance and therefore it can be concluded that there is no significant difference in the abnormal returns during the pre-announcement and post-announcement period of Digital India Campaign. In addition to the One Way ANOVA test, the researcher has also used the Paired Comparison Test to support the results above results.

Table-8: One Way ANOVA for Average Abnormal Returns of Various Industries around the Announcement of Digital India Campaign

Industry	Source of Variation	SS	d.f.	MS	F	P-value
Automobile	Between Groups	0.00073	1	0.00073	0.70811	0.4052
	Within Groups	0.04018	39	0.00103		
	Total	0.04091	40			
Banking	Between Groups	1.1E-05	1	1.1E-05	0.04007	0.84238
	Within Groups	0.01089	39	0.00028		
	Total	0.0109	40			
Finance	Between Groups	0.00029	1	0.00029	2.17124	0.14864
	Within Groups	0.00513	39	0.00013		
	Total	0.00541	40			
IT	Between Groups	0.00033	1	0.00033	1.47794	0.23141
	Within Groups	0.00866	39	0.00022		
	Total	0.00899	40			
Telecom	Between Groups	1E-06	1	1E-06	0.00382	0.95103
	Within Groups	0.01048	39	0.00027		
	Total	0.01048	40			
Iron & Steel	Between Groups	8.4E-05	1	8.4E-05	0.15719	0.69392
	Within Groups	0.02083	39	0.00053		
	Total	0.02092	40			
Pharma	Between Groups	4.2E-05	1	4.2E-05	0.20323	0.65462
	Within Groups	0.00808	39	0.00021		
	Total	0.00812	40			

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

Note: Critical Value @ 5% level of significance: 4.09128

It is clear from Table 9 that among the calculated t values for seven industries, all the seven t values are lesser than the critical value of 1.729133 at 5% level of significance, it can be concluded that the mean difference between the abnormal returns around the announcement of digital India program will be equal to zero.

Table-9: Paired Comparison t-test for Pre and Post Average Abnormal Returns of Various Industries under Study

Description	Industry						
	Automobile	Banking	Finance	IT	Telecom	Iron & steel	Pharma
Pearson Correlation	0.230117	-0.04094	-0.06664	0.06674	0.18351	-0.05913	0.33818
Hypothesized Mean Diff.	0	0	0	0	0	0	0
d.f.	19	19	19	19	19	19	19
t Stat	-0.33689	-0.15808	-1.51473	-1.43817	-0.12225	0.42319	-0.89147
P(T<=t) one-tail	0.369946	0.43803	0.07315	0.08333	0.45199	0.33845	0.19191
t Critical one-tail	1.729133	1.72913	1.72913	1.72913	1.72913	1.72913	1.72913
P(T<=t) two-tail	0.739892	0.87606	0.1463	0.16665	0.90398	0.67691	0.38383
t Critical two-tail	2.093024	2.09302	2.09302	2.093024	2.093024	2.093024	2.093024

Sources: <http://www.moneycontrol.com/stocks/histstock.php>

Note: Level of significance 5%

FINDINGS AND CONCLUSION

Digital India is an innovative programme of Government of India with a main intention to connect rural areas with high-speed internet networks. The main objective of this program is to transform the country into a digitally empowered society and knowledge economy. It would ensure that government services are available to citizens electronically. It would also bring in public accountability through mandated delivery of government's services electronically as we all know, stock market is highly sensitive. It will discount all information. Since Digital India program is a major by the Government of India, definitely it would have an impact on the behaviour of stock prices of stocks traded in Indian stock markets. Thus, the researcher has made an attempt to find out the impact of the introduction of Digital India Program on stock market.

The study reveals the fact that in most of the industries like; automobile, finance, IT, telecom, and pharmaceutical, the number of positive average abnormal returns are higher during the post announcement period than the pre-announcement period. It indicates that the Digital India program has resulted in bullish market for most of the industries. Except banking industries, all other industries have shown positive average abnormal returns on the date of announcement of Digital India campaign. This indicates that majority of the companies traded in India have reacted positively in the stock market for the announcement of the program. One of the very interesting findings of the study is that except banking and pharmaceutical industry, all other industries have shown higher abnormal returns compared to pre-announcement and post-announcement abnormal returns. This indicates that the positive reaction of the stock market after the announcement is not as good as on the date of announcement of the program.

The study also reveals the fact that the average of average abnormal returns during the post-announcement period is higher than pre-announcement period for all most all the industries, except Iron and Steel industry. It reveals the fact that the announcement of Digital India Campaign has improved the performance of the capital market. At the end of the study, the results are tested by using One Way ANOVA and Paired Comparison T test to find out; is there any significant difference in the pre and post announcement abnormal returns. The tests have proved that there is no significant difference in the abnormal returns of pre-announcement and post announcement period. Thus, it can be concluded that the announcement of Digital India Campaign has failed contribute significant abnormal returns to the investors in the stock market.

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**A STUDY OF MARKETING STRATEGIC UNETHICAL ALLIANCE:
CASE OF INTERRUPTED MARKETING BY THE PRIVATE INSTITUTES IN
INDIA - HOLISTIC vs. UNETHICAL PRACTICES**

Dr. Gurdev Singh Thakur³⁸

ABSTRACT

Private Educational Institutions in India mushroomed like a big virus as every business entrepreneur thought this a very lucrative business, considerable amount on advertising spend, least focus on quality faculty induction, big crabbing for survival, some of the institutions closed and many more on the verge of closer, quality education deteriorated to the extent that some the private universities/institutions ready to deliver degrees/allowing regular students as non-attending for a petty amount, unethically acquire personal information of the aspiring candidates, bombard with repeated messages on mobile to the extent of mental torture, through e-mail and through postal correspondence. An attempt has been made to adjudge the level of discomfort among the aspirants and parents through this study with special reference to the current year 2016.

INTRODUCTION

Defacto Status of Indian Higher Education: Higher education in Indian context since 20th century always remained a point of priority and contention for the Indian Government and private players. Up to Nineteen Nineties, situation was under considerable control of the Indian Government, worth quoting it started worsening since 1991, when the Indian Government tossed policy of Liberalization, Privatization and Globalization (LPG). Number of higher educational institutes developed across in India imparting education and training in various disciplines; first hand it had a great entry in South India and 1997 onward it start spreading like a virus in the North India. Noteworthy, a few universities/institutions focused on quality education; otherwise, majority of the institutions became a degree issuing centres and moneymaking machines.

Also worth quoting the UGC, AICTE, NCTE, State Governments, Universities providing affiliations etc., as regulators and monitoring agencies played a faint role and pen-ultimately we have a status that some of the higher education institutions got closed and many are on the average of closer because of negligible students' strength in their hands, no place of quality education, pitiable talent equipped faculty members, nil placements etc.; that all put forth a grave poor quality educated and underutilized human resource with India. Education regulating authorities are known for establishing standards but considerably lack in supervision and consistent monitoring, to the effect, we have today such kind of scenario that is pathetic and detrimental to have talented human resource compatible to the global standards.

Government Initiatives

Government of India and State governments are taking concrete steps and re-orienting education policies from time to time but as a major responsibility it is helpful in funding majority of government sector educational units barring a few that are aided but in case of private players; they are to maintain their own requirements at their own. Laxity and complacency on the part of both Central Government and State Governments in implementing rules and regulations stipulated thereof to regulate the private players perhaps are adjudged the basic underlining factors that private players are highly commercializing the higher education in India and quality of education maintenance is a distance dream, leading towards deterioration of talent creation that is compatible to the global requirements and accruing literate un-employment in India. Higher Education Regulatory bodies too are un-able to put consistent surveillance and monitoring on the functioning of the private institutes whereby attributable factors may range from the insufficient staff to political patronage to the private education players.

Marketing Strategies Including Un-Ethical Practices to Lure Aspirants

Outstandingly, it will be not proverbial that we provide Education Services status of an industry in Indian Context. Worth saying that educational services after commercialization has become a lucrative business and very to very huge investments are amply seen in the North India, if we talk of Punjab, on an average of 20 kms, one will find either a university or an institute. The situation in Himachal Pradesh, becoming worse as more than 18 Private Universities are established with a State having population around 80 lacs.

The **current scenario is this in majority of institutions**, faculty staff is quite below the stipulated Teacher-Student ratio, majority of Assistant Professors are deputed who are not UGC-NET/SLET qualified, faculty members burdened with 25-30 lectures per

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week, administrative work assigned, marketing jobs are assigned during the admissions time, faculty members used as Tele callers, admission targets are set very high, compelled to maintain the regular attendance of non-attending students, extension of unfair means of copying (UMC) during examinations, salary ranges between Rs. 8000 to 14000, regular threats of firing at any stage, unpaid relieving during non-teaching days or long holidays, showing fictitious faculty staff in the attendance register and in the feed back to the affiliated universities and All India Council for Technical Education/apex regulatory bodies, compelling of faculty staff to sign in salary registers with high salary, even if salary is through bank-bank withdrawal forms already signed by the faculty are obtained well before, charging of full fees if any student wants to leave the college, unscrupulous ways of charging heavy fine from the students, faculty staff bound to assign high internal marks etc.

In the context of **Marketing Strategies**, every kind of marketing promotional tool is applied through various medium like strategic marketers do in product/services industries, that's the reason, researcher of this paper assign impetus of 'education industry' to education services that actually falls under the purview of services. Advertisements through newspapers, newspaper inserts, magazines, hoardings, on transiting vehicles, sky ballooning, poster pasting on walls and road sides, Radio, TV Channels, TV Cable networks, door to door campaigning, authorized franchisee (admission counsellors/consultants), tie ups with the foreign embassies for inbound students, using community cards also for attracting admissions, banners/hoardings with the remarkable records of higher salary package as the best placements providers, unauthorized ranking banners, bombardment of messages on the cell phones of the aspiring students/parents, e-mails, unethically sourced personal data to call and torture aspirants (height of nuisance that researcher himself received more than 300 messages that is quite torturing with various warning and luring message starting like, congratulations-you are selected, 87 years of excellence, only one institute in India, last chance to join prestigious institute, last day reminder etc.). Undoubtedly, and ubiquitously, it is revealed through this study that higher education scenario in India has already paralyzed, prone and poised to unavoidable and unprecedented future.

Unsolicited messaging on cell phones, mailing through e-mails and postal correspondence by accessing data from the examination conducting agencies and schools/colleges from where student acquire basic education, eliciting personal data through informal interactive sessions and through developing nexus with some local data sources. Such practices in developed countries are considered unethical and falls under the category of **interrupted marketing** and in most the advanced countries concept of uninterrupted marketing (permission marketing) was that curbed these kinds of information bombardments. Possible solutions were developed pop-up advertisements that was on the discretion of users whether they wanted to see that pop-up commercial or ignore at single click and the grave impending danger of unwanted commercials and other informational bombardments were avoided.

REVIEW OF THE LITERATURE

Review of the literature was carried out with special reference to Indian Context studies but broader view scenic conceptualization and study reviews were referred with context to developed countries. The references from where conceptualization and studies reviews are mentioned in summated form in the reference section of this paper.

Study Framework and Perspective with special reference to JEE-2016

Research Framework: This study has a special reference to JEE-2016 conducted, respondents were selected through snow ball techniques' as the researcher had good amount of parents and candidates in the friend list, sample size was enhanced to the tune of 60, data were collected through the phone calls, reactive behavioural responses recorded and inferences were drawn thereof. The respondents belong to the Punjab and Himachal Pradesh.

Table-1: Data Analysis

Total Number of Respondents (60) / Number of SMS / Information Received	Information through SMS	Information through e-mail	Postal Correspondence: Registered / Book Posts	Number of Universities / Institutes / Colleges called upon
0-100	05	15	0-10/25	35
100-200	15	00	10-20/20	15
200-300	20	45	20-30/10	05
300-400	20	00	30-40/05	05
400-500	00	00	40-50/00	00

Sources: Authors Compilation

DATA ANALYSIS AND DRAWING OF INFERENCES

The summated inferences drawn from the data so collected as mentioned in the table above are as:



- That 33.33% of the respondents who received SMS through cell phones in the each slab intervals of 200-300 & 300-400 SMS reflected that majority of the respondents i.e. 66.66% received highest level of SMS from various universities/institutions/colleges that provide higher technical education; unscrupulously sourced data from the examination conducting authority in India, 0-100 and 100-200 SMS were received by 8.33% and 20% respectively.
- That in the context of e-mail receipts; majority of the respondents i.e. 75% received e-mails in the range slab of 200-300 and only 25% of the respondents have e-mail receipts in the range slab of 0-100.
- That in the context of postal correspondence letter receipts in the slabs of 0-10, 20-20, 20-30, 30-40 & 40-50 were observed 41.66%, 33.33%, 16.66%, 8.33% and 0% respectively whereby it is clearly deduced that majority of the respondents had postal letters receipts in the range of 0-10.
- That finally in the context of Universities/institutes/Colleges that called upon directly to the respondents were maximum in the call range of 0-100 i.e. 58.33% and followed by 25%, 8.33%, 8.33% and 0 respectively for the rest of the call slabs.

From the data analysis and inferences drawn, it is quite evident that maximum private institutions of higher education acquire candidates' data / personal information through unscrupulous ways and means and try to create awareness and this all in aggregation creates mind-boggling /ambiguity / doldrums state of mind among the aspirants. Virtually this all episode of interruption marketing practices is against the permission marketing and unethical in sense and essence. Such practices are banned in developed countries and Indian Union too needs curve such bad practices and create mechanism under cyber laws to protect Indian populace.

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IDENTIFYING AREAS FOR IMPLEMENTATION OF ERP IN AN UNORGANIZED RESTAURANT: A CASE STUDY

Prachi Tiwari³⁹ Charul Verma⁴⁰

ABSTRACT

In current scenario, ERP implementation is very common for any medium and large-scale business where plenty of resources are available and it is complex to manage these resources. However, if the resources are less and business is small then it becomes difficult for them to afford ERP due to its high cost. Today, ERP systems are important for much food business whether it is large, medium or small but smaller businesses need to consider various factors for its implementation when making first time purchase. Selection of the right ERP is the most critical aspect in implementing ERP system. Systematic study/evaluation of customer requirements, business requirements, and employee requirements is needed to do final selection of ERP and its implementation. In this, a case study of a low budget, unorganized restaurant is considered for ERP implementation, which can bring about a change in the efficiency as well as profit to the business. In case study, existing process of the restaurant is observed, discussed, and based on that challenges faced by them are identified first. Later, these challenges are used to identify critical success factors for the restaurant and a CSF matrix is created which will help the restaurant to do ERP selection and implementation.

KEYWORDS

ERP Implementation, Unorganized Restaurant, Critical Success Factors etc.

INTRODUCTION

To grow and survive in present competitive environment, industry needs to act responsively to the rapidly changing market and customer demands. In this changing market, needs it becomes necessary for every enterprise or industry to maintain high consistency in the quality of its product and services which can be achieved only if they strengthen their information exchange and communication system. According to the National Restaurant Association of India (NRAI), India Food Services Report 2016, the total market size of the Indian food & Beverage (F&B) service industry is INR 3,09,110 crore and is projected to grow to INR 498,130 crore by 2021 at a CAGR of 10%. By 2021, food & beverage industry is expected to provide direct employment to 8.5-9 million people [1].

The F&B services industry can be classified as:

- **Organized Segment:** Both full and quick service restaurants come under this segment.
- **Unorganized Segment:** Restaurants run by individuals or families, roadside vending, dhabas, food carts and street stalls, etc., come under this segment [2]. The NRAI 2016 report estimates that the 67% of F&B industry is unorganized sector, which is providing direct employment to approximate 4.6-5 million people.

Indian consumers spend about half of their total consumption expenditure on food & beverages. This seems to be rising among young generations due to urbanization, changing lifestyles, food preferences, rising number of working women & more number of eating out options. For any enterprise to be successful in such a growing and competitive world, it is required for them to understand how efficiently they are utilizing their existing resources.

Currently every industry whether they are large, medium or small is becoming technology oriented means use of computers is increasing day by day but if no one can make best use of these technologies then it is a waste. In such a competitive era, ERP has become the need of all enterprises. ERP not only deals with the issue related to the information technology but also make effective use of resources through in built control mechanism and correct and timely reporting, scalability. ERP also has single point of entry for recording all types of transactions.

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ERP does the Backward and forward integration in business process flow i.e. both customers and suppliers can be brought together and organization can serve them in an efficient and professional way through ERP gateway available in the organization. This helps in reducing the paper work and time lags in communication and make organization more efficient. It helps the enterprise to maintain transparency, consistency that ultimately leads to increasing efficiency. This software is majorly used by large and medium scale enterprises but how this can be used to manage resources of small-scale industry.

Therefore, in this, a case study business processes and functioning of a local low budget restaurant located in Pune is considered for ERP implementation. It is an unorganized, low budget, restaurant hence we believe ERP will be helpful to the business, as it will bring about a change in the efficiency as well as profits to the business.

RESTAURANT STUDY

Mission

To ensure customer satisfaction by providing prompt, courteous and professional service and well prepared meal using fresh and quality ingredients at budget price. To ensure that each customer gets a clean, comfortable premise and are treated with respect by our staff. To maintain comfortable, hygienic and co-operative environment for our staff.

Objectives

- Provide food & beverage service, which best meets the expectations of all the customers of the residential, professional, academic communities.
- Provide food and beverage service for banquets, parties and small group events.
- Improve operational efficiency across different functions like service operations, finance, procurement and purchase.
- Improve the menu based on customer demand and specialty dishes offered.

Challenges

- The business is currently very small and hence is not able to accommodate all the customers it gets especially at rush hours of lunch and dinner times, as it is located near college area.
- The extra customers end up waiting.
- Not enough labor hence service times are too long.
- Hygiene levels are not very high.

More detailed analysis of these and other problem is given in later part of the study.

Step-1: Understand the existing Business Processes of the Restaurant

The purpose of this step is to understand the current process of restaurant in detailed manner. For this process, flow mapping is done using basic charting tools such as flowcharts. With the help of process flow charts, any process can be analyzed in detail to identify the weakness & strength of the processes.

Background

It has been in the restaurant business over the past years and has gained a reputation of being an affordable casual dining place offering tasty Indian and Chinese food.

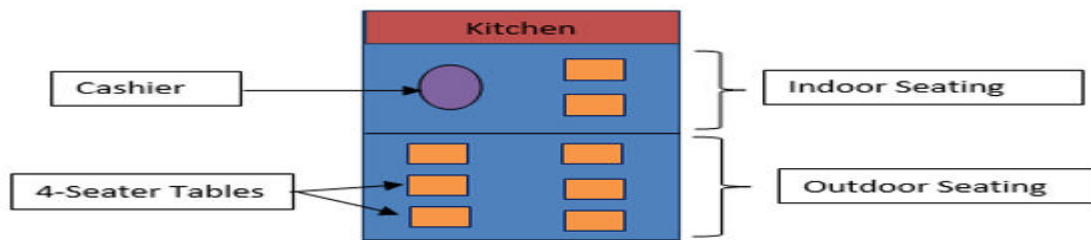
People Working

At present in the restaurant 9 to 10 persons are working.
Cooks -5, Waiters-2, Cleaners-1, 2 and the Owner.

Arrangement or Layout

Approximately 500 square feet of seating is available in the restaurant to dine of which 250 square feet has been converted into an outdoor sitting area, in addition to kitchen space and cashier counter. There are six 4-seater tables placed outside while the cashier desk and two 4-seater tables are placed indoors along with the kitchen space. Kitchen staff employed is 5 people.

Figure-1: Layout

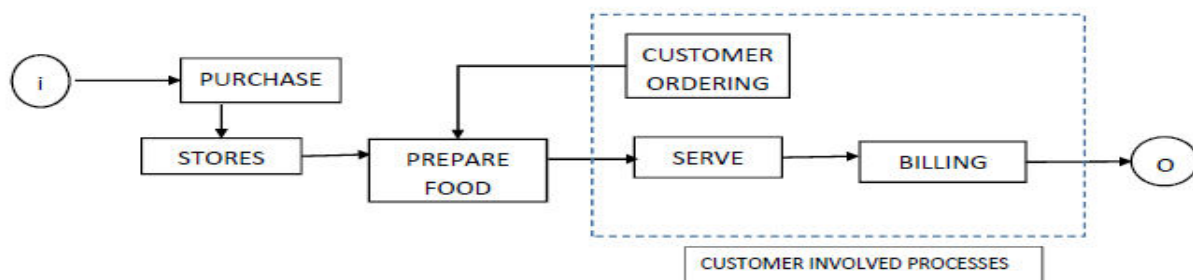


Sources: Authors Compilation

Food preparation can be bifurcated based on following:

- Vegetarian recipes and non-vegetarian recipes
- Pre-preparations for certain items and prepared at the time of order
- Useful and degraded stock

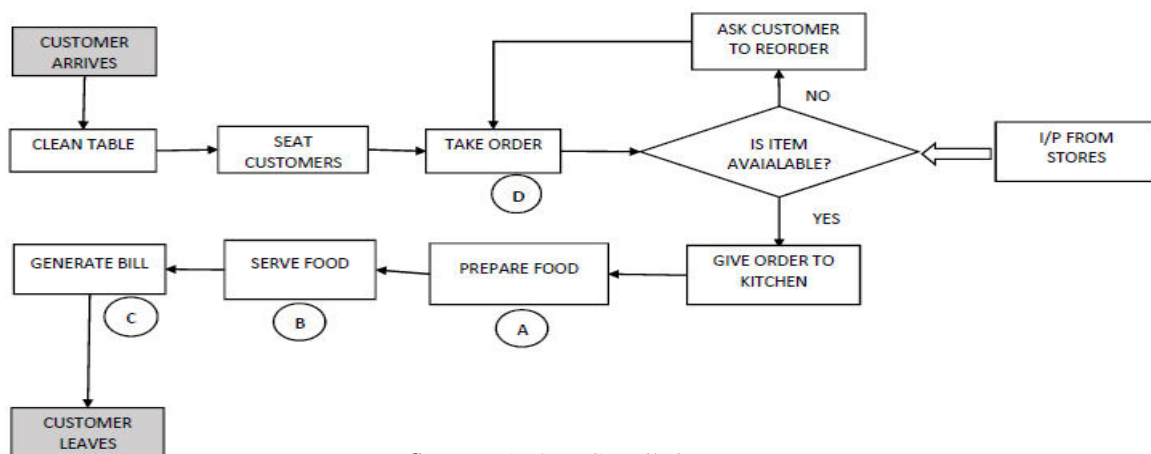
Figure-2: Overall Process Flow



Sources: Authors Compilation

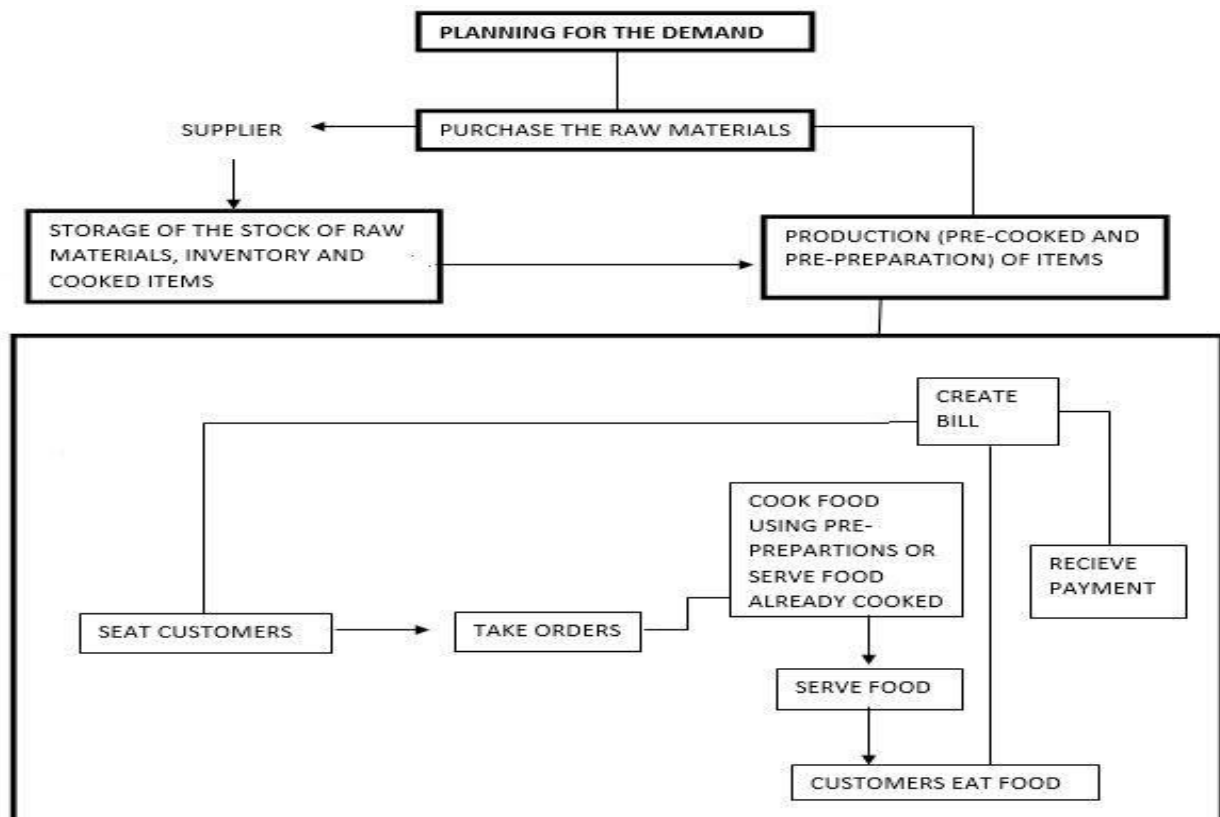
This process is further divided into various sub processes like customer order, prepare food, serve food, and generate bill and home delivery. In detailed process, flow can be understood below:

Figure-3: Customer Order Process Flow



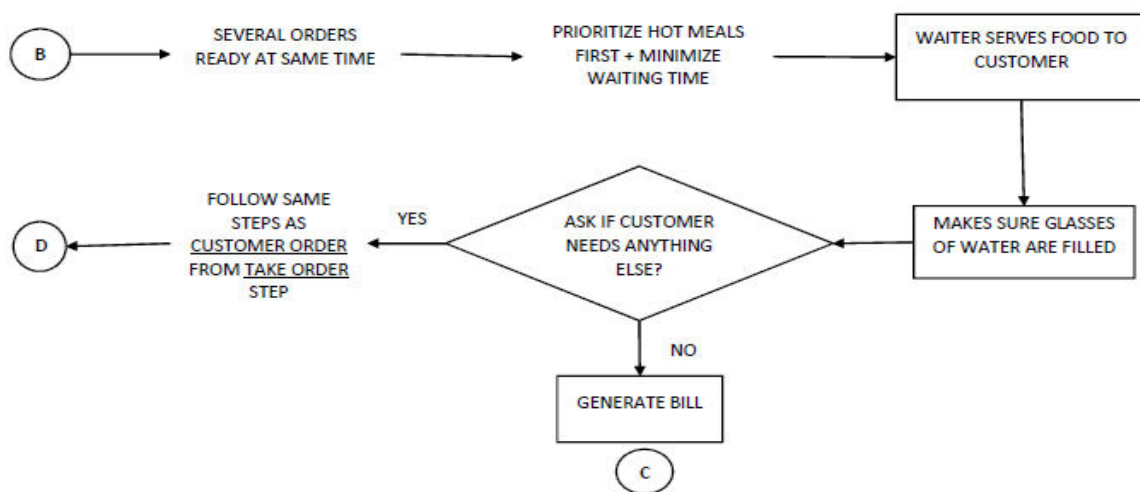
Sources: Authors Compilation

Figure-4: Food Preparation Process Flow



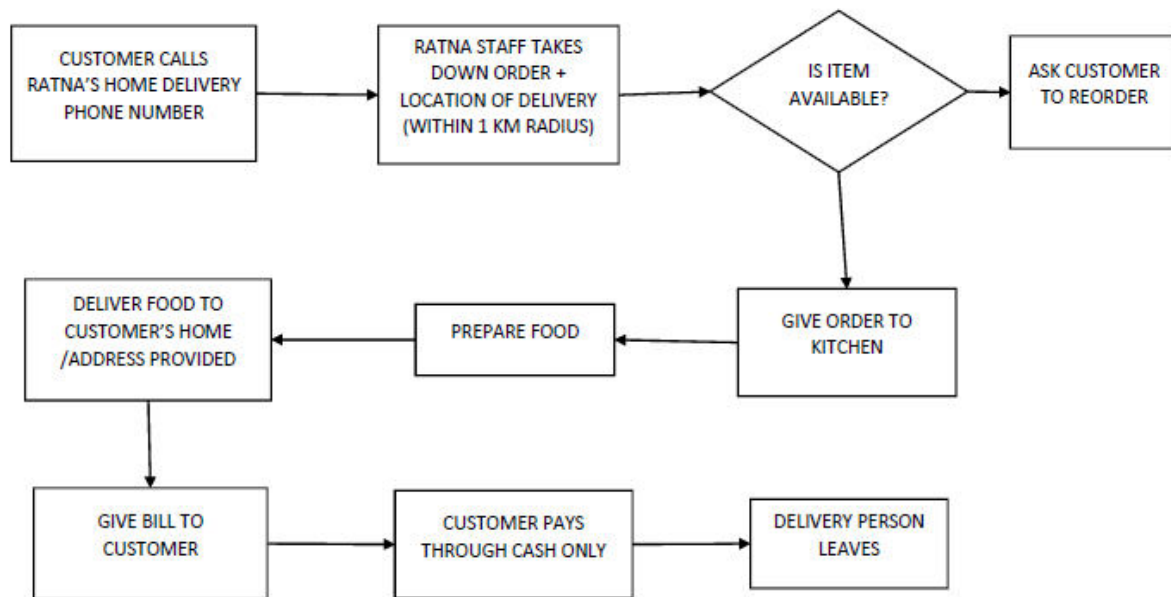
Sources: Authors Compilation

Figure-5: Service Process Flow



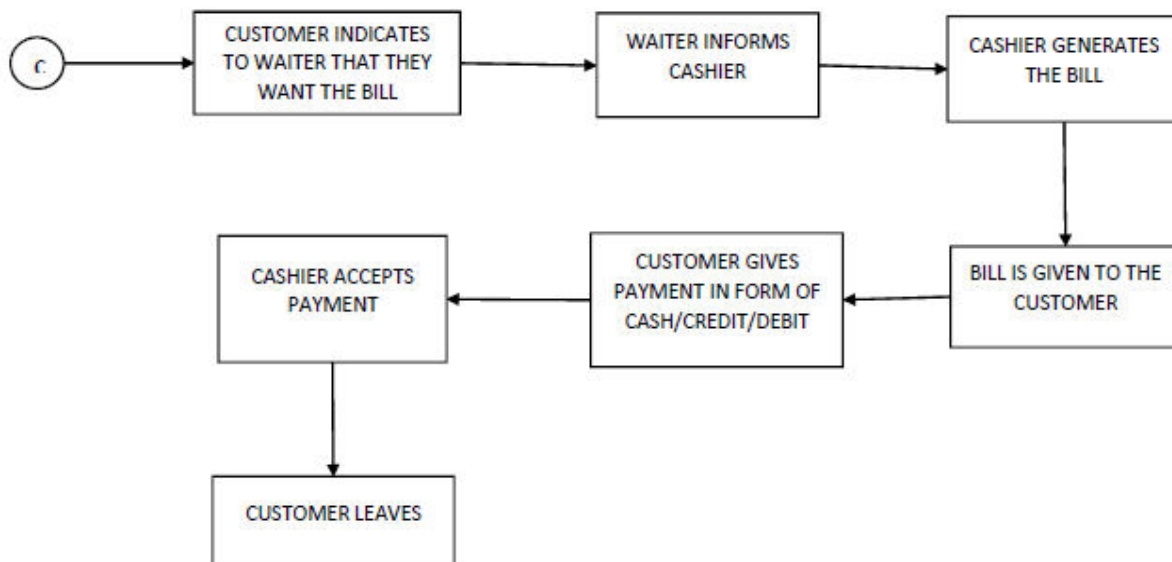
Sources: Authors Compilation

Figure-6: Bill Generation Process Flow



Sources: Authors Compilation

Figure-7: Home Delivery Process Flow



Sources: Authors Compilation

Step-2: Identifying Challenges in all of the above Processes

After analyzing different process flow charts and observing the processes in restaurants, challenges faced by the restaurants at different stages are identified as below:



Customer Order

The tables are cleaned only after a customer has arrived. This means the customer has to wait for a longer time than necessary and makes the customer think that restaurant is not hygienic.

- Sometimes several items are unavailable. This may annoy the customer while having to keep reordering.
- Input is needed from the stores to know if they have run out of some item. Communication gaps may lead to having to cancel orders later.

Production/Preparation of Food

- Segregation of cooking utensils and cooking space for Vegetarian and non-vegetarian dishes.
- Separate Storage for Vegetarian and non-vegetarian stock.
- Large quantity of degraded stock
- Gas wastage in preparing the utensils (for e.g. heating of pan for deep frying chicken sticks) for different dishes.
- Shortage of cleaning space for vegetables and chopped non-veg.

Serving the Food

When several orders are ready prioritizing is generally done well about which item should be served first but sometimes some customers end up receiving cold dishes.

Generation of the Bill

- Customers end up having to spend too much energy trying to catch the attention of a free waiter to tell them that they want the bill.
- The bill is presented in handwritten format. The cashier may miss out additions to the bill (if customers order after bill was written). This could lead to losses for restaurant.
- Some customers may not consider handwritten bill authentic and they may fight with the manager over prices.
- The machine used to swipe credit and debit cards is old hence sometimes malfunctions. Either customer's account is debited twice or restaurant sometimes does not receive payment if machine stops working (customer says they are not carrying cash and only credit card is available).

Home Delivery

- Customers sometimes request delivery outside the 1km radius and restaurant loses on business because they do not have enough number of delivery vehicles. They have only two motorbikes.
- Sometimes the wrong order is given to the wrong person if multiple orders are being requested at the same delivery location. e.g., many students order from same college orders and some other student picks up your order. There is no clear method of identification of customer and delivery man.
 - Sometimes customer cancels order halfway towards delivery destination. The food essentially goes waste and since no cash was paid, it becomes a loss for restaurant.

Step-3: Identifying Critical Success Factors

Depending upon the challenges, information key result areas, and critical success factors (CSFs) were mapped. Key result area is needed because it helps business to work on the area where satisfactory performance is required to achieve its goals. This is the means to identify tasks & requirements and it helps in prioritizing the requirements.

Critical success factors (CSF) will help the restaurant employees to perform their day-to-day work in the right direction towards the restaurant vision. After identifying critical success factors measurements for each critical success factor (CSF) need to be established.

For each and every measurement some information is required which helps the business to do measurement and metric should be chosen in such a way that it best reflects the understanding of how each issue affects the business. Now each factor should be set against a normalizing scale (Likert Scale) and what information should be collected. In case study of restaurant, Key Result Area (KRA) Matrix has been prepared for the restaurant for ERP selection.

Table-1

S. No.	Key Result Area	Critical Success Factor	Metric	Information required
1	Restaurant Profitability	Increased Profit Margin	Average order value per customer**	Daily bills
			Revenue earned per month**	Monthly sales
			Costs of food production per month**	Monthly operational costs
			FSN analysis	Number of times a product is ordered per day.
			ABC classification for sales	
2	Operational Efficiency	Good Supplier Relations	Discounts given by regular suppliers per month	Payment and delivery schedule database.
			On time payment to suppliers**	
			Credit period extended**	
3	Customer Satisfaction	Reasonable Pricing	Comparison with nearby competitors' pricing and quality	Price lists of nearby competitors.
				Rating by customers of competitors.
		Hygienic Environment	Percentage of clean tables***	Number of customer complaints.
			Percentage of vermin detected***	Visual inspection by staff.
			Percentage of clean plates***	
			Level of cleanliness of kitchen/hand wash area	Number of times kitchen/hand wash is cleaned.
			Percentage of complaints about bad smells & noise***	Customer feedback.
				Customer complaints.
		Quality of Food Served	Positive customer feedback*	Customer feedback.
			Increase in number of new customers**	Number of footfalls per month.
			Repeat customers per month	Number of visits by regulars or home deliveries per month (Identified from phone numbers).
4	Employee Performance	Efficient Staff	Quick service times*	Average waiting time per customer, average service time, number of complaints about service delay.
			Number of correct order deliveries*	Number of re-orders.
		Customer Friendly Staff	Customer feedback*	Customer complaints/feedback.
				Number of positive customer feedback.

Sources: Authors Compilation

Note: *Likert scale based on customer feedback on:

1. Cleanliness
2. Hygiene
3. Quality of food
4. Taste
5. Server/staff
6. Service time
7. Likely recommendation to peers

**All these parameters have been compared as a percentage change over a past time period (monthly, quarterly or yearly).

***These parameters are based on both- the Likert scale and comparison with the past time period as a percentage change.

Above CSF matrix expresses the need of the restaurant clearly and will help them to make a good selection of information system (ERP). Restaurant can target these indicators and regular monitoring like monthly or quarterly provides them with a quick visual for how successful their restaurant is. For any organization keeping goals at the forefront and monitoring them is the best way to ensure they are achieved. This can be easily done if they implement ERP solutions in their restaurant because ERP system offers a single repository for enterprise data that is accessible to everyone. In this case study, ERP selection for low budget restaurant is



considered so they can afford cloud based ERP offerings that brings more efficient business processes. Small players in food & beverage industry needs ERP provider that offers required level of functionality and expertise in budget but ERP selection should not be purely based on the size of the business.

CONCLUSION

In the present highly competitive environment enterprise resource planning is needed for growth and sustainability. In order to achieve its goals enterprise has to systematize all its functions such as order management, planning, purchasing, cost analysis, sales, accounting functions etc. Historically, ERP systems have been implemented in the large enterprises due to high cost of initial investment and it was out of reach for small enterprise or business. With the growing importance of IT in business and with the rapid growth in the food & beverage industry in unorganized sector, smaller businesses are also taking interest and looking for areas and ways to implement ERP.

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