DIGITAL DIVIDE IN THE ENGINEERING COLLEGE LIBRARIES IN PUNE CITY

A DISSERTATION SUBMITTED TO

TILAK MAHARASHTRA VIDYAPEETH, PUNE

AS PARTIAL FULFILLMENT FOR THE AWARDS OF THE DEGREE OF

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BY

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DECLARATION

I hereby declare that the thesis entitled “DIGITAL DIVIDE IN ENGINEERING COLLEGE LIBRARIES IN PUNE CITY” which is being submitted for the award of the degree of Master of Philosophy in department of Library and Information Science.

Dissertation completed and written by me has not previously formed the basis for the award of any degree or other similar title upon me of this or any other university.

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Chhaya Rahul Mane

C E R T I F I C A T E

This is to certify that the dissertation entitled **"Digital Divide in the Engineering College Libraries in Pune City"** which is being submitted herewith for the award of the Master of Philosophy (M.Phill) in **Library and Information Science** of Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by **Mrs. Chhaya Rahul Mane** under my supervision and guidance. To the best of my knowledge and belief the work incorporated in this dissertation has not formed the basis for the award of any Degree or similar title of this or any other University or examining body upon her.

Place: Pune **Dr. Mrs. Dhanishtha Khandare**

Date: 31 July 2017 **Research Guide**

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LIST OF ABBREVATION

- NACC - National Assessment and Accreditation Council
- NBA - National Board of Accreditation
- NDL- National digital libraries
- NPTEL- National programme on technology enhance learning
- OPAC- Online public access catalog
- QEEE- Quality enhancement in engineering

Digital Divide in the Engineering College Libraries in Pune City

Chapter 1

Introduction

1.1 Introduction

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1.1 Introduction:

The library professionals have witnessed the changes since past right from paper to microform to electronic and digital including e-publishing. The major transformation recently since 1990s took place in libraries and information centers are mainly due to massive use of ICT and other technologies useful to libraries including internet. The librarians are facing challenges as the technology changes and they have to adapt new practices. Essentially librarians have to understand the user behaviour, user needs as well as user requirements from the libraries. How users are using the digital resources and what are the access problems they are facing and how to eradicate the use problems in digital era is the main concern of the librarians. In the present changing ICT scenario the library users have to use traditional as well as digital resources using ICT. But many users are still unaware of the use of technology effectively and hence they lack in getting resources available globally. There are two groups in users one is those who have access to ICT and different technologies and internet and also using more effectively. Another group is not using the modern tools made available to them. In technical jargon digital divide is the term used. Librarians have to seek the digital divide level and remove it so as to get all the users at one plane.

1.2 What is Digital Divide?

Digital divide is a term used to identify the gap between users that they have access to modern technologies like ICT, Internet and those who don't have access to technology or have restricted access to users.

Wikipedia (https://en.wikipedia.org/wiki/Digital_divide) described digital divide as a social inequality with regard to access to, and use of, or impact of ICT. The divide between differing countries or regions of the world is referred to the term global digital divide, examining technological gap between developing and developed countries at an international scale. Digital divide is the analysis between users who have opportunities and skills to get benefit from digital resources, especially

the Internet, and those who do not have these opportunities or skills of accessing to internet.

Researcher also understood the meaning of digital divide as the difference between those users who have access to technology and the internet for data collection, and those users who don't have access to technologies and internet facilities for information gathering.

1.3 Digital Divide in Libraries:

The aim of any library is to provide information to user by applying requisite skills to access the available resources. In electronic era where the concept of digital library is emerging fast and information published and disseminated is in digital form and libraries are technologically advanced and provide all advanced facilities to users. While providing services to users in digital era libraries and library staff has to deal with various problems from management; information storage and information retrieval etc. The availability and use of electronic resources and services reduced gap in digital divide. Different types of barriers acts as reason for digital divide in libraries.

Information is core to all developmental activities and libraries play the key role in collecting, storing, and disseminating of the information. Many educational institutions are now conducting workshops and training programs for the library professionals to train them in field of digital literacy. The present day libraries are facing financial, technological and manpower crisis which are some of the basic constraints. The paradigm shift from print to digital era has also given rise to many problems like storage, retrieval and dissemination of information to the end user. A requisite skill with digital literacy is necessary to cope up with this situation. This has created a digital divide among libraries and library professionals working in different organizations.

Digital divide in libraries can be witnessed when librarians and user have access to information using ICT and enabled services offered by the libraries. Functions related to use, access, and store and retrieve information when used through technology and raised various hurdles that lead to digital divide. The reasons for

digital divide in academic libraries or any libraries is unfamiliarity with use of technology, lack of knowledge, internet problems, technical issues, financial constraints are few main reasons.

The study of digital divide in libraries helps to find problems and identified concept of digital divide which needs to be studied for: To identify the factors of digital divide in the libraries, to analyze different reasons for developing digital divide in the libraries, to update the resources and devices of the libraries as per user needs, to maintain quality and standard of libraries.

1.4 Reason for Selecting the Research Topic:

The term 'digital divide' was introduced in mid 1990s and becomes popular as an area of interdisciplinary concern. 'Digital Divide' may further lead to the concept of 'Knowledge divide' or 'Information divide' which reflects the level of knowledge and information. Due to lack of knowledge and information the socio-economic development of any nation may be affected (Cooper, M., 2000)

Engineering education is direct application of technologies and the libraries have to manage up-to-date information for users. Engineering libraries have good collection of e-resource and provides online services to users using digital resources and internet. Digital content are available in libraries online and even offline for searching desired information. Networking of libraries and resource sharing provides flexible use of resources to users of engineering libraries. However educational, technical and financial aspects are major factor which l causes digital divide in engineering colleges of libraries. Engineering libraries have infrastructure, digital resources, but it is necessary to identify Digital Divide to minimize the level at professional library users.

There is a need to assess the digital divide in the professional academic sectors like engineering in which availability of digital resources is ample but need to assess the access provided form the library and how digital resources have used by users. This helps in eradicating the digital divide in engineering sector.

In information age new technologies are emerging very fast and digital divide has emerged due to this. Engineering is closely related to changing and applications of technologies

and information. Engineering libraries are technologically advanced and also acquiring digital resources and provide internet to fulfil the user needs. This arises need to study of the digital divide among engineering college libraries which helps librarians to find existing digital divide and list out the causes and provide possible solutions to reduce the gap. This research study not only gives idea about digital divide but also suggests some suggestion to bridge digital divide.

1.5 Objectives:

The objectives of this study are fixed as under:

(i) To analyze digital divide in the engineering college libraries in Pune city.

(ii) To identify different factors responsible for digital divide in engineering college libraries in Pune.

(iii) To suggest possible solutions to reduce the digital divide among engineering college libraries in Pune.

1.6 Hypothesis:

Hypothesis for this study is:

There is need to reduce digital divide among engineering college libraries in Pune city.

1.7 Research Methodology:

Research methodology used for this study is descriptive research method and the data collection tool is a well structured questionnaire, prepared for the librarian which helps to identify the digital divide in the engineering college libraries. The researcher has personally visited the libraries and collected the data and also evaluated the libraries.

The data called has been grouped in the following categories:-

- General information
- Library information
- Librarians status and activities
- Availability of electronic resource in library
- Electronic services provided from the libraries

The data has then been analyzed and findings, suggestions have been drawn. Some suitable suggestions are also put forward which helps to bridge the digital divide in the engineering college librarians in Pune.

1.8 Population and Sampling

There are nearly 51 engineering colleges where professional graduation i.e. B.E. courses in different disciplines are conducted at regular level. The list of engineering colleges in Pune has been identified from DTE, AICTE and Pune university websites. From the different sources a list of 51 engineering colleges in Pune is prepared. Questionnaires have been circulated to all these libraries and out of 51 librarians, 50 Librarians have responded to the survey. The response rate is 98% which has been analyzed in research study.

1.9 Scope and Limitation of Research:

The scope of this research study is limited to the libraries of engineering colleges in Pune city only. This study is only limited to the engineering colleges where graduation i.e. BE courses are being conducted at regular basis and e-resources are collected. It excludes all other engineering colleges which conducts certificate, diploma, B. Tech., M. Tech., Architecture or any other Technological courses.

1.10 Structure of Research Study:

The present research study is presented in six chapters. The chapters are as fixed as under:

Chapter 1: Introduction: This chapter mainly highlights introduction to research topic, its importance, significance, objectives, hypothesis, research methodology, scope and limitations etc.

Chapter 2: Literature Review: Literature review is background study of related concepts to analyze the past developments in the area and easily eliminated. The review has been grouped under topics of engineering college education, need and importance, digital divide, digital divide in Indian libraries, digital divide in engineering colleges etc.

Chapter 3: Engineering education and Digital Divide: covers the history of engineering colleges in Pune, its origin, background, and accreditation, role of engineering libraries, impact and new trends in engineering college's libraries. This also covers digital divide in engineering colleges in brief.

Chapter 4: Engineering College Libraries in Pune: this chapter covers the topics related to role, need and importance of engineering college libraries in Pune. It gives brief introduction of all engineering colleges of Pune and its libraries.

Chapter 5: Data Analysis: Interpretation and Presentation: This chapter presents the analysis of data collected in survey along with observations.

Chapter 6: Findings, Suggestions and Conclusions: This chapter identifies findings from data analysis and also suggests some solutions to overcome the digital divide. It also concludes and includes scope for further study in related research.

Summary:

This chapter gives brief idea about digital divide and also covers the factors which indicate impact on digital divide. It is essential to study the concept and reasons for digital divide to understand the different aspect / gap, due to non accessibility of ICT in the libraries. This study is undertaken for libraries, especially of engineering colleges in Pune to trace out various problems and causes of digital divide. The chapter includes significance, objective, hypothesis, research methodology and other related aspects.

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Chapter 2

Literature Review

2.1 Introduction

2.2 Engineering Education: Need and Importance

2.3 Role of Academic Libraries

2.4 Digital Divide

2.5 Digital Divide in Engineering College Libraries

Summary

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2.1 Introduction:

Literature review is a systematic synthesis of the conclusions of the research conducted earlier from the literature published. Literature review is nothing but a critical explanation of the current research topic using earlier research reports. This chapter reviews literatures gathered by researcher on the theme (topic of research) undertaken. The literature has been collected and reviewed from different information resources like journal articles, books, thesis and dissertations. Different online resources available over the net are also consulted, which were useful to researcher while preparing draft.

The literature collected from the different sources is organized using sub themes related to main topic of research which includes digital divide, engineering education, engineering college libraries and other related aspects. The information is organized in different facets are as follows:-

- Engineering college education: need and importance.
- Role of academic libraries.
- Digital divide: definition, need and importance
- Digital divide in libraries.

2.2 Engineering Education: Need and Importance

Tandon, A. (2009) has discussed about the historical development of technical education in Uttar Pradesh. Author also explained the motivational factors of students who joined technical education and identified the developments and trends in technical education.

Edmond Byrne, Desha Cherly and Fitzpatrick John (2010) have analyzed a global overview of engineering education covering accreditation developments, highlighting emerging sustainability competentices in the context of relevant PEI declarations, initiatives, policies, code of ethics and guidelines.

Desha, Cherly (2011) have discussed need for global transformation for engineering education in order to equip the society with professionals who can manage the challenges of 21st century.

Thursby, M. (2014) in his research study observed that engineering is heart of education. It is the integration of ideas and technique for industrial innovation. It orders to increase the expertise of engineers it is essential to go in to areas well beyond the technical core.

The literature review indicated that importance of engineering education is more prominent and is related to professional carrier. The engineering discipline is to be supported by well developed facilities to manage digital divide.

2.3 Role of Academic Libraries

Bansode and Perirca (2000) reviewed automation and related areas in libraries and suggested that library automation in library is required to perform all the library functions. This helps in managing library system well and useful to users. Automation is the basic need of any library to adapt advances using ICT.

East, J. (2007) evaluated the role of librarians in the academic institutions. Author felt that librarians have to create a dynamic learning environment with rich and variety of services along with ability to handle electronic information source. Further author also stated that for institutional growth is important and the librarians respond with creatively to impact of electronic resources in academic libraries.

Anunobi, C.V. (2008) has described the nature of academic libraries in the digital age including digital resources. Further author throw light on concept of universal access and the role of the print and electronic resources and given a conceptual model to access the resource available academic libraries in developing countries.

Wiley Megan (2014) in research study stated that libraries can provide a strong contribution to student to develop work relevant skills as per the requirement of employers.

Emphasis is on collaborative working between libraries and contribution of student services which can be one and lead towards successful careers. Author focused on library staff and the strategies adopted by librarian to improve the institutional libraries.

From the literature scanned it is noticed that academic libraries are the backbone to the educational systems and have pivotal role in the education system. The growth of digital resources developed the different arena in academic libraries. The librarian's role is different in academic libraries and helps users in providing effective services using ICT and digital resources.

2.4 Digital Divide:

Cooper, M. (2000) in his study focused on converging dimension of digital society and the concept of digital divide.

Warschauer M. (2004) stated that in the early days the subject of unequal access and use of information was witnessed. But now use of modern technology and ICT developed general concepts among the users of getting maximum information available globally. The concepts such as "Information rich", "Information poor", "Information gap" or "Knowledge gap" and also emerged due to e-resources and use of technology like computer or media literacy.

Guomundsdottir, G.B. (2005) pointed out in the communication that despite of the growth of ICT, the access and use of it is uneven which applies particularly to the internet. According to Guomundsdottir (2005) digital divide was a debatable term. The term digital divide become popular among scholars and policy makers in the late 1990s.

Hasseloff (2005) explained that though the diffusion of ICT drives access to information and knowledge, the uneven distribution of ICT may result in an uneven impact on their economic development.

Billon, M. and Lera L. (2009) have explained that the digital divide has been a problem since early days of ICT, with the new initiatives of ICT, the digital divide is taking different forms and dimensions. The digital divide has become an extremely important issue facing

international organizations and poses a serious challenge for policy makers and researcher. The paper recognizes the efforts made by international organizations, different governments and researchers to address the challenges of the digital divide.

Abdul J.T. and Rajeev K .R. (2010) highlighted the concept of digital divide in general and the Indian scenario in particular. The study further revealed the challenges in the path of digit divide such as poverty, illiteracy, political instability and poor ICT infrastructure. It has tried to also propose the significant role of libraries in bridging the digital divide.

According to Srinuan and Bohlin (2011) the digital divide has some specific socio-economic implication that may have both direct and indirect impact on the lives of people. Srinuan and Bohlin (2011) stated that US department of Commerce's National Telecommunication and Information Administration,(NTIA) is the founder of the term “digital divide" with the invention of computer and internet. The need to use the concept of the digital divide to accommodate the various other divides began to increase. Despite the different terms proposed to refer to the uneven access to ICT, the term “digital divide” is still commonly used.

Singh K. (2012) has pointed out the various issues responsible for widening of digital divide. Author focused on issues such as library automation, development of digital library, use of bar code and smart card technology etc. Major reasons for digital divide in libraries are lack of infrastructural support, lack of commitment from the both organization and libraries and lack of necessary legislation for the development of libraries from government as well various controlling authorities on libraries.

De Lange and Van Solms (2012) noted that access to ICT has a specific impact in the educational, social, economical fields. It has transformed the way people work, socialize, discover and disseminate information. Panda I. (2013) studied how the digital divide can influence the global world and also the Indian. They highlighted some digital divide projects which would help in bridging the gaps with the help of libraries.

According to Kumbargoudar, P. (2013) the digital divide may also be called as “Information Technology gap”. In general terms, it is the gap between those who can

effectively use Information communication tools such as internet and those who cannot. Due to different factors such as illiteracy, poverty, computer illiteracy, lack of widespread telecommunication facilities, shortage of power supply etc. digital divide has been created in India. The Government of India and different State governments have already taken developmental measure to control the digital divide. Through this study author has explained different schemes, measure and programs which are aimed to overcome the digital divide and thereby enabling development of the digital libraries in India.

According to Tiny (2014) the origin of the digital divide can be traced to the mid 1990s and since then it has become a popular area of interdisciplinary concern.

According to Swalehin, M. (2015) due to the advent of the ICT, a new trend has emerged in the world which is technically known as 'Digital Divide'. It implies the gap among those who have access to digital technologies and those who do not have such access. The usage of the term is not only limited to some developed countries of the world but it is becoming more and more problematic in developing countries also. Initially the term referred to the gaps in the ownership of the computers, but now the term is used in reference to the internet access and also the access to ICT that the different segments of society can use. The term digital divide is the ever growing gap between those people and communities who have access to ICTs and those who do not have it. Author felt that those groups that remain isolated from the internet technology left behind and separable from the development taking place in information society.

In short digital divide is the term coined to indicate the gap between users of ICT, Internet, computers, e-resources / digital resources, technologies and those who are unable to use. Digital divide is everywhere in developed as well as undeveloped areas. The digital divide in libraries indicate the gap between two groups one uses technology very well to gather information from different resources and internet and other group who is lacking access to ICT and different technologies due to many reasons and these are to be resolved.

2.5 Digital Divide in Engineering College Libraries:

Iweha, C. (2005) has examined the electronic information resources used by the Obafemi Awolowa University in Nigeria and pointed out that inadequate financial resource were the main cause for poor library services. The scholar suggested that infrastructure development, assessment of the needs of the users, inter library collaboration, delivery of need based services and scientific evaluation of electronic information resources and services would improve the process of information management.

Adeyoye ,J.I.(2008) conducted a case study of automation project of Igbinedion University of Nigeria and observed that a full automated library system faced several challenges such as non-availability of funds, erratic power supply , inadequate professional librarians, lack of Local Area Network (LAN) , choice of software and absence of maintenance and support agreement. Author suggested that University management need to provide funds to facilitate full automated library system in the parent University.

Kanwal, A. (2008) evaluated the barriers to collection sharing in the Pakistan University libraries and pointed out that various technical, procedural, psychological and behavioural barriers in achieving planned and meaningful collection. The scholar suggested that modern libraries should explore new possibilities, opportunities and challenges of collection sharing in the emerging paradigm.

Mulla, K. R. (2009) investigated the impact of the changing information environment on the expectations from the libraries. Author analyzed different issues related to effective usability service and facility (OPAC module). Author also analyzed librarian's perspective, user's perspective, library automation, problems, challenges and opportunities regarding digital source and service of libraries.

Aharony, N. (2009) studied the relationship between the librarianship and information science. The research scholar suggested that information scientists should be encouraged to manage modern libraries in order to bridge the digital divide and facilitate optimum utilization of information resources and services.

Jange, S (2009) in his study analyzed the complex information needs of the society for better accreditation from National Accreditation and Assessment Council (NAAC). It has been found that NAAC played a greater role in building, developing and disseminating information products by establishing Virtual Learning Resource Centre. Author emphasized the role of library managers in developing an ICT infrastructure in rendering Internet and E-communication services for optimization of use of e-resource.

Harish, C.K. (2010) explored the software infrastructure for academic libraries in digital environment in Karnataka and suggested that professional libraries can able to make use of digital library resources and provide access to information and knowledge to the community of the users.

Rao, Y. S. and Choudhur, B.K. (2010) examined the computer infrastructure facilities and services at National Institute of Technology libraries in India and noted that computer infrastructure played a critical role in the academic system. The study revealed that computer infrastructure facilities were good enough in the academic libraries. They also suggested that development of trained and competent manpower would facilitate standardization of service in optimization of e-resource .He suggested some tool for developing anticipatory needs of user like compiling web resource directory of interest etc.

Jerry A. (2015) conducted a study in two dimensions, encompassing the issues concerned with the extend of adequacy of the various exiting Information Technology infrastructure facilities in the engineering colleges of Karnataka on one hand and mapping and assessment of the ICT core competency levels among the LIS professionals on the other. Author has suggested that AICTE affiliated (All India Council of Technical Education) engineering colleges have to go for quality management and LIS professionals have to be aware of recent trends in IT based information services. Author identified various problems and challenges regarding ICT practices in libraries.

Saini, O. P. (2015) has studied the factors that demand the traditional libraries to get digitized and what are the roles of librarian in the new environment and also points out some theoretical framework for developing concept of digital library.

Rao S. C. (2015) presented the concepts of libraries and access to e-service, concept of digital collection. Author also discussed future role of academic libraries and presented the use pattern of e-resource in engineering college libraries in Andhra Pradesh. The survey found out the problems and prospect of use of electronic information resource and their access.

Dhas A. J. (2015) described the information resources service and facilities among the engineering college libraries affiliated to Anna University, Tirunelveli. Author evaluated the factor socio economical background, Physical infrastructure, resource building, collection development, automation status with technologies; security system used in libraries. Author pointed out the concept of document processing, OPAC service and information resources (mainly e-resources) etc.

Baratha, C. (2015) in his study evaluated staff, students and faculties of different branches of engineering colleges of Tamilnadu and described the problems and challenges regarding recent ICT practice in libraries.

Summary:

The term 'digital divide' was introduced in the mid-1990s and has become popular as an area of interdisciplinary concern. 'Digital Divide' may result in 'knowledge divide' or 'information divide' and reflects the level of knowledge and information that one group can have or other do not have. In this chapter researcher has reviewed various literatures available on digital divide, its origin, engineering colleges, digital divide in India and engineering college libraries etc. and noticed that digital divide is reported in all disciplines and library professionals have to minimize the problems of digital divide among the users.

Digital divide is an economic and social inequality in access and use of information and communication technologies among the users including accessing to the internet. In the age of ICT engineering college libraries plays significant role in providing support to engineering colleges. Engineering college libraries faces different challenges and problems regarding update and standardization of library. Infrastructure, finance availability of e-resources, library automation, availability of number of computer and Internet etc are the barriers identified. For

accreditation and quality management system, LIS professionals have to develop awareness of recent trends in information services and management especially using ICT based information services.

Digital divide sometimes also called as "Information Technology gap". The developing country like India has many factors which are responsible for the digital divide in the libraries. They are as follows:-

- Library automation
- Literacy
- Skills
- Content (Collection)
- Languages
- Status of Library in terms of ICT development.

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CHAPTER 3

Engineering Education, Libraries and Digital Divide

3.1 Introduction:

India is one of the largest contributors in generating engineers in the world in all the fields. In India, several engineering colleges are established for imparting undergraduate graduate and post graduate courses in engineering, applied engineering etc. Engineering education system is well developed in India with different branches of engineering and its growth and development is continuous due to need. Engineering education is related to technical fields and development which has a large impact on the growth, development and changes occur worldwide. Accreditation and ranking system is also well established and has impacts due to various trends in engineering education adapted in engineering colleges. The main focus is to deal with the concept of digital divide and its existence in engineering college libraries.

3.2 History of Engineering Education and Colleges:

Engineering is science of application of mathematics, scientific, economic, social and practical knowledge in order to innovate, design, build, maintain, research, and improve the structure, machine, tools, system, components, materials, processes, solutions and organization. (Thursby, M. C., 2014). The term engineering is derived from the Latin "ingenium", meaning "cleverness" and "ingeniare", meaning "to contrive, devise" (History ABET). The existence of engineering traced since ancient times as human devised fundamental inventions such as the wedge, lever, wheel and pulley. The term engineering is derived from the word engineer, which itself dates back to the late 1390s when an engineer was originally referred to "a constructor of military engines." (History, ABET). Later with the introduction of technical features such as design of civilian structures like bridges and buildings matured the term civil engineering came in to its form. The Antikythera mechanism which invents the first

known mechanical computer and the mechanical inventions of Archimedes wear the examples of early mechanical engineering. (Hoover Dam –Fact and Summary)

3.2.1 Branches of Engineering:

According Hoover Dam-Fact and Summary: Engineering is a broad discipline which is often broken down into several sub-disciplines which involve differing areas of engineering work. Engineering education is characterized by four main branches

- Chemical engineering – The application of physics, chemistry, biology, and engineering principles in order to carry out chemical processes on a commercial scale, such as petroleum refining micro fabrication, fermentation and bimolecular.
- Civil engineering – The design & construction of public and private works, such as infrastructure (airports, roads, railways, etc.), bridges, dams, and buildings.
- Electrical engineering – It includes the design, study and manufacture of various electrical and electronic systems, such as electrical circuits, generators, motors, electronic circuits, optical fibers, opto-electronic devices, computer system, telecommunications, instrumenta- tion, controls, and electronics.
- Mechanical engineering – The design and manufacture of physical or mechanical systems, such as power and energy system, aerospace/ aircraft products, weapon systems, transportation products, engines etc.

Beyond these main four branches, a number of other branches evolved gradually. Historically, naval engineering and mining engineering were the major branches. Other engineering fields sometimes included as major branches like manufacturing engineering, acoustical engineering, corrosion engineering, aerospace, automotive computer, electronic, petroleum, environmental, software, architectural, agricultural, bio system,

biomedical, instrumentation, geological, textile, industrial, materials and nuclear engineering.

3.3 Accreditation of Engineering:

In India more than 4000 engineering colleges in different states which also include IITs, NITs, Central Universities departments, State Universities departments, constituent colleges, affiliated institutions, Government Aided Institutions, Institutes under Private Universities, Institutes under State Universities, and Autonomous Institutions.(Kulacki ,F.A. and Krueger E.R. , 2014). Due to outburst in quantity of engineering institutions, to maintain the quality of institutions even institutes of national importance like IITs, NITs Government of India, Ministry of Human Resource Development has established NAAC under UGC and NBA under AICTE in 1994 to look into the quality aspects and undertake accreditation of the higher educational institute. Engineering institutions can go for NAAC accreditation for institution as well as NBA accreditation for individual programs.

Due to implementation of RUSA which is funding the HEI and this is mandatory clause imposed by NBA of accreditation for capacity enhancement etc. These engineering institutions are striving for accreditation due to its benefits from UGC and other funding agencies. Moreover NBA accreditation is a prerequisite for the technical institutions to seek autonomous status from UGC.

NBA: National Board of Accreditation (NBA) was established by AICTE in 1994 and became an independent body in 2010 and in 2014 India has become permanent signatory to the Washington Accord (WA) which recognizes global equivalence of engineering degrees. NBA accredited Tier I engineering institutions degrees are valid in 20 nations. NAAC certifies institutions whereas NBA accredits the programs run by the institutions. NBA is more specific that it expects that the graduating engineers should have the graduate attributes as defined in Washington accord.

NAAC: National Assessment and Accreditation Council (NAAC) was established in 1994 as an autonomous institution of the University Grants

Commission (UGC). NAAC as on Dec 2014 has accredited 192 universities and 5627 colleges in India. NAAC methodology for Assessment and Accreditation (A&A) is very much similar to that followed by Quality Assurance agencies across the world and consists of self assessment by the institution and external peer assessment by NAAC. The basic difference between these two is NAAC has institutional grading approach and the NBA has programme grading approach.

3.4 Engineering Education in India:

Engineering education in India has flourished and indicated tremendous growth over the past few decades, both in number of students and number of colleges. The recent growth in Indian engineering education has been highly increasing due to privately funded educational institutions establishing their colleges rather than public funded ones. Engineering education started in India during the British era. In India the first engineering college was established at Roorkee, known as Thomson Engineering College in 1847. In early times emphasis was laid on Civil Engineering. (Engineers Council for Professional Development, 1947)

The Indian Institutes of Technology (IIT) has 23 centers located in Bhubaneswar, Bombay, Delhi, Gandhinagar,Guwahati, Hyderabad, Indore, Jodhpur, Kanpur,Kharagpur, Madras, Mandi, Patna, Roorkee, Ropar, Dhanbad, Palakkad, Tirupati, Bhilai, Goa, Jammu, Dharwad and Varanasi. All IITs enjoy the status of the Institutes of National Importance and are autonomous Universities that draft their own curriculum.

Indian Institutes of Engineering Science and Technology (abbreviated as IIEST) are a group of academic institutions in India for research and education in engineering. These were originally proposed by the Government of India in 2007 to meet the increasing demand for technological and scientific workforce in the industrial and service sectors of India as well as to create to the growing need for qualified personnel in research and development.

Birla Institute of Technology & Science (BITS) is an Indian institute of higher education and a deemed university under Section 3 of the UGC Act. The university has 15 academic departments, and focuses primarily on undergraduate education in engineering and the sciences. The institute was established in its present form in 1964. BITS Pilani has established centers at Goa, Pilani, Hyderabad and Dubai.

Indian Institutes of Information Technology (IIITs) are a group of four institutes of higher education in India, focused on information technology. They are established by the Central Government, centrally funded, and managed by the Ministry of Human Resource Development.

The National Institutes of Technology (NIT) are premier education colleges of engineering and technology in India. They have also been given the status of "Institutes of National Importance" by the Government of India. They were originally called Regional Engineering Colleges (RECs). In 2002, the Ministry of Human Resource Development, Government of India, decided to upgrade, all the 17 Regional Engineering Colleges (RECs) as National Institutes of Technology (NITs). There are currently 30 NITs, with the inception of 10 new NITs in the year 2010. The Government of India has introduced the National Institutes of Technology (NIT) Act 2010 to bring 30 such institutions within the ambit of the act and to provide them with complete autonomy in their functioning. The NITs are scattered throughout the country in line with the government norm of an NIT in every major state of India to promote regional development. After the introduction of the NIT Act they have been functioning as autonomous technical universities and hence can draft their own curriculum and functioning policies.

Delhi Technological University (DTU), Visvesvaraya Technological University (VTU), University of Mumbai Jadavpur University, Anna University, Hindustan University, Vellore Institute of Technology, Rajiv Gandhi Institute of Petroleum Technology, Nirma University, The Institution of

Engineers and many more etc. are some others who provide engineering education in India.

According to All India Council for Technical Education (AICTE), 401,791 engineers passed out from different engineering institutes or colleges in 2003. The number increased to 464,743 in 2004-05. Engineering colleges in India have been growing at 20 per cent per year. Five Indian states Tamil Nadu, Andhra Pradesh, Maharashtra, Karnataka and Kerala account for 69 per cent of India's engineers. Uttar Pradesh, Bihar, Gujarat, Rajasthan and Orissa account for only 14 per cent.

3.5 Engineering Education: Challenges and Opportunities:

Engineers play a key role in the social development, contributing to and enabling initiatives that drive economic growth, enhance social and physical infrastructure, and inspire the changes that improve the quality of life. Simultaneously, industry and manufacturing are facing extraordinary challenges due to globalization and distributed manufacturing. Some of the challenges that modern engineers face are in the areas of transport, infrastructure, energy management and generation, climate change, water supply and construction etc.

Some of the leading challenges before the engineering education system are continuous upgradation of curriculum to keep in pace with rapid growth of science and technology; globalization and the resultant challenges from the international universities; grooming of many private institutions without any method of ensuring maintenance of quality and standard; need for adequate funding to meet the demands of various novel innovative programmes; developing a meaningful and purposeful inter-face between the universities, National Research Laboratories, industries, government and society. In the context of these global challenges, the future of engineering is also being framed by all of these very complex global forces. In this fast moving world,

engineers need to be trained to manage the changes, complexities and uncertainty of the modern world. Designing sustainability into practical solutions is now a pillar of modern engineering education. The idea is to meet the needs of the present without compromising the needs of future generations.

3.6 Digital Divide:

Digital Divide is defined by many scholars who highlight the concepts behind using the term as:

- Digital Divide is "economic inequality between groups in terms of access to use of knowledge and information and communication technologies (ICT). Digital Divide also defined as an economic difference between groups in terms of access to use of knowledge and information and communication technologies (ICT). (Hargittai, E., 2008)
- Zillien, N. and Hargittai, E. (2009) defined the term that relates to result of widening imbalances of access to ICT.
- Digital divide is gap in libraries and can be defined as “Gap between traditional and modern methods of processing, storing, analyzing, retrieving, providing and using Information and its communication (Abraham, L.T., 2008).
- The concept of digital divide in libraries depends on few factors which have been stated by Bansode, S.Y (2008) as: Types of Library: Academic, Special, Public and Private Libraries. Functional Aspects: It relates to various technical libraries operation which includes the area of management and automation. Social and Economical Conditions: The financial and social status of an individual has a major impact majorly on the use and access of digital resource. Geographical dimensions: The rural and urban bifurcation has an impact on the concept of digital divide. Policies: The different types of governments or internal management laid down policies play an important role in defining the concept of digital divide. Broadband: The speed and availability of internet connection has an impact on the use of digital resources. Education: Required qualifications, attending various workshops,

digital literacy, training session are covered under this aspect. User of academic libraries: The users, their level of satisfaction, ISB, user orientation and other related factors have an impact on the use of digital resources.

The digital divide typically exists between those in cities and those in rural areas; between the educated and the uneducated; between socioeconomic groups; and, globally, between the more and less industrially developed nations. Even among populations with some access to technology, the digital divide can be evident in the form of lower-performance computers, lower-speed wireless connections, lower-priced connections such as dial-up, and limited access to subscription-based content.

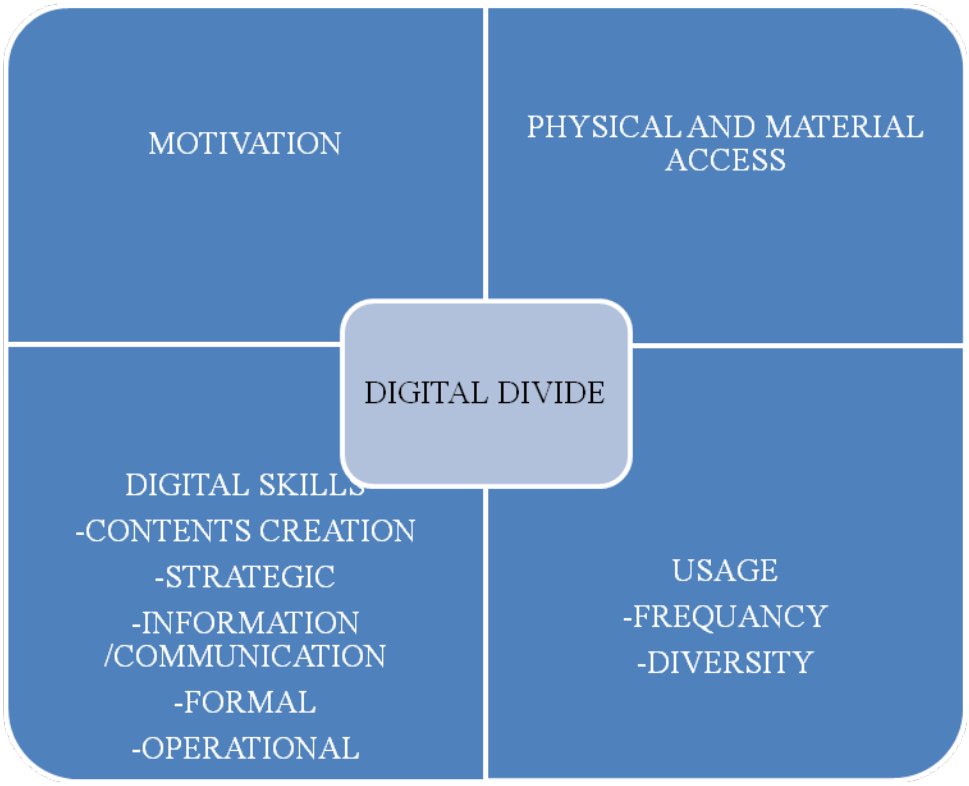
3.6.1History of Digital Divide:

The term 'digital divide' was introduced in the mid-1990s. 'Digital Divide' has further led to the concept of 'Knowledge divide' or 'Information divide' which reflects the level of Knowledge and Information one can have or not. Due to the lack of such Knowledge and information the socio-economic development of a nation may be affected (Cooper, M., 2000). Before the late 20th century, digital divide referred mainly to the division between those with and without telephone access; after the late 1990s the term began to be used mostly to describe the split between those with and without Internet access, particularly broadband. The digital divide can be understood as inequalities in four successive type of access: motivation, physical access, digital skills and different usage. (Van dijk, 2012)

Digital Divide Concepts:

Inequalities are described using simple demographic of individuals who have more or less access to computers and the internet and different level of digital skills.

Fig 3.1 Four successive kinds of access in the appropriation of digital technology



(Source - www.utwente.nllen/bms/vandijk/news/the evolution digital divide)

One of the reasons for this state of affairs is the predominance of individualistic notions of inequality like most social scientific and economical investigation; digital divide research works on the basis of so called methodological individualisms. Differential access to information and computer technologies (ICT) is related to individuals and their characteristics: level of income, education, employment, age, sex and ethnicity etc. (Van dijk, 2012). Van dijk also gave core concepts of resource and appropriation theory which highlights the points:

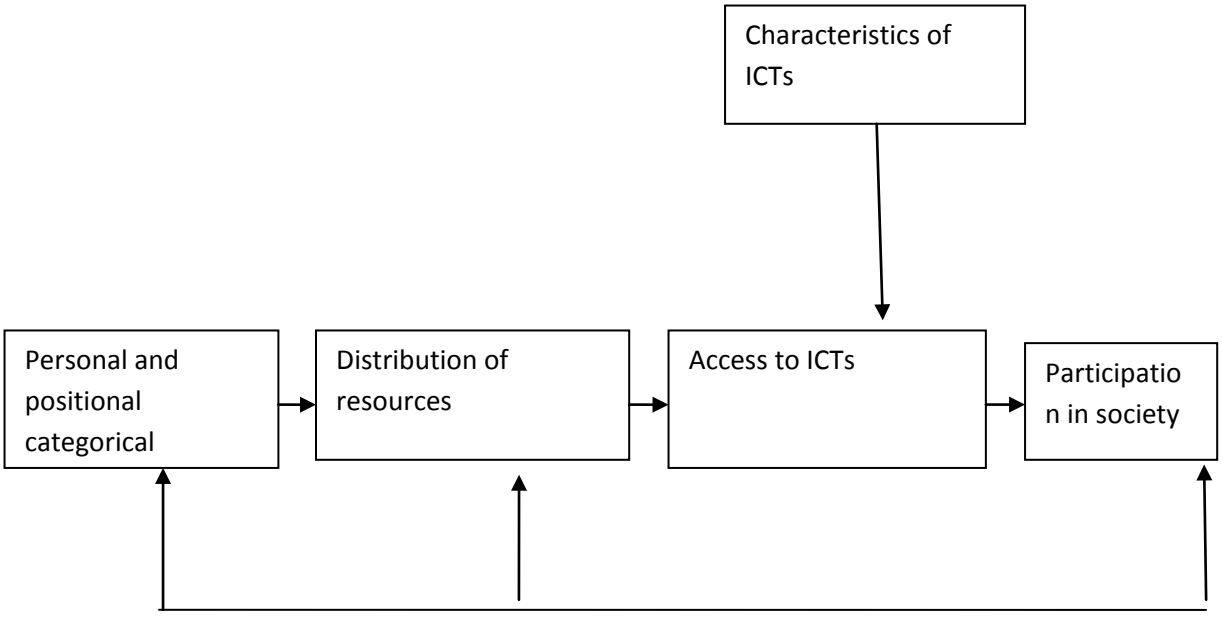
a) A number of personal and positional categorical inequalities in society

b) The distribution of resource relevant to this type of inequality.

c) A number of kinds of access to ICT.

d) A number of fields of participation in society.

Fig3. 2 casual models of resources and appropriation theory



(Source - www.utwente.nllen/bms/vandijk/news/the evolution digital divide)

Causes or reasons behind Digital Divide:

There are various types of factors that causes digital divide. Few factors can be explained as below:

- **Social Aspects:** Social aspects of digital divide is in term of inequalities in the form of status, cast, religions, traditions, , prestige, race, ethnicity, gender, age, class and customes.
- **Economical Aspects:** The economical differences such as rich and poor also lead to digital divide. Wealth and income inequality between peoples cause economical difference which is responsible for digital divide.

- **Educational Aspect:** A system under which all the people of society are not given equal opportunity to get education can cause educational inequality which leads to digital divide. Widening levels of education seem to magnify the digital divide.
- **Geographical Aspects:** Rural area and urban area affects the availability and access of information, resources and other things causing digital divide.
- **Political Aspects:** Political influence has strong impact on everything from socio-economical conditions to other related issues. This causes various gaps leading to digital divide.
- **Government Aspects:** Policies, plans and management of government have great impact on the country causing big changes and differences. This difference shows various gaps causing digital divide.

3.7 Digital Divide in Libraries

The aim of any libraries is to provide information related services to users by making available required information resources. In information age while providing services and managing functions in library, library staff has to deal with various problems from management to finance; information storage to information retrieval and many more. Information is the core in all developmental activities where in libraries play the vital role of collecting, storing, and disseminating information. The pattern which has now shifted from traditional to digital has given rise to many problems like storage, retrieval and dissemination of information to the end user. This has created a digital divide among libraries, library professionals and library users working in different organizations. Digital divide in libraries witnessed when librarians and user access information using ICT enabled services offered by the libraries. Function related to use, access, store and retrieve information when used through technology creates various hurdles which lead to digital divide. The reasons for digital divide in libraries are unfamiliarity with use of technology, lack of knowledge, internet problems, technical issues, financial constraints etc. Some of these factors are:-

- Types of Library: Different types of libraries like academic, public, special etc. are important factor as services and resources are different in these libraries which are based on need of their users.
- Library functions: Technical libraries have to manage operation which includes the area of management, organization, information dissemination and automation.
- Socio-economical conditions: The financial and social status of an individual has a major impact on the use and access of digital resource.
- Geographical dimensions: The rural and urban bifurcation has an impact on the concept of digital divide.
- Policies: The different types of governments or internal management laid down policies play an important role in defining the concept of digital divide.
- Broadband: The speed and availability of internet connection has an impact on the use of digital resources by users as well as services provide by librarians.
- Education: Digital literacy and required qualification play vital role to cause gap of digital device.
- User of academic libraries: The users and their level of satisfaction, user orientation and other related factors have an impact on the use of digital resources.

To eliminate digital divide in libraries many educational institutions are now conducting workshops and training programs for the library professionals to train them in field of digital literacy and managing trends in the profession. Government and higher education bodies need to support proper attention in this area. An action plan also needs to be framed for development of libraries, to manage future.

3.8 Digital Divide in Engineering College Libraries

Engineering education is related to the application of various technologies and libraries must have to be managed up to date with information support.

Engineering libraries have good collection of e-resource and provides various online services to users. Digital resources and products content in digital form are available in libraries online and offline. Network and resource sharing facilities are also provided by engineering libraries. The libraries have to adhere to the AICTE norms and hence offer various automated services like bar code system, RFID technology etc but gap is seen as these are not present in all libraries. The educational, technical and financial aspects are major factor which lay an impact on libraries causing digital divide in engineering colleges of libraries.

A) Lack of Literacy and skills - Essential education and qualification is required to used, to access, to provide services through ICT. Digital literacy and skills are important to manage and operate library function through technology but gap between it creates digital divide.

B) Economical factor - Economic difference causes a gap in availability of resource as well as uses of digital services. This act as hurdle in access and use causing digital divide.

C) Language Barrier- Maximum information is available in English languages. As India is land of multi- language country so it cause problems for those peoples whose primary language is not English.

D) Technical Barrier- Engineering field is related to technology so it is necessary engineering libraries should be technologically advanced. The difference of use of technology to provide various e-resource and e-service can cause digital divide.

Summary:

Engineering is the application of scientific knowledge to solve the problems in the real world. Engineering graduates understand the needs of their users and support to problem solving, designing and building things using technologies. New challenges in engineering education system are infrastructure, management, continuous up gradation of curriculum to keep in pace with rapid growth of science and technology; global competition, grooming and up to date institutions as well as maintaining quality and

standard; need for adequate funding to meet their demands and etc. India has lots of opportunities to convert his potential engineers in asset if it overcome its challenges and maintain the standard.

Digital divide is defined as the difference rose due to different access to ICT when used and accessed by users. Digital divide in libraries is gap in availability, use and access of different electronic resources and services of libraries. There are various factors responsible for digital divide like geographical area, age, education, language, technical difficulties, economical, infrastructure etc.

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CHAPTER 4

Profiles of Engineering College Libraries in Pune

4.1 Introduction

4.2 Role and Status of Engineering College Libraries

4.3 Profile of Engineering Colleges in Pune

Summary

Reference

4.1 Introduction

ICT has brought revolutionary changes in all fields including education. The main challenge before libraries and librarians are to transmit knowledge to users by using ICT techniques. Engineering college libraries play vital role in imparting engineering education and hence institutes and libraries are treated as information dissemination agencies. This chapter highlights major engineering colleges in Pune city and role of libraries in engineering colleges, which is need of the time to analyze importance as well as brief information of Pune engineering college libraries.

4.2 Role and Status of Engineering College Libraries:

Library's role depends on the parent institutions like schools, colleges and other professional and non-professional organizations and the needs of the user community. In order to fulfil their objectives, the libraries have to work out various strategies and develop their contribution to the education field with more serious insight which needs effective planning and support to the future developments. Without proper information and knowledge infrastructure, no education system can maintain and accomplish its goals and objectives. Involvement of libraries in education by offering various services like referral, reference, information and other teaching resources is backbone. Libraries are treated as resource centres.

In digital era the libraries are also changing their traditional look and have started their journey towards the digital libraries. Now a day's different changes in informative resources like e-books, e-journals, e-newspaper, CDs, DVD etc are seen. Learning processes are changing and libraries are also having to changes and provide various services to the users. The recent developments seen is maximum use of technologies in libraries such as RFID technology, Bar-Code technology, Scanners, Multimedia, Smart card, Web-OPAC, Animation Touch Screen, Web cam, Closed circuit cameras, Video and teleconferencing, speech recognition, Internet, Closed circuit cameras, DVDs, CD-ROMs, Theft detectors, Consortia, Automated self check machines and Automated book drop boxes etc. These modem practices are to be digested by the library professionals as well as library users and remove the digital divide. These different technologies

help libraries to accomplish objective and serve the users. The engineering college libraries are academic libraries and not only connecting link between teaching and learning, but also provides supplement resources to students to enrich their knowledge.

Engineering education consist of gaining of knowledge and learning principles, methods and theories which involve working behind the operation of machines and tools. It symbolizes the world consisting of the numerous sciences that are required in our daily lives. To meet the demands of engineering students and faculties there is a need of technological advance libraries to help users. The libraries are functioning in engineering education system, keeping in view:

- To support objectives laid by parent institution.
- To support curriculum of engineering education.
- To help teaching –student learning process.
- To provide current and update information
- To provide proper and relevant information on the time.
- To help in making knowledge based society.
- To provide library services as per user needs.
- To strengthen engineering education

Libraries provide support to engineering colleges for achieving the goals and vision of respective engineering colleges through ensuring quality based library and information support services to the students, research scholars and faculty members. Librarians are professionally committed to update the collections continuously in order to reinforce and enrich the knowledge base for assisting the stakeholders of engineering colleges to achieve excellence in academic, research and development, consultancy, continuing engineering education, and interaction with external environment. With the passage of time, the needs of engineering users have changed drastically. Libraries are the soul of any research or academic institution. They form the most vital forum of education, especially in the field of engineering education. Due to the rapid development taking place in various fields of science and technology, it

becomes imperative for the libraries to remain up-dated so that information becomes accessible to its users. The main purpose of engineering libraries is to support the teaching and research programs of engineering college

In the survey of Maharashtra State engineering college libraries conducted by Kadam, S. (2014) indicated that use of libraries is essential in engineering education system as to face seminars, exams, tutorials, projects and the level and status of engineering colleges is very high. Librarians are using ICT and different technologies, software's, e-resources, internet resources, networked resources and fulfil the need of the users.

4.3 Profile of Engineering Colleges in Pune:

1) College of Engineering, Pune: The Govt. College of Engineering Pune established in 1854. This college is among the oldest institute and has been granted status of "Autonomy" from the year 2003. The College have different engineering branches Civil, Computer, IT, Instrumentation, Mechanical, Production and Metallurgical.

Central Library

SLIM21 software is used for library automation. The Library has a rich collection of books (87499) on Science, Engineering, Technology, Humanities, Social Sciences, Management and General. The collection in the Library includes Reference books, Bound Volumes of Journals (8632), Thesis (767), Technical reports, CDs (2124) and special collection of books for Economically Backward Classes and Backward Classes students. The e book collection includes 10144 titles based on various topics of engineering. E journals - ASCE ONLINE , ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, Blackwell Wiley, J-Gate Engineering & Technology (JET), Taylor and Francis e-journals (TEQIP) are subscribed in library. NPTEL, N-LIST (Membership of INFLIBNET), LEARNING RESOURCE- ReliaSoft Software (TEQIP), LS –Dyna (TEQIP), KPoint Server KTPL Central Server Software is also available in library.

2) Maharashtra Institute of Technology (MIT)

Maharashtra Institute of Technology Kothrud, Pune established in 1983. It is an unaided, non autonomous and non-minority organisation managing engineering education system. The institute has different engineering branches Civil, Computer, IT, Electronic and Telecommunication, Polymer, Petroleum, Petro chemical and Mechanical.

Central Library

SLIM ++ library software is used in library. The library collection of books are 75000, e-books1000+ and CDs and DVD are 2000+. E journals subscribed by library are ASCE ONLINE , ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, Blackwell Wiley, J-Gate Engineering & Technology (JET), Taylor and Francis e-journals (TEQIP).NEPTEL, institutional membership, library network and 1000 books of different branches in pdf format is also available in library.

3) Pune Institute of Computer Technology (PICT)

Pune Institute of Computer Technology (PICT) is a private unaided engineering college located in Dhankawadi established by the Society for Computer Technology and Research, SCTR in 1983. PICT was accredited by India's two major accreditation agencies –NACC and NBA.

Central Library

Total books collections are 34897, e-books 686 and Cd s – 4028. E journals subscribed by ASCE ONLINE, ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, Blackwell Wiley, J-Gate Engineering & Technology. Institutional membership, NEPTEL, Online question paper, Intel literature, online syllabus etc also available in library.

4) D. Y. Patil College of Engineering Akurdi

Dr. D. Y. Patil Prathishthan's, D.Y. Patil College of Engineering, was established in 1984 in Pimpri and later shifted to Akurdi complex in 2001. The college spreads over 10 acres of land with seven Engineering disciplines. This Institute is approved by AICTE, New Delhi and is affiliated to the Savitribai Phule Pune University.

Central Library

Library was established in the year 1984. Library is enriched with vide variety of books, well equipped with modern facilities and resources in the form of books 37907, book bank 174, Indian journals 83, International journals 5826 and CDs 1577.E journals subscribed by library are ASCE, ASME, IEE E+AAPP+POP (COMBO PACK), ASTM DIGITAL LIBRARY (DL) ONLINE VERSION, Mc GRAW HILL, SPRINGER, ELESVIOR/ SCIENCE DIRECT,J-Gate Engineering, GALE CENGAGE LEARNING. NPTEL, institutional membership etc are also available.

5) Vishwakarma Institute of Technology (VIT, Bibwewadi)

Vishwakarma Institute of Technology established in the year 1984, financed and run by the Bansilal Ramnath Agrawal Charitable Trust, Pune. It is unaided, autonomous, non minority and affiliated to the Savitribai Phule Pune University. The institute has engineering branches of Computer, IT, Electronics, Instrumentation, Industrial and Production. The Institution was selected under the world bank project TEQIP Phase- I i.e. Technical Education Quality Improvement Program by Ministry of HRD, New Delhi. The Institution is ISO 9001-2015 certified by BSI, India. The Institute has been granted autonomous status since academic year 2008-09 and has autonomous status up to 2020.The Institute was accredited ('A' Grade) by National Assessment and Accreditation Council (NAAC).

Central Library

The central Library is an enviable collection of Books 15215, Print Journals 64, Periodicals, e-Journals 2600, e-conference proceedings, e-standards, online/offline e-Books 750, Question Papers and Syllabus in digital form, CD-ROM, DVD's 1312 and Video based teaching material from IIT's (NPTEL), etc. The library uses SLIM-21 Library Management software. E journals subscribed by library are ASCE ONLINE, ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, J-Gate Engineering & Technology (JET). NPTEL ,over 750 e-books (free Downloaded), Syllabus Copies of all Courses and question papers of all branches are in available in digital form with Printing, Photocopying and Scanning facility on 25 PC terminals with unlimited Internet access.

6) Pune Vidyarthi Griha's College of Engineering and Technology

It established in 1985. Pune Vidyarthi Griha's College of Engineering and Technology is unaided, affiliate to the SPPU and accredited 'A' by NAAC is one of the reputed engineering colleges in India.

Central Library:

Library area is 1271.58 sq. meters and reading hall for 100 students having total seating capacity 200 .Library has collection of Reference Books, Textbooks, E-Books, Journals, Periodicals, E-Journal Packages, Audio Visuals, CD's, DVD's, B. I. Standards, NPTEL (IIT) Video Lecture Series, etc. Institutional memberships of library are The Institution of Engineers (India), Automotive Research Association of India (ARAI), Pune, Flexographic Technical Association (FTA), USA.

7) MKSSS'S Cummins College of Engineering for Women (Karvenagr)

MKSSS, renowned education institutions for more than 100 years, started Engineering College exclusively for Women in 1991. Cummins India Foundation gave donation to start the college; hence name of the college is 'Cummins College of Engineering for Women'. College is

approved by AICTE. An Autonomous Institute affiliated to Savitribai Phule Pune University and accredited by National Board of Accreditation four times since 1998, 2002, 2006 & 2012

Central Library:

The Library of College was established in 1991. Library collections are 55708 books, national 92 and international journals27, Bound volume journals1917, Reference Books 4960 and 138 CDs. The central Library has Stack section, Periodicals section, Reference section and Reading Hall. All students have open access in all sections of Library. The Library uses SLIM 21 software. It consists of Acquisition, Cataloguing, Circulation, Serials control and Web OPAC. Barcode based circulation of books is practiced. E journals subscribed by library are IEE (ASPP) +POP, SCIENCE DIRECT, Mc GRAW HALL; SPRINGER.NPTEL lecture series are available in libraries. Library Institutional Membership is Savitribai Phule Pune University, British Library and Automotive Research Association of India, Pune.

8) All India Shri Shivaji Memorial Society College of Engineering

All India Shri Shivaji Memorial Society (AISSMS) was established in 1917 by Late H Shrimant Shri Shahu Chhatrapati Maharaj of Kolhapur. The AISSMS COE, Pune is a co-education Institute established in 1992. The College of Engineering is affiliated to the University of Pune. It conducts AICTE approved courses leading to the degree of Bachelor of Engineering (BE) in eight engineering streams and Master of Engineering (ME) in seven engineering streams.

Central Library:

The Library spread over 680 Sq m area .Library is automated with SLIM 21 Library Management Software. AISSMSCOE digital library use Knimbus search window for eBooks search. J-Gate Search window and DOAJ search window for E-Journals Search. Library is using blog and face book page for sharing resources with students and faculty members, Library has organize Book talks Author meet programs Book Exhibitions and Online Journals Training

Program for maximum utilization of E-Resources and Library Resources. Library collections are Books 34000 E-Journals 612.E journals subscribed by libraries are ASCE ONLINE, ASME ONLINE, Mc GRAW HILL, and SPRINGER. NPTEL lecture is also available. The Library also has membership of other libraries of reputed organizations like IIT Bombay, ARAI, and British Library etc for the benefit of the staff and students.

9) Sinhgad College of Engineering (Vadgaon)

Sinhgad College of engineering is established in 1996. It is unaided affiliate to the SPPU.

Central Library:

Central Library has collection of books 55813, journals 131and reference books 4647. E journals subscribes are IEEE ASPP+POP , PROQUEST, KNIMBUS E-LIBRARY, ELSEVIER SCIENCE DIRECT and SCOPUS INDEXING DATABASE.A well-lit spacious hall opens till late evening to facilitate convenience for learning. COE Central Library is situated on the Ground Floor of STES Central Library which is established in Sept. 2012. There are nine sectional Libraries under the Central Library, catering to the individual institutes. The Library is partially automated with SLIM 21 software. The book issue-return system is implemented with barcode facility. The library also has in house photocopy facility, Library Network DELNET and having institutional membership are ARAI, JAYAKAR LIBRARY and BRITISH LIBRARY.

10) Pune District Education Association College of Engineering Pune

It established in year 1998. It is unaided, and affiliate to the SPPU

Central Library:

Books collection of library is 28999 and subscribe e journals - ASCE ONLINE , ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, J-Gate Engineering & Technology (JET).NEPTEL, DELNET, etc are also available in library.

11) Dr. D.Y. Patil Vidya Prathishthan's Society's, D.Y.P.I.E.T. Pimpri Pune

Dr. D. Y. Patil Institute of Technology, Pimpri, Pune, was established as Dr. D. Y. Patil Women's College of Engineering in July 1998. The college is converted into Co-education College with a changed name as Dr. D. Y. Patil Institute of Engineering & Technology, Pimpri, and Pune from the academic year 2002-2003.All the eligible programs have been accredited by the National Board of Accreditation (NBA). The Institute has been awarded 'A' grade by the Government of Maharashtra (India). The Institute is an ISO 9001:2008 certified institute.

Central Library:

Library has one server, with 12 PC's and other accessories. Out of these 12 PCs, 10 PCs are meant for users to access. E-journals, e- books, NPTEL, NDL & OPAC is available on the internet. Total no. of volumes are 31982, total no. of titles are 8600 ,total no of CD's are 2182 and total no. of print international, national journals & magazines are 128.e-journals subscribes are IEEE ASSP+POP, Springer, ASME, ASCE, McGraw-Hill, j-GATE(JET), ELSEVIER, ASTM DIGITAL LIBRARY, J-Gate (JSMS) & EBSCO. Institutional membership of library is Indian Institute of Technology (IIT), Bombay, Automotive Research Association of India (ARAI), Central Institute of Road Transport (CIRT), Savitribai Phule Pune University, Jayakar Library, British Library, DELNET (Developing Library Network) and National Digital Library of India.

12) Progressive Education Society's Modern College of Engineering Pune:

It is established in 1999 and located in Shivajinagar. It is accredited by NBA. It is affiliated to Savitribai Phule Pune University.

Central Library:

The library has large number of books and eBooks collection. Print and e journals package are subscribed by institution. e-journals are ASCE ONLINE , ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, Blackwell Wiley, J-Gate Engineering & Technology (JET).NEPTAL, online database ,library network are available in library.

13) Genba Sopanrao Moze College of Engineering Pune

Genba Sopanrao Moze college of Engineering, Run and Managed by Genba Sopanrao Moze Trust, Pune. Founder & President, Hon. Shri. Rambhau Moze Established College in 1999 affiliated to Savitribai Phule Pune University since 1999.It's Approved by AICTE (Delhi) runs Under Graduate, Post Graduate Engineering Courses and MBA, MCA Post Graduates Courses.

Central Library

The library has large number of books and e-books collection. Print and e journals package are subscribed by institution. e journals - ASCE ONLINE, ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, and J-Gate Engineering & Technology. Online database and different institutional memberships are available. College have digital library to allow student for online access books and journal.

14) M I T Academy of Engineering Alandi Pune

It is establishment in 1999.It is affiliated by Savitribai Phule Pune University. It is approved by AICTE and Director of Technical Education, Maharashtra State.

Learning Resource Center

The Learning resource Center (LRC) established in the year 2001 is an invaluable resource for students, researchers and faculties of management and engineering. The LRC is well equipped with large number of textbook, reference books, periodicals, journals and newspapers The LRC consists of a fully air conditioned reading hall with a capacity of 250 students, internet browsing center and a digital section, reference section, open access periodical and stack area. The library has introduced computerized PVC I- card system for the students and staff. The library is automated with SLIM 21 Library Software and Enterprise Resource Planning (ERP) to ease its clientele at various levels while in the library The LRC has a separate place for a digital library. It has in housed with 10 independent machines with all the A/V facilities. A patron can surf the internet, listen and watch academic related audios & videos in a digital library. The LRC has developed collection of over 36540 books, e-books 2288, 2500 CD’s/ DVD’s and over 132

hard copy journals and 24 magazines. It has also maintained bound volumes of journals for important journals .E- journals subscribes are ASCE ONLINE, ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY and SCIENCE DIRECT. Online database, NEPTEL and Institutional memberships are also there.

15) Pimpri Chinchwad Education Trust College of Engineering:

It is establishment in 1999.Its located near Akurdi railway station. It's accredited by NAAC and NBA. It is affiliated by Savitribai Phule Pune University. It is approved by AICTE and Director of Technical Education, Maharashtra State.

Central Library:

Total Books collection is 39315, e-books, print journal are available.17 computer are available in digital library. Institutional membership, NEPTEL and other online sources are there for users. Different journals packages are subscribed by library.

16) Modern Education Societies College of Engineering Pune

Modern Education Society was established in 1932.The Modern Education Society's College of Engineering; Pune was established in 1999 and conducts the following courses leading to Bachelor's & Master's Degree in Engineering. It is affiliated by Savitribai Phule Pune University

Central Library:

The college library is the main centre for students to carry out their scholastic activities. Library Collection are Books -30326, Print journal-52 and E-journal- 463.E journals - ASME ONLINE, IEEE and SCIENCE DIRECT are subscribes in library. (OPAC) Online Public Access Catalogue, (NPTEL) National Programme on Technology Enhanced Learning, book bank, (SWO) Social welfare Organization is also available. Under this scheme a set of books covering all subject for every semester is given to SC, ST Students free of cost sponsored by Govt of Maharashtra. Reprographics, internet is also available etc.

17) All India Shri Shivaji Memorial Societies Institute of Information Technology

All India Shri Shivaji Memorial Society's Institute of Information Technology, Pune was established in August 1999. The college is a self financing college and is affiliated to Savitribai Phule Pune University (SPPU). It is approved by AICTE and Director of Technical Education, Maharashtra State. The institute has the branches, namely, Computer Engineering, Electrical Engineering, Electronics Engineering, Instrumentation Engineering, Electronics and Telecommunication Engineering and Information Technology. The Institute also has research centre for electronics and telecommunication engineering. The institute has received accreditation from National Board of Accreditation, New Delhi for Electronics Engineering, Electrical Engineering and Instrumentation Engineering. The institute has also received Permanent affiliation from SPPU for Computer Engineering, Electronics Engineering, Electrical Engineering and Instrumentation Engineering

Central Library:

Library collection books -29864, E journals are IEEE, Mc GRAW HILL, ASTM DIGITAL LIBRARY, ELSEVIERSCIENCE DIRECT, SPRINGER, J-Gate Engineering & Technology (JET).Library Network DELNET is use in library. NPTEL, DOAJ, PRESSREADER are available in library. Institutes memberships are Automotive Research Association of India (ARAI), British Council Library and Jaykar Library.

18) Bharati University of College of Engineering for Women, Katraj

Bharati Vidyapeeth's College of Engineering for Women was established on June 2000.It is affiliated to Savitribai Phule Pune University (SPPU). It is approved by AICTE and Director of Technical Education, Maharashtra State.

BVCOEW Library:

College library has reference books, textbooks, National and International Journals/Periodicals to satisfy the requirements of the AICTE and syllabus of the university. E-resources (online Journals) through INDEST-AICTE consortium etc are also available. Library area is 428 sq. m. and spacious reading hall of capacity near about 200 students is available. SOUL 2.0 is used in library management.20 computer and 1 laptop used in digital library. Details of Library Collection are Books for UG-21040, Book bank-458 and Print journals – 454.E journals subscribe by library are IEEE (ASPP+POP), ELSEVIER, and SCIENCE DIRECT.NPTEL is also available in library.

19) Sinhgad Technical Education Society's Smt. Kashibai Navale College of Engineering, Vadgaon

It is establishment in 2000.It is affiliated by Savitribai Phule Pune University. It is approved by AICTE and Director of Technical Education, Maharashtra State.

Central Library

Central Library has encyclopaedic collections, references & text books, wide range of periodicals & journals of national & international standing. A well-lit spacious hall opens till late evening to facilitate convenience for learning. SCOE Central Library is situated on the Ground Floor of STES Central Library. There are nine sectional Libraries under the Central Library, catering to the individual institutes. Total books (volumes) collection is 55813and number of print journals is 131.e journal databases subscribe by library are IEEE ASPP +POP 195 Trans. + 781 Conf. Pro. ELSEVIER Science Direct (Engg + Comp Sc) 275 Journals, PROQUEST Management 3000 Journals & Cases, Knimbus e-library: All major punishers open content and SCOPUS Indexing database: 30,000 Jr. indexed. The Library is partially

automated with SLIM 21 software. The book issue-return system is implemented with barcode facility. The library also has in house photocopy facility. The web OPAC of the Library is available in departments to browse through book-availability. Library gives softcopies of Syllabus, Question Papers for student's ready reference and soft copies of "Srujan" college magazine. The Central Library has a state of art Digital Library for downloading e-journal articles and various paid and free databases. There are 30 computers with modern infrastructure. Students and faculty can get access to various databases like IEEE, Science Direct, Proquest are given. Facilities like Printing, Scanning are available. Plagiarism checking is done from Library. SPPU recommended "Turnitin" software is used for the same.

NLIST : it is an INFILBNET database, covering major disciplines of Pure and Applied sciences - KNIMBUS e-Library : This gives facility to access 300 more Open Access Journals like Springer, Wiley, DOAJ collection, NPTEL Lectures - NPTEL Video Lectures : Available in special Hard disk - SCOPUS (Indexing Database) : World renowned indexing database with 30,000 journals is made available to faculty and Researchers.

20) Jaywant Shikshan Prasarak Mandal's Rajashri Shahu College of Engineering, Tathwade, Pune

The college started in the year 2001 and now conducts 5 under graduate and 7 post graduate courses, 4 polytechnic courses and 3 PhD programs with total annual intake of 1284+ students. It may thus be seen that the college is steadily progressing and accomplishing its goals.

Central Library:

The central library and reading hall are located in the building on the ground floor having books of 25081 for UG, 32 international and national journals. . The Central Library supports the teaching, research and extension programs of the Institute. The Library, besides having a collection of 363 e books on engineering, science and Technology offers library services. Daily news papers and other magazines in different languages are available in the Library. Encyclopedia of Britannica, Marathi Vishwakosh, Educational CDs, and Video Cassettes

are total 160 i.e. available in the Library. WEB OPAC facility, internet facility, photocopying and multimedia facility are also available for students and staff in the library. In addition to the Reading Hall, classrooms are also kept open for students to study before and after college teaching hours, to provide them additional space to study. A digital Library with four computer terminals along with multimedia facility is fully prepared and available for the students .E-journals subscribe ASCE ONLINE, ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT and J-Gate Engineering & Technology (JET).NEPTEL, institutional membership and different online database etc also available in library.

21) MAEER's M I T College of Engineering Kothrud, Pune

It is establish in 2001 and located in paud road kothrude.it is accredited by NBA .It is affiliated to SPPU.

L R C (Learning Resource Center) Library:

SLIM 21 and ERP software is used in library. Total collection in library is Books -35100 and EBooks-2500. E journals - ASCE ONLINE , ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, and J-Gate Engineering & Technology (JET).Open access database are provided ,total 19 direct hyperlink references are provided. NEPTEL, Library network are given to user.

22) B.R.A.C.T. S Vishwakarma Institute of Information Technology Kondhwa

Vishwakarma Institute of Technology, Pune, established in the year 1983, financed and run by the Bansilal Ramnath Agrawal Charitable Trust, Pune. It is affiliated to the University of Pune .Vishwakarma Institute of Technology is one of the autonomous Institutes permanently affiliated to Savitribai Phule Pune University. It was started in 1983 .Some important features are:

- The Institution was selected under the world bank project TEQIP Phase- I i.e. Technical Education Quality Improvement Programme by Ministry of HRD, New Delhi.
- The Institution is ISO 9001-2015 certified by BSI, India.

- The Institute has been granted autonomous status since academic year 2008-09 and has autonomous status up to 2020.
- The Institute was accredited ('A' Grade) by National Assessment and Accreditation Council (NAAC), Bangalore from July 2013 for the next five years.

Library

Library is having variety of books, well equipped with modern facilities and resources in the form of books, e-journals, CD-ROMs etc. Open access system is followed in the library. The library homepage will provide electronic access to various e-journals.

23) Jaywantrao Sawant College of Engineering, Hadapsar, Pune

Jaywantrao Sawant College of Engineering (JSCOE) is approved by the All India Council of Technical Education (AICTE), New Delhi and Govt. Of Maharashtra affiliated to Pune University. It was established by JSPM on the second campus at Hadapsar in year 2004.

Central Library:

Library is well equipped with a large collection of textbooks, reference books, technical journals, educational DVDs and CDs as well as with latest information technology tools for information collection, processing and retrieval. The collection of books, journals, e-journals, reports and other reading resources are adequate for not only domain specific resources but for also general resources. The library has AutoLib Software that supports all in-house operations. The library follows DDC classification system for books arrangement

24) Sinhgad Academy of Engineering Kondhwa

Sinhgad academy of engineering is approved by the All India Council of Technical Education (AICTE), New Delhi and Govt. Of Maharashtra affiliated to Pune University. It was established by SINHGAD group in Kondhwa. It established in year 2005.

Central Library:

Sinhgad Academy of Engineering (SAE) library is rich in collection which consist books - 21758, Print journals- 112, E journals – 449 and CD's – 1130. It also subscribes e-journal packages IEEE, SCIENCE DIRECT and PRO QUEST of engineering disciplines of well-known international publishers. Library conducts extension services like book exhibition, orientation programs for new users and "Earn & Learn" scheme for needy students. The College is an institutional member of the British Council Library and Automotive Research Association of India.

25) The Shetkari Shikshan Mandal Sanglis Pd. Vasantdada Patil Institute of Technology, Bavdhan

Padmabhooshan Vasantdada Patil Institute of Technology (PVPIT) is governed by The Shetkari Shikshan Mandal; a charitable Trust registered under Bombay Public Trust Act 1950 and Societies Registration Act 1860. The TSSM started the Padmabhooshan Vasantdada Patil Institute of Technology in the academic year 2006-07. The College is unaided and approved by All India Council for Technical Education (AICTE), New Delhi, recognized by Government of Maharashtra Director of Technical Education (DTE) and affiliated to University of Pune. It established in year 2006.

Central Library:

The central library PVPIT Bavdhan, Pune, has established in the year2006-07

Library collection includes books -14961, e-books-27000, CD's – 839, E journals - ASCE, IEEE and SCIENCE DIRECT and NPTEL (1068).

26) Marathwada Mitra Mandal's College of Engineering (Karve nagar)

The trust "Marathwada Mitra Mandal, Pune" was established in 1967 by Hon. Late Shri. Shankarraoji Chavan, Former Home Minister, Govt. of India as the "Founder President". It offers five engineering programs (Computer, Electrical, E&TC, Info Tech and Mechanical) and three P.G programs MBA, MCA and ME (Comp Engg). The College is unaided and approved by All India Council for Technical Education (AICTE), New Delhi, recognized by Government of Maharashtra Director of Technical Education (DTE) and affiliated to University of Pune. It established in year 2006.

Central Library:

The Central Library of Marathwada Mitra Mandal's College of Engineering was established in 2006 to provide easy and quick access to information. Library Collection includes books -28821, ebooks-6238, CDs and DVD's– 2370, institutional membership of ARAI library and Jaykar library, DELNET, NDL (National Digital Library) and Hadoop Digital library. It provides NPTEL facility also to its user.

27) JSPM's Imperial College of Engineering and Research Wagholi

Imperial College of Engineering and Research (ICOER) was established in 2006 on a 60-acre campus in the Wagholi suburbs of Eastern Pune. The College is unaided and approved by All India Council for Technical Education (AICTE), New Delhi, recognized by Government of Maharashtra Director of Technical Education (DTE) and affiliated to University of Pune

Central Library:

ICOER Central Library was started in the year 2006. Library has a rich collection of text books, reference books; national journal in all branches of Engineering, Science, Technology and the collection is ever increasing. The books are classified according to Dewey Decimal Classification Scheme. Open access system is followed in the library. Library is automated with AutoLib Library Management Software.

Each of the libraries consists of university prescribed books, reference books, national journals, International journals such as IEEE, ACM etc., periodicals, magazines, daily news papers. JSPM group has adopted digital libraries to share resources like power point presentations, assignments, materials etc. Digital libraries help faculty members and students to share information easily. E journals - ASCE, ASME, IEEE, EBSCO host and Wiley Online Library are available .Institutional membership of NDL and British Council library are subscribed.

28) Chanakya Education Society's Indira College of Engineering and Management Pune

Indira College of Engineering and Management, established in 2007, is a venture of SCES. The institute is unaided and approved by All India Council of Technical Education (AICTE), New Delhi and Govt. of Maharashtra and affiliated to the University of Pune.

Mr. Shankar Rao Wakalkar Library

Mr. Shankar Rao Wakalkar Library, established in the year 2007,
The college library is well equipped with large number of textbook, reference books, periodicals, journals and newspapers. The number of books in the library at present is about 25846**.**The library receives 80 journals and 10 magazines in specialized areas. The library

consists of reading hall, internet browsing center, reference section, open access periodical and research library. The library has introduced computerized PVC I- card system for the students as well as staff. The library is automated with SLIM 21 Library Software to ease its clientele at various levels while in the library. The library has a separate place exclusively devoted for a digital library. It has in housed with 12 machines with all the A/V facilities. A patron can surf the internet, listen and watch academic related audios & videos in a digital library.

Apart from this, the users from the digital library can also browse the parent library through web OPAC (Online Public Access Catalogue) and even subscribed electronic databases. The digital library is designed and developed keeping in view the shifting IT environment and the day to day needs of modern students. Total book collection are 25846 and 1650 CD are there. 18 open access links are also given E journals subscribe by library are SCIENCE DIRECT and J-Gate Engineering & Technology (JET).

29) Marathwada Mitra Mandal's Institute of Technology Lohgaon

The trust "Marathwada Mitra Mandal, Pune" was established in 1967 by Hon. Late Shri. Shankarraoji Chavan, Former Home Minister, Govt. of India as the "Founder President" and followed by Hon. Late Shri. Vilasraoji Deshmukh, Former Union Minister, Govt. of India. It is affiliated to SPPU.

Central Library:

The mission of the Central Library is: To provide information services and access to full text and bibliographic electronics, digital and printed resources to support the scholarly and informational needs of the Institute Community.

The central Library is a hub of knowledge with an enviable collection of Books, Print Journals, Periodicals, e-Journals, e-conference proceedings, e-standards, online/offline e-Books, Question Papers and Syllabus in digital form, CD-ROM, DVD's and Video based teaching material from IIT's (NPTEL), etc which spreads fragrance of knowledge. The library uses SLIM-21 Library Management software.

The library has more than 15215 books with subscription to 6500 online e-journals and 54 print journals. A rich collection more than 3950 Video's, 1312 CD and DVDs is also available. Students have open access in the library with extended hours of working even after college timings. Availability of over 2600 books, in digital form (offline/online) and 25 PC terminals with unlimited Internet access specially provided in Digital library is a pride. National Program on Technology Enhanced Learning [NPTEL] facility is available. Library Automation:- SLIM-21, Library Automation Software with Barcode Technology. It has Membership of ARAI, Jaykar Library UOP, MMCOE, and IMERT available in India. Under this, over 750 e-books (free Downloaded), Syllabus Copies of all Courses and question papers of all branches are available in digital form with Printing, Photocopying and Scanning facility.

30) Zeal Education Society's Dnyanganga College of Engineering and Research, Nare

Zeal Education Society is established in year 1996 by Hon. Shri S. M. Katkar, ZCOER is established in 2007. The college offers UG engineering degree courses in Civil Engineering, Computer Engineering, and Electrical Engineering, Information Technology, Electronics & Telecommunication and Mechanical Engineering.

Central Library:

ZCOER is having total 921.91 sq m specious area for central Library. In the central library we have different sections like; book stacking, periodicals, reference, PG Section, digital library with 10 nodes & well ventilated reading hall with capacity of 250+ students. All the books have been classified as per Dewey decimal classification system. Transaction of books has been done by computerized barcode system through AutoLib software. OPAC search facility available in Library Premises. Library collection includes books -29193,e-books- 11733,book bank-1155,E journals – 554, CD's – 2341,Other –NPTEL, Membership of NDL and ARAI and 15 nodes of computer are there to access digital content in library.

31) Sinhgad Technical Education Society, Sinhgad Institute of Technology and Science, Nare

Sinhgad Institute of Technology and Science (SITS) were established in 2008 under the umbrella of Sinhgad Technical Education Society. Sinhgad Institute of Technology and Science, Pune. It is the 5th Engineering College of the group, located at Narhe, Pune. SITS is approved by All India Council for Technical Education (AICTE), New Delhi, Directorate of Technical Education (DTE), Mumbai, and is affiliated to Savitribai Phule Pune University, Pune. The institute offers UG program in Computer Engineering, Information Technology, Electronics and Telecommunication, Mechanical Engineering, Civil Engineering and PG in E&TC Engineering, Mechanical Engineering, and MBA.

Central Library:

Library consist more than 13,340 books with 2414 titles. AutoLib Library Management Software with OPAC (Online Public Access Catalogue) is available, In Digital Library 53 computers with internet facility. Wi-Fi connectivity, reprography and printing facility are also available.5 Engineering colleges of Sinhgad Technical Education Society are in the vicinity, offer

interlibrary loan service to each other if required. NPTEL video lectures and educational CDs are available in library.

32) KJ 'S Educational Institute Trinity College of Engineering and Research, (Pisoli)

KJEI's Trinity College of Engg. And Research was established June 2008 at the scenic foothills of Bopdev Ghat, Yewlewadi, Pisoli, and Pune. The College is approved by AICTE & DTE, Govt of Maharashtra and is affiliated to University of Pune. The College offers courses in Electronics & Telecommunication, Mechanical Engg, Computer Engg, Information Technology, and Civil & Electrical Engg. The college boasts of quality state of art infrastructure with well planned designed adequate class rooms and labs.

Central Library:

The library is fully computerized with SLIM 21 Software.Library collection includes books -21381, e-books-200+, CD's – 742, E journals - ASCE ONLINE, ASME ONLINE, IEL ONLINE (Multi users), IEEE, NDL and SCIENCE DIRECT. NPTEL (4000) is also available.

33) Jaywant Shikshan Prasarak Mandal, Bhivarabai Sawant Institute of Technology and Research (Wagholi)

(BSIOTR) Bhivarabai Sawant Institute of Technology & Research (BSIOTR) is one among the competent engineering colleges, established in 2009. The institute offers Under Graduate courses in Electrical Engineering, Computer Engineering, Information Technology, Electronics & Telecommunication, and Mechanical Engineering. The College is unaided and approved by AICTE & DTE, Govt of Maharashtra and is affiliated to University of Pune

Central Library:

Central Library manages knowledge, both in print and digital formats, ensures seamless discovery and access to these scholarly resources, and provides faculty, students, and staff with professional support to find, evaluate, manage, and use such resources.. Its collection of about 14000 volumes has been knowledge resource for undergraduate and post graduate students. The Library has subscription of E-journals which can be accessed by students and staff. This digital library consists of various research papers, articles, etc. Students and staff can access sites like IEEE, Science Direct, ASME, Springer, JGATE, McGraw-Hill, ASTM, etc. Videos lectures on various topics conducted by faculties from IITs for different courses are another resource available in the Library. Library Automation Software is AutoLib. E journals - ASME ONLINE, IEEE , SCIENCE DIRECT, McGraw-Hill Access Engineering, J-Gate Engineering & Technology (JET).NPTEL is available. Whole campus is Wi-Fi.

34) Dhole Patil College of Engineering (Wagholi) Pune

Dhole Patil College of Engineering (DPCOE) is a premier Engineering and Management College in the city of Pune, Maharashtra, India. DPCOE was founded in 2008 with the objective of providing quality technical education of international standards and to help create students that match contemporary global requirements. The College is unaided and approved by AICTE & DTE, Govt. of Maharashtra and is affiliated to University of Pune.

Central Library:

Total books collection 16908 and DELNET is subscribed by library. Libraries have membership British Library, IIT Mumbai Library and Jaykar Library e -journals subscribes are IEEE Online journal facility, ASME Online Journal, ASTM Digital Library, McGraw-Hill Digital Library, SPRINGER Link Journal, SCIENCE DIRECT and ,J – Gate for Engineering

35) KJEI's Trinity Academy of Engineering Yewlewadi

KJEI's Trinity Academy of Engineering was established in 2010 located on 12 acres almost 22000 sq m constructed state of art infrastructure and marched ahead with quality education.

They offer four under-graduate programs in Computer Engineering, Electronics & Telecommunication Engineering, Mechanical Engineering and Civil Engineering and two post-graduate programs in Mechanical Engineering (Design Engineering), Civil Engineering

Central Library:

The library is fully computerized with SLIM-21 Software. Total collection of Books are10303.E journals subscribe by library ASCE, ASME, IEEE and SCIENCE DIRECT .Also institutional membership, NPTEL (4000), open access journal provided by library.

36) G H Raisoni Institute of Engineering and Technology, Wagholi

G H Raisoni, an institution established in 2007 .This Engineering College has been approved By ALL India Council for Technical Education, New Delhi and the Government of Maharashtra. All its courses are affiliated to Savitribai Phule Pune University. It offers Four Years/Eight Semester (12+Level) Degree courses in Engineering and Technology in the branches of Mechanical Engineering, Civil Engineering, Information Technology, Computer Engineering and Electrical Engineering.

Central Library:

The library collection includes of books, e-books, national and international journals and publications. It houses a vast collection of DVD and CD-ROMs that cover a range of topics across engineering and management the library subscribes to a lot of literature from reputed institutes like the IEEE (Institute of Electrical and Electronics Engineers), ASCE (American Society of Civil Engineers) and ASME (American Society of Mechanical Engineers) among many others. With interlibrary loan facility all college libraries of Raisoni group are linked through internet so

students can have access to near about 1,98,352 books ,research books, journals and other resources.

37) Dr D. Y. Patil School of Engineering Lohgaon, Pune

The Technical campus is situated in D Y Patil knowledge City with all the modern amenities. The Technical campus comprises of School of Engineering, School of Engineering and Technology, School of Architecture and School of Management. This Engineering College has been approved By ALL India Council for Technical Education, New Delhi and the Government of Maharashtra. All its courses are affiliated to Savitribai Phule Pune University.

Central Library:

Library contain sufficient amount of books required of staff and students .It has separate digital library set up which contain e-books and e-journals from IEEE ,SCIENCE DIRECT, ASCE & ASME. Different institutional memberships are there, NPTEL video lectures and different CDs are available for user. Reprographic and scanning facilities also provide by library.

38) Navsahyadri Group of Institute (Nesgi) (Koregaon Park)

Navsahyadri Group of Institutes (NESGI), Koregaon Park, Pune is established 2010. This Engineering College has been approved By ALL India Council for Technical Education, New Delhi and the Government of Maharashtra. All its courses are affiliated to Savitribai Phule Pune University.

Central Library:

The Library consists of Reference Section, Journals Section, reading Hall & Stack Room. The Library has unique collection of Textbooks, Reference Books, journals & CD'S, a separate digital library with NPTEL, e-Journals and over 4250 book titles.

39) Institute of Knowledge, College of Engineering (Hadapsar)

Institute of Knowledge, College of Engineering establish in 2010. Samanvay Prathishthan's IOK COE, is approved by the All India Council for Technical Education (AICTE), recognized by Director of Technical Education and affiliated to SPPU. The Institute offers degree courses in Mechanical, Electronics & Telecom, Automobile, Civil and Computer Engineering. The Institute also offers Post Graduate course in Computer Engineering.

Central Library:

The IOKCOE Library consists of a Central Library and 06 departmental libraries which collectively support the teaching, research and extension programs of the Institute. All students, faculty members of the Institute are entitled to make use of the Library facilities on taking library membership. The Library, besides having a huge collection of books on engineering, offers library services through its various Divisions.

They have large collection of around 10,155+ books, 44 Journals & 10 Magazines / Periodicals for all disciplines in hard bound session. Library provided NPTEL facility and Springer, Wiley, J GATE Engg & Tech., ASTM, IEEE, ASCE etc e-Journals Resources to all the Staff & Students in IOK-COE Campus. DELNET network is also there in library. These e-resources are possible to access & download from anywhere in IOK-COE campus through Internet

40) JSPM Narhe Technical Campus Pune

JSPM Narhe Technical Campus is part of JSPM groups i.e. is Jaywant Shikshan Prasarak Mandal was established in 1998.It is approved by the All India Council for Technical Education (AICTE), recognized by Director of Technical Education and affiliated to Pune University and established in 2011. JSPM Narhe Technical Campus offers degree courses in Mechanical Engineering, Electronics and Telecommunication Engineering, Computer Engineering and Civil Engineering

Central Library:

Library collection includes books – 15481, ebooks- 300+, Project report-73, CD's – 940,e journals - IEEE, Science Direct, Wiley Blackwell, Springer, ASTM, J gate and EBSCO. NPTEL is also available in library.

41) Rasiklal M Dhariwal Sinhgad Technical Institute Campus Warje Pune

RMD Sinhgad Technical Institutes Campus Warje, Pune was established in 2011 under the umbrella of Sinhgad Institutes. The Institute is recognized by All India Council for Technical Education (AICTE), New Delhi, Directorate of Technical Education (DTE), Mumbai, and is affiliated to University of Pune, Maharashtra State, India. The campus offers programs in Engineering, Management Studies and Computer Studies through the following schools.

Central Library:

The college has well-established computerized Library with a large collection of textbooks, reference books, technical journals, educational DVDs and CDs for all courses offered through RMDSTIC. In addition to print copies of relevant journals, the library has also subscribed international online journals like IEEE, ASME, ASCE, WILEY BLACKWELL, McGraw HILL, Science Direct, ASTM, J-Gate(JET and (JSMS), BCRC which can be accessed and downloaded through internet facility provided in digital library. NPTEL video lectures s is also available in library.

The library has separate reading area, reference section, digital library room, audio visual room, Periodicals section etc to facilitate fullest utilization of the available resources by the students and staff. In order to facilitate all the readers in selecting the reading materials of their interest, the open access provided to all members. The reading materials have been classified based on Dewey Decimal Classification (DDC). The Information and resources are constantly updated and the facilities are added periodically to keep pace with the recent developments in the

various areas of knowledge. Total book collection of library is 17071, NPTEL facility is available.

42) NBN Sinhgad Technical Institute Campus Pune

NBN Sinhgad School of Engineering (NBNSSOE), a part of NBN Sinhgad Technical Institutes Campus (NBNSTIC), Ambegaon (Bk), Pune. The Institute is recognized by All India Council for Technical Education (AICTE), New Delhi, Directorate of Technical Education (DTE), Mumbai, and is affiliated to University of Pune, Maharashtra State and established in 2011.

Central Library:

Library of NBN SSOE has all the necessary books & journals as per norms. It is being developed as true Learning Resources Utilization Centre. It is situated in a separate building. It has very large stacking area for books, journals & magazines & also a spacious reading hall. The library and information resources centre is automated with Online Public Access Catalogue (OPAC) using Library Software 'Auto Lib'. Digital Library provides access to various e-journals & e-books. Library collections includes Titles 1402, Volumes 6699,NationalJournals105,International & e- Journals 16222.e journals subscribed are IEL,J-Gate Engineering, ASTM Digital library Elsevier Science Direct ,ASME and Mc-Graw Hill

43) Anatrao Pawar College of Engineering and Research

Akhil Bharatiya Maratha Shikshan Parishad (A.B.M.S Parishad), an educational trust was Founded by a team of renowned educationists and social reformers. It was established in 2012. The Institute is recognized by All India Council for Technical Education (AICTE), New Delhi, Directorate of Technical Education (DTE), Mumbai, and is affiliated to University of Pune.

Central Library:

APCOER is having total 497.3 sq m specious area for Library. In the library we have different sections like book stacking, periodicals, reference, digital library with 10 nodes & well ventilated reading hall with capacity of 160 students. . The open access provided to all

members. All the books have been classified as per Dewey decimal classification system. They have large collection of around 8839 + books, 42 National Journals for all disciplines in hard bound session. Library provided NPTEL facility & they have an official Membership of Springer EEC, Springer Mechanical, Wiley Blackwell, J-Gate, ASTM Digital Library, DELNET, and NDL E-Journals Resources E-Journals Resources to all the Staff & Student in APCOER. There are 58 CD's in library.

44) Pad. Dr D.Y.Patil Institute of Engineering Management and Research, Akurdi Pune

Dr. D. Y. Patil Prathishthan's, D.Y. Patil College of Engineering, was established in 1984 in Pimpri and later shifted to Akurdi complex in 2001, which is in the vicinity of Pimpri Chinchwad Industrial area, one of the biggest Industrial belts in Asia. The college spreads over 10 acres of land with seven Engineering disciplines. This Institute is approved by AICTE, New Delhi and is affiliated to the Savitribai Phule Pune University.

Central Library:

Library was established in the year 1984. It has come a long way since then. Library is enriched with vide variety of books, well equipped with modern facilities and resources in the form of books 37907, e-journals5828, CD 1677 ,e journals - ASCE ONLINE , ASME ONLINE, IEEE +AAPP+POP, ACM DIGITAL LIBRARY, SCIENCE DIRECT, , J-Gate Engineering & Technology (JET) and Gale C engage, NPTEL video lectures (5000+), 15 nodes of computer in library to access digital content.

45) Keystone School of Engineering Pune

Keystone school of Engineering was established in the year 2012. It was started with three conventional courses viz., computer, E&TC and Mechanical Engineering. The institute is unaided and affiliated to Savitribai Phule Pune University.

Central Library:

State of art library with large number of books, e-books and digital library well equipped computer center with Wi-Fi facility Library is enriched and equipped with modern facilities and resources in the form of e-journals, CD-ROMs etc. Open access system is followed hence the library. Library has been continuously enhancing and improving its facilities. The library also provides electronic access to various e-journals.

46) Pimpri Chinchwad Education Trust Pimpri Chinchwad College of Engineering and Research (Ravet)

Pimpri Chinchwad College of Engineering (PCCoE) is established in 2014, nurtured and managed by Pimpri Chinchwad Education Trust (PCET). Academics at PCCoE are disciplined with results at the par of best colleges in Savitribai Phule Pune University (SPPU). The institute is unaided and affiliated to Savitribai Phule Pune University.

Central Library:

In PCCOER library & Information Centre established in year 2014. It is well equipped with textbooks, reference books, general books, magazines, Journals, CD ROM, Video lectures, online resources & other reading materials.

Library is fully computerized with ERP system. Every student can get information from any place and any time with effective work of ERP implementation in the library. Books are classified according to the Dewey Decimal Classification Scheme & open access is allows users a direct access to the library collection.

In Digital Section of library has six nodes for Internet browsing, so our users can access the e-Journals, e-books, video lectures easily. Once the Students are admitted to the

courses, their personal details and the course being pursued are automatically transferred to Library ERP SYSTEM. The College Identity cards issued to them bear the library barcodes that enable them to use library facilities.

47) ISB & M School of Technology (ISBMSOT), Nande, Pune

The Institute is recognized by All India Council for Technical Education (AICTE), New Delhi, Directorate of Technical Education (DTE), Mumbai, and is affiliated to University of Pune, Maharashtra State.

Central Library:

Sot library is an invaluable resource for student, researchers and faculties of engineering. The library has over the years built a robust collection of over 7666 books, journals and news papers, and many other resources like exam Questions papers, CDs (165) and videos. The library spread over 424 sq m. and Digital library 90 sq m. Also provides access to the best of engineering and research related digital resources through its subscription AICTE databases consisting of scholarly and industry relevant content. The library is automated with AutoLib Library Software to provide to computer rise information and issue-return to the users. The institute has a modern library where students and faculty have access to textbooks, CD's, national and international journals, periodicals, newspapers and e-journals. A supplementary digital facility is also available that students and use to research material that is available on the internet. They also provide access to information products online and a wide range of services.

48) Army Institute of Technology

Army Institute of Technology, Pune (AIT) is an undergraduate engineering college affiliated to the University of Pune. Only wards of army personnel are allowed admission. The admission is done through JEE MAINS exam. AIT functions under the aegis of the Army Welfare Education Society (AWES) and has the senior most officer of the Indian Army, the Chief of Army Staff of the Indian Army (COAS), as the President of its Board of Governors. It offers under-

graduate and post-graduate engineering courses. Under- graduate (Four year duration): Computer engineering (120 seats), Electronics and Telecommunication engineering (120 seats), Information Technology (60 seats) and Mechanical engineering (60 seats), Post-graduate (Two year duration): Mechanical Design (18 seats). All above programs are approved by All India Council for Technical Education (AICTE) and affiliated by Savitribai Phule Pune University (formerly Pune University). All U.G courses are accredited by National Assessment and Accreditation Council (NAAC) with A Grade in 2016 and NBA. Under Graduate receives a Bachelor of Engineering (BE) degree & Post Graduate receives a Master of Engineering (ME) degree from Savitribai Phule Pune University.

Central Library:

AIT has a well-stocked library having collection of Books 30931, National and International Print Journals and E-Resources, e journals - ASCE ONLINE , ASME ONLINE, IEEE, Mc Graw Hill, Springer, SCIENCE DIRECT, J-Gate Engineering & Technology (JET).The Library maintains a separate reference collection consisting of encyclopedias, dictionaries, handbooks, data books. It has a digital section having Audio/Video, CDs, CBTs. and NPTEL videos Library is fully computerized database using SLIM 21 Software. OPAC search and reissue transactions are made available on Intranet and Internet. Bar-code based circulation is available. Library membership is available of Jayakar Library, and A.R.A.I. Library, Pune. Plagiarism Check Facility is available. Suggestion Register for student and staff: Library Face book for suggestions and recommendations: https://www.facebook.com/aitpunelibrary

49) P.K. Technical Campus, Khed

P.K.Technical campus conducted B.E. course .It is unaided, affiliated with SPPPU and approved by AICTE.

Central Library:

Well organized and a collection of around 5000 books, journals, periodicals of national and international repute are available for the reference to our students. With Dell net & Reading room with the capacity of 300 students can do reading. It has huge collection of books, e-books, national and international journals and publications. It houses a vast collection of DVD and CD. E-journals - ASCE ONLINE, ASME ONLINE, IEL ONLINE (Multi users), ACM DIGITAL LIBRARY, SCIENCE DIRECT, Blackwell Wiley, J-Gate Engineering & Technology.

50) Genba Sopanrao Moze Trust Parvatibai Genba Moze College of Engineering Wagholi:

It is established in 2006 in Wagholi, Pune .It is un-aided and autonomous college. Affiliated to SPPU and approved by AICTE. Civil, Computer, IT, E&TC and mechanical engineering courses are conducted in it.

Central Library:

It has a well-stocked library having collection of Books, National and International Print Journals and E-Resources. The reading hall can accommodate 50 students at one time. The Library maintains a separate reference collection consisting of encyclopedias, dictionaries, handbooks, data books. It has a digital section having Audio/Video, CDs, CBTs. and NPTEL videos; this section also provides access to e- journals. Library is fully automated, OPAC search and reissue transactions are made available on Intranet and Internet.

Summary:

Engineering colleges where undergraduate education i.e. BE is conducted are well developed in Pune. Nearly 50 engineering colleges are in Pune city located at different parts. Each and every engineering college in Pune has well settled libraries and these are the soul of any academic institution. For providing information support to learning and teaching system and also growth of institutions it is necessary to have well developed libraries managed by qualified librarians and staff to meet the needs of users. In digital era libraries are changing from

traditional to modern to achieve the objectives of institutes. To cope up with situation, libraries have to be automated and managed with updated software's. Current, research, new, updated information is to be provided to right user at right time. Library services have to be according to latest trends. To provide services librarian and library staff have to update their knowledge and skills regular basis. There are many institutes of engineering colleges conducting diploma, polytechnic, certificate course, PG diploma course, B.E., M.E., B. Tech, and M Tech in Pune. Researcher has considered only colleges where bachelor of engineering course (B.E.) is conducted in Pune only. Not only print but digital content are also available in library. EBooks and e journals are available in libraries as per needs of branches. Many Institution spent finance on subscription of e-packages mandatory by AICTE and to automation. Some engineering institutes also accredited by NACC and NBA. Engineering college libraries are facing problems, challenges and opportunities while managing libraries in technological era.

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Chapter 5

Data Analysis: Interpretation and Presentation

5.1 Introduction

5.2 Libraries of Engineering Institutes in Pune City

5.3 Status of Engineering College Institutes

5.4 Affiliation Status

5.5 Accreditation Status

5.6 Accreditation Agencies

5.7 Library Working Hours

5.8 Status of Library Automation

5.9 Librarian's Qualification

5.10 Availability of Electronic Resource In Libraries

5.11 Electronic Service Provided From Library

5.12 Infrastructure Barrier

5.13 Literacy and Skills Barrier

5.14 Economical Barrier

5.15 Content Barrier

5.16 Language Barrier

5.17 Technical Barrier

5.18 Initiatives by Librarian to Digitalize the Library

5.1 Introduction:

A survey was conducted to assess the digital divide status in the engineering for this purpose researcher has collected data from engineering colleges from Pune city. The data collected is analysed and presented in this chapter. The analysis includes a brief overview of the college along with its accreditation status, working hours, affiliation to university, status of institute etc.

The chapter also presents the data analysis of six major factors that are reviewed in the research study.

A) Infrastructure Barrier
B) Literacy and skills Barrier
C) Economical Barrier
D) Content Barrier
E) Language Barrier
F) Technical Barrier

5.2 Libraries of Engineering Institutes in Pune City:

The questionnaire was prepared for the librarians to find out the practices followed by libraries and various services provided to the engineering libraries in Pune city. The developments of libraries are analyzed and impact of library resources and services analysed which causes barriers for digital divide that are identified.

5.2.1 Population and Sampling:

This study covers only those colleges which conduct Bachelor of Engineering courses (B.E.) in Pune. There are total 51 engineering colleges in Pune which conducts B.E. (UG) courses and only these are considered by the researcher for survey. A questionnaire was prepared for librarians to understand the different aspects like general information of institution,

automation status, library management software, electronic collection, librarian and staff information, library services (given by computer/Internet), availability of different resources, budget, technical problems, language problems, literacy and skill problems etc. Analysis has been done on basis of all these data collected through questionnaire.

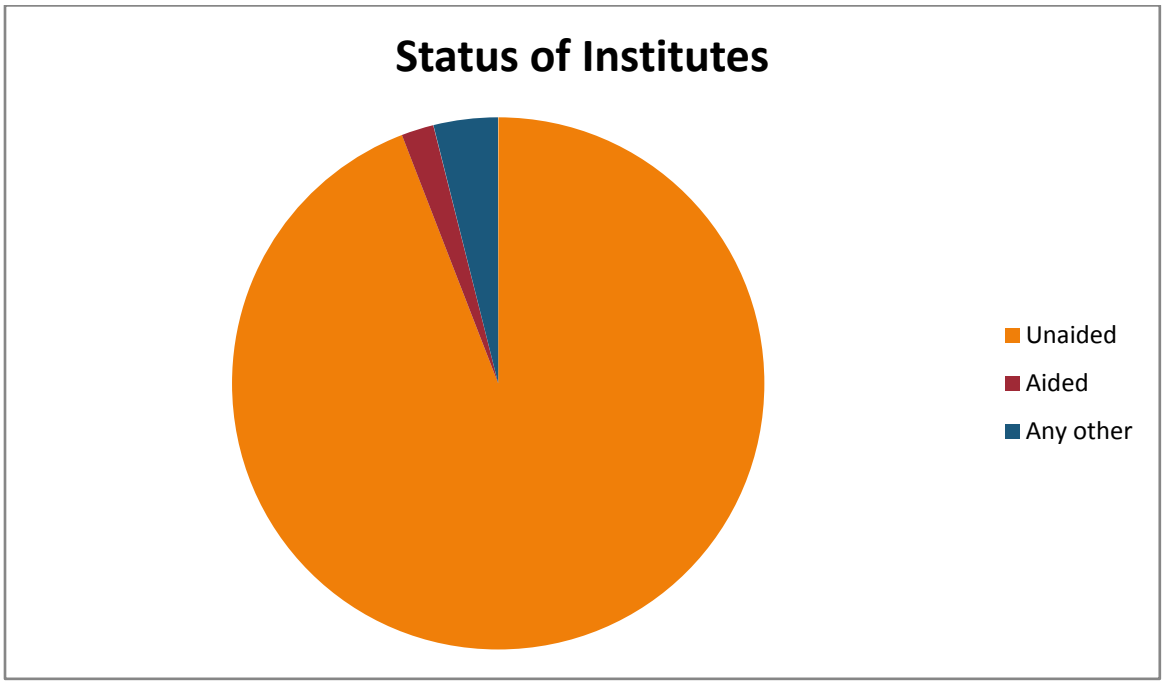
Out of 51 engineering college libraries questionnaires circulated among all librarians for survey, but out of 51 colleges surveyed only 50 (98%) Librarians responded to the survey. The maximum efforts were made to collect data from each library.

5.3 Status of Engineering College Institutes:

Table 5.1 Status of Engineering College Institutes

Sr. No	Aided	Un-aided	Any other	Total
1	1	47	2	50

Fig 5.1 Status of Engineering College Institutes



Observation:

Mostly all the colleges 94% engineering colleges are unaided, and only 2% (1) colleges are aided and 4% are managed by the deemed university.

5.4 Affiliation Status:

Affiliation is important factor for engineering institute.

Table 5.2 Affiliation Status

Sr No.	Affiliated to SPPU	Affiliated to any other	Total
1	50	0	50

Observation:

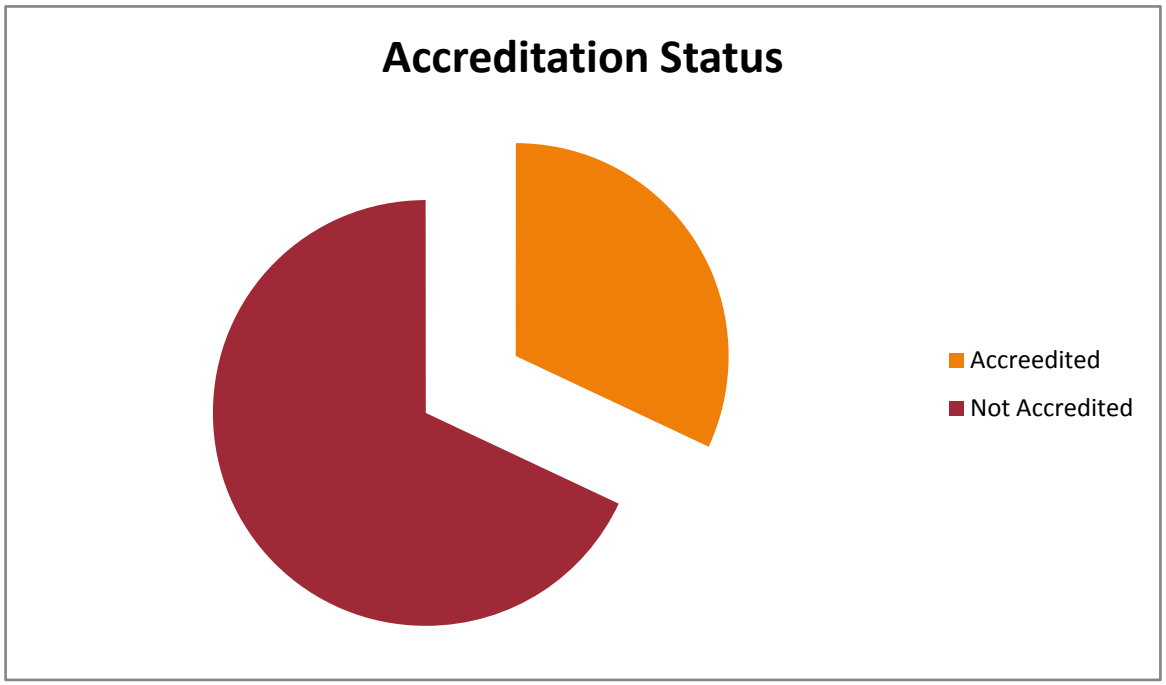
All engineering colleges are affiliated to Savitribai Phule Pune University (SPPU) where BE courses are conducted.

5.5 Accreditation Status:

Table 5.3 Accreditation Status

Sr No.	Accredited	Not accredited	Total
1	16	34	50

Fig 5.2 Accreditation Status



Observation:

32% (16) colleges are accredited and 68% (34) are not accredited so far by any agencies.

Table 5.4 Requested for Accreditation

Sr. No	Requested for accreditation	Not requested for Accreditation	Total
1	15	19	34

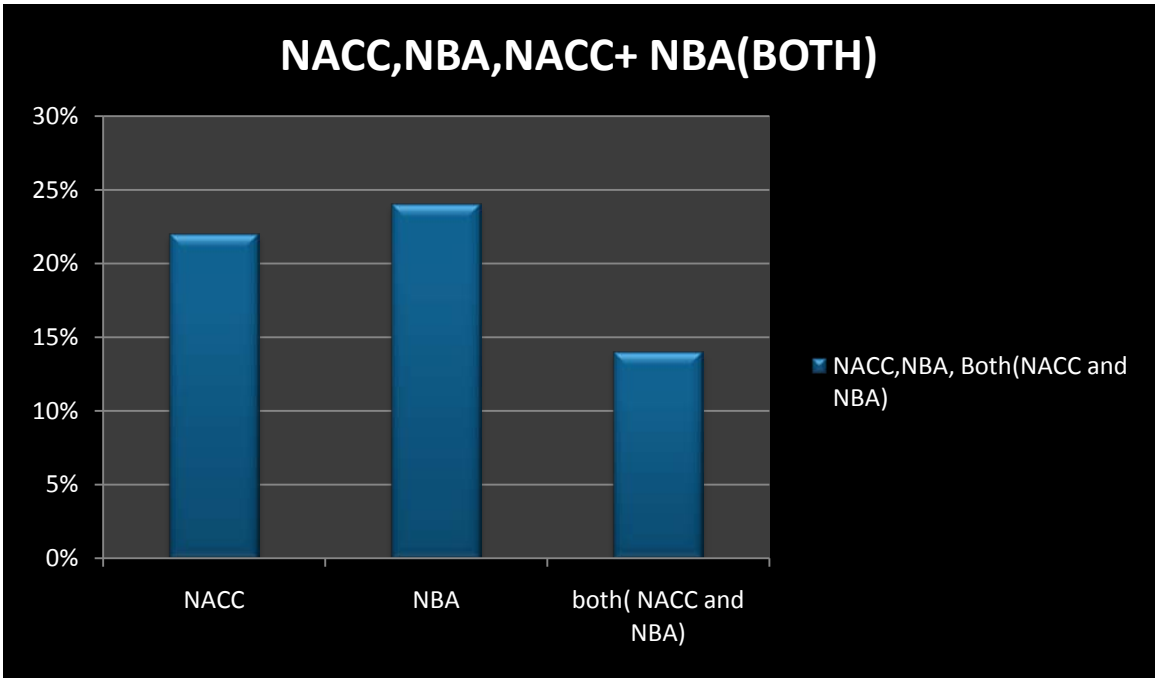
Observation:

Out of 34 colleges only 15 (44%) have applied for accreditation and remaining not applied for accreditation.

5.6 Accreditation Agencies:

NBA and NACC are accreditation agencies for academic and educational institutions. These accreditation agencies help to enhance the quality of institutes and proficiency.

Fig 5.3 Accreditation Agencies



Observation:

22% engineering colleges are accredited by National Assessment and Accreditation Council (NACC) and 24% are accredited by National Board of Accreditation (NBA). Remaining

14% institutes are accredited by both NBA and NACC. Accreditations of colleges are very less but many institutes have applied for NACC and NBA accreditation for this year.

5.7 Library Working Hours:

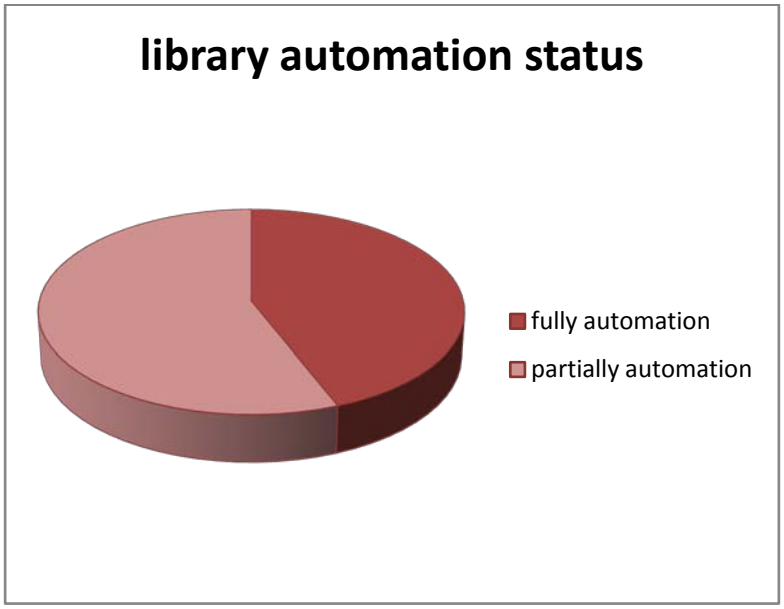
Most of the libraries have average working hours and follow 7 to 8 hrs per day. Reading hall of all libraries are kept open on an average 12 to13 hrs a day for the users. During examination period of reading hall timings are extended additional 2 hrs

5.8 Status of Library Automation:

Table 5.5 Automation status of Libraries

Sr. No,	Automation status	Respondent	%
1	Fully	22	44
2	Partially	28	56
3	Non-automated	0	0
	Total	50	100

Fig 5.4: Library Automation Status



Observation:

56 % libraries are fully automated but 44 % libraries are partially automated in engineering sector.

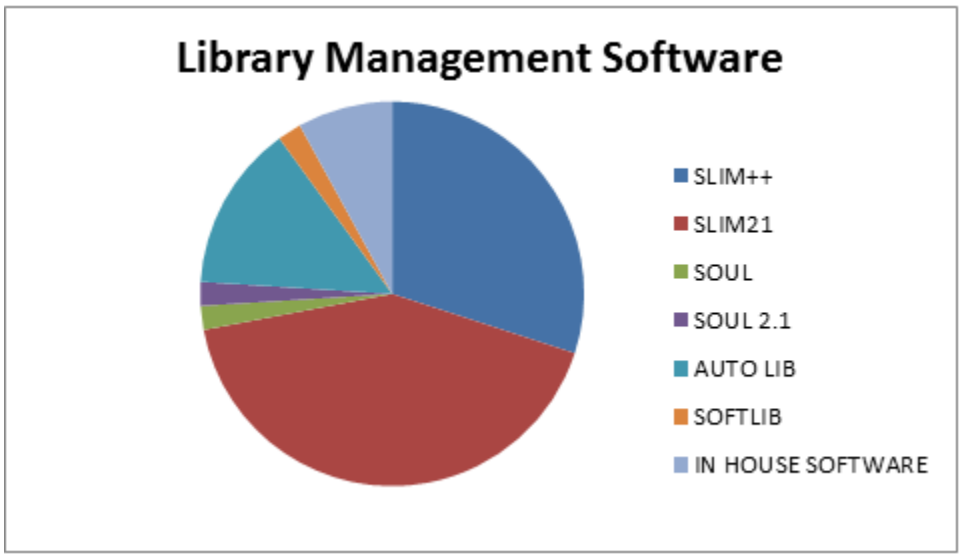
5.8.1 Library Management Software:

Many LMS like SLIM++, SLIM21, SOUL, SOUL2.1, AutoLib, softlib etc are used in libraries. Some institutes used customized software and some institutes have their own software development cell for developing in-house software.

Table 5.6 library management software:

Sr. No.	Software	Respondent	Percentage %
1	SLIM++	15	30
2	SLIM 21	21	42
3	SOUL	1	2
4	SOUL 2.1	1	2
5	AUTO lib	7	14
6	Softlib	1	2
7	In house software's	4	8
	Total	50	100

Fig 5.5: Library Management Software



Observation

30% institute's uses SLIM++ software, 42% have used SLIM21 software, 14% used Auto lib software, and 8% used in house software's and rest 2% libraries used SOUL, SOUL2.1 and SOFTLIB software,

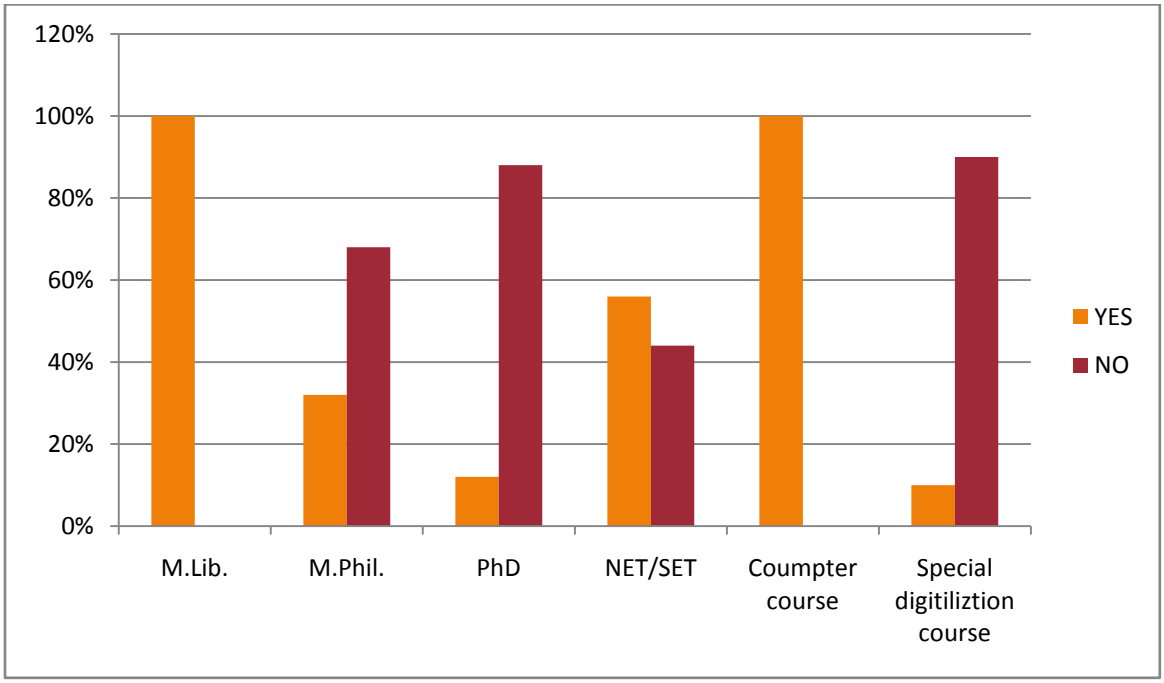
5.9 Librarian's Qualification:

Librarians are professionally well qualified and have good experienced in LIS field to manage the libraries in digital era. The assessment indicates:

Table 5.7 Qualifications

Sr. no	Qualification	M.Lib	M.Phil	Phd	NET/ SET	Computer Course	Specialized Digital Course
1	Yes	50	16	06	28	50	05
2	No	0	34	44	22	0	45
3	Total	50	50	50	50	50	50

Fig 5.6 QUALIFICATIONS



Observation

All librarians have completed their M.lib degree at minimum level and they are sufficiently qualified. 32% Librarians also completed their M. Phil degrees in library science. Out of 50 librarians only 12% have completed PhD and 56%) are NET/SET qualified. All 50 of them completed basic computer awareness courses. Only 10% are completed special digitization course.

5.10 Availability of Electronic Resource in Libraries:

Availability of electronic resource has a great impact on the libraries. It shows its strength and richness of collection.

Table 5.8 Availability of electronic resources

Sr. No.	Collection	Yes	No
1	e-books	50	0
2	e-journals	50	0
3	e-newspaper	10	40
4	Online thesis(ETD)	45	05
5	e-reports /projects etc	20	30
6	Audio –visual material(cd's etc)	50	0
7	NPTEL	50	0
8	QEEE Lecture	1	49
9	OPAC/WEB OPAC	50	0
10	Network based information service	42	08
11	Online databases	43	07

Observation:

All libraries have good collection of e-Books and e-Journals in their libraries. E-package subscription is now mandatory by AICTE and e-resources are subscribed as per the need of the institute. NPTEL video lectures of IITs are also available in all institutes. Audio video collection is also accessible to user in all institutes. OPAC are made available in the institute and online database access is also provided to the users.

5.11 Electronic Service Provided from Libraries:

Electronic services are provided effectively and efficiently only when library staff is well aware of its provision and use. Proper guidelines and special skills are necessary for giving these types of services. Various services can be provided using technologies but library staff needs to be technological savvy.

Table 5.9 Availability of electronic service

Sr. No.	Electronic services	Yes	No	Yes %	No%
1	CAS	50	0	100	0
2	SDI	35	15	70	30
3	Library website	50	0	100	0
4	Email alert	50	0	100	0
5	Internet	50	0	100	0
6	Abstract	2	48	4	96
7	Indexing	0	50	0	100
8	OPAC/Web OPAC	50	0	100	0
9	Intranet	50	0	100	0
10	Computer access	50	0	100	0
11	Wiki	0	0	0	0
12	Social networking (library blog, fb etc.)	5	45	10	90
13	Mobile application	2	48	4	96
14	Wi Fi	50	0	100	0
15	Digital library (if separate section)	36	14	72	28
16	Institutional membership(online access)	50	0	100	0

Observation:

All engineering institutes (100%) provide services like CAS, website (mostly under college website), email alert, internet access, intranet OPAC, computer access and Wi-Fi facilities to users. It was observed that some services provide by libraries are differs like 70% provide SDI and 4% provide Abstracting and indexing, 10% officially attached to social networking and only 4% provide services through mobile applications.

5.12 Infrastructure Barrier:

The different aspects of infrastructure of libraries are observed under this component through various questionnaires. Library building, space for different section, hardware and library software all this different perspectives is observed.

Table 5.10 Infrastructure Barrier

Sr. No.	Infrastructure	Yes	No
1	Separate Library Building	5	45
2	Separate Space for digital Library/ computer section in library	36	14
3	Sufficient No. of Computer for access of e-resource	50	0
4	Latest Hardware is used in Library	6	44
5	Latest (Update Version) Software is used in Library	35	15

Observation

Every engineering institute has space for library building including reading room facility for students, staffs and faculties. Out of 50 colleges only 5 institutes having separate library building rest of institute have its central library inside the main building of institute.

All engineering institute provide access to electronic resources to their users. For this purpose separate space for digital library with computer is provided by some institutes and some of them provide this space inside the library. 36 out of 50 engineering colleges' libraries have separate digital library section apart from library while 14 make arrangement for users inside the library to access electronic resource. 72% has separate section while and 28% don't have separate section for digital library

All engineering institute provide sufficient number of computer to their users to access electronic resource. Internet, intranet and Wi-Fi facilities are also provided and user can access information from anywhere within institute's campus.

Out of 50 institutes only 12% institutes used updated hardware. 70% institute libraries have updated version of software's.

5.13 Literacy and Skills Barrier

Different questionnaires are put to find out the literacy and skills barriers among libraries. Various promotional activities are conducted to increase the use of electronic

resources from the libraries. ICT training and skills are adapted by the library staff and such developments are also vital for effective use of library resources. If librarian and library staff is not technology savvy then handling computer related work is not easily managed.

5.13.1 User Orientation Programs / Workshops for Increase in Use of e-Resources:

Orientation programs and workshops helps user to access electronic resources properly and make 100% use of it. Different institute conduct different types of workshops or orientation for faculty and students.

Table 5.11 user orientation/workshop in library for e resource

Sr. No.	User orientation program	Respondent	%
1	Yes	50	100
2	No	0	0
	Total	50	100

Observation:

The table shows that all institutes conduct orientation programs or workshops for user to increase the effective and efficient use of e-resources.

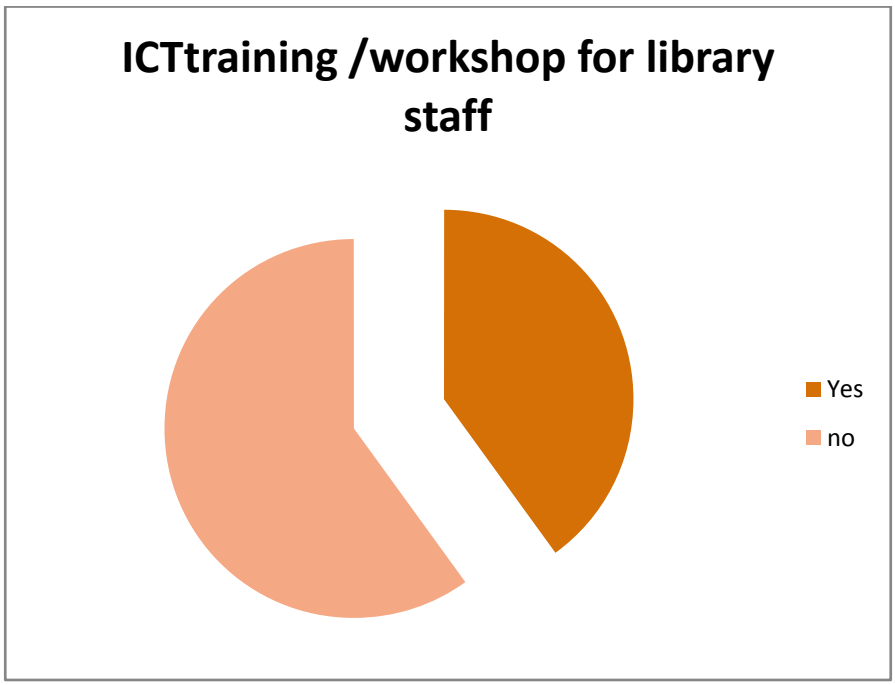
5.13.2 ICT **Training /Workshop for Library Staff:**

ICT training is important to develop advanced skills for handling various resources and services in the libraries by librarian and staff. They can serve user in a much better way.

Table 5.12 ICT training /workshop for library staff

Sr No	ICT training /workshop for library staff	Respondent	Percentage
1	Yes	20	40
2	No	30	60
	Total	50	100

Fig 5.7 ICT training/ workshop for library staff



Observation:

It is observed that the percentage of providing training or workshop in the field of ICT is very low. 60% institutes do not conduct any ICT training or workshop for library staff while 40% conduct training /workshop for library staff for last 03 years regularly.

5.13.3 Internet Savvy:

All librarians said that they are well aware of use of internet for various purposes. They use computer for professional as well as offering library services to the users.

5.13.4 **Other Activities:**

Librarian need to handle various computer related work in academic libraries. It is observed that all librarians can manage to perform all types of computer work easily which is necessary for managing library in advanced age.

5.13.5 Hardware and Software Problems:

Librarians are not able to handle hardware related problems but some software related issues are managed by them. Usually different sections of technical staffs are available in institute to handle these problems or they have tie up with computer Maintenances Company / agency. Librarians are not able to handle hardware related problems more but 20% librarians can handle software related problems.

5.13.6 Special Digitization Course:

There are special courses for digitization of library

Table 5.13 special digitization course regarding library

Sr. no.	Special digitization course regarding library	Respondent	%
1	Yes	5	10
2	No	45	90
	Total	50	100

Observation:

10% librarian of engineering institute have undertaken special digitization course for managing digitization in library and 90% have not done any specialized courses in digitization.

5.13.7 **User Satisfaction due to Electronic Resources and Electronic Services :**

Survey of user satisfaction gives an idea of use of electronic resource and services. Libraries can give more effective services by analyzing user level of satisfaction.

Table 5.14 User satisfaction survey and service

Sr. no.	User satisfaction survey about e-resource and e- service	Respondent	%
1	Yes	36	72
2	No	14	28
	Total	50	100

Observation:

Most of engineering institute have conducted user survey for understanding their user satisfaction from the electronic resources and services provided by libraries. 72% respondents have positively responded and 28% have negatively indicated for the survey.

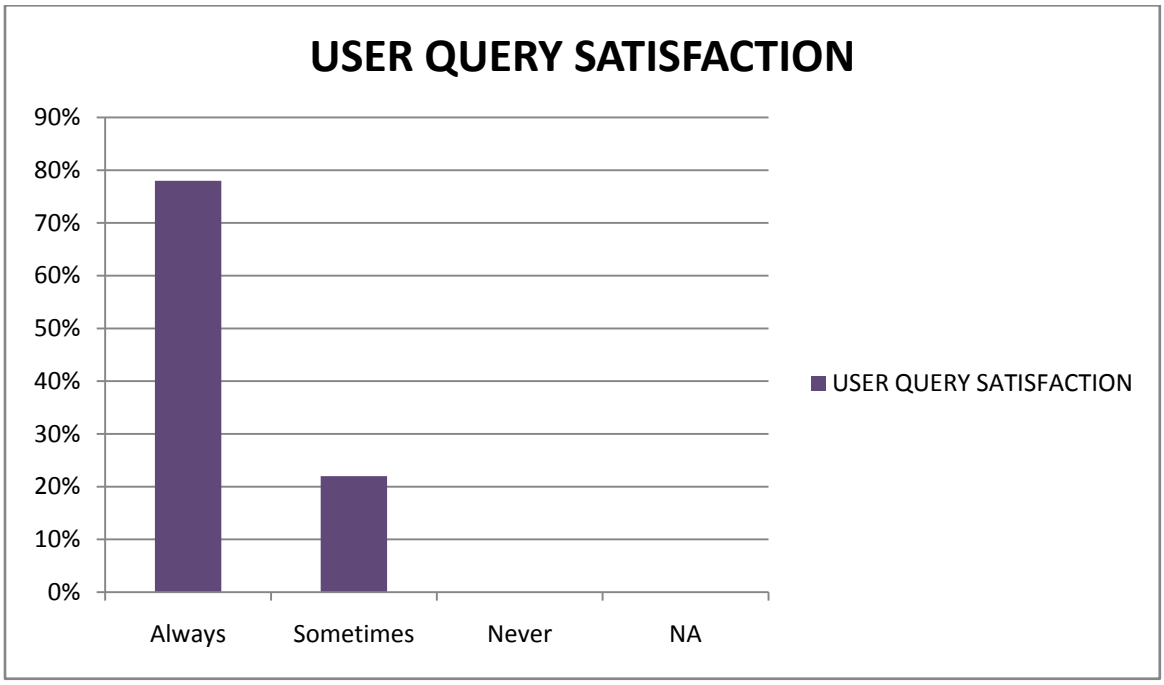
5.13.8 Access to e-Resources:

It is necessary to find if libraries are able to satisfy the user query regarding access of e-resource. If they have proper knowledge then only they can satisfy the queries.

Table 5.15 user query satisfaction regarding e resource

Sr. no	Response	Respondent	%
1	Always	39	78
2	Sometimes	11	22
3	Never	0	0
4	NA	0	0
	Total	50	100

Fig 5.8 User query easily satisfied regarding access of e- resource (in %)



Observation:

78% librarians have opined that they can be able to satisfy the user query using e-resources and 22% yet to develop.

5.14 Economical Barrier:

This question was related to budget but most of libraries did not respond this question very well.

Table5.16: Separate Budget

Srl No	Separate Budget Provision for	Yes	No
1	E resources	0	50
2	Training/ Workshop for Librarian and Staff	0	50
3	Digitization of Library	0	50
	Total	0	50

Table 5.17: Common Budget

Sr. No	Common Budget	Respondent	Percentage
1	Yes	50	100%
2	No	0	0

Observation

Separate budget is not provided for any activity like e-resource subscription, training/workshop for librarian and staff (for knowledge update) and digitization of library but a common budget of library is formed and under it provision is made for it.

5.15 Content Barrier:

Availability of large, irrelevant and overload of information is a common problem of information age. This difficulty is faced by every library when they have to provide information services to users.

Table 5.18 content barrier (in value)

Sr.No	Content barrier	Always	Sometimes	Never	total
1	Online material are not available	0	35	15	50
2	Incomplete information	12	33	5	50
3	Difficulty in finding relevant information	1	11	38	50
4	Overload of information on internet	32	12	6	50

Observation:

70% librarians pointed out that sometimes online materials are not available while only 30% indicated that they could find the online material for users. 24% said, they have found incomplete information and 66% said, they found it sometimes and remaining said they have never found incomplete information.

76% librarians never find difficulties in searching relevant information, but 22% said they have find difficulties in getting information for users. 2% has always find difficulties in searching relevant information. 64% said, there is always overload of information on internet, but 24% sometime and 12% never find overload of information on internet.

5.16 Language Barrier:

Language plays vital role in information handling and can act as a barrier. The communication skills of librarian if developed well, the barrier can be removed, and they can communicate in proper way to their user and solve their queries.

Table 5.19 soft skill communication training for staff

SR No.	Soft skill course/communication	Respondent	Percentage
1	Yes	32	64
2	No	18	36
	Total	50	100

Observation:

64% librarians of the institute conduct soft skill course /communication courses for library staff and rest 36% do not conducted any type of such courses to remove language barrier in communication.

Table 5.20 language translator

Sr No.	Language Translate software	Respondent	Percentage
1	Yes	0	0
2	No	50	100
	Total	50	100

Observation:

In engineering institute librarians do not use any language translator software in library. They use Goggle translator or search for translated copy on net.

5.17 Technical Barrier:

Internet speed, data downloading problems, broadband problems, slow access etc are some important hurdles in the use of technology and providing technology based services. Search tools, availability of information, difficult to access information etc are also some other issues. Barcode system, smart membership card, RFID, security system and computer security system also influenced the use of resources. Library networks, resource sharing etc highly affect the technology based services for users.

Table 5.21 Technical barrier (in value)

Sr No.	Technical barrier	Always	Sometimes	Never	Total
1	Slow internet speed	36	13	1	50
2	Slow access	36	14	0	50
3	Long time to download information	30	16	4	50
4	Conversion of information is difficult	5	37	8	50
5	Round the clock availability to access e-resource(in campus)	50	0	0	50
6	Broadband problems	42	6	2	50
7	Easily accessible to user	50	0	0	50
8	No proper search tools for information retrieval	0	10	40	50

Fig 5.9 technical barrier

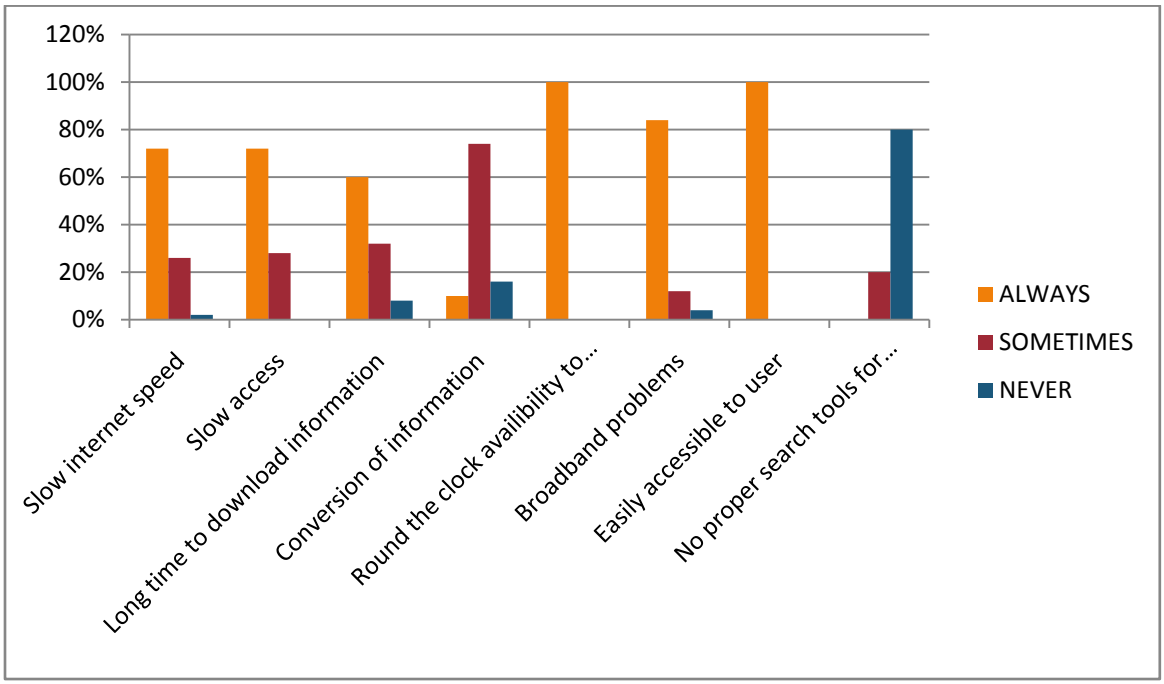
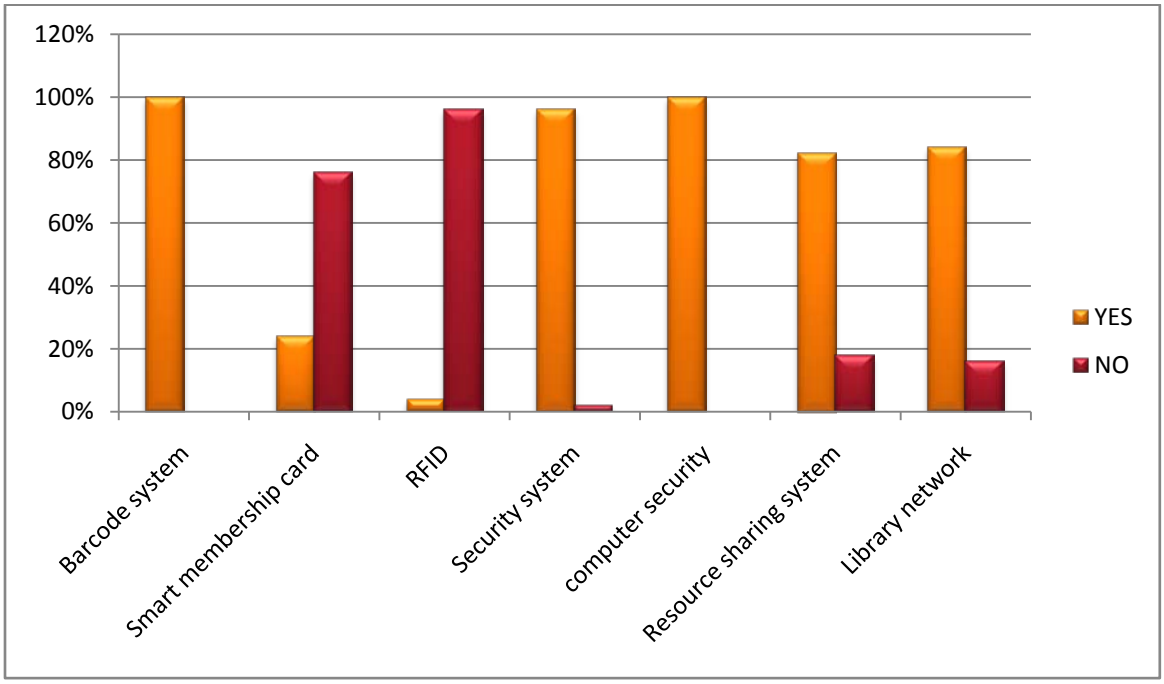


Table 5.22 Other systems (in value)

Sr No.	Availability of systems	Yes	No	Total
1	Bar code system	50	0	50
2	Smart membership card	12	38	50
3	Security system(cctv etc)	48	2	50
4	Computer security system (antivirus)	50	0	50
5	RFID	02	48	50
6	Resource sharing system	41	09	50
7	Library network (e.g. DELNET etc)	42	08	50

Fig 5.10 other systems



Observation:-

All institutes provide round the clock availability to access e-resource in campus and few internet facilities also. All engineering institutes used technologies which are user friendly i.e.

easy to access. All institutes have bar code system and computer security systems like antivirus etc in their institutes.

Librarians have indicated that there are no proper search tools and techniques for information retrieval is known to users and hence they are not in a position to either retrieve proper information or even get information available in libraries also. There is a demand from the users for the training for searching information using technology and e-resources.

72% librarians have indicated that they always face the problems of slow internet speed form the users, whereas 26% s faced problem sometimes and 2% never faced such problem. 72% librarians opined that users faced the problem of slow access to information resources and 28% faced it sometimes. Problem regarding long time to download information is faced by 60% users and 32% users indicate they face the issues sometimes and 8% never faced it. 10% always found difficulties in conversion of information in other form while 74% found sometimes and 16% never.

84% libraries always face broadband related problems. Smart membership card is used by 24% libraries and 76% don't use it. RFID is available in libraries just 4% only. 98% have Security system in libraries. 82% librarians are involved in resource sharing to gather information desired by users from other institutes or internet. Library network is available in 84% libraries

5.18 Initiatives by Librarian to Digitalize the Library:

Different initiatives are taken by librarians to digitalize the library collection and the efforts are as follows:-

- Subscriptions to e- journal packages
- Subscribed e- books
- Use and provides open source information resources to users available on net
- Attending different workshop and training for gaining expertise in ICT to update their knowledge.
- Provide e-sources as per the user need and their satisfaction level.

- On-line question bank and syllabus made available on library home page
- Library Blogs development
- Current notification/ alert on website
- E-mail alert, CAS, SDI services online
- Reference and Referral service through Intranet and Internet.
- Learning new technology and set up library.
- Library automation and digitization.
- Resource sharing using Internet and library networks.

Summary:

This survey is carried out in the engineering college libraries which conducted bachelor of engineering course i.e. B.E. only. In Pune city there are total 51 engineering colleges; out of which 50 college's respondent to survey. The factors considered are directly and indirectly affect the users need and use of ICT for information gathering.

The data analysis and interpretation to find out the digital divide in engineering colleges while solving the educational and research problems it is noticed that digital divide is comparatively less in professional education system, but use of ICT, e-information resources, availability of information on subject are few problems yet to many users and librarians which relates to digital divide. After analyzing data Infrastructure barrier, literacy and skills barrier, economical barrier, content barrier, language barrier and technical barrier are major factors that cause digital divide among professionals and users. Availability and access of resources and services from libraries also affects and act as cause of digital divide. From this it is conclude that many factors create digital divide in engineering college's libraries. Librarians have to manage to eliminate digital divide by applying best practices in libraries.

Chapter 6

Findings, Suggestions, Best Practices and Conclusion

6.1 Introduction

6.2 Findings

6.3 Suggestion

6.4 Best Practices for Bridging Digital Divide

6.5 Causes of Digital Divide

6.6 Best Practices

6.7 Objective Satisfied

6.8 Hypothesis

6.9 Scopes for Further Research

Summary

6.1 Introduction

This chapter presents the findings after data analysis. The researcher has tried to put forth few suggestions and best practices for elimination of the research problems in hand. It is necessary in the era of ICT that engineering college libraries have to cope up with the technological developments at both user and professional end. Libraries are changing their look from traditional to modern due to use of technologies but still digital divide is noticed. In this information and ICT era the libraries have to adapt best practices to enhance use of different technologies, practices and digital resources and provide services to the users as well as try to reduce digital divide issue.

6.2 Findings:

This survey is carried out in the engineering college libraries and focused on bachelor of engineering course i.e. B.E. only. In Pune city there are total 51 engineering colleges; out of which 50 colleges have responded to survey. The factors considered are directly and indirectly affect the users need and use of ICT for information gathering and analyze the impact of it.

The data analysis and interpretation is focused on to find out the digital divide in engineering colleges, and solve the educational and research problems. It is noticed that digital divide is comparatively less in professional education system, but use of ICT, e-information resources, availability of information on subject have few problems, which yet too many users and librarians relates to digital divide. After analyzing data on infrastructure barrier, literacy and skills barrier, economical barrier, content barrier, language barrier and technical barrier which are major factors that cause digital divide among professionals and users. Availability and access of resources and services from libraries also affects and act as cause of digital divide. From this it is conclude that many factors create digital divide in engineering college's libraries. Librarians have to manage to eliminate digital divide by applying best practices in libraries.

A) General Findings:

- The term 'digital divide' was introduced in the mid-1990s. 'Digital Divide' has further led to the concept of 'Knowledge divide' or 'Information divide' which reflects the level of Knowledge and Information one can have or do not have.
- The digital divide can be understood as inequalities in four successive type of access: viz. Motivation, physical access, digital skills and different usage.
- Function related to use, access, store and retrieve information when used through technology creates various hurdles which lead to digital divide
- The reasons for digital divide in libraries are unfamiliarity with use of technology, lack of knowledge, internet problems, technical issues, financial constraints etc.

B) Findings from the Survey:

- Mostly all the colleges 94% engineering colleges are unaided, and only 2% colleges are aided and 4% are managed by the deemed university. All engineering colleges are affiliated to Savitribai Phule Pune University (SPPU) where BE courses are regularly conducted.
- Only 22% engineering colleges are accredited by National Assessment and Accreditation Council (NACC) and 24% are accredited by National Board of Accreditation (NBA). 14% institutes accredited by both NBA and NACC. Accreditation of colleges is very less but many institutes has applied for NACC and NBA accreditation for this year. (To capture the international market the standardization of institutes is considered as a most important factor. NACC and NBA are one of the most important committees which analyses the quality of institute and enhance its standards).

- Every engineering institute has space for library building including reading room facility for students, staffs and faculties. Out of 50 colleges only 5 institutes having separate library building rest of institute have its central library inside the main building of institute.

- 56 % libraries are fully automated but 44 % libraries are partially automated in engineering sector.

- Most of the libraries have average working hours up to 7 to 8 hrs per day. Reading halls of all libraries are kept open on an average 12 to13 hrs a day for the users. During examination period reading hall timings are extended additional to 2 hrs.
- 30% institutes uses SLIM++ software, 42% have uses SLIM21 software, 14% used AutoLib software, 8% uses in house software's and rest 2% libraries used SOUL SOUL2.1 and SOFTLIB software. OSS are not used by the library professionals

- All libraries have good collection of e-Books and e-Journals in their libraries. E-package subscriptions are now mandatory by AICTE and e-resources are subscribed as per the need of the institute. NPTEL video lectures of IITs are also available in all institutes. Audio video collection is also accessible to user in all institutes. OPAC are made available in the institute and online database access is also provided to the users.

- All engineering institutes (100%) provide services like CAS, website (mostly under college website), email alert, internet access, intranet OPAC, computer access and Wi-Fi facilities to users. It was observed that some services provide by libraries are differs like 70% provide SDI and 4% provide Abstracting and indexing, 10% officially attached to social networking and only 4% provide services through mobile applications.

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- All engineering institute provide sufficient number of computer for their users in libraries to access electronic resources. Internet, intranet and Wi-Fi facilities are also provided and users access information from anywhere within institute's campus.

- Out of 50 institutes only 12% institutes used updated hardware. 70% institute libraries have updated version of software's.

- Different questionnaires are put to find out the literacy and skills barriers among libraries. Various promotional activities are conducted to increase the use of electronic resources from the libraries. ICT training and skills are adapted by the library staff and such developments are also vital for effective use of library resources. If librarian and library staff is not technology savvy then handling computer related work is not easily managed.

- The survey indicates that all institutes conduct orientation programs or workshops for their user to increase the effective and efficient use of e-resources. It is observed that the percentage of providing training or workshop in the field of ICT is very low. 60% institutes do not conduct any ICT training or workshop for library staff while 40% conduct training /workshop for library staff for last 03 years regularly.

- All librarians said that they are well aware of use of internet for various purposes. They use computer for professional as well as offering library services to the users.

- Librarians are not able to handle hardware related problems but some software related issues are managed by them. Usually different sections of technical staffs are available in institute to handle these problems or they have tie up with computer Maintenances Company / agency. Librarians are not able to handle hardware related problems more but 20% librarians can handle software related problems.

- 10% librarian of engineering institute have undertaken special digitization course for managing digitization in library and 90% have not done any specialized courses in digitization.

- Most of engineering institute have conducted user survey for understanding their user satisfaction from the electronic resources and services provided by libraries. 72% respondents have positively responded and 28% have negatively indicated for the survey.

- 78% librarians have opined that they can be able to satisfy the user query using e-resources and 22% yet to develop.

- Separate budget is not provided for any activity like e-resource subscription, training/workshop for librarian and staff (for knowledge update) and digitization of library but a common budget of library is formed and under it provision is made for it.

- 70% librarians pointed out that sometimes online materials are not available while only 30% indicated that they could find the online material for users. 24% said, they have found incomplete information and 66% said, they found it sometimes, remaining said they have never found incomplete information.

- 76% librarians never find difficulties in searching relevant information, but 22% said they have find difficulties in getting information for users. 2% has always find difficulties in searching relevant information. 64% said, there is always overload of information on internet, but 24% sometime and 12% never find overload of information on internet.

- All institutes provide round the clock availability to access e-resource in campus and few internet facilities also. All engineering institutes used technologies which are user friendly i.e. easy to access. All institutes have bar code system and computer security systems like antivirus etc in their institutes.

- Librarians have indicated that there are no proper search tools and techniques for information retrieval is known to users and hence they are not in a position to either retrieve proper information or even get information available in libraries also. There is a demand from the users for the training for searching information using technology and e-resources.

- 72% librarians have indicated that they always face the problems of slow internet speed form the users, whereas 26% s faced problem sometimes and 2% never faced such problem. 72% librarians opined that users faced the problem of slow access to information resources and 28% faced it sometimes. Problem regarding long time to

download information is faced by 60% users and 32% users indicate they face the issues sometimes and 8% never faced it. 10% always found difficulties in conversion of information in other form while 74% found sometimes and 16% never.

- 84% libraries always face broadband related problems. Smart membership card is used by 24% libraries and 76% don't use it. RFID is available in libraries just 4% only. 98% have Security system in libraries. 82% librarians are involved in resource sharing to gather information desired by users from other institutes or internet. Library network is available in 84% libraries

C) Digital Divide in Engineering Libraries:

1. Partial automation of library increases the digital divide in engineering college libraries. Even though there is availability of module but because of non availability of related technology to operate it, the system can't be used in full form. Hence even though the librarians are skillful and qualified non availability of latest technology (Hardware and software, information resources) gives rise to gap of digital divide due to unawareness.
2. Due to the accreditation process yet in process among few engineering institutes the overall development is not measured in term of quantity but also quality. In case of libraries, there are fixed parameters ranging from collection to library operation; from users to library management, from reading room space to digital library space.
3. The digital divide in engineering institutions libraries has visualized due to non-availability of e-resources and services. Source availability makes sure access but unavailability means again a gap which gives rise to the digital divide.
4. Wi-Fi facility is available to all campuses in all institution, but mobile applications like library apps, official social networking etc modern current trends are still not visualized and leads to digital divide.
5. Availability of electronic resource and the related services directly as well as indirectly cause digital divide. The provision of access and delivery of services to user has given rise to the digital divide due to availability and non availability of resource and service.

6. Infrastructure facility includes computer access, hardware and software access etc. Due to higher costs necessary upgrading of hardware and software is difficult; and hence, despite the rapid spread of the Internet the gap is growing wider as the technological standard grows even higher. But funding requirement lacks facilities like faster networks, higher level machines, more complex software and more capable professionals, advanced services based on digital resources.
7. Present information environment has given ways for proper information retrieval and users are not in a position to search information independently from different resources. The lack of information searching skills is also a digital divide.
8. In technology era, technology is changing and the infrastructure need is to be updated. When hardware and software is updated regularly then information dissemination with proper speed, in accuracy and in less time is possible. The user may get right information at right time and digital divide may be reduced if technologies are used properly.
9. Literacy skills are major barrier of digital divide which covers much literacy including information and ICT. Information literacy skills are required for accessing information and providing information based services to users. Literacy development covers: information accessibility and searching, information utilization, and information receptiveness. Accessibility means how to make use of information and communication tools (ICT) for fetching desired information.
10. User orientation program or workshops regarding access to technologies and e-resources is essential to promote activities of library. Even ICT workshop for librarian is necessary. User needs orientation to avoid digital divide.
11. Awareness and non awareness of information resources in digital form and collecting information is digital divide. User orientation programs helps in enhancing use of e-resources. Orientation activity bridges the gap between digital divide. If librarians are aware and qualified to set up of digitalized libraries then they can work in perfect manner as compared to that don't have such qualification. User survey and user query also show mirror to institute about satisfaction of e-resource and e-service.
12. It is noticed that finance has major impact and cause of digital divide. The financial support from institutes is essential for development of institutional libraries. Collection development, library automation, e-packages, institutional memberships, online / offline

database, NPTEL, establishment of new technologies, workshop etc. are based on provision of finance.

13. Libraries provide different services to users using both traditional and digital resources. The services are not known to users and non availability of online material, incomplete information, difficulty in finding relevant information, overload of information on internet etc are also covered under digital divide.
14. This digital divide act while providing e-service or access of e-resources to users. Digital divide is caused due to content barrier, and not able to access or utilize the source due to overload of information, not finding relevant information, incomplete information or non availability of information it give rise to digital divide.
15. No language translator software is available in any engineering libraries of Pune. 36% of institutes not conduct any soft skill course /communication training for library staff while 64% of institutes are conducted such course. They are well aware of fact that communication skills are most important fact between user and library staff. Language is most important factor of digital divide .Different people speaks different languages in India and in world. The information published in different languages other than English develops digital divide.
16. 72% libraries of engineering institutes of Pune face the problems of slow internet speed and access. 60% always find that downloading time is long. 74% sometimes find difficulty in conversion of information. 84% faces technical barrier of broadband problems. All institute libraries provide round the clock availability of access e-resource in campus. Technological barriers cause problems in handling and information accessing, information dissemination, information utilization and providing different service using technology. The service provided through computer using internet shows adverse effects when problems like slow internet speed, slow access, taking long time to download information and broadband problem etc. Sometimes conversion of information becomes difficult because of a technology barrier. The libraries are not able to provide the round a clock availability to access e-resource if there is technological hindrance. The availability of technology system like bar code system, smart membership card, RFID, security system, computer security (antivirus), network, resource sharing etc also has an impact on digital divide.

17. Ignorance about technology acts as biggest barrier and causes digital divide. Digital literacy is needed to operate information.

D) Initiatives by Librarians to Reduce Digital Divide:

There are many initiatives taken by librarians to improve and provide efficient services to users and also reduce digital divide.

- SMS alert on mobile.
- Use of Social media like blogs and Whatsapp in libraries to provide notification, new arrivals etc.
- Mobile applications helps user to get access to information from anywhere.
- Efforts to digitize library.
- Providing services using new technologies.
- Online availability of lecture notes to users.
- Resources and services in digital form can access information anytime and anywhere.
- Motivation for learning new technologies through orientation.
- Subscriptions to e- journal and e-book packages
- Use and providing open source information resources to users available on net
- Attending different workshop and training for gaining expertise in ICT to update their knowledge.
- Provide e-sources as per the user need and their satisfaction level.
- On-line question bank and syllabus made available on library home page
- Current notification/ alert on website
- E-mail alert, CAS, SDI services online
- Reference and Referral service through Intranet and Internet.
- Learning new technology and set up library.
- Library automation and digitization.
- Resource sharing using Internet and library networks.

6.3 Suggestions:

Based on the findings of the survey the researcher has indicated some suggestions and best practices to eliminate digital divide in engineering as well as other libraries too.

- Libraries have to be fully automated as this is the first step towards the advancement using technologies. The prevailing problems to be identified and solved to overcome automation problems, even OSS can be used to automate libraries like KOHA.
- All engineering institutes initiate for accreditation to enhance their standard and quality. The institutes to be encouraged for accreditations.
- All the necessary resources and services to be made available in libraries.
- Sufficient finance to be made available for acquiring electronic resources.
- Application of new technologies to be adapted in libraries.
- The need and requirements to be carefully identified and services to be provided accordingly.
- Digital library initiatives to be followed immediately with high capacity of Internet
- Sufficient computer access to be given to access information to users.
- Hardware to be updated and OSS software to be used.
- All engineering institutes' libraries have to conduct user orientation programs to increase use of e-resources and technologies to eliminate digital divide.
- A survey of user satisfaction regarding e-services and e-resources can act as best practice in libraries
- Librarian as well as library staff should well verse to handle computers and technologies.
- Qualified librarians and library staff satisfy user query for access to e- resources.
- Proper and sufficient amount of finance is to be provided to library for managing activities using technologies.
- For collection development of e -resource and providing e- services separate budget to be allocated.
- For training /workshop / orientation, librarian and library staff need to take initiatives to manage current trends and serve libraries in efficient and effective way.

- Enhance use of internet, relevant search engines, subject gateways, portals for information support to be provided to access information easily to users.
- Proper search tools and information retrieval skills to be developed among the users.

Bridging Digital Divide:

The national knowledge commission (2007) has made recommendations that all academic institutions have to set up repository of ETD, so the libraries can go for an effective resource sharing networks. There are certain efforts taken at the regional levels. (ALIBNET, MALIBNET, ADINET, and PUNET). Libraries continuously orient their users with modern information ways in handling information and access to information, communication and technologies can ultimately results in bridging digital divide. Digital Libraries Project aims to digitize million of rare books in the country and make it available to the users freely .In order to bridge the digital divide Govt of India in collaboration with the Centre for Advanced Computing aims to bring about one million of digital books to the doorsteps of promote literacy. The best practices to be adapted for bridging digital divide.

6.4 Best Practices for Bridging Digital Divide

6.4.1 Introduction:

The benefits to information society are increasing fast throughout the globe as information, knowledge and services are shifting towards electronic or digital media and mostly available online (Databases and internet). In such changing scenario, the users those have managed trends and moving along the waves of ICT survive in the information area and those could not move suffers with disadvantages. Digital divide hurdle is observed everywhere. Digital divide basically connotes the meaning as technological gap which has created hurdles for access to, use of, mainly ICT for any task and in case of Libraries, technological gap which has developed hurdles in managing information access using technologies and internet as well as e-resources. It can also be considered as unequal ability to access information, create knowledge bases (Data bases) using ICT.

6.5 Causes of Digital Divide:

There are numerous divides which has to be considered before bridging them.

1. Ability: Developing capacity to manage access to information using ICT
2. Access: Lack of access to ICT, internet
3. Age: Elder persons are not aware of ICT and also not comfortable for use
4. Connectivity of Net: Higher speed of internet is not provided which causes interruption in access.
5. Content of data: The Language is essentially known to users otherwise is a divide
6. Education: Low education values do not cope up the quality use of ICT for effective use in any discipline
7. Location: Rural and urban variations is also a divide
8. Skills: Lack of skills in managing ICT, and use of internet, searching skills etc
9. Cost: Cost of resources, equipments, maintenance is also divide
10. Manpower: Trained manpower with ICT skills is necessary

These are the major divides and need to be eliminated to bridge the digital divide.

6.6 Best Practices:

- Subscriptions to e- journal packages
- Subscribed e- books
- Use and provides open source information resources to users available on net
- Attending different workshop and training for gaining expertise in ICT to update their knowledge.
- Provide e-sources as per the user need and their satisfaction level.
- On-line question bank and syllabus made available on library home page
- Library Blogs development
- Current notification/ alert on website
- E-mail alert, CAS, SDI services online
- Reference and Referral service through Intranet and Internet.

- Learning new technology and set up library.
- Library automation and digitization.
- Resource sharing using Internet and library networks.

6.7 Objective Satisfied:

The objectives fixed for the study are satisfied completely. The objective

1) To study digital divide in the engineering college libraries in Pune city is satisfied in Chapter 3, 5, and 6. It is noticed that the digital divide in engineering and professional libraries are less as compared to other libraries.

2) To trace different factors which are responsible for digital divide in engineering is studied in chapter 6 and suggested few suggestions to eliminate the digital divide issues by adapting best practices.

3) To suggest possible solutions to reduce the digital divide among engineering college libraries in Pune also satisfied in chapter 6.

6.8 Hypothesis

Hypothesis considered for this study in the initial stage is:

- There is need to reduce digital divide among engineering college libraries in Pune city and this hypothesis is also proved true as there is still digital divide among the users in use of e-resources, technologies, information retrieval skills using internet etc.

6.9 Scopes for Further Research:

The scope of the present study is limited to BE engineering colleges only but similar study can be carried out for institutes conducting different technical courses like medical, pure sciences.

The area of study is limited to Pune and researcher may define extended area to state level.

6.10 Conclusion:

Engineering institute's libraries in Pune are technologically driven well. They focus on fulfilment of objectives, mission and vision of institutes. Still digital divide is exists in libraries of engineering colleges Pune in terms of

- Infrastructure Barrier
- Literacy and skills Barrier
- Economical Barrier
- Language Barrier
- Technical Barrier
- Status of library automation etc.

These are the real digital divide among the users. All these factors influence growth and development of libraries of engineering colleges. It creates difference in not only institutional libraries but also affects its collection, sources and services. Infrastructure facility means not only place or space for library but it also includes computer access, hardware and software management. More than just accessibility, individuals need to know how to make use of the information and communication tools (ICT). For growth and development of libraries of engineering provision of finance is necessary. India is a country having a multicultural and multilingual population and large percentage of information content available on the Internet is in English, for some users searching information is barrier and reason of digital divide. There is technological barrier which causes various problems regarding information accessing, information dissemination, and information utilizing and providing different service using

technology. Source availability makes sure access but unavailability means again a gap. All engineering institutes have to go for accreditation and networking to enhance its quality and standard. Partial automation of library increases digital divide. Fully automation of libraries is necessary for bridging the digital divide.

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LIST OF ENGINEERING COLLEGES

1). COLLEGE OF ENGINEERING, PUNE

2) MAHARASHTRA INSTITUTE OF TECNOLOGY (M.IT.)

3) PUNE INSTITUTE OF COMPUTER TECHNOLOGY (PICT)

4) D. Y. PATIL COLLEGE OF ENGINEERING AKURDI

5) VISHWAKARMA INSTITUTE OF TECNOLOGY (BIBWEWADI)

6) PUNE VIDYARTHI GRIHAS COLLEGE OF ENGINEERING AND TECNOLOGY

7) MKSSS'SCUMMINSCOLLEGEO F ENGINEERINGFORWOMEN(KARVENAGR)

8) ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY COLLEGE OF ENGINEERING

9) SINHGAD COLLEGE OF ENGINEERING (VADGAON)

10) PUNE DISTRICT EDUCATION ASSOCIATION COLLEGE OF ENGINEERING PUNE

11) DR. D.Y. PATIL VIDYA PRATISHTHANS SOCIETY, D.Y.P.I.E.T. PIMPRI PUNE

12) PROGRESSIVE EDUCATION SOCIETYS MODERN COLLEGE OF ENGINEERING PUNE:

13) GENBA SOPANRAO MOZE COLLEGE OF ENGINEERING PUNE

14) M I T ACADEMY OF ENGINEERING ALANDI PUNE

15) PIMPRI CHINCHWAD EDUCATION TRUST COLLEGE OF ENGINEERING

16) MODERN EDUCATION SOCIETIES COLLEGE OF ENGINEERING PUNE

17) ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETIES INSTITUTE OF INFORMATION TECHNOLOGY

18) BHARATI UNIVERSITY OF COLLEGE OF ENGINEERING FOR WOMEN,KATRAJ

19) SINHGAD TECHNICAL EDUCATION SOCIETY'S SMT. KASHIBAI NAVALE COLLEGE OF ENGINEERING, VADGAON

20) JAYWANT SHIKSHAN PRASARAK MANDAL'S RAJARSHRI SHAHU COLLEGE OF ENGINEERING, TATHWADE, PUNE

21) MAEER'S M I T COLLEGE OF ENGINEERING KOTHRUD, PUNE.

22) B.R.A.C.T. s VISHWAKARMA INSTITUTE OF INFORMATION TECHNOLOGY KONDWA

23) JAYWANTRAO SAWANT COLLEGE OF ENGINEERING PUNE

24) SINHGAD ACADEMY OF ENGINEERING KONDHWA

25) THE SHETKARI SHIKSHAN MANDAL SANGLIS PD. VASANTDADA PATIL INSTITUTE OF TECNOLOGY, BAVDHAN

26) MARATHWADA MITRA MANDAL'S COLLEGE OF ENGINEERING (KARVENAGAR)

27) JSPM'S IMPERIAL COLLEGE OF ENGINEERING AND RESEARCH WAGHOLI

28) CHANAKYA EDUCATION SOCIETYS INDIRA COLLEGE OF ENGINEERING AND MANAGEMENT PUNE

29) MARATHWADA MITRA MANDALS INSTITUTE OF TECNOLOGY LOHGAON

30) ZEAL EDUCATION SOCIETYS DNYANGANGA COLLEGE AND ENGINEERING AND RESEARCH NARE

31) SINHGAD TECHNICAL EDUCATION SOCIETY, SINHGAD INSTITUTE OF TECHNOLOGY AND SCIENCE, (NARE)

32) KJ's EDUCATIONAL INSTITUTE TRINITY COLLEGE OF ENGINEERING AND RESEARCH, (PISOLI)

33) JAYAWANT SHIKSHAN PRASARAK MANDAL, BHIVARABAI SAWANT INSTITUTE OF TECNOLOGY AND RESEARCH (WAGHOLI)

34) DHOLE PATIL COLLEGE OF ENGINEERING (WAGOLI) PUNE

35) KJEI'S TRINITY ACADEMY OF ENGINEERING YEWALEVADI

36) G H RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, WAGHOLIs

37) DR D. Y. PATIL SCHOOL OF ENGINEERING LOHEGAON, PUNE

38) NAVSAHYADRI GROUP OF INSTITUTE (NESGI)(KOREGAON PARK)

39) INSTITUTE OF KNOWLEDGE COLLEGE OF ENGINEERING (HADPSAR)

40) JSPM NARHE TECHNICAL CAMPUS, PUNE

41) RASIKLAL M DHARIWAL SINGHGAD TECHNICAL INSTITUTE CAMPUS WARJE PUNE

42) NBN SINHGAD TECHNICAL INSTITUTE CAMPUS PUNE

43) ANATRAO PAWAR COLLEGE OF ENGINEERING AND RESEARCH

44) PAD. DR D.Y.PATIL INSTITUTE OF ENGINEERING MANAGEMENT AND RESEARCH, AKURDI PUNE

45) KEYSTONE SCHOOL OF ENGINEERING PUNE

46) PIMPRI CHINCHWAD EDUCATION TRUST PIMPRI CHINCHWAD COLLEGE OF ENGINEERING AND RESEARCH RAVET

47) ISB & M SCHOOL OF TECHNOLOGY (ISBMSOT), NANDE, PUNE

48) ARMY INSTITUTE OF TECHNOLOGY, ALANDI ROAD

49) P K TECHNICAL CAMPUS KHED

50) GENBA SOPANRAO MOZE TRUST PARVATIBAI GENBA MOZE COLLEGE OF ENGINEERING WAGHOLI

NOT RESPONDED TO THE QUESTIONARIES –

1) SIDDHANT COLLEGE OF ENGINEERING, SUDUMBARE.

DIGITAL DIVIDE IN THE ENGINEERING COLLEGE

LIBRARIES IN PUNE CITY

Questionnaire to Librarian

Note: Please tick mark (√); write numbers, information wherever necessary.

A. **General information of the organization:**

1. Name and Address of the Institute / college: _____

   _____

   _____

   Phone No.: _____ e-mail Id._____

2. Year of Establishment : _____ Website:_____

3. Status of Institute / college: Aided ( ) Non – Aided ( ) Any other ( )

4. Affiliated to which University:

5. Accreditation status: Accredited ( ) Not Accredited ( ) Applied for Accreditation ( )

6. Accreditation by : NAAC ( ) NBA ( ) Both ( ) Other, Specify name:_____

B. **Institute Library:**

1. Name of the Library : _____

2. Library Working Hours:

Particulars	**Library Hrs**	**Timing**
Working Days		To
Sunday		To
Holiday		To

During exam period		To

3. Name of the library software :_____

4. Status of library automation :

   Fully ( ) Partially ( ) Non-automated ( )

5. Have you created website for your library : Yes ( ) No ( )

   If yes, please provide website address: _____

6. Total collection of the library : _____

7. Detail of staff members working in the library :

   Professional staff number: _____ Trained in IT number: _____

   Semi professional number: _____ Trained in IT number: _____

   Technical staff number: _____ Trained in IT number: _____

[C] Personal Details: (LIBRARIAN)

1. Name _____

2. Designation: _____ Age: _____ Gender _____

3. Educational qualification: _____

4. Qualification and training in the field of information technology (computer course):

   _____

5. Contact no. _____ e mail id : _____

D (1) Availability of electronic resource in the library:

Sr. No.	Digital Collection	Yes	No	(If Yes) give number

				where applicable
1	e- books			
2	e-journals			
3	e-newspaper			
4	Online thesis (ETD)			
5	Digitizes reports/dissertations/projects			
6	Audio –visual material(cd's etc)			
7	NPTEL			
8	QEEE Lectures			
9	OPAC / Web OPAC			
10	Network based information service			
11	Online database			
12	Any other			

Any other **(**please specify) _____

[D] 2 Availability of electronic service in the library:

Sr no.	Electronic service	Yes	No
1	CAS		
2	SDI		
3	library website		
4	Email alert		
5	Internet		
6	Abstract		
7	Indexing		
8	OPAC/ Web OPAC		
9	Intranet		
10	Computer access		
11	Wiki		
12	Social networking (library blog,fb etc)		
13	Mobile application		
14	Wi fi		
15	Digital library(if separate section)		
16	Institutional membership (online access)		
17	Any other		

Any other **(**please specify) _____

[E] Infrastructure Barrier:

Sr no.	Infrastructure	Yes	No
1	Separate library building		
2	Separate space for digital library / computer section in library		
3	Sufficient number of computer for access of e-resource		
4	Latest(update version) hardware is used in library		
5	Latest (update version) software is used in library		

[F] Literacy and skills barrier:

1. Do you conduct any user orientation program/ workshop etc to increase the use of e-resource?

Yes ( ) No ( )

If yes (please specify)

_____

2. Have you ever conducted any ICT training /workshop for library staff?

Yes ( ) No ( )

If yes (mention last training period or workshop)

_____

3. Are you net sway person?

Yes ( ) No ( )

4. Online work, file transferring/sharing, pdf etc work can easily handle by

SR NO.		Always	Sometimes	Never
1	Librarian			

5. Do you easily handle the problems related to I T in the library?

Hardware problems: Yes ( ) No ( )

Software problems: Yes ( ) No ( )

If no (give reason) _____

6. Have you done any special digitization course regarding library?

Yes ( ) No ( )

If yes (please specify) _____

7. Have you ever conducted a survey regarding user satisfaction about e-resource and e-service of library?

Yes ( ) No ( )

If yes (overall response):_____

8. Are you easily satisfied user query regarding access of e-resource:

Always ( ) sometimes ( ) never ( ) NA ( )

If never (please specify) _____

_____

[G] Economical barrier:

Sr no	Separate budget	Yes	No
1	e-resource		
2	Training /workshop for librarian and staff(for update knowledge)		
3	Digitization of library		

Or

Sr no	Common budget	Yes	No

[H] Content barrier:

Sr no	Content barrier while providing eservice or access of e-resource	Always	Sometimes	Never
1	Online Material are not available			
2	Incomplete information			
3	Difficulty in finding relevant information			
4	Overload of information on internet			

Any other (please specify) _____

[I] Language barrier:

1 Do you conduct any soft skill course/ communication training for library staff?

Yes ( ) No ( )

2 Do you have any language translate software for access the different language material available online/offline on computer?

Yes ( ) No ( )

If no (please specify reason and what you did in this situation:

_____

_____

_____

[J] Technical barrier:

Sr no	Technical barrier	Always	Sometimes	Never
1	Slow internet speed			
2	Slow access			
3	Long time to download information			
4	Conversion of information is difficult			
5	Round the clock availability to access e-resource			
6	Broadband problems			
7	Easily accessible to user			
8	No proper search tools for information retrieval			

Sr no	Do you have	Yes	No
1	Bar code system		
2	Smart membership card		
3	RFID		
4	Security system(cctv etc)		
5	Computer security system (antivirus etc)		
6	Resource sharing system		

7	Library network (e.g. DELNET etc)		
8	Any other technical system		

Any other (please specify): _____

[H]YOU'RE VIEW:

1. What initiative is taken by librarian to digitize the library?

_____

_____

_____

_____