forwarded

Head, DCIS

Shilpi
2/8/18

COE

2-8-2018

DECLARATION

I hereby declare that this dissertation entitled **"USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY"** submitted by me for the award of the Degree of Master of Philosophy in Library and Information Science to the Department of Library and Information Science, Babasaheb Bhimrao Ambedkar (A Central University), Lucknow is an outcome of my own efforts and is an original work. The contents of this dissertation did not form a basis for the award of any previous degree to anyone else.

I hereby also undertake that the Dissertation submitted by me to Babasaheb Bhimrao Ambedkar University Lucknow satisfies all the requirements as stipulated in the Master of Philosophy (M.Phil) regulation 2015 and it is fit for submission and evaluation for the award of the degree of Master of Philosophy in Library and Information Science of the University.

It is also certified that the suggestion suggested by the DRC during pre-submission presentation on dated 24-05-2018 duly incorporated in my dissertation.

Date: 02/08/2018

Place: Lucknow

Alok Kumar

(Alok Kumar)
Research Scholar

CERTIFICATE

This is to certify that the dissertation **"USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY"** submitted by Mr. Alok Kumar is an original research work and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

The dissertation submitted to Babasaheb Bhimrao Ambedkar University Lucknow satisfies all the requirements as stipulated in the Master of Philosophy (MPhil) regulations 2015 and it is fit for submission and evaluation for the award of the degree of Master of Philosophy in Library and Information Science of the University.

The suggestions made by DRC on the day of his pre-submission presentation are incorporated by the candidate.

Date: 2/8/18

Place Lucknow

Shilpi

Supervisor

2.8.2018

Head of Department

ACKNOWLEDGEMENT

There are many people whom I would like to acknowledge for enabling me to stand at this milestone of completing M.Phil degree. With great pleasure, I consider myself lucky to have Prof. Shilpi Verma, Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow as my research work supervisor. I offer her heartfelt gratitude for her guidance, help, support, affection and encouragement throughout the research study. Her precious guidance helped me in all the time of research, from the initial stage to compilation of the dissertation. I also wish to state truthful thanks to Prof. M.P. Singh, Head, Department of Library and Information Science, B.B.A.U, Lucknow and all the faculty members of the Department of Library and Information Science, Prof. K. L. Mahawar, Dr. Sharad Sonkar, Dr. Ranjeet Kumar Choudhary and Dr. Vinit Kumar, for their encouragement, cooperation and valuable suggestions for the study.

I am also grateful to all Library professionals of (IIMs) Indian Institutes of Management for their cooperation and assistance.

I would like to thank to all friends for their cooperation and help throughout research work. I am placing special thanks to all authors who have contributed their valuable research paper or research works on cloud computing which were used for the study.

I extend genuine gratitude to family members, especially my parents and my brother. I am thankful to all who directly or indirectly helped me during this research.

Alok Kumar

Date: 02/08/2018 ***Alok Kumar***

Place Lucknow

USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY

A DISSERTATION

FOR THE DEGREE OF

MASTER OF PHILOSOPHY

IN

LIBRARY AND INFORMATION SCIENCE

Submitted by

ALOK KUMAR

Supervisor

Prof. SHILPI VERMA

Department of Library and Information Science
(School for Information Science & Technology)
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
(A Central University)
VidyaVihar, Raebareli Road Lucknow, Uttar Pradesh

YEAR- 2018 **ENROLMENT NO-1366/16**

DECLARATION

I hereby declare that this dissertation entitled **"USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY"** submitted by me for the award of the Degree of Master of Philosophy in Library and Information Science to the Department of Library and Information Science, Babasaheb Bhimrao Ambedkar (A Central University), Lucknow is an outcome of my own efforts and is an original work. The contents of this dissertation did not form a basis for the award of any previous degree to anyone else.

I hereby also undertake that the Dissertation submitted by me to Babasaheb Bhimrao Ambedkar University Lucknow satisfies all the requirements as stipulated in the Master of Philosophy (M.Phil) regulation 2015 and it is fit for submission and evaluation for the award of the degree of Master of Philosophy in Library and Information Science of the University.

It is also certified that the suggestion suggested by the DRC during pre-submission presentation on dated 24-05-2018 duly incorporated in my dissertation.

Date:

Place: Lucknow

(Alok Kumar)
Research Scholar

CERTIFICATE

This is to certify that the dissertation **"USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY"** submitted by Mr. Alok Kumar is an original research work and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

The dissertation submitted to Babasaheb Bhimrao Ambedkar University Lucknow satisfies all the requirements as stipulated in the Master of Philosophy (MPhil) regulations 2015 and it is fit for submission and evaluation for the award of the degree of Master of Philosophy in Library and Information Science of the University.

The suggestions made by DRC on the day of his pre-submission presentation are incorporated by the candidate.

Date:

Place **Supervisor**

Head of Department

ACKNOWLEDGEMENT

There are many people whom I would like to acknowledge for enabling me to stand at this milestone of completing M.Phil degree. With great pleasure, I consider myself lucky to have Prof. Shilpi Verma, Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow as my research work supervisor. I offer her heartfelt gratitude for her guidance, help, support, affection and encouragement throughout the research study. Her precious guidance helped me in all the time of research, from the initial stage to compilation of the dissertation. I also wish to state truthful thanks to Prof. M.P. Singh, Head, Department of Library and Information Science, B.B.A.U, Lucknow and all the faculty members of the Department of Library and Information Science, Prof. K. L. Mahawar, Dr. Sharad Sonkar, Dr. Ranjeet Kumar Choudhary and Dr. Vinit Kumar, for their encouragement, cooperation and valuable suggestions for the study.

I am also grateful to all Library professionals of (IIMs) Indian Institutes of Management for their cooperation and assistance.

I would like to thank to all friends for their cooperation and help throughout research work. I am placing special thanks to all authors who have contributed their valuable research paper or research works on cloud computing which were used for the study.

I extend genuine gratitude to family members, especially my parents and my brother. I am thankful to all who directly or indirectly helped me during this research.

Date: ***Alok Kumar***

Place

PREFACE

In the age of virtualization, Cloud computing plays an important role to provide service in library. The adoption of cloud computing in libraries changes library finance, information technology, and personnel resources. It is the driving factor of library. It influences different areas like library operations, Meta data management, cataloguing, library services and digital collection. After the advent of internet, library services have been changed. Emergence of electronic and digital collection, demand of digital reference service, new trend of networked bibliographic data are changing the services and delivery methods.

This study has tried to investigate about library professionals, how much they use cloud computing application and what is the pattern and purpose of using cloud computing. IIMs are the premier institute in management education. They have world class libraries in terms of resources as well professionals. They have been adopted new technologies to provide good service to their users to achieve the goal.

The first chapter is introduction of the whole study, starting from the overview of cloud computing, basic of libraries and Introduction of IIMs has been discussed. After that statement of the problem, need and significance of the study, objectives of study, as well as hypothesis, scope and limitations of the study, are discussed.

The second chapter presents the literature review related to the study. Since cloud computing is the latest technology and models then most of the literatures belong to the recent decade.

The third chapter is profile of selected Indian Institutes of Management and their libraries. This chapter is also divided into sub titles like Introduction of IIM, IIMs libraries and their resources and services.

The Fourth chapter of this dissertation consist theoretical part of Cloud Computing. In this chapter, the introduction of Cloud Computing, Usage of cloud computing, model of cloud computing has been discussed. Types of cloud computing and application of cloud computing in library are also presented in this chapter. This chapter also explains the characteristics, advantage and disadvantage of cloud computing

The fifth chapter presents tabulation, statistical analysis, interpretation, and graphical representation of the collected data from the library professionals.

The sixth chapter presents the major findings and conclusion of the study. It deals with recommendations of the study and suggestion for further future research.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

IIM-C	Indian Institute of Management Calcutta
IIM-A	Indian Institute of Management Ahmedabad
IIM-B	Indian Institute of Management Bangalore
IIM-L	Indian Institute of Management Lucknow
IIM-I	Indian Institute of Management Indore
IIM-K	Indian Institute of Management Kozhikode
SaaS	Software as a Service
PaaS	Platform as Service
IaaS	Infrastructure as a Service
CC	Cloud Computing
AWS	Amazon Web Service

LIST OF TABLES

LIST OF FIGURES

Chapter-1
Introduction

Chapter- 1

Introduction

1.1 Overview

After the advent of Internet, there are lots of services developed online. Cloud computing is online service based model. The concept of cloud computing is a new one but there are lot of stages to reach here. There were different name to be used in initial stage; like grid computing, utility computing and SaaS. Cloud computing is widely adopted technology due to delivery of service over internet. Internet availability has become very easy that's why service of cloud computing is reachable on wider group. There are some technical reason to adopt cloud computing in any organization and system; improvement of energy efficiency, optimization hardware and software resources utilization, elasticity, Flexibility, performance isolation and on demand self-service.

The cloud computing is new business model wrapped around new technologies which attract the users. It provides smooth service for users. Now a days most of the mobile applications work on cloud platforms. Library has been also developing the mobile application for service providing. Due to attractive feature of cloud computing, it is used in different business organization.

The present study has been taken up to investigate, use of cloud computing by library professionals of libraries of Indian Institute of Management. The study has been conducted on Six Institutes of IIMs. They are IIM Calcutta, IIM Ahmedabad, IIM Bangalore, IIM Lucknow, IIM Kozhikode and IIM Indore. Library plays an important role for any institution or organization. In Indian context, IIMs libraries are very rich not only in resources but also in technologies. They offer

latest technologies to their users. Nowadays, Cloud computing is a smooth tool for users for storing and retrieving information over internet at virtual platform.

1.2 Cloud Computing

Cloud computing is an online computing that provides services on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of grid computing resources (e.g., computer networks, servers, storage, applications and services), which can be rapidly provisioned and released with less management effort.

Cloud computing has lots of application which is used for different purposes. Users have used it for storage (Google drive, Dropbox, Flickr, Youtube, just cloud, one cloud etc.) for documents, Video, Image. It is used for commercial purpose to host website. Online forms are created using cloud based platform. Google forms help to create online forms to know the feedback of customers and users.

Cloud computing is the result of the evolution and adoption of existing technologies and paradigms. The main goal of cloud computing is to allow users to take benefit and make life easy from all of these technologies, without the need for deep knowledge about or expertise with each one of them. The cloud aims to cut costs, and helps the users focus on their core business instead of being hindered by IT obstacles. The main enabling technology for cloud computing is virtualization. Virtualization software separates a physical computing device into one or more "virtual" devices, each of which can be easily used and managed to perform computing tasks. With operating system–level virtualization essentially creating a scalable system of multiple independent computing devices, idle computing resources can be allocated and used more efficiently. Virtualization provides the agility required to speed up IT operations, and reduces cost by increasing infrastructure utilization.

1.3 Indian Institutes of Management

IIMs are world class institutions in management education, a group of 20 public, autonomous institutes. They offer different types of programs Diploma, Postgraduate, doctoral and executive education program. The first prime minister of India Jawaharlal Nehru initiated to make IIMs on the recommendation of planning commission. IIMs are autonomous body; they are free to take decisions for operating the institutions. They have IIM council to make plan and strategy to run the institutions. IIM council consists of chairpersons and directors of all IIMs as well as senior official of HRD and headed by Human Resource Development Minister of India.

All IIMs offers different types of courses. They are following:

- PGP (Post Graduate Program in Management)
- PGDM (Post Graduate Diploma in Management)
- FPM (Fellow Program in Management)
- EMBA(Executive MBA)

Both PGP and PGDM programs are of two years, offered by all IIMs. They are considered equal to MBA Programs. FPM is a doctoral program and is considered equivalent to PHD all over the globe. They also offer one year program i.e. called EMBA. Union government has given special importance. Due to this, they passed a Bill in Lok Sabha and Rajya Sabha regarding Indian institute of management in 2017which declares IIMs as Institute of national importance and enables them to grant degrees and further bring many other important changes to the institute.

IIMs have also world class libraries. They are fully automated using different types of library automation software and digital repository software. New IIMs libraries are also in process to compete the old IIMs. Libraries subscribe enormous

resources in e-form. They have more e-book than printed books and same in case of journal.

1.4 Statement of the Problem

The problem has chosen for the present study is entitled, "USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY".

The present study has focused on the usage of cloud computing among library professionals of IIM Calcutta, IIM Ahmedabad, IIM Bangalore, IIM Lucknow, IIM Kozhikode and IIM Indore. The aim of the study is to explore the usage of cloud services and applications among library professionals.

1.5 Significance of the Study

Library has a significant role in maintaining bulk of books, journals and different forms of document. A special library denotes the collection of special kind of documents to a special group of users. This study deals with the usage of cloud computing by library professionals of IIM libraries. Also, there is no updated study on the usage of cloud computing of LIS professionals. This study will help to identify the strength and weakness of library professionals about new technology as well as approach about cloud services. After the careful examination of the existing literature it was found that in the time of IT era only few libraries have been going ahead to use cloud computing.

1.6. Objectives of the Study

1. To examine the awareness about cloud computing among LIS professionals;
2. To examine the usage of open source cloud services;
3. To find out the cloud based library websites which are used by library professionals;
4. To investigate security doubt among LIS professionals about cloud storage;

5. To find out the cloud based paid services used in library;

6. To find out most favorable cloud service among library professionals.

1.7 Scope and Limitations of the Study

It mainly involves the coverage area of the study. The term scope refers to the limitation which covers specific area. Present time, there are 20 IIMs Institutes in India in different geographical region but Study has been done for six Institutes. The selected institutes are:

S.N.	Institute	Establishment Year
1	Indian Institute of Management, Calcutta	1961
2	Indian Institute of Management, Ahmedabad	1961
3	Indian Institute of Management, Bangalore	1973
4	Indian Institute of Management, Lucknow	1984
5	Indian Institute of Management, Kozhikode	1996
6	Indian Institute of Management, Indore	1996

As the title suggests **"USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY**

The total population of user survey comprises only Library professionals.

1.8 Hypotheses

H1. Majority of LIS professionals are aware of cloud computing;

H2. LIS professionals use Google drive, Google Docs and Dropbox;

H3. Majority of LIS professionals use WorldCat and Google Scholar;

H4. Cloud security is the big concern among LIS Professionals;

H5. Google drive is used most frequently by LIS Professionals.

1.9 Methodology

Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge. Typically, it encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques. Keeping in mind the library professionals in IIM, Whole population was covered for study, survey method, questionnaires as a tool for data collection and Ms-excel were used for data analysis and interpretation.

1.9.1 Sample Selection

In order to investigate, usage of cloud computing by LIS professionals, all LIS professionals of IIMs covered for this study. It means the whole population is the part of the study .The sample is homogeneous in nature as they belong to same disciplines.

1.9.2 Data Collection

This study is based on primary data. The research has adapted to form an integral part of the whole process of the present study. This study conducted to gather data from the library professionals of IIMs libraries with regards to cloud computing and their usage. The data collected by using questionnaire as a tool that was personally distributed to the concerned librarians and library professionals. The researcher was made personal visit to distribute the questionnaires and observed the working as well as service system of the libraries. One set of questionnaires were designed for collecting the data from all library professionals.

Questionnaires were two types:

1. Open ended
2. Close ended

1.9.3 Tools and Techniques

For this study questionnaire was used as a main data collection tool. After data collection, Ms-Excel was used to analysis and interpretation of data.

1.10 Tentative Chapterization

Present study is divided into following chapters:

Chapter- 1: Introduction

In the first chapter, following points have been discussed such as overview of the study on IIMs, Library and cloud computing, applications of cloud computing, objectives of the study, scope of the study, hypotheses, research methodology, Population size, statistical tools and techniques and significance of the study.

Chapter- 2: Review of Literature

Second chapter, review of literature discusses all recent study on usage of cloud computing in library by library professionals and services in different institutions or universities of national and international level. It encompasses such as general studies on Cloud Computing and cloud computing models.

Chapter-3: Profile of Central Libraries of Indian Institutes of Management

This chapter presents the brief introduction of Indian Institutes of Management along with profile of their central libraries. It describes central Libraries of IIMs. Six libraries have been discussed with their establishment and development. Especially collection and Services are described in this chapter.

Chapter-4: Cloud Computing: Theoretical Study

This chapter presents the whole aspects of cloud computing. This chapter has discussed evolution of cloud computing, different types of deployment models, kinds

of cloud networks and different library services. Characteristics, Features, Pros and Cons of cloud computing have been also discussed in this chapter.

Chapter-5: Analysis and Interpretation of Data

This chapter presents the tabulation, statistical analysis, interpretation and graphical representation of the collected data.

Chapter-6: Findings, Suggestions and Conclusion

This chapter presents the findings and suggestions of the study and concluded with suggestions in future to improve the cloud computing Technology applications and uses in the IIMs libraries. Finding, hypotheses testing and conclusion have been discussed in the chapter.

References:

https://en.wikipedia.org/wiki/Indian_Institutes_of_Management retrived on 15-02-2017

Rao, M N (2015) *Cloud computing*, PHI Learning, Delhi

Sowndarya,N., & Umarani, V. (2014). An Overview of Cloud Computing. *CiiT International Journal of Software Engineering*, *5*(12), 396-400

Yuvaraj, M. (2015).Cloud libraries.*Library Hi Tech News*, *32*(8), 19–23

Yuvaraj, M.(2016).Perception of cloud computing in developing countries. *Library Review*, *65*(1/2), 33–51

Chapter-2
Review of Literature

Chapter- 2

Review of Literature

2.1.1 Introduction

A literature review is a survey of those literatures that have been written about on a particular topic, theme, theory, or research question and survey it may provide the background for larger work, or it may stand on its own. Much more than a simple list of sources, an effective literature review analyses and synthesizes information about key themes or issues.

- To discover what has been written about a topic already
- To determine what each source contributes to the topic
- To understand the relationship between the various literatures, identify and (if Possible) resolve contradictions, and determine gaps or unanswered questions.

2.1.2 Purpose of Literature Review

- It gives readers easy access to research on a particular topic by selecting high quality articles or studies that are relevant, meaningful, important and valid and summarizing them into one complete report.
- It provides an excellent starting point for researchers beginning to do research in a new area by forcing them to summarize, evaluate, and compare original research in that specific area.
- It ensures that researchers could not repeat the work that has already been done.
- It can provide clues as to where future research is heading or recommend areas on which to focus.
- It highlights key findings.

- It identifies inconsistencies, gaps and contradictions in the literature.
- It provides a constructive analysis of the methodologies and approaches of other researchers.

Here Cloud computing based literatures have reviewed which are published from 2009 to 2018 in various national and International Journals.

Keisling (2018) studied on "Blended learning Scaling library services and instruction to support changing educational landscapes". They found that scaling services is implemented in IT and business sectors. It is helpful for online students by developing library services. In modern times, users' need have been changed, scaling library services will help to fulfill users' requirement. With changing users' need, organizational resources and technological advancement will also change to maintain the library system. It will help to change the educational environment to generate the new and different types of services and resources.

Walterbusch, Fietz & Frank (2017) studied on "Missing cloud security awareness: investigating risk exposure in shadow IT". It is based on a triangulation of the data sets; the paper provides two types of model, both from an employee's and employer's point of view. Employees don't care about risk and they use unauthorized cloud computing services in daily life. Employers should advice to employees about cloud computing risk and talk about risk exposure. In modern times data security is the main issue for both employees and employers.

Tomer (2017) discussed on "Cloud computing and virtual machines in LIS education: options and resources". It has revealed that how much change the library system and why library has been going ahead towards virtualization. Virtual technologies and cloud computing has changed library education system and help to

develop cloud computing resources. Cloud computing and virtualization allow to create modern cloud computing infrastructure for library and other education.

Sanjeev (2017) discussed on "Use of New technologies in Libraries globally: a study" and cloud-based services in developing countries. It has revealed that in the present environment most of users access the information online through internet; they don't visit library physically for getting services and access information. It is clear from the surveys, users are getting more online and are accessing internet based resources and services which are cloud based to a great extent. The survey also revealed that the use of the mobile technology has also increased to access cloud based e-resources. That's why libraries have been shifting towards cloud-based services. Due to changes of user attitude, demand, library resources and infrastructure, library and users both have adopted cloud based services. To maximum use of resources, library should develop cloud based services.

Parrigin (2017) discussed on "From request to assess: using cloud-based tools for the library instruction lifecycle". Librarian can manage library services using different types of cloud based tools. Google forms, Librarian instruction/reservation calendar help to know the feedback as well as smooth running of the library. By using Google drive, Google calendar and Google form, Librarians can take feedback from users and interpret the result on their own system. They can evaluate and develop or change library services or system according to their response. They teach their staffs and collect feedback on their system also.

Xu et al. (2017) studied on "understanding Chinese users' switching behavior of cloud storage services". The study has cleared that there is some parameter has decided to measure users' satisfaction like perceived usefulness and expectation disconfirmation; they have a positive and negative effect on user satisfaction,

respectively. While expectation disconfirmation has a negative impact on perceived usefulness, user satisfaction positively affects users' habit and switching cost. At the same time, switching intention is affected significantly and negatively by perceived usefulness, user satisfaction, as well as switching cost, where in switching intention and habit can commendably predict switching behavior. The result shows that how cloud service providers connect their users in cloud computing markets.

Nogales, Sicilia-Urban & García-Barriocanal (2017) studied on "Measuring vocabulary use in the Linked Data Cloud". This study has explained that Linked Open Vocabularies in context of model Semantic Web Data for using Resource Description Framework, RDF Schema and simple knowledge organization. It is found that most used language English and their vocabularies are not considered standard and highly specialized in the field. It is not the major scope of vocabularies. For quantitative study, including the use of network analysis and matrices; data are gathered from Linked Open Vocabularies catalogue. The paper has provided empirical analysis.

Yuvaraj (2016) conducted a study on "Perception of cloud computing in developing countries: A case study of Indian academic libraries". The study revealed that library professional use cloud computing regularly. Due to the global availability, different service layers and economy are the main reason to use in libraries. Respondents have concern about data security and privacy. They want to use cloud computing to avoid repetition of works in libraries.

Murad & Dowaji (2016) studied on "Service value optimization of cloud hosted systems using particle swarm technique", especially SaaS model of cloud computing. It has become a more demanded model. But there are some issues with this model. To reduce the issues, there is a need of new model, which can face

challenges for future and provide services to the users. Deployment choice is very difficult challenge. Apart from SaaS, another model can be deployed. The purpose of this paper is to present a new model that provides good service to help customers in selection of resources according to their priorities.

Makori (2016) conducted a survey "Exploration of cloud computing practices in university libraries in Kenya" on the implementation of CC. This paper raises a question, in the time of harsh economy situation. Library should not purchase hardware and software for providing services to client, but invest minimal budget to cloud computing and make library serviceable and will provide good service. Library should study on cloud computing, its drawbacks and features then implemented. In all over the world cloud computing services has been used for resource sharing, website hosting and digital library development. First understand about cloud computing, weigh the quality and implement in the library. Cloud computing has attractive features which attracts the organization to compel for utilizing. The paper provides roadmap of support information service as cloud computing which is new business paradigm all over the world. It leads to digital economy

Yuvraj (2016) conducted survey on "Ascertaining the factors that influence the acceptance and purposeful use of cloud computing in medical libraries in India". Many factors that need to address purposefully to adopt cloud computing technologies. In medical library, due to complex set up of library system, acceptance of cloud computing technologies is not easy. In cloud computing, data, applications and services all are in remote servers then it is not easy for library to ignore the privacy and security for adopting new technologies. Many important factors came after the survey of medical libraries of India.

Yuvaraj (2016) studied on "Library automation with cloud based ILMS Librarika: case study of Central University of South Bihar". Traditionally, libraries have tried to automate their system purchasing servers and software, installing, updating and configuring them. In analysis of the automation software Librarika, It is seen that circulation and OPAC modules are good. Software has its own characteristics. During this study it found that security, privacy and Policy of vendor are the main concern, if anyone wants to adopt this software.

Yuvraj (2015) studied on "Cloud Libraries", Cloud librarians are a new genus of librarians; the study has explained about cloud libraries. In cloud libraries, how cloud librarian and other staffs will work. Cloud librarians can make their blog or virtual profile. They can use this platform for providing reference services or interact with users. They can also use for library orientation program where they can teach how resource access in cloud environment. Cloud librarians should be highly skilled. They could manage all the things of every library section as well as handle troubleshooting problems in online environment.

Yuvaraj (2015) examined the "Problems and prospects of implementing cloud computing in university libraries: A case study of Banaras Hindu University library system" and characteristic elements of various organizational factors to identify whether a favorable climate for implementing and sustaining cloud computing in Banaras Hindu University library system (BHULS) existed. The paper found that the professionals of BHU eager to implement cloud computing technologies in library.

Aharony (2015) studied on "An exploratory study on factors affecting the adoption of cloud computing by information professionals". This study explains that factors which help to influence information professionals to attract towards cloud computing. In this study; there is a model which has discussed that is called

Technological Acceptance Model. The main objective of this study is how TAM attracts professionals to use new technologies. TAM explores users experience, characteristics and features of system which could influence on users.

Oyelude (2015) discussed on "What's trending in cloud computing from the internet cybersphere". This paper explores the how a system shifts from local server to remote servers or web based servers. During this study investigator have tried to know what is cloud computing? And what are the implications of cloud computing in library system. How much it can increase the system as well as users productivity. In mobile age, it will play an important role to provide services.

Majhi, Mehar & Maharana (2015) studied on seventeen Indian university Libraries to assess the familiarity and usage of cloud computing applications among Library and information Science professionals. Results revealed that the usage of cloud computing among library professionals is mostly on personal purpose. The libraries infrastructure of universities is not good. That's why. It can be said that it is difficult to identify the user's behavior towards cloud computing, but it is clear that this study help to the policy makers who will work for this. **Yuvaraj (2015)** discussed on "Security threats, risks and open source cloud computing security solutions for libraries" This study reveals that security is the main concern of non-adoption of cloud computing in libraries, but there are many solutions in open source cloud computing which will handle the risk .Investigators took interviews and done various literature survey , it is found that risk and threat is the big concern of non-adoption of cloud computing but existing security solution will overcome the obstacle.

Wasike & Njoroge (2015) studied on Keniyan Library Perspective. This paper found that cloud computing reduces the technological cost, increase capability

and reliability and less maintenance of hardware. Through cloud computing old, rare and historical documents can be scanned and stored on cloud database. It will be easy access for users. In cloud computing environment, data backup is easy for library. The problem of data loss is reduced. It can also overcome the crowd over network.

Jede & Teuteberg (2015) studied on "Integrating cloud computing in supply chain processes: A comprehensive literature review". Cloud computing (CC) services are available for various applications with in supply chain management (SCM) processes and related enterprise information systems (ISs). Cloud services provide information in a real time. Due to access of real time, taking decision is easy for users. It will help to enterprises where he works. It means that cloud computing provides services and make a chain, where others also benefited. This chain is limitless. Moreover, the purpose of this paper is to gain a deep understanding of the current state of research and to identify future research challenges.

Gangwar, Date & Ramaswamy (2015) conducted a study on "Understanding determinants of cloud computing adoption using an integrated TAM-TOE model" This study explores the integrated model that is called TAM-TOE model. This study has done in Indian context. In Indian environment, it has tried to know some important points in Indian system. They are following. i.e. relative advantage, compatibility, complexity, organizational readiness, training and education, and top management commitment; which have direct effect on either of the two constructs of TAM or both, and has indirect effect on adoption. In Indian environment, there are some companies which want to adopt cloud computing model for increasing productivities. Some companies have already adopted these technologies. During study of existing literature related to TAM-TOE model. It is found that some features of this model help to adopt cloud computing.

Mohamed & Pillutla (2014) discussed on "Cloud computing: a collaborative green platform for the knowledge society". Potential of Cloud Computing is a multilayer integrative collaboration space for knowledge acquisition. The paper has been discussed on green platform as well as knowledge society. The study has cleared cloud computing technologies help to make a knowledge society. Cloud has feature to organize, process and distribute the knowledge. It has unique feature to using less energy to provide efficient service. It will also help environment. It can be say that it is a green platform.

Aharony (2014) studied on "Cloud computing: information professionals' and educational technology experts' perspectives". The current study has tried to know about the information professionals' approach towards cloud computing. They have divided in two parts according to use of CC: perceived ease of use and personal innovativeness. Both factors impact on information professionals for using cloud computing. Some personal characteristics like risk and security challenges, openness, efficiency and new technology affect the use of cloud computing. Every group has own reason to use new technology.

Mavodja (2013) discussed on "The impact of cloud computing on the future of academic library practices and services". Issues involved in modern information environment, cloud computing is difficult to ignore. Due to exponential growth of data, information storage is not easy on personal system. Management of information is very difficult for any small organization and system. Software and hardware is not cheap. It has been increasing with technological development. In this case, cloud service providers can manage all those things. They are worked as a business organization. They invest huge amount of money to provide service. Libraries are using the cloud for putting together user resources, i.e. using Software as a Service

(SaaS), such as in library catalogues, WorldCat, Googledocs, and the aggregated subject gateways like SUMMON, and others; the web Platform as a Service (PaaS) as in the use of GoogleApp Engine; or Infrastructure as a Service (IaaS) as in the use of D-Space, FEDORA, and others. The cloud is confirmed as a facilitator in storing and accessing information in addition to providing a unified web presence with reduced local storage capacity challenges.

Koury & Jardine (2013) discussed on "Library instruction in a cloud: perspectives from the trenches". The strength of cloud computing is wider. It is use for instructing library. For collaborative writing, project making and peer review journal it is very helpful. (Aaron and Roche, 2011). One of the standards from the National Educational Technology Standards (NETS) teachers as well as student both can use for increasing efficiency and connect with big user community. It helps to lifelong learning. Cloud computing helps users to use digital tools and resources. (Thomas, 2011). Instruction librarians at Idaho State University have found that cloud computing applications are very useful and it can be planned for future use of technologies.

Liu & Cai (2013) studied on "Embracing the shift to cloud computing: knowledge and skills for systems librarians". Cloud computing has much to offer to the library world. It changes the way of thinking about library technology. It is clear that system librarian has been facing new challenge with the development of new technologies. System librarian should increase the knowledge base of new technologies. It will help to adopt cloud computing in library system. Library landscape has been change with technology. Users demand has been changed also. Service and resources has been changed the library system. It is essential for system

librarian to change the library system to adopt cloud services. It is a time for paradigm shift of technology.

Delozier (2013) discussed on "Anonymity and authenticity in the cloud: issues and applications". This paper has explored the privacy and corruption of data. Five browsers settings are identified to reduce the illegal practices of data. It helps to avoid tracking the browser. It reduces the chances to wrap from malware sites. Since cloud computing is online activities then it is very essential for users when using online resources they can safely download. Libraries are adopting cloud computing eagerly. They are preserving their resources despite of privacy concern.

Wu, Lan & Lee (2013) studied on "Factors hindering acceptance of using cloud services in university: a case study". The study has explored about internal clouds as well as external clouds. For university systems internal cloud is better than external clouds. There are lots of factors which emphasize to adopt internal cloud. Due to concern of privacy, vendor lock control, efficiency and reliability, these are the factors tend to adopt internal cloud. In external cloud, there is a problem after post implementation phase. The traditional one-theme DEMATEL seemed insufficient to fully capture the whole pictures involving two themes like the case study. Hence, this study has contributed to develop the operational procedures of duo-theme DEMATEL to assess the acceptance of usage of internal clouds in a university in the following: it satisfactorily grasped the causal knowledge in terms of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) at the same time; it produced a four-quadrant integrated causal map, which manifestly displayed perceivable and comprehensive information to facilitate the decision makers to focus on the "root causes" of each theme to develop more effectual intervention actions. In sum, this study has successfully provided a new evaluation framework that simultaneously deals with two

distinct themes; and furthermore, recommended appropriate intervention activities to foster the acceptance of cloud services usage in a university, and, meanwhile, to avoid making likely biased decisions.

Han (2013) discussed on "IaaS cloud computing services for libraries: cloud storage and virtual machines". This study has found that current use of cloud computing can be modified and improve it and make it more serviceable. There is an option of IaaS (Infrastructure as a Service) which works as integrated cloud system. This model helps to take data backup in harsh situation and also monitor the system. It also discussed that case study of integrating cloud storage using S3 and GCS. S3 can be integrated with any program whether the program runs on cloud or locally, while GCS is only good for applications running on GAE. The limitation of the current GCS approach makes it hard to use for stand-alone cloud storage. The author also discussed virtual machines using EC2 and its related tools for backup, increase storage, and monitoring service. These services make system administration easier as compared to the traditional approach.

Romerio (2012) discussed on "Cloud computing in library automation: benefits and drawbacks". In this study, it is discussed about drawback and benefits of automation on cloud platforms. As far as benefit is concerned; cloud provides quick and efficient service. Due to high scalable feature of cloud, it doesn't create problem during service. It needs less management effort. Less skill users can use easily. It offers high performance service, less hardware and software use and multi tenancy. It balances load during high use of services. It has drawbacks due to third parties services. There is no total control over system, data privacy and security.

Yang (2012) studied on "Move into the cloud, shall we?" This paper has investigated about future of cloud computing in libraries. It is the first phase of Cloud

computing which mostly implemented in industry and business sectors but it has influenced on library also. There are many products related to cloud computing in market which attracts the library to adopt this. It has replaced client computing. It is time for both librarians and library based vendors to think about cloud computing features to implement in library system. . It gives rise to a totally new generation of ILSs with innovative features that have gone beyond our dream for the NGC the new generation of cloud-based ILS is here and more will be delivered into the future. The classic ILSs are on the way out. The new system is revolutionary in many ways and will change how we work and think.

Goldner & Birch (2012) studied on "Resource sharing in a cloud computing age". The paper has explored about inter library loan in cloud computing age. Due to development of new technologies and increase of heavy resources, the method has also changed of resource sharing. Librarian should work with publishers, politicians and system developers to share traditional publication as well electronic publication to ensure all types of resources can be shared. It should also be ensure that all formats can be shared. To find the solution of resource sharing in digital age, cloud computing is better tools than others. It helps to share different types of formats and distributed knowledge systems.

Galvin & Sun (2012) studied on "Avoiding the death zone: choosing and running a library project in the cloud". This study has explored the usefulness and impact of cloud computing in library system. There are most of things which can be adopted and some can be ignored. First of all, it is essential to identify which cloud project is useful for library or which is not. Efficiency and cost saving are the best reasons to adopt cloud computing. There are some important reasons also which don't move to cloud computing.

Low, Chen & Wu (2011) studied on "Understanding the determinants of cloud computing adoption" The paper investigated the factors that affect the adoption of cloud computing in high tech industry. The eight factors are examined in this study. They are followings: relative advantage, complexity, compatibility, top management support, firm size, technology readiness, competitive pressure, and trading partner pressure.

Patel et al. (2011) studied on "Comparative study and review of grid, cloud, utility computing and software as a service for use by libraries". Before cloud computing, grid computing is more accessible and demanded. In present digital age, it is most important thing is which product is most demanded and efficient for users. In present time demand of cloud computing is increasing and grid computing is decreasing. Due to modern and high quality features of cloud computing like cost saving, efficient services, all over the world access, load balance and multi tenancy has helped to adopt. It is also a reason to replace grid computing to cloud computing i.e. Website hosting which have reduces hardware and software cost.

Askhoj, Sugimoto & Nagamori (2011) discussed "Preserving records in the cloud" and presented a layered model for archiving in a cloud computing environment. This paper explains that in cloud environment data can be shared or archived easily. The strength of this model is that it builds on existing OAIS concepts, while being compatible with cloud computing systems. Through this model, it becomes easy to abstract services, such as the provision of a trusted repository and preservation metadata. The model also describes that how services can be easily shared in a way that makes it simpler to construct archiving systems, by making it possible to rely on services from lower layers.

Cho (2011) studied on "Study on a SaaS-based library management system for the Korean library network". It will help to increase economic efficiency of library

operation. It will also help libraries to provide services on demand due to change of information environment. Due to unique feature of Software as a Service (SaaS), at single platforms, several libraries facilitate to sharing the resources and enhance the knowledge base services. In the different sectors including libraries, they adapt to SaaS and make the system better and help the users. In a library network, it is effective for users they use single network for access and subscribe of data which help to exploit the resources of library. In consortium, multi users can use same resources at the same time.

Scale (2009) studied on "Cloud computing and collaboration". Due to the new trends of automations and web developments, library and users both are depend on software. In library, outside companies provide software to make library modern and sophisticated. They help to users indirectly. In 1990, libraries have their own system, resources, services as well as man power but in 21 century, library system became different due to technological change. Users demand has been also changed. Like automation software, library also trusts in cloud which is third parties or outside providers. They are using cloud and trying to provide good service to users. Social and technological change, compel to library to collaborate to outside companies to develop web content, producing new services and collect feedbacks from users. External collaboration help users as well as library but some are cautious who helps to shaping intellectual contents.

Fox (2009) examined "Library in the clouds". The issue of cloud computing and how it relates to digital library service provisioning. The paper explains the merit and demerit of cloud computing for digital libraries. The paper has also described the challenges and issues of cloud computing technology in next few years and also showed relation between current internet business and modern library practices.

References:

A. Mohamed, M., & Pillutla, S. (2014). Cloud computing: a collaborative green platform for the knowledge society.*Vine*, *44*(3), 357–374.

Aharony, N. (2014). Cloud computing: information professionals' and educational technology experts' perspectives. *Library Hi Tech*, *32*(4), 645–666.

Aharony, N. (2015). An exploratory study on factors affecting the adoption of cloud computing by information professionals.*The Electronic Library*, *33*(2), 308–323.

Askhoj, J., Sugimoto, S., &Nagamori, M. (2011). Preserving records in the cloud.*Records Management Journal*, *21*(3), 175–187.

Cho, J. (2011). Study on a SaaS-based library management system for the Korean library network. *The Electronic Library*, *29*(3), 379–393.

Delozier, E. P. (2013). Anonymity and authenticity in the cloud : issues and applications. *OCLC Systems & Services: International digital library perspectives*, 29(2), 65-77.

Fox, R. (2009). Library in the clouds. OCLC Systems & Services: International digital library perspectives. 25(3), 156-161.

Galvin, D., & Sun, M. (2013).Avoiding the death zone : choosing and running a library project in the cloud, *Library Hi Tech*, 30(3), 418-427.

Gangwar, H., Date, H., &Ramaswamy, R. (2015).Understanding determinants of cloud computing adoption using an integrated TAM-TOE model.*Journal of Enterprise Information Management*, *28*(1), 107–130.

Goldner, M.,& Birch, K. (2012). Resource sharing in a cloud computing age.*Interlending& Document Supply*, 40(1), 4-11.

Han, Y. (2013). IaaS cloud computing services for libraries: cloud storage and virtual machines. *OCLC Systems & Services: International Digital Library Perspectives*, *29*(2), 87–100.

Jede, A., &Teuteberg, F. (2015).*Integrating cloud computing in supply chain processes*.*Journal of Enterprise Information Management*, 28(6), 872-904.

Keisling, B. (2018). Blended learning.*Library Management*, *39*(3/4), 207–215.

Koury, R., &Jardine, S. J. (2013). Library instruction in a cloud : perspectives from the trenches. *OCLC Systems & Services: International digital library perspectives*, 29(3), 161-169.

Liu, W. (2013).Embracing the shift to cloud computing : knowledge and skills for systems librarians.*OCLC Systems & Services: International digital library perspectives*. 29(1), 22-29.

Liu, W., &Cai, H. (2013) Embracing the shift to cloud computing: knowledge and skills for systems librarians, *OCLC Systems & Services: International digital library perspectives*, 29(1), 22-29.

Lloret Romero, N. (2012). "Cloud computing" in library automation: benefits and drawbacks. *The Bottom Line*, *25*(3), 110–114.

Low, C., Chen, Y., & Wu, M. (2011).Understanding the determinants of cloud computing adoption.*Industrial Management & Data Systems*, 111(7), 1006-1023

Majhi, S., Meher, S., &Maharana, B. (2015). Awareness and usage of cloud computing application among LIS professionals: A case study of 17 Indian university libraries. *Library Philosophy and Practice*.

Makori, E. O. (2016). Exploration of cloud computing practices in university libraries in Kenya. *Library Hi Tech News*, *33*(9), 16–22.

Mavodza, J. (2013). The impact of cloud computing on the future of academic library practices and services.*New Library World, 114*(3/4), 132–141.

Murad, S. E., &Dowaji, S. (2016). Service value optimization of cloud hosted systems using particle swarm technique. *Journal of Enterprise Information Management, 29*(4), 612–626.

Nogales, A., Angel Sicilia-Urban, M., &García-Barriocanal, E. (2017).Measuring vocabulary use in the Linked Data Cloud.*Online Information Review, 41*(2), 252–271.

Oyelude, A. A. (2015). What's trending in cloud computing from the internet cybersphere.*Library Hi Tech News.*32 (10), 22-23.

Parrigin, J. (2017). From request to assess : using cloud-based tools for the library instruction. Library Hi Tech News, 34(6), 14-20

Patel, A., Seyfi, A., Tew, Y., &Jaradat, A. (2011).Comparative study and review of grid, cloud, utility computing and software as a service for use by libraries.*Library Hi Tech News*, *28*(3), 25–32.

Sanjeev (2017). Use of new technologies in libraries globally: a study", *Library Hi Tech News*, 34(9), 15-18.

Scale, M. E. (2009).Cloud computing and collaboration.*Library Hi Tech News*, *26*(9), 10–13.

Tomer, Christinger. (2017). Cloud computing and virtual machines in LIS education: options and resources. *Digital Library Perspectives*, *33*(1), 14–39.

Walterbusch, M., Fietz, A., &Teuteberg, F. (2017). Missing cloud security awareness: investigating risk exposure in shadow IT. *Journal of Enterprise Information Management*, 30(4), 644-665.

Wasike, J. M., &Njoroge, L. (2015). Opening libraries to cloud computing: a Kenyan perspective. *Library Hi Tech News, 32*(3), 21–24.

Wu, W., Lan, L. W., & Lee, Y. (2013). Factors hindering acceptance of using cloud services in university: a case study. *The Electronic Library*, *31*(1), 84–98.

Xu, F., Tian, M., Xu, G., Reyes Ayala, B., &Shen, W. (2017).Understanding Chinese users' switching behaviour of cloud storage services.*The Electronic Library*, *35*(2), 214–232.

Yang, S. Q. (2012). Move into the Cloud, shall we? *Library Hi Tech News*, *29*(1), 4–7.

Yuvaraj, M. (2015a).Cloud libraries.*Library Hi Tech News*, *32*(8), 19–23.

Yuvaraj, M. (2015b). Problems and prospects of implementing cloud computing in university libraries. *Library Review*, *64*(8/9), 567–582.

Yuvaraj, M. (2015c). Security threats, risks and open source cloud computing security solutions for libraries. *Library Hi Tech News*, *32*(7), 16–18.

Yuvaraj, M. (2016a).Ascertaining the factors that influence the acceptance and purposeful use of cloud computing in medical libraries in India.*New Library World*, *117*(9/10), 644–658.

Yuvaraj, M. (2016b). Library automation with cloud based ILMS Librarika: case study of Central University of South Bihar, *Library Hi Tech News*, 33(7), 13-17.

Yuvaraj, M. (2016c).Perception of cloud computing in developing countries.*Library Review*, *65*(1/2), 33–51.

Chapter-3
Profile of Central Libraries of Indian Institutes of Management

Chapter-3

Profile of the Central Libraries of Indian Institutes of Management (IIMs)

3.1 IIM Calcutta

The Indian Institute of Management Calcutta (IIM-C) was established in November 1961. It was the dream of Jawaharlal Nehru, the first prime minister of India. It was the first national institute for Post-Graduate studies and Research in Management by the Government of India. It was established in collaboration with Alfred P. Sloan School of Management (MIT), the Government of West Bengal, The Ford Foundation and Indian industry. In starting time, most prominent faculties like Jagdish Sheth, J. K. Sengupta, among others to help to give shape.

After the five decades of journey, IIM-C has made a famous institution in the education of management. It has global fame. It has played major role to educate postgraduate, doctoral and executive level students. It also organize training program for management student. Now a days it is an autonomous institution, which is working for future challenges. Institute details are given below in Table.

3.1.1 Profile of IIM Calcutta

Institute Name	Indian Institute of Management, Calcutta
Establishment Year	1961
Location	Kolkata
Library Name	B C Roy Memorial Library

3.1.2 IIM Calcutta Library

The IIM Calcutta library was established in 1962. Library has given name on the honorable Dr. Bidhan Chandra Roy who is the first chairman of the institute. This

library is spread in about 30000 sqft. This library is best in Asia in the field of management science. It is a learning resource centre for academician and research scholars. It has print, online resources in huge volumes. It provides different types of services to their users. Services are Photocopy, Interlibrary loan, book requisition, Remote access for electronic resources. It is totally automated with library automation software VTLS. It has one lakh sixty lakh printed books and bound journals. It subscribes forty thousand full text journals.

3.1.3 Library Collection

Resources	Total Numbers
Books and bound journals	1.6 lakh
Online full text journals	40000

3.1.4 Services in Library

- Photocopy
- Interlibrary Loan
- Book Requisition
- Remote access to electronic Resources
- It uses VTLS Library Automation Software

Old IIMs, IIM-C, IIM-A, IIM-B, IIM-L, IIM-K and IIM-I, they developed IIM Library consortium in 2000. IIM Calcutta is also the member. This consortium helps to exploit maximum e-resources among IIMs professionals

IIM Calcutta has institutional membership with British Council Library and The American Library located in the same city.

3.2 IIM Ahmedabad

IIM Ahmedabad established in the same year 1961 after IIM Calcutta. It was the second IIM of India. There were eminent persons who connected to establish this

institution; one of them was honorable Vikram Sarabhai. This institute got help from Central government, State government, Industrialists, the Ford Foundation and Harvard Business School to make shape in initial year.

3.2.1 Profile of IIM Ahmedabad

Institute Name	Indian Institute Of Management Ahmedabad
Establishment Year	1961
Location	Ahmedabad
Library Name	Vikram Sarabhai Library

IIM-A has made a society that is called IIM society. By IIM society Act, A board of governor is established. Board has some members who take decision to run the IIM-A. No single person can take a decision. It is a democratic way to operate the system. That's why, today IIM Ahmedabad is a premier institution not only India but also in the world. It has international fame; it is the first management school in the country to be awarded EQUIS accreditation by the EFMD in 2008.

3.2.2 IIM Ahmedabad Library

IIM Ahmedabad library was set up in 1962. In the honor of Dr. Vikram Sarabhai, the founding director of IIM-A, Library name is named after Vikram Sarabhai. Vikram Sarabhai is a renowned Physicist and Philanthropist. He also established Physical Research Laboratory (PRL). It is one of the best libraries in Asia. It is opened round the clock. It provides different types of material. It identifies, acquires organizes and retrieves information in various formats to serve the information needs of academic fraternity of IIM Ahmedabad and other also.

The library has huge digital collection, which is more than print collection. It subscribes more than hundred databases which is accessible on campus network.

Library has Discovery service tools (EBSCO), journal title search alphabetically, remote login and institutional repository also. Library has purchased 20 Kindle E-Book readers. For Kindle, they subscribe the book from Amazon. It is the great device which works on cloud technology. Koha library automation software is used in IIM-A Library has vast collection which is shown through table below.

3.2.3 Library Collection

Resources	Total Number
Books	195795
Bound Volumes	52481
News Papers	25
Working Papers	3821
Thesis	349
Project Reports	2282
CDs	2527
Videos	128
Online Journals	26608
Print Journals	149
Kindle e-reader	20

3.2.4 Services in Library

- Research Help
- Remote Access
- Interlibrary Loan
- Photocopy facility
- Book Drop facility

- Discovery Services
- Institutional Repository

3.3 IIM Bangalore

The Indian Institute of management Bangalore was established in 1973. At a time it was third business school of IIM. IIM Bangalore is the leading business school in Asia. It had inaugurated by then Prime Minister Indira Gandhi. IIM has about 100 full time faculty members. For long duration programs more than 1200 students are enrolled and 5000 for executive education participants.

3.3.1 Profile of IIM Bangalore

Institute Name	Indian Institute of Management Bangalore
Establishment Year	1973
Location	Bengaluru
Library Name	IIM Bangalore Library

3.3.2 IIM Bangalore Library

IIM Library has no any other name. Library building is very big and beautiful. It has independent building. It is completely automated with VTLS Library automation software. Library timing is Around the clock. It also provides external membership. One who want to join a member, they can take prior approval through email. Library identifies the resources according to teachers, research scholars and students' requirement. Library has been generally purchased management, industrial, business and allied others resources to meet the users need.

It has about one lakh seventy thousand printed books, thirty seven thousand bound volumes. Library subscribes more than two thousands electronic journal and thirty thousand electronic books. It provides lots of services to their users. Remote

access, Inter library loan article request and Information search service are major services for users. It has created a digital depository for archiving records. It provides discovery service EBSCO.

3.3.3 Collection in Library

Resources	Total Numbers
Books	168102
Bound Volumes	37353
Working Papers	5375
Theses	1130
Project Reports	12802
Audio-Visual Resources	13448
e-Journals	2602
e-Books	30884
Newspapers	22
Micro Documents	19907

3.3.4 Library Services

- Inter Library Loan
- Article Request
- Information Search service
- Report a technical Problem
- Archiving Services
- Remote Access
- Institutional Repository

3.4 IIM Lucknow

The fourth institute of IIM was set up in 1984 after IIM Calcutta, IIM Ahmedabad and IIM Bangalore. It was first in Hindi region. Noted academician Ishwar Dayal play an important role to establish the institution. He was the first founding director of the institution and served four years. IIMs were the dream project of Pandit Jwaharlal Nehru. It had been developed with time and new IIMs have been opened. Today 20 IIMs are established. IIM Lucknow has beautiful campus. It has modern library. After the establishment, its development is continued. In starting period, it has not a permanent building but today it has a permanent building as well as a new campus has been developed in Noida also. The institutes has touched directly or indirectly millions of lives. The institute undertakes a diverse range of academic activities aimed at creation, dissemination and application of management knowledge and practice.

IIM Lucknow campus spreads over more than 190 acres in Prabandh Nagar lucknow, It is 21 km far from main railway station of lucknow. Its satellite campus Noida spreads over 20acres. Like other IIMs, IIM Lucknow has a autonomus Institution. IIM Lucknow is an ideal setup conducive to learning, accessibility and excellence.

3.4.1 Profile of IIM Lucknow

Institute Name	Indian Institute of Management Lucknow
Establishment Year	1984
Location	Lucknow
Library Name	Gyanodaya

3.4.2 IIM Lucknow Library

IIM Lucknow library is a big and modern library. Library building is centrally located and air conditioned. In initial period, it has not a permanent building. It is operated from a rented building, Giri Institute of developmental studies. Library is completely automated with library automation software Libsys. It has its own digital repository.

Today Library has rich collection of over 60,000 select learning resources in the discipline of management and related areas. It has high professional library team which provides IT based value added services. The library also provides external membership to the outsiders.

3.4.3 Library Collections

Resources	Total Numbers
Books	45000
Current Periodicals	442
E-Journals	2700
Back Files (Bound Volumes)	21237
Current Periodicals	11875
E-Journals (print)	63

3.4.4 Services in Library

- Borrowing
- Reprographic Services
- Retrospective searches

3.5 IIM Kozhikode

IIM Kozhikode is the fifth IIM of IIMs. It was established in 1996. It is situated on two hillocks in the Kunnamangalam of Calicut in Kerala. It is about 20 km from Kozhikode railway station. It is one of the most beautiful places where Management School has been set up. It has world class infrastructure with highly professional staffs and faculties. The institute has tried to balance administrative system with only 36 regular staff. Whole campus is connected with LAN. Buildings are completely air-conditioned. It has smart class room. It spread over about 100 acres of land.

In the starting period IIM Kozhikode started with only 42 students. The current strength is 356. It provides distance learning Program for those who working in any system or companies. In 2001 it started 300 class contact hour but today it has become 450.

3.5.1 Profile of IIM Kozhikode

Institute Name	Indian Institute of Management Kozhikode
Establishment Year	1996
Location	Kozhikode (Kerala)
Library Name	Library and Information Centre

3.5.2 IIM Kozhikode Library

IIM-K library is fully automated library system using library automation software VTLS. It has vast collection of print as well as non-print resources. It subscribes about two lakhs e-books. Library has emphasized on electronic collection. It has about 35000 books. About twenty thousand journal has been accessed. IIM-K purchase print journal 270. Library has modern infrastructure to access the collections

of electronic forms. It has different types of service. Web scale Discovery service, Ask a Librarian, Inter library loan, Remote access etc.

3.5.3 Library Collection

Resources	Total Numbers
Books	35500
e-Books	200000
Journals	270
e-Journals	20000
Videos	274
Electronic Databases	54
Corporate Reports	40
Corporate Reports(Digital)	15000
CD-ROM Publications	3700
Cases Notes	387
Bound Volumes	6119
Annual Reports	20

3.5.4 Services in Library

- Research and Reference Services
- Online Public Access Catalogue (OPAC)
- Curriculum Support, Class Room Support
- Special Access Arrangements
- Information Alerts
- User Instruction
- Digital Library

- Institutional Repository
- E-Journals
- Databases & E-Resources
- Remote Access Facility
- Web-scale Discovery Service
- Inter-library Loans
- Document Delivery Services
- Reprographic Services
- Ask a Librarian
- Media Alert Services

3.6. IIM Indore

IIM Indore was established in 1996. It is the sixth management school of IIMs group. It is also situated on the hillock like IIM Kozhikode. It spread over 193 acres. It is about 20 km from Indore railway station. The Institution is also the leader in management like other five management school. It supports company, industry and government and private organizations. It has world class infrastructure. It has Class room building, hostels building and staff quarters. IT based infrastructure are one of the best in whole campus.

3.6.1 Profile of IIM Indore

Institute Name	Indian Institute of Management Indore
Establishment Year	1996
Location	Indore (MP)
Library Name	Learning Centre

3.6.2 IIM Indore Library

The IIM Indore library name is Learning Centre It is a hybrid library with the state-of-the-art technological applications. It has vast collections and provides various services to the users. The library offers print as well non print resources to users. Apart from management resources, library has different resources also. The whole resources like database and other collection are accessible on library network. Users can access resources from the network in real time. IIM-I Library is an active member of IIM Consortia & INDEST Consortia. Library offers a range of services like remote access, discovery service, inter library loan etc.

3.6.3 Library Collection

Resources	Total
Book	30,000 approx.
e-book	10,0000 approx.

3.6.4 Library Services

- Inter Library Loan
- Book Requisition
- Remote access to electronic resources.
- Using VTLS Library Automation Software.
- Discovery Service

References:

https://www.iimcal.ac.in/retrived on 15-03-2017

http://library.iimcal.ac.in/retrived on 15-03-2017

http://www.iiml.ac.in/retrieved on 15-03-2017

http://www.iimk.ac.in/libportal/retrived on 15-03-2017

http://www.iimk.ac.in/iimk/retrived on 15-03-2017

https://www.iima.ac.in/web/iima retrived on 15-03-2017

http://library.iima.ac.in/retrived on 15-03-2017

https://www.iimidr.ac.in/ retrived on 15-03-2017

https://www.iimidr.ac.in/facilities/library/retrieved on 15-03-2017

http://www.iiml.ac.in/facilities/libraryretrieved on 15-03-2017

Chapter-4
Cloud Computing: Theoretical Study

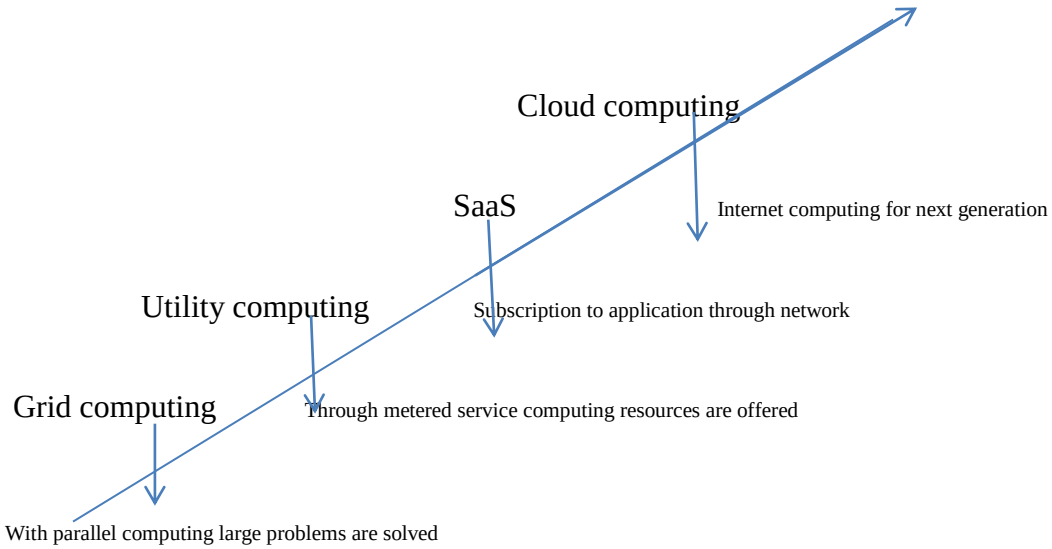
Chapter- 4

Cloud Computing: Theoretical Study

4.1 Introduction

In last decade, cloud computing solution has appeared rapidly. In IT field, it has been adopted easily. It is the extension of grid computing. Late 1980, it was the time of grid computing. Grid computing means controlling of several computers at a time. Cloud computing is the extension of Grid computing. Cloud computing refers to controlling several resources, including system resources, to distribute an integrated service to the customer.

In the 1990, the theory of virtualization was evolved, after that utility computing, Saas and cloud computing appeared.



Evolution of Cloud Computing

Above figure shows that how cloud computing came in existence after a long period of virtualization. Cloud computing developed due to the development of Internet, it is the main catalyst behind cloud computing. Many big players came in the

field like Amazon, Google, Microsoft and IBM. They developed their data center and provide web based services free as well as paid.

4.2 Definition of Cloud Computing

Cloud Computing can be defined as "A model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

Cloud computing is a computing in which data are organized, process and share through remote servers instead of local servers. Cloud computing is shown through a symbol below. It means cloud computing is internet based service which provide services to organization through network.

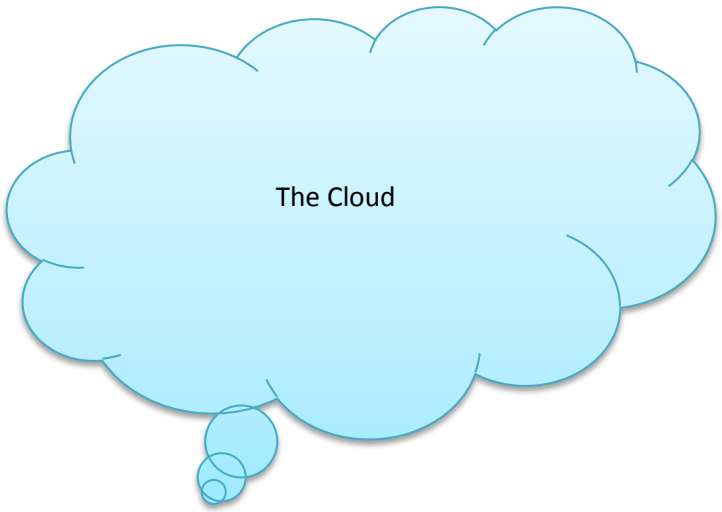


Figure 4.2.1

4.3 Cloud Deployment Models

Cloud Computing can be categorized on the basis of location and management. It means who host or manage the servers. There are four types of cloud deployment model; Public Cloud, Private Cloud, Hybrid cloud and Community cloud.

4.3.1 Public Cloud

In Public Cloud, computing infrastructure is hosted by vendor or service provider; it is also called as external cloud. It is the popular form of cloud computing which is used through pay per use. To develop this cloud, there is huge investment is needed. For using this cloud, customers choose a location to deploy their applications. Information is share between two organizations. Rack space, Microsoft Azure, Amazon Web Service and Google applications are the examples of Public Cloud.

4.3.2 Private Cloud

In Private Cloud, computing infrastructure is hosted by organization. It is also called as internal cloud. It is controlled by the organization. It is secured with internal firewall. It is more secure than public cloud. It is limited use of a single client. For implementing private cloud, organization require IT infrastructure with small number of high skilled IT staffs. This model provides high level of control over utilization of resources. Private clouds can be set up by using a variety of offerings Microsoft. IBM,VMware and others. OpenStack and Eucalyptus are some of the open source implementations

4.3.3 Hybrid Cloud

Hybrid cloud is the combination of Public and private cloud. In any organization, some important information uploaded on private cloud and which are not important information uploaded on public cloud. This type of cloud called as hybrid cloud. In banking system, some information are important for public purpose. They provide space for public to use them but some are very important in terms of security purpose. Hybrid cloud provides faultless scalability by moving the private cloud based applications to the public cloud.

4.3.4 Community Cloud

When interests are same of different organizations, then community cloud is implemented to share information. Government institutions, Business branches and Private suppliers are those who may have same interests. In this case, community cloud can be developed. It works as a private cloud where security is better than public cloud.

The Cloud infrastructure is shared between the organizations of the same of community. For example, all the government agencies in a city can share the same cloud but not the non-government agencies.

4.4 Benefits and Challenges of Cloud Computing

Question arise, why people go behind the cloud computing. It is latest technology but, there are some qualities which attracts the customer/consumers. There can be lots of profit after investing in cloud computing

- It is available at low cost with high automated computing.
- Provides quick access service to customers/users.
- Provides easy, simplified and efficient service.
- Huge volume storage capacity
- Instant application deployment
- Due to scalable features, It provides service a large number of customers in a real time without obstacle.
- Due to Fault tolerance and high reliability, it provides quality service to the users.

Benefits can be categorized in three parts:

4.4.1 Operational Benefits

The business can be changed after using applications and storage of cloud computing. There are following major benefits:

- Minimized Cost
- Increased Storage
- Automation
- Flexibility
- Better mobility
- Better use of IT staff

4.4.2 Economic Benefits

Money is the big concern of any organization. In cloud computing, software and hardware cost can be reduced. Major benefits are follows

- People
- Hardware
- Pay-as-you-go
- Time to market
- Low entry cost
- Service
- Wiser investment
- Security
- Reduce Capital expense
- Meet short-term needs

4.4.3 Staffing Benefits

If the employers use the applications of cloud providers, they have got huge benefits from service providers. Like another business, in cloud computing, service providers also benefited from employers. Major benefited are following;

- No software installation and maintenance
- Shorter deployment time
- Upgrades
- Worldwide availability
- Service level agreement
- Make life easier of IT Staff
- More money

4.5 Models of Cloud Computing

Cloud computing is a service based model. On the web, there are different types of services but cloud computing has three models.

- SaaS (Software as a service)
- PaaS (Platform as a Service)
- IaaS (Infrastructure as a Service)

4.5.1 Software as a Service

In this model, users can use software and application from cloud service providers. Gmail, Hotmail, Google apps Skype can be used free of cost. Some are paid based software which can be used on subscription basis and make benefits from this. Users can maintain, control and customize also according to their use. Users can be benefited to invest low initial cost and use lots of hardware and software.

4.5.2 Platform as a Service

This model helps to provide computing platform to run the software and other tools on Internet. In this model, Cloud computing providers provide online operating system on rental basis. Those platforms are such as Window Azure, Google App Eng. and Force.com. These platforms are used for making application. In this case users

don't invest much money to make platform. On the use of rental basis they do their work.

4.5.3 Infrastructure as a Service

This model also called as a hardware as a service. AWS (Amazon web service) is the big player in the field. They provide two types of service; One for computing resources other for data storage. It is different for SaaS model. In this model, service providers provide hosting website. It is completely pay-per use service model. IBM, Amazon web service, Rackspace, Savvis, HP, Google Base and Sun are service providers in this field.

4.6 Characteristics of Cloud Computing

The essential characteristics of cloud computing is on demand self-service like email service, Server service without human interactions. There are big players like AWS, Google, Microsoft and Force.com. AWS who provide service like New York Times, NASDAQ

4.6.1 Broad Network Access

. Cloud computing is a network based service who provides service all over the world in real time in different devices like laptop, mobile phone and PDAs. It is a standard mechanism which provides service on different platform.

4.6.2 Resource Pooling

For providing resources to multiple consumers, cloud computing use multiple-tenant model. According to consumer demand, resources are dynamically assigned or reassigned. Resources can be storage, bandwidth, email service, operating system etc. Resource pooling also secure the user's privacy.

4.6.3 Rapid Elasticity

Cloud computing has unique features of elasticity. During the rush of users, automatically adjust the system without reducing speed. This features shows in IaaS model. The system is breakdown down the workloads in different pieces and services. It works like linear scalable. If one servers process hundred transactions then other will work 200 transactions.

4.6.4 Measured Service

Like electricity, telephone and water service, cloud computing services are measured. Higher you use, pay the high price, if you use less, pay the less price. Cloud service providers as well as consumers service both are measured in scale. It has metered capability to measure how much resources are used. Cloud computing enables to control and optimize resource use.

4.6.5 Multi Tenacity

At the same time, System allows multiple users to use the infrastructure. This is done by virtualizing the servers on the available machine pool and then allotting the servers to multiple users. This is done in such a way that the privacy of the users or the security of their data is not compromised.

NIST (National Institute of Standard and Technology) elements of Cloud Computing

Essential Characteristic	**Service Model**	**Deployment Model**
On demand Self service	SaaS	Private Cloud
Broad Network Access	PaaS	Community Cloud
Resource Pooling	IaaS	Public Cloud
Rapid elasticity		Hybrid Cloud
Measured or metered		

4.7 Cloud Computing in Libraries

Cloud computing has more potential for libraries. Developing digital libraries, website hosting and most important in Automation of Library; these three areas can be recognized where cloud computing can be adopted. For archiving old documents, digital repository can be developed which is easily searchable. In the minimal cost and management, website hosting is also possible in library. They will provide good service for users and also help the professionals. Automation will help to minimize the work load and handle the repeated work. In the difficult time, data backup is easy in cloud computing environment.

There are some grey areas where library professionals worried about cloud computing adoption. Security and Privacy of data is the most important aspects of any organization. But nowadays for development of libraries, it can be ignored. It cannot possible; library will develop all software and hardware solution and compete with market challenge. It will need some compromise with third parties service providers, and then library can provide efficient and quality service to users.

4.7.1 Example of Cloud Libraries:

- OCLC
- ExLibris
- Polaris
- Discovery service
- Encore
- Google Scholar
- World Cat
- Scribd
- Dura Cloud

4.7.2 Advantage of cloud computing in libraries

- Availability anywhere any time
- Openness
- Transparency
- Flexibility and Innovation
- Interoperability
- Create and Collaborate
- User Centric

4.7.3 Disadvantage

- Constant internet connectivity require
- Privacy
- Dependency
- Data security
- Failure in compliance
- Budget

References:

Gosavi, Nandkishor, Sheetal, S. Shinde & , Dhakulkar, Bhagyashree (2012). Use of cloud computing in library and information science field.*International Journal of Digital Library Services***,** 2(3**),** 51–60

Alotaibi, Mishan S. (2012). Utilizations of cloud computing in library and information centers: a theoretical study. *International Journal of Digital Library Services***,**3(4), 83-93

.Kaushik, A. & Kumar, A. (2013). Application of cloud computing in libraries. *International Journal ofInformation Dissemination and Technology,* 3(4), 270-273.

Rao, M N (2015) *Cloud computing*, PHI Learning, Delhi

Mitchell, Erik T. (2013). Cloud based services for your library: a LITA guide. An imprint of American Library Association,

Das, K. C. (2013).Impact of Cloud computing in Library services.

Aher, Vaishali N, Pandit, Praveen J & Borse, T R (2016). Cloud computing and library automation: an overview, *International conference on emerging trends in engineering and management research,* 1247-1252

Chapter-5
Data Analysis & Interpretation

Chapter-5

Data Analysis & Interpretation

This chapter discusses in detail about the analysis and interpretation of data collected through a survey conducted among the six Indian Institute of Management. This chapter is based on the responses of questionnaires by library professionals of IIMs. It helped to make investigator to analyze and interpret the data.

"Cloud computing" is the delivery of computing services over the internet. Cloud services allow individuals and institutions to use software and hardware that are managed by third parties at remote location. Cloud services include online file storage, social networking sites, webmail, online applications etc. The Cloud computing model allows access to information and computer resources from anywhere that a network connection is available. Cloud computing offers real alternatives to IT field for improved flexibility and lower cost. Digital libraries are developing for software applications, platforms, and infrastructure as a service to IT department over the "cloud". It also provides for better and easier management of data security, since all the data is located on a central server. So, in order to find the usage of applications of cloud based services among LIS professionals, the collected questionnaires are 50.

5.1.1 Questionnaire Distributed & Received

During study, Investigator visited all IIMs Libraries and distributed questionnaires and collected also. Some questionnaires are received by email later. Data are shown through table and graph below.

Table 5.1.1

S.No.	Name of the Institute	Distributed	Received	Received %
1	IIM-C	9	6	66.67
2	IIM-A	23	10	43.48
3	IIM-B	18	10	55.56
4	IIM-L	9	8	88.89
5	IIM-K	9	7	77.78
6	IIM-I	9	9	100.00
7	Total	77	50	64.94

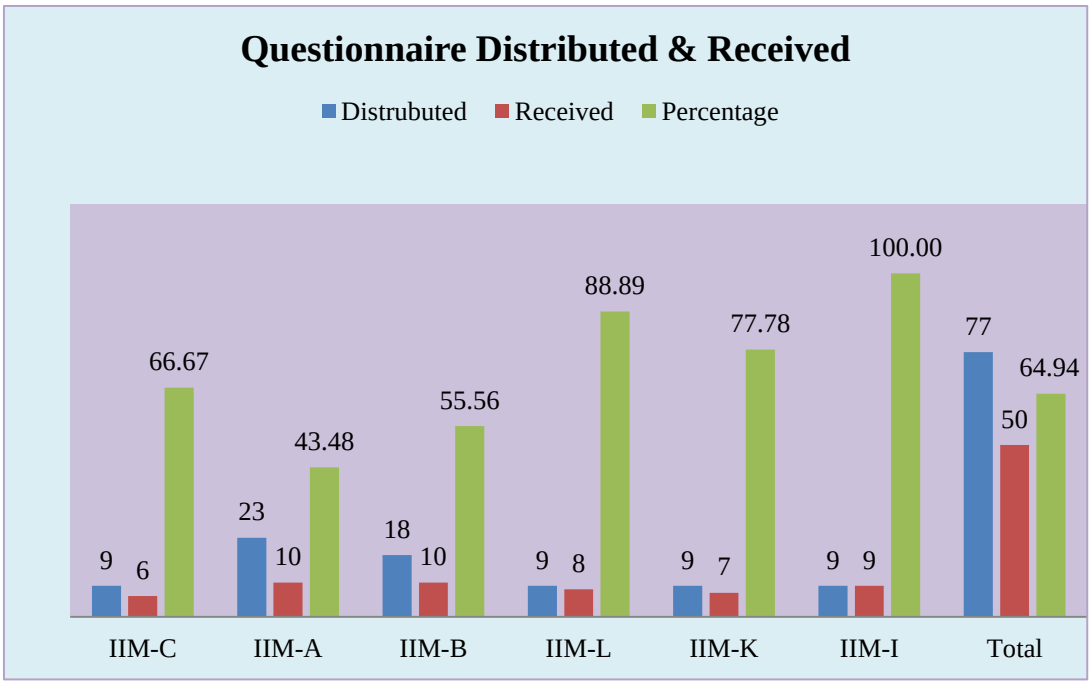


Figure.5.1.1

Table.5.1.1 and Figure 5.1.1 shows that total 77 questionnaires were distributed among Library professionals of IIMs and 50 were received. It means that 64.94% is received. Maximum response came from IIM-I which is 100% and less response from IIM-A which is 43.48%.

5.1.2 Gender Wise Response

It is generally seen that, in Institution or Organization, there is big gap in numbers between female and male workers/professionals. Nowadays, it is a part of study in context of gender inequality, uneven presence of particular gender. Below table and graph are shown the whole statistics.

Table 5.1.2

S.No.	Name of the Institute	Male	Female	Male %	Female %
1	IIM-C	4	2	66.67	33.33
2	IIM-A	5	5	50.00	50.00
3	IIM-B	7	3	70.00	30.00
4	IIM-L	8	0	100.00	0.00
5	IIM-K	2	5	28.57	71.43
6	IIM-I	7	2	77.78	22.22
7	Total	33	17	66.00	34.00

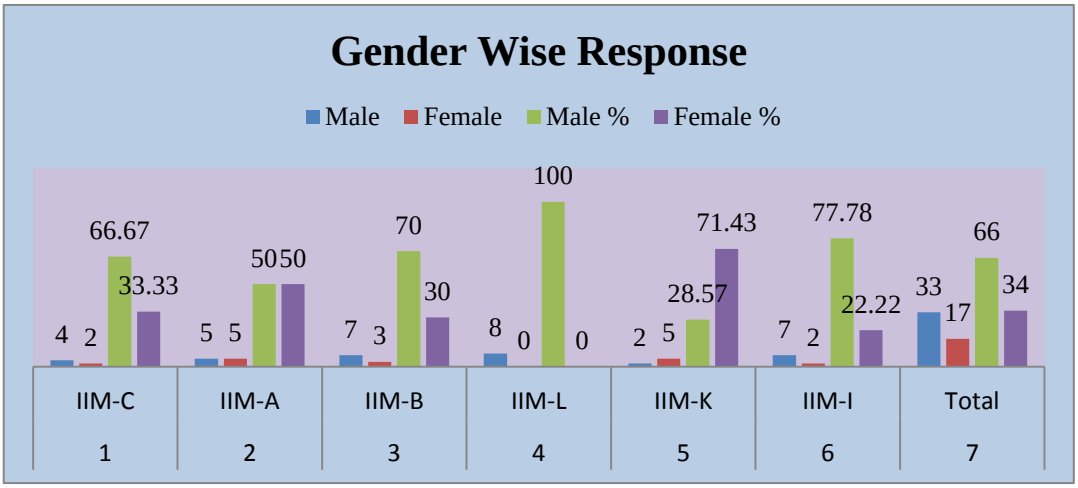


Figure 5.1.2

Figure: 5.1.2 shows the responses which are received from male professionals are more than female respondent. In IIM-L, 100% is male responder and female response rate is zero. IIM-A has equal response rate that is 50 % each. Figure also shows that majority of the IIMs Professionals are male. Despite of total response, 77.78% is male and 22.22 % is female.

5.1.3 IT Related Qualification

As the study is based on cloud computing which is related to information technology. Moreover most of libraries have been changed traditional to IT based system. It is very essential for library professionals they should have knowledge of IT or degree of IT. It is also good for the sake of library and users. Data are shown through table and graph below.

Table 5.1.3

S.N.	Name of the Institute	IT Related Qualification	IT Related Qualification %
1	IIM-C	3	50
2	IIM-A	6	60
3	IIM-B	4	40
4	IIM-L	2	25
5	IIM-K	4	57.14
6	IIM-I	7	77.78
7	Total	26	52

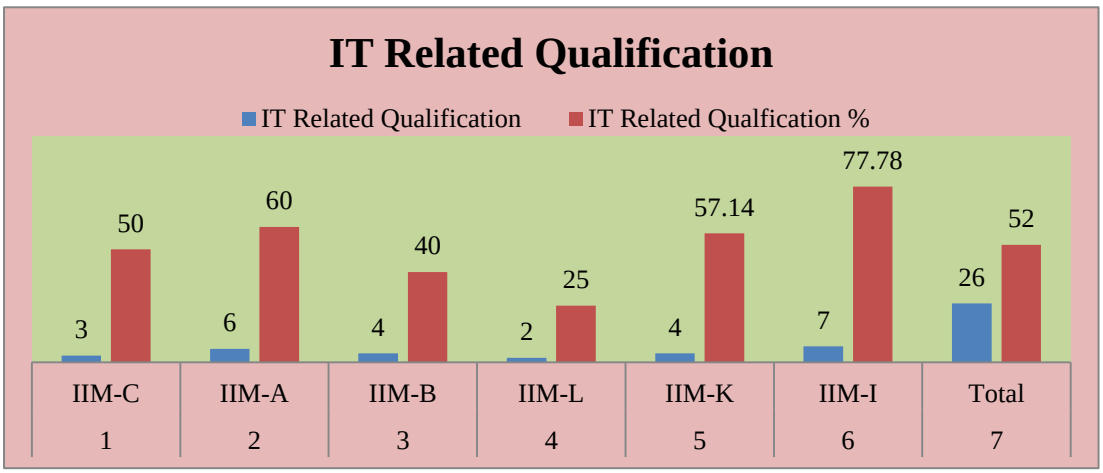


Figure 5.1.3

Table 5.1.3 and Figure 5.1.3 shows that, 52% Library professionals of IIMs have IT related degree. IIM-I has maximum number (77.78%) of professionals which have degree of any diploma and other higher degree of IT and IIM-L has least that is 25%.

5.1.4 Awareness about Cloud Computing

It is the main objective of the study. Without awareness of any topic, nobody can respond on this topic. Awareness means knowledge of any topic. It doesn't matter less or more. To identify the awareness of any topic of library professionals, then anyone can respond next questions of questionnaires. Through table and graph, it is shown below.

Table 5.1.4

S.N.	Name of the Institute	Aware	Respondent	Aware %
1	IIM-C	6	6	100.00
2	IIM-A	10	10	100.00
3	IIM-B	10	10	100.00
4	IIM-L	7	8	87.50
5	IIM-K	7	7	100.00
6	IIM-I	9	9	100.00
7	Total	49	50	98.00

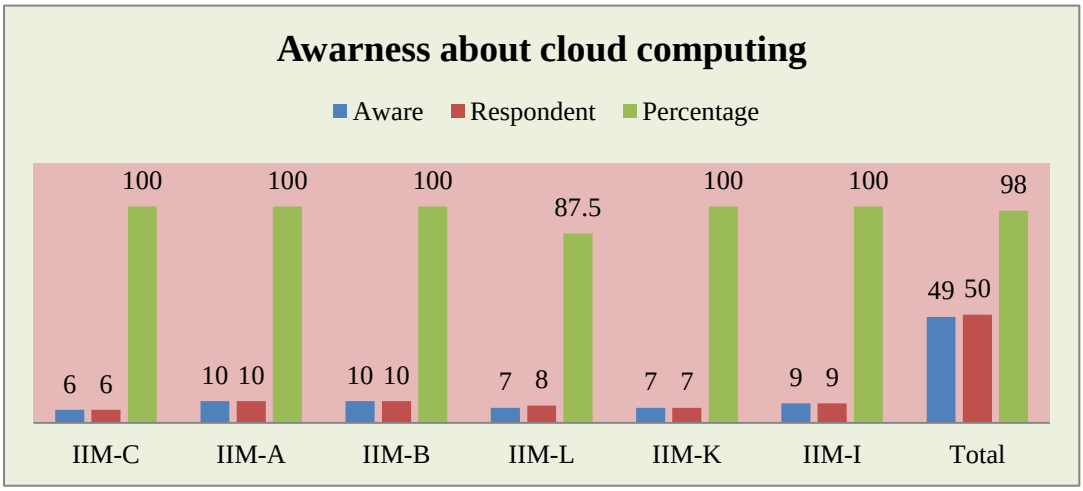


Figure 5.1.4

Table 5.1.4 and Figure 5.1.4 depict that 98% Library professionals of IIMs are aware about cloud computing whereas only 2% are not aware. This result shows the positive sign for study as well as libraries.

5.1.5 Concept of Cloud Computing

Concept is the theoretical and soul of any topic. It is different from awareness. Concept means the core of any subjects which reflects completely. During making questionnaires, Investigators tried to make question about cloud computing for checking the concept of cloud computing among library professionals. Two options have been given to choose, first is, "Practice of using a network of remote servers hosted on the internet to store, manage and process the data" and second is "Practice of using local server to store, manage and process the data".

Table 5.1.5

S.No.	Name of the Institute	Practice of using a network of remote servers hosted on the internet to store, manage and process the data (C1)	Practice of using local server to store, manage and process the data (C2)	C1 %	C2 %
1	IIM-C	1	5	16.67	83.33
2	IIM-A	7	3	70	30.00
3	IIM-B	7	3	70	30.00
4	IIM-L	2	6	25	75.00
5	IIM-K	5	2	71.43	28.57
6	IIM-I	9	0	100	0.00
7	Total	31	19	62	38.00

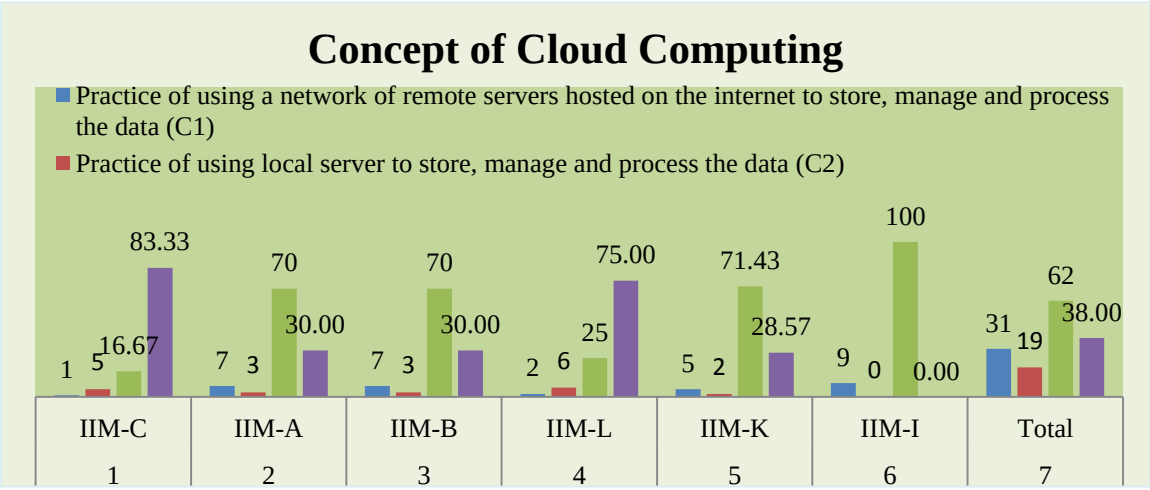


Figure 5.1.5

Table 5.1.5 and Figure 5.1.5 shows that 38% know the real concept of cloud computing and 62% don't know, they are confused in local servers and Remote servers, but they use cloud computing services. Majority of Library professionals of IIMs don't have true concept about cloud computing whereas about one third professionals know the actual concept.

5.1.6 Purpose of Using Cloud Computing

Cloud computing is used for different purposes. Without knowing the fact, many people use cloud based services for personal purpose; they store texts, images, audio and videos on cloud platforms. They also share all these files for individual purpose.

At the same time, in library, library professionals use cloud computing for library purpose. They use cloud computing for providing reference services, collaborating with librarians and users and also for collaborating writing. Remote access and discovery service is the part of cloud computing.

Table 5.1.6

S.No.	Name of the Institute	Personal Purpose only	Library Purpose only	Both Purpose
1	IIM-C			6
2	IIM-A	2		8
3	IIM-B	1		9
4	IIM-L		2	4
5	IIM-K	1		6
6	IIM-I	3	1	5
7	Total	7	3	38

Figure 5.1.6 indicates that only 7 professionals use cloud computing for Personal Purpose, 3 for Library Purpose and Remaining 38 use for both purposes. It means

majority of professionals use cloud computing service for library and personal purpose which is good sign for adoption of new technology in Library.

5.1.7.1 Using Cloud Computing for Personal Purpose

Due to social and technological change, There are many areas where cloud computing is used to ease the daily life. In a routine life to store documents, photos, videos and sharing files have been essential.

Table 5.1.7.1

Use of cloud computing for Personal Purpose	Number of respondents	In Percentage
Store Document	45	90
store Photo	40	80
Store video	34	68
Sharing files	43	86
Collaborative Writing	18	36

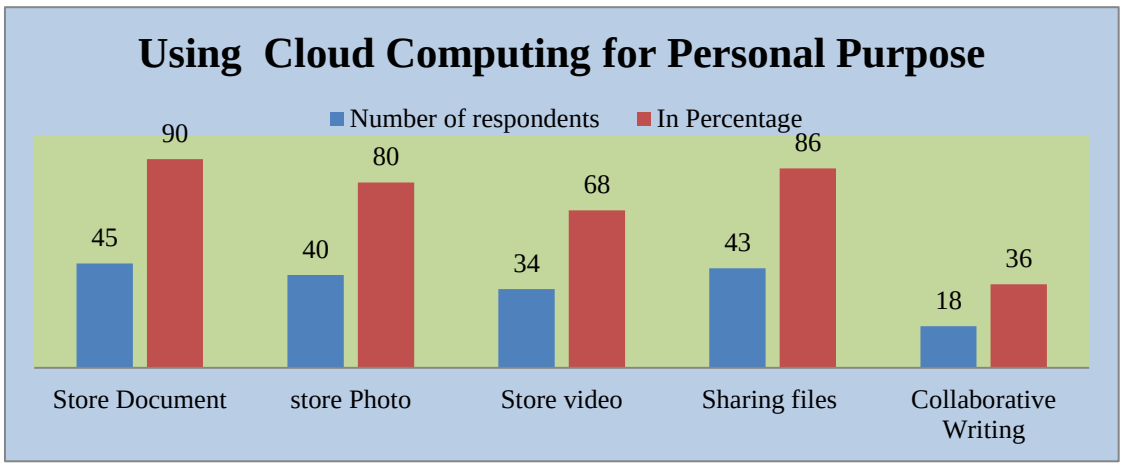


Figure: 5.1.7.1

Table 5.1.7.1 and Figure 5.1.7.1 show that 90% Library professionals use cloud computing to store document, 80% use to store photo, 68% use to store video, 86% use for sharing Files and 36% use for collaborative writing for personal Purpose.

5.1.7.2 Using Cloud computing for Library Purpose

In a library, cloud computing is used for sharing files, to know the users feedback. Through cloud computing, It can also be taken staff input by librarian and make plan or program for future. Library professionals can collaborate with users and other professionals. They can provide reference service also.

Table 5.1.7.2

Use of cloud computing for Library Purpose	**Number of respondents**	**In Percentage %**
Collaboration with Library Users	43	86
Providing Reference service	33	66
Collaboration with other Library Professionals	19	38
Collaborative Writing	10	20

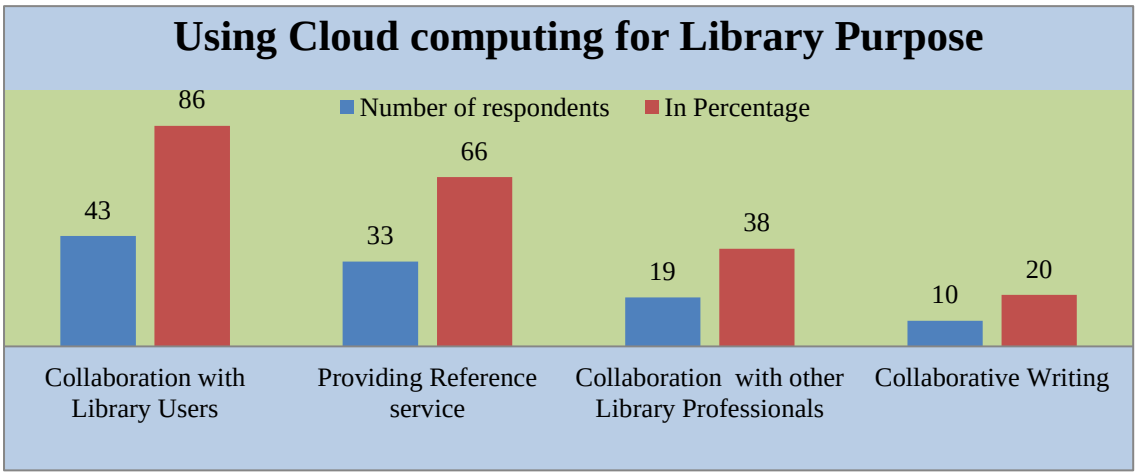


Figure: 5.1.7.2

Table 5.1.7.2 and Figure 5.1.7.2 indicate that 86% of Library professionals use cloud computing for collaboration with library users, 33% use for providing reference service, 38% use for Collaboration with other Library Professionals and 20% use for Collaborative writing.

5.1.8 Use of Cloud Services

In library, there are different types of services which are frequently used by library professionals. Mailings services, forums, social networking sites and library websites are the basics platforms which help to library professionals to provide good service to users.

Table 5.1.8

Cloud Services	Frequently	Occasionally	Rarely	Don't
Mailing services	38(76%)	6(12%)	2(4%)	4 (8%)
Forums	14(28%)	17(34%)	8(16%)	11(22%)
Social Networking	24(48%)	12(24%)	5(10%)	9(18%)
Library Website	21(42%)	12(24%)	4(8%)	13(26%)

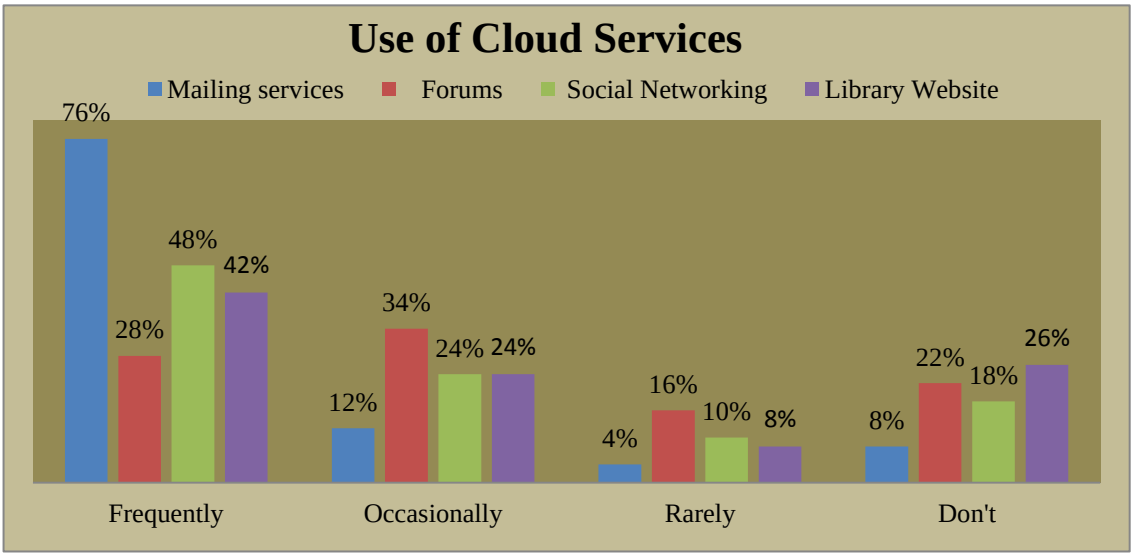


Figure 5.1.8

There are many cloud based services being used by the library professionals. Here Figure 5.1.8 clearly indicates that majority of library professionals (76%) uses mailing services frequently followed by social networking (48%), library website (42%) whereas only 28% professionals they use forums frequently.

5.1.9 Use of Mailing Services

There is lot of mailing service providers. Some are very popular, to use for sending personal mail. Well known mailing services are Gmail, Yahoo, Hotmail and Rediff. Some institutes also use institutional mailing service.

Table 5.1.9

Mailing Services	Frequently	Occasionally	Rarely	Don't
Gmail	45 (90%)	1 (2%)	3 (6%)	1 (2%)
Yahoo	9 (18%)	7 (14%)	8 (16%)	26 (58%)
Hotmail	2 (4%)	7 (14%)	8(16%)	35 (70%)
Rediff	1 (2%)	1 (2%)	3 (6%)	45 (90%)

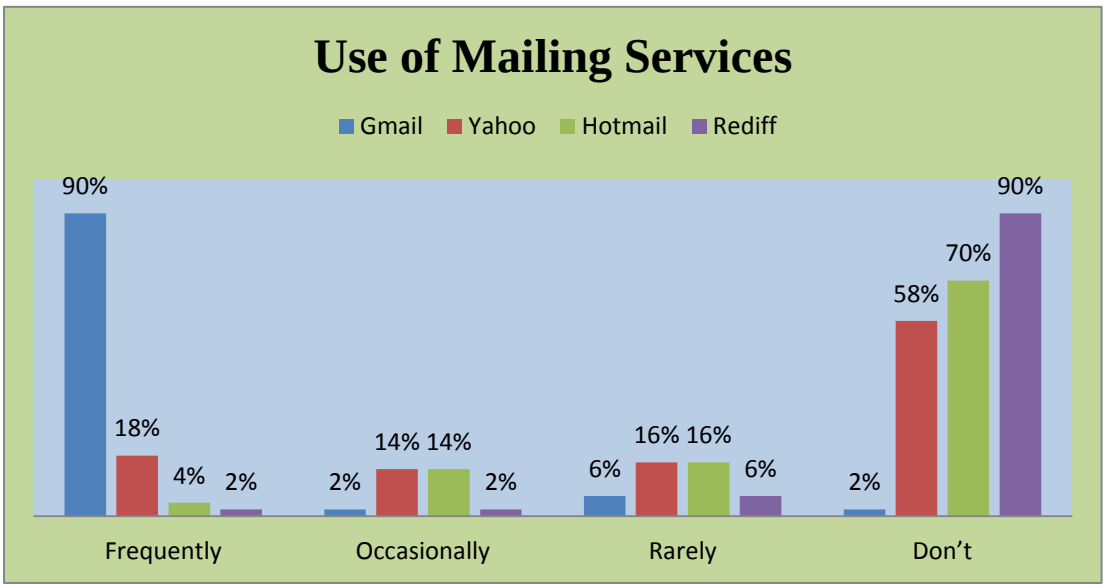


Figure 5.1.9

Table 5.1.9 and Figure 5.1.9 interprets the responses towards mailing service used by the library professionals. Where 90 % professionals responded they use Gmail mailing service frequently whereas only 2% responded that they use Rediff frequently. Similarly 90% respondents said that they do not use Rediff and only 2% said that they do not use Gmail. 14% professionals use Yahoo and Hotmail occasionally where as 16% use rarely each. 18% prefers Yahoo to use frequently.

5.1.10 Use of Forums

Forums are those platforms where questions are asked, information are shared in a group. It is two way communication public platform where any one respond which is registered. LIS Forum, LIS Link, Voice Thread and Google group are some forums which help to professionals.

Table 5.1.10

Forums	Frequently	Occasionally	Rarely	Don't
LIS Forum	27 (54%)	2 (4%)	5 (10%)	8 (16%)
LIS Link	26 (52%)	10 (40%)	3 (6%)	11 (22%)
Voice Thread	4(8%)	2 (4%)	6 (12%)	38 (76%)
Google Group	15 (30%)	6 (12%)	6 (12%)	23 (46%)

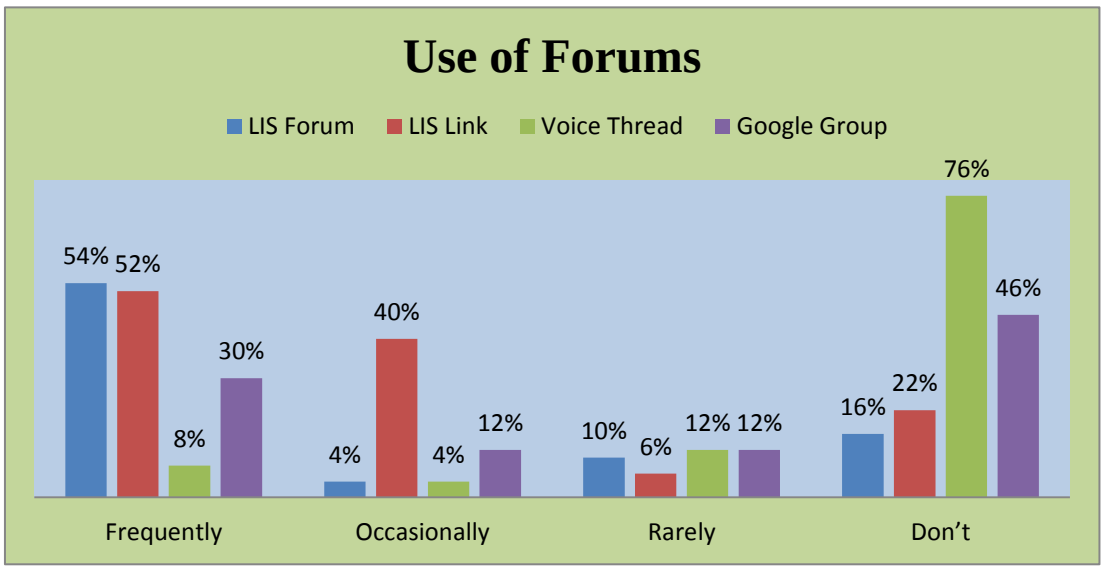


Figure 5.1.10

Table 5.1.10 and Figure 5.1.10 interpret the responses towards forums used by the library professionals. Where 54 % professional they use LIS Forum frequently followed by LIS Link 52%and Google Group 30% whereas only 8% respondent that they use Voice Thread frequently. Similarly 76% respondents they don't use Voice Thread and only 2% s that they don't use LIS Forum. 20% use LIS Link Occasionally.

5.1.11 Use of File Sharing

In the last decade, big file sharing over internet is a difficult task. But nowadays, it is easy to share big file due to development of cloud based platform. Google Drive, Drop Box, Slide Share and Egnyte help the users to share files. Apart from these, there is lots of platform from which files can be shared.

Table 5.1.11

File Sharing	Frequently	Occasionally	Rarely	Don't
Google Drive	40 (80%)	3 (6%)	4 (8%)	3 (6%)
Drop Box	13 (26%)	12 (24)	9 (18%)	16 (32%
Slide Share	12 (24%)	10 (20%)	8 (16%)	20 (40%)
Egnyte	1 (2%)	2 (4%)	2 (4%)	45 (90%)

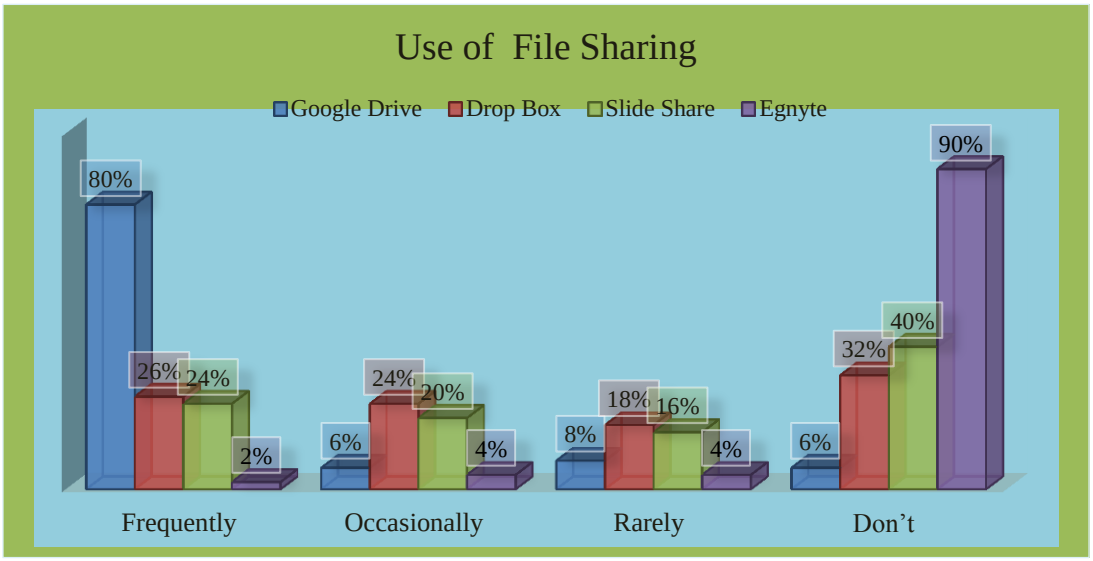


Figure 5.1.11

To find out the most frequent file sharing cloud based service a question was framed in the questionnaire. On the basis of the responses Table 5.1.11 and Figure 5.1.11 have been prepared. From the above Figure it can be clearly stated that Google drive (80%) is the most frequently used file sharing cloud based service followed by Drop box 26% and Slide Share 24% among the library professionals whereas only 2% responded that they use Egnyte.

5.1.12 Software and Application

There is lots of software and application which is based on cloud. Today some libraries are developing their mobile library application for providing good services to users. Google play store, Google Sites, Zotero and delicious are some important cloud platform.

Table 5.1.12

Software & Application	Frequently	Occasionally	Rarely	Don't
Google Sites	34 (68%)	4 (8%)	1 (2%)	11 (22%)
Google Play store	25 (50%)	7 (14%)	5 (10%)	13 (26%)
Zotero	12 (24%)	9 (18%)	7 (14%)	22 (44%)
Delicious	2 (4%)	3 (6%)	7 (14%)	38 (76%)

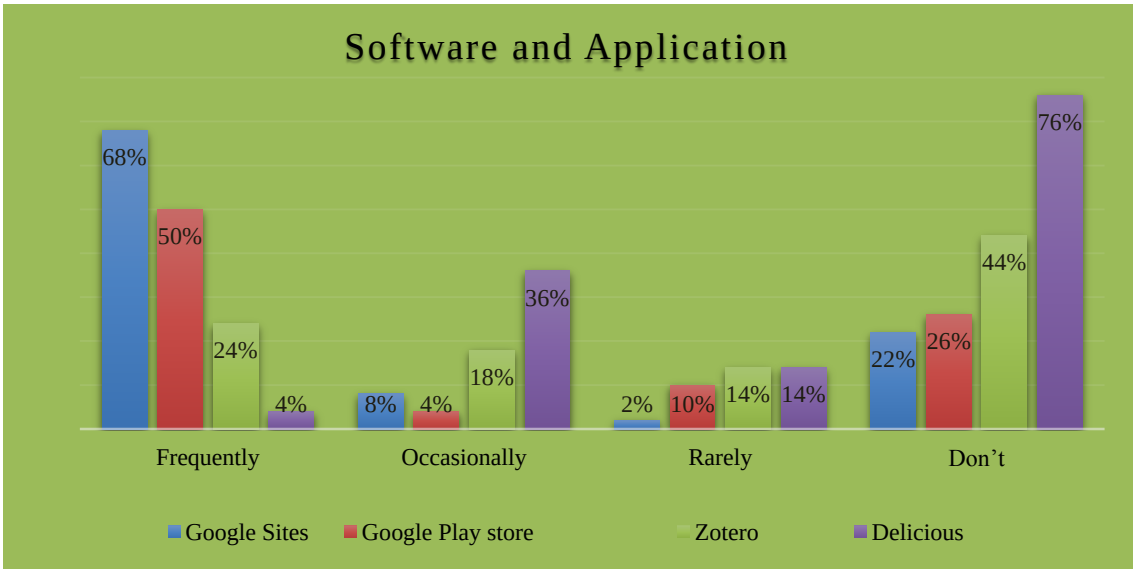


Figure 5.1.12

Figure 5.1.12 has showed that Google Sites are the most frequently used web applications among the library professionals as got responded by 68%, whereas, There are only 4% users which has been using Delicious comparatively. Google Play Store has also shown its popularity among the half of the respondents. 36% respondents are occasionally using delicious which reflects good use among the library professional than rest of the other software.

5.1.13 Cloud Based Storage Platform

Generally for data storage, physical systems are used. After the advent of cloud platform, many cloud based big players like Google, Microsoft, Amazon and IBM have given space on cloud. People have used the space for data storage. Due to storage of data over cloud, file sharing has become easy over internet.

Table 5.1.13

Storage Platform	Frequently	Occasionally	Rarely	Don't
Google Drive	40 (80%)	2 (4%)	2 (4%)	6 (12%)
Drop Box	16 (32%)	9 (18%)	4 (8%)	21 (42%)
Just cloud	5 (10%)	2 (4%)	7 (14%)	34 (68%)
Sugar Sync	0	2 (4%)	9 (18%(	39 (78%)

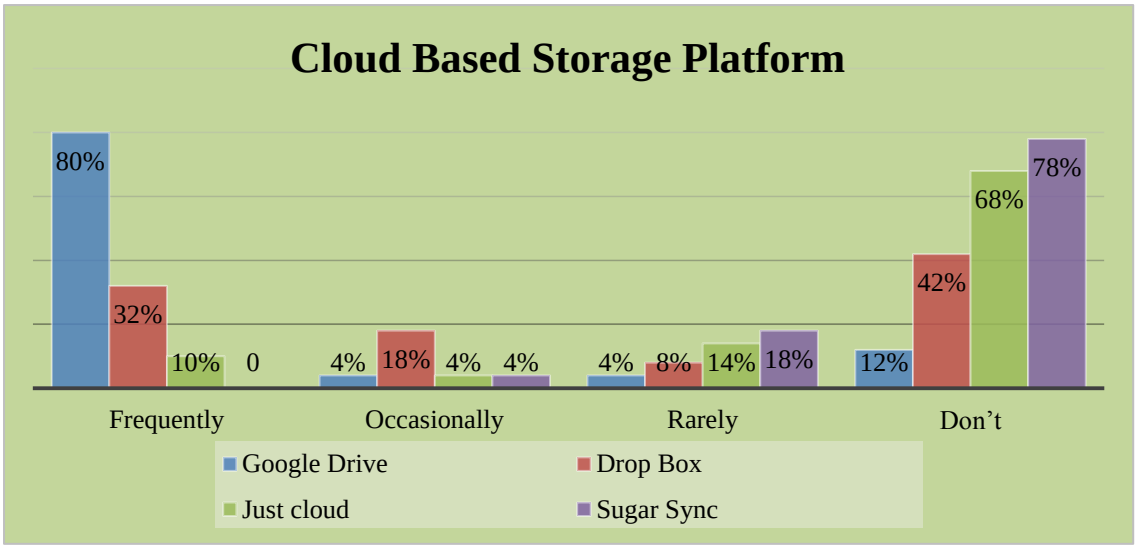


Figure 5.1.13

Cloud computing delivers various services to the users over internet. There are many cloud based options are available for storage of data. Among four storage platform (that are Google Drive, Drop Box, Just Cloud and Sugar Sync) Google Drive is the most frequent used platform for data storage. Among 50 LIS professional of IIMs 40 supports Google drive and they use it very frequently. Whereas Dropbox is also quite known platform for data storage on Cloud as it was supported by 16 LIS Professionals. They use Dropbox for data storage (Table5.1.13 and Figure 5.1.13).

5.1.14 Implementation of Cloud Computing In Library

In library, there are many areas where cloud computing can be implemented to develop library sophisticated and web based. Digital library development, Website hosting and Library automation are major areas where cloud computing can be implemented. On cloud platform, data backup is easy during difficult situation.

Table 5.1.14

Digital Library Development	44 (88%)
Website Hosting	37 (74%)
Library Automation	34 (68%)

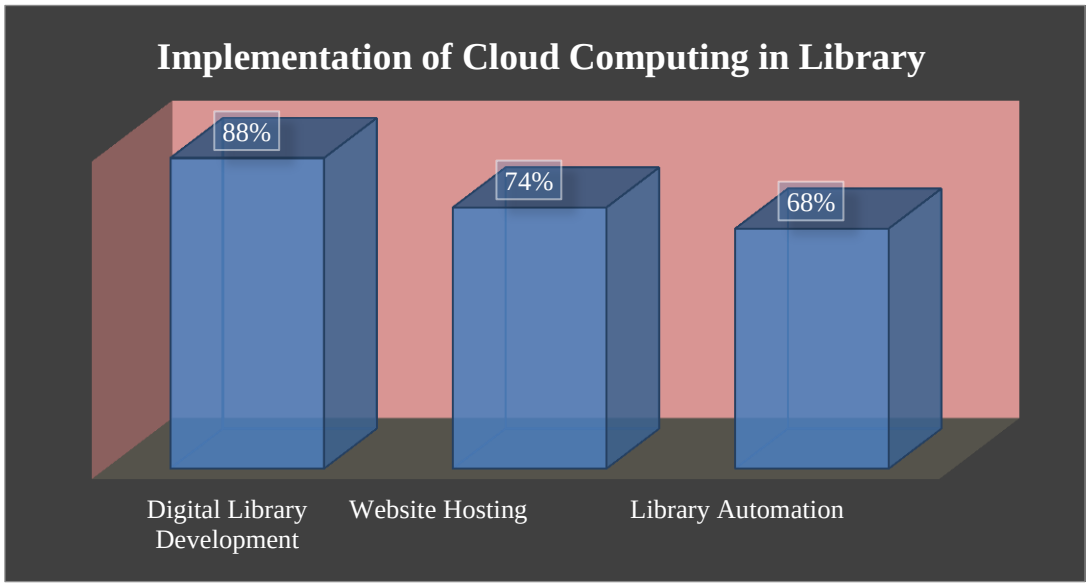


Figure 5.1.14

Above Table and Figure has been prepared for showing implementation of cloud computing in library. In Table and Figure 5.1.14, total three areas are given, they are digital library development, website hosting and Library automation. Total 88% LIS professionals have opinion that cloud computing services are the best way for developing a digital library. 74% want to use for website hosting and 68% want to use in Library Automation.

5.1.15 Trust in Cloud Service Providers

Cloud computing is a third party service provider then trust on third party is not easy for users as well as library. But in the age of internet, it is very difficult to ignore cloud system because it helps to system more serviceable. Before cloud computing, libraries had been purchased automation software from outside companies. They believed in outsiders. In coming years due to providing smooth service in any system, they will implement cloud computing services, technologies and models.

Table: 5.1.15

YES	**NO**
44 (88%)	6 (12%)

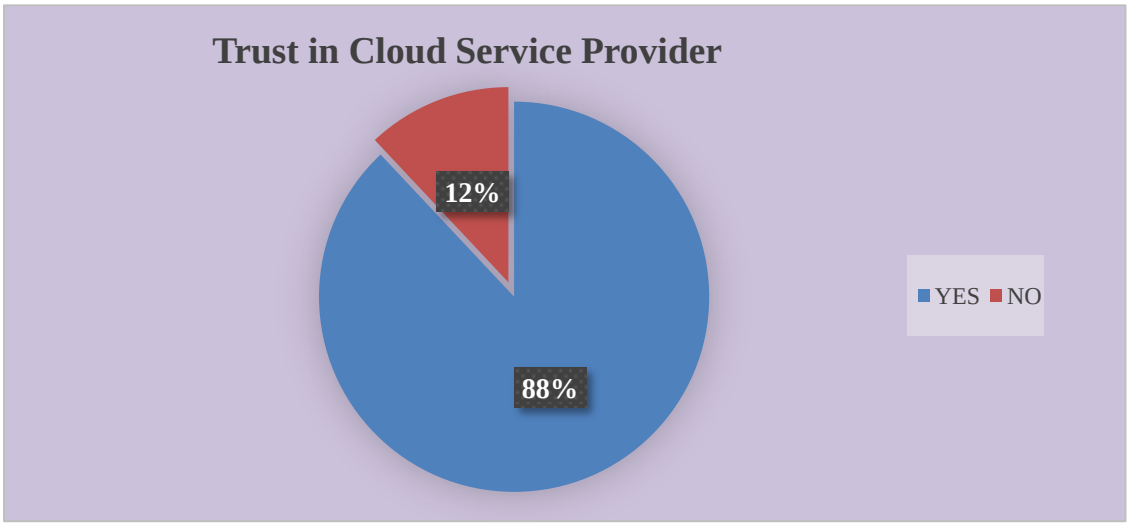


Figure 5.1.15

Figure 5.1.15 shows that 88% professionals responded that they have trust on the cloud service providers over internet while 22% responded that they don't trust due to data security aspect. Since technology is growing and developing day by day and also cybercrime. So 22% professionals have shown their fear and distrust issues with the cloud provider.

5.1.16 Ability to Store Data on Cloud Platform

Physically, data store is easy, because a lot of data storage devices are available but online storing data over cloud is little bit difficult but not complicated. Google Drive, Dropbox, Just cloud, Flickr YouTube etc. are platforms where data are uploaded.

Table 5.1.16

YES	NO
48 (96%)	2 (4%)

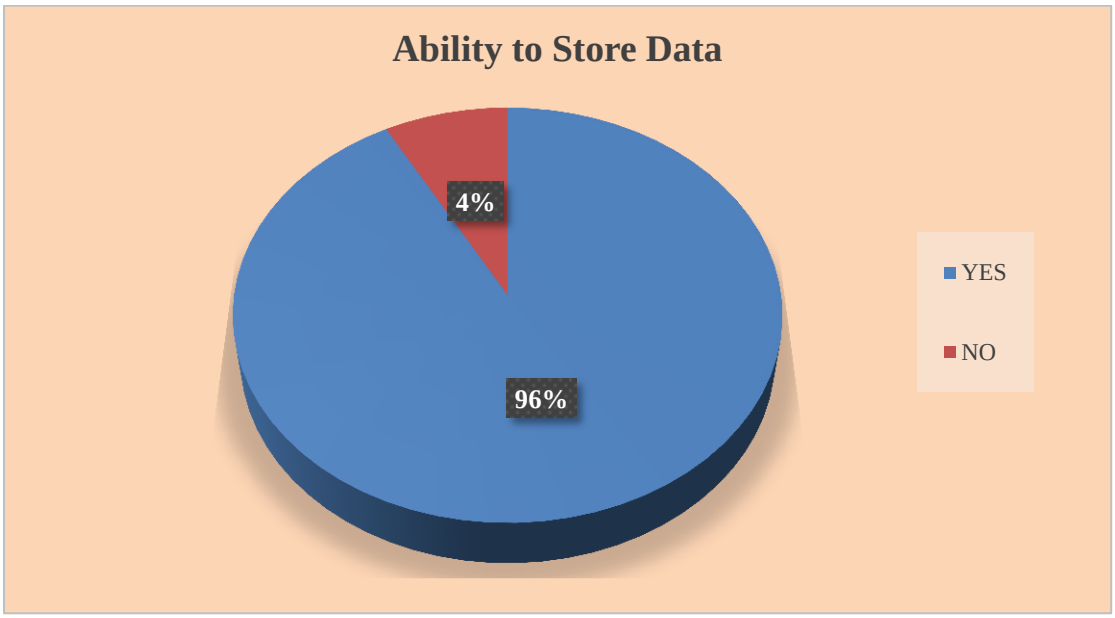


Figure 5.1.16

From the above figure 5.1.16 it can clearly state that professionals of IIMs' Libraries are able to store and retrieve data from cloud. Here 96% professionals are comfortable with cloud computing and they are capable to store data on cloud.

5.1.17 E-Book Reader

In IIMs, Libraries are emphasizing on subscribing e-books, some libraries have more e-book than physical document. In age of ICT, There are many e-book devices for reading. E-Book readers are comfortable to carry. IIM Ahmedabad has purchased 20 Kindle e-book readers and they subscribe books from amazon. There are many companies who have developed e-book readers and application for book reading. They are using cloud base technology to make them. In case of data loss, data could be synced easily. It has also made eye friendly.

Table 5.1.17

YES	NO
22 (44%)	28 (56%)

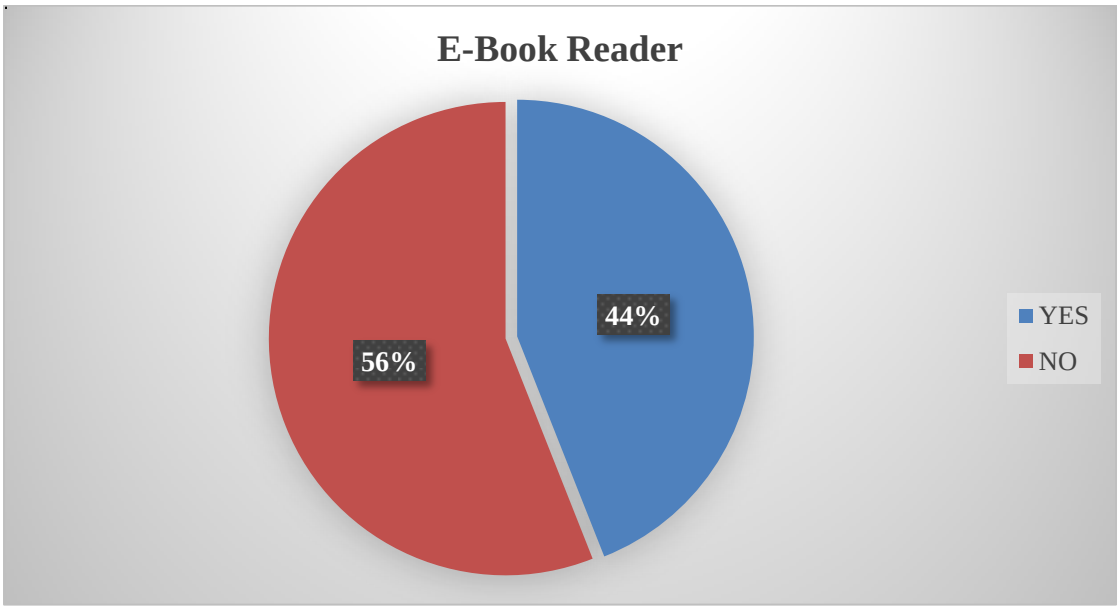


Figure 5.1.17

Table 5.1.17 and Figure 5.1.17 indicates that 56% Library professionals of IIMs library are aware with the E-Book reader. 44% are not aware. It is clear that majority of professionals are aware about e-book readers.

5.1.18 Awareness about Big Data

In a big organization, organizing, managing and analyzing the data are big task. Big data is nothing but institutional data which cannot be easily organize and process. In ICT environment data has been increased exponentially. It can be managed through different tools.

Table 5.1.18

YES	NO
46 (92%)	4 (8%)

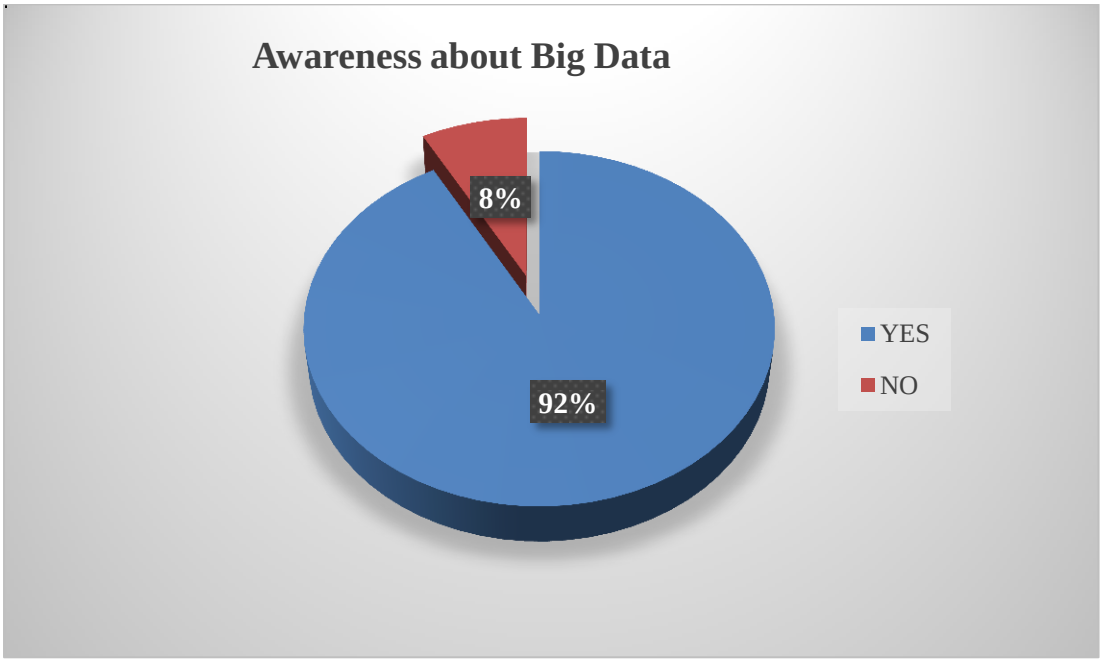


Figure 5.1.18

Big data is another concept related with the cloud computing. A 92% of professionals responded that they are aware with the concept of Big Data whereas 8% responded that they are not aware with the concept of Big Data.

5.1.19 Cloud Computing Manage Big Data

Cloud computing is related with service providers. Service providers work for organizing and analyzing of big volume of data. It means that management of data can be possible through cloud computing.

Table 5.1.19

AGREE	DISAGREE
46 (92%)	4 (8%)

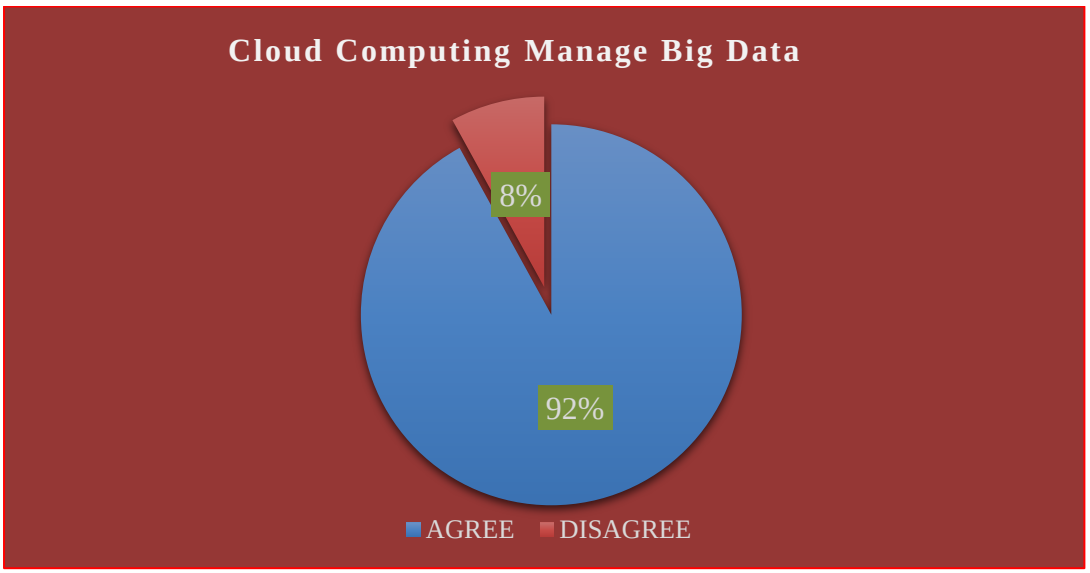


Figure 5.1.19

The above Table 5.1.19 and Figure 5.1.19 states that 92% respondents agrees that cloud computing help to manage Big Data and only 8% denied the statement.

5.1.20 Using Cloud Based Paid Service

There are many big players to provide cloud based services. Amazon, Google, IBM and Microsoft, they provide free as well as paid service. For website hosting, data storage and making mobile applications, services are purchased by systems or organizations. In library, Remote access and discovery services are example of cloud based service.

Table 5.1.20

YES	NO
10 (20%)	40 (80%)

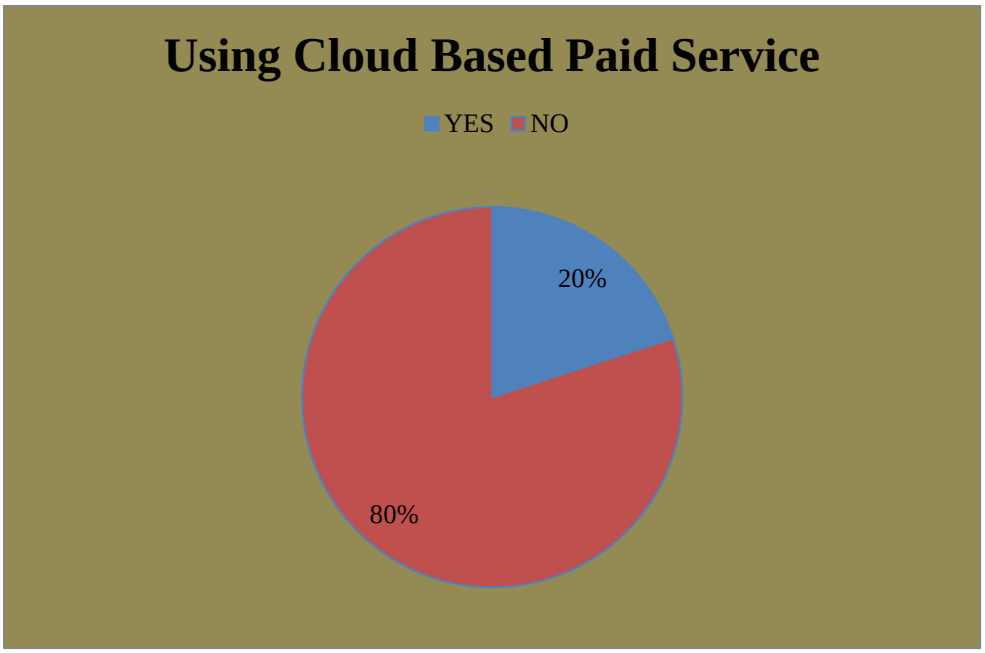


Figure 5.1.20

Many cloud based services are in trend these days. Some are available freely over internet and some are paid. Here Table 5.1.20 and Figure 5.1.20 shows that 80% professionals are not using cloud based paid services whereas 20% use paid services.

5.1.21 Awareness of Open Source Cloud Service

Software is very costly but open source software is very important in commercialized world. Open source cloud service is developed by using open source software. OpenStack and OpenShift are the example of open source cloud service.

Table 5.1.21

YES	NO
35 (70%)	15 (30%)

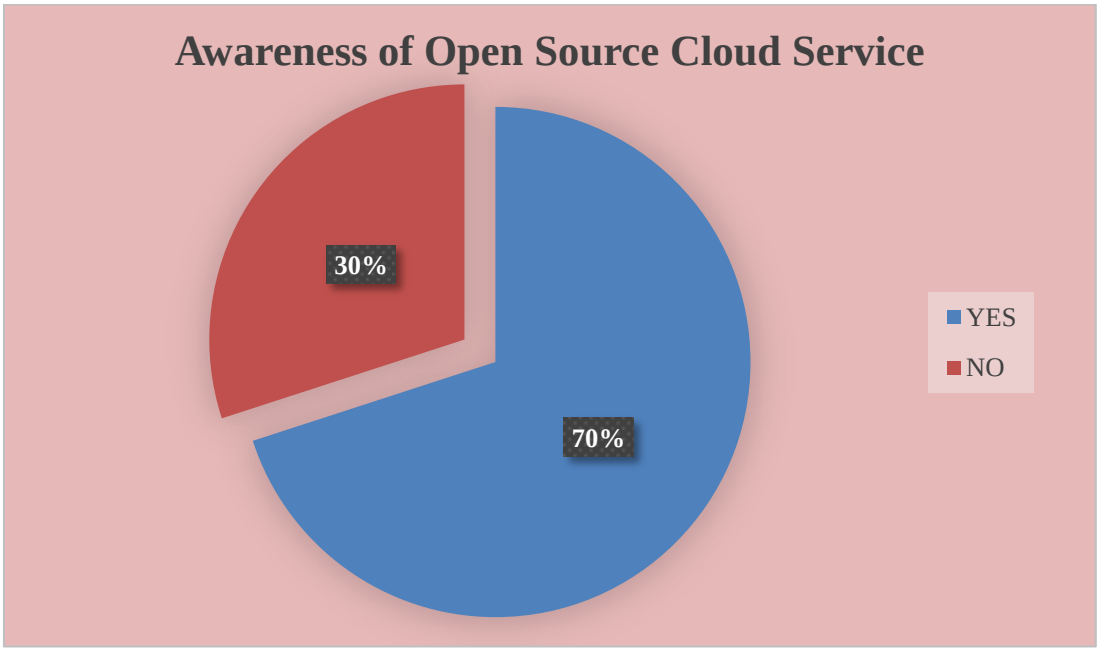


Figure 5.1.21

Table 5.1.21 and Figure 5.1.21 describes the result of awareness of open source cloud based services among library professionals; with response to these 70% professionals they are aware about the open source cloud services whereas 30% are not aware with the open source cloud based services.

5.1.22 Use of Open Source Cloud Computing

For development of mobile applications and other service based works open source services are used. Nowadays open source play an important role to minimize the budget of business as well as library system.

Table 5.1.22

YES	NO
12 (24%)	38 (76%)

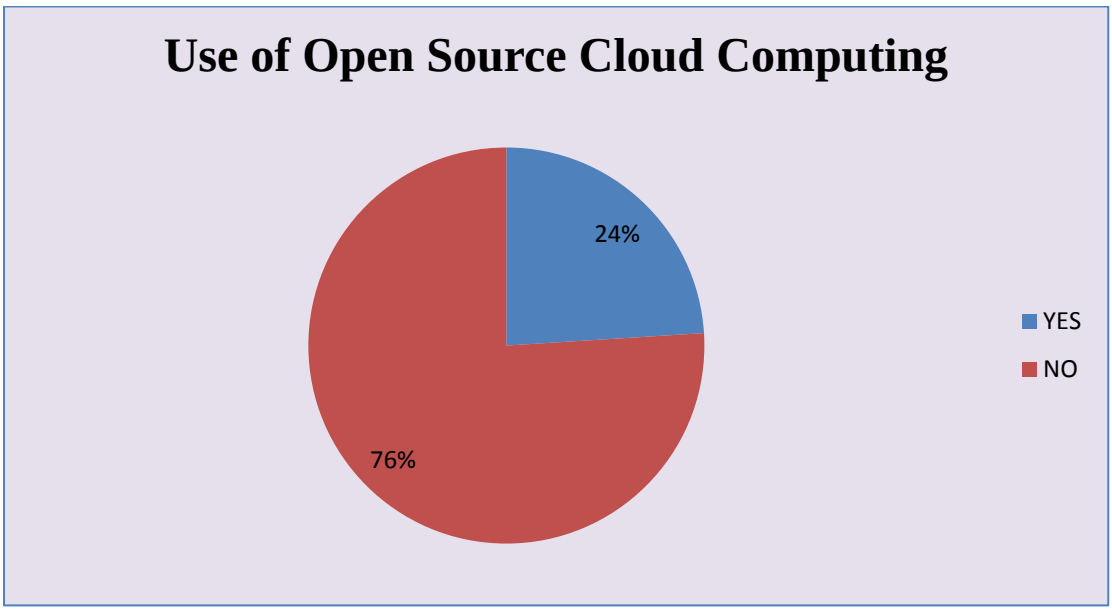


Figure 5.1.22

Table 5.1.22 and Figure 5.1.22 state that 24 % library professionals of IIMs Library use the open source cloud computing whereas 76 % responded that they don't use the open source cloud computing.

5.1.23 Use of Library Based Cloud Platform

In library operation, there are many websites are used. These websites help to provide service as well as to run library system. Some are cloud based library websites i.e. World Cat, Google Scholar Google Doc and Discovery services. All sites are very popular among library professionals.

Table 5.1.23

S.N.	World Cat	Google Scholar	Google Doc	Discovery
Yes	42(84%)	44(88%)	35(70%)	45(90%)
No	8(16%)	6(12%)	15(30%)	5(10%)

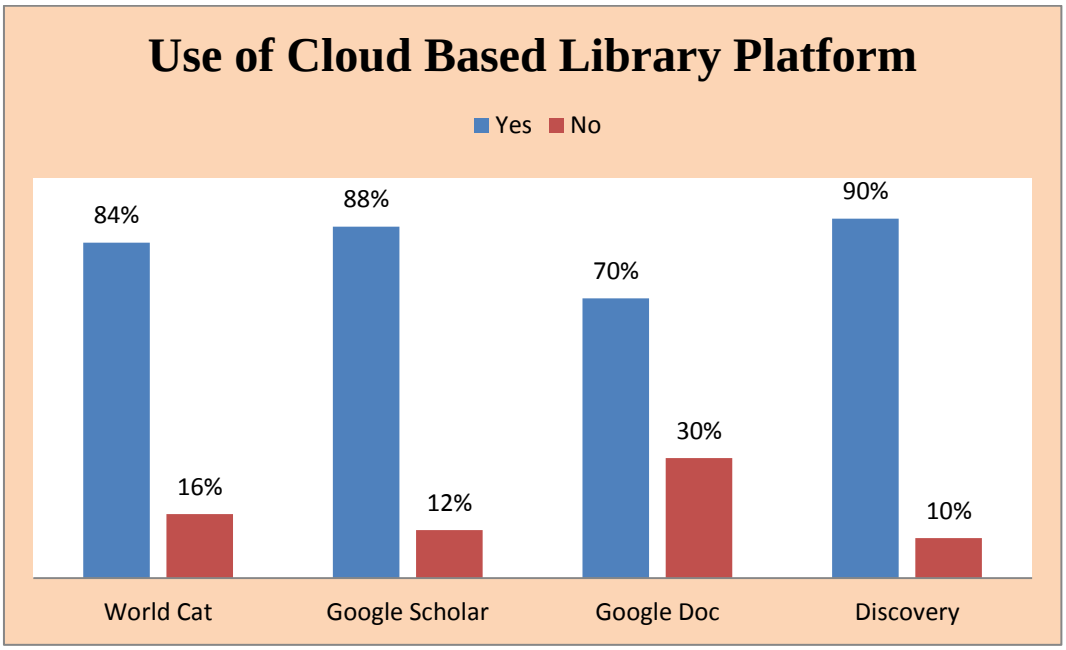


Figure 5.1.23

Table 5.1.23 and Figure 5.1.23 clears that all the cloud Platforms which are mentioned on X-axis are used by Library Professionals. Majority of professionals use the basic library platform. 84% use World Cat whereas 88% Google Scholar, 70% Google Doc and 90% Discovery Service. It means that all the above platforms are popular among Library Professionals.

Testing of Hypothesis

H1: Majority of LIS professionals are aware of cloud computing.

Table 5.1.4 and Figure 5.1.4 depicts that 98% Library professionals of IIMs are aware about cloud computing. It means clear that hypothesis statement is similar to the actual result. Therefore, the hypothesis is proved.

H2: LIS professionals use Google drive, Google Docs and Dropbox.

Table 5.1.13 and Figure 5.1.13 show that 80% use Google drive frequently, only 32% use Dropbox frequently. Figure5.1.23 depicts that 70% use Google Docs. It means clear that except Dropbox, other two Google drives and Google Docs has been used frequently.

Hence, the hypothesis is proved.

H3: Majority of LIS professionals use World Cat and Google Scholar.

Table 5.1.23 and Figure5.1.23 show that World Cat and Google Scholar are used by maximum number of Library professionals. 84% use world Cat and 88% use Google Scholar.

It means clear that study supports the hypothesis statement. Hypothesis is proved.

H4: **Cloud security is the big concern among LIS Professionals.**

Table 5.1.15 and Figure 5.1.15 show that 88% professional trust in cloud service provider, only 12% don't trust. It means study clear that result is contradictory of hypothesis. Hypothesis is rejected.

H5: **Google Drive is used most frequently among LIS Professionals.**

Table 5.1.11 and Figure5.1.13 show that for storage data as well sharing files, Google drive is used frequently. 80% professionals use Google drive for both purposes. The study supports the hypothesis. Hypothesis is proved

Chapter-6

Findings, Conclusion and Suggestions

6.1 Introduction

The study was conducted to find the cloud computing applications in the central libraries of Indian Institutes of Management. This chapter explains the findings of the study with reference to objectives of the study with testing of hypothesis, conclusions and suggestions that can be drawn from the analysis and interpretation of data. It also presents a real picture of the central libraries of Indian Institutes of Management. This chapter concludes with suggestions and recommendations on the basis of users' feedback for further research in the context of central libraries of IIMs. The following findings are purely based on data which collected through questionnaire and observations from the library Professionals of Indian Institutes of Management.

6.2 Findings of the Study

6.2.1 Basic Finding

- After distribution of 77 questionnaires in six IIMs, Investigator received 50 questionnaires. Response rate is 64.95%
- In IIMs majority of staffs is male. 66% questionnaire' responses from male, and 34% from female. IIM-C has maximum number of female professionals whereas IIM-L has no female Professional.
- In IIMs Libraries, 52% professionals have IT related qualification, they have diploma to advance IT degree. Library of IIM-I (77.78%) has maximum number of Library Professionals which have IT degree and whereas IIM-L(25%) has less.

6.2.2 Major Findings

- 98% Library professionals of IIMs are aware about cloud computing. Only one Professionals of IIM-L doesn't aware about cloud computing.
- Despite of 98% awareness of cloud computing, only 62% Library Professionals know the basic concept of cloud computing, 38% professionals do not know the concept.
- 14% Professionals use cloud based services and application for personal purpose whereas only 6% use for Library Purpose and 76% use for both library and Personal Purpose.
- When Library professionals use cloud computing for Personal Purpose, 90% professional use for store document, 80% use for store photo, 68% use for store video. 86% use for sharing files, 36% use for collaborative writing.
- When Library professionals use cloud computing for Library Purpose, 86% use for collaboration with library users, 33% use for providing reference service, 38% use for collaborating with other Library professionals and 20% use for collaborative writing.
- 76% library professionals frequently use mailing services whereas 42% use cloud based Library websites.
- For Mailing service, 90% use Gmail and 18% use Yahoo frequently. Apart from this they use institutional mails also.
- 54% Library Professionals use LIS forum and 52% use LIS Link Frequently. Google Group and Voice Thread like forums are used less. 76% don't use voice thread where as 46% not use Google Group.

- For file sharing, 80% use Google Drive frequently whereas 26% use Dropbox, 24% use Slide Share and only 2% use Egnyte frequently.
- Library professionals frequently use cloud based software and applications like Google Sites (68%) and Google Play store (50%). Delicious and Zoterois used less. Some professionals also use Mendeley.
- For storing data on virtual platform, 80% use Google Drive frequently whereas 32% use Dropbox and 10% use just cloud. One drive is also used by Library professionals.
- 88% professionals have opinion, Cloud computing should use to implement for developing digital library, 74% want to hosting website whereas 68% want to use in Library Automation.
- It is very interesting fact 88% library professionals trust in cloud service providers whereas only 12% afraid, due to third party service providers.
- Storing data on Cloud platform is easy for library professionals. 92% professionals have ability to store data whereas only 8% don't store.
- 44% aware about e-book reader and remaining 56% don't know. They use especially Kindle-e- book reader.
- 80% professionals are not using cloud based paid services whereas 20% use paid services.
- 84% use World Cat, whereas 88% Google Scholar, 70% Google Doc and 90% Discovery Service.

6.3 Conclusion

Library has been changed regularly with the development of technology. Traditional library has changed in automated library system. Nowadays, professionals have been talked about cloud library or virtual library. There are some services in

library like remote access and discovery services which tend to the library to make a virtual library. IIMs libraries have vast online information resources as well as skilled human resources which help to satisfy their users. Cloud computing has changed the role of library professionals. Library expends lots of money to purchase resources and services. Professionals must have duty, not only providing services but they taught users, how to exploit maximum information from library. Library has been purchased/subscribed lot of online databases and e-books, but frequency of access is very low. It is the main concern of library system. In IIMs libraries, there are various facilities, they are best for users. High speed internet, digital repository, automated library systems; cloud based remote access and discovery services. Due to these facilities, library professionals have been used various cloud based platforms frequently.

Library professionals are well aware of cloud computing. They use frequently. It is interesting fact that they also trust in cloud service providers. In present time cyber security is the big concern all over the world but study found that majority of library professionals' trust in cloud service provider. Behind this outcome, study found that library professionals had problem of real concept of cloud computing. They are confused in concept.

In IIMs most of library professionals use cloud computing applications. Some applications they use frequently. It is the positive sign for library. During study it is seen that IIMs infrastructure is very rich and also use service of cloud service providers. All six IIMs are using discovery service and remote access and different database which run on cloud platforms. They also have in house digital repository. This study helps to those library professionals who work in the field and they want to do new in the field.

6.4 Suggestions

In the time of virtualization, every walk of life is influenced from Internet. From entertainment, travelling to education, cloud applications are ea.sy used Professionals use lots of cloud application and services but they do not know basic concept and their proper utilization. In IIMs, during study it is observed, lots of application they used but some are unaware about cloud applications.

- Training should be necessary to Library professionals for new services related to IT or cloud based.
- During library visit, it is seen that, presence of users in IIMs libraries are very less. Most of the services and resources in IIMs are on library websites. Library should have been purchasing e-books.
- For users perspective, Library should have been organise orientation program at the regular interval.
- Librarian should take feedback from library professionals as well as users using cloud application. It will help to improve services.

6.5 Areas of Further Studies

The study can be initiated on usage, growth, infrastructure, awareness of different kind of libraries in context of users as well as professionals.

- The study can be extended to whole IIMs
- The same study can also be extended to the University libraries.
- Research can be carried out on special libraries and information institutions.
- The Study can be carried out on users' perspectives.
- The study can be carried out on Infrastructure perspectives.

Bibliography

Bibliography

Mohamed, M., &Pillutla, S. (2014). Cloud computing: a collaborative green platform for the knowledge society.*Vine*, *44*(3), 357–374.

Aharony, N. (2014). Cloud computing: information professionals' and educational technology experts' perspectives. *Library Hi Tech*, *32*(4), 645–666.

Aharony, N. (2015). An exploratory study on factors affecting the adoption of cloud computing by information professionals.*The Electronic Library*, *33*(2), 308–323.

Aher, Vaishali N, Pandit, Praveen J & Borse, T R (2016). Cloud computing and library automation: an overview, *International conference on emerging trends in engineering and management research*, 1247-1252

Alotaibi, Mishan S. (2012). Utilizations of cloud computing in library and information centers: a theoretical study. *International Journal of Digital Library Services***,** 3(4), 83-93

Askhoj, J., Sugimoto, S., &Nagamori, M. (2011). Preserving records in the cloud.*Records Management Journal*, *21*(3), 175–187.

Cho, J. (2011). Study on a SaaS-based library management system for the Korean library network. *The Electronic Library*, *29*(3), 379–393.

Das, K. C. (2013).Impact of Cloud computing in Library services.

Delozier, E. P. (2013). Anonymity and authenticity in the cloud : issues and applications. *OCLC Systems & Services: International digital library perspectives*, 29(2), 65-77.

Fox, R. (2009). Library in the clouds. OCLC Systems & Services: International digital library perspectives. 25(3), 156-161.

Galvin, D., & Sun, M. (2013).Avoiding the death zone : choosing and running a library project in the cloud, *Library Hi Tech*, 30(3), 418-427.

Gangwar, H., Date, H., &Ramaswamy, R. (2015).Understanding determinants of cloud computing adoption using an integrated TAM-TOE model.*Journal of Enterprise Information Management*, *28*(1), 107–130.

Goldner, M.,& Birch, K. (2012). Resource sharing in a cloud computing age.*Interlending& Document Supply*, 40(1), 4-11.

Gosavi, Nandkishor, Sheetal, S. Shinde & , Dhakulkar, Bhagyashree (2012). Use of cloud computing in library and information science field. *International Journal of Digital Library Services*, 2(3), 51–60

Han, Y. (2013). IaaS cloud computing services for libraries: cloud storage and virtual machines. *OCLC Systems & Services: International Digital Library Perspectives*, *29*(2), 87–100.

http://library.iima.ac.in/retrived on 15-03-2017

http://library.iimcal.ac.in/retrived on 15-03-2017

http://www.iimk.ac.in/iimk/retrived on 15-03-2017

http://www.iimk.ac.in/libportal/retrived on 15-03-2017

http://www.iiml.ac.in/facilities/libraryretrieved on 15-03-2017

http://www.iiml.ac.in/retrieved on 15-03-2017

https://en.wikipedia.org/wiki/Indian_Institutes_of_Management retrived on 15-02-2017

https://www.iima.ac.in/web/iima retrived on 15-03-2017

https://www.iimcal.ac.in/retrived on 15-03-2017

https://www.iimidr.ac.in/ retrived on 15-03-2017

https://www.iimidr.ac.in/facilities/library/retrieved on 15-03-2017

Jede, A., &Teuteberg, F. (2015).*Integrating cloud computing in supply chain processes*.*Journal of Enterprise Information Management*, 28(6), 872-904.

Kaushik, A. & Kumar, A. (2013). Application of cloud computing in libraries. *International Journal ofInformation Dissemination and Technology,* 3(4), 270-273.

Keisling, B. (2018). Blended learning.*Library Management*, *39*(3/4), 207–215.

Koury, R., &Jardine, S. J. (2013). Library instruction in a cloud : perspectives from the trenches. *OCLC Systems & Services: International digital library perspectives*, 29(3), 161-169.

Liu, W. (2013).Embracing the shift to cloud computing : knowledge and skills for systems librarians.*OCLC Systems & Services: International digital library perspectives*. 29(1), 22-29.

Liu, W., &Cai, H. (2013) Embracing the shift to cloud computing: knowledge and skills for systems librarians, *OCLC Systems & Services: International digital library perspectives*, 29(1), 22-29.

Lloret Romero, N. (2012). "Cloud computing" in library automation: benefits and drawbacks. *The Bottom Line*, *25*(3), 110–114.

Low, C., Chen, Y., & Wu, M. (2011).Understanding the determinants of cloud computing adoption.*Industrial Management & Data Systems*, 111(7), 1006-1023

Majhi, S., Meher, S., &Maharana, B. (2015). Awareness and usage of cloud computing application among LIS professionals: A case study of 17 Indian university libraries. *Library Philosophy and Practice*.

Makori, E. O. (2016). Exploration of cloud computing practices in university libraries in Kenya. *Library Hi Tech News*, *33*(9), 16–22.

Mavodza, J. (2013). The impact of cloud computing on the future of academic library practices and services.*New Library World*, *114*(3/4), 132–141.

Mitchell, Erik T. (2013). Cloud based services for your library: a LITA guide. An imprint of American Library Association,

Murad, S. E., &Dowaji, S. (2016). Service value optimization of cloud hosted systems using particle swarm technique. *Journal of Enterprise Information Management*, *29*(4), 612–626.

Nogales, A., Angel Sicilia-Urban, M., &García-Barriocanal, E. (2017).Measuring vocabulary use in the Linked Data Cloud.*Online Information Review*, *41*(2), 252–271.

Oyelude, A. A. (2015). What's trending in cloud computing from the internet cybersphere.*Library Hi Tech News*.32 (10), 22-23.

Parrigin, J. (2017). From request to assess : using cloud-based tools for the library instruction. Library Hi Tech News, 34(6), 14-20

Patel, A., Seyfi, A., Tew, Y., & Jaradat, A. (2011).Comparative study and review of grid, cloud, utility computing and software as a service for use by libraries.*Library Hi Tech News*, *28*(3), 25–32.

Rao, M N (2015) *Cloud computing*, PHI Learning, Delhi

Sanjeev (2017). Use of new technologies in libraries globally: a study", *Library Hi Tech News*, 34(9), 15-18.

Scale, M. E. (2009).Cloud computing and collaboration.*Library Hi Tech News*, *26*(9), 10–13.

Sowndarya,N., & Umarani, V. (2014). An Overview of Cloud Computing. *CiiT International Journal of Software Engineering*, *5*(12), 396-400

Tomer, Christinger. (2017). Cloud computing and virtual machines in LIS education: options and resources. *Digital Library Perspectives*, *33*(1), 14–39.

Walterbusch, M., Fietz, A., &Teuteberg, F. (2017). Missing cloud security awareness: investigating risk exposure in shadow IT. *Journal of Enterprise Information Management*, 30(4), 644-665.

Wasike, J. M., &Njoroge, L. (2015). Opening libraries to cloud computing: a Kenyan perspective. *Library Hi Tech News*, *32*(3), 21–24.

Wu, W., Lan, L. W., & Lee, Y. (2013). Factors hindering acceptance of using cloud services in university: a case study. *The Electronic Library, 31*(1), 84–98.

Xu, F., Tian, M., Xu, G., Reyes Ayala, B., &Shen, W. (2017).Understanding Chinese users' switching behaviour of cloud storage services.*The Electronic Library*, *35*(2), 214–232.

Yang, S. Q. (2012). Move into the Cloud, shall we? *Library Hi Tech News*, *29*(1), 4–7.

Yuvaraj, M. (2015).Cloud libraries.*Library Hi Tech News*, *32*(8), 19–23

Yuvaraj, M. (2015a).Cloud libraries.*Library Hi Tech News*, *32*(8), 19–23.

Yuvaraj, M. (2015b). Problems and prospects of implementing cloud computing in university libraries. *Library Review*, *64*(8/9), 567–582.

Yuvaraj, M. (2015c). Security threats, risks and open source cloud computing security solutions for libraries. *Library Hi Tech News*, *32*(7), 16–18.

Yuvaraj, M. (2016).Perception of cloud computing in developing countries.*Library* Review, *65*(1/2), 33–51

Yuvaraj, M. (2016a).Ascertaining the factors that influence the acceptance and purposeful use of cloud computing in medical libraries in India.*New Library World*, *117*(9/10), 644–658.

Yuvaraj, M. (2016b). Library automation with cloud based ILMS Librarika: case study of Central University of South Bihar, *Library Hi Tech News*, 33(7), 13-17.

Yuvaraj, M. (2016c).Perception of cloud computing in developing countries.*Library Review*, *65*(1/2), 33–51.

Appendix

Appendix

USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY

QUESTIONNAIRE

(For Library Professionals)

Dear Sir/Madam I'm Alok Kumar, a MPhil Scholar, in Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, doing a research work on the topic**"USAGE OF CLOUD COMPUTING BY LIBRARY PROFESSIONALS IN INDIAN INSTITUTES OF MANAGEMENT (IIMs): A STUDY".** In this context, I would like to request for your kind co-operation in filling this questionnaire for my study and giving some necessary suggestions. Spendingsome time, will help me to complete this research work. I assure you that the data provided by you will be used only for this research work and shall be kept confidential.

Thanking you

1. Personal Information:

(a) Name	**(b)** Designation	
(c) [redacted]	**(d)** Male/Female	Male ☐ Female ☐
(e) Highest qualification	**(f)** IT related qualification	
(g) Institution	Email/[redacted]	

2.Are you aware about cloud computing?

(a) Yes (b) No

If Yes;

What is your concept about cloud computing?

(a) Practice of using local server to store, manage and process the data.

(b) Practice of using a network of remote servers hosted on the Internet to store, manage and process data.

3. Do you use cloud computing?

(a) Yes (b) No

If yes;

For which purpose-

(a) For Personal Purpose

(b) For Library Purpose

(c) For both

Please Tick

Personal Purpose	**Library Purpose**
Store Photos/Document/Video	Collaborating with Library User
Sharing Files	Providing Reference Service
Collaborative Writing	Collaborating with other Librarians
Create and editing documents online	Collaborative Writing
Others [Please Specify]	Create and editing documents online
	Others [Please Specify]

If No;

Please give proper reason.

4. Which types of cloud service you have used?(Rank the following Cloud-based library services as the code given below)

RANKS: 0 -Don't **1 -** Rarely **2 -** Occasionally**3 -** Frequently **4 -** Highly

Cloud Services	**Ranking**				
	0	**1**	**2**	**3**	**4**
a. Cloud based mailing service					
b. Cloud based Forums					
c. Cloud based Social Networking					
d. Cloud based Library websites					
e. Any Other (please specify)					

5. Which of the cloud service provider are you using? (Rank the following Cloud-based library services as the code given below)

RANKS: 0 -Don't **1 -** Rarely **2 -** Occasionally**3 -** Frequently **4 -** Highly

(A) Mailing

Mailing Services	**Ranking**				
	0	**1**	**2**	**3**	**4**
a. Gmail					
b. Yahoo					
c. Hotmail					
d. Rediff					
e. Any Other (please specify)					

(B) Forums

RANKS: 0 -Don't **1 -** Rarely **2 -** Occasionally**3 -** Frequently **4 -** Highly

Forums	**Ranking**				
	0	**1**	**2**	**3**	**4**
a. LIS Forum					
b. LIS Link					
c. VoiceThread					
d. India Talk					
e. Any Other (please specify)[ ]					

(C) Social Networking

RANKS: 0 -Don't **1 -** Rarely **2 -** Occasionally**3 -** Frequently **4 -** Highly

Social Networking Services	**Ranking**				
	0	**1**	**2**	**3**	**4**
a. Facebook					
b. Twitter					
c. Google+					
d. Linkedin					
e. Any Other (please specify)[ ]					

(D) File Sharing

RANKS: 0 -Don't **1 -** Rarely **2 -** Occasionally**3 -** Frequently **4 -** Highly

File Sharing	**Ranking**				
	0	**1**	**2**	**3**	**4**
a. Google Drive					
b. Drop Box					
c. Slide Share					
d. Egnyte					
e. Any Other (please specify)[ ]					

(E) Software and Application

RANKS: 0 -Don't **1 -** Rarely **2 -** Occasionally**3 -** Frequently **4 -** Highly

Software and Application	**Ranking**				
	0	**1**	**2**	**3**	**4**
a. Google Sites					
b. Google Play store					
c. Zotero					
d. Delicious					
e. Any Other (please specify)[ ]					

(F) Storage

Storage Service	**Ranking**				
	0	**1**	**2**	**3**	**4**
a. Google Drive					
b. Drop Box					
c. Just cloud					
d. Sugar Sync					
e. Any Other (please specify)[ ]					

(7) Have you used any of the following cloud based Library Websites? Please Tick

(a) WorldCat.org ☐

(b) Library of Congress ☐

[redacted] ☐

(d) TalisPrism ☐

(f) Others (Please Mention Name) ☐

(8) In which area you want to implement cloud computing in Library. Please Tick.

(a) Digital Library Development ☐

(b) Website Hosting ☐

(c) Library Automation ☐

[redacted] ☐

(e) Any other (please specify)

(8) Do you feel safe to store data online?

(a) Yes

(b) No

If No;

Please give reason:

(9) Are you able to retrieve data from cloud.

(a) Yes

(b) No

If No;

Please give reason:

(10) Do you use cloud based e-book reader?

(a) Yes

(b) No

If Yes;

Please Mention Name:

(**11**) Do you agree? To adopt Cloud computing technology in Library "Big Data" can be managed.

(a)Yes

(b) No

(12) Do you use cloud based paid service?

(a) Yes

(b) No

If Yes;

Please Mention Service Name:

(13) Do you use open source cloud service?

(a) Yes

(b) No

If Yes:

Please Mention Service Name:

(14) If you have any suggestion or problem regarding cloud computing in context of Library. Please write.