CHALLENGES AND OPPORTUNITIES IN MIGRATING TO WEB-BASED INFORMATION SERVICES: A CASE STUDY OF DHAKA UNIVERSITY LIBRARY

Thesis

Submitted for the partial fulfillment of the requirements
for the degree of Master of Arts

By

Examination Roll No: 2545
Registration No: HA-6738
Session: 2013-2014

Department of Information Science & Library Management
University of Dhaka

2014

To...

...My Parents

তথ্যবিজ্ঞান ও গ্রন্থাগার ব্যবস্থাপনা বিভাগ
ঢাকা বিশ্ববিদ্যালয়

Department of Information Science and Library Management
University of Dhaka

CERTIFICATE

This is to certify that the thesis entitled **"Challenges and Opportunities in Migrating into Web-based Information Services: A Case Study of Dhaka University Library"** submitted and conducted by **Examination Roll No.-2545** as a partial fulfillment of the requirements for the degree of Master of Arts is a bonafide record of research. It was guided and supervised by me. To the best of my knowledge this thesis contains no material which has been accepted for the award of any other degree, diploma or fellowship in any university and not previously published by any other person or corporate body in any journal or publication.

Dhaka
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DECLARATION

I thereby declare that this thesis entitled **"Challenges and Opportunities in Migrating into Web-based Information Services: A Case Study of Dhaka University Library"** submitted for the partial fulfillment of the requirements for the degree of Masters of Arts in the department of Information Science & Library Management is my own work resulted by my own investigation under the supervision and cordial guidance of **Dr. M. Nasiruddin Munshi,** Professor, Department of Information Science & Library Management, University of Dhaka.

I further declare that this thesis has not been previously submitted in partial or full by me for any degree or diploma to any University or Institution.

Signature

Examination Roll No.-2545

ACKNOWLEDGEMENT

At first I wish to acknowledge the immeasurable grace and profound kindness of Almighty Allah, the Supreme Ruler of the Universe, who enabled me to make my dream a reality.

I feel profound pleasure to express my sincere gratitude, deepest sense of appreciation and indebt to my supervisor Professor Dr. M. Nasiruddin Munshi, Department of Information Science and Library Management, University of Dhaka for his Scholastic guidance, advice, constructive criticism and constant inspiration from the beginning to the completion of this research. He also painstakingly edited the work and offered valuable suggestions for improvement of this untiring cooperation. His constant supervision and efforts helped me to a great extent bring this up to its present standard.

I humbly express my gratitude to the librarians and library personnels of Dhaka University Library and also to the surveyed people who filled up my questionnaire with great patience and helped me to carry out this thesis.

Specially, I would like to thank Imran Vai, Cartographer of Department of Geography and Environment who spared his valuable time in teaching me how to analyze data.

For completing this study, I had to depend upon different international and national publications. I am really grateful to all the authors whose work I have used in this thesis.

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LIST OF ABBREVIATIONS

3D	Three-dimensional
AACR-2	Anglo-American Cataloguing Rules-Second Edition
ACS	American Chemical Society
ASCII	American Standard Code for Information Interchange
BBS	Bulletin Board Service
CAS	Current Awareness Service
CD	Compact Disc
CD-ROM	Compact Disc- Read Only Memory
DOAJ	Directory of Open Access Journals
DU	Dhaka University
DUL	Dhaka University Library
DVD	Digital Versatile Disc
EDB	Extended Database
E-Mail	Electronic Mail
ESDI	Electronic Selective Dissemination of Information
FAQ	Frequently Asked Question
HTML	Hyper Text Markup Language
ICT	Information Communication Technology
ILMS	Integrated Library Management Software
IP	Internet Protocol
IS	Information System

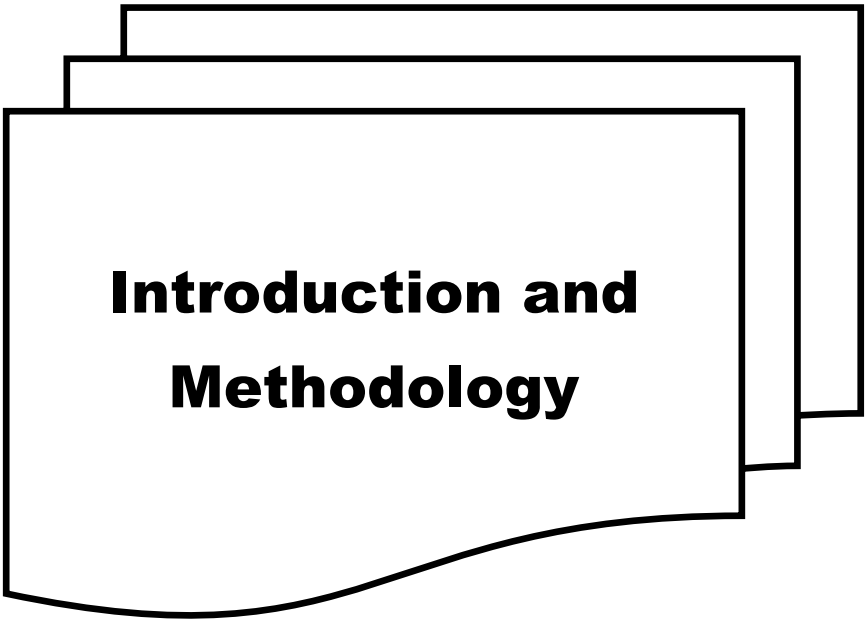
IT	Information Technology
KE	Knowledge Economy
LAN	Local Area Network
LC	Library of Congress
LIS	Library and Information Science
M. Phil	Master of Philosophy
OCR	Optical Character Reader
PDA	Personal Digital Assistant
PDF	Portable Document Format
PhD	Doctor of Philosophy
RIP	Research Interest Profiles
SDI	Selective Dissemination of Information
SGML	Standard Generalized Markup Language
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
URL	Universal Resource Locator
USA	United States of America
WAN	Wide Area Network
WWW	World Wide Web

Abstract

Keywords: Web-based information service, Web-based library, Web-technology in academic library, Web in DUL.

World Wide Web (WWW) and Internet becomes a new media of libraries for information storage and information providing with greater speed and economy. The web technology and Internet has changed the way of information is stored, retrieved and communicated in the libraries. As more libraries move towards providing their services in a digital environment, the improved access to remote library collections is making the use of electronic information resources more realistic and more attractive. This paper discusses about the web-based library services available in Dhaka University Library.

This paper focuses on the use of web-based library services by the Dhaka University Library users and examines how DUL provides web access to its collections and user support for that access and the problems faced by the users in accessing web-based library services. Findings show that DUL is yet to exploit full potential of the web forms, and lagging behind in effective use of library website as it has some problems like ICT-infrastructure and manpower. It is also troubled with slow speed internet connection. This paper highlights the current state of web-based library services against which DUL can benchmark its own web-based library services. This paper also has some recommendations for increasing the effective use of web-based library services.



Introduction and Methodology

Chapter – 1: Introduction and Methodology

1.1 Preamble

In this digital age, the great advances made by modern science and technology have speeded up information exchange and information distribution. The internet and web search engines assist users to obtain large amount of information with great speed. On the one hand, large amount of information does exist around information seekers, but on the other hand, scattered and disparate information resources, various formats, and dynamic channels confuse them. Under library settings, for example, many library users need assistance to access, locate, convert, synthesize, and evaluate information effectively and efficiently. Academic information services librarians and executives have primary responsibility of designing, developing, enhancing, implementing, and leveraging high quality library user services to satisfy library users' dynamic needs.

The web was designed as an information space, with the goal that it should be useful not only for human – human communication, but also those machines would be able participate and help. Most of the web based library service provider is getting a lot of feedback from their effective users. So libraries also introducing more and more services on the web, a tremendous amount of content and the system has had some continuity over time.

The web has become commonplace throughout the world, a natural complement to traditional library services and develops innovative ways to meet the information needs of users. Traditional online services have transformed themselves into web-based services using web technologies. The web also offers libraries the potential for more revolutionary change as well. Library websites have become the main point of access and catalyst for new web-based library services.

Emergence of websites is the ideal medium through which knowledge and information can be disseminated very efficiently to every nook and corner of the world. The library is only one of many institutions changing in the face of technological advances. With its wealth of data and information-sharing capabilities, web is a natural complement to traditional library services. The inherent character of the web offers many advantages and improvements for library services including the ability to hyperlink to other resources, use of a graphical interface, and access for

remote users. Web based Library services means that library users can obtain services whenever they need them and other databases are accessible twenty four hours per day from anywhere on campus.

The first generation of information retrieval tools was designed for use with bibliographic databases. The first generation provided access to references to the end documents rather than to the documents themselves, and indexing and searching were thus applied to document surrogates, such as titles or abstracts. These tools require considerable human efforts to collect, arrange, code, and annotate the various resources. A primary benefit of the first generation of tools is providing users with easy browsing capabilities.

The second generation of tools attempts to collect and index resources as an automated function. Automatic collection and indexing reduces the amount of human effort. The ability to search through massive amounts of information and locate the desired information for the user is the primary benefit of the second generation of tools.
The third generation deals with World Wide Web Meta search engines, such as Harvester and Meta crawler.

The fourth generation involves new ideas such as search agent technology currently being developed to search for information on the web.

Web-based search engines are as a means of finding relevant pages on the Internet. Different search engines, directory, meta-search engines, gateways, subject portals, electronic journals and on line databases each type could be used in a different way, from simple keyword searching up to peer reviewed web sites.

A library website is a virtual public face, the quasi equivalent of the front door, signage, pathfinders, surrogates to the collections, services and it is used as a window to the world wide web (WWW) (Diaz, 1998). It also serves as an integrated interface to a wide variety of digital resources and web-based library services for users over a network (Letha, 2006).

As more libraries move towards providing services in a web environment, the improved access to remote library collections is making the use of electronic information resources more realistic and more attractive. Indian university libraries also have realized the paradigm shift in library services and they are providing better web-based library services to their current techno savvy users.

Traditional library operation system is laborious, hackneyed and time consuming. So to get rid of this and to save time of the reader web-based library services have been introduced.

Library is a repository of resources. It is an integral part of the educational system whose primary function is to serve users (students, faculty, researchers and staff and others). Computers and related electronic resources have come to play a central role in education. Electronic resources (E-Resources) are the prime ingredients and they become a common part of the suite of most academic library resources today.

AACR2 Rule 9.0A1 states "electronic resources consist of data (information representing numbers, text, graphics, images, maps, moving images, music, sounds, etc.), programs (instructions, etc., that process the data for use), or combinations of data and programs.(Rao, Srinivas)

The library and information centre is an important component of any educational institution, which is the hub of the teaching and learning activities where students, teachers, and researchers can explore the vast resources of information. In the traditional libraries, users have to spend much more time for searching a small piece of information and for that they have to depend mainly on the library professional or library staff. But in the age of information communication technology, computers are being used for day -to-day housekeeping activity of the library, which saves the time of the end users and library professionals also and at the same time avoid duplication of work and make the library service smooth and effective (Sinha, 1990).

Libraries are mainly entrusted with a host of predetermined tasks like acquiring, organizing, preserving, retrieving and disseminating information to the users. Right from ancient times to the present Internet era, the primary objective of library has

always been this. However, the way this purpose has been achieved has drastically changed. Information technology has influenced the very nature of business and management libraries.

Libraries play different roles for different people. To some, a library is a place to read books; be furnished with the current news from up-to-date newspapers; to do research; a place to access or share information in response to a particular need; etc. Now days, libraries and librarians play an important role in providing access to information, organizing it, and helping users to find the information they need. Consequently, information services have become a key element for libraries. The present user's interest is to get the information in need within a given timeframe. The timeframe varies with the user's mission or task. For example the timeframe for a surgeon preparing for an operation before entering a theater is much shorter and critical than that of a teacher preparing for the next lecture. Though the present users can get access to the vast amount of information on the Internet and online databases, the role of library information services has no where reduced. The amount and diversity of the ever-increasing information on the Internet and in online databases is one of the major attributes to the increased role of library information service units. The lack of information organization on the web; the demands of users who want quicker and clear answers in response to their information needs; technological skill deficiency among some information seekers to efficiently and effectively search for the right information; are among the few causes that have raised the need for information services more than before in libraries.

They are undergoing significant changes today not only in outlook but also in function, services, methods and techniques for collection development, processing and dissemination of information (Singh & Krishna).

With the advancement in technology and its direct application to libraries, business and management libraries are becoming lean and agile libraries that streamline information supply. The pervasive nature of the internet, coupled with platform independent database connectivity is turning library portals more and more effective. The main purpose of this study is to study the availability of websites at technical; institutes and the extent of library information hosted on it. The study also aims to

examine the reasons behind why websites have provides sufficient information and brings attention of majority of users and to identify the library services that they wish to carry through the internet.

Computer culture all over the world has been continuously and rapidly changing the library and information scenario. It is challenging the professional duty and responsibility to assist its clientele to make utmost use of all the advances of information technology which are emerging fast. It is quite obvious that new skills, competence and professional capability are required to face the present challenges of coping with information revolution. The present trend is toward Digital Library and western world has already done some significant innovations towards the establishment of electronics libraries (Chandel & begum, 1998:16).

Because of its outstanding efficiency, performance and ability to handle large volumes of information /documents, the use of technology is gaining wide popularity in the field of librarianship and information services. Many library and information routines are being performed proficiently by the use of internet.

Karl jaspers describe the university as a "community of scholars and students engaged in the task of seeking truth". The development of a country depends largely on its research output. University is the highest academic institutions of a country, where intelligent, trained manpower, scientist and research worker produced and boundary of knowledge are broaden. The quality of education and research depends to a great extent on the quality of a library.

The university library should be the centre of all the activities of a university. According to Paul Buck, "The degree of educational advances in proportionate to the potential of the library to respond". The quality of education can be expected without a library.

The university library plays an important role in the overall development of a university. Undergraduate, graduate, post graduate, students often visit the library to search books, to borrow books and other materials, and to use other services. Teachers, researchers also visit library to look for journals, books, reference materials

etc. With the application of information technology and the advent of Web-based services, contents are now available to students on their desktop. Various consortia provide access to digital contents any time and in any place. Students want to see traditional services transformed into digital information services.

The basic function of the university library is to provide the study materials to its users in short possible time to serve the information requirements of the students and teachers. In this digital age, most of the university libraries have started computerization of in-house activities. Many Integrated Library Management software (ILMS) LIBSYS, SLIM ++, LIBERTY, Trodoon, LIBMAN, and open source software such as NewGenlib, Koha, Weblis, ABCD, Evergreen are also available in public domain to automate the library operations. Unquestionably the reputation and status of any college library depends on the quality information services provided to clients but it is rather difficult to ignore the advances in the field of ICT and libraries must adapt the new mode of information services.

1.2 Statement of the Research Problem

We are in the digital age; the primary role of information in this age is in many digital cases. The primary means of sharing information is the digital network. With the digital technology, information in various formats- text, audio, video and electronic can be created, stored, organized, accessed and transmitted with relative ease, and in forms that we could not have thought of earlier.

The significant growth in information technology allows more people to become independent users of information sources. The convenience of remote access, browsing, retrieval, and document delivery means that patrons can use libraries without the help of a librarian and without physically visiting the library.

The digital age has brought about many changes to libraries, some of these changes having been taking place before the introduction of the Internet in the mid 1990s. The 1980s and early 1990 saw much discussion in libraries on issues such as print versus electronic; “access versus ownership”, "mediated versus unlimited online searching" and professional concerns not gradually widened to include electronic licensing and consortia collection development. Today the digital age has brought many aspects of library services. The card catalog has been replaced with OPAC in many libraries,

users now search for information from their desktop; users down load e-books on to their PDAs, full text retrieval of information sources is becoming common place and services are increasingly becoming personalized and pay as use.

In the 1990s, the internet became the primary platform for libraries to build and deliver information resources, services and instructions. Lately library user information services, also called library user public service became evolving into two sections: traditional library user information services and electronic library user information services.

De Jager (2002) found that use of the library improved student exam results. The main objective of the college library is to provide conceptual information and provide information to students for preparing assignments. Teaching relies more on lectures than on textbooks.

The Dhaka University Library (DUL) plays an important role in the overall development of students. The students of different level like graduate, post-graduate need to visit the library to borrow books and other material, and to use other services. With the application of information technology and the advent of Web-based services, contents can be available to students on their desktop.

At present, Dhaka University (DU) has 37,800 students from 70 departments under 13 faculties and 11 institutes. These students need books, reference materials, journal articles etc to carry out their study and to make standard note. DU also has M. Phil and Ph. D researcher who need various types of book, newspapers clippings, journal articles, reference materials to carry out their research. Moreover, DU is one of the leading research institutes in Bangladesh. Most importantly, the University's research enterprise is devoted to the search for knowledge and truth that upholds the University's commitment to education. This combination of activities strengthens the University's mission of service resulting in the continued improvement of quality of life for the citizens of Bangladesh & the rest of the world. DUL has a great responsibility to provide required materials to student, researcher and teacher. But it is very difficult to provide quality services to this great number user manually.

To serve this purpose, internet and web makes a great opportunity for library as various types of library services can be served to its users concurrently within less time. DUL can also take this blessing of internet and web to meet the requirements of its users.

Although various types of research has been done in past on library automation, internet using behavior of library users, information gathering behavior of users but very little work has been done on this problem. The problem of the present study is as below.

"CHALLENGES AND OPPORTUNITIES IN MIGRATING TO WEB-BASED INFORMATION SERVICES: A CASE STUDT OF DHAKA UNIVERSITY LIBRARY"

1.3 Objectives of the Study

The purpose of this study is to investigate the use of web technology in DU library to serve the student needs & find the problem to migrate in web based information services. It specifically focused on the following objectives:

I. To study the present web products and services available in DU library.

II. To find out the different purposes of using web technology and services.

III. To assess to what extent users are utilized web based library services and facilities.

IV. To identify the type of problems faced by users when using web technology in libraries under study.

V. To find out the user satisfaction with the web based products and services provided by the Dhaka University library.

VI. To suggest measures for improvement of existing resources and services and implementation of web.

1.4 Hypothesis

The study was carried out based on the following hypotheses:

Hypothesis 1: The majority of the users of DUL use the internet on a regular basis.

Hypothesis 2: Dhaka University Library (DUL) provides some kinds of web-based information services.

Hypothesis 3: DUL is converting its contained resources into electronic format.

Hypothesis 4: DUL has a collection development policy that is revised keeping in view the electronic resources.

Hypothesis 5: DUL are striking balance between print and electronic resources, specifically the periodicals.

Hypothesis 6: The faculty and research scholars of universities under study are familiar with e- resources and prefer to use them for research, publication and teaching in that order.

Hypothesis 7: The students (undergraduate, graduate, post-graduate) faculty members, research scholars are aware of web-based information services.

Hypothesis 8: DUL are facing budget limitation in migrating to web-based information services.

Hypothesis 9: The users of DUL want more web-based information services.

1.5 Methodology of the Research

1.5.1 Research Strategy

This research has been conducted to identify the present situation of Dhaka University Library in using technology and providing web-based information services to its users. This research also tries to identify the challenges and opportunities of Dhaka University Library in providing web-based information services.

In this study, a survey model has been followed. Survey methodology as a scientific field seeks to identify principles about the sample design, data collection instruments, statistical adjustment of data, and data processing, and final data analysis that can create systematic and random survey errors. Survey errors are sometimes analyzed in connection with survey cost. Cost constraints are sometimes framed as improving quality within cost constraints, or alternatively, reducing costs for a fixed level of quality. Survey methodology is both a scientific field and a profession, meaning that some professionals in the field focus on survey errors empirically and others design surveys to reduce them. For survey designers, the task involves making a large set of decisions about thousands of individual features of a survey in order to improve it.

This entire survey was conducted from June 2014 to December 2014.The tools and techniques of survey method are used to collect data from the sample users for the following reasons;

i. The population of this research are very much wide

ii. Survey method bring out the accurate information

iii. The collected information is dependable and reliable and has great amount of certainty

iv. The chances of objectivity and bias are reduced to the minimum

v. This method also time consuming and economically viable.

The study was limited to some faculties, institutes, research centers and libraries of Dhaka University.

The faculties are: Faculty of Arts, Science, Law, Business Studies, Social Sciences, Biological Sciences, Earth & Environmental Sciences, and Engineering & Technology.

The name of the institutes are: Institute of Education and Research, Institute of Business Administration, Institute of Social Welfare and Research, Institute of Modern Languages, Institute of Information Technology, Institute of Disaster Management and Vulnerability Studies, Institute of Leather Engineering & Technology.

The name of the research center is: Japan Study Centre.

1.5.2 Population and Sampling

The population of this study includes faculty members, students (Undergraduate, graduate and post graduate), researchers, administrative staffs and library personnel of Dhaka University. At present, there are 70 departments under 13 faculties, 11 institutes and 34 bureaus and research centers in Dhaka University (University of Dhaka website, visited date December 05, 2014).The sample was drawn from some faculties, institutes and bureaus and research centers.

Fifty (50) sample library users from different categories such as faculty members, students (undergraduate, graduate and post graduate), researchers, library professionals and administrative staff have been selected for interview through a semi-structured questionnaire. Questionnaires were delivered personally to respondent. The purpose of the study was explained at that time briefly and adequately and respondents fill up the questionnaire and return.

1.5.3 Methods of Data Collection

To collect primary data, two sets of semi-structured questionnaire have been designed based on the review of literature keeping in view of the objectives of the study. One set of questionnaire (Appendix II) was prepared for the survey of Dhaka University Library resources, services and web-based information services which was filled up by the librarian and his representative. Another set of questionnaire (Appendix III) was prepared for the library user's to assess their library using behavior, satisfaction towards various services provided by the library and to collect their opinion towards web-based information services.

Secondary data were collected from available books, publications, research studies, journal articles, websites, and articles on web-based information services, use of ICT in libraries, library automation and use of e-resources.

1.5.4 Methods of Data Analysis

For analysis of data, SPSS and Microsoft Excel software have been used. To entry data and coding option has been used after the receiving of all completed questionnaires. Both parametric and non-parametric statistical tools were used to prepare a meaningful conclusion from the collected data. Two sets of SPSS files were

created. The first set contained the responses from the librarian and the second set contained the responses by library users. Percentage values of the survey materials are introduced to analyze and discuss.

1.6 Organization of the Study

The whole research activities are arranged in seven chapters.

Chapter-1: Introduction and Methodology

As an introductory chapter, this chapter included general information about web, internet, use of web to provide library services and described about research methodology which has followed in this research. This chapter also highlighted Statement of the research problem, objectives of the study, hypothesis, research strategy, population and sampling, data collection and analysis methods which are used this research.

Chapter-2: Literature Review

Overviews of related literatures are included in this chapter which has done before in this field at different time in different period in whole world.

Chapter-3: Web-based Information Services: An Overview

This chapter included the general information about web-based information services that is origin and gradual development of web-based information services.

Chapter-4: Web-based Information Services in Dhaka University Library

This chapter enumerates the web-based information services in Dhaka University Library (DUL) that is the use of web in DUL, current situation of providing web-based information services by DUL.

Chapter-5: Data Analysis, Discussion and Findings

This chapter focuses data analysis, discussions, presentations and major findings of this study.

Chapter-6: Implementing Web-based Information Services in Dhaka University Library

To implement web-based information services in DUL a model has been proposed in this chapter.

Chapter-7: Recommendations and Conclusion

As a concluding chapter, this chapter identifies the challenges and opportunities of DUL in providing web-based information services and also includes a set of recommendations so that the library can perform the task easily.

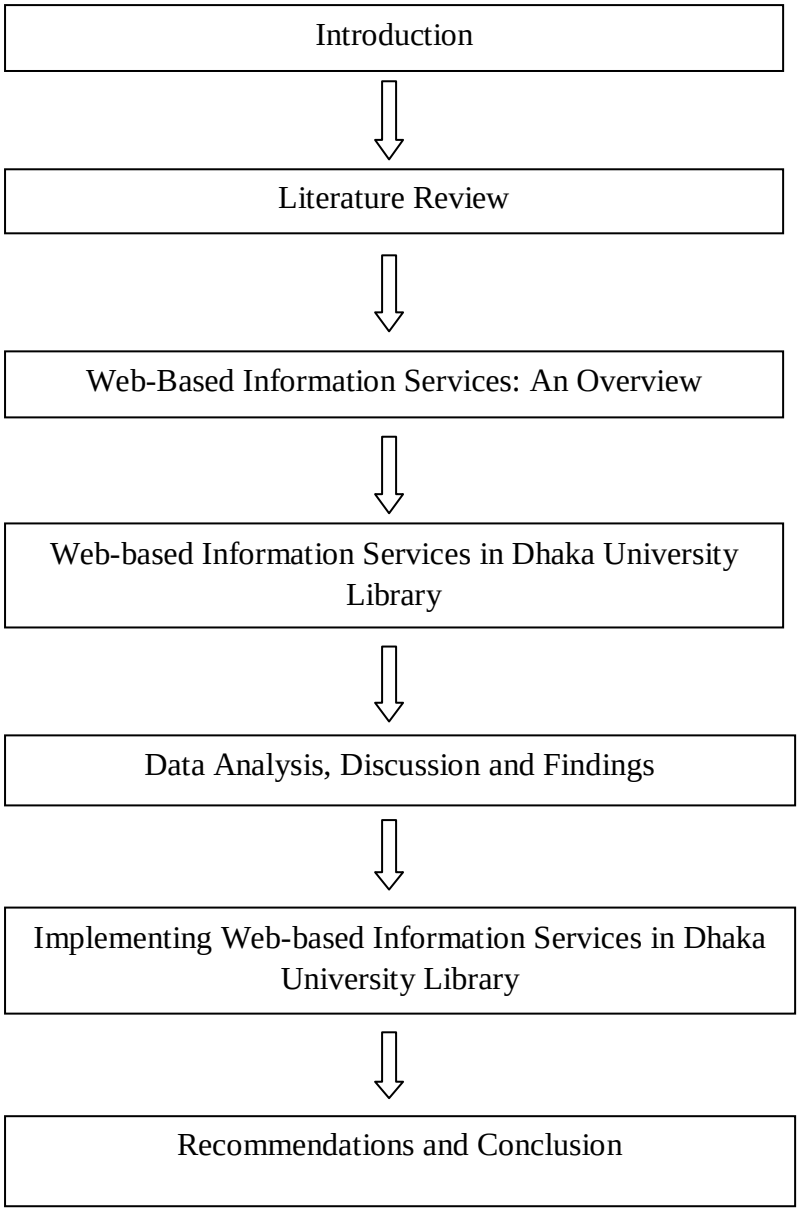
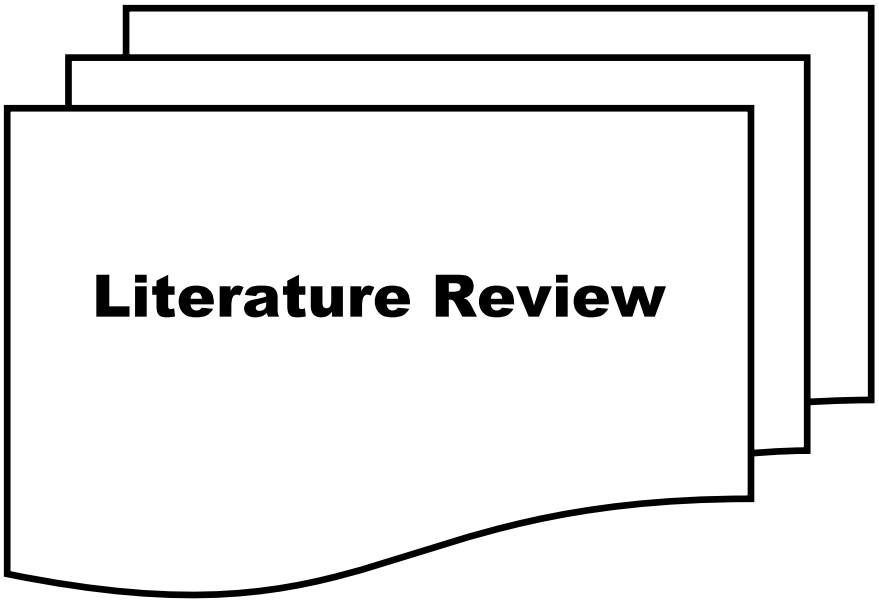


Figure 1.6.1-Organization of the study



Chapter – 2: Literature Review

2.1 Introduction

Information and communication technologies (ICT) have brought a lot of conveniences to the library users (Gupta, 1996). Information being accessible at their desktop, the productivity of the students and faculty members has increased. As libraries continue to be flooded by more and more electronic resources, future students will become more and more dependent on them (McGeary, 2005). Libraries in business and management institutes use propriety or in-house software packages for library management. There is a growing trend in libraries to move towards e-resources. In this scenario, basic library services like online public access catalogue (OPAC), reservation, accessing current awareness bulletins, pay for the library dues and document delivery needs to be done at the convenience of users.

A lot of studies had conducted to assess the impact of internet in libraries, use of internet and web to provide library services, challenges and opportunities in migrating to web-based information services etc in all over the world specially in UK, USA, Nigeria, Ghana, Korea, Pakistan, India, Malaysia, Srilanka and Bangladesh also. Here, an overview of these studies are endorsed to understand the present situation of web-based information services in libraries of different countries and also to identify the scope of this study.

2.2 Review of Related Literature

Literature review is the most crucial part before conducting any research. In this study the literatures are categorized chronologically into the following two sections for better understanding the previous research.

This are-

2.2.1 Literature before 2000

2.2.2 Literature after 2000

2.2.1 Literature before 2000

Hollands (1997) explains the need to promote the use of internet based information services among teaching and research staff at a university in the UK.

Lazinger et al. (1997) conducted a survey of the faculty members of the Hebrew University of Jerusalem provided data on internet access as of 1995.The results showed higher usage by the members of the faculties of science, medicine and agriculture than the members of the faculties of social science and humanities.

Rao (1997) has discussed the impact of CD-ROM databases, internet and digital libraries on collection development. He has reported that it is quite significant. Finally, there is lack of research on electronic resources in Bangladesh. So, this study has been attempted discuss the electronic resources and its use in one of the premier universities in the country.

Ray and Day (1998) on the other hand, conducted their study to determine the level of use of electronic resources and how students feel about various issues surrounding electronic resources. The findings of their study are that 91 per cent of respondents acknowledged access to a networked computer via university, and also that more internet access is from work place than from home. The most popular electronic resources used were CD-ROM and the internet. Only 37.5 per cent of the sample population used electronic journals as an information tool.

Becker (1998) conducted a study on the Internet use by 2250 teachers from public and private schools in the USA. The study revealed that 90% of the teachers had Internet access. More than half of the teachers (59%) had Internet access at home. A majority of the teachers (68%) used Internet to find information resources for preparing their lessons.

Singh (1998) conducted a research study on the use of Internet by the librarians in Malaysia. The main findings of the study indicated that 90% of the respondents used the Internet for work related purposes. Most of the respondents were recent users.

Timothy T. Perry, Leslie Anne Perry, Karen Hosack-Curlin (1998) investigated this study sought to determine if differences exist among various age groups regarding students' use of the Internet. Surveys were administered to 548 students from three regional universities in the southeastern USA. Survey responses were then analyzed to determine how many students regularly use the Internet, how many hours per week regular users spend on the Internet, and what computers they use. Information was

also tabulated for use of e-mail, use of the Internet to obtain university information, and for the number of students who had home pages. In this article he found survey responses were analyzed to determine which students: consider the Internet to be a fad; project their future use of the Internet to be less, the same, or more than now; and project them will use the Internet in their chosen careers.

Jefferies and Hussein (1998) reported that teaching faculty construct web pages to help structure students gather data and to provide access to other resources. Students, on the other hand, use email to communicate with their peers and with their tutors. The researchers emphasized the fact that students preferred to email their tutors rather than have face-to-face meetings.

Petre and Gunn (1998) surveyed the use of Internet with a self-selecting sample of 445 users. They reported that female Internet users were more likely to volunteer to participate in research and the proportion of female internet users were growing rapidly. There was a significant relationship between high internet use and positive attitudes towards the Internet with both self-reported depression and introversion.

Pevic (1998) reported that teenagers liked to use cybercafés because of their social dimensions, regardless of their access to the Internet at home or in the school.

Srikantaiah and xiaoying (1998) in their papers suggest that the internet has significantly changed information management in developed countries through creating pressures to improve communication systems and develop more user friendly environments for information sharing. Now the internet is penetrating developing countries, changing information practices in .various sectors. It is changing traditional ways of conducting information business by establishing new sources of information and new methods of communication on a global basis. Also discusses the role of the internet and its impact on developing countries, including major issues associated with journal information access and delivery.

Eric Sandelands(1998) investigated about internet its utilization Observes the increasing influence of new communications technologies on information transfer and business practices, and highlights features of the Internet which could prove essential

for marketing managers and academic researchers. In this study he found internet Spotlights new developments, such as the "virtual university" model, which can provide cost-effective management learning programs, and concludes that the Internet has much to offer, particularly for global companies.

Ramesh Babu and Gopalkrishnan (1998) found that the majority of the users were engineers and belonged to the age group of 21-40 years. The most used internet services were E-mail and WWW. The Female group of users use it more compared to male group and majority of the respondents use it for sending Email(100%) retrieving required information (93.8%), getting news and publish information.

Srikantaiahet et al. (1998) discussing on the internet and its impact on developing Countries with special reference to India and China penetrated that most developed countries obtained their connection to the Internet between 1988 and 1990, while developing countries began around 1994 - 1995. Even now many developing countries do not have Internet facilities. A high proportion of respondents are using e-resources and about 98% of research scholars are more concerned about easy to use downloaded materials for their research work at University of Delhi.

Bavukutty and Salih (1999) conducted a study at Calicut University, which showed that students, research schools, and teachers used the Internet for the purpose of study, research and teaching respectively. The purposes of Internet use were: sending and receiving e-mails in connection with academic requirements, making a search on library catalogues, downloading images and communication with the peer.

Mahajan and Patil (1999) revealed that the purpose of using Internet by research workers at Pune University was to conduct literature search; for students was to know curriculum based information; for teachers to find supporting Information to write articles .

Lippincott (1999) discusses the inter-relations of product content with associated services, or "blessing" and its relation to federal information and services. Highlights include the federal role in facilitating use of government collected information

"infrastructure and policy issues" and implications for University Library reference services, instruction & staffing.

Gulati (1999) explains that electronic publishing has put forth a spectrum of problems and issues in libraries, end users in general and information professionals in particular. It specially discusses the major issues and challenges in electronic publishing such as accessibility, acceptability, copyright and pricing, standardization, credibility and technical issues etc. Further it gives emphasis on the advantages and problems with electronic publishing.

Chandra (1999) describes the future trends in libraries by year 2020. She highlights that the electronic publication, network, electronic information and online databases will be the part of libraries in coming future.

Voorbij (1999) examined the use of the Internet amongst students and academicians in Netherlands. A questionnaire was distributed among 1000 members of the academic community and three focus group interviews were also held with faculty members, the study revealed that the web was being used primarily to search general, factual, ephemeral or very specific information. The study also revealed that students and academicians faced many problems while searching the web.

Williams (1999) reported the use of information technology and the Internet in his project entitled "Information Technology in Michigan: Adult and teen Survey Report." The results indicated that the majority of the respondents (72%) used the internet at least once a week and 45% at least once a day.

Kooganurmath and Jange (1999) conducted a study, which revealed that a majority of the users used the Internet for communication, followed by the access to information. More than 70% of the users used it for higher studies and only 39% used it for discussions with peer groups. The most used services of Internet were e-mail, the Web, discussion forums, Ftp and Telnet.

2.2.2 Literature after 2000

Laite (2000) surveyed 406 graduate and undergraduate students from Shippensburg University. The survey showed that 57.6% of the undergraduate students used the Internet 1-2 times per week and another 37.1% used it 1-2 times daily. More than 50% of the graduate students used Internet 1-2 times per week and 37.7% used Internet 1-2 times daily. The survey showed that the most used Internet services was e-mail. A hundred percent of the graduate and undergraduate students used e-mail services.

Choo and Deltor (2000) report results of a questionnaire survey to determine how knowledge workers use the web to seek external information part of their daily work. The result of the survey is 61 significant episodes of information seeking were observed framework that relates motivations and moves may be helpful in analyzing pattern of web-based information seeking.

Hölscher and Strube (2000) acknowledged that searching for relevant information on the Web is often a laborious and frustrating task for newbie's and experienced users.

Branin, Groen and Thorin (2000) point out the challenges of librarians in a new environment. They highlight that digital information brings the fundamental changes in different library operations.

Ferguson (2000) highlights new ways of selecting information for the digital library. Asserts that selectors need to put their emphasis on buying more information rather than on trying to figure out what is the best information. Review several techniques to accomplish these goals.

Newman (2000) investigates the importance of the organization of electronic resources. Different types of Websites are discussed. Both purchased and free resources are considered with particular reference to those who set policy on how the resources are organized.

Thronton (2000) proves that with the advent of internet and the ability to simultaneously share virtual resources, cooperative collection development through consortia arrangement popular today.

Naushad Ali (2000) conducted a study at Aligarh Muslim University. Aligarh the study showed that more than 50% of the study population was satisfied regarding the timings of the Internet services, but were not satisfied with staff's cooperation, and reservation facility. Majority of the respondents were not happy with the number of nodes available.

Chandran (2000) conducted a study at S V university, Tirupathi , which showed that more than 25% of the respondent used the Internet for 2-3 times a week and more than 56 % used it for accessing information. A majority of the respondents used the Web and e-mail services of Internet. The purposes of using Internet included communication and information gathering. The sources used for identifying information about Internet included website itself, journals and magazines, staff and newspapers. A majority of the respondents used general websites as compared to recreational and discipline oriented websites.

Amritpal Kaur (2000) conducted a survey regarding the use of Internet facility at the Guru Nanak Dev University, Amritsar. The study indicated that all respondents used Internet for sending e-mail and 82% for web. More than 60% of the respondents used internet for primary information.38% for secondary and only 15% used it for consulting OPACs. A majority of the respondent's i.e.75.6% faced the problem of slow Internet connectivity. All respondents used search engineers to browse the required information. More than one third of the respondents typed the web address directly and only 1.5% used subscription data based. The results of the study further showed that more than 80% of the respondents felt that in comparison to traditional documents ,Internet was time saving ,easy to use more informative , more useful and more preferred.

Bhatnagar et al. (2000) found that men are more likely to buy online for products categories such as hardware, software, and electronic; whereas women are more likely

to buy online for product groups like food, beverages, and clothing. In addition, women are also more likely to shop for legal service via the Internet.

Jane E. Klobas, Laurel A. Clyde (2001) investigated examines social influences on Internet use and training based primarily on the results of longitudinal research with adult Internet trainees in Iceland. The authors briefly discuss the theoretical context before outlining the research and its findings. Social influences included the effect of family and friends, employers, professional colleagues, the media, and a general sense that, increasingly, "everybody" is expected to be able to use the Internet.

In this study they have found librarians and the managers of libraries and information services are experts who are best placed to exert their influence on attitudes to the Internet by providing recommendations, demonstrations, and training about the Internet as a source of information and knowledge.

Peh and Foo (2001) express that with the emergence of the internet and its related technologies, many educators assert that there are obstetrical benefits to reap from online learning and educational technology. This study provides insights into the experiences related by participants of the virtual school of business (VBUS) a seek polytechnic's online project.

Chang and perng (2001) carried out work on information search habits of graduate students at Tating University the purpose of their study was to investigate the information requirement and search habits of graduate students at tatung University in Taiper city, Taiwan they show 90% at the subjects conducted information searches using outside sources in addition to the university library. They also reported making extensive use of internet in the recent past; Mostly World Wide Web based databases, electronic journals and search engines.

The internet has emerged as the most powerful medium for storing and retrieved of information. This paper examined the use of the internet by the members of the social science faculty of Karnataka University in Dharwad India. This study revealed the frequency of internet use, purpose of using the internet, use of different internet services and impact of internet on research / teaching. A questionnaire was prepared

for this study and it was sent to 50 faculties. Members and the response rate was 84% the results indicate that the use of internet services by the faculty members is associated with an increase in the number of research papers and with improvement in the quality of research and teaching.

Hsieh-Yee (2001) shares the views that many studies in published literature did not analyze Web search behavior directly but sought to understand who searched the Web, what tasks they performed, what their perception was of Web search tools, and how they searched. She conducted a study in 2001 that shows the trends of research on the phenomenon of Web search behavior during the period of 1995 to 2000. Hsieh-Yee mentioned that according to the Search Engine Index, the Internet users ranked searching as the most important activity, giving it a 9.1 on a 10-point scale. The Index also indicated that 57% of the Internet users search the Web each day and that searching was reported to be the second most popular activity, right behind e-mail.

Keisler et al. (2001) reported that Internet use predicted better outcomes for extroverts and those with their social support but worse outcomes for introverts and those with less support. Many people have integrated the Internet into their ordinary lives to their advantage.

Anders Hektor.(2001) suggested and described eight forms of information activities to describe a model of information behavior in non-work everyday life. This model builds on literature reviews and data from ten cases of information users. Findings from applying the model are also presented and their implications discussed. The conclusion states that the Internet takes the role of a complementary information system in everyday life, side by side with already existing information systems.

Cmor and Lippold (2001) noted a number of observations of student searching behavior on the Web. Their findings can be summarized as follows: (1) students use the Web for everything, (2) they may spend hours on searching or just a few minutes, and (3) students searching skills vary.

Satyanarayan and Mishra (2001) conducted a survey of 50 users of the central library Lucknow university to determine the use of Internet. They found that 80% of

the users make use of Internet and out of 10% users are not able to find relevant research information. They also found that 90% of the users wanted training for Internet. The study suggested that a user friendly environment in the library and training for the users in information search and internet services should be provided.

Seetharama and Ambuja (2001) Showed that information technology has made the management of information relatively easier thus helping improve quick and easy access to information. With the growing number of electronic sources of information it has become imperative for information professional to redefine the process of collection development.

Nicholas et al. (2003) conducted a study in the UK to examine the use of the web for health information and advice .More than 1300 people were surveyed. The study showed that 66% of the respondents accessed the Internet from home, 28% from work place and the remainder (6%) used a combination of both work place and home.

Mohammad Nasir Uddin (2003) investigated, in Bangladesh, there are only 0.2 million Internet users out of a population of 140 million. Because there is a lack of academic research on Internet usage, the prime objective of this study is to report the level of Internet use by university academics for their information and communication needs. The study also sought to find out whether differences exist among the various levels of academics in terms of their use of the Internet. Six categories of information and communication needs were identified and a survey conducted among the lecturers of Rajshahi University where the Internet was introduced in 2001.

In this article he found several information and communication needs through, Internet use by academics is useful for some common needs and that the academic rank of users is an important factor in determining the priority of needs. It also showed that there are some barriers to adequate use of Internet resources. Suggestions are made for increased use of the Internet, to benefit the nation as a whole. He reports in his study the level of internet use by university academics for their information and communication need .six categories of information and communication needs were identified and a survey conducted among lecturers of Rajashai University where the internet was introduced in 2001.Findings of the study showed that internet use by

academics is useful for some common needs (E-mail, WWW and E-books) and that the academic rank of users is an important factors in determining the priority of needs. The use of WWW is becoming increasingly significant for the teachers of Bundelkhand University and it has an important place among various sources of information. It is suggested that proper training should be provided for creating awareness of knowledge of resources in the respective subject fields. (Sridevi, 2003)

Sheau-yueh J. Chao (2003) investigated the Internet and World Wide Web offer a rapidly increasing quantity of valuable resources on Asia-specific information. In view of the vast scope of the Asian countries and the fast proliferation of good sites, this article offers only a sampling of valuable Internet resources as starting points for further exploration. It covers Meta sites, Asian search engines, library resource pages, and electronic journals and newspapers. The first part of this paper includes the Internet sites of Asian studies, the second part contains selected East Asian country resources from China, Hong Kong, Japan, Korea and Taiwan, and the third part presents the leading Asian electronic journals and newspapers. Preference was given to comprehensive sites on countries or regions that have been the focus of recent academic study and research. All the sources are in English and some of them contain bilingual or multilingual versions.

Cho et al. (2003) conducted a case study in hitch they attempt to investigate what types of ranges have been made in Korea due to the Aniston of the networking environment .Findings the study reveal that internet users with a high need internet service system tend to enjoy various needs of services, including E-mail and depend less of the traditional media , such as TV and radio, or information and entertainment.

Ehikhanmenor (2003) describes that the internet culture is creating a new scientific communication system with new facilities that are imputing with and might replace the present internet information sources. Findings of the study knows that the scientists are still heavily dependent printed information sources , journals indexes and abstracts and non –use of the internet is distributed to problems of accessibility, case of use and cost

Ojedokun and Owolabi, 2003: Applebee et al., 1997; Adele et al., 1995; Tillman and Ladner, 1992). Marklein (1997) indicates that the use of email by college students in the US is so common that for some of them, "It is like picking up a phone". In one study, researchers used survey data to extrapolate that 9.1 million college student use email regularly and 6.1 million use it almost daily. Some studies have revealed that academic staffs use the Internet in various ways to enhance teaching and learning.

Dong, 2003 Dong work emphasized the evaluation of the Internet. He reported the examination of the using the Internet resources and the evaluation of their usefulness from the Chinese students' and academics' point of view.

Gifty Adika (2003) investigated lack of access to current materials in libraries of universities in developing countries is a major problem that hinders research and teaching. Interlibrary loans and document delivery projects have not solved this problem by themselves. The Internet makes it possible for users to have access to large volumes of information irrespective of their geographical location. The three older universities in Ghana are all linked to the Internet. The assumption then is that their faculty now has access to current information through the Internet.

In this study he found research results show that in spite of the benefits of the Internet, its use among faculty is still very low. The main reasons for this are lack of access to the Internet and the need for training. Clearly, university authorities need to take immediate steps to provide general access points for faculty through computer laboratories. Again, the expertise of librarians, information professionals and computer scientists needs to be tapped to provide training and refresher sessions for faculty to keep up to date on harnessing the immense potential of the Internet as a source of information for teaching and research.

Maheshwarappa and Ebnazar (2003) reports the results of an exploratory study on the use of internet resources and services in Gulbarga city based on the data collected from 123 users of internet in private and public sectors covering 47 from cybercafés and 76 users from the university and college environment .Most frequently used resources and tools of the internet were E-mail, web browsers and search engines. Most frequently used search engines were Yahoo, Rediff, MSN search and

Lycos.70% have not received any instructions in the use of internet and felt the need for training.

CKanaujia and Satyanarayan (2003) had conducted a level of awareness and demand of web based learning environment among Science & Technology information seekers. The major findings of the study revealed that 49.2% users browsed the Web for more than 2 to 4 hours and 14% for more than 5 hours a day. The study further showed that 36.6% users consulted e-journals regularly on the Internet, 40.4% used Internet for consulting technical reports, 24.8% to find online databases and 10.4% for telnet service.

Tenopir (2003) studied the 200 recent research publications that focus on the use of electronic library resources and were published between 1995 and 2003 in the report for the council on library and information resources. The study used a variety of research methods, including observations, surveys, interviews, experiments and transaction log analysis. The findings show that both faculty and students use and like electronic resources and most readily adopt them if the sources are perceived as convenient, relevant, and time saving to their natural work flow. Print medium is still used for some reading and is part of research in almost every discipline.

Cox and Yeats (2003) today library website is very common for the libraries to maintain their own websites, where they provide the information relating to their services what they provide, different events that they organize from time to time, exhibition like books, different library products, etc. Now many libraries have organized their own websites. A well-defined library website includes information on the inception and history of the library, working hours, holidays, layout of the library building, rules and regulations of the library for different members, rules of the book bank, circulation, etc. A good library website will also include information about the staff, their contact details, their responsibility details and they also give their WebOPAC address on their websites so that users of the institution could know the collection and other information about the library. Libraries are procuring more and more electronic sources like electronic journals, electronic books, online databases along with locally digitized theses and dissertations. The efforts of libraries in

providing users with an integrated way of checking the availability of a source in all possible formats have necessitated a properly designed web portal.

Kacherki and Umeshareddy, engineering college library, by developing homepage, can disseminate a wide range of information to users' community. It is the best way to keep users abreast about latest developments of library resources and services with the introduction of pictures, graphics, 3D images, audio and video. A lovely homepage of the library could be developed which will really help the users to have a complete knowledge of library.

Yapa (2003) revealed the overall scenario use of ICT in Sri Lanka and particularly in libraries. Author argues that, National Information Policy and National Information Infrastructure are essential, if a country would like to exploit the IT to its advantage. The major finding of the study is that the progress of library automation in Sri Lanka is a result of the effort few professionals who worked collectively. One good feature in the Sri Lankan scenario is the commitment and obligation of library professional for library cooperation. Library consortia in Sri Lanka function with the initiative of the library professionals with minimal administrative
and financial support from the authorities.

Hanauer et al. (2004) surveyed a diverse community college to assess the use of the Internet by the students for health- related information. The survey showed the although all the although all the students surveyed had free internet access through their community college, yet only 97 % of the students reported having access to the Internet . The Survey showed that 83% internet users had access to the Internet at their home and 51% of the respondents accessed Internet at college or library. Eighty –One percent of the students reported to access the Internet most for college work and 80% for e-mail/chat .Men and women searched for health information in almost equal numbers.

Spink(2004) Discussed the changes in Web search trends from 1997 to 2003 that explored how people search the Web. They pointed out some patterns and trends in general Web searching.

Dimitrios Xanthidis, and David Nicholas (2004) investigated internet usage its studies and surveys conducted world-wide, government incentives and current legal frameworks, private initiatives and investments, technology available at a reasonable price, and public acceptance of the internet as an efficient medium for buying goods and services.

In this study he found internet access has grown significantly and the digital foundations are there, e-commerce is yet to reach measurable levels in Greece.

A.A. Oduwole (2004) investigated about impact of internet use on Agricultural research this study was carried out to examine the utilization of Internet facilities and its impact on the research outputs of agricultural scientist at the University of Agriculture, Abeokuta, Nigeria during the 2001/2002 academic session. To elicit the necessary information, 210 copies of questionnaire were administered to all academic and research staff of university.

In this study he found respondents use the internet to find research materials respondents use the Internet to find research materials such as journals and conference proceedings, followed by sending and receiving of electronic mails (email) the study concludes that the use of the Internet for academic research by Agricultural Scientist has improved their research output. The study recommends the training of scientist in information searching and retrieval skills.

Henrietta O'Connor, Clare Madge (2004) investigated the potential of the Internet as a valuable methodological research tool is increasingly being recognized by both market researchers and academics. This paper contributes to the debate surrounding virtual synchronous group interviews and the value of online research. Specifically it introduces the use of a software conferencing technique – Hotline Connect – and discusses the implications of using the technique for Internet-based research. In this article he found, in particular, issues of interview design, developing rapport and the virtual venue are considered. The paper draws on the experience of a recent research project entitled "cyber parents" and concludes that the use of conferencing software holds great potential for synchronous online interviewing. However, this must be

combined with sensitive, ethical handling of both the research process and the data to overcome problems inherent in any interviewing Situation.

Nyamboga et al. (2004) in their paper report finding of a study which aimed to identify how far the use of internet has enhanced teaching, research and scholarly communication at Edgerton University. Results of the study show that use, interest and confidence in using the internet by female respondents is less compared to male respondents.

Sinha (2004) has studied the Internet Use pattern of the academic community and local population of Barak Valley and find the interesting findings in respect of Internet use pattern.

Asemi (2005) showed that all the respondents were using the Internet frequently because all faculties were provided connection to the Internet. It was revealed that the researches of the university were getting quality information through the Internet. Fifty –five percent of the respondents searched for scientific information through the Internet because the university library had provided access to various databases and online journals for all the students and staff.

Mohamed Salah Eldin Mudaw(2005) investigated about use of internet. This research is based on primary data: a structured field survey was conducted among six information institutions in Sudan. Because the number of librarians in these institutions was thought manageable, all librarians in the selected institutions were surveyed.

In this study he found the described the major patterns of internet use were: chat sessions; checking e-mails; and surfing professional sites. The majority of the sample did not utilize email for library services as such. The low use of internet resources for library services was due to inadequate access and inadequate time that can be devoted to internet activity, rather than a matter of lacking skills per. But it was also found that there was a real need for training on using internet for library services.

Akporido (2005) investigated Internet usage patterns in a Nigerian suburban setting - Abraka Delta State. Findings revealed the personal characteristics of the respondents, different aspects of their internet use such as duration of internet usage access time, motivation for using the Net, search engines employed, internet skills acquisition, frequency of internet use, evaluation of internet information content, problems encountered while using the internet as well as way forward.

Jürgen Kai-Uwe Brock, Yu (Josephine) Zhou (2005) investigated the focal construct OCU The focal construct OIU was conceptualized as an abstract collective object with three components, forming an index with formative, causal indicators. A multi-method research design – including a cross-sectional drop-and collect survey among Small Technology-based Firms (STBFs) in Germany and an observational study of web sites – was applied to assess empirically the theoretically developed construct OIU. In this study he found, the empirical assessment of the scale, applied to the international business domain, proved to be reliable and valid in the structural model and across assessment methods. Research limitations/implications – The focal construct was assessed among a very specific population. This limits the claims that can be made with regard to applying it in other industries, countries, and firms. Future research should address this by applying OIU in maximally different research contexts.

Griffiths and Brophy (2005) conducted a survey on students searching behavior on the Web. Concluded with students prefer to locate information or resources via a search engine and found that Google is the search engine of choice .Also reports that search engines now influences their perception and expectations of other electronic resources.

Ebersole (2005) reviewed the research conducted in 1998-99, examining students' perceptions and uses of the Web for academic purposes. The results of the content analysis of sites visited by students suggest that students believe the Web to be an important and valuable resource.

Recebtly, Mishra, Yadav and Bisht (2005) conducted a study to know Internet utilization pattern of the undergraduate students of G.B Pant University of Agriculture

and Technology, Patnagar. The findings of the study indicated that a majority of the students (85.7%) used the Internet. Out of the Internet users67.7% were male students and 32.3% female students. The findings of the study also showed that61.5% of the males and 51.6% of the females used Internet for preparing assignments. A majority of the respondent's i.e.83.1% male and 61.3% female respondents indicated that they faced the problem of slow functioning of Internet connection.

Biradas and sampath kumar (2005) studied the use of Internet by physicists in the University of Karnataka and they found the major obstacles in internet use and lack of training regarding internet use.

Kumbar and Raj (2005) studied on the use of electronic resources by research scholars in Central Food Technological Research Institute (CFTRI) Mysore. It showed that 97.7%of research scholars used Internet for Information Search engine among the users .The study suggested the Institution should provide hands on experience and conduct user orientation programmers to improve the efficiency of research scholars in accessing electronic information.

Badu (2005) conducted a study to find the extent of awareness and use of the internet and its resources by academic staff and postgraduate students of the University of Ghana. The main findings indicate that both staff and students are fully aware of the Internet and most of its services. The study established that email is highly used by both staff and students. Both staff and students found the Internet a very useful resource. The main reason for non-use of the Internet is inadequate training. Both staff and students need appropriate education and training of to ensure effective use of the Internet in all their academic pursuits. A survey of eighty-one users of a cyber café owned and run by the Delta State University.

Abraka Igun (2005) conducted to examine the self reported level of Internet skills. The results showed that 71% of respondents rated their Internet skills between average and very high. Only, 78.8% acquired their Internet skills either online or through teaching by colleagues or friends. World Wide Web (WWW) skills were the most sought after additional skill (73%). Continuing education and self study were the most preferred ways to acquire new skills.

Biradar and Sampath kumar (2005) investigate the use of Internet, its purpose amount of time spent to use the internet, place of use, Internet expertise, and the perceived obstacles in the use of internet by physicists in the universities of Karnataka State. They recommended some strategies to use the internet to greater extent. A similar study conducted by Biradar et al. (2006) concluded that e-mail is still one of the most popular services. The Review conducted to study the pattern of internet use: satisfaction with the search results and the internet services; and reason of non-use of internet by the Ph.D. scholars of Dr.H.S.Gour University, Sagar,M.P. The findings show that the rate of internet use is more in research scholars of science ,Life science, Engineering Technology and Management faculties as compared to the faculties of arts ,Social science, Law ,Education and Commerce .Among the non-users of internet, the number of female research scholars is more as compared to male. The research scholars use internet for research purpose, entertainment as well as for job search.

Amritpal Kaur , Rajeev kumar (2005) The aim of this study was to analyze the use of the Internet and related issues among the teachers and students of engineering colleges of Punjab, India. The present study demonstrates and elaborates the various aspects of Internet use such as, frequency of Internet use, most frequently used place for Internet use, purposes for which the Internet is used, use of Internet services, ways to browse the information from the Internet, problems faced by the users and satisfaction level of users with the Internet facilities provided in the colleges. The result of the survey also provided information about the benefits of the Internet over conventional documents. It was found that the Internet had become a vital instrument for teaching, research and learning process of these respondents.

Krishnamurthy and Chan (2005) The developments in information and communication technologies (ICT) and their subsequent absorption in library and information science (LIS) have forced information professionals to change the way they are functioning at present. Because of their popularity with the users, an overwhelming attention is being given to the web-based information services in libraries.

Cholin (2005) study is an attempt to give an overview of Information Technology implementation in different university libraries in India that provides effective access to resources available within universities and elsewhere. Also discussed is the role of the INFLIBNET Centre in the overall development of university libraries across the country with special emphasis on efforts through UGC-Infonet E-Journals Consortium.

Shuva (2005) deals with the development of public libraries in Bangladesh, their present situation, and some recommendations for improving their services and implementing Information and communication technology (ICT). It plays a vital role in bringing about changes in society. This age of ICT the role of the public library has changed drastically in developed countries. They are providing more cultured and user friendly information services to their patrons. In this view, public libraries in developing countries are using these facilities very slowly due to shortage of funds, skilled manpower and other support. As a result the users of public libraries in developing countries are not fully satisfied.

Asemi and Riyahiniya (2006) conducted a survey on awareness and use of digital resources in the libraries of Isfahan University of Medical sciences, Iran. Results of the study are; 70% students are aware of digital resources available in the university databases, 87.2% of students feel that the available digital resources meet their information needs. Authors conclude that users are facing some problems like low speed connectivity and shortage of inadequate hardware facilities.

Husain Al- Ansari (2006) investigated of internet use by the faculty including purpose for use, its impact on teaching and research, internet resources that they use, and the problems faced while using the internet a questionnaire, expert-received and pilot-tested was used to collect data from the faculty coming from four colleges of Kuwait University i.e. Arts, social science, sciences and responses rate of 62.6 percent.

In this study he found that large majorities have been using the computer and mail, colleagues, slow speed, lack of time and lack of access from home are the major

problems. Most of them are interested in improving the internet use skills through formal training.

Nwagwu et al. (2006), showed that about 73% of respondents considers internet information as useful, while much less as this 44.4% reported finding internet information as trustworthy. The results of this study show that there are very few University libraries in Pakistan with access to the Internet and there is a desperate need to develop functional IT infrastructure in the Universities of both private and public sectors.

Rajeswari .D (2006) the author discusses the importance of the web based information resources with specific reference to e-books, e-journals and UGC Infonet. It also highlights the various web based Information services used by Faculty, Research scholars and students of Padmavathi Mahila University. It was observed through personal experience faculty could enhance their participation in national and international conferences manifold by availing E-mail facility.

Mahajan (2006) conducted a study on Internet use by researchers in Punjab University, Chandigarh, which analyzed the convergence of information and communication technologies as embodied by the Internet which has transformed the present day society into a knowledge society. It was stated that the Internet is considered to be the most valuable among other computer technologies available to the society.

Nazim,Mohd Saraf, Sanjiv(2006) : The study reports the results of a survey conducted at Banaras Hindu University (BHU) to determine the extent to which Internet users are aware and make use of the Internet. Efforts are on to find the information searching habits of Internet users. Data were collected using a questionnaire and follow-up interviews with the Internet users of three institutes and six faculties. Results show that all respondents are using Internet because of quality information they got through the Internet. Majority of respondents use Internet for research work because the university library has provided access to a large number of databases and online journals. Fifty percent of respondents search information through the search engines, whereas thirty-five percent prefer to go through the

specific website/URL. Google and AltaVista are more widely used search engines compared to others due to their wide coverage and user-friendly interface. About seventy percent of respondents prefer to take print out before making use of Internet material as compared to those who prefer online or CD.

Thirty-five percent of respondents believe that Internet is most useful because they find valuable information all the time. It has also been observed that slow speed, high Internet charges, lack of training and lack of organized information are some of the factors that affect the use of Internet. Present recommendations to improve the use of Internet, including a well planned Internet literacy program and preparation of subject gateways.

Mulla,K.R (2006) The digitization of the library collections or e-resources has given a new mission to librarians in terms of providing training to the users in the skills needed to discover access to in-house as well as remote materials, and in evaluating the retrieved information. In a digitized library, an engineering college librarian is required to be an active player--retrieving information from vendors, publishers, web sites, and other e-resources on the one hand; and processing and transmitting it to the users on the other hand. The information has to be transmitted to library staff by training and upgrading of skills

Shuling (2007) analyzed the use of electronic resources in Shaanxi University of Science and Technology. The sample consists of 909 respondents of all types of library users. The study found that nearly 80 percent of respondents knew little about electronic resources. Nearly half the respondents use both printed and electronic resources, followed by print periodicals.

Sadeh (2007) Libraries provide their collections and services to a large variety of users, some of whom will continue using the library interface regardless of the way in which it addresses their expectations. However the majority of today's library users are those who were born into the internet age and whose scholarly research habits are tightly bound with their overall internet experience.

Raza and Amar Nath (2007) point out that the use of Information Technology (IT) in the university libraries of Punjab, Himachal Pradesh and Chandigarh with a clandestine objective to establish some co-relation between quality in libraries and use of IT. The paper highlights the use of hardware and software facilities in university libraries. It also highlights the access of networks, information services and barriers in IT applications. Questionnaires, interview and observation methods were used for data collection. A survey conducted on four university libraries, namely Panjab University library, Chandigarh; Himachal Pradesh University, Shimla; Punjabi university Library, Patiala; and Guru Nanak Dev University Library, Amritsar found that only Panjab University Library, Chandigarh and GND university library, Amritsar have provided computerized access to in-house databases. Library literature reveals that quality depends on merging print culture with digital culture but the result of this survey confirm that print culture is still dominating in university libraries of this region.

Prabhatsingh Rajput and gopal singh Jandon (2007) study describes a survey of the internet resources and services by the users of institute of engineering and science, IPS Academy, Indore the questionnaire methods is to solicit the opinions of different user groups. Examines the purpose of internet use, most used internet services difficulties faced by the users while using internet services and satisfaction of users about facilities available in ITS finally highlight the suggestions made by the users for improvement of internet services at IES, Indore.

Madhusudhan (2007) conducted a survey on Internet use by research scholars at Delhi University, which revealed that most respondents used search engines more than subject gateways or web directories to locate information. Negative attitudes as well as conservatism act as barriers to effective Internet use.

Malikarjun and Suresh gudimani (2008) conducted a survey to understand student's usage of internet and computer technology, their experience with technology and their aptitudes and expectation about technology resource and identify areas for improvement that all the respondents are using computer and online services in the library.

Antherjanam & Sheeja (2008) carried out a study to find out the impact of ICT on LIS and its major shifts and practices in university library of CUSAT. The major findings of the study were:(a) Users are making very good use of the available ICT facilities.(b) With the help of telephone, e-mail, Fax etc. reference queries are answered faster than before.(c) SDI, CAS etc. are also done faster than before.(d) Issue & return of books, renewals are done faster than before.(e) Book selection, price checking are also done very efficiently using ICT.(f) About 90% of the users of the library search OPAC for getting information about the where about of books.

Ghosh and Ghosh (2009) conducted a study to examine the progress India has made in its move towards a knowledge-based economy. The Indian Government has demonstrated its commitment to the development of fundamental pillars of knowledge sharing infrastructure, knowledge workers and a knowledge innovation system. Libraries are identified as key players in building an inclusive knowledge economy (KE) for a country. The important findings of the study were: the practice-based examples of how information and communication technology (ICT) projects are influencing contemporary Indian society and an account of government policies in regard to ICT implementation and development towards a KE are presented. The impediments in the process of KE in India are identified and recommendations are made.

Sun, Hao-Chang, Chen, Kuan-nien, Tseng, Chishu and Tsai, Wen-Hui (2010) in their study shows how implementing new information technology has expanded the role of librarians as educators and how this role has evolution of new technology. It was found that collaboration with faculty member was to be an essential feature of the most successful stories. Teaching students and faculty to use new ICT may have become one of the important roles of librarians and information managers.

Hussain and Abalkhail (2013) revealed that the majority of users of the library used the circulation service. The study found that a majority of research scholars consult the reference books for research work followed by undergraduate students who used the library circulation service.

2.3 Conclusion

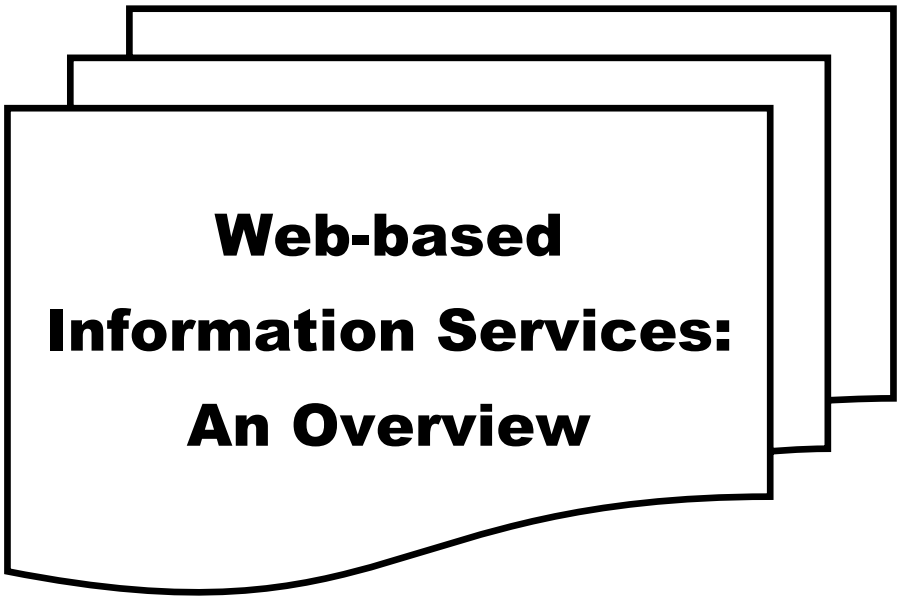
After the review of related literature it is found that various researchers tried to identify the impact of internet on library and its users in providing and getting library services. They also identified the user behavior towards internet, usage percentage of internet for getting library services and other materials

And with the growth and expansion of the Internet, more and more firms focus on the development of the Web-based information system (IS). As the Internet matures, the Web is increasingly used to provide remote and broad access to fully featured applications via a web-browser (David, 2000).

Hundie (2003) stated that as information providers, libraries of all types, and documentation and information centers should be the main beneficiaries of the enormous amount of Internet resources that can be used to noticeably enhance the quality of their services and at the same time to save time and money.

Islam (2009) opined that the application of information technology (IT) in libraries is not a sudden movement, but rather a product of continual development of telecommunications and computer technologies.

Marry (2005) believed that electronic reference services have rapidly replaced the traditional face-to-face or telephone reference service. Libraries and librarians were perceived to embody in connection with Internet services: lifelong learning, free access to information, literacy, intellectual freedom, privacy, and services to underserved groups.



Chapter – 3: Web-based Information Services: An Overview

3.1 Introduction

Technology-led developments have created new opportunities and challenges for libraries in creation, promotion, dissemination and storage of information. The library is one of the many institutions undergoing change in the face of technological advances. This, in turn, has led to the generation of new services, hitherto non-existent, as well as modification of existing library services and their deliverables, as well as the move towards new communication paradigms and the shift from face to face human contact to human machine interaction, from paper to electronic delivery, from text centered mode to multimedia and from physical presence to virtual presence.

The web was designed as an information space, with the goal that it should be useful not only for human – human communication, but also those machines would be able participate and help. Most of the web based library service provider is getting a lot of feedback from their effective users. So libraries also introducing more and more services on the web, a tremendous amount of content and the system has had some continuity over time.

WEB is popularly used as the synonymous term of World Wide Web or Internet or Online. The Internet and its "publishing arm" the WWW are important components in the communication process. The web is a client or server system used to access all kinds of information to anyone on the net. The information can be in the form of regular text, hypertext, pictures, sounds, Usenet newsgroups and other types of data. To access this information, use a client program called browser. Within the web, the information is stored in pages. Each page can hold not only information but links to other pages. In each page a particular word or sequence of words highlighted item and the other information related to that words in some other pages. This means that there is a link between the highlighted item and the other information, the service is called hypertext. When anyone wants to follow a link, the browser will find out where it is and connect the web server at that location, request the new page and then display it on the screen.

The WWW may represent an intermediate form between recorded and unrecorded communication and information transfer. Because it is a new medium we have not yet

fully identified the dynamics of its behavior. Keeping in mind today's tremendous increase in information and changing users behavior we can say that web is an ideal media for providing information. There are some common facilities we can enjoy form web.

Library services refer to facilities, which are provided by a library for the use of books and dissemination of information for the need and meet the users' requirement. The well known existing library services are cataloguing, classification, circulation services, reservation, renewal, new arrivals, current contents, current awareness service, selective dissemination of information, indexing and abstracting, reference service, document delivery, inter library loan, externally purchased database, CD-ROM databases, access to other library catalogues, access to online databases, internally published newsletter, reports and journals, bibliographic services, and so on. All these services have changed its mode to an extent with web environment.

Libraries are organized collection of monographs, periodicals and other sources of recorded information. They commonly include catalogues, directories that provide factual information and indexes which help users to find information in other sources for the last few years, libraries started providing access to information in electronic formats such as CD-ROMs, World Wide Web and online databases.

3.2 Web-based Information Services

a. Access to Database

Several publishers today offer web-based, intranet solutions for providing local access to their databases. Examples include Silver Platter, Cambridge Scientific Abstract and Institute for Scientific Information. Journal publishers have also begun to offer similar situation, for example Elsevier, for electronic version of their journals. Large R&D libraries can take advantage of these developments and provide desktop access to key database and electronic publications to their users.

Apart from the externally purchased databases, libraries have their own collection of CD-ROM databases mounted on their CD server/tower. Online database vender such as Dialog, Lexis-Nexis and ERIC are delivering their database over internet. So a library which subscribes to these databases can now easily access them over Web.

b. Bibliographic and Cataloguing Services

This service can also be prepared from different databases available on the Web. For example in physics the Los Alamos e-print archives is the more productive means of communication for Astrophysics, Quantum Physics, and Considered Matter Theory etc. Veronica's net-wide index, Archie and NCSTRL's technical report on Computer Science some other. www.chemceter.org is the American Chemical Society's "virtual community" for chemistry professionals, researchers as central source for information on Chemistry related resources. It is an interesting, integrated electronic workplace where we-

1. Receive information on ACS's (American Chemical Society) program and activities.
2. Provide awareness of important scientific issues.
3. Explore career option and job opportunity.
4. Link to publication of ACS.
5. Link to world's most comprehensive database of Chemical information.

Telnet access to remote computer of different organizations' library catalog is also available. Information on books which are not easily available may be accessed through telnet. Library of Congress Catalog is a very popular online service LC. Other libraries, which are on the Web, can be easily accessed through telnet services, which help the researchers. Some of the bibliographic services are available online on the Net. Links from the library homepage can be provided to those sites.

c. OPAC

The Online Public Access Catalog is one manifestation of the massive changes that are taking place as we plunge into the information age. OPACs are the gateways to information in libraries and provide facilities to browse search and locate information. OPACs were developed to meet the needs of users in two different ways-

i. It meant access to library housekeeping operations especially circulation, and
ii. To give the library users direct access to the machine-readable bibliographic records.

Functions of OPAC are:

1. It provides the public with direct access to a library's bibliographic database though the use of a terminal.

2. It is searchable though a variety of access points greater than those available card forms catalogs.

3. It is searchable with a common command language, which may be transferred when the public moves from one library to another.

4. Retrieves information from a local library field, and if not successful locally, retrieves information from other libraries' files.

5. Provides instructional help.

6. Displays search results in readily understandable form.

7. Provides links to card form catalogs, reference help, circulation files, etc.

8. May be accessed remote from the library's location.

Generally OPAC is accessed via Telnet. But at present, where the internet is dominating in the networking environment, OPAC is available and accessible via Internet. They are known as WebPAC or InternetPAC. WebPAC became more simple popular and easy to handle.

d. WebPAC

WebPAC is the Web interface that is familiar and graphics aid navigation. In WebPAC the user can click complex subject, or other, headings. Less typing is good. There are no Unix, VMS or other weird commands. It's easy to check periodical holdings in a new browser window without losing search results. It offers the libraries the opportunities to have access to various resources of other libraries on the web. It allows users to interact with documents stored on computers all over the world. It makes easier to access catalogue data in the form of bibliographic records. Sometime has the ability to search the OPACs of other libraries powerful tool that links all the electronic resources for easy access. It makes the catalogue from

providing information to providing access to large banks of actual information. It becomes another search engine.

It also referred as 'Web Cats' and as well a type of 'Information Gateway' where a login ID, username and or password required. Some include information on the screens such as login ID, username or password in boxes and users can see when they access the catalogue.

The users use a standard interface – the Web browser –, which the end users are well accustomed to. So there is little need for end user training. The Web's standard functionality hyper linking text files as well as database reports or searches are used.

In addition to searching and browsing the library catalogue end-users can transmit orders or requests directly from the Web OPAC as well as view their own borrower accounts. While they need not do anything but click on a hyperlink to access the OPAC of their local library they have to enter their personal user ID and password to access these services.

Hyperlinks through OPAC need not be static but may start a new database search. For example, our end users can identify other publications by the same author or corporate source by simply clicking on their name. Similar link reports are offered for classification codes, or controlled and supplementary terms. Such hyperlinks are only generated if there are further references within the database in addition to the one just being displayed. They may provide for horizontal browsing that means "show me more like this".

Web OPAC can give different types of link: on the one hand there are links, which identify related records within the catalogues (link reports or cross searches as well as bibliographic hierarchies). On the other hand there are those which refer to external resources, i.e. full text links, links to companies or scientific societies, and links to publishers. This led to database design problem—how exactly should which type of link be displayed.

e. Current Awareness Services

CAS according to Luhn is an essential function of management to make the members of its organization aware promptly of such new information which will most likely contributes to performing their individual task with the highest possible degree of competence. Modern procedures and techniques of CAS have included individual notification of published information directed to individual professional scientist's engineers and others.

The purpose of a current-awareness service is to inform the users about new acquisitions in their libraries. Public libraries in particular have used display boards and shelves to draw attention to recent additions, and many libraries produce complete or selective lists for circulation to patrons.

The long-term purpose of the CAS is to provide a substitution for the circulation of new journal to the users various electronic current products have been investigated that could partly provide what the circulation of journal has provided over the years. They also had to be available via the Web in order to allow the ultimate extension of the service to research students located at the distance from the campus. Silver platter, NISC, Ovid, Dialog and Faxon allow the user to save profiles.

A library can provide this service through e-mail, which is easiest and common procedure. Otherwise a library can refer or link directly to some location to their WebPages.

f. Electronic Selective Dissemination of information

Most of the R&D and academic institute because of the tight teaching and research schedule, it was found that scientists and faculty members of the institute were hard-pressed to personally visit the library. Here an electronic SDI service was formulated to deliver current information of interest to faculty members on their desktop. Through this service the Research Interest Profiles (RIPs) of users are searched in a batch mode on the latest updates of EDB's on a monthly basis and the result are e-mailed to respective faculty members. Thus this service not only function as a Current Awareness Tool, but also influenced the acquisition of information sources as well as

usage of other library services like document delivery, resource sharing and acquiring reprints.

For promoting E-SDI services on the web, library should create a link from the existing library environment (i.e. E-SDI page is accessed by clicking the SDI siblink from the information service link of library main page) and the different task followed provide the services can be traced by hyper-navigating the active link. A general definition about E-SDI can be given on the basis of H.P.Luhn's original definition of SDI developed in 1958 which involves the matching of user profile with the new materials, the notification to the user feedback from the users and the modification of user profile. Further link outline the different step followed in delivering the output, how the RIPs are constructed, answering the frequently asked question, feedback received from the users, statistical details about the service, and a figurative representation of the whole activity.

g. Reference Services

The reference service in a library is often defined as direct personal assistance given to its reader for finding information. It is the branch of library services, which includes personal assistance given to in their search for information on various subject areas, irrespective of size and collection of the library.

Whereas much of traditional library networking has focused on information access within and between the physical boundaries of libraries and research institutions, web based reference services owe their increasing popularity amongst librarians to the increasing need to extend the reference desk beyond the library's walls. The goal is to meet the demand for easy 24 hours access to electronic reference sources from the dorm room, the office, and even the kitchen table.

Much work has been done recently on the demographics of the current day library regarding access to electronic services. Virtually every academic library and almost all-public ones offer access to CDROM products. Almost all-academic libraries offer mediated access to the traditional online services such as DIALOG, Dow Jones and LEXIS-NEXIS. Much of this searching is done on databases made available either through loading the data on the library's own server or through access to remote reference servers, such as Information Access Company's InfoTrac Search Bank or

OCLC's FirstSearch. A search of the web will yield literally hundreds of libraries that have home pages which offer a startling array of services, ranging from book catalogue to commercial databases to community information such as events schedules, political minutes, and information of interest to a user public. Many of these services attempt to provide similar levels of service to those found in the library. In fact most end users and librarians expect that remote access to electronic resources mean these resources must be self service, from the perspective of offering easy access to the complete content from a wide variety of sources material in electronic form. And all of these services are available 24 hours a day, seven days a week.

h. E-mail

The Internet is not purely a source of information however. It is also a means of communication, and many users will want to use it to send and receive messages.

Allowing users to set up personal e-mail account (e.g. a.reader@countyshire.gov.uk) on library computers can be administratively and financially problematical and is seldom done in public libraries, although as networked services become more common and users' demands more sophisticated this situation may change. If people are prepared to pay for this sort of service it could become a good income generator.

It is also possible to send messages through an Internet browser, but although mail can be sent, there is no way to receive a reply as browsers have a general rather than a person-specific e-mail address. It is not therefore very satisfactory for users, except for those users who have their own e-mail accounts elsewhere and wish to send information to them without the need to download or print in the library. Also, people could send e-mail which would appear to have been sent by the library, and it would be virtually impossible to control what was sent, or track down who sent it after the event. For these reasons many libraries do not configure their web browsers to allow mail.

However, e-mail is not just for personal correspondence. It is also a means of obtaining information. Online book groups for example run on e-mail, as do many support groups, for example, for cancer sufferers. And if the library supports lifelong learning it may want to allow learners to contact tutors and fellow students.

People using this are simply visiting another web site, so it is difficult to prevent, and there are no technical or financial reasons to do so. They register under their own name with the company offering the service.

E-mail is not at all web based library service. It is a web based excellent media and most probably most popular media. And we the library professionals can use this web medium for various purposes specially for delivering some web based services.

The most easy and convenient method to access the web sources is e-mail. When a researcher who registers his name and chose the content pages of some journals of publishers like Elsevier science, Pergamon Press and some other society publication, request for sending the content page of the selected journal the publishers take care of sending the content in advance, against the registered individual's e-mail address. This helps as excellent current awareness service to the scientists.

i. Electronic Journals

Electronic journals, also known as ejournals, e-journals, and electronic serials, are scholarly journals or intellectual magazines that can be accessed via electronic transmission. In practice, this means that they are usually published on the Web. They are a specialized form of electronic document: they have the purpose of providing material for academic research and study, and they are formatted approximately like journal articles in traditional printed journals. Many electronic journals are listed in directories such as the Directory of Open Access Journals, and the articles indexed in bibliographic databases and search engines for the academic discipline concerned.

Some electronic journals are online-only journals; some are online versions of printed journals, and some consist of the online equivalent of a printed journal, but with additional online-only (sometimes video and interactive media) material.

Most commercial journals are subscription-based, and/or allow pay-per-view access. Many universities subscribe in bulk to packages of electronic journals, so as to provide access to them to their students and faculty. It is generally also possible for individuals to purchase an annual subscription to a journal from the original publisher.

An increasing number of e-journals are available as open access journals, requiring no subscription and offering free full-text articles and reviews to all. Individual articles from electronic journals may be found online for free in an ad-hoc manner: in working paper archives; on personal homepages; and in the collections held in institutional repositories and subject repositories. Some commercial journals find ways to offer free materials. They may offer their initial issue or issues free, and then charge thereafter. Some give away their book reviews section for free. Others offer the first few pages of each article for free.

Electronic journals form a large part of the collection of a library for providing web based services. Today many journals are available electronically - some are full text and some contain only bibliographic information with abstract. Major advantage of electronic journals is that they are constantly updated and easy to access but disadvantage is that breaching of copyright law is very easy. They are available as bitmaps, PostScript, PDF, ASCII, SGML and HTML. Library services may be delivering to users on CD-ROM, through email or through web. Some international societies and associations have developed their own digital libraries through which users can get access to all their publications. Services are available to the members of society or associations through subscription.

j. Frequently Asked Questions (FAQ)

FAQ stands for Frequently Asked Questions. A compilation of Frequently Asked Questions and their answer is referred to as a FAQ list or FAQ article. FAQs are compilations of information which are the result of certain questions constantly being asked hence the name FAQ.

There are thousands of FAQs on the World Wide Web. AskERIC is an Internet question answering services run buy the ERIC Clearinghouse on Information and Technology at Syracuse University, New York. Since it began in 1994 it has answered more than 2 million education-related questions from around the world. It now offers a new features for ERIC/IT, an abstracts in process database of abstracts that are awaiting final editing to be loaded on to the ERIC database updated weekly, the in process database offer 15 searchable fields and each record contains

bibliographic information and an abstract of document and journal articles ERIC/IT has produced.

k. Internet Subject Gateways

Subject based Information Gateways are subject entrances (clearing houses) to quality assessed Internet resources. This can be contrasted with gateways where resources are arranged according to where they are physically placed or "geographically" like W3 servers or according to what type of resource they are, such as InterNIC. Compared to common link-lists SBIGs are labor intensive, but gives the advantage of a quality-assessed collection, with standardized descriptions that gives the user a possibility to judge the relevance of the resources.

A number of libraries in Europe are involved in the development of internet subject gateways services that aim to help users find high quality resources of internet subject gateways offer an alternative to the Internet search engines and Web directories. The definition of subject gateways says in some sense they are the Internet equivalent of an academic or special library. Subject gateways are Internet based services designed to help users locate high quality information that is available on the Internet. They are typically databases of detailed metadata records, which describes Internet resources and offer a hyperlink to the resources. User cans chose to either search the database by keywords or to either search the database by keywords or to browse the resources under subject heading.

l. Bulletin Board Services

A bulletin board is a public discussion area where people can post message without sending them to anyone's e-mail address that can be viewed by anyone who enters the area. On CompuServe a bulletin board is called a forum. On the Internet, the equivalent areas are called newsgroups

Bulletin Board Systems (BBS) started in the late 70s, as a means of communication for virtual community existing in Cyberspace where participants usually under pseudo names may send and receive public and private messages to each other on any topic, transfer software, play online games, etc. Ward Christensen and Randy Suess of USA had discussed on 18 January 1978,

about designing of the first electronic BBS in the world and implemented the system on 16 February 1978.

Separate notice board option can be created though e-mail facility and the latest information of the daily news, job opportunities, admission notice, entrance examination, scholarship and fellowships, new courses etc. can be posted and made available for the users though this bulletin board service.

It is proposed to provide this facility to display/ view news, announcements etc. with constant updating of information in an electronic bulletin board. The UGC circular can also be put on this board. Several bulletin boards can be made available in the networks for each specific category of user discipline.

m. ListServe

Listserv discussion lists are topic oriented forums distributed by e-mail, dealing with a wide variety of topics, many of which are academic in nature. Once you've subscribed to a listserv discussion list, messages from other subscribers are automatically sent to your electronic mailbox. To subscribe to a listserv discussion group we have to send an e-mail message to a computer thousands of miles away. The listserv program handles subscription information and distributes messages to and from subscribers. There are varieties of listserv programs but they all work essentially the same way.

Library listservs are usually maintained by library associations and organizations. Its subscribers are typically members of that organization, or librarians with a vested interested in the listserv's goals or approved topics of discussion. Along with contacting local library associations and others local or national library, contacting appropriate library listservs is another way to receive needed information and resources in the field, and to develop contacts with other library professionals.

n. NewsClipping Services

News clip service is one of the CAS provided in many libraries in print/ photocopy form. To provide this service, news items from selected news papers are first marked and then the clippings are pasted on a white sheet. These filed clippings are then circulated among the users. Due to its physical nature, its distribution is limited by the

number of copies generated as well as this conventional filing systems provide only one index field for the file. The risk of misfiled and unreturned documents is virtually eliminated in an electronic format. The format may be Text or PDF (Portable Document Format). The image may represent as GIF (Graphic Interchange Format) or JEPG (Joint Photographic Experts Group). All of the document should be copied to the server root and the executable to the CGI-BIN directory. A homepage for news clips service has been created and through which access to the news clips has been achieved.

o. NewsGroup

They are on-line discussion groups on many topics of varied interest. A program called newsreader is required to view and post message in newsgroups. Unlike mail lists and chats, newsgroups allow readers to choose the topics to discuss. They can be of immense help to professionals and scientists. Special libraries must encourage users to participate in newsgroups thereby enhancing the organizational knowledge base. The library staff can post messages in the appropriate newsgroup and discuss library –related problems, adoption of new techniques in libraries, etc.

p. Newsletter Services

It is very good service to the users, listing available Internet services, sites, new addition, publications, useful like Conference, Workshops, Training and Fellowship programs. A catalog of Internet base information sources is useful assets for all R&D libraries if given at regular intervals through e-mail or they can host it in their website.

q. Patent Information Services

Internet is the fastest expanding network to access patent information sources of different countries. Most important patent information services available on Internet are—

1. General information for obtaining patent (full text or bibliography), list of publications, and offices like USPTO, IP office of Brazil, and Canadian patents and current awareness services form bibliographic database.
2. Search can be made by inventers name, applicant's name, classification symbols etc. It is free access services for the users, (http://patents.cnidr.org).

Full text of patent are not available for free services through Internet. US Patent Trademark Office (USPTO) allows access to their patent databases (http://www.uspto.gov). Internet Patent News Service provides lists of all U.S. patents issued during the previous week, available by free subscription via-e-mail.

3. Derwent Scientific and Patent Information (http://www.derwent.co.uk/) – Derwent World patent index contains patent information from different patent issuing authorities and derwernt patents citation index. Derwent's database is available a different online hosts like DIALOG, STN, Datastar, Orbit etc. They are giving links to other various patent information services.
4. Chemical Patents plus from Chemical Abstract – http://casweb.cas.org/chempatplus/ New patent files can also be obtained free of cost.

r. UseNet

Usenet is a worldwide distributed Internet discussion system. It was developed from the general purpose UUCP dial-up network architecture. Tom Truscott and Jim Ellis conceived the idea in 1979 and it was established in 1980.[1] Users read and post messages (called articles or posts, and collectively termed news) to one or more categories, known as newsgroups. Usenet resembles a bulletin board system (BBS) in many respects, and is the precursor to Internet forums that are widely used today. Usenet can be superficially regarded as a hybrid between email and web forums. Discussions are threaded, as with web forums and BBSes, though posts are stored on the server sequentially.

One notable difference between a BBS or web forum and Usenet is the absence of a central server and dedicated administrator. Usenet is distributed among a large, constantly changing conglomeration of servers that store and forward messages to one another in so-called news feeds. Individual users may read messages from and post messages to a local server operated by a commercial usenet provider, their Internet service provider, university, employer, or their own server.

The Usenet is a global electronic bulletin board, of sorts, in which millions of people exchange public information on every conceivable topic. Also called "Netnews", it

consists of thousands of newsgroups covering a vast range of topics. The Usenet newsfeed can be read by a variety of newsreader software programs. Standard newsreader software includes 'rn' on UNIX hosts, 'news' on the VMS system, 'nuntius' client software for the Mac, and 'trumpet' client software for DOS machines. Unlike messages received via e-mail, the Usenet newsgroup messages are not stored on your computer unless you specifically save each one.

s. UnCover

UnCover is an online periodical article delivery service and a current awareness alerting service. It indexed nearly 18000 English language periodicals in its database and is still growing. Over eight million articles are available through a simple online order system. Five thousand citations are added daily. Articles appear in UnCover at the same time the periodical issue is delivered to your library or local newsstand, which makes uncover the most up-to-date index anywhere.

It is very helpful to the people who need up-to-the minute information, delivered quickly. Articles located in the UnCover database can be sent via fax machine within 24-48 hours, Monday to Friday- often in less than one hour. Searching the UnCover database is absolutely free. We have to pay only for the articles that we order. Article cost US$10.00 plus copyright royalty fee.

t. WebCasting

Webcasting which is another example of Push Technology is defined as the "Pre-Arranged updating of news, weather or other selected information on an Internet user's desktop through periodic and generally unobtrusive over the WWW". In other words, push technology or webcasting is a method of information delivery across the web that pushes information to the screens of user computer. It is a webcasting was introduced by the PointCast Network in 1996. Presently most of the webcasters concentrate on news delivery.

u. White Board Environment

In a whiteboard environment, there can be many users connected to discuss on a topic and it is different from the newsgroup in the sense that the computer screen serves as a whiteboard and the user can draw figure using the mouse and post message/

explanation in the comment box that appears simultaneously with the whiteboard for other users to view. It is multi-user Java chat and drawing program and so the systems that are connected must be enabled to download Java applets.

v. Subject Portals

Web Search Engines had been developed initially by computer scientists, by borrowing techniques from information retrieval search such as best match searching and relevance ranking. Information professional are increasing bringing their skills to help organize the growing wealth of Internet resources. A good example of their influence is the development of subject-specific web search engines known as subject portals, where evaluation of material covered is a major concern.

Subject portal sites can be very helpful, but they should be used with care. Users should bear the following points in their mind:

1. The aim of the subject portal is to list and review the most important sites on the web relevant to that subject. The sites are usually constantly peer-reviewed to ensure that the site is relevant and up to date.

2. New sites are appearing all the time. Relying on a subject portal site to find everything users require may mean that they miss an important site that has recently appeared and has not yet been reviewed by the producers of the particular subject portal.

3. A subject portal is a one stop shop for information on the topic it covers. Users don't have to carry out extensive Internet searches in order to find the information require. They can simply go to the required subject portal site.

4. Subject portals save users having to have long lists of bookmarks (saved addresses of web pages), which are often, cumbersome and time consuming to arrange and keep up to date. However, if users do prefer to use bookmarks they can arrange them in an order to suit the way they work and not have an order forced on them by the subject portal.

5. A subject portal site is only as good as the reviewers who peer-review the site listed. The reviewers need to have a policy of keeping the portal sites up to date and of constantly reviewing the sites they list, to make sure that they are still relevant and still contain good, timely information.

6. A subject portal may be available to everyone who needs to use it to only certain groups of users. A good portal should be publicly available to anyone who needs it.

w. Web-based User Education

Web guides and teaching tools are found everywhere on the Web because they are easily updated, accessed, and printed on demand. The web-based user education provides a high degree of interactivity and flexibility to the users. The library web sites can use web-based user education for imparting training to users in teaching the basic library skills along with glossary of library terms, using Library OPAC, locating books, magazines, biographical data and other library materials, understanding how to navigate the libraries website and how to select the most relevant database, instructions for searching CD ROM and guidance in locating web-based databases and other electronic resources and instructions on subject searching training, using Boolean operators and searching internet resources through search engines (How to make efficient search strategies).

x. Web Forms

Library web sites have some web forms for suggestions and comments on the Library Services. Different types of Web Forms are available on web that may be an Indent form for acquiring some publications, interlibrary loan request form for document delivery, Ask-a-Librarian forms, on line reservation form or user survey form etc.

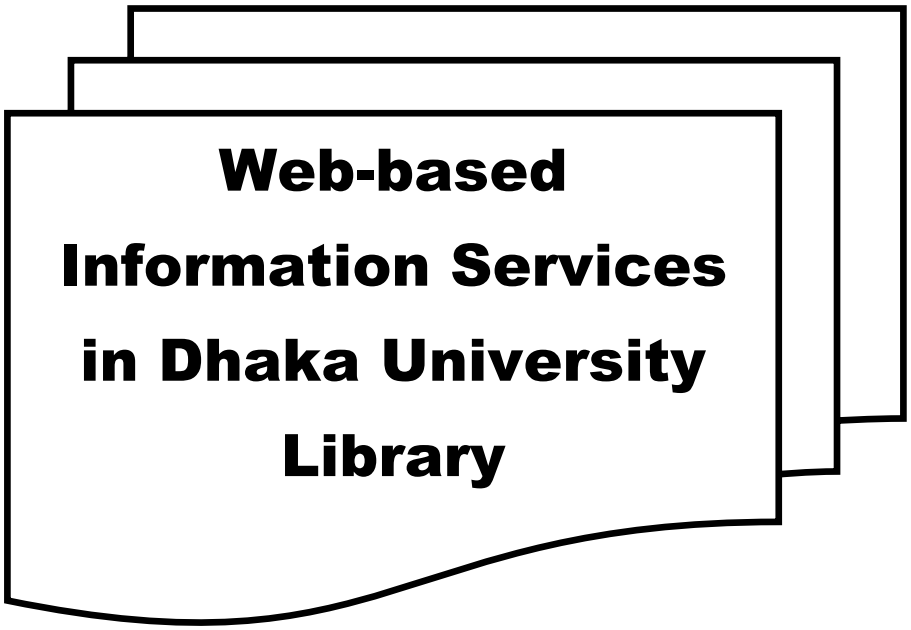
y. Chat lines or rooms

Chat lines are very similar to bulletin boards and mailing lists except that they operate in real time. Messages are received and responded to by people who are online in the chat room at the same time. Like bulletin boards and mailing lists they can be a very useful source of information where people with mutual legitimate interests can

exchange ideas. However, they are associated in many people's minds with sexually explicit or potentially harmful material, and, as young people seem particularly attracted to them, are often banned in libraries. Another consideration for libraries is that chat lines can be addictive and users can tie up library computers for lengthy periods of time. However, if the range of chat lines available is controlled, they can be a useful service.

3.3 Conclusion

Services are the heart of any kind of library. Web-based library services are a trend. Libraries are taking full advantages of internet and web facilities. They are remarkable changing their mode of provision of services. Users are also very happy by getting the library services through web. They can save their time and harassment from not getting the information. The western countries have gone far miles than developing and underdeveloped countries. This new mode of service is highly effective in special libraries rather than academic libraries.



Chapter – 4: Web-based Information Services in Dhaka University Library

4.1 Introduction

The library and information centre is a part of any educational institution, which is the hub of the teaching, and learning activities where students, teacher and researchers get their required information according to their need. In the traditional libraries users have to spend much more time for searching a small piece of information and for that they have to depend mainly on the library professionals or library staff. But in the age of information communication technology, computers are being used for day-to-day housekeeping activity of the library, which saves the time of the end users, and library professionals also and at the same time avoid duplication of work and make the library service smooth and effective (Sinha, 1990).

The Dhaka University Library started in 1921 in the premises of present Dhaka Medical College. The former Principal of the Dhaka College, F.C. Turner, was the first Librarian of the Dhaka University Library. The Library was started with 877 students, 60 teachers of 12 departments under 3 Faculties - Arts, Science and Law. At present the library serves about 35000 individuals, comprising of faculty members, students, researchers, staffs and approval members of other academic communities.

Initially, the library started with a collection of 18,000 of books received from Dhaka College and Dhaka Law College. Now, the library contains 621,058 volumes of books and bound journals; over 30,000 rare and old manuscripts and numerous microfilms, microfiches, CDs and DVDs. The collection of this library is increasing gradually because library is a growing organization.

4.2 Web-based Information Services in Dhaka University Library

a. Catalogue Search

Catalogue search through web is available at Dhaka University Library. Any user can access DU Library OPAC and can know about the collection of the Library from anywhere. The website address for catalogue search is http://www.library.du.ac.bd/

DUL OPAC provides users various search facilities as All keywords, Title keywords, Author, Subject, Title begins with, Keywords, Tear and Call number.

Screenshot of DUL OPAC is shown below in Figure 4.2.1 and 4.2.2. It is divided into two categories as catalogue search and result of catalogue search for getting clear concept about DUL catalogue search facilities.

Figure 4.2.1-Screenshot of catalogue search page from DUL website

Figure 4.2.2-Screenshot of catalogue search result page from DUL website

b. Institutional Repository

Dhaka University Library established a rich digital Institutional Repository using D-Space. The digital library includes e-books, journals, newsletters, theses, internship reports, images, news clippings, audio, video, DU publications and external publications of DU.

c. E-book

Students, faculty members and other patrons can access and download e-books through any PC within all campuses of Dhaka University having user name and password from the following databases published by various internationally reputed publishers through the link-
http://www.library.du.ac.bd/?q=content/e-books-0

DUL contains the following Publishers e-book

- Taylor and Francis
- De Gruyter LIS books collection
- Emerald eBook Series
- Oxford Scholarship Online
- SAGE
- Cambridge
- World Scientific
- Gale Virtual Reference Library
- McGraw Hill
- MyiLibrary
- Springer
- Pearson

d. Online Journals

Dhaka University Library provides a wide range of scholarly electronic resources, but for licensing reasons, these are to be restricted with some downloading rules. E-Resource Downloading Rule Complete and continuous downloading of any journals and e-books violates the online user agreement and thus publisher will suspend the access for Dhaka University users.

Firstly, a consortium is constituted for online journal subscription, Bangladesh Academia of Science (BAS) makes consortium with International Network for the Availability of Scientific Publication (INASP) and Program for the Enhancement Research Information (PERI). The library authority also contract with them for subscription. Almost each department purchases and uses online journal. There are total 46 publishers for online journal (about 22,000 journals) where teachers, students, researchers and other officers can free download. This section sent the notice about online journal to each department chairman, director of institution and other office chief. The authority collects weekly, fortnightly, monthly, ½ yearly, and yearly. It is also be collected by gift or donation.

e. FAQ

Dhaka University Library provides FAQ services to its users through library website. The link is- http://www.library.du.ac.bd/?q=faq

Some sample questions and answers from DUL website is given below-

i. Where is the Central Library and Library Science Section?

-The Central Library is located in the Arts Faculty Campus, South side of Dhaka University Central Mosque.

-The Science Section is located in the Mukarram Hosain Campus near Doel Chattar.

ii. Where is the Library Cyber Center?

-The Library Cyber Center is located in the Ground Floor of Central Library Administrative Building.

ii. How do I join the Library?

If you are a currently registered Dhaka University student, you need to submit a prescribed Borrower's Information Form with one passport size recent photograph for your borrowers ID card to become a member of the Library. You will need to have it with you to enter at the Library and to borrow the Library materials.

f. Ask a Librarian

DUL provides Ask a Librarian facilities. One can contact with librarian from the link- http://www.library.du.ac.bd/?q=contact

A screenshot of this webpage is given below-

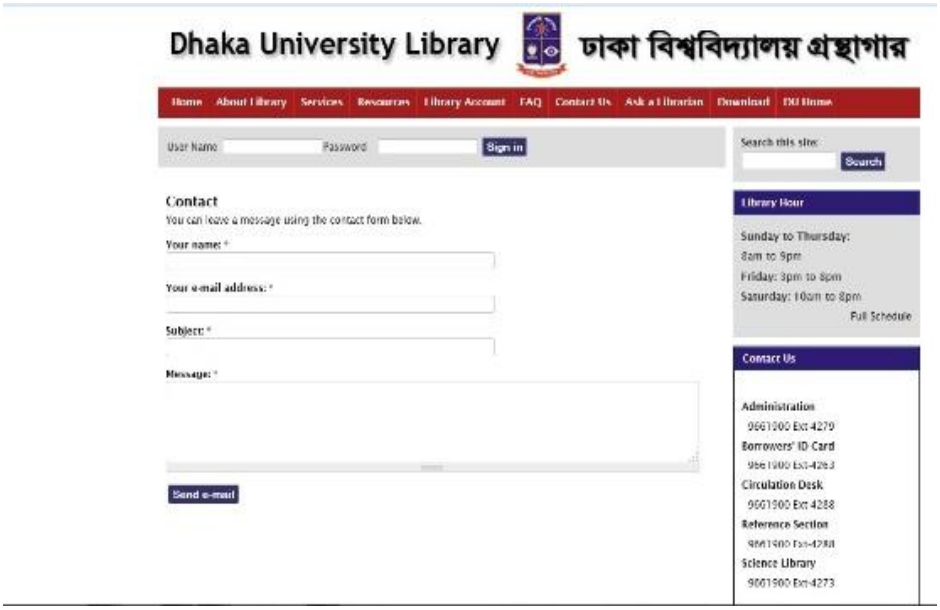


Figure 4.2.3-Screenshot of ask a librarian page from DUL website

g. Current Awareness Service

The library regularly keeps its users aware of the new arrivals of resources and services through Current Awareness Service (CAS) using modern techniques and technologies.

4.3 Conclusion

Earlier academic libraries were "place-based" service providing institutions and users visited the library to consult the catalogue and use the physical collection of books, journals, CDs, etc. With the rapid changes in the field of information and communication technologies (ICT), library and information centers have been completely transformed. Now-a-days, various types of web-dependent library has emerged such as digital library, virtual library etc. Web-based information services has also become an popular way to provide library services as it is less time consuming, cost effective. Dhaka University has also adopted some of the web-based information services like catalogue search, institutional repository, FAQ, ask a librarian, e-book, CAS, online journal etc. Dhaka University Library provides access to some online databases for its users like HINARI (Health InterNetwork Access Research Initiatives), AGORA, JSTOR, DOAJ (Directory of Open access journal) etc.

Data Analysis, Discussion and Findings

Chapter – 5: Data Analysis, Discussion and Findings

5.1 Introduction

Libraries are collections of books, manuscripts, journals, and other sources of recorded information. They commonly include reference works, such as encyclopedias that provide factual information and indexes that help users find information in other sources; creative works, including poetry, novels, short stories, music scores, and photographs; nonfiction, such as biographies, histories, and other factual reports; and periodical publications, including magazines, scholarly journals, and books published as part of a series. As home use of records, CD-ROMs, and audiotapes and videotapes has increased, library collections have begun to include these and other forms of media, too.

As a service oriented organization library has a duty to fulfill the information needs of the users. It is a treasure house of knowledge. Its knowledge preserved in various forms, i.e. books, journals, reports, microfilms and other media of communication to suit one's needs. It plays a major role in the development of a nation. The status of a university could be gauged with the up-to-date collection and services of its libraries. A university library, which occupies the central place in teaching and research, has to meet the diverse and growing needs of educational program at the student's and researcher's levels. Dhaka University Library also has great responsibility to meet the all kinds of information needs of its users as it is one of the largest and most reliable sources of information in the country. Now-a-days, internet and web is playing a vital role in providing library services through all over the world and DUL is not different from them.

In this chapter, it has been tried to evaluate the existing web-based information services of DUL. The present work has been prepared on the basis of findings of the survey results of librarians, administrators, researchers, teachers and students.

5.2 Data Analysis, Discussions and Findings

This chapter has been prepared on the basis of the surveyed questionnaires from the sample users and Dhaka University Library and those questionnaires are included in this study. This chapter also discussed and presented major findings from the surveyed questionnaires.

5.2.1 Data about DUL

I. About the Library

The primary information about the library is shown below in the Table No.5.2.1.1

Name of the Library		Dhaka University Library
Year of Establishment		1921
Address of the library		Dhaka University library, University of Dhaka-1000
Mode of communication	Fax	88-02-9667222
	Telephone	9661920-73/4262
	E-mail	librarian@du.ac.bd
Library hours		Sun-Thurs: 8am-9pm; Sat:10am-8pm; Fri: 3pm-8pm
Parent Organization		University of Dhaka

Table 5.2.1.1-Primary information about DUL

Table 5.2.1.1 reveals that Dhaka University library whose parent organization is University of Dhaka was established in 1921.Its working period is varying on weekend day. DUL remains open 8am-9pm at Sunday to Thursday, on Friday it remains open 10am-8pm and on Saturday it remains open 3pm-8pm.That is DUL kept open 13 hours a day (without weekend day).

II. Library Collections

The collections of DUL are shown below in the table no. 5.2.1.2

Collections types	**Quantity**
Books and bound volumes	6,67,783
Online journals	22,000
Total	**6,89,783**

Table 5.2.1.2-Library collections of DUL

Table 5.2.1.2 reveals that DUL has 6, 89,783 vast collections of books, bound volumes and online journals. The number of books and bound volumes is 6, 67,783. 22, 000 online journals are also available in DUL.

III. Library Services

DUL services are shown below in the table no. 5.2.1.3

Types	**Names of the services**
Manually	Rare collections, Research papers
Through Internet	E-books, E-journals, Digitized Manuscripts and Newspapers

Table 5.2.1.3-Library services of DUL

From the above table, it is clear that DUL provides its services both manually and via internet. Rare collections, research papers are providing manually. The services providing through internet are e-books, e-journals, digitized manuscripts and newspapers.

IV. Library Users

The information about library users of DUL is shown below in the table no 5.2.1.4

Searching method		Search for					
Manually	Through internet	Book	Periodical	Reference material	Manuscript	Audio-visual material	Micro-form
✓	✓	✓	✓	✓	✓	-	-

Table 5.2.1.4-Information about library users of DUL

Table 5.2.1.4 reveals that, the DUL users search information both manually and through internet. They usually search for book, periodical, reference material, manuscript.

V. Purchase and Processing of Library Materials

The information about purchase and processing of library materials of DUL is shown below in the table no 5.2.1.5

Methods of processing		Classification scheme			Catalogue code	
Manual	Automated	DDC	UDC	LC	AACR-1	AACR-2
✓	✓	✓	-	-	-	✓

Table 5.2.1.5-Purchase and processing of library materials of DUL

From the above table, it is clear that DUL used both manual and automated method for processing. Dewey Decimal Classification (DDC) scheme is used for classification and AACR-2 is used for cataloguing.

VI. Information Technology Infrastructure

VI (a): Hardware and other equipments

A brief description is given below in the table no 5.2.1.6 about the hardware and other equipments available at DUL.

Name of Hardware		Total Number
Computer		98
Scanner		06
Reprographic equipment		-
Audio visual equipment		-
Internet equipment	Switch	14
	Server	07
Printer		28

Table 5.2.1.6 Hardware and other equipments of DUL

Table 5.2.1.6 reveals that, DUL has 98 computers, 06 scanners, 14 switches, 07 servers and 28 printers.

VI (b): Available Information Communication and Reprographic facilities

In table no 5.2.1.7, available information communication and reprographic facilities in DUL is endorsed.

Telephone	E-mail	Internet	Telex	Fax	Microfilm/ Microfiche	Photocopy	Tele-conferencing device
✓	✓	✓	-	✓	✓	✓	-

Table 5.2.1.7-Available information communication and reprographic facilities in DUL

From the above table, it is clear that DUL communication mediums are telephone, e-mail, internet, and fax. The available reprographic facilities are microfilm/microfiche and photocopy.

VI (c): Library Operation, Software and Network

The information of DUL operation, software type and network type is shown below in the table no 5.2.1.8

Library operation			Software type		Network type	
Manual	Computerized	Partly computerized	In-house built software	Readymade software package	LAN	WAN
		✓	✓		✓	

Table 5.2.1.8-Library operation, software and network of DUL

The library operation of DUL is partly computerized. DUL use in-house built software and its network is LAN.

VIII. Human Resources Development

The present situation of human resources development in DUL is shown below in the table no 5.2.1.9

Types of staff			Present manpower condition			Training Program	
Professional	Semi-professional	Non-professional	Adequate	Almost adequate	Inadequate	Yes	No
✓	✓				✓	✓	

Table 5.2.1.9-Human resources development in DUL

Table 5.2.1.9 reveals that, DUL has both professional and semi-professional staff. But the present manpower condition to provide web-based information services is inadequate though DUL arrange training program for its staff.

IX. Available Web-based Information Services

Available web-based information services in DUL are shown below in the table no 5.2.1.10

Access to Database	✓
OPAC	✓
CAS	✓
SDI	✓
Reference Services	
E-mail delivery	✓
Newsletter services	
Library Portals	
Bulletin Boards	
ILL and document delivery services	
FAQ	✓
Bibliographic and cataloguing services	✓
Listserves	

Table 5.2.1.10-Available web-based information services in DUL

Table 5.2.1.10 shows that DUL provides various types of web-based information services for its users. These are -Access to database both in-house and online, Online Public Access Catalogue (OPAC), Current Awareness Services (CAS), Selective Dissemination of Information (SDI), E-mail delivery, Frequently Asked Questions (FAQ) and Bibliographic and cataloguing services. It is also clear from the above table that, some of the web-based information services as reference services, newsletter services, library portals, bulletin boards, Ill and document delivery services, listservs are not available at DUL.

X. Library Finance and Budget

The last 5 years budget of DUL is shown below in the table no 5.2.1.11

Year	Total amount	Sector wise expenditure					Remarks
		Books	E-books	Periodicals	Online journals	others	
2013-2014	195 lac	110 lac	-	-	24 lac	-	-
2012-2013	178.50 lac	100 lac	-	-	24 lac	-	-
2011-2012	176.50 lac	100 lac	-	-	18.44 lac	-	-
2010-2011	95.50 lac	50.90 lac	-	-	-	-	-
2009-2010	101.88 lac	59.38	-	-	-	-	-

Table 5.2.1.11-DUL finance and budget

In table 5.2.1.11, the last five years budget of DUL has been endorsed. It is clear from the above table that the allocated budget for books and online journals in the year 2013-2014 has been increased comparing the budget of 2009-2010. Whether the total amount was 101.88 lac taka in 2009-2010, it has increased to taka 195 lac in 2013-2014. The budget for book also increased from taka 59.38 lac to taka 110 lac in the budget of 2013-2014.

5.2.2 Data from Sample Users

I. Age of the Users

Age of the respondent users is shown below in the figure no. 5.2.2.1

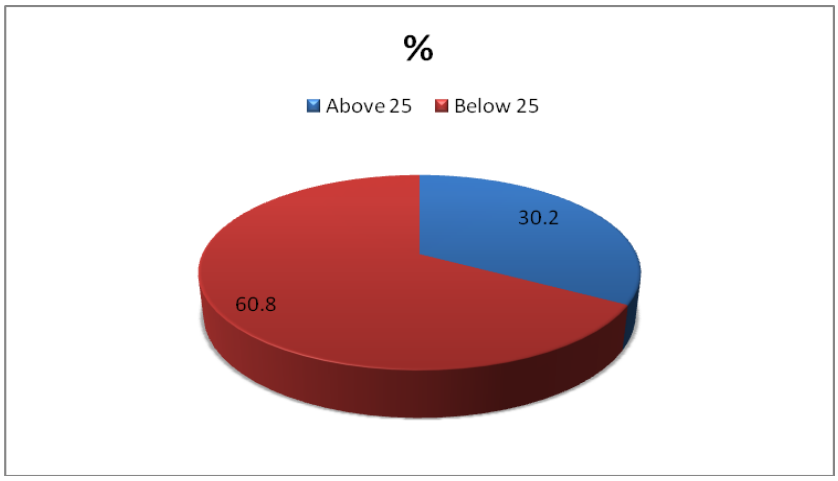


Figure 5.2.2.1-Age of the users

It is clear in the figure 5.2.2.1 that the majority of the respondent users are in the age of below 25 percentage is 59.8% and above 25 percentages is 40.2%.

II. Gender of the Users

Gender of the sample users is shown below in the figure no. 5.2.2.2

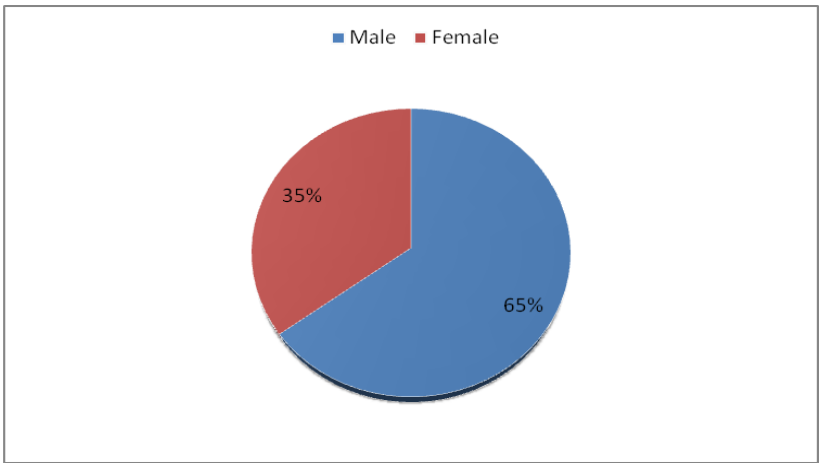


Figure 5.2.2.2-Gender of the users

Data in figure 5.2.2.2 reveals that 65% sample users are male and 35% sample users are female.

III. Designation of the Users

Designation of the sample users is shown below in the figure no. 5.2.2.3

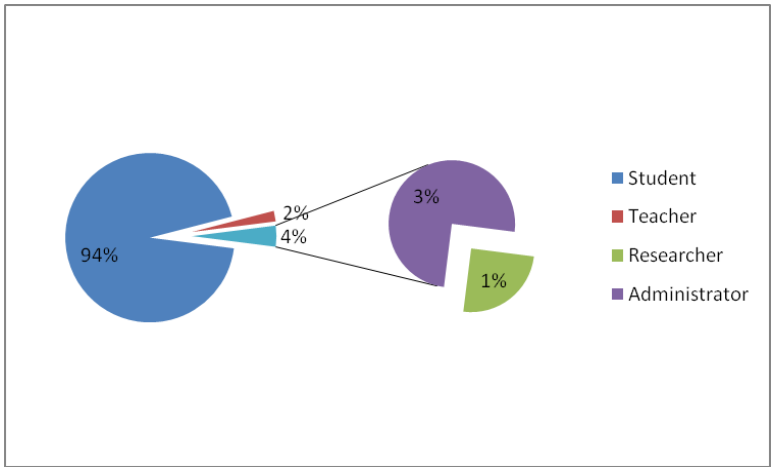


Figure 5.2.2.3-Designation of the users

It is clear from the above figure that the majority of the sample users are student then administrator, teacher and researcher. Respectively the percentage is 94%, 3%, 2% and 1%.

IV. Library Visiting Frequency of the Users

The frequency of visiting library by the sample users is shown below in figure no 5.2.2.4

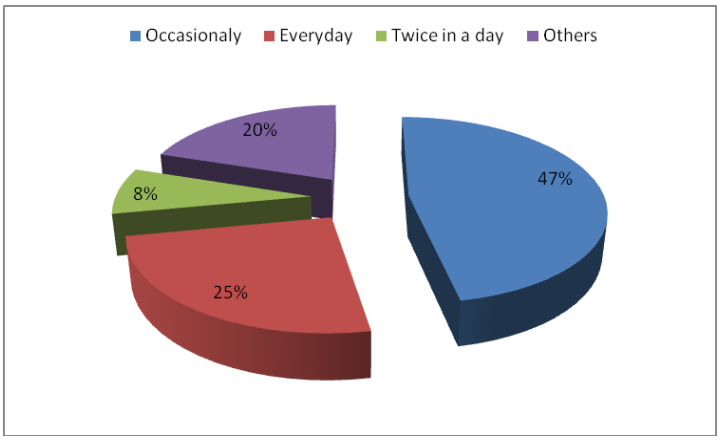


Figure 5.2.2.4-Library visiting frequency of the Users

From the figure 5.2.2.4, it is clear that the majority of the sample users visit the library occasionally. Their percentage is 47%. Only 25% sample users visit the library every day. Only 8% sample users visit the library twice in a day. 20 % sample users visit the library once in a week, month, year etc.

V. Purpose of Library Visit

The purpose of library visit of the sample users are shown below in figure no 5.2.2.5

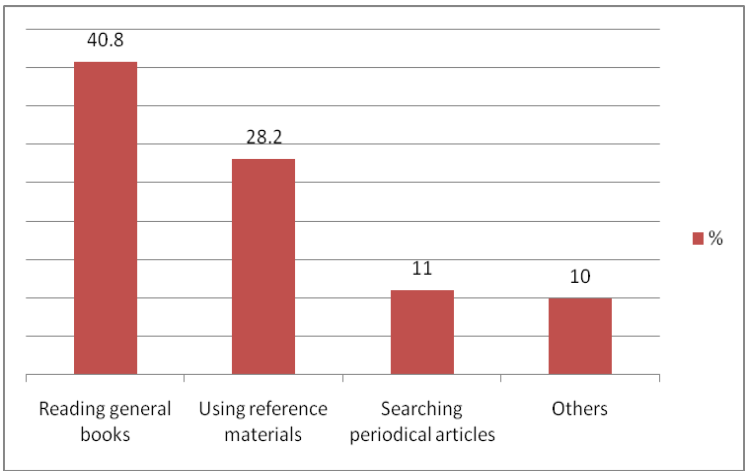


Figure 5.2.2.5-Purpose of library visit

Figure 5.2.2.5 reveals that most of the sample users (40.8%) visit the library for reading general books. For using reference materials and searching periodicals 28.2% and 11% users visit the library respectively. Only, 10 % sample users visit the library for using IT facilities, conference proceedings, research papers etc.

VI. Priority of Available Services to Users

Priority of available services to sample users is shown below in table no 5.2.2.1

Name of the services	Priority extent			Total Percent
	To great extent	To some extent	Almost no extent	
CAS and SDI services	45%	15%	40%	100%
Reference & referral services	76%	14%	10%	100%
Bibliographic services	88%	10%	2%	100%
Indexing & abstracting services	6%	14%	80%	100%
Reprographic services	94.6%	4%	1.4%	100%
Periodical	43.2%	37.2%	19.7%	100%

Table 5.2.2.1-Priority of available services to users

From table 5.2.2.1 it is clear that, reprographic services are the most prior information to the sample users. Mostly, 94.6% sample users remark the necessity of its as great extent, 4% remark it's as some extent and only a minimal number of respondents (1.4%) remark it as almost no extent. Bibliographic services are need to great extent for 88% users, 10% users need it to some extent and 2 % shows that almost no extent. 76% sample users remark the necessity of reference and referral services as great extent, 14% remark it's as some extent and 10% remark it as almost no extent. CAS and SDI services are need to great extent for 45% users, 15% users need it to some extent and 40 % shows that almost no extent. Periodicals are need to great extent for 43.2% users, 37.2% users need it to some extent and 19.7 % shows that almost no extent. A minimal number (6%) shows the need of indexing and abstracting services as great extent, 14% remark it as some extent and 80% remark it as almost no extent.

VII. Searching Method of Information

Searching method of information used by DUL users is shown below in figure no 5.2.2.6

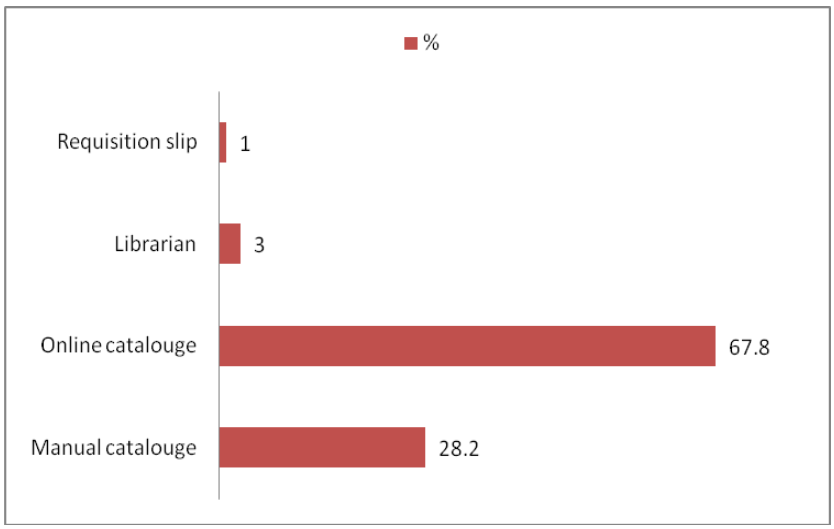


Figure 5.2.2.6-Searching method of information

Figure 5.2.2.6 reveals that most of the library users search information through online catalogue that is 67.8%. Manual catalogue also used by 28.2% sample library users. Only 3% and 1% users search information through librarian and requisition slip respectively.

VIII. Use of E-resources

Use of e-resources by DUL users is shown below in figure 5.2.2.7

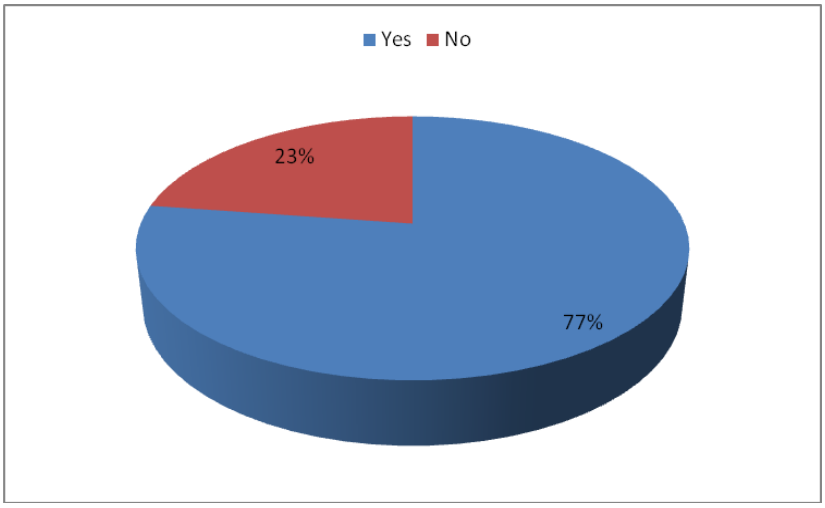


Figure 5.2.2.7-Use of e-resources

Figure 5.2.2.7 reveals that 77% sample library users use e-resources and 23% don't use.

IX. Types of Used E-resources

Types of e-resources that are used by sample library users are shown below in figure no 5.2.2.8

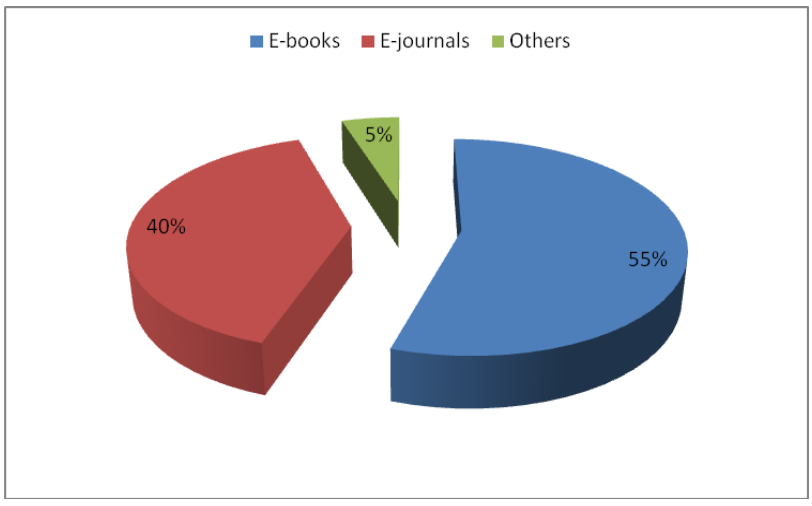


Figure 5.2.2.8-Types of used e-resources

Figure 5.2.2.8 shows that, 55% sample library users use e-book whether 40% sample users use e-journals.5% users use others e-resources namely manuscripts, newspapers etc.

X. Use of Web-based Information Services

Use of web-based information services by sample library users are shown below in figure 5.2.2.9

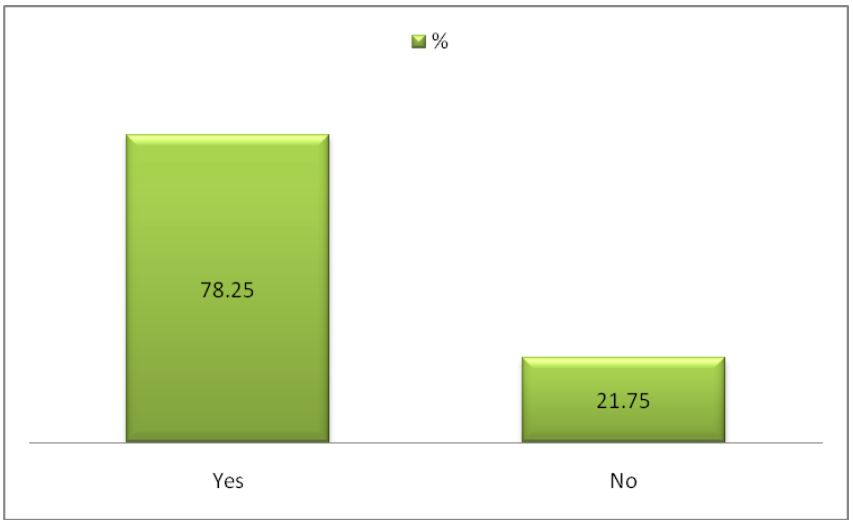


Figure 5.2.2.9-Use of web-based information services

Figure 5.2.2.9 shows that 78.25% sample library users use web-based information services and 21.75% users are not using web-based information services.

XI. Frequency of Visiting Library Website

Frequency of visiting library website of DUL by sample library users is shown below in the table no. 5.2.2.2

Using Frequency of libray website	Percent(%)
Daily	15.5
Several times a week	36.2
Several times a month	33.3
Occassionaly	15
Total	**100**

Table 5.2.2.2 Frequency of visiting library website

Table 5.2.2.2 reveals that 36.2% users visit the library website several times a week.33.3%, 15.5% and 15% visit the library website several times a month, daily and occasionally respectively.

XII. Respondents Regarding Web-based Services Using Period

The percentage of respondents regarding web-based information services using period is shown below in figure 5.2.2.10

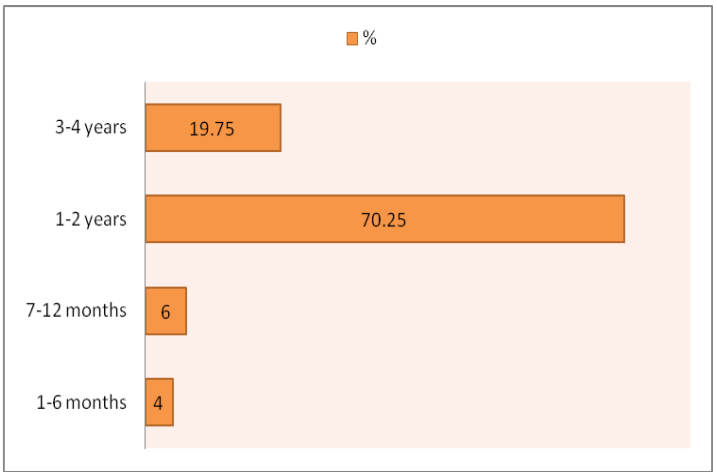


Figure 5.2.2.10-Respondents regarding web-based services using period

Figure 5.2.2.10 shows that 70.25% users are using DUL web-based information services since 1-2 years. Only, 19.25% are using since 3-4 years. Respectively, 6% and 4% users are using this services since 7-12 months and 1-6 months.

XII. Frequently Used Web-based Information Services

Frequently used web-based information services are shown below in table 5.2.2.3

Name of the services		**Percent(%)**
For catalouge search		62.5
To know about new arrival		12.5
To use library database	In house database	5.4
	Online database	13.6
For borrowing library materials		6
Total		**100**

Table 5.2.2.3-Frequently used web-based information services

Table 5.2.2.3 shows that 62.5% respondents use the web-based information services provided by DUL for catalogue search. 13.6% users use it to access in online database. 12.6% users use it to know about new arrival. 6% users use it for borrowing library materials. 5.4% users use it to access in house database.

XIII. Rationale of not Using Web-based Information Services

There are so many users have found who are not using web-based information services. They were asked for the rationale of not using web-based information services. From their answer, it has been analyzed that 80% users are bored with the slow speed of internet. 7% users don't have any internet accessibility. 4% don't know how to access on it and another 4% find it more critical. 3% of sample users don't know about it and rest 2% don't like this.

These information are endorsed below in table no 5.2.2.4 for more clarity.

Rationale of not using web-based information services	**Percent(%)**
You don't know about it	3
You don't know how to access on it	4
You don't have internet accessibility	7
You don't like this	2
You find it more critical	4
You are bored with slow speed of internet connection	80
Total	**100**

Table 5.2.2.4-Rationale of not using web-based information services

XIV. Stipulated Library Services through Internet

Stipulated library services through internet by user are shown in table 5.2.2.5

Category	**Yes**	**No**	**Total Percent(%)**
To get books, journals and reference materials	100%	-	100
Search database of the books(both text and reference)	100%	-	100
To know the availability of a book	100%	-	100
To search books with all approaches	100%	-	100
Transaction of a book	100%	-	100
Additional services provided by the library	100%	-	100

Table 5.2.2.5-Stipulated library services through internet

Table 5.2.2.5 reveals that 100% users want to get books, journals, references materials from the library through internet. They also want the facilities of database search, news about the availability of a book, transaction of a book, search a book with all approaches via interne. Other additional services provided by the library also stipulated through internet.

XV. Stipulated Web-based Services from DUL

Stipulated web-based information services from DUL by respondent users are shown below in the table no 5.2.2.6

Access to Database	100%
OPAC	100%
CAS	100%
SDI	100%
Reference Services	100%
E-mail delivery	100%
Newsletter services	100%
Library Portals	100%
Bulletin Boards	100%
ILL and document delivery services	-
FAQ	100%
Bibliographic and cataloguing services	100%
Listservs	-

Table 5.2.2.6-Stipulated web-based services from DUL

Table 5.2.2.6 shows that 100% sample users want the above web-based information services from Dhaka University Library.The stipulated services are Online Public Access Catalouge (OPAC), Current Awareness Service (CAS), Selecctive Dissemination of I nformation (SDI), Reference services, E-mail delivery, Newsletter services, Library Portals, Bulletin Boards, ILL and document delivery services, Frequently Asked Question (FAQ), Bibliographic and catalouging services etc.

XVI. Extent of User's Satisfaction with Web-based information Services

Extent of user's satisfaction with present web-based information services is shown below in figure 5.2.2.11

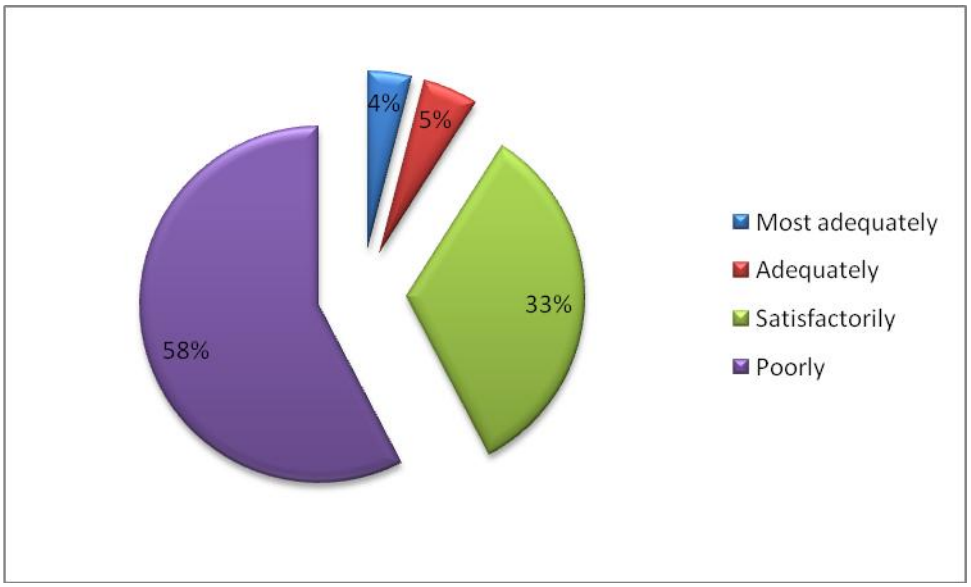


Figure 5.2.2.11 Extent of user's satisfaction

Figure 5.2.2.11 shows that most of the users are poorly satisfied with the present situation DUL in proving web-based information services. The percentage of poorly satisfied users is 58%. 33% users are satisfied with this. Only 5% and 4% users need meet adequately and most adequately respectively.

5.3 Conclusion

Dhaka University library whose parent organization is University of Dhaka was established in 1921.Its working period is varying on weekend day. DUL remains open 8am-9pm at Sunday to Thursday, on Friday it remains open 10am-8pm and on Saturday it remains open 3pm-8pm.That is DUL kept open 13 hours a day (without weekend day).

DUL has 6, 89,783 vast collections of books, bound volumes and online journals. The number of books and bound volumes is 6, 67,783. 22, 000 online journals are also available in DUL.

DUL provides its services both manually and via internet. Rare collections, research papers are providing manually. The services providing through internet are e-books, e-journals, digitized manuscripts and newspapers.

DUL users search information both manually and through internet. They usually search for book, periodical, reference material, manuscript.

DUL used both manual and automated method for processing. Dewey Decimal Classification (DDC) scheme is used for classification and AACR-2 is used for cataloguing.

The library operation of DUL is partly computerized. DUL use in-house built software and its network is LAN.

DUL has both professional and semi-professional staff. But the present manpower condition to provide web-based information services is inadequate though DUL arrange training program for its staff.

DUL provides various types of web-based information services for its users. These are -Access to database both in-house and online, Online Public Access Catalogue (OPAC), Current Awareness Services (CAS), Selective Dissemination of Information (SDI), E-mail delivery, Frequently Asked Questions (FAQ) and Bibliographic and cataloguing services. It is also clear from the above table that, some of the web-based information services as reference services, newsletter services, library portals, bulletin boards, Ill and document delivery services, listservs are not available at DUL.

The majority of the sample users visit the library occasionally. Their percentage is 47%. 25% sample users visit the library every day. Only 8% sample users visit the library twice in a day. 20 % sample users visit the library once in a week, month, year etc.

Most of the sample users (40.8%) visit the library for reading general books. For using reference materials and searching periodicals 28.2% and 11% users visit the library respectively. 10 % sample users visit the library for using IT facilities, conference proceedings, research papers etc.

Reprographic services are the most prior information to the sample users.94.6% sample users remark the necessity of its as great extent, 4% remark it's as some extent and only a minimal number of respondents (1.4%) remark it as almost no extent. Bibliographic services are need to great extent for 88% users, 10% users need it to some extent and 2 % shows that almost no extent. 76% sample users remark the necessity of reference and referral services as great extent, 14% remark it's as some extent and 10% remark it as almost no extent. CAS and SDI services are need to great extent for 45% users, 15% users need it to some extent and 40 % shows that almost no extent. Periodicals are need to great extent for 43.2% users, 37.2% users need it to some extent and 19.7 % shows that almost no extent. A minimal number (6%) shows the need of indexing and abstracting services as great extent, 14% remark it as some extent and 80% remark it as almost no extent.

78.25% sample library users use web-based information services and 21.75% users are not using web-based information services

36.2% users visit the library website several times a week.33.3%, 15.5% and 15% visit the library website several times a month, daily and occasionally respectively.

62.5% respondents use the web-based information services provided by DUL for catalogue search. 13.6% users use it to access in online database. 12.6% users use it to know about new arrival. 6% users use it for borrowing library materials. 5.4% users use it to access in house database.

The users are poorly satisfied with the present situation DUL in proving web-based information services. The percentage of poorly satisfied users is 58%. 33% users are satisfied with this. Only 5% and 4% users need meet adequately and most adequately respectively.

Form the above analysis, it is observed that DUL are providing some web-based information services but most of the users are not satisfied with this because of slow speed internet, lack of knowledge about it etc. They want more services from DUL through web.

Chapter – 6: Implementing Web-based Information Services in Dhaka University Library

6.1 Introduction

Due to the tremendous growth and continuous development of technology, the role of library becomes more responsive in making the users techno-savvy. Technological developments have affected not only the formats and sources of the information, but also how and where to provide library services. Libraries and their resources have partially moved to the virtual world of the Internet. As a result, library users can access the resources from outside the physical library. In an effort to reach users accessing the library via their computers, many libraries and library consortia are extending their services to include virtual reference. Technology now allows users to submit their queries to the library at any time from any place in the world. Web Based Services, Digital Library Services, Internet Library Services and Electronic Library Services are terms with similar meanings. As more libraries move towards providing services in a digital environment, the improved access to remote library collections is making the use of electronic information resources more realistic and more attractive. Traditional online services had transformed themselves into internet-based online services using web-based technologies. From traditional online services to today, four generations of information retrieval tools have passed that assist users in searching the World Wide Web.

As university is the uppermost educational institution in a country, which produce scientific and skilled manpower for the nation having the responsibility to endow the country. To perform this duty, every university is depended on its information enriched library. It is the utmost duty of a university library to fulfill the information needs of the academic community. Use of web in providing services will increase the credence of a university library.

6.2 Implementation of Web-based Information Services in DUL

Implementation is the carrying out, execution, or practice of a plan, a method, or any design for doing something. Implementation is the action that must follow any preliminary thinking in order for something to actually happen.

In an information technology context, implementation encompasses all the processes involved in getting new software or hardware operating properly in its environment,

including installation, configuration, running, testing, and making necessary changes. The word deployment is sometimes used to mean the same thing.

System implementation generally benefits from high levels of user involvement and management support. User participation in the design and operation of information systems has several positive results. First, if users are heavily involved in systems design, they move opportunities to mold the system according to their priorities and business requirements, and more opportunities to control the outcome. Second, they are more likely to react positively to the change process. Incorporating user knowledge and expertise leads to better solutions.

The relationship between users and information systems specialists has traditionally been a problem area for information systems implementation efforts. Users and information systems specialists tend to have different backgrounds, interests, and priorities. This is referred to as the user-designer communications gap. These differences lead to divergent organizational loyalties, approaches to problem solving, and vocabularies.

Implementation of web-based information services in DUL is a user centered system implementation which includes overall structure of DUL, software, user's attitude etc. There are some prerequisite of implementing web-based information services in DUL. This are-

6.2.1 Prerequisites of Implementation

a. Adequate Finance

Adequate staff is the first and foremost prerequisite for implementing web-based information services in library. DUL is not a different one. To provide web-based services necessary IT infrastructure is required and that's why finance is the most important prerequisite for it.

b. Proper Planning

Without a proper planning, no implementation work can be succeeding at all. Proper planning is required in every sector which is related to this process.

c. Adequate Management Support

Adequate management support is another important prerequisite for implementation of web-based information services in DUL. If management support is not provided, proper implementation can be done.

d. IT Trained Staff

The effectiveness and success of implementation of web-based information services in DUL lies on the people who work in there. It follows therefore that the employees in the library to be able to perform their duties and make meaningful contributions to the success of the library goals need to acquire the relevant skills and knowledge. In appreciation of this fact, DUL need IT trained staff.

e. Willingness of Staff

Willingness of staff has a great impact on web implementation in DUL. If they are un willing to migrating into web-based information services, the migration can be done properly.

f. Consultancy Service for ICT

Major technology waves impact library in a profound way. Accenture Technology Consulting helps staff ride these waves by leveraging emerging technologies - cloud, everything-as-a-service, mobility, social, big data, analytics and maximizing the value of your legacy environment.

g. Standard of Library Management Software (LMS)

Library Management Software standard is another important factors for web implementation. At a reasonable price, a standard LMS can improve the overall situation of web-migration of DUL.

h. Adequate Hardware

Adequate hardware like computer, library management software, server, router, printer, scanner etc. is required for implementing web-based information services.

I. Training Facility

Training facility for both user and library personnel are necessary for providing web-based information services. As it is a new way of providing library services, without proper training the implementation process can go in vain.

j. Awareness

Awareness is also an important prerequisite for implementing web-based information services. Without creating awareness among users no effect will seen in future.

In a broader sense, awareness refers to people's ability to sense relevant changes in their environment. Awareness is usually related to the perception of the direct or indirect changes in the computational and social environments originated by other people in the group. These changes are usually communicated through different computational resources, devices and applications.

6.2.2 Model Plan for Implementation

A model plan is a diagrammatic representation of any work that describes work's strengths, weaknesses, opportunities, and threats, and outlines work goals, strategies and directions for the future responsibilities. It is a program planning tool that provides a blueprint to strengthen program activities, address areas for improvement, and move the program forward to new accomplishments. A logic model is a pictorial diagram that shows the relationship between program components and activities and desired outcomes. It is a visual way to present and share understanding of the relationships among the resources that will operate the program.

In view of the earlier discussion, based on previous theoretical literature review and analysis of survey result a conceptual model of implementing web-based information services in DUL is proposed below in figure 6.2.2.1-

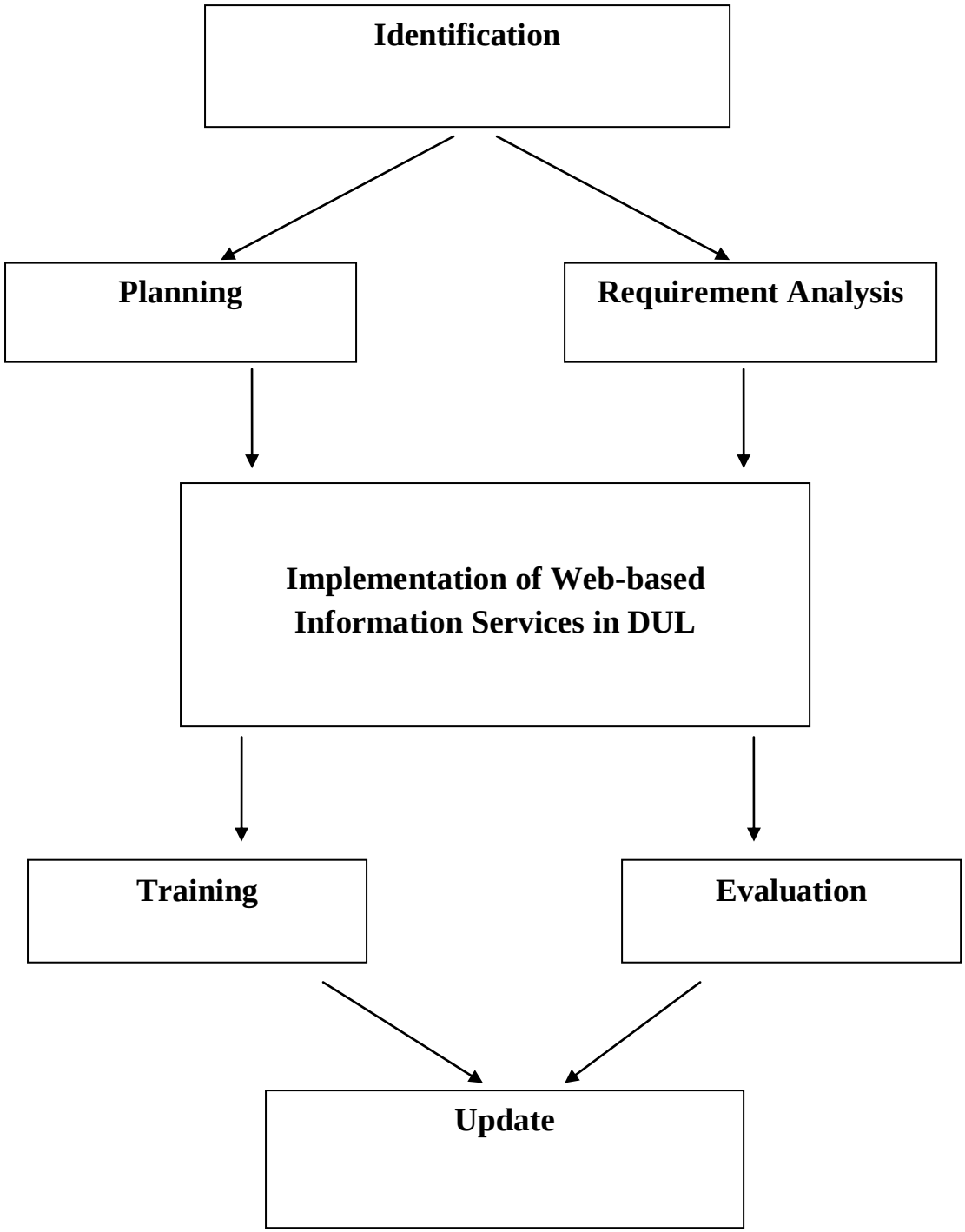
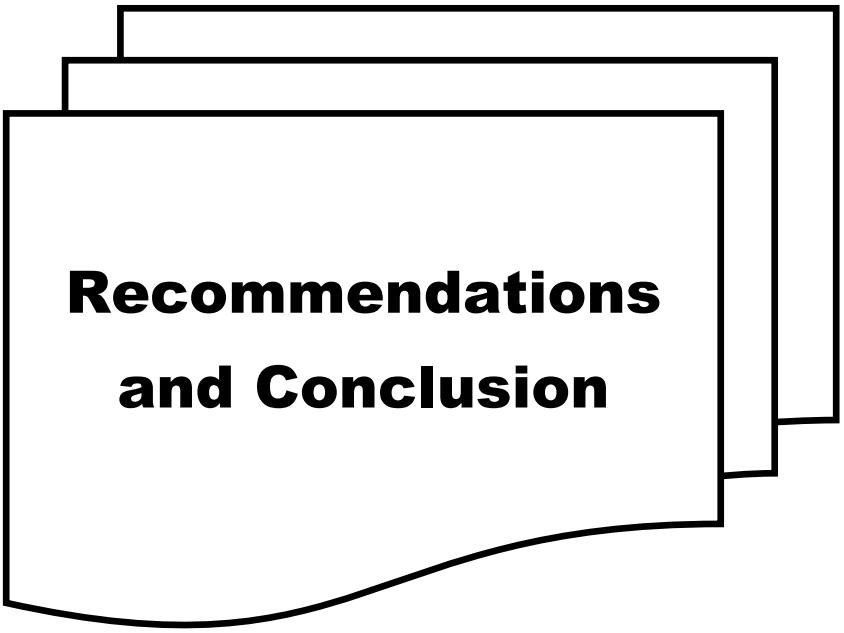


Figure 6.2.2.1-Model plan for implementing web-based service in DUL

6.3 Conclusion

The standards for organizing web-based resources are still in the early stages of development, and librarians are forced to utilize standards for print resources that were not designed for electronic resources. Additionally web-based information resources are volatile in the sense that may be moved from one site to another or may be removed altogether from web. Web-based library services will become more widespread and sophisticated as the web becomes common place throughout the world, and to be successful players in the E-world. Libraries must continue to address the web design and implementation issues. As we actively transfer library services, our central purpose remain the same, to serve and teach users to find, evaluate, and use information effectively. The librarians should be expert to hold the hands of the users who are moving towards new communication paradigm a shift from face to face human contact to human machine interaction, from paper to electronic delivery, from text centered mode to multimedia and from physical presence to virtual presence. Despite these changes in communication technology, the reference interview will remain at the heart of the reference transaction. To meet these challenges the librarians may play a leadership role in providing better Web Based library Services facilities to their current techno savvy users.

Though DUL provides some web-based information services, but for starting all kind of web-based services and providing quality services DUL can follow the above model plan.



Chapter – 7: Recommendations and Conclusion

7.1 Introduction

7.2 Challenges

7.3 Recommendations

7.4 Conclusion

7.5 Limitations of the Study

7.6 Future Study Scope

7.1 Introduction

Developments in information and communication technologies (ICT) have a profound impact on every sphere of academic activity. Library and information management is not an exception to this. Business and management libraries have so far not adapted the innovations of the Internet and networking to the fullest extent. Earlier, card catalogue was called as the "Mirror to the Library". Now in this age of the Internet, it is the library portal that is being called as the "Mirror of the Library". A library portal reflects the strengths and weaknesses of the libraries very effectively. They are also the tools through which libraries are trying to reach out to the tech-savvy users. Libraries should make consistent efforts to provide web-based services to their users.

The main task of a library is to collect, store and distribute the reading materials keeping in view the user requirements. The efficiency of a library is judged by the satisfaction of its reader. The library should render services according to the needs of the users. Service is the first and last word of a library. Its reputation depends on its efficiency to render various services to maximum user satisfaction .The user of DUL are becoming aware of various types specialized web-based information services. With the gradual development of our educational system, the number of faculties, students and researcher are increasing proportionately. DUL are facing different problems due to the increased enrollment, the number of graduate and undergraduate programs, new comprehensive area of study etc. Academic institution requires up-to-date information that is expensive, scarce and difficult to obtain. With the help of web, DUL can meet the information needs of its users. Some problem that is challenges and opportunities has identified from the conducted survey.

7.2 Challenges

Challenge One: Adopt Improved Technology for Digitizing Analog Materials.

User groups particularly in higher education and research are increasingly dependent on e-publication in respond to the research need DUL have to build a comprehensive

resource, historical materials now in analog form (e.g., books, journals, laboratory records, sound recordings, manuscripts, photographs) must be converted. Today, the technology for digital conversion is emergent and there are few established standards on which they have to ensure reproduction quality. Unfortunately most of the information professionals are not well verged about the equipment and their applications let alone the standard of digitization. Cost of some essential equipment e.g. high speed scanner, communication switch, storage servers are still beyond the library budget.

Challenge Two: Design Search and Retrieval Tools that Compensate for Abbreviated or Incomplete Cataloging or Descriptive Information.

Providing access to library collections is labor-intensive. In digitization there is a need for more automated support for capturing explicit data structures, generating descriptive elements, re-keying and encoding texts and indexing the full-text. There is an inadequacy of such sort of efficient human resources in DUL. As a result, we have to depend on commercial digitization which is not also less expensive.

Challenge Three: Design Tools That Facilitate the Enhancement of Cataloging or Descriptive Information by Incorporating the Contributions of Users.

Among millions of users, there will be those who can enhance the description or cataloging of an item, thus improving the next researcher's chance of finding it. Collaborative tools could allow far-flung professional colleagues. Unfortunately due to centralized in-house function and absence of networking in DUL the sort of facilities are absent.

Challenge Four: Addressing Legal Issues of Intellectual Property

A key element for providing web-based information services from libraries is recognition and protection of legal rights such as copyright, publicity, privacy, matters of obscenity, defamation intellectual property protection as well as less legalistic but serious concerns associated with the ethics of sharing or providing access to digital

contents. This is often in conflict with the duties of libraries and archives entrusted with care and management.

Challenge Five: Develop Approaches that Can Present Heterogeneous Resources in a Coherent Way.

Web-based information system provides a wide variety of contents that are heterogeneous in terms of original format, digital format and resolution, level of descriptive information and access support. Accumulation and repackaging of these diversified formats in digital library system is really a challenging job due to the emerging technologies. The current scenario of digitization program in DUL prevail that institutions basically include in-house publications, research reports, old publications and in most cases excludes articles, pamphlets, personal papers, legislative documents, prints, architectural drawings, photographs, maps, sheet music, sound recordings, and movies etc. Thus the challenges will occur with the policy decisions to include diversified content and evolution of diverse technologies of digitization.

Challenge Six: Make the DUL Useful to Different Communities of Users and for Different Purposes.

DUL should be open for authorized users but must be user friendly and respond to multi-faceted query. It indicates the design challenges that encompass user customization of interface, strong vocabulary with efferent mapping etc. Most of the digital preservation initiatives in the country are based on package programs and allow a little for customization.

Challenge Seven: Provide More Efficient and More Flexible Tools for Transforming Digital Content to Suit the Needs of End-users.

Today many digital objects are hard to transform system to system and fly over the network and Internet. That is why digital libraries are represented in multiple forms or versions. The multiple forms exist to serve varieties of users, function as archival masters, and reduce download time and transmission loads on networks.

Challenge Eight: Weak ICT Infrastructure

ICT infrastructure of a country is directly related to the communication systems. With the intent to enhance connectivity emphasis should be given on the establishment of infrastructures to "connect the unconnected" More importance may be given on laying more optical fiber to reach the marginal people of the country particularly the rural areas. Wireless broadband Internet services remain virtually non-existence in the country.

Challenge Nine: Electricity Failure

Electricity or power failure is directly related to the ICT infrastructure. We dare to discuss the issue as separate heading because overcoming the electricity crisis is one of the most challenging jobs of the government in the recent times. Bangladesh is facing huge load shedding of electricity. Bangladesh's installed electric generation capacity was 4.7 GW in 2009; only three-fourth of which is considered to be 'available'. The government has failed to add new power plants over the last decade against the increasing demand of electricity. Now almost all parts of Dhaka have at least four to five hours load shedding of electricity everyday let alone the other parts of the country.

Challenge Ten: Skilled Manpower

Skilled manpower is one of the prerequisite of the successful implementation of digitization and digital information system. Besides traditional librarianship, digital preservation systems and services requires some basic working knowledge from the professionals such a scanning, OCR (Optical Character Recognition), Online procurement and use of e-books and e-journals, maintaining bibliographical and full text databases, searching and retrieval, web design and hosting, etc. Unfortunately working knowledge regarding ICT based library systems among the practicing librarians and supporting staff is still below the expected level. The major part of the information workers in the country seldom has practical ideas on digitations and digital librarianship. So, switching the traditional librarians to digital librarians is one

of the key challenges toward digitization in our country. The information professionals and their higher authority should recognize this need and take necessary action for refresher training. In this case they can consult with persons or institutions that have the dual expertise (Librarianship and ICT).

7.3 Recommendations

The survey and the subsequent analysis of the data and the findings of the study have enabled the researchers to provide some practical suggestions for improving the web-based library services expected from study university libraries as given here under:

a) Professional and technically qualified staffs need to be increased for developing web-based library services.

b) Digital library portal can be created with Library 2.0 or Library 3.0.

c) Outsourcing the present library services need to develop as web-based library services.

d) Proper training for staff in web technology and digital literacy need to provide to develop new web-based library services.

e) Providing table of contents of each book with its web catalogue; and user awareness programs are needed for web-based library services.

f) Developing web forms for reference queries, to suggest a document and journal to library, circulation queries, and request of article (s) by e-mail.

g) Dhaka University library are faced with various challenges of offering quality web-based library services to both generation X students and faculty. There is an urgent need for web-based library committee in DUL to strengthen web-based library services.

h) DUL must continually develop effective web-based information literacy programs to provide a high degree of interactivity and flexibility to enhance the quality of web-based library services they offer.

i) There is an urgent need to develop dynamic library websites, apply semantic technologies and ontologies. Ontology try to resolve the problem of ambiguity in natural language and the problems that arise due to the use of transmission meanings, analogy, comparison or metaphor (Toleva, 2010).

j) Users today are accustomed to the dynamic and interactive nature of the web, as well as social networking tools. Many of them use web tools to find the information they need (Wang, 2009). So, more RSS feeds, library wikis, instant messaging reference services, virtual library tours, online library and floor maps, discussion forums and listservs, multi-language support content to regional and international users, and increase more terminals for access the new power for web-based library services.

k) The major problem facing by the study libraries during study period is an acute shortage of professional and technical staff (lying vacant). So it is recommended that DUL must recruit professionals with practical knowledge of web technologies in libraries for developing and implementing new web-based library services.

l) The study shows that internet surfing is most important for user in computer centre. So that the lab should be well equipped with enough numbers of computer.

m) Staff of the computer centre should be well trained. Time duration of using ICT activity should be increased.

n) Proper ICT training should be given to the library professionals of the library to improve the ICT skill of the professionals.

o) Seminar and conferences on ICT and web-based information services should be held at least once in a year to create awareness among the people.

p) Job of the library professionals should be rotated and every professional should be given the chance to work with ICT in library.

q) In digital era library should be well equipped that all the functions can run smoothly and user can get used all enriched resources of the library.

r) More online journals should be incorporated. Training and knowledge must include to spreading of awareness of students as well as faculties.

7.4 Conclusion

Web-based library services will become more widespread and sophisticated as the web becomes common place throughout the entire world. Librarians should be expert in holding the hands of the users who are moving towards a new communication paradigm shift from face to face human contact to human machine interaction, from paper to electronic delivery, from text centered mode to multimedia and from physical presence to virtual presence. Library professionals must use web-based information services in an innovative manner and address the information requirements of the techno-savvy users (Tripathi and Kumar, 2010). Despite these changes in communication technology, the reference interview will remain at the heart of the reference transaction. To meet these challenges the librarians may play a leadership role in providing better web-based library services to their current techno savvy users. The findings from this study show that DUL is yet to exploit the full potential of the web. In fact, by looking at what other libraries have done, librarians can discover new ideas and learn how to develop and implement such web-based library services, for example, instant messaging reference services, weblogs, and wikis represent the new ultimate level of power for web-based library services.

In web based environment, role of library and information professionals have changed altogether, their role is not just as custodian of books but to teach the students how to use the existing resources, frequently organizing workshops, book talks, debates, develop web based contents and provide web based service to its client. Library

professionals cannot ignore the changes in the field of ICT and redefining as well as reengineering the library and information services is the need of the hour. Information professionals must change the way of managing documents with latest tools and technologies. Professionals must have competencies to create web pages, how to build up institutional repository. Library staff has to give instruction, training to users to promote optimum use of information sources. In the digital environment, the information seeking pattern of the faculty members and students has changed and through web based library and information services-Institutional Repository, Knowledge Gateway, WebOPAC and other web based services in DUL provide users about latest updates at their desktop. The survey results reveal that majority of the faculty members are aware about the e-resources, most of them desired training to use the available resources through workshop and lecture methods. It is the right time for library professional to come forward firmly and convert the traditional library into teaching library providing organized training to use e-resources to DUL users.

7.5 Limitations of the Study

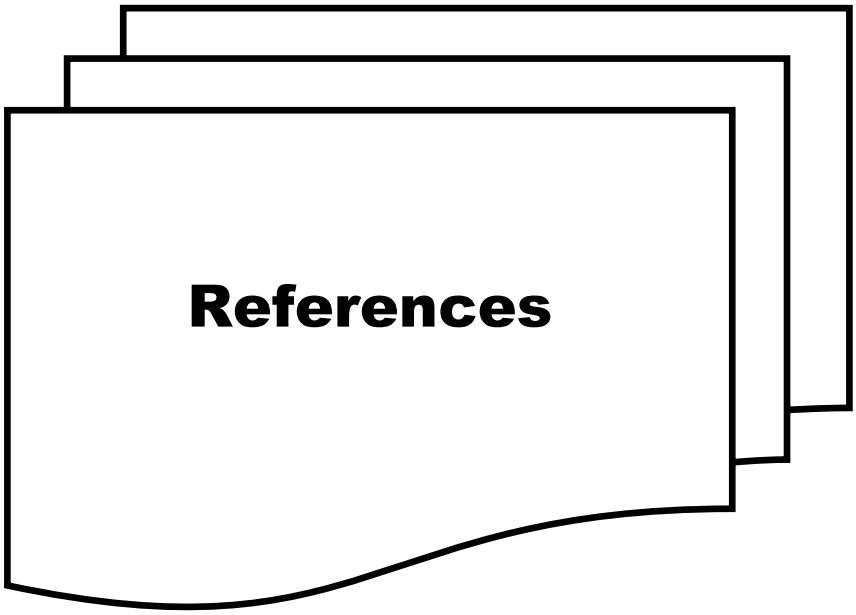
The present study has some limitations as following-

- At first, this study was conducted within some selected department, institutes and research centers of Dhaka University. If all of the departments, institutes and research centers can be covered more authentic information will revealed.
- This study confined to Dhaka University Library. It does not represent the situation of other libraries.
- The size of the sample users might have limited the scope of the study.
- Method of selecting the sample users is also a limitation of the study because purposive sample is not a scientific method.
- Limited questionnaires were used to assess the challenges and opportunities in migrating to web-based information services for DUL.

7.6 Future Study Scope

This research was conducted to assess the challenges and opportunities of Dhaka University Library in migrating to web-based information services. But it is not complete and actual figure as it has some limitations. To explore more information and expand it, some research areas are suggested below-

- The same type of research may be taken up covering the entire department, institute and research centre of Dhaka University Library.
- This study only base on Dhaka University Library. Same study can be conducted for all of the libraries specially university libraries of the country.



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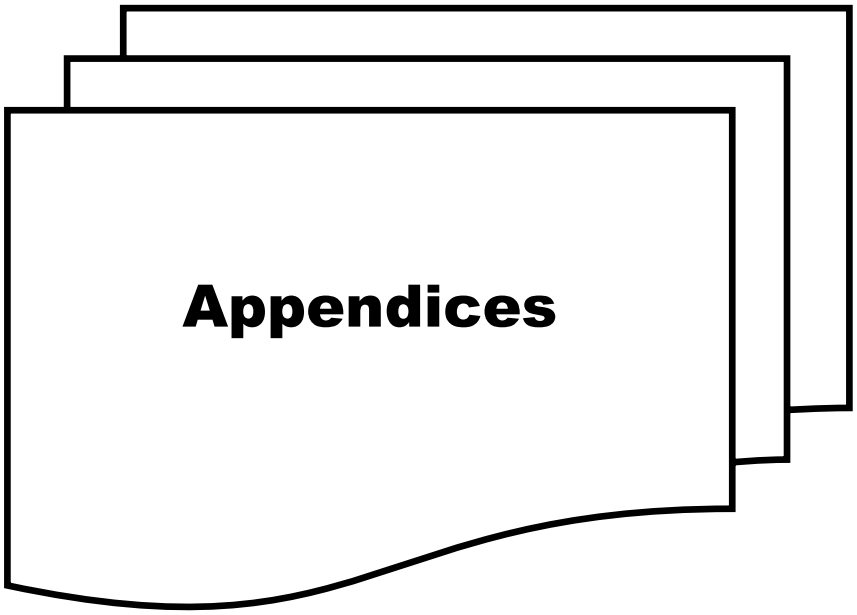

Appendices

APPENDIX-I

Cover Letter

Challenges and Opportunities in Migrating to Web-based Information Services: A Case Study of Dhaka University Library

Dear Sir/Madam,

It is my pleasure to inform you that I am conducting a research for M.A. thesis in the Department of Information Science and Library Management at the University of Dhaka entitled **"Challenges and Opportunities in Migrating to Web-based Information Services: A Case Study of Dhaka University Library".** As a part of this research, I need to carry out a survey on the respective subject with a structured questionnaire.

I will be highly obliged if you could kindly spare a few minutes from your valuable time to fill up the questionnaire. Without your assistance, this study will remain inconclusive.

The information provided by you will be kept confidential and used only for this research purpose.

Thanking you in anticipation.

Faithfully yours

Zannatul Rayan
M.A. Student,
Department of Information Science and Library Management,
University of Dhaka.

APPENDIX-II

Questionnaire for Library Survey

(General Information)

1. **About the library:**
   - 1.1 Name of the library.....
   - 1.2 Year of establishment.....
   - 1.3 Address of the library.....
   - 1.4 Mode of communication available for contact
     - a. Fax.....
     - b. Telephone.....
     - c. E-mail.....
   - 1.5 Library hours.....
   - 1.6 Parent organization.....

Please put (✓) mark wherever is appropriate & If necessary you can use more than one

2. **Library Collection:**

2.1 Please mention the number of collection against each of the following:

□Text books..... □Reference books.....
□Periodicals..... □Manuscripts.....
□Audio-visual materials..... □Microforms.....

2.2 Please mention the number of journals that are subscribed:

□Local..... □National.....
□International.....

2.3 Does your library contain digital collection?

□Yes □No

If yes, please narrate the type of your digital collection

.....
.....

3. **Library Services**

3.1 How does your library provide services to users-

□Manually □Through internet
□Both □Any other (Please specify).....

3.2 Please mention which services are provided manually?

……

Please mention which services are provided through internet?

.....

4. Library Users

4.1 Total number of users using the library (daily):

□Teachers..... □Researchers.....

□Students..... □Others.....

4.2 What types of materials they usually searched for-

□Book □Reference book

□Periodical □Manuscript

□Audio-visual materials □Microforms

□Any other (Please specify).....

4.3 Your library users usually search information-

□Manually □Through internet

□Both □Any other (Please specify).....

5. Purchase and Processing of the library materials

5.1 Classification scheme used for processing of library materials-

□DDC □UDC

□LC □Any other (Please specify).....

5.2 Catalogue code followed for processing of library materials-

□AACR-1 □AACR-2

□Any other (Please specify).....

5.3 Methods of processing(Classification and Cataloguing)-

□Manual □Automated □Both

6. Information Technology Infrastructure

6.1 The library operation is:

□Manual □Computerized

□Partly computerized

6.2 Please write the details of the hardware and other equipment available in your library:

Name of Hardware	Total Number
Computer	
Scanner	
Reprographic equipment	
Audio visual equipment	
Internet equipment	
Others	

6.3 The library is using...

□In-house built software □Readymade software package

6.4 Which are the following information communication and reprographic facilities available in your library?

□Telephone □Fax
□E-mail □Telex
□Internet □Teleconferencing device
□Photocopy □Microfilm/Microfiche

6.5 Do you think that the present information technology infrastructures are adequate to provide web-based library services?

□Yes □No

7. Access to CD-ROM, In-house and Online database

7.1 Does your library subscribe/acquire CD-ROM databases for library users?

□Yes □No

If yes, please mention the number.....

7.2 Does your library provide the facility of accessing in-house databases through OPAC or internet?

□Yes □No

7.3 Does your library provide computer terminals to the library users to access various computer-based services?

□Yes □No

7.4 What type of network is used for accessing the library ?

□LAN □WA

8. Human Resource Development

8.1 Please, mention the total number of library staff in your library-
□Professional
□Semi-professional
□Non-professional
□Any other(Please specify).....

8.2 Whether your library deployed of employee for computerization of library services-
□Yes □No

8.3 Do you think that your present manpower for providing web-based information services is?
□Adequate □ Almost adequate
□Inadequate

8.4 Please mention the number of employee having computer background-
.....

8.5 Are your library personnel are involved in in-house data creation?
□Yes □No

8.6 Has your library deputed any training program for developing personnel skills-
□Yes □No

9. Towards web-based information services

9.1 Which of the following digital information services are available in your library?

Access to Database	
OPAC	
CAS	
SDI	
Reference Services	
E-mail delivery	
Newsletter services	
Library Portals	
Bulletin Boards	
ILL and document delivery services	
FAQ	
Bibliographic and cataloguing services	
Listservs	

If any other services are available, please mention below-

.....

Do you have any plan to provide those services which are not available?

□Yes □No

9.2 Did you face any problem in providing the above web-based information services?

□Yes □No

If Yes, please specify some problems that you had to face-

.....

9.3 Do you have any plan to provide all of the web-based information services from Dhaka University Library?

□Yes □No

If Yes, Please mention what type of problem you need to face to do this-

.....

If No, Please mention the reason-

.....

10. <u>Library Finance and Budget</u>

10.1 Please mention the details of the library budget and expenditure for last 5 years-

Year	Total amount	Sector wise expenditure					Remarks
		Books	E-books	Periodicals	Online journals	others	
2013-2014							
2012-2013							
2011-2012							
2010-2011							
2009-2010							

10.2Please mention the sources of finance for the library-

……

APPENDIX-III

Questionnaire for User Survey

1 Personal Data

Please put (✓) mark wherever is appropriate for you-

1.1 Name of the Department:.....

1.2 Age of the respondents:

□ 20-25 □ 26-30 □ 31-35 □ 36-40 □ 40- above

1.3 Sex : □ Male □ Female

1.4 Designation:

□ Student □ Teacher
□ Researcher □ Administrator
□ Any other (Please specify)……

1.5 Please indicate your present academic qualification:

□ Undergraduate □ Graduate
□ Postgraduate □ M.Phil
□ PhD □ Any other (Please specify)……

2 Library Use

2.1 How frequently do you visit the library?

□ Twice in a day □ Everyday
□ Once a week □ Once a month
□ Occasionally □ Any other (Please specify).....

2.2 Why do you visit the library?

□ Reading general books □ Searching periodical articles
□ Using IT facilities □ For research purpose
□ Recreation □ Any other (Please specify).....

2.3 Which information do you frequently look for?

□ Textbooks □ Periodicals
□ Conference proceedings □ Current information
□ Reference materials □ Any other (Please specify).....

2.4 Which information is most prior to you?

Please (o) **encircle wherever is appropriate.**

No.	Need of Information	To Great extent	To some extent	Almost no extent
1.	CAS & SDI services	3	2	1
2.	Reference & referral services	3	2	1
3.	Bibliographic services	3	2	1
4.	Indexing & abstracting services	3	2	1
5.	Reprographic services	3	2	1
6.	Using periodicals	3	2	1

2.5 How do you search the information from the library? Through-

□ Manual catalogue □ Online catalogue

□ Librarian □ Requisition slip

□ Any other (Please specify).....

2.6 Do you use the library e-resources?

□ Yes □ No

If Yes, Please mention what type of e-resources you do use-

.....

If No, Please mention the reason why you are not using e-resources-

.....

3 Use of Internet for Library Services

3.1Do you use library web-based services?

□ Yes □ No

If Yes, Please put (✓) mark wherever is appropriate for you-

3.1.1 How frequently do you visit the library's website?

□ Daily □ Several times a week
□ Several times a month □ Any other (please specify).....

3.1.2 From how long have you been using the library's web-based services?

□ 1-6 Months □ 7-12 Months
□ 1-2 Years □ 3-4 Years
□ Any other (please specify).....

3.1.3 Why do you use the library's web-based services?

□ For catalogue search □ To know about the new arrivals
□ To use library database □ For borrowing library materials

3.2 How often do you use the following web-based services?

Please (o) **encircle wherever is appropriate.**

No.	Services Provided through Web		Very often	Sometimes	Never
1.	OPAC		3	2	1
2.	Access to database	In house database	3	2	1
		Online database	3	2	1
3.	Borrowing book		3	2	1
4.	News of new arrival		3	2	1

3.3 If you don't use the above services please tell why you don't use-

□ You don't know about it
□ You don't know how to access on it
□ You don't have internet accessibility
□ You don't like this
□ You find it more critical
□ Slow speed internet connection

3.4 Do you want the following library services to get through internet-

Category	Yes	No
To get book, journal and reference materials that is e-resource		
Search database of the books (both Text & Reference)		
To know the availability of a books		
To search books using all approaches(like subject, titles Authors, Publishers, Year of Publications, Publishers…etc)		
Transaction of a book		
Additional services Provided by library		

3.5 Which of the following web-based information services you want to get from Dhaka University library-

Access to Database	
OPAC	
CAS	
SDI	
Reference Services	
E-mail delivery	
Newsletter services	
Library Portals	
Bulletin Boards	
ILL and document delivery services	
FAQ	
Bibliographic and cataloguing services	
Listservs	

4 **Problems & Suggestions**

4.1 Do you face any problem in obtaining information through internet?

□ Yes □ No

If Yes, Please put (✓) mark wherever is appropriate for you-

4.1.1 What types of problem do you face?

.....

4.2 How far the library's web-based services meet your information needs?

□Most adequately □Adequately

□Satisfactorily □Poorly

4.3 What action can Dhaka University Library take to improve its web-based services?

.....