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Chapter 1

Introduction

1.1 Introduction of Information and Communication Technology

Information and communications technology (ICT) has become one of the basic building blocks of modern society. Many countries now include ICT as part of the core of education, alongside reading, writing and numeracy understanding it as a basic skill required for students. ICT has created innovative applications that have led to making life easier in many sectors. ICT provides better business environment, it strengthens the success of corporations, and it provides governments with an efficient infrastructure.

According to 2009 World Bank report, it was found that For every 10 percent increase in high speed internet connections there is an increase of 1.3 percent economic growth (World Bank Report, 2009). Efforts to build infrastructure in the developing world, both by governments and development agencies, have predominantly focused on providing computer hardware, satellite connections and fibre-optic cabling, the Forum writes in its report on the Southern African Development Community's e-Readiness. (World Bank, 2002) The development of ICTs brought about a major shift in the world (Kuyoro Shade, Awodele, & Okolie, 2012). Many international developed institutions have identified that ICT is a crucial element in developing the worlds' poorest countries, by integrating them into the global economy and by making global markets more accessible. ICT covers any products that will store, retrieve, manipulate, transmits or receives information electronically in a digital form.

ICT has become an integral part of everyday life for many people. It is expected that the trend will continue in increasing the importance of ICT in people’s lives and, to the
extent that ICT literacy will become a functional requirement for personal lives, work and social life. These are directly influencing the way human beings are engaging themselves in their routine activities. The socio-economic environment needs a catalyst to bring social change in the human development. Large scale deployment of communications technologies has produced major changes in the way we communicate for social and business purposes and most of these deployments are technology-led. The internet, television, mobile phones, computer-based devices and other new forms of information technology are changing rapidly and are also influencing the social life. ICT applications can support sustainable development, in the fields of public administration, business, education and training, health, employment, environment, agriculture and science.

The development and use of technology has greatly improved our lives. We are dependent on technologies to accomplish specific tasks in our lives. With the use of various emerging technology life has become very comfortable. Technology is being implemented in almost every segment of our lives and businesses. We can book tickets of shows, book railway, bus or flight tickets, purchase or sale products, pay bills at our comforts sitting at home without. ATMs are used to withdraw money any time and much more applications. All these processes are carried out with the help of technology. Earlier data was maintained manually in the banks and other financial institutions. Now it is being easily updated and maintained with the help of computers. With the help of system data can be retrieved easily and speedily such as account holder details, name of the account holder, address, email address, age, date of birth, phone numbers balance etc. Technology has also made the buying and selling of products very flexible and secured with the introduction e-payment systems like Paypal.com and Square Wallet App. The
customers can easily access their account using internet banking. Technology has provided credit cards, debit cards and smartcards when one do not have cash at hand for performing monetary transactions.

In past communication was limited to postal services and letter writing. Currently many advanced communication tools are available such that business letter can be sent via email or fax and received within seconds without delay to the authorized recipient. People no more wait for formal reminders that are received by post. The reminders are already set and received at the correct time using tools of communication such as mobiles, emails, etc.

In this demanding era everyone is very busy. With the development of the social networking sites such as Facebook and mobile phone Apps such as WhatsApp, Hike etc. people can get connected with one another digitally any time .

Even the education field is not spared from the use of technology. This sector is the most effective sector to anticipate and eradicate the negative impact of ICT. The use of technology has changed the education world. To cope up with the competition in this era of technological advancement, education sector has to get updated frequently. The quality of education has become the basic need for the society. It plays vital role in enhancement of students, staff, administration, recruiters, parents of students etc. ICT - especially an internet plays important role for integrating technology into the educational activities.

Students use internet and mobile apps for learning. Lectures are supported with videos of the respective topics. Distance learning and e-learning is becoming common nowadays. A full library can be accessed using a mobile app on any smart phone or ipad.
Earlier students had to physically visit the libraries to get the information they need but now they can get n number of books on their mobiles in just few clicks. Students are very much accustomed to technology. They communicate with the educational institutions using communication tools. Cloud computing technology is fast evolving and people have started using electronic clouds for learning and administration purposes.

Technology is changing fast. Today’s technology might get outdated tomorrow. If we do not get updated then we will lack behind and hence it is better to use the emerging technologies to stay updated.

Information and communication technology (ICT) is a tool that can be used as part of your strategy to improve institutional effectiveness. Technology can transform your internal efficiency, raise your profile, provide streamlined access for stakeholders, and reach out to new communities.

The definition provided by United Nations Development Programme (UNDP): “ICTs are basically information-handling tools- a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information”. They include all the old and new tools such as radio, television and telephone, computers, satellite, wireless technology and the Internet. These different tools are used to combine and work together, which reaches into every corner of the world. The newer computer and Internet based technologies called the “digital media” are widely preferred tools for communication.

ICT has become one of the basic building blocks of modern society. Understanding ICT and mastering the basic skills and concepts of ICT; it is added as a part of education, together with reading, writing, and numeracy in many countries. There
is a widespread belief that ICTs have an important role to play in changing and modernizing educational systems (Swamy, 2012).

Information and Communication Technology is a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.” These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony. It plays an important role in improving the quality of education. Administration and management applications of ICT are currently used in many fields due to its capabilities in facilitating administration activities from data storage to knowledge management and decision making. It is used for strengthening administration and management in higher education system. The effective use of IT services can greatly enhance efficiency of the existing system and increase transparency in the functioning of various departments in educational sector. It is a key technology and an interdisciplinary technology; it helps institutions to reduce costs, improve processes and improve innovation.

ICT covers all the technological tools to process and communicate information. It includes two aspects of information technology and communication technology. Information technology encompasses all matters relating to the acquisition, manipulation, and management of information. Communication technology encompasses all the matters to the transfer and sharing of information.

The Association of African Universities (2000, p. 3) defines ICT as “a shorthand for the computers, software, networks, satellite links and related systems that allow people to access, analyze, create, exchange and use data, information and knowledge in ways that, until recently, were almost unimaginable”. The term IT was first time
published in a 1958 article of Harvard Business Review, in which authors Leavitt and whisler commented that —”the new technology does not yet have a single established name. We shall call it information technology”.

Information refers to facts, data or opinions in any form such as textual, numerical, or audiovisual forms. Information Technology is interconnected system of tools that is used to acquire, store manipulate, and manage transmission or receive of data or information.

Information Technology has the following Characteristics:

- Acquisition, Storage, manipulation, management, transmission or receive of data or information.
- Real time information.
- Information easily available
- Connecting dispersed regions
- Use of various communication tools

Communication Technology involves the knowledge, skills and understanding needs to exchange information. It is processing of information is in this way. It accesses the information, decode it and send it through a medium/channel to the receivers. Medium/channel can be written or oral or any electronic machine. Communication Technology uses electronic systems to communicate between individuals or groups. It facilitates communication among the people who are not physically present at the same location. For communication telephone, Fax, radio, T.V. and Video, as well as computer based technologies, including electronic data interchange and e-mail, social networking sites, blogs, videoconferencing etc. are used. In short, communication technology
comprises of the activities of designing, constructing and maintaining communication systems. ICT have been proven as potentially powerful tools for educational change and reform. When used appropriately, different ICTs can help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality by helping make teaching and learning into an active process connected to real life. Similarly it is utilized for administrative purposes of the institution to help the teaching staff to save time and concentrate more on their teaching and research work.

1.2 EVOLUTION of ICT

The evolution of ICT can be divided into four phases. The first was from the mid-1960s to the late 1970s which was the mainframe phase. Many computer systems were developed which showed the use of ICT. But due to costly and static nature the implementation of such systems was limited.

The second was from the early 1980s to the mid-1990s known as the microcomputer phase. It was economical and provided interactive use of software packages and became popular and powerful. The use of microcomputers was increased.

The third was in the late 1990s, the web phase. The beginning of the Internet stimulated to develop websites for individual access from a wide variety of sites, sitting at their homes. People started developing their own websites.

The fourth is the current one that is the digital phase. The various communication tools are merges like smart phones, televisions etc. into computers. Individuals can now access internet through televisions and mobile phones also. Capacity for transferring audio video clips with higher speed is also possible.
ICT is used for efficient e-governance by all the sectors. It is the application of ICT for delivering government services, exchange of information communication transactions, integration of various stand-alone systems and services between back office processes and interactions within the entire government or organizational framework. (Wikipedia, the free encyclopedia)

It is the process that brings transparency in the system, so e-governance initiatives in the field of higher education can reduce the malpractice up to a large extent. This type of initiative can give a better interface and opportunity to students, parents, teachers and administrative management (Kapoor & Kelkar, 2013)

It uses a wide range of modern Information and Communication Technologies such as Internet, other networks, mobiles etc. in order to improve the effectiveness, efficiency and services in the organizations. The purpose of e-governance in institutions is to achieve efficiency, participation and the most important is the transparency. ICT enables the change and process reforms with minimum resistance.
For most organizations, there are a variety of requirements for information. Senior authorities need information to help with their organizational planning. Middle management needs more detailed information to help them monitor and control organizational activities. Employees with operational roles need information to help them carry out their duties.

As a result, institutions tend to have several "information systems" operating at the same time. Information systems such as Management information system, executive support system, decision support system, transaction processing system operate simultaneously in the institutions efficiently with the use of ICT.

1.3 ICT Tools

The end-user of ICT generally uses the following hardware

1) PCs or laptops
2) Net-books
3) Smart phones.

Use of these tools decreases the cost for communicating the information quickly. The Internet platform has provided social networking applications such as Face-book, Twitter and other networking applications like blogs, Google docs etc. that are being used in the teaching and learning environment as well as sharing of information for governance activities in the institutions. Most of the students and staff use mobile phones for their personal purposes; additionally it can be used for circulation of notices, exam time tables, results, fees details, assignment submission details and confirmation of data etc. Thus the integration of ICT can promote significant changes in the practices of teaching, learning and administration which are beneficial for students and staff.
With today's sophisticated hardware, software, and communications technologies, it is often difficult to categorize any system that belongs to one specific application program. Organizations increasingly are consolidating their information needs into a single, integrated information system. For example SAP is a powerful database that enables companies to organize all their data into a single database, then choose the modules or tables they want. Different modules are customized to fit each customer's needs.

Different types of tools are available for communicating information within different functional areas. Some of the widely used tools and their uses are given below:

1. **MS Office** - Suite of products developed by Microsoft Corporation that includes Microsoft Word, Excel, Access, Publisher, PowerPoint, and Outlook.
2. **Customized software** - A tailor made software that is specially developed for some specific organization or other user
4. **Wikis** - Server software that allows users to freely create and edit Web page content using any Web browser.
5. **Online forums** - An online discussion site where people can hold conversations in the form of posted messages
6. **Google Talk** - A Windows web-based application for instant messaging and voice over internet protocol (VOIP) client
7. **Facebook** - A popular free social networking website (VOIP) client
8. **Blogs** - A Web site on which an individual or group of users record opinions, information, etc. on a regular basis.
9. **Newsgroup** - A group of Internet users who exchange e-mail messages on a topic of mutual interest.

10. **Video Messaging** - A standard way to send messages that include multimedia content

11. **Phone** - A device that permits two or more users to conduct a conversation when they are not in the same vicinity of each other to be heard directly.

12. **Twitter** - An online social networking and microblogging service

13. **Fax** - A telephonic transmission of scanned printed material

14. **Radio, Television, etc** - Transmission media

15. **What’sApp** - A mobile messaging app. It uses the internet to send messages to friends and family.

### 1.4 Need for the Research

To survive in this technology driven age, the higher educational institutions need efficient central resource planning which can manage the whole information and operations. By automating the processes and centralizing the data, transparency & flexibility can be increased in the institutions. To par with the global institutions, the HEIs in India should make use of the latest technology services to rightly equip students as well as the parents/guardians, recruiters and other linked HEIs with frequent updates about their areas’ performance and provide related information.

The workload and governance of higher educational institutions are becoming more and more complex and are not only limited to deliver education. They deal with a many other activities like admissions, library management, personnel management, hostel
management, placements, accounts and finance management, examination management and many other internal and external processes. Hence, ICT can be used to a very large extent for governance in the higher education institutions for fast and reliable work.

The current status of the use of technology in the field of governance of educational institutions should be known so that the steps towards the progress and maximum utilization of resources and technology can be made to survive in the competitive advantage. The variations and utility of the technology should be found out so that the benefits could be identified and the disadvantages and limitations can be very well understood and can take measures to overcome them. The study finds out the usage of Information and Communication Technology in the colleges and institutes affiliated to either North Maharashtra University or University of Pune. The first one is 25 years old, a booming university which is separated from the second University. The other university is well established, 65 years old university, too large compared to the first one. With the help of technology (which was not much developed at that time) it was hard to govern all the 6 districts from a single place. Now it has been separated to two universities depending on geographical location. With the advanced technology, the new colleges are growing faster competing with the old ones. Changes are required in the old organizations to compete with the new ones. They have to adapt the technology. The old renowned institutions sometimes lack behind due to attitude of the people not willing to change or adapt with the technology. The advance technology is required for the growth and smooth working of the higher education institutions. This research finds out the extent of usage of ICT and analyses the extent of use of it in the colleges/institutes
affiliated to these universities. The project will analyze the use of technology on the basis of size, age, population and location.

1.5 Significance of the Research

In an integrated system, in order to maintain students’ information, personnel information, accounts details, library, hostel and transportation details are essential elements of any higher educational institution. Technology helps to streamline the institution’s processes right from admissions management to placement cell management. Educational institutions with a specialized administration of integrated modules have better management and decision making capabilities.

The purpose of this research is to find out to what extent the technology is used effectively for e-governance in higher educational institutions. The study signifies that the utility of technology provides the institution with secured, timely, relevant, fast, accurate and most important the transparent system. It provides the systematic flow of information within the different functional areas of the institutions.

The study finds out the factors responsible for benefits and failures by the use of technology for e-governance in institutions. The study helps in finding out the perception of the people for implementing the technology in HEIs. It is important to know the barriers for implementation of technology. The study is conducted for colleges where traditional courses are offered and also for the institutes and colleges of conducting professional courses. The study indicates the implementation of the technology with respect to location, population, income, age and background. People from rural and urban areas of all age group are aware of technology and are ready to use the technology. The infrastructure required for implementation of ICT can be set up
in the urban as well as rural area. The use of technology by an individual affects the process and progress of the institution, university, state and ultimately the country. The study contributes in streamlining the processes by identification of benefits that can assist in achieving optimal usage and utilization of the ICT systems in HEIs. The study may help the institutions and its stakeholders by the using the framework suggested by the researcher.

1.6 About North Maharashtra University

The North Maharashtra University is one of the upcoming universities in India established on 15th August, 1990. Its jurisdiction is spread over three districts in North of Maharashtra state - Jalgaon, Dhule and Nandurbar. The University campus is spread over a picturesque lush green hilly terrain of more than 650 acres with aesthetically designed buildings for its various academic and administrative affairs. The University offers a blend of modern, applied, job oriented and conventional courses complimented with the state-of-the-art research facilities, supporting infrastructure and stimulating environment for learning and training through its 13 schools and one institute on the campus and four satellite campuses

As per Survey conducted by Careers360 magazine, India's 100 BEST Universities 2014, (March2014), North Maharashtra University, Jalgaon ranks 27th amongst 742 universities in India and 1st amongst the State Universities in Maharashtra.

The administrative activities were started under the leadership of Prof. Dr. N. K. Thakare, the first Vice Chancellor of the university, from academic year 1991-92.
Prof. Dr. S. F. Patil was the second Vice Chancellor in 1996. He started two new academic departments viz. Department of Comparative Languages & Literature and Department of Information Technology on the campus.

Prof. Dr. R. S. Mali was appointed the third Vice Chancellor of the University in 2001. During his Tenure University progressed towards excellence. He motivated students and small bands were constructed by the students.

In a very short period of time the university has gained name and fame on National and International levels. This university has also acquired the prestigious 2(f) & 12(b) recognition from the UGC. The university has been re-accredited with 'B' (CGPA 2.88) grade duly honoured by the National Assessment and Accreditation Council (NAAC), Bangalore.

In the year 2002 honorable Vice-Chancellor received "VANASHREE" award from the then Chief Minister of Maharashtra, Shri Vilasrao Deshmukh.

Prin. Dr. K. B. Patil was the fourth Vice Chancellor of the university appointed in 2006. He started School of Social Sciences along with Department of Education.

Most of the computerization projects were completed during this period, university successfully adopted MKCL’s product called e-Suvidha, SAP ERP in the functioning of its' Finance and Administration departments. Recently North Maharashtra University has been ranked 40th in all India University rankings.

Prof. Dr. S. U. Meshram, is being appointed as the fifth Vice Chancellor of the North Maharashtra University, Jalgaon since 8th Sept. 2011.

There are more than 200 colleges comprising of Arts, Science and commerce, B.Pharmacy, B.Ed., engineering and management institutes affiliated to North
Maharashtra University spread in the jurisdiction of three districts Jalgaon, Dhule and Nandurbar. At present there are 94 Arts, science and commerce colleges and 34 recognized institutes affiliated to North Maharashtra University.

1.7 About University of Pune

The University of Pune is in western India, in the city of Pune. It was established in 1949 and is one of India's leading Universities. The university has been given the "A" grade by the National Assessment and Accreditation Council (NAAC) for its overall performance.

The University of Pune (formerly known as University of Poona) was established under the Poona University Act, passed by the Bombay Legislature on 10th February, 1948. In the same year, Dr. M. R. Jayakar assumed office as the first vice chancellor of the University.

Initially the University had a jurisdiction extending over 12 districts of Western Maharashtra. However, with the establishment of the Shivaji University, Kolhapur, in 1964, the jurisdiction of the University was restricted to 5 districts, namely Pune, Ahmednagar, Nasik, Dhule and Jalgaon. Out of these, two districts - Dhule and Jalgaon are attached to the North Maharashtra University established in August 1990.

During the year 1949, there were only 18 colleges affiliated to the University, with an enrollment of over 8000 students. Thereafter, the number of colleges increased, and in 1994-95, the University had 41 post-graduate departments, 209 affiliated colleges and 118 recognized research institutions, with an enrollment of 1,70,000 students for both the under-graduate and post-graduate courses in different faculties. 70 research institutions have been recognized by the University for Research. At present there are 293
Arts, Science and Commerce colleges and 185 recognized institutes affiliated to the University of Pune.

Pune is the main educational center of Maharashtra. Numerous students from every corner of India and the world come to Pune. It is quite safe and peaceful city as compared to other educational centers in India. The University of Pune offers excellent programs in various areas including Science, Commerce, Arts, Languages and Management Studies.

Around 900 colleges comprising of Arts, Science and commerce, B.Pharmacy, B.Ed., engineering and management institutes affiliated to University of Pune are spread in the jurisdiction of three districts Pune, Ahmednagar and Nasik.

In both the universities the colleges are spread in various cities of these districts and thus the information of the educational institutions should be centrally stored. For this purpose both the universities are using e-suvidha application provided by MKCL. All the colleges use this software to communicate with the university.
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