CHAPTER-1
INTRODUCTION TO THE SUBJECT

1.1 Library and Information Technology

Human society has traveled a long journey from the Stone Age to the Age of Technology. We are living today in the age of technology, and technological revolutions are founded on the pillars of information. Our present society is an information-based society. Every individual in the society—whether he/she is a student, a researcher, a specialist, a layman, a professional, an industrialist, a worker, a child or an aged person—need information of one kind or the other. The explosion of information has therefore to be analyzed and controlled, so as to derive maximum benefit. This implies, taking steps to ensure that the available information reaches to the right users at the right time. And there can possibly be no better organization/institution than a library for collecting, analyzing, storing, and disseminating right information to the right users.

The primary aim of education is to impart specialized and advanced knowledge to the students and enable them to acquire competence and skill in various fields of human activity. The real purpose of education is to bring out what is the best in a man to develop his personality, to train him to be useful to the society, so as to contribute to its culture, social and economic development and to make him a better person to enable him to contribute his might. The higher education in any where in the world has depended upon the libraries for successful implementation of its academic programs. The development of a country depends largely on its research output.

Universities are the highest academic institutions in a country, which produce intelligent, trained manpower, scientists and research workers and help to broaden the boundary of knowledge. The University has been described as “A community of scholars and students, engaged in the task of seeking truth”. Universities are integral
part of the society. Therefore, these have a social obligation to solve social, economic and political problems. University's research facilities are being increasingly used towards this aim.

The role of the universities has changed considerably, to include teaching and research, and the universities are required to provide training to foster the preservation and advancement of knowledge. This new role is essentially a twenty first century phenomena, necessitated by the industrial revolution and the increasing role of science in economic and industrial growth. These values have emphasized the need to orient the education system to suit and cater to the demands of time. In almost all the advanced countries, educational systems have been contributing to the economic progress, industrial development and social transformation. In fact, the universities in the developed countries have attained sustained results in the growth of the nation.

The library is the heart of education. A quality education is impossible without a good library. The quality of higher education and research depends to a great extent on a quality library. A well-equipped and well-managed library is the foundation of modern educational structure. Education, in the absence of library service, is like a body without a soul. They are supplementary to each other.

The most talked-about subject among library professionals today is the need for application of IT in libraries to meet myriad information requirements of the present changing society. Libraries and library professionals are undergoing rapid changes to cope with the demands of fast changing information requirements of its users. Unless, sincere efforts are made to cope with the situation, librarianship will definitely become obsolete. Traditionally, the LIS professionals have been doing all library operations manually and the curriculum of the Library and Information Science Courses in the country are not in consonant with the emerging requirements. Many librarians, therefore, are really in a dilemma where to start and how to proceed, to adopt the newly emerged situation.

Now a modern library and resource center usually have a computerized information management system, which promotes a collaborative relationship between
research and information (Ghosh & Wesley, 2002:135-145). The use of libraries is at an all-time high. The professionals need to continue to develop and support libraries because they work, and because they contain the knowledge resources upon which the present information society is based. Libraries are here to stay, but by no means are they going to remain the same. Technology is a tool, which will enable libraries to deliver more efficient way in the days ahead. Library systems are changing extremely at a rapid pace due to the development of technology. For the blessing of technology, clay plates, papyruses were changed into paper and finally to optical disks. Electronic materials have become more popular for their everlasting attribute, optimum storage capability, and efficiency. Libraries are dealing with myriad information sources for which, computer has become an essential part of the modern library systems. Data storage, processing, retrieval, use of digital texts, inter library networking, internet using, email, voice mail, video conferencing, procurement of library materials, circulation control, etc. are extensively being performed more efficiently in libraries with the help of computers and other communication technologies. The library patrons are also preferred to use more electronic resources and computerized services compared to conventional materials and services for their needs.

The last three decades have witnessed the emergence of major technological development (Sharma & Rawaran, 1997:100). The new technology brings forward to the information yield many products and services. Thus the nature and fundamental objectives and services of the library have been changing markedly with the emergence of information technology.

Presently various types of computers like micro, mini, mainframes are available for information processing at high speed and low cost with huge storage capacity. Combination of various computers and advanced communication technologies allowed the development of various computer networks like Local Area Network (LAN) and Wide Area Network (WAN) for transmitting information faster. Other developments in communication technology include audio-technology, audio visual technology, telex, videotext, facsimile transmission, online search electronic mail, teleconferencing, satellite technology, Internet, various types of input and output devices, etc. CD-ROM has been introduced in the libraries with potential of huge
storage capacity, good archival function, quick information retrieval, easy information handling etc.

University libraries are considered to be the nerve centers of the University, and must support teaching, research, and other academic programs. This task has become more important with information explosion. To access to information pin-pointedly, exhaustively and expeditiously, organized university library services have become essential. The teaching and research in universities are entered on their libraries.

1.2 Aims and Objectives of the Study

"The purpose of research is to discover answer to questions through the application of scientific procedures. The main aim of research is to find out the truth, which is hidden and...has not been discovered as yet" (Kothari, 2004:2).

Libraries are the main custodian, catalyst, and distributor of knowledge. At present, every user expects the IT applied library services. Without the connecting with information super highway a library cannot be able to meet the satisfaction level of a user. University libraries are playing a great role in disseminating information to their users. To get access to information pin-pointedly, exhaustively and expeditiously, organized university services have become essential. So, the use of IT, particularly in university libraries, to provide better services to its users becomes demanding. But, the state of IT-based services in the University Libraries of Bangladesh is far from satisfactory. As Bangladesh is a developing country, it is confronted with certain problems to introduce IT-based services and other facilities in the university libraries.

The present investigation, among other things, intends to identify the key problems that prevent the application of IT in the university libraries of Bangladesh and suggest possible solutions there of. The proposed study is, therefore, intended to focus on the following key aims and objectives:
The main objective of this study is to examine the status of the use of Information Technology (IT) in some selected public and private university libraries in Bangladesh, identify the problems, prospects, and constraints which mostly remained unexplored yet, and to suggest/recommend the solutions. This study is intended to focus on the following objectives:

1.2.1 To assess the status of the university libraries of Bangladesh and their capability of adopting Information Technology (IT);

1.2.2 To identify the extent, and areas in which these university libraries have adopted ITs in their day to day library and information related activities;

1.2.3 To ascertain both strength and weakness in adopting IT in university libraries of Bangladesh;

1.2.4 To identify the problems faced by the readers in exploiting the benefits of library resources and services;

1.2.5 To evaluate the various existing services in respect of their utility to readers to effect suitable modification and introduction of new services using IT facilities whenever necessary;

1.2.6 To find out the technical skill of manpower engaged in university libraries of Bangladesh and their ability to handle various ITs required for providing effective library services to the users;

1.2.7 To identify various areas of the library operations where information technology can be utilized;

1.2.8 To find out the major types of hardware and software that are suitable for university libraries; and that may be used;

1.2.9 To suggest means to overcome the existing problems and to improve the situation for the benefit of the users.
1.3 Scope and Limitations of the Study

Scope and limitation are the two fundamental features responsible for timely completion of any social investigation. The term, scope includes more than a simple designation of the population being studied. However, the scope must also include the level of generality of the study. As a rule, the research has the implications beyond the immediate data, since it was designed with the notion, but these implications need to be stated clearly. Scope and limitations also cover the way for stating now far the data have actually carried the problems being investigated, this clearly indicating the limitations of the investigation (Islam, 2007: 7).

1.3.1 Scopes of the Study

The scope of the present study thus, primarily confines to the present state and trend of the use of Information Technology prevailing in the public and private university libraries of Bangladesh. The followings are the scopes of the study:

1.3.1.1 The study covers the use of information technology if any, exclusively in some selected public, private and international university libraries in Bangladesh;

1.3.1.2 The study covers the application of computer and associated peripherals as the major part of the information technology, but no other domain of Information Technology;

1.3.1.3 The study covers the information management for processing, storing, retrieval and dissemination of information to library users; and

1.3.1.4 The study covers those activities, operations, and services of university libraries, which are directly related to the use of information technology.
1.3.2 Limitations of the Study

This study is restricted to some selected public and private university library systems functioning within the geographical area of People's Republic of Bangladesh, which serves to large number of students, have good teaching reputation and renowned faculty members and offer good facilities to the students and use Information Technology (IT) at least to some extent. Thus, the scope and limitations of the present study is as under:

1.3.2.1 The present study is restricted to the public and private university libraries, but not any other Academic library systems (i.e. limitation by type of libraries);

1.3.2.2 The study is confined to those public and private university Libraries exclusively functioning within the territorial jurisdiction of People's Republic of Bangladesh only (i.e. limitation by geographical area);

1.3.2.3 The present study aims to consider the status, problems, and prospects of the use of IT, which has been applied in different processing and dissemination activities and services of university libraries, irrespective of their size, collection, user population (i.e. limitation by technological application);

1.4 Methodology of Selection and Size of the Sample

"Sampling may be defined as the selection of some part of an aggregate or totality on the basis of which, a judgment or inference about the aggregate or totality is made. In other words, it is the process of obtaining information about an entire population by examining only a part of it" (Kothari, 2004:153).

The size of the sample becomes a prerequisite for timely completion of any social investigation. An optimum sample for a study may be defined as that sample which fulfills the requirements of the efficiency, representative, reliability and
flexibility. The sample should be small enough to avoid unnecessary expenses and large enough to avoid sample error beyond the limit of tolerance.

It is not wise in a qualitative study to select the sample without any preliminary survey, where samples are adequate, diverse, and inconsistent in their attributes. It is, therefore, decided to select the sample based on the background data elicited from the preliminary investigation by applying certain parameters as depicted in the succeeding paragraph. In order to avoid any possible error in selection of the sample, data relevant to the present study were collected in two phases, namely, through preliminary survey and final survey separately so as to achieve the core and preordained objectives of the study.

In the process, the mailing addresses were collected from the Annual Report-2007 of University Grants Commission (UGC). Hence, a census preliminary survey was made. So, the preliminary survey questionnaires were sent to all 80 (27 public, 51 private and 2 international) university libraries of Bangladesh, which are functioning within the geographical region of the People’s Republic of Bangladesh. To ease the comparative and qualitative survey the investigator categorized all the University libraries under three broad groups according to their mode of management as follows:

i) Public;

ii) Private and

iii) International.

Fortunately, 67 (83.75%) out of 80 samples were responded with duly filled up preliminary survey questionnaires. Where, 22 (81.48%) out of 27 public university libraries, 43 (84.31%) out of 51 private university libraries and 2 (100%) out of 2 international university libraries were responded. Though the response rate was satisfactory but the investigator tried a lot to increase the success rate of receiving the responses.
To reach the survey objectives the respondents were scrutinized in chapter 4 under section 4.2.8, by using ranking methods some selected university libraries were selected. Mention may be made that, the responded libraries were ranked under the mode of their management domain. To achieve the study objectives, these 67 responded university libraries were short listed according to their respective ranking based on the following 8 (eight) parameters with the special emphasis on the application of information technologies in their library activities and services.

i) Computer installed;

ii) Internet connection;

iii) OPAC Facilities;

iv) Automated Catalogue;

v) Automated Circulation;

vi) Number of Collection and

viii) Staffing strength.

According to the above parameters the highest top ranked $\frac{1}{3}$ of the samples have been selected as per the logic from public, private and international individually. As a result 8 out of 22 public university libraries, 15 out of 43 private and 1 out of 2 international university libraries have been selected for the final survey. Therefore, total 24 top ranked university libraries were selected for the final survey.

After then 'Final Survey' questionnaires were sent to said top ranked 24 selected Public, Private and International university libraries of Bangladesh in response to which 22 (92%) out of 24 filled-in questionnaires were received as feedback. Where individually 7 (88%) out of 8 public, 14 (93%) out of 15 private and 1 (100%) out of 1 international university libraries returned back duly filled it up questionnaires.
1.5 State of the Art

The ICT status of Bangladesh is not remarkable except for some favorable initiatives by the Government and by private entrepreneurs. The first computer came to Bangladesh in 1960 (Sattar, 1997: 275-277) and first mainframe computer came in 1964 (Rahman, 2001). PC became popular very late among the common people. Several large banks and private entrepreneurs in industrial sectors are the path makers of achieving benefits from computer and computerized applications. The Internet came late to Bangladesh with Unix-to-Unix Copy Protocol (UUCP) e-mail beginning in 1993 and IP connectivity in 1996 (Press, 1999). A joint survey by the Bangladesh Computer Council (BCC) and Bangladesh Bureau of Statistics (BBS), published in April 1999 has found that there were more than 78,000 PCs in Bangladesh by the end of 1998. In June 1999, the government decided to allow private entrepreneurs to act as Internet Service Providers (ISP) using VSATs (Very Small Aperture Terminal). In 1999, there were about 22,000 account holders with 10 ISPs (8 in Dhaka and 2 in Chittagong) and the total number of users ranges around 100,000, while in 2000, there are about 50 ISPs providing Internet services to more than 250,000 Internet users (Rahman, 2001).

In April 2000, the Government withdraws taxes on VSAT after that, the use of Internet scenario of the country has been changing rapidly. Presently, there are nearly 207 ISPs serving for accountholders-based connectivity with more than 500,000 users [1]. The Ministry of Science and Information and Communication Technology approved the national ICT policy in 2002. Meanwhile, the ICT Act 2003, based on the United Nations Commission on International Trade Law (UNCITRAL), known as the UNCITRAL Model Law on Electronic Commerce, has been passed and the Copyright (Amendment) Act 2005 has been passed to protect intellectual property rights, including computer equipments like software, hardware and patent.

South East Asia-Middle East-West Europe (SEA-ME-WE-4) is a submarine cable consortium connecting 14 counties at 16 landing stations. Bangladesh joined the consortium and signed a MoU on 4 September 2002 at Bali in Indonesia, and then signed the Construction and Maintenance Agreement in 2004 in Dubai. After four
years of joining the consortium, on 21 May 2006, the Prime Minister of Bangladesh inaugurated this submarine cable connecting with Bangladesh. The total length of the cable is 22,000 km (approx.), where the Bangladesh landing station is 1,260 km away from the Cox’s Bazar seashore. According to the Project Director, the Submarine Cable Implementation Project “...initially Bangladesh would get the opportunity to transmit data 10 gbps which are equivalent to 100,000-voice channel” (The Independent, 2006). Meanwhile, many ISPs in Dhaka have already started using the submarine cable although an appropriate cable infrastructure is yet in place.

To introduce the e-governance the Government of Bangladesh is to implement a project “Support to ICT Task Force” under which a computer networking would be established initially covering 6 Divisional HQs by connecting the 8 ministries in the Bangladesh Secretariat with the Prime Minister’s Office and the Planning Commission. The official website of the Government of Bangladesh is http://www.bangladesh.gov.bd/ contains link to ministries and government agencies. Government founded “ICT incubator centre” at Kawran Bazar in Dhaka, in which 48 firms are currently working in this incubator centre. An IT village is going to set up very close to Dhaka. The government has already made 18 acres of land available setting up IT village.
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Five private and one government owned cellular companies are operating competitively. Bangladesh Telecommunication Regulatory Commission (BTRC), issued license to the WARID Telecom in 2007 to operate their services in Bangladesh to create competitive telecom market and to help deliver low-cost telecommunication service to people. It is evident from the above table that the number of cell phone subscriber is growing rapidly compared to the fixed phone subscriber in Bangladesh. The growth rate of fixed phone subscriber recorded 20.29% in 2007. Against this, the growth rate of cell phone subscriber recorded 72.12% in 2003 and rose to 134% in 2007. In 2001, the mobile tele-density was 0.58 which increased to 16.85 in January 2007.

According to the University Grants Commission of Bangladesh (2007:), at present there are 27 public and 51 private and 2 international universities are providing higher education facilities through specific programmes in Bangladesh. The programme of learning must be supplemented by the library services not only to support academic purposes but also to upgrade the quality of students. Moreover, the poor income basis of the most of our students, high cost of textbooks and non-book materials also compelled them to depend on library from where they could borrow and use learning materials.
Mostafa and Bandyopadhyay (2004:294) have found in their study that the existing status of the university libraries of Bangladesh and their services are not satisfactory. There are lots of limitations, especially lack of budget, lack of proper IT facility, lack of communication and cooperation among university libraries engaged in library automations etc. Library users are dissatisfied with the current traditional library system and services rendered by the university libraries of Bangladesh. Both librarians and library users have high expectations and positive attitudes towards the importance of IT facilities for improving their library services”.

We know that, information technology can play an important role in helping libraries and information centers to better confront development challenges and to compete more effectively in the global information society. Information technology is being used in the various sectors of Bangladesh. But their use in libraries and information centers are indeed till unsatisfactory.

Bangladesh is going to establish a sustainable information communication infrastructure for keeping in touch with global information flow. Libraries and information service centers are getting immense facilities to access and cooperate with information world. Due to economic constrains, libraries of Bangladesh are facing a lot of problems. Internet connections are not satisfactory, and broadband connections, Digital Data Networks (DDN), and radio links are all still inadequate.

Although Bangladesh entered into the computer age in 1964, after passing 43 years, it could not reach up to its goal. In 1986 after the introduction of CDS/ISIS by UNESCO some libraries started with library automation projects using this software. The graphical user interface version of CDS/ISIS made things easier to the user. Islam & Rahman (2006:143) expressed in their article that “The government allowed the private companies to install VSATs and provide ISP services beginning June 1996. Since then Libraries have been slowly and steadily marching through for computerization and Internet facility. Some of the special libraries, public and private university libraries and information centers also started to automate their functions, and began to create bibliographic databases using CDS/ISIS, GLAS, Alice for
Windows, LIBSYS etc. Some of them are serving their catalogue services through Internet as OPAC”.

In an article Rahman (2005:103) stated that “among public universities, University of Dhaka and Bangladesh University of Engineering and Technology (BUET) are providing automated library facilities. Some universities like Rajshahi University, Chittagong University, Jahangirnagar University, Shahjalal University of Science and Technology, Khulna University and Islamic University, Kustia, are using computers but they do not yet introduce computers for automated library services. Among the 52 private universities, most are not using library management software. But a few private universities, like North South University (NSU), Independent University Bangladesh (IUB) and East West University (EWU) are providing automated library services. BRAC university library is going to launch automated library services within a short time. However no coordinated holistic approach is found”.

Sustainable Development Networking Programme (SDNP) is a UNDP funded non-profit ISP, which is working in the field of providing digital connectivity to academics, national and international agencies and development partners. They started a union catalog service in 2002 in their virtual library program.\(^{31}\) The SDNP virtual library has prepared this union catalogue of thirteen libraries, which are using CDS/ISIS software for bibliographic record keeping. SDNP virtual library union catalogue is a web-based Online Public Access Catalogue. SDNP converted CDS/ISIS records into MySql. The following 16 libraries/organizations are participating in SDNP Virtual Library Program:

(i) Library and Documentation Centre, BIDS [Special Library];

(ii) Bangladesh Agricultural University (BAU) Library [University library];

(iii) Bangbandhu Sheikh Mujibur Rahman Agriculture University (BSMRAU) Library [University library];

(iv) International University of Business, Agriculture and Technology (IUBAT) Library and Information Services [University library];
(v) Bangladesh Public Administration Training Centre (BPATC) [Special Library];

(vi) Unnayan Shamunnay (US) [Special Library];

(vii) Library and Information Services Unit (LISU) (previously Dissemination and Information Services Centre), International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) [Special Library]

(viii) Institute of Public Support Unit, Ministry of Environment and Forestry [Special Library];

(ix) Centre for the Rehabilitation of the Paralyzed (CRP), Bangladesh [Special Library];

(x) Capacity Building for Gender Mainstreaming Project [Special Library];

(xi) National Academy for Education Management Library [Special Library];

(xii) Independent University, Bangladesh, Dhaka [University library];

(xiii) East-West University [University library];

(xiv) Independent University, Bangladesh, Chittagong Campus [University library];

(xv) Darul Ihsan University [University library];

(xvi) BRAC University [University library];

SDNP’ s union catalog is not enough, but it shows us the future path of wide union catalog to established a sustainable library network among interested groups. Bangladesh has weathered some 36 years after independents, but it has been unable to achieve remarkable developments in the field of library and information services. Poor ICT infrastructure and lack of funding are the main drawbacks to develop our library services. Till now complete digital libraries are unthinkable in Bangladesh.
1.6 Literature Reviewed

Literature review is a jot down of an account of accredited scholars and researchers. Review of literature helps to identify the established findings on a chosen research subject. Understanding and organizing these findings will help to provide the required impetus for research.

Review of literature is, therefore, a vital pre-requisite for any social research as it shows well in advance the quantum of literature extended on a given subject along with its length and breadth. Similarly, this study aims at making a descriptive review of literature on application of information technology in university libraries in a global phenomenon, which in turn helped the researcher to determine the extent to which information technology has been applied in myriad library operations and their significance and impact on use of library resources. Therefore, this study has made a critical review of the literature already published in the above field. However, some of such important study that deserves mentions are as under:

1.6.1 Nigel Cox (Thompson: 1970) analyses the functions of university library under the five heading: (i) control – covering acquisition, accession, processing and shelving; (ii) archive – building up collection; (iii) service – including professional guidance to the readers; (iv) co-operation – linking the local and national network of library resources; and (v) research and development to enhance the library techniques.

1.6.2 According to Wilson, L.R. and Tauber, M.F (1975: 114), the university library functions as the conservator of knowledge and ideas. 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 programmes. No university can develop effective work, in the academic sense, without a strong library at its centre.

1.6.3 The Atkinson Report of 1976 enlisted the importance of library by saying “The library is the core of a university. As a resource, it occupies the central and
primary place, because it serves all the functions of a university teaching and research, the creation of new knowledge and transmission to posterity of the learning and culture of the present and the past. In a sense, a university library can be called the womb of higher education, which brings forth newer and newer areas of knowledge to take care of the well-being and future development of a nation. The university library is the focal point for those who seek information on diverse subjects, for those who wish to improve and update their knowledge and education for the purpose of teaching and research. It should be the goal of the university library to take care of the information needs of the academic community.

1.6.4 Daniels (1980:75) noted that Library automation may be defined as the application of automatic and semi-automatic data processing machines to perform library functions such as acquisition, circulation, cataloguing, reference service, and serials control.

1.6.5 Cotta-Schonberg (1989) revealed that Today, the library community as a whole is realizing that apart from the immediate practical advantages, computers and information technology (IT) in general are tools of a new information era which started with Gutenberg and lasted until the middle of the twentieth century.

1.6.6 “The Library as a Network-based Information Server” by Larsen (1991) expressed that, most would agree that the primary function of a library will continue to provide organized access to information, no matter what its form. But technological innovation is likely to add a new feature to “create on the network a knowledge management system that enables scholars to navigate through [the] resource in a standard, initiative, and consistent way”.

1.6.7 Mambo (1993) noted that in the developing countries, although computers will be required in all library activities, they should be deployed first to those areas where the service needs an immediate boost.

1.6.9 *Lambert (1994)* reported that IT applications in cataloguing were having a huge impact on the way academic libraries functions and the services they offer to their users.

1.6.10 *Borgman (1997)* expressed that computer have been used for about four decades now for different functions in libraries, especially in the developed world.

1.6.11 As propounded by *Raseroka (1999:11)* cited in *Rosenberg (1997)*, According to the survey of African libraries IT exploitation by university libraries for information organization and access has become prevalent. The automation of the university library through the use of the UNESCO Micro CDS/ISIS or purchased library software and the advent of the Internet and other information communication technologies (ICT) provide a golden opportunity for provision of value added services to parent organizations. Indexing, abstracting and publication of locally produced researches and their digitization to facilitate faster IT based access to meet researchers' and student learning needs. Digitization of local materials provides a window of opportunity is an extension of the technical process, which will facilitate African university library contribution to the communication of locally produced researches globally.

1.6.12 *Wolpert (1998:34)* expressed that university education process values self-motivated discovery on the part of students and faculty and assumes that libraries and librarians play an important sometimes essential role in education.

1.6.13 *Resenberg (1998:6)* stated that University education in Africa have leaned towards the adoption of IT—whether for the automation of libraries or for the accessing or acquiring of information through the use of CD-ROM or electronic networks—as being of key importance in solving university library problems.
1.6.14 *Eyitayo (1998:3)* noted that the pace at which IT is evolving is such that practically nearly every aspect of human endeavor is becoming affected and has brought with it such possibilities that are very amazing.

1.6.15 *Leech (1999:47)* expressed that public libraries have long been information hubs for the communities they serve, and the fact that these hubs are rapidly becoming electronic will only ensure better services.

1.6.16 *Raseroka (1999:11)* in her article on "The role of university libraries" stated that the convergence of Information Communication Technologies (ICT) as a basis for provision of information in the educational arena and to society in general, has created a need for universities to access and exploit ICTs in support of their core business. The accessibility and use of networking technology such as the word wide web (www), e-mail and real time for video conferencing communication tools used concurrently, allow distance learning, integration and exploration of information sources in different libraries, other web-based sources and human interaction. University libraries must craft a role in this challenging arena.

1.6.17 *Dutch & Muddiman (2000)* expressed that ICTs have, of course, had an important influence on the development of the UK public library for many years before the advent of these formal policy statements. In terms of the real impact of ICT on the public there is a clear and unsurprising pattern.

1.6.18 *Mutula (2000:320)* stated in his article titled "IT development in Eastern and Southern Africa: implications for university libraries" that new information technology, especially the Internet, has spawned the information revolution with the communication and transfer of information as text, images, audio or video being transmitted rapidly and inexpensively around the world. Many university libraries around the world, especially in developed countries, have taken advantage of these developments and have responded appropriately to exploit the opportunities offered by the new information technology.
1.6.19 Mutula (2000:332) expressed that University libraries in the region [Eastern and South Africa] are increasingly putting their online public access catalogues on the web to allow remote searching as well as reservation.

1.6.20 A survey conducted by Saeed, Asghar, Anwar & Ramzan (2000:157) on “Internet use in university libraries of Pakistan” stated that Findings related to the importance of the Internet for library functions revealed that it has taken a pivotal position for performing library tasks and improving library services.

1.6.21 In an article “IT development in Eastern and Southern Africa: implications for university libraries” expressed by Mutula (2000) that the rapid and continuing evolution of information technology has occasioned large stocks of electronic resources in libraries and created pressure for both library professionals and users to continue learning in order to provide effective service and make adequate use of the new information materials.

1.6.22 “Speaking IT, Staying a librarian: building successful relationship with the information technology organization without losing your identity as a librarian” by Heyman (2000), aptly described about the IT dependability in library. For myriad use of IT in the library, librarian used to get help from IT professionals. Digital divide and IT have captured a great part of the library. Librarians handle information and IT professionals handle technology. In some cases, it makes conflict. The work, therefore, suggested further that, librarians can collaborate successfully with IT professionals without losing their identities as Librarians.

1.6.23 Chopra (2000:49) expressed that an academic library network can be defined as a group of individual academic libraries that are interconnected through different nodes situated at different sites. Therefore, a common platform is created for sharing of resources for finding solutions to similar problems at less cost in least time and with much more efficiency.
1.6.24 Sawhney and Kotler (2001) consider that the age of information is also the age of information democracy, since information is becoming omnipresent and cheap. When the issue of marketing in the age of democracy and information is approached, it can be seen that users are obtaining information of a higher quality. In the statement of Rights for Users in the Age of Information, they underline the following rights: to be informed, to have privacy, to be heard, to remain anonymous, to be cited, to share profits, to request responsibilities, and the right for their rights to be recognized.

1.6.25 Vasanthi (2001) stated in her article on “The changing environment of academic libraries: end-user education and planning strategies for libraries in India” that the academic digital library (ADL) should provide new services and extend existing ones to guide libraries in the successful integration of traditional and digital formats. The programs of the ADL should support information access and delivery via electronic communications; information preservation, storage, and retrieval; information management consultation and training; new forms of scholarly and scientific communication; and development of the knowledge network of the university.

1.6.26 According to Sridhar (2001) in his article titled “Internet: a powerful tool disseminating medical knowledge in urban and rural India” stated that digital resources in the field of medical science are both timely and important, because, the medical knowledge of doctors at all levels can be enhanced very quickly.

1.6.27 Davarpanah (2001:447) stated that the dearth of on-line services and Internet facilities impedes the libraries from accessing up-to-date information of databases located outside the country.

1.6.28 Chowdhury (2001) in his study on, “Continuing Professional Education of Librarians Working in the University Libraries of Pakistan and Azad Jammu Kashmir” stated that, the Information Technology is changing rapidly and application of IT in libraries and information centers are growing very fast. The
rapid development of IT and its application are greatly influencing library and information scientists to a change with the development of IT and their use for futuristic approach.

1.6.29 *Bostick* (2001:129) noted that for academic libraries, consortia are becoming an increasingly important part of the culture, particularly because the cost of library collections and services has soared.

1.6.30 *Hewitson* (2002) stated in his “Use and awareness of electronic information services by academic staff at Leeds Metropolitan University—a qualitative study” that in new-style libraries combining services such as teaching, information technology (IT) facilities and access to academic archives with library services has brought more students through the library doors and most important has increased the number of resources borrowed.

1.6.31 In “Limited to access you can look but don’t touch”, *Cobb* (2002) has given his opinion about unlimited access through information super highway. In the new digital age the concept of open access mentality flourished a new gateway for information seekers. Digital access in the information is increasing day-to-day and becoming open to all.

1.6.32 *Konnur & Madhusudhan* (2004:197) expressed that Academic libraries need to enhance and upgrade current technical architecture to accommodate digital material. The architecture includes: high speed local networks and fast connections to the Internet, relational databases that support a variety of digital formats, full text search engines to index and provide access to resources, variety of servers, such as Web servers and FTP servers and electronic document management of digital resources.

1.6.33 *Ani, Esin & Edem* (2005:701) stated in their article titled “Adoption of information and communication technology (ICT) in academic libraries: a strategy for library networking in Nigeria” that the use of information technology (computers, telecommunication, reprography, etc.) has a special role in the modernization of library practices.
1.6.34 *Ani, Esin & Edem* (2005:702) stated in their article titled that the use of library networks to facilitate library cooperation and resource sharing cannot be overemphasized; hence the need for the adoption and provision of electronic or computer networks in academic libraries.

1.6.35 *Ani, Esin & Edem* (2005:707) stated in their article titled that Libraries must give priority to ICT if they are to continue in the business of providing information to the public and remain as the main point of access for researchers/students—this means then that the provision of OPACs at all service points and access to the Internet and the world wide web are vitally imperative.

1.6.36 *Amekuedee* (2005:452) stated that University libraries should get their various university administrations to purchase an OPAC software for them as a matter of urgency and finally more computers should be purchased for the libraries because there can be no library automation without investment in computers.

1.6.37 *Fatoki* (2005:272) noted in her paper on “The prospect of GSM technology for academic library services” that the seemingly high cost of calls on the networks presently might still make libraries sceptical about the possible adoption of GSM services.

1.6.38 *Singh* (2005:680) expressed in this article on “The role of technology in the emergence of the information society in India” that The University Grants Commission (UGC) and Indira Gandhi National Open University (IGNOU) are actively involved in the educational process through their regular e-learning programmes.

1.6.39 *Oduwole* (2005:290) asserts that automation in cataloguing has enhanced efficiency and productivity and has produced new assignments for copy cataloguers. With the use of IT in cataloguing, card catalogues are closed down, on-line systems are developed, bibliographic utilities are joined, cataloguing records are standardized, resources are shared through networking and staff are reassigned.
1.6.40 *Asemi and Riyahiniya* (2006:2) in their study entitled “Awareness and use of digital resources in the libraries of Isfahan University of Medical Science, Iran” revealed that Academic libraries must be a place of discovery for students and the use of digital resources can be a proper tool to have a voyage of discovery in depth of these resources.

1.6.41 *Emojorho & Adomi* (2006:706) stated that Information Technology (IT) encompasses a range of new technologies and their application, including all aspects of the use of computers, micro electronic devices, satellite, internet and communication technology. These technologies are somewhat revolutionary in institutions of higher learning because of the speed of their development as well as their ability to record, manipulate and communicate information effectively.


1.6.43 *Fourie & Bothma* (2006:471) expressed in their article on “Addressing the digital divide in teaching information retrieval: a theoretical view on taking students from ICT access to knowledge sharing” that the technologies offer students the tools to explore, experiment, construct, converse, and reflect on what they are doing, so that they learn from their experiences.

1.6.44 *Ani, Uchendu & Atseye* (2007:363) stated that the prevalence of the digital divide in developing countries is a serious threat to effective utilization of information for socioeconomic development and nation building. In Nigeria, using University of Calabar in Calabar Metropolis as a case study, survey findings show that a digital divide exists in areas such as gender, marital status, age, and educational level of the Internet users.
1.6.45 Kavulya (2007:301) cited that Endres and Fellner (2000) argue that the notion of
digital library embraces two related concepts: digitization of all media, which
results in the "electronic library" and "virtualization" of the library service,
which leads to the "virtual library". Consequently they see digital libraries as
encompassing three issues: storage of text and images in electronic devices
(electronic library), provision of library services to remote based customers
(virtual library), and integration of library stock and services efficiently
through standard methods by use of intelligent system.

1.7 Hypothesis

"A hypothesis may be defined as a proposition or a set of propositions set forth
as an explanation for the occurrence of some specified group of phenomena, either
asserted merely as a provisional conjecture to guide some investigation or accepted as a
highly established facts" (Kothari, 2004:184).

"A hypothesis is a proposition that is stated in testable form and predicts a
particular relationship between two or more variables" (Baily, 1982: p. 41).

"Hypothesis is the feature of the theoretical model closest to the things
observable that the theory is trying to model" (Dublin, 1969: p. 211-12).

Hypotheses are usually considered as the principal instrument in research. Its
main function is to suggest new experiments and observations. In fact, many
experiments are carried out with the deliberate object of testing hypothesis. In social
science, where direct knowledge of population parameter(s) is rare, hypothesis testing
is the often used strategy for deciding whether a sample data offer such support for a
hypothesis that generalization can be made, therefore, the specific predictions
stemming from a broader theory about what is expected to happen in a particular set of
circumstances. For any one-research study, hypotheses or predictions are derived from
a more general theory and an experiment is designed to test the hypotheses. If the
hypotheses are not supported, the theory is weakened. So, hypotheses are very much
crucial so as to keep the investigation in right track.
This study formulated the following hypotheses for scientific progress of the investigation:

\( h_01 \) There is no association between the management domain of the university and the computer installation in the university libraries of Bangladesh;

\( h_02 \) Location of the university libraries of Bangladesh does not have any association with internet connectivity;

\( h_03 \) There is no relation between computer installation, Automated Cataloguing, Automated Acquisition, Automated Circulation and OPAC facilities in university libraries of Bangladesh;

\( h_04 \) There is no relation between the mode of management and the number of collections in the university libraries of Bangladesh;

\( h_05 \) There is no association between the number of Manpower and the Mode of Management of the University Libraries of Bangladesh.

\( h_06 \) There is no significant difference between the present staffing pattern of public and private university libraries of Bangladesh.

\( h_07 \) There is no significant difference between the levels of IT applications in the private and public university libraries of Bangladesh.

\( h_08 \) There is no significant difference between the specialized general services of the private and public university libraries of Bangladesh.
1.8 Methodology Followed

The term ‘methodology’ in broad sense refers to the processes, principles, and procedures by which the researchers approach problems and seek answers. In social research, the term applies to how one conducts research. As in everything else the researchers do, their assumptions, interests, and goals greatly influence the methodological procedures.

“Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it, we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is not only necessary for the researcher to know only the research methods/techniques, but also the methodology”. Thus when we talked to research methodology we not only talk of the research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or techniques and why we are not using others so that research results are capable of being evaluated either by the researchers himself or by others” (Kothari, 2004: 8).

The present study is primarily aimed to examine the status of public and private university libraries of Bangladesh in terms of using IT in their various library activities and services, and the extent to which they are effective.

The names and addresses of public and private university libraries functioning in Bangladesh were collected from the Annual Report of University Grants Commission (UGC) and through personal contacts and these samples were designed in ‘sampling frame’ method.

The survey method was adopted and the questionnaire was framed with the following broad facets so as to gather necessary data from the librarians/ Head of the library/information officers of the sample public and private university libraries of Bangladesh included in this study.
i) Background information;

ii) State of library collection;

iii) State of library services and utilization of the resources;

iv) State of work force;

v) State of library finance;

vi) State of space and physical condition;

vii) State of user population;

viii) State of standardization /technical processing;

ix) State of computerization;

x) State of internet connection and the web-based facilities;

xi) State of networking;

xii) State of present problems and constraints encountered by the library staff in using IT; and finally

xiii) Possible prospects of the application of IT /computerization in University libraries.

The responses of the samples were scrutinized, classified, tabulated, and analyzed with the suitable statistical techniques to attain the survey objectives. Running references have been used in text and Harvard Referencing Style has been followed in this thesis in text references, bibliographical descriptions, but the general web references have been shown as e.g. 1-1
1.9 Social Impact of the Study

Libraries are indispensable for society; these educate, inform and convert an individual into a better citizen, which makes information available in a better, organized and more economical manner. Libraries in the academic institutions have a fundamental role to play in the development of higher education. To enable the academic to meet the demands of higher education and to help them keep abreast of the latest developments in their field of specialization, it is essential to have well stocked libraries with IT facilities. Thus the university has a great role to play to keep pace with the developing trends in the field of education and research.

The conditions of university libraries of Bangladesh are miserable in comparison to those of developed countries. Most of the university libraries in the country are not adequate in resource collection, in organization of materials, in providing services and also are not yet equipped with modern technologies. Computerized documentation or information retrieval services are not adopted in most of the university libraries.

No comprehensive work covering university libraries in regard to use of Information Technology (IT) has yet been done in Bangladesh. This work is supposed to give a representative picture of university library situation in Bangladesh with their functional capability in relation to the use of Information Technology in their day-to-day services.

This sort of assessment would also depict a clear picture on the magnitude of modernization of the university library systems needed to adopt Information Technology in their environment. So, to ensure optimum utilization of their library resources, besides helping to develop a suitable library network through Information Technology in future, the possible outcome of the proposed study would be of considerable help to policy makers, and planners to suitably reform the university library systems and services of the country.
Further, this would help to develop an appropriate network of university libraries in Bangladesh with the help of IT to make the university libraries more responsive and user-friendly.

1.10 Originality of the Study

"Application of IT in Libraries" has been chosen as research topic. However, no comprehensive study on “Application of IT in the University Libraries of Bangladesh” in particular has yet been done in Bangladesh. So, no attempt has yet been made to unfold the condition of IT application exclusively in different university libraries of Bangladesh. This study neither has done by the practicing university Librarians nor the researchers in this field. From the best of my knowledge this study is the first serious effort of its kind to investigate the problems and prospects of the application of IT exclusively in the university libraries of Bangladesh. Hopefully, this effort would be able to disclose the status of IT using in university libraries of Bangladesh.

1.11 Scheme of the Work

Chapter -1: INTRODUCTION TO THE SUBJECT

This chapter is an introductory one that gives a detailed outline of research design including a brief introduction on the subject; Aims and Objectives; Scope and Limitations; Methodology of Selection and Size of the Sample; State of Art; Literature Reviewed; Hypotheses formulated; Methodology followed.

Chapter -2: GROWTH AND DEVELOPMENT OF UNIVERSITY LIBRARIES: A BRIEF SKETCH

It contains a detailed description of University libraries that includes the beginning, Growth, and Development along with the current scenario of University libraries covering global, regional, and local perspectives;
Chapter 3: GROWTH AND DEVELOPMENT OF INFORMATION TECHNOLOGIES AND THEIR USAGE IN THE LIBRARIES WITH SPECIAL REFERENCE TO THE UNIVERSITY LIBRARIES OF BANGLADESH: A HISTORICAL OVERVIEW

It bears an overall description of IT that includes the History, Development, and the present status of trends and its application in the University libraries with special reference to Bangladesh;

Chapter 4: ANALYSIS AND INTERPRETATION OF DATA

This part of the thesis reflects a detailed analysis of data and makes necessary interpretations including findings and provides the results of the present investigation conducted at two different stages – (i) preliminary and (ii) final survey so as to achieve the predetermined objectives of this investigation;

Chapter 5: FINDINGS AND SUGGESTIONS

It is the last chapter, which clearly presents a precise summary of findings, conclusion, and suggestions of the investigator along with the areas for the further study, followed with a bibliography, an index, a list of libraries studied, and the questionnaire administered for the purpose at the end.

1.12 Physiographic state of the Country Surveyed

Without the patting of historic, geographic and socio-economic condition of a country, it is very hard to represent this. A country with various natural resources can never be deprived of its people from the facilities they deserve. The more rich and compatible physiography of a nation, the more developed its libraries expected to be. It is important to represent the physiographic state of Bangladesh for the purpose of acquiring background knowledge so as to understand the environment in which those University libraries established.
The Europeans began their trading posts in the area of the then Bengal in the 16th century; eventually the British came to dominate the region and it became part of undivided British India. In 1947, West Pakistan and East Bengal (both primarily Muslim) separated from India (largely Hindu) and jointly became the new country of Pakistan. East Bengal became East Pakistan in 1955, but the awkward arrangement of a two-part country with its territorial units separated by 1,600 km left the Bengalis marginalized and dissatisfied. East Pakistan seceded from its union with West Pakistan in 1971 and was renamed Bangladesh.

Bangladesh has an area of 1,48,393 sq. km and occupies the apex of the arch formed by the Bay of Bengal into which all rivers flowing through the country drain (land area of about 1,47,570 sq. km) and it is located in South Asia, between 20°34'N to 26°38'N latitude and 88° 01E to 92° 41E longitude. Maximum extension is about 440 km in E-W direction and 760 km in NNW-SSW direction. The Indian states of West Bengal, Assam, Meghalaya and Tripura border Bangladesh in the west, north and east respectively. Myanmar (Burma) forms Southern part of the eastern frontier. The total length of the land border is about 4,246 km, of which 93.9% is shared with India and about 6.1% with Myanmar. The country is bounded in the south by the Bay of Bengal.

Bangladesh has one of the most complex river systems in the world numbering about 700 under three mighty river system: Ganga—Padma River system, Brahmaputra—Jamuna River system and Surma—Meghna River system with their tributaries having a total length of about 24,140 km. The climate of Bangladesh is subtropical monsoon. Average maximum and minimum winter temperatures are 29°C and 11°C respectively; average maximum and minimum summer temperatures are 34°C and 21°C respectively. Annual rain fall 1,194 mm to 3,454 mm. Highest humidity 80% to 100% (August—September), lowest 36% (February—March) (Banglapedia, 2003: 457).

Soil of Bangladesh may be divided into three main categories, namely hill soils (Chittagong and Sylhet regions), terrace soils (Barind and Madhupur tracts) and alluvial and flood soils (Bangladesh, 1995:16). Population 138.8 million (projected in
2006), Male-Female ratio 105.4 and density per sq km 941 (projected in 2006), Life expectancy is 64.9 years; population growth rate 1.438 (as on 2003). Per Capita national income is US$ 482. Per Capita Gross Domestic Product (GDP) is US$ 456, GDP growth rate in constant price is 6.71% (BBS 2006: 27). It comprises (i) 6 divisions, (ii) 64 districts, (iii) 599 police stations/upazilas (481) (iv) 6 city corporations and (v) 87319 villages. The key indicators of Bangladesh are shown in Table 1.3.

Table 1.3
Socio-Economic Indicators of Bangladesh (Concise)

<table>
<thead>
<tr>
<th>General</th>
<th>20°34-26°38' North latitude 88°01-92°41' East longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (sq. km)</td>
<td>147570 (land only)</td>
</tr>
<tr>
<td>Standard time</td>
<td>GMT +6 hours</td>
</tr>
<tr>
<td>Vital Statistics</td>
<td></td>
</tr>
<tr>
<td>Population (Million), 2008 (Projected)</td>
<td>144.5</td>
</tr>
<tr>
<td>Population Growth Rate (Percentage), 2008</td>
<td>1.39</td>
</tr>
<tr>
<td>Male-Female Ratio, 2008</td>
<td>105</td>
</tr>
<tr>
<td>Population Density/Sq Km, 2008 (Projected)</td>
<td>979</td>
</tr>
<tr>
<td>Basic Vital Statistics</td>
<td></td>
</tr>
<tr>
<td>Crude Birth Rate (Per 1000 Population), 2007</td>
<td>20.9</td>
</tr>
<tr>
<td>Crude Death Rate (Per 1000 Population), 2007</td>
<td>6.2</td>
</tr>
<tr>
<td>Infant Mortality Rate (Per 1000 Live Birth), Below 1 Year of Age, 2007</td>
<td>43</td>
</tr>
<tr>
<td>Total Fertility Rate per Women, 2007</td>
<td>2.39</td>
</tr>
<tr>
<td>Contraceptive Prevalence Rate (%), 2007</td>
<td>59.0</td>
</tr>
<tr>
<td>Life Expectancy, 2008</td>
<td>66.7</td>
</tr>
<tr>
<td>Life Expectancy, 2008, Male &amp; Female</td>
<td>65.6 &amp; 70</td>
</tr>
<tr>
<td>Mean Age at First Marriage, 2007 Male &amp; Female</td>
<td>23.6 &amp; 18.4</td>
</tr>
<tr>
<td>Health and Social Services</td>
<td></td>
</tr>
<tr>
<td>Persons Per Hospital Bed (Including Dispensary), 2007-08</td>
<td>2874</td>
</tr>
<tr>
<td>Persons Per Registered Physician, 2007-08</td>
<td>3469</td>
</tr>
<tr>
<td>Safe Drinking Water Use (%), 2008 (Rural &amp; Urban)</td>
<td>85.0 &amp; 60.0</td>
</tr>
<tr>
<td>Sanitary Latrine User (%), 2008 (Rural &amp; Urban)</td>
<td>87.0 &amp; 87.0</td>
</tr>
<tr>
<td>Rate of Poverty Based on Household Income &amp; Expenditure Survey (HIES), 2005</td>
<td>40.0, 43.8 &amp; 28.4</td>
</tr>
<tr>
<td>Based on CBN Method (Using Upper Poverty Line: National, Rural &amp; Urban (CBN=Cost of Basic Needs)</td>
<td>25.1, 28.6, &amp; 14.6</td>
</tr>
<tr>
<td>Based on DCI Method: National, Rural &amp; Urban</td>
<td>40.9, 40.1 &amp; 43.6</td>
</tr>
<tr>
<td>Financial</td>
<td></td>
</tr>
<tr>
<td>Gross Domestic Products (GDP), 2007-08 (Provisional)</td>
<td>5419.19</td>
</tr>
<tr>
<td>GDP at Constant Price (In million BDT)</td>
<td>3217.86</td>
</tr>
<tr>
<td>Per Capita National Income (In BDT)</td>
<td>41103</td>
</tr>
<tr>
<td>Per Capita GDP (In BDT)</td>
<td>38056</td>
</tr>
<tr>
<td>Per Capita GDP (In US$)</td>
<td>554</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Literacy Rate (%) Age 7+ (2004) National: Both sex, male, female</td>
<td>50.0, 53.7 &amp; 46.2</td>
</tr>
<tr>
<td>Literacy Rate (%) Age 15+ (2004) National: Both sex, male, female</td>
<td>57.6, 57.2 &amp; 45.8</td>
</tr>
</tbody>
</table>

(Source: Ministry of Finance, Bangladesh 2008: XVII)
Map of Bangladesh

Map-1

Page # 35
1.13 Conclusion

The use of telecommunication and computer technologies in the context of libraries has been the product of continual development rather than a sudden moment. Information Technology has virtually unlimited potential for getting shaped on the Internet and different networks around the world.

In the past, materials were published in print, thus only printed materials were collected by the libraries and, users used to come to the library to make use of these books and journals. But now a day, the advent of a new format for information enabled libraries and users to access multimedia information from remote locations anywhere in the world and the users can also search and reserve their items through OPAC. Since Library and Information Science is a practical oriented, professional and technical discipline, research has a tremendous impact on the development of library system. By understanding research in library and information science coupled with the continuous improvement to achieve the centre of excellence in terms of disseminating information, the University library can become the true and effective facilitator of knowledge and promote its R & D activities to a new thought.

Science the present study is new of its kind and no comprehensive work covering university libraries in relation to use of IT have yet been done in Bangladesh. This study intends to provide a comprehensive picture of University Library situation in Bangladesh, with their functional capability in relation to the use of IT in their library activities and services. This sort of assessment would also depict a clear picture on the magnitude of modernization of the university library systems needed to adopt Information and Communication Technologies in their library environment, and to ensure optimum utilization of their library resources, besides helping to develop a suitable library network in Bangladesh through IT in future. The outcome of the present study would, therefore, be of considerable help to University libraries administrators, policy formulators and planners to suitably reform as well as reengineer the university library system of the country, beside aiding to develop an appropriate network of university libraries in Bangladesh.
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