

## Usage of a digital library system at a private university library in Bangladesh

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The factors that influenced usage of digital libraries at East West University in Bangladesh have been explored. Questionnaire-based survey and observation methods were used to collect primary data from 129 users of East West University Digital Library (EWUDL). The findings suggest that some factors such as users' knowledge of search domain, quality of digital library content, system characteristics, service quality, perceived ease of use, perceived usefulness, and intention to use influenced the usage of the digital library. Users' intention to use digital library is significantly related to their perceived ease of use and perceived usefulness of the system. The users were more or less satisfied with EWUDL. The study identified a number of challenges in establishing a digital library system in a university in Bangladesh. Some suggestions for adoption and usage of digital libraries in the country are made.

**Keywords:** digital libraries; usage; East West University; Bangladesh

### Introduction

The emergence and widespread use of internet and web technologies have made profound impact on traditional library operations, management and services. Libraries have undergone a transformation from a manual system to a technologically-driven system. Libraries of all sizes and types are now adopting the latest technologies and innovations in order to find new ways to organize and manage information resources, and to provide user-centred information services. The concept of a "digital library" is not merely equivalent to a digitized collection with information management tools- it is rather an environment to bring together collections, services, and people in support of the full life cycle of creation, dissemination, use, and preservation of data, information, and knowledge<sup>1</sup>. According to Borgman et al<sup>2</sup>, "digital libraries are a set of electronic resources and associated technical capabilities for creating, searching, and using information. In this sense, they are an extension and enhancement of information storage and retrieval systems

that manipulate digital data in any medium (text, images, sounds, static or dynamic images) and exist in distributed networks."

A number of digital library initiatives were undertaken in North America, Europe and Australia during 1990s. Different research projects focused on the issues underlying the design, development, and usability of digital library. Two of the examples of international (global) digital library initiatives are the World Digital Library project, coordinated by the Library of Congress and sponsored by UNESCO; and the National Libraries Global project, developed by the National Library of New Zealand<sup>3</sup>.

The digitization of libraries in Bangladesh, however, is not pervasive. Some efforts have been made by university libraries to create digital libraries. The initiatives of the information professionals toward digital librarianship reveal some activities including the acquisition and subscription of e-books and e-resources, developing online databases and repositories, and providing searching and downloading facilities<sup>4</sup>.

Although digitization of libraries is still in its infancy in Bangladesh, a few initiatives have digitized materials and are providing digital library services.

Islam<sup>5</sup> mentioned some of these initiatives, e.g. Bangladesh Bureau of Educational Information and Statistics (BANBEIS) undertook the library and documentation centre automation and digitization project in December 2008 and the first phase of this project was completed in December 2009. International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), Bangladesh Institute of Development Studies (BIDS), and Ayesha Abed Library have ongoing digitization projects. Islam<sup>6</sup> identified that BRAC University Library, East West University Library, ICDDR,B Library, Islamic University of Technology Library and North South University Library have established digital libraries in order to provide full-text information resources. Earlier, Shoeb<sup>7</sup> focused on setting up an IR at the Independent University, Bangladesh (IUB). Moving toward a next-generation library, BRAC University Library implemented a number of projects using open source software. This included developing an institutional repository using DSpace; an integrated library system using Koha; a library resource portal using Vufind; and a content management system using Drupal<sup>8</sup>. Shuva<sup>9</sup> mentioned that noticeably, International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) and Agricultural Information Center (AIC) were the pioneers in creating and introducing bibliographic databases on specialized subject areas. Later, a number of initiatives had been taken to digitize the collection of libraries. The digitization project of Bangladesh Bureau of Educational Information and Statistics (BANBEIS) digitized 400 books, reports, and statistical documents from April to June 2009.

Bangladesh Rural Advancement Committee (BRAC) University is the first university in Bangladesh to establish a digital institutional repository started in June, 2008. The repository was funded by the International Network for the Availability of Scientific Publications (INASP). ICDDR,B has also developed its institutional repository and started to include articles and research papers in the repository. Bangladesh Institute of Development Studies (BIDS) also has an ongoing digitization project to digitize all its publications. Moreover, Eastern University (EU) has also

integrated Greenstone and Koha for integrated digital library system. It has included internship reports, thesis papers, news clippings and EU publications into its digital collection so far. Another significant initiative of building a digital library consortium was taken by the University Grant Commission (UGC) in June 2012. The UGC digital library (UDL) is largely funded by the World Bank's Higher Education Quality Enhancement Project (HEQEP). The UDL consortium supports teaching, learning and research by facilitating online access to a high-quality and scholarly electronic resources to all member institutions (both public and private universities of Bangladesh) at substantially lower rates of subscription. From 1 July 2012, UDL is offering access to three major online information resources: ACM Digital Library, Emerald and JSTOR.

Despite such important efforts, the empirical evidence of usage of digital library systems is still limited, and therefore, the adoption process and the determinants of adoption of digital library have basically remained unknown in the dynamic socio-technical complex environment. In addition, there are different antecedents which influence digital library adoption among the users. It is necessary to understand how users feel about the digital library, and more importantly, what are the factors that will influence the intention to use digital library<sup>10</sup>. Thus, the present research problem has been formulated to explore the factors that influenced usage of digital library system based on a case study of East West University Library, a pioneer private university library in Bangladesh.

### **The East West University (EWU) Digital Library System**

The EWU library launched computer based library services effectively in 1996. To keep pace with modern IT based world, the library in assistance with SDC (Software Development Center) of EWU developed unique indigenous library software namely East West University Library Management Information System (EWULIBMIS) to support and manage various library activities. The library software included processing system, circulation system based on barcode, catalogue search as well as other useful features. In addition, the software could also generate different kinds of library reports like user's status, acquisition report,

department-wise report, subject-wise report, overdue of books, fine circulation, etc.<sup>11</sup> EWU library transferred its bibliographic data to the integrated library system KOHA successfully in 2010. Finally, in 2011, EWU launched its digital library.

The library has used DSpace to build their institutional repository, where students, staff, or teachers can contribute their resources. EWU library started developing a collection of newspaper clippings related to Business, Economics, Health, Technology, Human rights, etc. Then it started uploading other types of documents including thesis paper, dissertation, project report, and their own published journal articles, etc.<sup>12</sup> East West University Library introduced "Virtual Library Service" on 18 July 2010. The Library collection has grown steadily. At present, the total number of library books and CDs are 23,740 and 1,400 respectively. The collection of EWU Library comprises of books and periodicals related to the field of business studies, economics, liberal arts, social sciences, electrical and electronic engineering, physics, pharmacy, computer science, mathematics, English language and literature and Bangladesh studies, Public Health. EWU library enables students and faculty to access a wide range of journal articles through BIPC (Bangladesh INASPERii Consortium) and UDL (UGC Digital Library) consortium. Through this consortium, the faculty, staff, and students of EWU can subscribe a number of journal databases and e-books. The users of this library can subscribe to resources of 30 well-known and reputed publishers of the world because of the consortium, such as JSTOR, Agora, HINARI, OARE, Springer, etc. Thus, the digital library system of EWU provides users with access to e-journals, e-book and virtual book collections, electronic theses and dissertations, newsclippings, image library, audio library, video library, Bangla collections, etc.

### Review of literature

Coleman<sup>13</sup> discussed about the uses and users of interactive digital libraries in terms of interactivity, information behavior, and language. She found that modeling information behavior and generating requirements based on these models is more effective to develop uses of interactive digital library. In such modeling, three types of information behaviors were distinguished: information seeking,

information searching, and information use. Chowdhury<sup>14</sup> enunciated the need for, and provision of, personalized information services in the next generation digital libraries as the Web and digital libraries are meant to provide direct access to information sources and services without human intermediaries. While focusing on the needs of the digital library, Zhang<sup>15</sup> emphasized that in terms of the technologies used in digital libraries, the evaluation should include the novelty, innovativeness, usability, usefulness, and the access mode. Assessing the importance of digital library has become complicated by the expansion of technology associated with it. A number of studies have been conducted in identifying constructs and investigating their impact on digital library adoption and usage. Table 1 summarizes some of the factors of DL adoption and usage-related studies.

Park et al<sup>20</sup> examined the factors that have significant impact on peoples' adoption and use of digital library systems in the context of developing countries. Domain knowledge and experience in computer use were found to influence perceived ease of use. They added three new categories namely English literacy, users' interest in publishing and conducting research, and library assistance through technical support. Among the system characteristics of this proposed model, visibility of the system did not have any significant impact on perceived usefulness, while ease of access and relevance of system have impact both on perceived ease of use and perceived usefulness. Moreover, perceived ease of use was significant in influencing perceived usefulness (PU) which later culminated into behavioral intention to use digital library. In another study, Hong et al<sup>10</sup> mentioned that in order to encourage users to accept and continually use digital libraries, library professionals, designers and managers need good understanding of the factors that influence users' adoption. Perceived ease of use and perceived usefulness were found to be significant antecedents of the intention to use a digital library. Individual differences, such as computer self-efficacy and knowledge of search domain were found to have positive effect on perceived ease of use of digital libraries. As one of the system characteristics, relevance had a significant impact on both perceived ease of use and perceived usefulness, while the

Table 1—Summary of the variables related to DL adoption and usage

Author(s) of works	Year	Methodology used	Variables
Brown <sup>16</sup>	2002	Survey of students who had recently been introduced to web-based learning technology.	Ease of finding, ease of understanding, self-efficacy, computer anxiety, perceived usefulness, perceived ease of use, usage.
Venkatesh et al <sup>17</sup>	2003	A questionnaire –based survey	Performance expectancy, effort, expectancy, social influence, and facilitating conditions.
Ramayah and Aafaqi <sup>18</sup>	2004	A questionnaire –based survey	Self-efficacy, perceived ease of use, perceived usefulness, usage.
Porter and Donthu <sup>19</sup>	2006	A survey in a major Southeastern US metropolitan area.	Age, education, income, race, perceived ease of use, perceived usefulness.
Park et al <sup>20</sup>	2009	Questionnaire –based survey	Individual factor i.e. e-learning self-efficacy, social factor i.e. subjective norm, organizational factor i.e. system accessibility.
Miller and Khera <sup>21</sup>	2010	User survey at 16 institutions in Africa, Latin America, and Asia.	PU (visibility, social norm, domain knowledge, trust in content, relevance); PEOU (computer literacy, level of infrastructure, librarian assistance, ease of access, English literacy, self-efficacy); Perceived intent to use.
Iqbal and Qureshi <sup>22</sup>	2012	A survey based study conducted through standard questionnaire.	Perceived ease of use (PEOU), perceived usefulness (PU), resources, knowledge, Internet speed, support personnel; perceived playfulness and social influence.
Nazari et al <sup>23</sup>	2013	Analytical survey of faculty members of eighth zone of Islamic Azad University, Iran.	Five factors of innovation described by Rogers (i.e. relative advantage, compatibility, complexity, trialability, and observability), and adoption of online databases.

other two system characteristics (screen design and terminology) were found to have significant effect on perceived ease of use only. However, there may be other individual and system factors that have not been incorporated into the proposed model.

According to Lee et al<sup>24</sup>, perceived ease of use has a direct influence on perceived usefulness of digital library. Likewise, terminology clarity also has positively influenced perceived ease of using the digital library. On the other hand, screen design and navigation were not found to have much impact on perceived ease of using digital library. However, there are many other significant aspects of digital library system which were not discussed in this study.

Thong et al<sup>25</sup> included three system characteristics (terminology, screen design, navigation), three organizational variables (relevance, system accessibility, system visibility), and three individual differences (computer self-efficacy, computer experience, domain knowledge) as critical external variables that have impact on adoption intention through perceived usefulness and perceived ease of use. Based on the survey of 164 post-graduate students from the faculty of engineering at the International Islamic University, Malaysia (IIUM), Bagudu and Sadiq<sup>26</sup> found high level of awareness and utilization of digital library services among

respondents. The respondents also showed positive attitude towards the IIUM digital library services. On the other hand, Alajmi<sup>27</sup> identified factors influencing digital library adoption including perceived relative advantage, visibility, result demonstrability, trialability and awareness of users. Among the factors, perceived ease of use, compatibility, and perceived image had insignificant effect on the usage of digital libraries.

### Objectives of the study

The main objective of this study is to explore the factors that influenced usage of digital libraries based on a case study of East West University Digital Library (EWUDL) in Bangladesh. Other related objectives of this study are:

- To identify what factors to what extent have influenced users to use East West University Digital Library (EWUDL) system;
- To analyse whether perceived ease of use (PEOU) and perceived usefulness (PU) have any significant relation with users' intention to use a digital library;
- To examine users' level of satisfaction of using EWUDL system;
- To explore the challenges of adopting and using digital libraries in Bangladesh; and

- To suggest guidelines for promoting adoption, acceptance and usage of digital libraries in Bangladesh.

### Methodology

Although some libraries claim to have digital library system of their own, in fact, full-fledged digital library can rarely be found in Bangladesh. In such a situation, a preliminary comprehensive search of the websites of some selected private university libraries were conducted to have an understanding of the functions, activities and services of these libraries. EWU library seems to be more organized as it is one of the pioneers in introducing digital library and other technologies by analyzing their library procedure, type of documents, requirements of staff, developing a project plan, and finally using Greenstone software. In addition, EWU has been conducting workshop, seminars, and training on a range of aspects for library and information professionals.

Visiting the East West University Library of Bangladesh, data were collected from both users and staff of the library. On the basis of observation of the EWU library use in a week, 140 library users were selected randomly for the study irrespective of their age, gender and academic qualification. A structured questionnaire was used as a data collection instrument. We received 129 filled in the questionnaire with a response rate of 94.14%. The structured questionnaire for the library users consisted of the following elements:

- demographic and academic information, such as user category, gender, age, affiliated discipline, educational background;
- experience of using computer and internet, frequency of using internet;
- experience of using DL, duration and frequency of using EWU DL;
- nature of content of DL including its richness, currency, adequacy, completeness, clearness, relevance, usefulness;
- respondents' knowledge of search domain, such as if users have idea on searching under subject or author domain, and on required topic;
- DL system characteristics, i.e. whether the interface is well-designed, system is fast, easily accessible, and available;
- Service quality of EWUDL, such as availing technical and other services without breakdown, promptness in providing service, help messages on the screen and providing access to full text resources;
- Users' perceived ease of use, i.e. if users find learning and using DL and their interaction with it easy and understandable;
- Users' perceived usefulness, i.e. whether they consider DL useful in meeting information needs.
- Users' intention to use DL depending on their PEOU and PU;
- Overall satisfaction of users regarding DL.

Most of the questions were close ended and users' responses were measured on a 7-point Likert scale anchored by strongly disagree (1) at one end, to strongly agree (7) at the other, or insignificant to significant, or unsatisfied to satisfied. Data were analysed statistically using Statistical Package for Social Science (SPSS). In addition, librarian and other library staff of East West University library were interviewed. The main focus of the interviews was to identify the perception of library professionals regarding usage of digital library system and services. Moreover, problems usually encountered during digitizing collection, recommendations to overcome such problems, and future plans to enhance the services for library users were also explored through the interviews.

### Data analysis and discussion

#### *Demographic profile of the respondents*

The demographic data were analysed using descriptive statistics. Target population in this study consisted of students, teachers, and administrative staff of EWU library. As shown in Table 2, majority of the respondents were students (77.5%), followed by teachers (14%) and administrative staff (8.5%) of the EWU library.

More than three-quarters (75.2%) of 129 respondents were males, while 24.8% were females. This suggests that there is a huge difference between the ratio of male and female users. More than half of the respondents (52.7%) were between 20-24 years, while 21.7% respondents were between 25-29 years, and 14% between 30-34 years. In respect of discipline, 38.8% of the respondents came from science and engineering discipline, while one-third

belonged to business management, followed by 20.2% humanities and 6.2% social sciences. The majority of the respondents (58.1%) were enrolled in the under graduate courses, whereas 40.3% of them were enrolled in post-graduate courses. Doctoral program is not conducted in any of the private universities in Bangladesh. The two respondents having doctoral degree were faculty members.

**Experience of using computer and internet**

Table 3 shows that majority of the respondents (35.7 %) have experience in using computers for 5-7 years, while 23 (17.8 %) users have used computers for 2-4 years and 39 (30.2%) users have used it for 8-10 years. As regard to the experience of using internet, 41.1% respondents reported to have used internet for 2-4 years, followed by 36.4% who have used it for 5-7 years, 10.1% for 8-10 years and so on.

**Frequency of using East West University Digital Library**

Of the total respondents, more than two-thirds (64.3%) were found to use the library frequently, while 27.1% used the digital library occasionally. The proportion of respondents who used the digital library more frequently and rarely were the same (3.9%) (Table 4).

Table 2—Demographic profile of the respondents

Demographic variables	n=129	Percent
<i>User Category</i>		
Student	100	77.5
Teacher	18	14.0
Administrative staff	11	8.5
<i>Gender</i>		
Male	97	75.2
Female	32	24.8
<i>Age</i>		
Less than 20 years	11	8.5
20-24 years	68	52.7
25-29 years	28	21.7
30-34 years	18	14.0
More than 34 years	04	3.1
<i>Background discipline</i>		
Humanities	26	20.2
Science & Engineering	50	38.8
Business	45	34.9
Social Science	08	6.2
<i>Education</i>		
Undergraduate	75	58.1
Masters	52	40.3
Doctoral	02	1.6

**Quality of digital library content**

Table 5 represents the perception of users regarding the nature or quality of East West University digital library content. Users are more or less positive about the nature of content. The highest mean score of 6.09 was on clarity of the digital library followed by relevance and usefulness of content with a mean score of 5.62 and 5.68 respectively. Furthermore, contents have been considered as rich, updated, adequate, and complete with mean score of 5.26, 5.51, 5.44, and 5.72 respectively. The average score (m=5.62) of seven items listed in Table 5 reveals that users were positive about the overall quality of EWUDL content.

**System characteristics of EWUDL**

On the basis of mean score, Table 6 indicates that users agreed about the availability of system and easy accessibility of content. Moreover, participants also agreed about the statement that the user interface is well-designed and that the system is fast enough to access and retrieve resources. However, users

Table 3—Users’ experience of computer and internet

Experience	Using computer		Using internet	
	Frequency	Percent	Frequency	Percent
Less than 2 years	02	1.6	11	8.5
2-4 years	23	17.8	53	41.1
5-7 years	46	35.7	47	36.4
8-10 years	39	30.2	13	10.1
More than 10 years	19	14.7	05	3.9
Total	129	100	129	100

Table 4—Frequency of using EWUDL

Using EWU DL	Frequency	Percent	Cum. Percent
More frequently	05	3.9	3.9
Frequently	83	64.3	68.2
Occasionally	35	27.1	95.3
Rarely	05	3.9	99.2
Don't know	01	0.8	100.0
Total	129	100.0	

Table 5—Quality of digital library content

Quality	Mean	Std. Deviation
Richness	5.26	1.25
Up-to-datedness	5.51	1.22
Adequacy	5.44	1.24
Completeness	5.72	1.13
Clarity	6.09	0.90
Relevance	5.62	1.20
Usefulness	5.68	1.17
Valid n = 129		

Table 6--System characteristics of EWUDL

Statement	Mean	Std. Dev.
The EWU DL is available when I need it to use	5.67	0.76
The user interface on the screen is well-designed	6.06	0.92
The system provides easy accessibility to its content and services	5.83	0.87
I usually get documents and services of high relevance from the system	5.33	1.20
The system is fast enough to access, retrieve, and download files	6.06	0.88

Valid *n* = 129

Note: 1.00- 1.49= Strongly disagree, 1.50- 2.49= Disagree, 2.50- 3.49= Disagree to some extent, 3.50- 4.49= Neutral, 4.50- 5.49= Agree to some extent, 5.50- 6.49= Agree, 6.50- 7.00= Strongly agree.

recorded "to some extent" regarding the relevance of documents and services from the system with a mean score of 5.33. The analysis of users' opinion on five items of systems characteristics indicates that users agreed (m=5.79) about the overall system characteristics of EWUDL.

**Service quality of EWUDL**

Table 7 shows that in terms of service quality, respondents agreed about the promptness and smoothness of getting services with mean score of 5.73 and 5.95 respectively. On the other hand, participants agreed to some extent when they were asked about getting technical and other support from library staff instantly. Similarly, they agreed to some extent in getting full text access to resources and help messages on screen. The overall mean score (5.45) tended towards the users rating the EWUDL faring high on service quality to some extent.

**Perceived ease of use**

Table 8 represents respondents' perception of ease of use of EWU digital library. The mean scores of all the three statements on users' perceived ease of use suggest that 'learning to use EWUDL', 'using EWUDL' and 'interaction with EWUDL' were easy.

**Perceived usefulness**

According to mean scores obtained, Table 9 shows that respondents agreed to some extent regarding the perceived usefulness of digital library system to meet their information needs, in conducting their study and research, and in overall performance.

**Intention to use digital library**

Table 10 demonstrates the intention of users to use digital library in terms of perceived ease of use and perceived usefulness. Most respondents stated that they intended to use digital library due to perceived ease of use (m= 5.59). Majority of the users strongly

Table 7--Service quality of EWUDL

Statement	Mean	Std. Dev.
I get instant technical support from library staff when required	5.18	1.19
The digital library is prompt in providing services	5.73	0.96
The digital library provides full text access to its resources	5.11	1.25
Help messages on the screen is very useful	5.28	1.09
I can get smooth service without breakdown	5.95	0.81

Valid *n* = 129

Notes: 1.00- 1.49= Strongly disagree, 1.50- 2.49= Disagree, 2.50- 3.49= Disagree to some extent, 3.50- 4.49= Neutral, 4.50- 5.49= Agree to some extent, 5.50- 6.49= Agree, 6.50- 7.00= Strongly agree

Table 8—Perceived ease of use

Statement	Mean	Std. Dev.
Learning to use digital library is easy	6.13	0.89
The use of digital library seems to me easy	6.13	0.92
My interaction with digital library is easy	6.08	0.91

Valid *n* = 129

Note: 1.00- 1.49= Extremely difficult, 1.50- 2.49= Difficult, 2.50- 3.49= Difficult to some extent, 3.50- 4.49= Neutral, 4.50- 5.49= Easy to some extent, 5.50- 6.49= Easy, 6.50- 7.00= Extremely easy

Table 9—Perceived usefulness

Statement	Mean	Std. Dev.
I find the system very useful	5.43	1.26
The role of DL in conducting study/research is effective	5.30	1.32
The contribution of DL is satisfactory	5.41	1.23

Valid *n* = 129

Note: 1.00- 1.49= Strongly disagree, 1.50- 2.49= Disagree, 2.50- 3.49= Disagree to some extent, 3.50- 4.49= Neutral, 4.50- 5.49= Agree to some extent, 5.50- 6.49= Agree, 6.50- 7.00= Strongly agree.

Table 10—Intention to use EWUDL

Statement	Mean	Std. Dev.
I intend to use the DL due to perceived ease of use	5.59	0.69
I intend to increase my use of DL due to PU	6.58	0.51
Valid <i>n</i> = 129		
<i>Note:</i> 1.00- 1.49= <i>Strongly disagree</i> , 1.50- 2.49= <i>Disagree</i> , 2.50- 3.49= <i>Disagree to some extent</i> , 3.50- 4.49= <i>Neutral</i> , 4.50- 5.49= <i>Agree to some extent</i> , 5.50- 6.49= <i>Agree</i> , 6.50- 7.00= <i>Strongly agree</i> .		

agreed on their intention to increase the use of DL due to perceived usefulness with a mean score of 6.58. Thus, on an average ( $m=6.13$ ), users agreed about their intention to use EWUDL.

**Overall satisfaction**

Table 11 shows that majority of users (42.6%) were satisfied with EWUDL. Thirty one percent were satisfied to some extent followed by 10.9% with extremely satisfied users. However 18 respondents (14.0%) reported to be dissatisfied to some extent and 1.6% were neutral. The overall mean score reveals that users were satisfied with EWU DL to some extent.

**PEOU and PU vs intention to use EWU DL**

Pearson Chi-Square test was conducted to explore the relationship of users’ intention to use EWUDL with perceived ease of use (PEOU) and perceived usefulness (PU). The result of the *p* value ( $p<0.01$ ) in Table 12 shows a significant relationship between PEOU and intention to use DL. Similarly, there exists a significant association between PU and users’ intention to use DL.

**Challenges for the adoption and usage of digital libraries in Bangladesh**

The staff of EWU library shared their experiences and identified a number of challenges in the adoption, implementation and usage of digital library system in Bangladesh. EWU is one of the leading private universities which introduced digital library system in Bangladesh. The challenges they encountered while adopting and using digital library system are more or less similar to those of other universities and organizations of a developing country like Bangladesh. Based on the interviews of selected staffs and informal discussion of the users of EWU Library, the following challenges have been identified which

Table 11—Level of users’ satisfaction about EWUDL

Level of satisfaction	Frequency	%	Overall mean
Extremely satisfied	14	10.9	
Satisfied	55	42.6	
Satisfied to some extent	40	31.0	
Neutral	2	1.6	5.34
Dissatisfied to some extent	18	14.0	
Dissatisfied	0	0	
Extremely dissatisfied	0	0	
Valid <i>n</i> = 129			

*Note:* 1.00-1.49= *Strongly dissatisfied*, 1.50-2.49= *Dissatisfied*, 2.50-3.49= *Dissatisfied to some extent*, 3.50-4.49= *Neutral*, 4.50-5.49= *Satisfied to some extent*, 5.50-6.49= *Satisfied*, 6.50-7.00= *Strongly satisfied*.

Table 12—Chi-Square test for PEOU and PU vs intention to use EWUDL

Relationship	Value	Asymp. Sig. (2-sided)
PEOU and intention to use EWU DL	103.958	.005*
PU and intention to use EWU DL	189.604	.003*
<i>Note:</i> * Significant at $p<0.01$		

may impede the adoption and usage of digital libraries in Bangladesh.

*Lack of awareness*

Users are not aware of digital libraries and those who are aware do not know how to use digital libraries. Perception of many library professionals towards technology and innovation acceptance is negative which hinders the adoption and usage of digital library system.

*Lack of adequate manpower*

Most library professionals in Bangladesh do not possess strong ICT knowledge and related skills. As a result they are unable to initiate technological changes in the library.

*Lack of infrastructural facilities*

The availability of infrastructural facilities in the libraries of Bangladesh is unsatisfactory. Though many of the libraries have initiated digitization of their collection, availability of fast internet connections, and other required computer hardware could make these initiatives faster and more advanced.

*Lack of government concentration*

The National ICT Policy integrates all the components of ICT Policy 2002 in a more structured



manner<sup>28</sup>. However government initiatives in building digital libraries are still in infancy in Bangladesh which has a negative impact on the adoption of digital libraries in the country.

### Suggestions

Considering the prevailing challenges of DL adoption and usage, the following suggestions are made on the basis of existing literature, interview data and authors' own points of view:

- a) Technical, physical and intellectual infrastructure must be developed to facilitate the building and using digital libraries in Bangladesh.
- b) Library personnel, information professionals and users should be made aware of using digital library.
- c) Libraries should organize orientation program for users on how to use, search, and retrieve resources in digital library.
- d) Library authorities should arrange in-house training facilities for library staff and promote knowledge sharing culture to increase skills and knowledge of them regarding digital library system and services.
- e) More user-friendly interface should be developed including user-familiar terminology, consistent interface style, and clear navigation flow.
- f) Sophisticated search techniques should be introduced to facilitate electronic access to information content and services.
- g) The government should allocate sufficient fund to initiate digital library projects and develop digital library software.

### Conclusion

In order to facilitate digital library adoption and usage, user-centric digital library systems must be designed. The quality of content in terms of its richness, up-to-datedness, adequacy, completeness, clarity, relevance and usefulness are also important when creating digital libraries. From the present study it was found that DL content, DL system characteristics, and DL service quality have influenced both perceived ease of use (PEOU) and perceived usefulness (PU) of digital library.

Digital library adoption and usage are faced with a number of challenges which must be resolved for creation and effective usage of digital libraries in Bangladesh.

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