Use and Applications of Library Software in University Libraries of Bangladesh

Thesis submitted to the Department of Information Science and Library Management, University of Dhaka, as a partial fulfillment of the requirements for the Degree of Master of Arts of the year 2012.

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Use and Applications of Library Software in University Libraries of Bangladesh

DEDICATED

TO

MY LATE FATHER

PREFACE

The main objective of the thesis **"Use and Applications of Library Software in University Libraries of Bangladesh"** is to fulfill the partial requirements for course MISLM-508 of the Masters Degree in Information Science and Library Management. It is believed that this type of work is inevitably the result of the collaboration of many great helpers, otherwise continuing alone with a gigantic mass of scattered materials and on the subject and their presentation in a form most coherent and consistent can outbalance the patience of a feeble mind as him. All available papers, relevant documents, international journals' articles and some brochures have been minutely scanned through.

The core objective of this research is to explore the status of use and application of library software in university libraries of Bangladesh. The present study has been discussed under six broad chapters. The study discusses the methodology, description of various kinds of library software, scope and objectives adopted for collection, presentation, analysis and discussion of data for this study. Data has been gathered through interview and questionnaire. Other purposes of the study include: to find out the information professionals preference of library software and their satisfaction with the current software they are using, to illustrate the skills of library professionals in university libraries in Bangladesh and to find out the problems hindering software installation in university libraries and finally to offer recommendations to introduce automation and digital library software in university libraries of Bangladesh.

In this study, total 20 university libraries have been taken as sample out of 58 universities situated in Dhaka. Due to limitations of time and logistic support, the researcher has used purposive sampling.

The findings and recommendations from the study should hopefully lead to a clarification of the current status of automation and digitization program in Bangladesh along with many problems in the formulation of planning and policy making regarding automation and digitization. It is assumed that it would help the librarians, policy makers, entrepreneur and concerned authority to develop and implement automation and digitization in various university libraries and other kinds of information institutions in Bangladesh. However, all the possible investigations have been made to collect data related to the study in order to give a complete picture. It may be useful as a basic work for future investigators. If the work is found useful to the planners, librarians and information specialists, the efforts undertaken would be successful.

Md. Mizanur Rahman

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In pursuing the study, I had to depend on different public and private university libraries. I am grateful to the librarians and information professionals of those public and private university libraries who provided me necessary information and extended all possible helps for this work. I owe my deepest gratitude to the authors whose work I have used in this study as I had to depend on different national and international publications for the completion of thesis.

I am deeply grateful to my elder brother and my mother whose scarifies, prayers and persistent support made it much easier to accomplish this work. I owe all of my beloved brothers and specially some of my friends a great debt of gratitude, as well, for their unlimited support and encouragement all along.

Above all, I am deeply grateful to Almighty Allah, the Most Gracious and Most Merciful, for giving me mental power and ability to accomplish this study.

Md. Mizanur Rahman

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CHAPTER-1

INTRODUCTION AND BACKGROUND

1.1 Introduction

Man's quest for knowledge has led to the creation and accumulation of tremendous amount of information. This quest for knowledge knows no bounds and limits. It has continued since the dawn of civilization to the modern age. This hard-earned knowledge and information is valuable for the entire mankind and therefore liable to be preserved. Libraries are established for the systematic collection, organization, preservation and dissemination of knowledge and information.

We and our surrounding environment are changing frequently to cope with the flow of time. Computer application has brought an epoch-making and tremendous change and development in the arena of information technology in this information era. Library which is the spectator of each era of civilization is not out of the touch of information technology. Developments in emerging information and communication technologies have had a tremendous impact on all kinds of libraries and information resource centers. The rapid growth and uses of emerging technologies has changed the name and functions of traditional library into automated, electronic, virtual and digital library (Sheikh & Jan,2013). The advent of technologies and the internet has revolutionized the activities of information creation, organization, preservation and scholarly communication. The immense ability of these technologies to access, interpret and create digital information has increased its level of importance in the continuum of literacy, changes the working pattern of information professionals as well as users' information seeking behavior. This changing wind is also pushing the libraries and information centers in Bangladesh in adopting the recent technologies and digital information resources to make the library service up to date (Alam & Islam, 2011).

Bangladesh entered into the computer village in 1964 with the installation of an IBM 1620 machine at the Atomic Energy Commission in Dhaka. The 1980s are considered the beginning of the automation era as far as libraries and information centers in Bangladesh are concerned (Siddike, Munshi & Sayeed, 2011). The International center for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) Library and the Agricultural Information Center (AIC) are pioneers in creating bibliographic databases on specialized fields using microcomputers (Ahmed, 1998). Little progress

was observed in the application of computers to library services between 1964 and 1995, but there has been considerable progress since 1996 (Islam & Islam, 2007).

Information technology is not static. With the course of time, library adopts new and modern attributes. The technology which is new and modern today will be old tomorrow. In order to provide the latest status of use and application of library software in university libraries of Bangladesh, the research has been conducted.

1.2 Background of the study:

The term 'software' did not come into use until 1958. It is probable that it was coined by

Princeton University professor John W. Tukey in an article 'The American Mathematical Monthly' in January of that year (Rowly, 1998). Software may be viewed as a digital version of human knowledge. Library Management Softwares (LMSs) may be divided into four generations on the basis of sophistication of their facilities for integration and interconnectivity. The LMSs developed in all parts of the world from mid 1970s to till date may be fitted into one of the following four compartments (Mukhopadhyay, 2002):

- The first generation LMSs were module based systems with no or very little integration between modules. Circulation module & cataloguing module was the priority issue for these systems and were developed to run on specific hardware platform and proprietary operating systems.

- The second generation LMSs becomes portable between various platforms with the introduction of UNIX and DOS based systems. The LMSs of this generation offer links between systems for specific function and are command driven or menu driven systems.

- The third generation LMSs are fully integrated systems based upon relational database structures. They embodied a range of standards, which were a significant step towards open system interconnection. Color and GUI features, such as windows, icons, menus and direct manipulation have become standards and norms in this generation.

- The fourth generation LMSs is based on client-server architecture and facilitates access to other servers over the Internet. These systems allow accessing multiple sources from one multimedia interface.

Thus the progress of LMSs through the generations provides us an effective and straightforward user interface which supports access to multiple sources and services from one multimedia interface.

Evolution of some renowned library software:

- Evergreen initially released on September 2006.
- DsPace initially released on September 2002.
- Greenstone was established in August 2000
- Work starts on Koha from 6th September 1999.

1.3 Statement of the problem:

Library software practice of public and private university library of Bangladesh has gained popularity and obtained concern in the recent decades. So, considering all of the universities, it can be said, only a few numbers of libraries are in good position in using library software. The number of libraries in using library software is moderate, but the maximum number of libraries have not been yet adopted library software even there are some libraries which are not aware of this at all.

So, comparing with the benefits and demand of library software, it is to know what the status of public and private university library of Bangladesh in using library software, how is the eagerness and carefulness of the library about software, and whether or not they are ready to compete with other libraries and to meet the demand of the users and maintaining time using library software.

The study intends to show the skeleton of the status of using library software in various university libraries of Bangladesh. Brief history and description of different library software, Preference and future plan of libraries about library software, problems which libraries are Faced to and finally the recommendations.

1.4 Aims and objectives:

The core objective of this study is to explore the status of the use and application of library software in university libraries of Bangladesh.

Some other objectives of the study are mentioned below:

- To find out what software are used in different libraries and what are the reasons behind using these software.
- To find out the information professionals preference of library software and their satisfaction with the current software they are using.
- To illustrate the skills of library professionals in university libraries of Bangladesh.
- To find out the problems hindering software installation in university libraries.
- To offer recommendations to introduce automation and digital library software in university libraries.
- To identify the satisfaction level of the library staff using the existing library software in the library.
- To identify which software are used for automation and digitization program in a library and which software are used most frequently in the university libraries of Bangladesh.
- To come upon by seeking the mental map and readiness of the library authority to inaugurate, develop and carry out library software in the libraries where automation and digitization program has not been started yet.

1.5 Research question:

In order to achieve the above objectives, the following research questions are used:

a) What is the present status of use and application of library software in the universities?

b) What is the software preference of the library staff?

c) What barriers come in front of library automation and digitization?

d) What is the potentiality of future growth and development of library software in Bangladesh?

e) What software is used for what task in different modules (e.g. acquisition cataloguing, circulation etc.)?

f) Does the library offer training program on library software or arrange seminar, conference, and workshop?

g) What is the satisfaction level experienced from using library software?

h) What is the allocated budget for each library for library software?

1.6 Scope of the study:

The scope of the study has been presented below:

i. The study is confined or limited to some selected public and private university libraries in Dhaka city, the capital of Bangladesh.
ii. A large number of literatures have been studied about library software. A large number of documents have been reviewed from internet and both from university and public library of Bangladesh.
iii. Apart from library software related aspects, some core information about the library have been collected such as: number and type of the collections of the library, name and number of physical equipments used in the library etc.
iv. Both quantitative and qualitative data has been obtained through questionnaire, interview.
v. There is also a scope for providing suggestions and recommendations for the librarians who have filled up the questionnaire.
vi. The areas: collections the library, number of equipments used in the library, staff information, whether the library is automated or digital, specific functions which are accomplished by a specific library software, arranging training program for the staffs and users, software updation, budget for the library, satisfaction level by using the existing software, the problems libraries are facing and the recommendation.

1.7 Limitations:

The research has been conducted through some limitations. The study suffers from the following problems:
i. It is confined to some selected public and private university libraries in Dhaka city, Bangladesh.
ii. The scope of the study might be limited due to the small size of sample for libraries.
A large sample would certainly bring better result with more specific information.
iii. Scarcity and unavailability of related literature is one of the major problem faced during reviewing literature.
iv. There were also some time and cost related limitations.
v. Indifference, unwillingness and apathy of librarians were also notable limitations of the study.

1.8 Rationale for the study:

Rationality behind the study is presented below:

- There are a limited number of researches in Bangladesh on library software.
- As flow of technology is changing frequently, the study has been conducted to present the most recent library automation and digitization scenario.
- Unlike other most of the study, this study has carried out considering both open source and proprietary software.
- It was to find out whether the libraries hitch forward to open source software or digital library software.
- Overall, the intention was to present the current scenario of Bangladesh in regard to the library development aspect.

1.9 Outline of the thesis

The research report consists of 6 chapters. Outline of this chapter with summery is discussed below:

CHAPTER-1: INTRODUCTION
This chapter presents the introduction of the study. It includes background of the study, statement of problem, aims and objectives, research questions, scope of the study, limitations, rationale for the study, outline of the thesis.

CHAPTER-2: LITERATURE REVIEW
This chapter presents systematic review of the related literature. It describes library software, digital library software, library management system, status of ICT, automation and digitization initiatives in general in public and private university in Bangladesh.

CHAPTER -3: RESEARCH METHODOLOGY
This chapter discusses the research design of the study. It elaborates the research paradigm, research methodology and methods, data collection instruments (e.g. interview and questionnaire), advantages and disadvantages of these methods, conduct of the study, data analysis techniques.

CHAPTER-4: DESCRIPTION OF LIBRARY SOFTWARE

This chapter covers short description of both open source and proprietary automation or digital library software which is used in the university libraries of Bangladesh.

CHAPTER -5 FINDINGS OF THE STUDY

It describes the analysis of qualitative and quantitative data collected through semi-structured in-depth interviews of library experts. The chapter also provides a summery of findings. Findings have been presented through tables created by SPSS and Microsoft excel.

CHAPTER-6 DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS:

In this chapter the researcher discusses the problems faced by the library and also giving suggestions for improving university libraries status and implications of the study.

Library automation and digitization have presented us easy access to information and taught us how to utilize library resources properly.

CHAPTER-2
LITERATURE REVIEW

A literature review is a description of the literature relevant to a particular field or topic. A literature review demonstrates to understand and critically analyze the background research and to Select and find out the source of the information that is necessary to develop a context a research (University of Reading, n.d.). This chapter covers literature review related to software, library management software and library automation software, digital library software in both terms of national and international. Secondary data were searched from print and online resources. Literatures on this topic were very limited, though foreign literatures on digitization of public or private universities were many but literature on the status of software program in Bangladesh is very little.

This chapter consists of literature review related to digital library initiatives and status of automation and digitization worldwide, digitization of public and private university library at national, regional and international levels.

This chapter highlights a body of knowledge and issues concerning the automation, digitization some other associated aspects from different perspectives and contexts. Although some of the ideas are drawn from countries in which technology is already in an advanced stage. This literature will help to establish a framework or guidelines for evaluating the status of library automation and digitization at the university libraries in Bangladesh.

The literature review in this chapter is used to establish the potential topics and suggest ideas for another research, reporting published materials on existing conceptual framework, theories, techniques, processes, styles, instruments of other researchers related to the topic under investigation.

For the study, several keywords were used during the search such as software, library software, library management software, ICT, digital library, digital library initiatives, digital library problems, library automation, digital library software, automation software, open source and proprietary software, public and private university in Bangladesh etc.

A list of related literature has been mentioned below which have been reviewed during the research:

Islam (2009) mentioned that software is a general term for various kinds of program used to operate computers and related devices that can be thought of as the essential part of a computer.

Shahkar, Humma and Shafi (2012) highlighted that digital Library management system provides the appropriate framework both for the production and administration of Digital Library System by incorporating functionality essentially fundamental to Digital Libraries, and also provides provision for integration of additional software that provides more refined and advanced functionality.

Randhawa (2008) considered Open source software as computer software whose source code is available under a license (or arrangement such as the public domain) that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified firm. It is often developed in a public, collaborative manner.

Anuradha and Sivakaminathan (2009) explained Library automation software, integrating all the activities and routines of the library as essential software for the libraries and is referred to as Integrated Library Automation Package (ILAP). An ILAP means an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed the items. In other words it is one where all the library activities such as acquisitions, cataloguing, circulation, serials, and the Online Public Access Catalogue (OPAC) are automated.

Witten and Bainbridge (n.d.) defined digital library software as a comprehensive suite of software for building and distributing digital library collections. It provides a new way of organizing information and publishing it on the Internet or on removable media.

Saeed (2013) stated that Software plays the role of gateway between technology and end users. For the effective use of hardware, standard software is also very important.

Sarathi discussed that Library Management Software (LMSs) are now established as an essential tool in the support of effective customer service, stock management and management of services offered by libraries. These are based on knowledge and experience of library professionals over the centuries.

Tramboo et.al.2012 cited in O'Mahony stated that Open source defines method of software development, which harnesses the power of distributed peer review and transparency of progress.

Sukhwinder (n.d.) traced out that most software that we all use every day is known as "proprietary", which in a nutshell means that it costs money and that the actual code of the software is restricted, in that the code of the software cannot be

modified, copied, or changed from its original construction. The code is "unreadable" and pretty much is what it is.

Tramboo et.al. (2012) examined that open source digital library software presents a system for the construction and presentation of information collections. It helps in building collections with searching and metadata-bases browsing facilities. Moreover, they are easily maintained and can be augmented and rebuilt automatically. With many Open Source Software (OSS) applications now available for library and information management, Organizations now have novel options for acquiring and implementing systems.

Witten and Bainbridge found out that Greenstone aims to enable users, particularly in universities, libraries, and other public service institutions throughout the world, to build their own digital library collections in the fields of education, science and culture.

Sangsuree et al.(2011) discussed Evergreen supports user/patron management, an ability to perform overdue and predue email notification, limited statistical report generation, a remote access via web browser may be possible and also providing a support for session Initiation protocol (SIP).

Ribera (2007) mentioned that Asian governments are considering “open source as a Boost for their economies and a way to increase technological innovation in the region.”

Rafiq and Ameen (2008) analyzed Koha as a true enterprise-class library management system with comprehensive functionality and impressive features (About Koha, 2008). It includes modules for circulation, cataloging, acquisitions, serials management, reserves, patron management, branch relationships, and compliant with library standards and protocols (MARC21, UNIMARC, Z39.50, etc.). It also supports major industry-standard database type (text, relational database management system) and offers independence in operating system choice to the users. Koha is fully integrated and multilingual (Unicode enable) software that provide multi-user support.

Muller (2010) reported on integrated library systems (ILS) as multifunction, adaptable software applications that allow libraries to manage, catalog and circulate their materials to patrons. In choosing ILS software, libraries must base their decision not only on the performance and efficiency of the system, but also on its fundamental flexibility to readily adapt to the future demands and needs of their patrons.

Muller (2010) focused on Koha as the ILS that offers the most international options: choice of date format (US, metric, ISO), choice by type of MARC record (UNIMARC or MARC21) and choice of 25 languages. Koha is the only one to offer options related to FRBR, OAI, event logs and reporting based on OPAC usage.

Dion et al. (2006) highlighted Greenstone as a tool for building libraries and aims to empower users, particularly in universities, libraries and other public service institutions to build large distributed digital library collections. The current installed base is unknown but the number of downloads of the software appear to be large.

Muller (2010) suggested that When a library selects free software, it chooses not only a powerful means of reducing its spending, but also opportunities to become more independent in terms of its choices of business and software vendors; more importantly, it reinforces its primary mission of disseminating information while further justifying its choice of technology in a context of public service.

Dion et al. (2006) described that Fedora's key strength is its support for preservation and standards, in which full scores were obtained. It also ranked highest in the metadata category due to its support for many metadata standards. Other than the lack of Z39.50 support, Fedora appears to be a good candidate with regards to long-term digital preservation needs.

Rabishankar(n.d.) defined an integrated library management system (ILMS) which is normally expected to provide for all of the usual library functions like acquisitions, cataloguing, circulation, administration, serials management, OPAC, ILL and statistical reporting with a facility for directly accessing any sub modules across these main functional modules.

Rabishankar reported that Koha had gone first online on 2000 and several OSS projects were developed with an aim for application in the library and information science domain. Many of them, like Greenstone, DSpace, and VuFind, have developed a wide user base across the globe, and have shown sustained development of features and significant cross-fertilization of ideas based on shared experiences.

Dion et al. (2006) found out that Greenstone was the only software package that consistently fulfilled the majority of the criteria in many categories and obtained full scores in five of the 12 categories. These five indicators were report and inquiry, user

interface, automatic tools, standards compliance, and support and maintenance. Clearly, Greenstone places great emphasis on end-user functionality.

Breeding (2008), cited in Pruett stated that ILS is software applications and hardware that organize, track, and make accessible library information resources.

Alam and Islam (n.d.) reviewed that Digitization and automated library systems in Bangladesh are still in the infancy level. However, in the recent times a very few initiatives have been noticed taken by different institutions.

Islam (2013) emphasize on Digitization that has become a practical necessity and reality with technology interventions to provide improved access to information sources, preservation and dissemination as required, at anytime; anywhere and any place as it were.

Sangsuree et al.(2011) discussed Dspace is focusing on managing digital repository supported variety of digital documents such as articles, books, theses, multimedia files and bibliographic. It supports multiple languages.

Dion et al. (2006) provides some criteria for initial selection of DL software therefore included the following:

- The software must be available for download and installation at no cost via an Open source license to facilitate evaluation.
- The software should be relatively well known and commonly used, and this was Inferred from the number of bases installed, especially in credible organizations such as universities.
- The software must be supported either on Linux or Windows, as these are commonly used platforms.

Islam (n.d.) Attempted to investigate mainly the problems and prospects related to library digitization in Bangladesh. The findings of this paper is almost shocking, very few libraries of Bangladesh has been taken digitization program successfully where most of the libraries are still far behind from any sort of digitization efforts to their library. On the basis of the survey, the study ends up with some important suggestions which will definitely help the libraries of Bangladesh to overcome the problems and step forward to the digital world.

Without literature review, a research can't be completed.The literature review helped establish a sound footing and suggest possible answers to the research questions for the study.

CHAPTER-3
RESEARCH METHODOLOGY

This chapter describes the methodology used in this research to make a comprehensive work.

3.1 Approaches of research methodology:

Two general approaches are widely recognized for research methodology: quantitative research and qualitative research.

Qualitative research describes events, persons and so forth scientifically without the use of numerical data. Qualitative research is more open and responsive to its subject. Sometimes, qualitative research is used to develop new theory that didn't exist before. Qualitative methods produce information only on the particular cases studied, and any more general conclusions are only propositions (informed assertions).

Strengths

- Because of close researcher involvement, the researcher gains an insider's view of the field. This allows the researcher to find issues that are often missed by the scientific, more positivistic enquiries.

- Qualitative descriptions can play the important role of suggesting possible relationships, causes, effects and dynamic processes.

- Because statistics are not used, but rather qualitative research uses a more descriptive, narrative style, this research might be of particular benefit to the practitioner as she or he could turn to qualitative reports in order to examine forms of knowledge that might otherwise be unavailable, thereby gaining new insight.

- Qualitative research adds flesh and blood to social analysis.

Limitations

- The problem of adequate validity or reliability is a major criticism. Because of the subjective nature of qualitative data and its origin in single contexts, it is difficult to apply conventional standards of reliability and validity.

- Contexts, situations, events, conditions and interactions cannot be fake to any extent nor can generalizations be made to a wider context than the one studied with any confidence.

- The time required for data collection, analysis and interpretation is lengthy.

- Researcher's presence has a profound effect on the subjects of study.

- Issues of anonymity and confidentiality present problems when selecting findings.

- The viewpoints of both researcher and participants have to be identified and elucidated because of issues of bias.

Quantitative research consists of those studies in which the data concerned can be analyzed in terms of numbers. Quantitative research is based more directly on its original plans and its results are more readily analyzed and interpreted. Quantitative research is used to support or expand a theory that already exists.

Strengths

- Precision - through quantitative and reliable measurement
- Control - through sampling and design
- Ability to produce causality statements, through the use of controlled experiments
- Statistical techniques allow for sophisticated analyses
- Replicable

Limitations

- Because of the complexity of human experience it is difficult to rule out or control all the variables;

- Because of human agency people do not all respond in the same ways as inert matter in the physical sciences.
- Its mechanistic ethos tends to exclude notions of freedom, choice and moral responsibility;
- Quantification can become an end in itself.
- It fails to take account of people's unique ability to interpret their experiences, construct their own meanings and act on these.
- It leads to the assumption that facts are true and the same for all people all of the time.
- Quantitative research often produces banal and trivial findings of little consequence due to the restriction on and the controlling of variables.
- It is not totally objective because the researcher is subjectively involved in the very choice of a problem as worthy of investigation and in the interpretation of the results.

Both types of research are valid and useful. They are not mutually exclusive. It is possible for a single investigation to use both methods.

3.2 Research techniques:

Basic research techniques are based on a formal process. The purpose of research techniques is to use a logical approach to obtain information about a specific subject. Research techniques can be applied to a broad range of issues or areas of research.
Some important techniques for gathering data are questionnaire, interview, observation, case study etc. Amongst these- questionnaire, interview methods have been followed for this research.

Interviews

Interview refers to gathering in depth information from individuals through a one-on-one session over the phone or face to face. So, face-to- face conversation between the researcher and the respondent (who has the desired information in his mind or possession) is called an interview (Kumar, 1997).
Frey and Oishi (1995) define it as "a purposeful conversation in which one person asks prepared questions (interviewer) and another answers them (respondent)" This is done to gain information on a particular topic or a particular area to be researched. Interviews are a useful tool which can lead to further research using other methodologies such as observation and experiments.

This method acts as a very vital tool for the collection of the data in the social research as it is all about the direct systematic conversation between an interviewer and the respondent.

Strengths

- Possibly the greatest advantage of Qualitative Interviewing is the depth of detail from the interviewee.
- This is a good technique for complex subjects where one need to clarify a response, or sensitive topics where s/he need to build relationship with the interviewee.
- It is particularly useful as a pilot study, to test out what peoples responses would be to a particular issue
- It may throw a completely different light on an issue that the interviewer had previously never considered
- Yields a good percentage of returns.

Limitations

- Time consuming process.
- Involves high cost.
- Requires highly skilled interviewer.
- Requires more energy.
- May sometimes involve systematic errors.
- More confusing and a very complicated method.

Questionnaire

A questionnaire is a written document listing a series of questions pertaining to the problem under study, to which the investigator requires the answer (Kumar, 1997). A questionnaire is a means of eliciting the feelings, beliefs, experiences, perceptions, or attitudes of some sample of individuals. As a data collecting instrument, it could be structured or unstructured.

The questionnaire is most frequently a very concise, preplanned set of questions designed to yield specific information to meet a particular need for research information about a pertinent topic. The research information is attained from respondents normally from a related interest area. The dictionary definition gives a clearer definition: A questionnaire is a written or printed form used in gathering information on some subject or subjects consisting of a list of questions to be submitted to one or more persons.

Strengths

- The responses are gathered in a standardized way, so questionnaires are more objective, certainly more so than interviews.
- Large amounts of information can be collected from a large number of people in a short period of time and in a relatively cost effective way
- The results of the questionnaires can usually be quickly and easily quantified by either a researcher or through the use of a software package
- Can be analyzed more 'scientifically' and objectively than other forms of research
- It is practical.
- Large number of respondents is possible.
- Open or closed questions can be asked.

Limitations

- Questionnaires are standardized so it is not possible to explain any points in the questions that participants might misinterpret.
- Some respondents may not fully understand some of the questions.
- Some people are not honest with their answers.
- Sometimes respondents tend to be bias when answering the questionnaire because there is a tendency that the respondent is not given the chance to give his/her opinion because there are already the “suggested” answers.
- Limited questions equals limited analysis

3.3 Sampling techniques:

Population of the study is the university libraries situated in Dhaka city, the capital of Bangladesh. According to UGC (University Grants Commission), there are total 111 universities in Bangladesh. Among these, the number of public universities is 34 and the number of private universities is 77.In Dhaka city, there are 8 public and 50 private universities.

In this study, total 20 university libraries have been taken as sample out of 58 universities situated in Dhaka. Due to limitations of time and logistic support, the researcher has used purposive sampling.

Purposive sample is a non-representative subset of some larger population, and is constructed to serve a very specific need or purpose. A researcher may have a specific group in mind. The researcher will attempt to zero in on the target group, interviewing whoever is available. Although selection may be unguided, it probably is

not random, using the correct definition of everyone in the population having an equal chance of being selected. Volunteers would constitute a convenience sample.

3.4 Questionnaire design:

To meet the objectives of the research a questionnaire was prepared, which includes various technical questions. The questionnaire was made with simple, direct and familiar words keeping respondents in mind. It was created to measure the status of use and application of library software in university libraries of Bangladesh using both close and open ended questions. There were no questions about the respondent's basic demographic data, but all the questions were related to the library only. The questionnaire also includes library materials' collection, ICT and staff information of the library, automation and digitization scenario of the library, other services, satisfaction level by using the existing software, budget and finally problems and recommendations.

3.5 Questionnaire survey:

The researcher visited 5 public and 19 private universities. Among these the researcher got responses from 20 universities and from the rest of 4 universities, the researcher didn't get responses. He has visited from November 2013 to February 2014. Researcher has visited physically and discussed with the librarian of the universities.

3.6 Data analysis:

In order to determine the current status of use and application of library software in university libraries of Bangladesh, collected data have been analyzed. The data analysis has been carried out using SPSS statistical analysis software and Microsoft excel.

3.7 Participants:

The participants of this study were the chief librarian/librarian/head/director of twenty universities including five public and fifteen privet universities. Both female and male participants took part in this survey.

CHAPTER-4

DESCRIPTION OF LIBRARY SOFTWARE

Computer software, or simply software, also known as computer programs, is the non-tangible component of computers. Software contrasts with computer hardware, which is the physical component of computers. Computer hardware and software require each other and neither can be realistically used without the other (Wikipedia, 2013).

4.1 Different types of software:

Based on the goal, computer software can be divided into

- Application software uses the computer system to perform useful work or provide entertainment functions beyond the basic operation of the computer itself.

  Application software consists of programs that perform a specific, well-defined task for a particular application (Islam, 2009).
- System software is designed to operate the computer hardware, to provide basic functionality, and to provide a platform for running application software. System software consists of program that facilitates the use of the computer by the users (Islam, 2009).

There are two approaches to the distribution of software:

- Open source software
- Proprietary software or closed source software

Open source software

Open source software is computer software whose source code is available under a license (or arrangement such as the public domain) that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified firm. It is often developed in a public, collaborative manner (Randhawa, 2008). Open source software helps to provide better quality software's having higher reliability, flexibility with lower cost, and an end to the traditional vendor lock-in (Tramboo, Humma, Shafi & Sumeer, 2012).

The most well-known example of open source software is the Linux operating system, but there are open source software products available for every conceivable purpose.
It has revolutionized the development of software and offers a number of attractions for libraries, especially for developing countries (Rafiq & Ameen, 2008).

A list of open source software given below (Vasupongayya et. al.,2011)

Table1: list of some open source software

Notation	Open Source Software
Koha	http://www.koha.org/ originated in New Zealand
Evergreen	http://www.open-ils.org/ originated in USA
OpenBiblio	http://obiblio.sourceforge.net/ originated in Spain
NewGenLib	http://www.verussolutions.biz/ originated in India
Dspace	http://www.dspace.org/ originated in USA
Greenstone	http://www.greenstone.org/ originated in New Zealand
Eprints	http://www.eprints.org/ originated in UK
MicroLCS	http://www.avantilibrarysystems.com/ microlcs.html originated in USA
OPALS	http://www.mediaflex.net/ originated in USA
Emilda	http://www.emilda.org/ originated in Finland
Invenio	http://invenio-software.org/ originated in Europe

Proprietary software

Proprietary software or closed source software is computer software licensed under exclusive legal right of the copyright holder with the intent that the license is given the right to use the software only under certain conditions, and restricted from other uses, such as modification, sharing, studying, redistribution, or reverse engineering. Proprietary, which in a nutshell means that it costs money and that the actual code of the software is restricted, in that the code of the software cannot be modified, copied, or changed from its original construction? The code is "unreadable" and pretty much is what it is (Randhawa, 2008).

In the library perspective, according to the library automation and digitization aspects, library software can be of two types:

- Library Automation software
- Digital library software

4.2 Library automation software:

Koha:

Koha was created in 1999 by Katipo Communications for the Horowhenua Library Trust in New Zealand. It is a promising full featured open source ILS (integrated library system) currently being used by libraries all over the world (Randhawa, 2008). The name comes from a Māori term for a gift or donation.

Koha has most of the features that would be expected in an ILS, including (Wikipedia, 2013):

Features:

- Simple, clear interface for librarians and members (patrons)
- Various Web 2.0 facilities like tagging, comment, Social sharing and RSS feeds
- Union catalog facility
- Customizable search
- Circulation and borrower management
- Full acquisitions system including budgets and pricing information (including supplier and currency conversion)
- Simple acquisitions system for the smaller library
- Ability to cope with any number of branches, patrons, patron categories, item categories, items, currencies and other data
- Serials system for magazines or newspapers
- Reporting
- Reading lists for members

Evergreen

Evergreen ILS is another option when researching open source ILS options.
Evergreen is an open source Integrated Library System (ILS), initially developed by the Georgia Public Library Service for Public Information Network for Electronic Services (PINES), a statewide resource-sharing consortium with over 270 member libraries. The software was initially released on September 2006.Linux operating system is needed to run the software. It too is standards compliant and uses the OPAC interface, and offers many features including flexible administration, work-flow customization, adaptable programming interfaces, and because its open source, cannot be locked away and can benefit from any community contributions (Randhawa, 2008).

Alice for windows

If you are looking for an easy to use, reliable and effective library management system where you may not have access to the latest technology or IT infrastructure, the Alice library management system is the solution. This LMS developed by Soft link International, Australia is an international software package and is marketed worldwide through a number of agencies based in America, Australia, Britain, Iceland, India, Malaysia, New Zealand and Singapore. This software is marketed under the name of Embla in Iceland, Alice elsewhere in Europe, OASIS in South East Asia & Australia and Annie in America and other parts of the world. Recently Soft link International decided to call the software Alice for Windows all over the world to maintain consistency in nomenclature (Mukhopadhyay, 2002).

The main features of Alice are as follows (Mukhopadhyay, 2002):
1. It has four distinct versions – Public library ver., Special library ver., Academic library ver. And School library ver.
2. The package is modular and modules are grouped into one of the three sets –
Standard Set: Includes Management; Reports & Utilities; Circulation; OPAC
Advanced Set: In addition to standard set it includes Acquisition; Periodicals; Journal Indexing; Multimedia; Web Inquiry Special Set: In addition to Standard & Advanced set it includes Reservation; Interlibrary loan; Patron self checking; Rapid retrospective conversion;
Multilingual features; Self circulation; Union catalogue

Advantages of the software:
1. Making learning easier
- Innovative search and discover methods – Search and Quick Search
- Book Cover Images and icons identify resources
- Multilingual capabilities
- Book reviews

2. Easy Cataloguing
- Scan and go with Rapid Retro
- Up to date records with AEM catalogue records

3. Easy implementation and maintenance
- Easy to install

- Remote installation options available
- Flexible training options
- UK based support team – 5 days a week

4. User friendly

- Simple to search quick search
- Student reviews, reports on loans

5. Easy to use technology

- Based on Windows technology and easy to install
- Solo or network system available

6. Simple to change and easy maintenance

- User friendly housekeeping processes
- Minimal support required from school IT staff
- Experienced UK support
- Flexible add ons available

Libsys

LIBSYS Ltd., the company, Headquartered at Gurgaon, is a pioneer in providing innovatory library management systems across the country and is deemed as one of the most credible names for libraries, which is attributed to the all-encompassing functionality and outstanding features of its software. LIBSYS is a fully integrated multi-user library system based on client-server model and supports open system architecture, web-based access and GUI. This indigenous LMS is designed and developed by LibSys Corporation, New Delhi. LIBSYS has seven basic modules – Acquisition; Cataloguing; Circulation; Serials; OPAC; Web-OPAC and Article indexing (Mukhopadhyay, 2002):

Advantages of the software:
The major advantages of using LIBSYS [8,9] are as follows:
1. Based on client-server model and TCP/IP for communication and networking
2. Provides ANSI Z39.50 complaint web access for making the server accessible through
Internet/Intranet
3. Supports web OPAC for access of bibliographic databases through Internet/Intranet
4. Supports standard bibliographic formats like USMARC, UKMARC, CCF, UNIMARC etc.

5. Includes images and multimedia interfaces with LIBSYS search engine
6. Supports barcode technology for membership card production and circulation
7. Offers SDI, CAS, fine calculation, e mail reminders etc. utilities

Mirror

The aim of the Mirror library is to provide both compile-time and run-time meta-data describing C++ constructs like namespaces, classes with their base classes, member variables, constructors, member functions, etc. and to provide uniform and generic interfaces for their introspection.
Mirror is designed with the principle of stratification in mind and tries to be as less intrusive as possible. New or existing classes do not need to be designed to directly support Mirror and no Mirror-related code is necessary in the class' definition, as far as some general guidelines are followed. This allows you to do reflection even on third-party code that you cannot modify.

History:

This version of the Mirror library is a major rewrite of a previous version which has been developed in C++98 since April 2008. The new (C++11) version draws from more than one and half year of user experience with the previous version and is in development since September 2009.

Features:

- Reusability: The meta-data provided by Mirror is reusable in many situations and for many different purposes.
- Flexibility: Mirror and the additional layers built on top of it allow accessing the provided meta-data both at compile-time and run-time in a functional and object-oriented manner depending on the application needs.
- Encapsulation: Mirror and the additional layers provide interfaces for easy access to program meta-data.
- Stratification: Mirror is non-intrusive and separates the meta-level from the base-level constructs it reflects.
- Ontological correspondence: The meta-level facilities correspond to the ontology of the base-level C++ language constructs which they reflect.
- Completeness: Mirror tries to provide as much useful meta-data as possible, including various specifiers, iteration of namespace members and much more.
- Ease of use: Although Mirror allows doing very complicated reflective (meta-) programming, simple things are kept simple.

- Cooperation with other libraries: Mirror can be used with the introspection facilities provided by the standard library and other libraries.

In house made:

Library may require unique software requirements to function effectively. While there are numerous unique requirements, library must ultimately choose between in-house developed software and commercial (out-of-the-box) packages.
In house made software is software that is specially developed for some specific organization or other user.
By meeting library's exact specifications, library can cover every aspect of your requirements without unnecessary extras. It gives library greater control, which is important if library has specific needs that the library can't fulfill. Having customized software should also make the interface more familiar and easy to use.

4.3 Digital library software:

Greenstone:
Greenstone Digital Library Software is a project from New Zealand that provides a new way of organizing information and making it available over the Internet. Collections of information comprise large numbers of documents (typically several thousand to several million), and a uniform interface is provided to them distributing digital library collections (Tramboo, Humma, Shafi & Sumeer, 2012). It provides a way of organizing information based on metadata and publishing it on the Internet (Witten & Bainbridge, 2005). A typical digital library built with Greenstone will contain many collections, individually organized. Easily maintained, collections can be augmented and rebuilt automatically (Tramboo, 2102).

Greenstone users employ the "Librarian" interface to create and maintain digital library collections. This is intended to help librarians (and others who compile electronic anthologies) expedite the construction and organization of digital information collections. Only a few minutes of the user's time are needed to set up a collection based on a standard design and initiate the building process, assuming that documents and metadata are already available in electronic form.

Listed below are some of special features possessed by the Greenstone (Shafi &Gul,2001):

i. Accessible via web browser: Collections are accessed through a standard web browser (Netscape or Internet Explorer) and combine easy-to-use browsing with powerful search facilities.

ii. Full Text and Field Search: The user can search the full text of the documents, or choose between indexes built from different parts of the documents.

iii. Flexible browsing facilities: The user can browse lists of authors, lists of titles, lists of dates, classification structures, and so on. Different collections may offer different browsing facilities and even within a collection, a broad variety of browsing interfaces are available.

iv. Create access structures automatically: The Greenstone software creates information collections that are very easy to maintain. All searching and browsing structures are built directly from the documents themselves.

v. Make use of available metadata: Metadata, which is descriptive information such as author, title, date, keywords, and so on, may be associated with each document, or with individual sections within documents. Metadata is used as the raw material for browsing indexes.

vi. Plug-in extends system's capabilities: In order to accommodate different kinds of source document, the software is organized in such a way that "plug-in" can be written for new document types. Plug-in currently exist for plain text, html, Word, PDF, PostScript, E-mail, some proprietary formats, and for recursively traversing directory structures and compressed archives containing such documents.

vii. Customization: The Greenstone allows customization of presentation of collection that are based on Extensible Style sheet Language transformation (XSLT) and other agents that govern the definite functions of Digital library.

viii. Designed for Multi-gigabyte collection: Collections can contain millions of documents, making the Greenstone system suitable for collections up to several gigabytes.

ix. Multilingual Support: Unicode is used throughout the software, allowing any language to be processed in a consistent manner.

x. Collections support multiple formats: Greenstone collections can contain text, pictures, audio and video clips.

xi. Collections can be published on the Internet or on CD-ROM: The software can be used to serve collections over the World-Wide Web. Greenstone collections can be made available, in precisely the same form, on CD-ROM.

DSpace:

Dspace is a groundbreaking digital institutional repository that captures, stores, indexes, preserves, and redistributes the intellectual output of a university's research faculty in digital formats. It manages and distributes digital items, made up of digital files and allows for the creation, indexing, and searching of associated metadata to locate and retrieve the items (Randhawa, 2008). The first public version of DSpace was released in November 2002, as a joint effort between developers from MIT and HP Labs. Currently the DSpace software and user community receives leadership and guidance from DuraSpace.

DSpace is adaptable to different community needs. Interoperability between systems is built-in and it adheres to international standards for metadata format. Being an open source technology platform, DSpace can be customized to extend its capabilities. Some of its characteristics as shown in DSpace documentation are as:

a) It is a service model for open access and/or digital archiving for perennial access (Tramboo, Humma, Shafi & Sumeer, 2012).

b) Provides a platform to frame an Institutional Repository and the collections are searchable and retrievable by the Web.

c) Helps to make available institution-based scholarly material in digital formats. The collections will be open and interoperable.

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c) Helps to make available institution-based scholarly material in digital formats. The collections will be open and interoperable.

Optimized Search & Browse: As per Bass, M J et al (n.d), the system allows end-users to discover content in a number of ways.

Fedora

Fedora (or Flexible Extensible Digital Object Repository Architecture) is a digital asset management (DAM) architecture upon which institutional repositories, digital archives, and digital library systems might be built. Fedora open source software gives organizations a flexible service-oriented architecture for managing and delivering their digital content (Randhawa, 2008). Fedora is the underlying

architecture for a digital repository, and is not a complete management, indexing, discovery, and delivery application. It is a modular architecture built on the principle that interoperability and extensibility are best achieved by the integration of data, interfaces, and mechanisms (i.e., executable programs) as clearly defined modules. Fedora initially released on 16th May 2003.

EPrints

EPrints is free software developed by the "University of Southampton, England (Tramboo et al., 2012). EPrints repository collects preserves and disseminates in digital format the research output created by a research community. It enables the community to deposit their preprints; post prints and other scholarly publications using a web interface, and organizes these publications for easy retrieval (Tramboo et al., 2012).

EPrints is an extensible content management system. It has been extensively configured to accommodate the needs of academics and researchers amid at dissemination and reporting, but it could be easily used for other things such as images, research data, audio archives - anything that can be stored digitally, but you'll have make more changes to the configuration. The real strength of EPrints lies in its ease of use for both end-users and administrators. Submitting documents in EPrints is very straightforward.

Features:

Listed below are some of special features possessed by the EPrints (Tramboo et al., 2012).

Accessibility via web browser: EPrints provides web based interface that makes it easy to use and administer.

Full Text and Field Search: Searching is based on metadata not full text based search is supported by EPrints. Searching in EPrints allows scanning each of the metadata field types in the database by using simple or advanced search. Any metadata field can be searched with fine granularity by SQL querying the database.

Administrative function provided: EPrints archive can use any metadata schema as being provided by the administrator. The administrator decides what metadata fields are held about each EPrints item.

Open Source Software: EPrints uses traditional technologies and runs on pure Open Source systems. It uses MySQL, Apache database and web server.

Multilingual Support: Unicode is used throughout the software, allowing any language to be processed in a consistent manner.

File formats supported: Functions with many file types, including: PDF, HTML, JPEG, TIFF, MP3, and AVI etc. Metadata schema can be tailored to meet the requirements.

Statistics: Statistics are provided for administrative usage .Statistical reports/summary can be used for performing analysis on repository.

Customization: The EPrints data modal consist of user defined metadata. In order to export data in other formats plug-ins can be written.

Item preview in EPrints: Thumbnail preview of documents and images is generated automatically upon file upload.

Among the above mentioned automation and digital library software, the commonly used software in the university libraries of Bangladesh are Koha, Mirror, Winisis, Greenstone and DsPace.

CHAPTER: 5

FINDINGS OF THE STUDY

This chapter includes the analysis and final discussion of the questionnaire. The questionnaire was designed to find out the status of the use and application of library software in university libraries of Bangladesh.

Out of 58 public and private universities in Dhaka (population N=58). Due to place and time limitation, interview was conducted with 20 respondent libraries (sample size n=20). Which means that 27 questionnaire were received. Among the universities in Dhaka city, the number of public universities is 8 and the number of private universities is 50.

Among 8 public and 50 private universities situated in Dhaka city, 5 public and 15 private universities have been taken as sample.

5.1 Collection information

In the university library, collection mainly includes books, monographs, journals, audio/video tapes, maps/photographs, e-books, e- journal, CD-ROM/DVD etc. Library software is used for acquisition, processing, circulation, preservation and providing library services.

Table 2: Collection information

Collection amount	Public university		private university	
	No. of respondents	Percentages	No. of respondents	Percentages
(A)Books				
Less than 5000		0%	1	7%
5001-10,000		0%		0%
10,001-15,000		0%	4	27%
15,001-20,000		0%	3	20%
20,001-30,000	1	20%	3	20%
30,001-40,000	1	20%	1	7%

40,001-50,000		0%	1	7%
More than 50,000	2	40%	2	13%
No response	1	20%		
Total	5	100%	15	100%
(B)Journal collections				
	No. of respondents	Percentages	No. of respondents	Percentages
Less than equal 100			2	13%
101-500	1	20%	3	20%
501-1000	1	20%	1	7%
1000- 2000			2	13%
More than 2000	1	20%	5	33%
No response	2	40%	2	13%
Total	5	100%	15	100%

(A) Among the respondent of private university libraries 13% have more than 50,000 books while 7% libraries have less than 5000 books which is very frustrating. On the other hand, 20% public university libraries have at least 2000-3000 books. The collection of books of the public university is better than the collection of private university.

(B) Private university library holds maximum 33% collection of journal having more than 2000 journals, and the public university library contains maximum 20% collection having more than 2000 journals. So, in the aspect of journal collections, public universities are in better position than private universities. Most of the university libraries are the member of Bangladesh INASP-PERI Consortium (BIPC).

Table 3: collection amount on monograph of various university libraries

Collection amount	Public university		Private university	
	No. of respondents	Percentages	No. of respondents	Percentages
Monographs				
Less than 200		0%	2	13%
201-500		0%	2	13%
501-1000		0%	3	20%
1001-2000		0%	1	7%
2001-5000	2	40%	3	20%
More than 5000		0%	1	7%
No response	3	60%	3	20%
Total	5	100%	15	100%

Monographs refer to thesis paper, PhD paper, research reports etc. In some private university library, there are a lots of internship report submitted by the students of the associated library. Among the public universities, only two public universities have monographs' collection ranging from 2001-5000. 3 public universities didn't give response regarding their monographs' collection. Maximum 3 private universities contain monographs' collection range from 2001-5000.Only 13% private universities have less than 200 monographs.

Table 4: collection amount on Audio/video tapes, CD-ROM/DVD of various university libraries

Collection amount	Public university		Private university	
	No. of respondents	Percentages	No. of respondents	Percentages
Audio/video tapes, CD-ROM/DVD				
Less than 200	1	20%		0%
201-500		0%	3	20%
501-1000		0%	5	33%
1001-2000	1	20%	1	7%
More than 2000		0%	3	20%
No response	3	60%	3	20%
Total	5	100%	15	100%

60% of public university and 20% of private university libraries didn't response about their collection on Audio/video tapes; CD-ROM/DVD.20% of public university libraries have less than 200 collections while the maximum 20% libraries have more than 2000 materials. According to the ratio, private universities are in good position than public universities. Private university libraries are advanced in the collections of Audio/video tapes, CD-ROM/DVD while they are in poor position for the collection of microfilm and microfiche than the public university library.

Table 5: collection amount on Maps and photographs of various university libraries

Collection amount	Public university		Private university	
	No. of respondents	Percentages	No. of respondents	Percentages
(A) Maps, photographs				
Less than 100	2	40%	6	40%
101-200		0%	2	13%
No response	3	60%	7	47%
Total	5	100%	15	100%

In overall consideration, the condition of the collection of Maps and photographs do not yield satisfactory result. Only 2 public and 6 private universities possess less than 100 Maps and photographs. Only 40% of public and 53% of private universities have Maps and photographs, but their amount is not pleasurable.

Table 6: collection amount on digital collections of various university libraries

Collection amount	Public university		Private university	
	respondents	Percentages	No. of respondents	Percentages
(A) Digital collections				
Less than 200		0%	1	7%
201-500	1	20%	2	13%
501-1000		0%	1	7%
1001-2000	1	20%		0%
2001-3000	1	20%	2	13%
More than 3000		0%	5	33%
No response	2	40%	4	27%
Total	5	100%	15	100%

Here digital collections refer to all kinds of electronic books, journals etc. In regards to digital collections, private university libraries are advanced. Digital collection of the university libraries is one of the main indicators to give the information about the status of digitization of the university libraries. Among the private universities, 33% hold more than 3000 digital collections while there is no public university library which has more than 3000 digital collections.

5.2 Category of libraries:

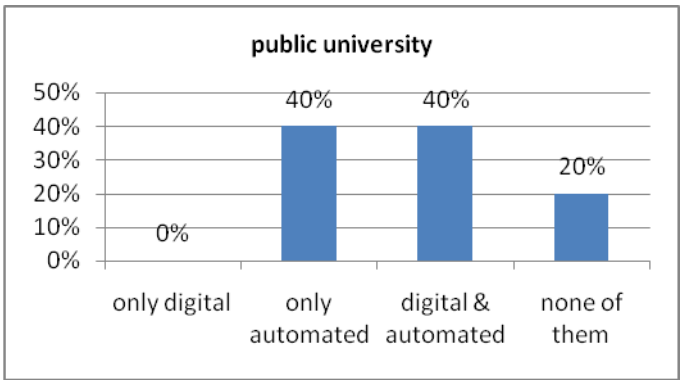

Figure 1: category of public university library

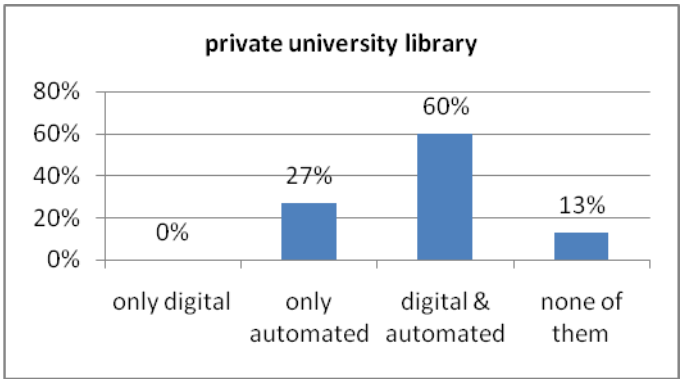

Figure 2: category of private university library

The above table presents important information about the current status of the university libraries of Bangladesh. Digital library is a focused collection of digital objects that can include text, visual material, audio material, video material, stored as electronic media formats (as opposed to print, microform, or other media), along with means for organizing, storing, and retrieving the files and media contained in the library collection. On the other hand, automated library refers to the library that uses computers to automate the typical procedures of libraries such as cataloging and circulation. In Bangladesh, libraries are going ahead in library automation and digitization aspect.

40% public and 27% private universities in Dhaka city, Bangladesh are only automated. Some of them are very satisfied, some trying to make their library digitized. It is an hopeful information that, 60% private and 40% public university libraries are both automated and digitized.

5.3 ICT information:

Table 7: ICT equipments of various university libraries

ICT Profile	Category	Public university		Private university	
		No. of respondents	Percentages	No. of respondents	Percentages
(A)Number of Computer	Less than 03			2	10%
	03-10	2	10%	4	20%
	11-20			5	25%
	21-50	2	10%	2	10%
	51-100	1	5%	2	10%
	Total	5	25%	15	75%
(B)Number of printers	Only 1			5	25%
	2-5	2	10%	7	35%
	More than 5	1	5%	2	10%
	No response	2	10%	1	5%
	Total	5	25%	15	75%
(C)Barcode scanner	1-2			6	30%
	3-5			3	15%
	More than 5			1	5%
	No scanner	5	25%	5	25%
	Total	5	25%	15	75%
(D)Scanners	1-3	1	5%	10	50%
	More than 3			1	5%
	No scanner	2	10%	4	20%
	No response	2	10%		
	Total	5	25%	15	75%
(E)RFID	1-5			1	5%
	More than 6			1	5%
	No RFID	5	25%	13	65%
	Total	5	25%		75%

(A) Number of computer is an essential and unavoidable rod for measuring the automation and digitization scenario of a library. Maximum 40% public university

libraries have 3-10 computers. In the perspective of private university library, 33% libraries have 11-20 computers. Private university libraries are in better position in the collection of computers.

(B) Printer is an important electronic device which is noticed in almost all of the university libraries today. Maximum private and public university libraries have 2-5 printers.

(C) A barcode reader (or barcode scanner) is an electronic device for reading printed barcodes. In public university libraries, there is no barcode scanner, which is too frustrating. On the other hand, private university libraries are in pleasurable and appreciable position.40% private universities have ½ barcode scanner.

(D) Maximum public universities have 2 scanners while 10 private university libraries have 1-3 scanners obtaining 50% of the private universities.

(E) Radio-frequency identification (RFID) is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. RFID, latest library 2.0 technology, has not developed notably in our country. Among the surveyed public universities, no library uses RFID. Moreover among 15 private universities, only 2 universities have RFID facilities.

5.4 Staff information:

Table 8: number of staff with their background in various university libraries

Staff type	Category	Public university		Private university	
		No. of respondents	Percentages	No. of respondents	Percentages
Total Staff Number	Less than 10		0%	7	47%
	10-20	1	20%	4	27%
	21-30	1	20%	4	27%
	More than 30	3	60%		0%
	Total	5	100%	15	100%
Staff with ICT knowledge	1-5		0%	5	33%
	6-15		0%	6	40%
	16-20	1	20%	1	7%
	More than 20	1	20%	1	7%

	No response	3	60%	2	13%
	Total	5	100%	15	100%
DL & Automation knowledgeable staff	0		0%	1	7%
	1-5	1	20%	8	53%
	6-10	1	20%	2	13%
	More than 10		0%	3	20%
	No response	3	60%	1	7%
	Total	5	100%	15	100%
LIS background	0		0%		0%
	1-5	1	20%	2	13%
	6-10	2	40%	8	53%
	More than 10	1	20%	3	20%
	No response	1	20%	2	13%
	Total	5	100%	15	100%
Computer science background	0		0%	6	40%
	1-5		0%	7	47%
	6-10	1	20%		0%
	No response	4	80%	2	13%
	Total	5	100%	15	100%

While there is no staff less than 10 staff in public universities, 47% private universities have less than 10 staff. 60% public universities have more than 30 staffs while there is no private university having more than 30 staffs. So there are more staffs in public university libraries than the public university libraries.

For building and maintaining digital library, the library staff must have the knowledge and clear concept on digital library software. Lack of knowledgeable, properly trained and experienced staff is one of the main causes behind the acceleration of the library digitization program in Bangladesh. Private universities are in good situation than the public universities in terms of automation and digital library software.

Library staff without LIS (Library and Information Science) background can't run a library in the way in which a staff with LIS background can. In Bangladesh, there was

a tradition of running library with staff having no LIS background, at present the situation is changing. From the table, it can be said that in all the libraries, all of the staffs have LIS background. 40% of public and 53% of private university libraries have 6-10 staff with LIS background. Most of the university libraries' staff has computer science background. But this scenario of private university is better than public university.

5.5 Automation scenario:

The automation scenario of both public and private university libraries is presented in the following graphs:

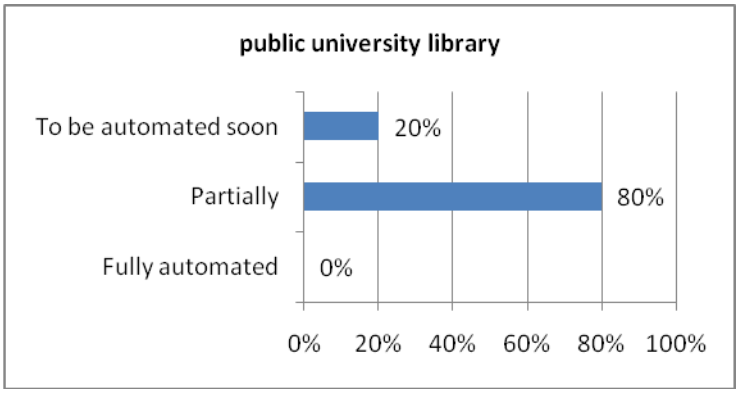

Figure 3: automation scenario of public university library

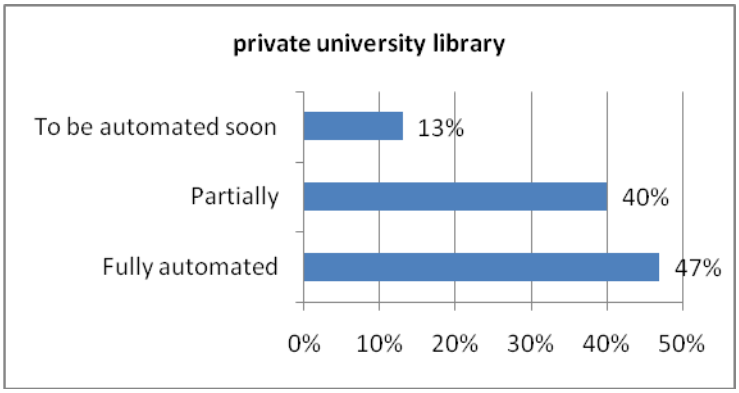

Figure 4: automation scenario of private university library

The automation of the university libraries is developing and spreading out very soon. The table shows that maximum 80% public and 40% private university libraries are partially automated. While 47% private universities are fully automated, there is no public university which is fully automated. 20% public and 13% private university libraries are going to be automated soon.

5.6 Use of automation software:

Table 9: Various automation software used in the libraries

Software	Public	%	Private	%
KOHA	1	20%	9	60%
Mirror		0%	1	7%
Winisis	1	20%		0%
In house	3	60%	2	13%
Don't use	0	0%	3	20%
Total	5	100%	15	100%

Library automation software is software which is used to automate the typical procedures of libraries such as cataloging and circulation. Among various automation software, in Bangladesh the above mentioned software are in use. According to the table, maximum public university libraries use in house made software while maximum private university libraries use koha software. There is only one private university to use mirror software.

5.7 Use of digital library software:

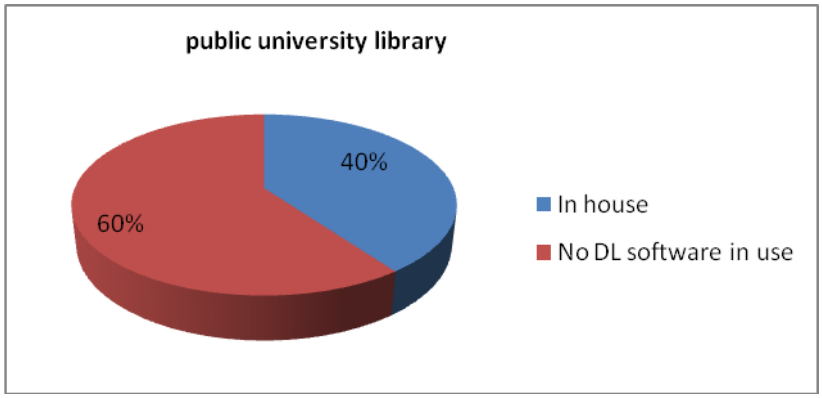

Figure 5: use digital library software in public university library

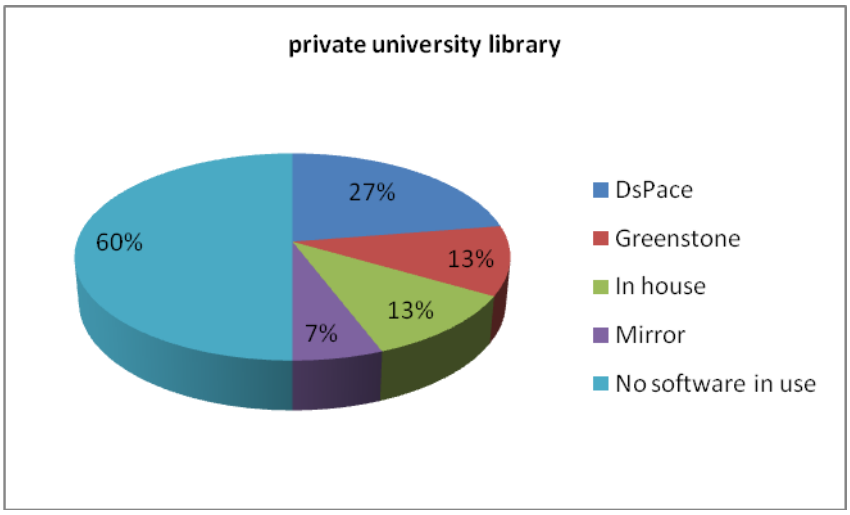

Figure 6: use digital library software in private university library

Digital library software is a Category of software for specialist software for building, maintaining, managing or running digital libraries. The scenario of public university libraries in using Digital library software is worse than the scenario of private university libraries. While 27% private university library uses DsPace software, there is no public university library to use DsPace. Only 40% public university libraries are using in house made software and 60% don't use any digital library software.

5.8 Provision of reservation and renewing of books using online circulation system:

Table 10: libraries' reservation and renewing system

Status	Public	%	Private	%
Yes	2	40%	7	47%
No	3	60%	8	53%
Total	5	100%	15	100%

Most of the university libraries offer the opportunity to the users for reserving and renewing library materials online. Some university libraries don't offer these facilities even though their software supports these facilities. The ratio of providing this facility between public and private university libraries does not differ much.

5.9 Software are hosted in-

Table 11: Location where the software are hosted in the libraries

	Public	%	private	%
University server	3	60%	11	73%
Local commercial server		0%	2	13%
No response	2	40%	2	13%
Total	5	100%	15	100%

Library software of the public and private universities are hosted in university server and local commercial server. 60% public and 73% private university libraries have responded that their library software is hosted in university server.

5.10 Libraries having user training facilities-

Table 12: Status of libraries' to provide user training

	Public	%	Private	%
With training facilities	3	60%	13	87%
Without training facilities	2	40%	2	13%
Total	5	100%	15	100%

To improve the reading habit of the users, to orient new users with the library, to use the library materials properly, to keep the users up-to-date there is no alternatives to training. Training helps users utilize library and library materials with full potential. 87% private and 60% public university libraries provide user training opportunities.

5.11 User training-

Table 13: Frequency of user training

	Public	%	Private	%
Very frequently		0%	4	27%
Frequently	1	20%	6	40%
Not frequently		0%	2	13%
Rarely	2	40%	1	7%
Never	2	40%	2	13%
Total	5	100%	15	100%

Private university libraries put more emphasis on user training than the public university libraries. 27% private university libraries provides user training very frequently.

5.12 Responsibility for the development and implementation of automation and software project:

Table 14: Responsible person for automation & digitization

	Public	%	Private	%
a)Library staff	4	80%	6	40%
b) Outsourcing		0%	1	7%
c) ICT dept. attached with library		0%	1	7%
d) Both a & c		0%	4	27%
e) a, b, c		0%	1	7%
No response	1	20%	2	13%
Total	5	100%	15	100%

For the implementation and development of automation and digital library software, skilled manpower in needed. This manpower can be the library staff or the staff from ICT department attached with the library or from both. 80% public and 40% private university libraries do task of development and implementation by the library staff.

5.13 Satisfaction level of the librarian using software:

Table 15: Level of satisfaction using existing software in the library

	Very satisfied				**satisfied**				**dissatisfied**				**No response**			
	pub	%	pri	%	pub	%	pri	%	pub	%	pri	%	Pub	**%**	Pri	
a)Automation software	1	20%	1	7%	1	20%	1	7%		0%		0%		0%		0%
b)Digital library software		0%		0%		0%		0%		0%		0%		0%		0%
c)in house		0%		0%		0%		0%		0%		0%		0%		0%
d)open source		0%		0%		0%	2	13%		0%		0%		0%		0%
e) both a & b		0%		0%		0%		0%		0%	1	7%		0%		0%

f) both a & c		0%		0%	1	20%		0%		0%		0%		0%		0%
g) both b &d		0%		0%		0%		0%		0%		0%		0%		0%
h) both a &d		0%	1	7%		0%		0%		0%		0%		0%		0%
i) a,b,c		0%	2	13%		0%		0%		0%		0%		0%		0%
j) a,b,d		0%	3	20%		0%	1	7%		0%		0%		0%		0%
k) a, b, c, d		0%		0%		0%	1	7%		0%		0%		0%		0%
No response		0%		0%		0%		0%		0%		0%	2	40%	2	13%
Total	1	20%	7	47%	2	40%	5	33%		0%	1	7%	2	40%	2	13%

This table illustrates the level of satisfaction of the university libraries by using their existing software. By this table it can be known whether they are satisfied or dissatisfied by using specific software. Here automation software includes Koha, Mirror, Winisis and digital library software includes DsPace and Greenstone. These software have been used by the respondents' libraries.

20% public and 47% private university libraries are very satisfied by using their software while 7% private university libraries are dissatisfied by using their software. Among these, 20% public and 20% private universities are satisfied and 20% public and 20% private universities are dissatisfied by using automation software.

5.14 Name of software which have been used before:

Table 16: Name of software which have been used before

Software name	Public	%	Private	%
WINISIS & LIBRARIUM		0%	1	7%
BIMS		0%	1	7%
CDS/ISIS		0%	2	13%
iUMS		0%	1	7%
LMS & Autolyb		0%	1	7%
Customized software		0%	1	7%
GLAS	1	20%		0%
No response	4	80%	8	53%
Total	5	100%	15	100%

Before the currently used software, various software were used by some university libraries.20% public university libraries used GLAS (Graphical Library Automation

System) software. 13% private university libraries used CDS/ISIS (Computerized Documentation Service / Integrated Set of Information Systems).

5.15 Responsible persons for providing technical supports for ICT or automation-

Table 17: Person having responsibility to provide technical support

	Public	%	Private	%
a) IT staff within the organization	2	40%	2	13%
b) IT staff from outside(outsourcing)		0%		0%
c) Library staff	1	20%	6	40%
d) both b & c	1	20%		0%
e) both a & c	1	20%	6	40%
No response		0%	1	7%
Total	5	100%	15	100%

For technical support for ICT or automation, 40% public and 13% university libraries employ IT staff within the organization. In 80% private university libraries, both IT staff and library staff within the organization provides technical support.

5.16 Access to the bibliographic information of the library materials/catalogue-

Table 18: Path of access to the bibliographic information

	Public	percentage	Private	percentage
a) Through LAN (in campus)	4	80%	1	7%
b) Through WAN/WEB		0%	4	27%
c) Within library	1	20%	3	20%
d) Both a & b		0%	2	13%
e) a, b, c		0%	4	27%
No response		0%	1	7%
Total	5	100%	15	100%

80% public and 20% public university libraries provides access to the bibliographic information of the library materials/catalogue through LAN(Local Area Network) and

WAN (Wide Area Network)subsequently. 27% private university provide access through WAN and again 27% provides access through LAN, WAN and within library network.

5.17 Searching options:

Table 19: Searching options

	Public	%	Private	%
VuFind	1	20%	4	27%
Knimbus		0%	1	7%
Don't use	3	60%	8	53%
No response	1	20%	2	13%
Total	5	100%	15	100%

The researcher has found the following two searching options which are used in the university libraries.

VuFind is a library resource portal designed and developed for libraries by libraries. The goal of VuFind is to enable users to search and browse through all of the library's resources by replacing the traditional OPAC to include:

- Catalog Records
- Digital Library Items
- Institutional Repository
- Institutional Bibliography
- Other Library Collections and Resources

Knimbus is the largest open access knowledge platform that enables users to discover and share knowledge globally. It provides full text access to over 13000 journals, over 3000 e-books and 4 lakhs plus thesis & course documents for free. Besides knowledge discovery, users can share their knowledge globally amongst peers.

20% public and 27% private university libraries use VuFind. 7% private university libraries use Knimbus.

5.18 Frequency of software package updating-

Table 20: Frequency of software package updating

	Public	%	Private	%
Very frequently		0%	2	13%
Frequently	1	20%	5	33%
Not frequently	1	20%	3	20%
Rarely	2	40%	2	13%
No response	1	20%	3	20%
Total	5	100%	15	100%

If the software package is not updated regularly, the software starts to lose its importance and smartness. The above table shows that only 13% private university libraries update software package very frequently while no library update software package very frequently.

5.19 Collection & analysis of user satisfaction and requirements about library & library software-

Table 21: Collection & analysis of user satisfaction and requirements

	Public	%	Private	%
Frequently	1	20%	5	33%
Weekly		0%		0%
Monthly		0%	4	27%
No response	2	40%	2	13%
Not applicable	2	40%	4	27%
Total	5	100%	15	100%

Library is a service oriented organization. Everything of a library is for its user. So, it is very important for the library to assemble and examine the satisfaction, dissatisfaction and the new requirements of the user about the library software. 20% public and 33% private university libraries collect and analyze user satisfaction and requirements about the existing library software. But it is frustrating that 40% public and 27% private university libraries do not conduct such kind of survey.

5.20 Problems:

For automation and digitization program, the surveyed libraries are facing the following problems frequently. These problems are shown in a statistics:

Table 22: Descriptive statistics on problems frequently faced by the university library

	N	Minimum	Maximum	Mean	Std. Deviation
Lack of professional staff	14	1.00	3.00	2.0714	.91687
Lack of ICT staff	16	1.00	4.00	2.3750	1.02470
Lack of adequate staff	14	1.00	3.00	1.7857	.89258
Lack of training of staff	14	1.00	11.00	3.0000	2.60177
lack of integrated library software	11	1.00	4.00	1.7273	1.27208
Lack of staff to customize and maintain DLS	11	1.00	4.00	1.7273	1.10371
Lack of budget	14	1.00	4.00	2.3571	1.00821
Lack of content management	11	1.00	4.00	1.6364	.92442
Lack of Infrastructure	13	1.00	4.00	1.7692	.92681
Low speed of internet connection	13	1.00	3.00	2.0769	.86232
Lack of coordination	13	1.00	3.00	1.7692	.92681
Lack of equipments to digitize	13	1.00	4.00	2.3077	1.03155
Management is not interested	15	1.00	4.00	1.8667	1.06010
Lack of skilled human resources	15	1.00	4.00	1.9333	1.03280
lack of proper initiatives	15	1.00	4.00	1.8667	.99043
lack of technical support	13	1.00	4.00	2.2308	.92681
lack of security	14	1.00	3.00	1.6429	.74495
Poor searching facility	11	1.00	4.00	1.8182	1.07872
Not error free	12	1.00	4.00	2.2500	.96531
Not compatible with different operating system	11	1.00	3.00	1.9091	.94388
Not good speed	12	1.00	4.00	1.6667	.98473
Not multilingual	12	1.00	3.00	1.9167	.90034
Searching display is not attractive	13	1.00	3.00	1.5385	.77625
No proper documentation	11	1.00	4.00	1.6364	1.02691
No updating	11	1.00	4.00	1.8182	1.07872
Does not allow customization	11	1.00	4.00	1.8182	1.16775
No standard software	12	1.00	4.00	1.7500	1.05529
Valid N (list wise)	8				

The first highest mean score is 3.0000 for the statement lack of training of staffs which mean that it is a great problem for libraries, second large problem is lack of ICT staff which mean is 2.3750, third highest problem in the rank is Lack of budget whose mean score is 2.3571 followed by 2.3077 for the problem of lack of equipments to digitize, then the mean score 2.2500 represent problem of not error

free, then 2.2308 for lack of technical support, 2.0769 mean for low speed of internet connection, in the rank next problem is lack of professional staff whose is mean is 2.0714, then the problem is not multilingual for mean 109167, than mean 1.9091 is for Not compatible with different operating system , mean 1.8667 is both for lack of proper initiatives and management is not interested, mean 1.8182 is for poor searching facilities. Lowest mean score 1.6364 is for lack of content management.

Apart from the above problems, the following reasons are also mentionable:

Administrative complexity:
This factor is much more acute than other factors. Administrators, policy makers, and government executives are not fully aware of the importance of ICT as well automation and digital technologies. Moreover information professionals have failed to make its importance clear.

Lack of support of the higher authorities:
Lack of reliable financial, technical, infrastructural, institutional, and administrative support from the government as well as higher authority creates rigorous problems to library automation and digitization program in the public and private university libraries of Bangladesh.(Siddike, Munshi & Saeed, 2011)

Insufficient computer literate professionals:
Although computer is becoming popular in Bangladesh, still we have of lack of computer literate professionals. Many senior and old information professionals do not know how to operate computer. But to know how to operate computer for different library functions and purpose is very crucial in modern world.

Failure of internet connection:
Dial up connection as well as broadband connection in our country is frequently interrupted due to technological disruptions of service provider and so often cables are cut down by the theft of wires.

Unbearable expenditure of infrastructure development*:*
Although ICT is a must for all the public and private university libraries of Bangladesh, but it requires a good infrastructure facilities like adequate number of workstations with internet connection, high bandwidth, laser printers, sometimes need dedicated web servers, modem, UPS etc. are very costly and many libraries cannot afford the cost.

Lack of skilled manpower:
The information professionals of Bangladesh do not have adequate skills to run to library automation and digitization program. They can’t get the proper opportunities for training.

.

Lack of ICT knowledge:

Library and information professionals of the university libraries of Bangladesh do not have proper knowledge about ICT as well as other digital technology related knowledge.

Lack of physical infrastructure:

Inadequate physical facilities of the university libraries of Bangladesh hamper the growth of automation and digitization program. Inadequate data structure, computer application and telecommunication infrastructure. (Chowdhury, 2011)

Lack of proper and adequate financial support:

Inadequate financial support has made the possibility of the development of library automation and digitization in the university libraries of Bangladesh much more complex.

Psychological problems:

The reluctance of the information professionals of Bangladesh to accept new technologies
hinders the development of ICT based as well as digital libraries.

Lack of proper planning:

To implement software in the public and private university libraries of Bangladesh, need proper long term as well as short term planning.

Lack of training programs:

To increase the skills of the information professionals of the public and private university
libraries of Bangladesh need continuous training and orientation programs.

Lack of standards:

There is no international standard among the library and information professionals of the university libraries of Bangladesh. In this case, private university like BRAC University has started to maintain international standards. (Siddike, Munshi & Saeed, 2011)

Lack of adequate library and information service facilities:

The Poor information delivery system often causes duplication of research studies resulting in unnecessary expenditure of time and energy of researchers (Jasim Uddin, 2004).

Defective curriculum of Library and Information Science discipline
The education for librarianship is derived from and related to the field like library science, computer science, communication, behavioral sciences etc. and by nature this discipline is constant changing as changes occur in information technologies. Academic institutions, responsible for producing the manpower in information sector, must recognize requirements of the job market. In LIS discipline, technological aspect is not sufficient to the present scenario.

Lack of awareness:
Many of the library staff are still unaware and not serious about library automation and digitization.

5.21 Respondents' background

Some core information about the participant libraries are presented below:

Public university libraries:

Dhaka University Library:

The Dhaka University Library (DUL) is the oldest and largest academic library in the Bangladesh. It was established in the year of 1921. The library is housed in over 1,52,000 sq ft floor area consists of Library Administration Building. The number of present collection of the library is 6, 63,946. The DUL installed ICT in 1998.The library is now partially automated. From 2012-2013 academic years, the library started its digitization work. This Library provides a wide range of scholarly electronic resources to its members, but for licensing reasons, most of them have to be restricted. This Library is also a member of BIPC Consortium and subscribes INASP-PERI journals. It renders photocopying services for its users too (Chowdhury, 2012).The library website is www.library.du.ac.bd

The Central Library, BUET (Bangladesh University of Engineering and Technology):

The library was established in the year of 1962. BUET entered the world of computer applications in 1968 by offering courses in Numerical Methods and Computer Programming and acquiring an IBM 029 computer for data entry. BUET has launched ICT in the library in 2003. There are 73 computers in the BUET library. The library is now partially automated.
In BUET library, automation program was first inaugurated in 2003.
The library is housed in a 4-storied building of its own having approximately 20,000 sq ft floor space and stands close to the academic buildings. It is a compact library with built in facilities to provide various services to students, teachers and

researchers and to perform administrative and technical jobs. Approximately 200 students can use reading facilities at a time (Chowdhury, 2012).

Sher-e-Bangla Agricultural University Library:

The library was established in 1938. SAU Central Library presently located at the west wing of the university building. The library has a collection of around 38,000 books comprising the major subjects of agriculture and related subjects. It also collects all the popular national journals related to agriculture and a few international journals.

The library has launched ICT in the library in 2012. In library, automation program was first inaugurated in 2011-12. Sher-e-Bangla Agricultural University Library, digitization has not been yet introduced.

Jahangirnagar University Library:

Jahangirnagar University Library was established in 1970. Computers were introduced in this library in 1994 but this library is not as far along as other libraries in Dhaka with regard to providing computer facilities to users. JU Library has launched ICT in the library in 1998 through providing computerized card catalog. In the library, automation program was first inaugurated in 1999 through WINISIS and still WINISIS is used in the library. JUL is the least advanced university library in Bangladesh in the context of ICT-based activities (Islam & Islam, 2007).

Central Library of Jagannath University:

Central Library of Jagannath University was established in 2005.Library has not introduced neither automation nor digitization program yet. But the library is going to be automated soon. The website of the library is- www.jnu.ac.bd

Private university libraries:

Ayesha Abed Library (BRAC University)

The library was established in the year of 2001. The library has launched ICT in the library in 2003.The library is fully automated from 2003. BRAC University library has successfully formed a Institutional repository using open source software DSpace. The Digital Institutional Repository program was funded by the International Network for the Availability of Scientific Publications (INASP) in April, 2007.

East West University Library

East West University Library was established in the year of 1996. The library is fully automated from 2000. EWUL initiated a digital library program buying the Greenstone Software from the June 2010. Public and private university libraries having well infrastructural and ICT facilities can join the network.

North-South University Library (NSU, L)
The library was established in the year of 1992 .The library is the first fully automated library in Bangladesh using locally developed, Customized software, which is known as NSU Library Software from 2000. The library started its automation program in 1996 by CDD/ISIS. Its online database gives Users access to information through a LAN and the Internet. The library was established in 1992, but ICT was installed to perform library-based activities in 1996. Windows 2000 NT is the operating system used in the NSU library. The website of the library is- http://library.northsouth.edu

The Independent University, Bangladesh Library (IUB Library)
The library was established in the year of 1993 .The IUB installed ICT in the library in 1993. The library is partially automated.The library started its digitization program from 2011 .The IUB library has installed the LIBRARIUM software package on a network server with 25 PCs distributed in a LAN. A computerized campus wide information service has been developed, and the library maintains a computerized catalogue using Mini/Micro CDS/ISIS. The IUB library website (www.iubedu.bd/lib) provides access to the library catalog and periodical database.

Daffodil International University Library:
Daffodil International University Library, ICT and Automation were introduced in 2005.The library started its digitization work in 2012.Koha and DsPace are being used in the library.

Southeast University library
Southeast University library was established in 2002. The library has launched ICT in the library in 2007. The library is fully automated from 2010.The library has not started its digitization program yet. The library prefers DsPace for digitization. The website is www.seu.ac.bd/library/library.php

Library and Information Department NUB(Northern University of Bangladesh):
The library was established in 17th October 2002 and the ICT was introduced in the same year. The library became automated in 22 December 2011 .The library is fully automated. The library started its digitization work from 2013.There is no individual budget for the library, when anything needed by library, then the university take the action instantly.

Stamford University Bangladesh Library:
The library was established in 2002 and the ICT was introduced in 2009. The library is partially automated. Library is not digitized. The preference of digital library software is Greenstone.

Eastern University Library
Eastern University Library started to launch in 2003.In the library, ICT has been introduced in 2003, and the library first automated in 2011. The library became digitized in 2011 through installing Greenstone.

ASA University Bangladesh Library:
ASA University Bangladesh Library was founded in 31 May, 2007. ICT introduction was occurred in the library in 2008.The library became automated in 2008 and now the library is fully automated. The library is using Mirror automation software.

United International University Library:
United International University Library became automated in 2012 and now the library is partially automated. The library started its digitization program in 2012 through in house developed software.

University of Asia Pacific Central Library:
University of Asia Pacific Central Library was founded in 1996.ICT was inaugurated in 2003 and the library became automated in the same year. Library is not digitized.

Victoria University Library:
In the Victoria University, ICT has been introduced and the library is going to be automated soon. The preference of the digital library software is DsPace for digitization. There are around 16,000 books, 300 monographs and around 15 nationals journals in the library. CD-ROM/DVD is also available. There are 2 computers for the employees in the library, but there is no computer for the users.

European University of Bangladesh Library:
European University library was established in 2012. In European University library, ICT was introduced in 2013 and the library became automated in the same year. The library is using open source software. There are total 3,000 collections in the library. The library is partially automated having only one computer with windows operating system. The number of total library staff is 3. The library provides their staffs the opportunity of training.

City University Library:
The library was established in 2002.The library will be fully automated soon. Windows operating system is being used for 3 computers in the university library. There are total 9 staffs in the library. The library has already used CDS/ISIS software.

The above findings represent a comprehensive discussion about the software usages and applications among the university libraries of Bangladesh. Automation and digitization scenario in Bangladesh are yet in infancy term but the development has been accelerated recently.

CHAPTER-6

DISCUSSION, RECOMMENDATIONS AND CONCLUSION

6.1 Discussion:

Data analysis suggests that automation and digitization program in both public and private university libraries are increasing gradually. In this development ratio, private university libraries are in better position than the public university libraries. Public university libraries are facing with financial, administrative, and manpower related problems more than private university libraries.

Most of the libraries are in good condition in Digitization program. Among the private university libraries, only those libraries are not automated yet which are new.

ICT status of the respondents:

Among the respondents, maximum university libraries are automated. The libraries which are not automated yet are very aware of their library automation and some of them will be automated soon. Every library has at least two computers. Other electronic devices like printer, scanner is also available. A few numbers of private university library use barcode scanner and RFID. In maximum libraries, technical supports for ICT, automation and digitization are provided by the library staffs.

Status of staff:

Maximum number of public university libraries has more than 30 staffs and maximum number of privet university libraries has less than 10 staffs. But private university libraries have possessed more number of library staffs having ICT and automation and digitization knowledge than the public university libraries.

Automation scenario:

Maximum numbers of libraries have become automated from 2000 to today. For automation, open source and in house developed software are used frequently. For automation Koha, Mirror and Winisis are used in the libraries of Bangladesh. Maximum private university libraries are fully and Maximum public university libraries are partially automated. Some other software which have been used in various libraries are WINISIS & LIBRARIUM, BIMS, CDS/ISIS, iUMS, GLAS, LMS & Autolyb.

Digitization scenario:

In Bangladesh, digitization is in infancy condition. There is a great distinction between public and private university libraries in digitization perspective. While 60% of private university libraries are digitized, there is no digitized public university library. According to the respondents of the public university libraries, it is hard to digitize the library due to lack of efficient fund, proper initiatives and skilled staffs. The university libraries which don't have any digital library software prefer DsPace and Greenstone software subsequently.

Services of the libraries:

Private university libraries are advanced in maintenance and updating library software than the public university libraries. Mainly library staffs are responsible for updating. VuFind And Knimbus are used for searching. Maximum libraries offer access to the users online. Some of the libraries collect and analyze user satisfaction and their needs, complains about the existing software.

Budget:

Most of the university libraries were reluctant to give information about budget to the researcher as it is confidential. Most of the libraries don't have apart budget for library. But the library take approve for s budget only when it is needed. Private university libraries are advanced in budget allocation for the library than the public university libraries.

6.2 Summary of the study through research questions:

After the analysis, answer to the research questions which were mentioned in the introduction chapter, are presented below:

Research question- a) what is the present status of use and application of library software in the universities?
The findings of the analysis reveal that 40% public and 60% private university libraries are both automated and digital. For various reasons e. g. lack of sufficient fund, lack of enterprise, administrative complexity, public university libraries are not developing like private university libraries. But it is hopeful information that both public and private university libraries have the mentality, intension, readiness to automate or digitize their library.

Research question-b) what is the software preference of the library staff?
Among the automation software, maximum libraries choose open source software as their preference and they prefer Koha mostly. Among the digital library software, DsPace is preferred by the maximum libraries followed by Greenstone.

Research question-c) what are the barriers which hinder the library automation and digitization program?
The most common problems which are faced by the university libraries are- lack of training of staffs, lack of ICT staff , Lack of budget , lack of equipments to digitize, lack of technical support, low speed of internet connection, lack of professional staff, for lack of proper initiatives , poor searching facilities so on.

Research question-d) what is the potentiality of future growth and development of library software in Bangladesh?
After conducting the research, the researcher realizes that the use and application of library software is gaining popularity day by day. The library which is not automated yet, most of them are taking initiatives and going to be automated soon.

Research question-e) what software is used for what task in different modules (e.g. acquisition cataloguing, circulation etc.)?
For Budget, Accession, checking, duplication, Recording, requests, cancellation of order functions of acquisition module, maximum 8 private university libraries use koha and maximum 2 public university libraries use in house made software.
For the functions of preparation of authority file, original cataloging, MARC based data entry, editing & deletion of catalog card in cataloging module, maximum 9 private university libraries use koha and maximum 2 public university libraries use in house made software.
For the functions of registration of users charging & discharging renewal & reservation, fine calculation & receiving, stocktaking, self-charging in circulation module, maximum 9 private university libraries use koha and maximum 2 public university libraries use in house made software.

Research question- f) Does the library offer training program on library software or arranges seminar, conference, and workshop?
The study reveals that while 27% private university libraries provide training program for users very frequently, there is no public university library to provide this service.

Research question- g) what is the satisfaction level experienced from using library software?

The study found out that by using the library software, libraries are satisfied mostly. Most of the libraries don't work with all of the functions which are supported by the software.

6.3 Recommendations

To overcome the existing problems and to develop library automation and digitization speed, the following recommendations are presented:

Government should take proper initiatives to build digital library:

The government of Bangladesh as well as other government's agencies should allocate sufficient funds to support and maintenance of automation and digitization project of the university libraries (Siddike, Munshi & Saeed, 2011).

Government should reformulate their "National ICT Policy" for libraries and also "National digitization Policies for libraries" and should formulate a National Taskforce Digital library development for University libraries of Bangladesh. The government's administrative complexity should be reduced to help create awareness of the library software in libraries.

Developing ICT infrastructure:

It is clear that most of libraries do not have adequate infrastructural facilities, so ICT infrastructure should have to increase as soon as possible because digital library is technology dependent.

Developing staff skills:

Well-trained and skilled personnel are essential ingredients for automation and digitization project in libraries. Steps should be taken to develop properly trained and competent people for this purpose.

Allocation for sufficient fund:

The government and the respective authority have to co-operate with the libraries and have to allocate them adequate fund so that they can increase digital information resources.

Implementation of practical DL course:

Into LIS course curriculum Practical Digital library development courses should be integrated at different levels of education.

Arranging training program for university librarians:
Library and information science teaching and training institutions and various university libraries should introduce different types of training programs for the library professionals So that they can gain knowledge about automation and digital library software.

Cooperation from international organizations:
International cooperation is a must in the library field and international agencies like UNDP, UNESCO and World Bank should offer funds for developing digital libraries in university libraries. Without these fund and support university libraries in Bangladesh will be far behind from the modern services and facilities.

Cooperation from local organizations of the country:
Libraries need strong support from their parent organizations and the government. It can be achieved only if there is such awareness regarding ICT. The Library Association of
Bangladesh (LAB), The Department of Information Science & Library Management, University of Dhaka, The Department of Library & Information Science, University of Rajshahi, and any other professional organization should also organize seminars, workshops, etc., to create awareness among library authorities about the advantages of ICT (Islam & Islam, 2007). They should organize seminars, workshops, etc. to create awareness among librarians about current developments in technology.

6.4 Conclusion:

Before the independence there were only 6 public universities established in the country. The prime necessity for a university is a good library with a balanced and adequate collection, which can satisfy the needs of the university faculties and help to promote advanced study and research programs. A university is rated largely by its strength of library. No university can develop effective work, in the academic sense, without a strong library at its center. Automation and digitization of the university libraries have become practical necessity and reality with technology interventions to provide improved access to information sources, preservation and dissemination as required, at anytime; anywhere and any place as it were.

The study reveals that the initiative for automation and digital information systems in Bangladesh is still in the infancy level and these activities are very much related to the development of bibliographic and full-text database, hosting e-papers and metadata on the web, online searching and downloading facilities etc. As a

developing country, Bangladesh faces various problems in the development of library discipline. As a result public university libraries are not developing. Private university libraries are gradually developing faster than public university libraries by individual enterprise. So, to reach the destination library authorities and librarians and the educator for librarianship have to go a long way with care. Librarians, library patrons and supporters, and, above all, the government, must help develop ICT-based libraries to meet the changing demands of the users.

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APPENDICES

APPENDIX-1: COVER LETTER

APPENDIX-2: QUESTIONNAIRE FOR LIBRARY SURVEY

APPENDIX-1: COVER LETTER

[It is purely for academic purpose]

Thesis Title: "*Use and Applications of Library Software in University Libraries of Bangladesh"*

Chief Librarian/Librarian/Head/Director

Dear Sir/Madam,

In partial fulfillment of the requirement of my M.A. studies at the department of Information Science and Library Management, University of Dhaka, I am conducting a study entitled ***"Use and Applications of Library Software in University Libraries of Bangladesh".***

The core objective of this research is to explore the status of use and application of library software in university libraries of Bangladesh. Other purposes include: to find out the information professionals preference of library software and their satisfaction with the current software they are using, to illustrate the skills of library professionals in university libraries in Bangladesh and to find out the problems hindering software installation in university libraries and finally to offer recommendations to introduce automation and digital library software in university libraries of Bangladesh.

In order to collect the necessary information for my research work, I need to conduct a survey of university libraries in Bangladesh. Your response to the questionnaire is vital to the successful completion of my research.

I would be very grateful if you kindly spend your busy schedule to fill up this questionnaire.

I assure you that the information would be used for academic purposes following research ethics.

Thanking you very much in anticipation for your time and cooperation.

Yours sincerely,

Md. Mizanur Rahman

M.A (Session: 2011-12)
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Department of Information Science and Library Management
University of Dhaka, Dhaka-1000

APPENDIX-2: QUESTIONNAIRE FOR LIBRARY SURVEY

Questionnaire on

"Use and Applications of Library Software in University Libraries of Bangladesh"

(For Librarian)

[Please give tick (√) mark on the relevant ones. Please mark as many boxes as apply]

01. About the Institution and the Library

Name of the Library : .....
Year of Establishment of the Library : .....
E-mail : ..... Telephone/cell number: .....
Website (if any): .....

02. Collection Info:

Collection type	Amount
Books	
Monographs(Thesis, PhD paper, Research reports)	
Journal and periodicals (published by your institution)	
Journal and periodicals (published by others)	
Audio/Video tapes	
Photographs	
Maps	
Microfiche	
CD-ROM/DVD	
Digital collections (e-books, e-journals etc)	
Others	
Total	

03. ICT Info:

03.1 Please write the year ICT introduced in your library: ……..

03.2 Is the library automated?

- □ Fully
- □ Partially
- □ Not yet
- □ To be automated soon

03.3 Number of computers in your library-

For users	
For employees	

03.4 Which operating system your library mainly use -

- □ Windows
- □ Macintosh

- Unix e.g. Linux

03.5 Number of Server (if any): …….

03.6 Who provides the technical supports for ICT or automation services?

- IT staff within the organization
- IT staff from outside (Outsourcing)
- Library staff

03.7 How users access to your bibliographic information of library materials/catalogue?
(You can tick more than one if applicable)

- Through LAN (in campus)
- Through WEB/WAN
- Within library

03.8 Number of other physical equipments-

Name of equipments	Number
Computer	
Terminals	
Scanner	
Printer	
Barcode scanner	
RFID	
Others (if any)	

04.Staff Information

	Number of Staffs
Total Library Staff	
With General ICT knowledge	
Library Staff with Integrated Library Software Knowledge (e.g. KOHA, Evergreen etc)	
Library Staff with Digital Library Software Knowledge (e.g. Greenstone, DSpace etc.)	
With LIS background	
With Computer Science background	
Others	

04.1 Who are responsible for the development and implementation of automation and software project?

- Library staff
- Outsourcing
- ICT department attached with the library
- Both A and C

05. Automation of the Library

05.1 When automation program was first inaugurated in your library?

……

05.2 What is the software preference of your library?

- Open source
- Commercial Customized
- In-house developed

05.3 Integrated Library Automation System

Please give tick (√) which software is used in your library in different sections?

Software	Areas									
	Acquisition	Processing	Circulation	Cataloguing	Budget	Record	Administration	Reference	searching	Serial control
KOHA										
Evergreen										
Libsys										
Mirror										
Alice for Windows										
In house made										
Others										

05.4 Please indicate the use of library software in various functions of different modules:

In **acquisition** module (please give tick in the suitable one):

Functions	KOHA	Evergreen	Libsys	Mirror	Alice for Windows	In house made
Budget control						
Recording requests						
Checking of duplication						
Verification of books with order file						
Claiming for or cancellation of outstanding orders						
Accession work						
Reports:						
Preparation of order cards/slips						
Print out of received and non-supplied document						
Status of order						
Status of requests						
Status of funds						

In **cataloguing** module:

Functions	KOHA	Evergreen	Libsys	Mirror	Alice for Windows	In house made
Preparation of authority file						
Original cataloging						
MARC based data entry						
Importation of records from external sources						
Editing of catalog records						
Deletion of catalog records						
Preparation of shelf list						
Centralized/cooperative and shared cataloging						
OPAC						
Functions	KOHA	Evergreen	Libsys	Mirror	Alice for Windows	In house made
Web OPAC						
Reports:						
List of new catalog records						
List of new and dropped authority file terms						
Spine labels						
Book labels						
Barcode labels						
Catalog cards						

In **circulation** module:

Functions	KOHA	Evergreen	Libsys	Mirror	Alice for Windows	In house made
Registration of users						
Charging and discharging of items						
Renewal						
Reservation						
Calculation of fines						
Fine receiving						
Setting parameters for different categories of members						
Setting parameters for different categories of items						
Handling photographs of members						
Stocktaking						
Self-charging						
Reports:						
Book availability status						
Book issuance history						
Member wise issuance history						
Period wise issuance history						
Overdue notices production						
List of members						

05.5 Do users of your library can reserve, renew books using online circulation system of your software?

- Yes
- No

05.6 Where does your software hosted?

- University Server
- Local Commercial Server
- International Commercial Server

05.7 Do you offer training on library software use to the users of your library?

- Yes
- No

05.8 How frequently you offer the training?

- Very frequently
- Frequently
- Not frequently
- Rarely

05.9 Does your authority allow LIS professionals to attend workshop/training/conference on new technologies in library sector?

- Yes
- No

05.10 Who pays the fees?

- University authority
- Trainee
- Both a and b together

05.11 Please indicate the satisfaction of different modules of the software you are currently using

	Satisfied highly	Satisfied	Satisfied Slightly	Dissatisfied
Acquisition				
Processing				
Circulation				
Cataloging				
Budget				
Record				
Administration				
Reference				
Others (please write the name)				

05.12 Please mention (if any) names of two library software which have been used in the library before:

i.

ii.

05.13 Do you use “VuFind” for searching?

- Yes
- No

06.Digital Library System:

06.1 Have you launched digitization program?

- Yes
- No

(If you don't have digital library yet, please go to question no. 06.7. If yes, please answer all the following questions)

06.2 When the library started their digitization work?

……..

06.3 What type of software is used in your library?

- Open source
- In-house made
- Commercial

06.4 Name of the DL software you are currently using (Please tick)-

- Greenstone
- DSpace
- Fedora
- ePrints
- In-house developed (Please write the name here)
- Commercial DL software (Please write the name here)

06.5 Frequency of software package updating-

- Very frequently
- Frequently
- Not frequently
- Rarely

06.6 Indicate your satisfaction with the current DL software-

- Very satisfied
- Satisfied
- Neither satisfied nor dissatisfied
- Dissatisfied
- Very dissatisfied

06.7 Preferences of DL Software-

If you have not yet built a digital library system at your library please indicate your preference about DL software-

- Greenstone
- Dspace
- Fedora
- Eprints

- In house made
- Commercial
- If others, please mention the name…….

07. Services

07.1 Frequency of your library software maintenance /updating –

- Frequently
- Occasionally
- Rarely

07.2 Who does the updating-

- Library staff
- Outsourcing
- ICT department attached with the library
- Both A and C

07.3 Is the library available online from anywhere and anytime?

- Yes
- No

07.4 Whether your libraries analyze/collect the user satisfaction and their requirements about their use of the library or the software?

- Yes
- No

If yes, what is the frequency –

- Frequently
- Weekly
- Monthly

08.Overall Satisfaction

Softwares	Very satisfied	Satisfied	Dissatisfied	Very dissatisfied	Neither satisfied nor dissatisfied
Automation (integrated library automation) software					
Digital library software					
Open source software					
In-house software					

09.Budget

Please mention the budget allocation of your library:

Areas	2012	2013	upcoming 2014
ICT budget			
Software installation			
Software maintenance			
Others			
Total budget			

10.Problems and Recommendation

Please point out the problems that hinder automation at your institution:

Problems	Not a problem	Slightly Problematic	Problematic	Extremely problematic
Lack of professional staff				
Lack of ICT staff				
Lack of adequate staff to help user				
Lack of training to make staff efficient				
Lack of Integrated library software				
Lack of staff to customize and maintain digital library software				
Lack of local vendor support				
Lack of budget				
Lack of content management				
Lack of infrastructural facilities				
Low speed of internet connections				
Lack of coordination among departments				
Lack of equipments to digitize library resources				
Management is not interested				
Lack of web compatibility				
Lack of skilled human resources				
Lack of proper initiatives				
Lack of volunteer culture				
Problems	Not a problem	Slightly Problematic	Problematic	extremely Problematic
Lack of technical support				
Lack of security				
Lack of compatibility with hardware & software				
Minimum searching options are available				
Poor searching facility				
Non availability of all required modules				
Circulation module needs improvement				
Not error free				

Not compatible with different operating systems				
Not good speed				
Non compatible with web				
Not multilingual				
Searching display is not attractive				
Accessioning has duplication problems				
Catalog cards cannot be printed				
No proper documentation				
No updating				
Does not allow customization				
Difficulty in data handling				
Not standard software				

11. Please mention your suggestions and recommendations for the solution to the existing problems and for the development of the automation and digitization program -

i……
ii……
iii……
iv……
v……
vi……
vii……
viii……

Name of the Respondent:

Designation:

Signature & date:

Thank you for your co-operation

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