

Technology Readiness For Library Automation

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Abstract

There is no doubt that there exist a relationship between technology and growth. Many researchers have emphasized that the acquisition of technological capability in educational institutions and nations in East Asia helps them in growing and sustaining their economies. Successful implementation of integrated automation software in universities/educational institutions could be an initiative in this direction. In educational institutions and universities, automation of libraries is very important for the sharing of knowledge. Usually, the automation and digitization of library take one or more years to implement and many institutions prefer outsourcing as it allows them to use the latest technology, expertise and service value at competitive costs. There exist many problems in implementing such software that includes lack of technological capability, complacency, lack of data and information flow, and mistrust. A number of studies have been conducted on the above mentioned parameters, however the key i.e. "readiness of software users" has not been studied a lot especially in Indian context, which is very crucial for the success or acceptance of technological advancement. Thus, the present study analyzes the technology readiness amongst the various stakeholders like faculty, students and library staff in educational institutions for the automation and digitization of library.

Keywords: Technology Readiness, Library Automation, Optimism, Innovativeness, Discomfort, Insecurity

1. Introduction

Today, India is one of the fastest growing economies of the world and there is no doubt that education is one of the key factors, which helps to boost the growth of Indian economy. The continuous innovations and technological enhancement in the field of Information and Communication Technologies (ICTs) helps India to develop as knowledge based economy (Ghosh and Ghosh, 2009). Indian education system has a great potential and the private sector has realized the enormous business opportunity in Indian education sector. Like everywhere in the world, India too has intense competition in providing a quality education and in attracting the

pool of students to take admission. Throughout the world, higher education is strongly influenced by ICTs developments, due to the government's call to improve its performance and efficiency in education system especially universities (Allen and Kern, 2001). The competitive educational environment and the expectations from the students around the world are forcing universities to improve their overall performance (Fisher, 2006). Many studies revealed that for any good education institute, there are various factors which affect the quality of education such as faculty experience, placement, infrastructure, physical facilities etc. Apart from this in any educational institute, library also plays a vital role as it stands not only as a good collection house, but also acts as a knowledge center for the stakeholders.



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1.1 Automation and Digitization of Library

There is a significant impact of technology on the functioning of libraries and this is the main reason for changes that are taking place in libraries around the world. Automation of library mainly deals with the usage of computers and related product and services in the performance of various library operations. According to Alhaji (2004), library automation has helped to provide easy access to collections through the use of computerized library catalogue. Library automation is the most commonly used terms to describe the computerization of library activities with the help of computer (Uddin, 2009).

The concept and working of digital libraries differ from the traditional libraries, as it facilitate library members/users to get an on-line entrée in the library using electronic form of full text documents and their associated images. In case of digital library, users can also access multimedia contents like audio and video. Digital libraries could be considered as an organization that offers plenty of digital resources as well as the specialized staff to manage and preserve the integrity of digital data (DLF, 2001). Smith (2001) defined digital library as an organized collection of digital data that includes text, images, audio and video, along with the means of accessing the digital data. Witten and David (2003) defined digitization as the process of taking traditional library materials available in physical form and converting it to the electronic form, so that it can be stored and controlled using computer.

1.2 Technology Readiness

Mick and Fournier (1998) revealed that users/consumers interacting directly with new technology simultaneously develops positive as well as negative

perception towards it. Technology readiness refers to people's response/inclination towards the use of new technologies for personal as well as official work (Parasuraman, 2000). There exist many factors that affect the willingness of an individual to use new technology and some of the key factors are an individual's capacity and willingness to use (Walker et al, 2002); attitudes toward technologies (Curran et al., 2003); the level of technology anxiety (Meuter et.al., 2003), and culture (Singh, 2006). Gustafson (2004) observed that the college students expect to learn cutting-edge technology during their academic course and suppose that these learning technologies are integral to their course work. In the global economy, changes are taking place with up-gradation in technology and it has a remarkable impact on the functioning of service industry. As a result, many services increasingly being delivered through self-service technologies and thus, offering benefits to the users like flexibility, customization and satisfaction (Curran and Meuter, 2005; Meuter et.al. 2005).

2.0 Literature Review

Various studies are already conducted on the use of Information Communication and Technology in libraries and automation of libraries. These studies are basically focusing on the causes or factors affecting automation of libraries.

2.1 Global Scenario

In a research study conducted by Chung (1997), it has been explored that the success of library automation in Taiwan in the 1990s was depending on three main factors namely good planning; collaborative efforts among library staff for automation; and most importantly, the government's financial support for the library automation. Beside this, it

has also been revealed that there exist some problems like - lack of flexibility due to menu-driven systems; unpredictability of free-text searching; slow speed; and precision of an online search. Tam and Robertson (2002) conducted a study relating to the challenges faced by the universities of Hong Kong in library automation. It has been reported that key challenge was the changes in the information environment due to the developments in electronic information resources and digitalization of information.

In a study conducted in Nigeria, Ani et al. (2005) indicated that only six university libraries in Nigeria were fully computerized at that time and nine were about to be computerized. The major obstacles that influenced effective implementation as well as adoption of ICTs in university libraries were inadequate funds and the poor state of electricity in Nigeria. Oduwole (2005) observed that computerization of the cataloguing process had increased efficiency in libraries. However, the high maintenance cost of the software like TINLIB was recognized as a major constraint. Beside this, the explored obstacles for library automation were poor computer literacy of the librarians, lack of infrastructure and poor state of electricity. According to Matoria et.al (2006), the non-supportive attitude of the top management; inadequate funds from governing bodies/agencies; repetitive changes in the technology affects the implementation of library automation.

Efe (2006) highlighted that the faulty equipments and outdated computer systems in library as major obstacles in the success of proficient library automation system. Uwaifo (2007) revealed that the absence of a national policy on ICTs was responsible for the limited library automation systems. Mutula (2012) discussed the library automation case study

of the University of Botswana, where the automation of the library has facilitated the dissemination of digital data and electronic information services to its users/clients sitting far away from the library. In conjunction, it also helped the university to improve the scholarly roles and image of the librarians. Beside this, due to automation of library, one very important action took place and it was that the librarians and faculties were working closely on research and jointly published on library automation issues.

2.2 Indian Scenario

A number of studies have been conducted in order to explore factors that affect the development of library automation in India. Main factors were lack of skilled staff; inefficient library software; issues of management; dearth of resources available in the libraries; and geographic location areas (Moorthy and Karisiddappa, 2001; Singh, 2003). In line with this, Suku and Pillai (2005) conducted research in the state of Kerala and Karnataka and revealed various factors that affect library automation like infrastructure, in-house activities, information services and their usage, development of manpower and budget of universities for automation purpose. Cholin (2005) found that the most of the university libraries in India were at different stages of development in the implementation of information technology tools in their libraries. Matoria et.al (2006) concluded that the public libraries in India were not very good as compare to the others libraries in the world and the reasons behind this were inadequate facilities, lack of automation of back-end operations, and the insufficient use of ICT for housekeeping operations as well as for user services.

Haneefa (2007) reported that most of the libraries surveyed in Kerala were hampered by lack of funds,

lack of infrastructure, and dearth of skilled professionals. These factors severely affected the automation of libraries and implementation of efficient ICT applications. In a similar kind of study conducted in Goa, where 23 college libraries were studied, Bansode and Periera (2008) showed that 4 libraries out of total surveyed libraries were fully automated, 5 were partially automated and 14 were in the early stages of library automation. The researchers reported that most of the libraries lack in terms of the staff required for successful automation. Many libraries were affected with the conventional factors like as dearth of funds, lack of trained staff, and lack of space for the library automation.

Automation makes the library system, resources, and services more smart and interactive as well as helps to meet users' expectations. According to Rao and Choudhary (2009), the automation of library housekeeping functions, such as acquisition, cataloging, circulation, serial control, stock verification, and article indexing, is an important parameter to evaluate library performance. In recent years, libraries of Indian educational institutions such as IITs, IIMs and other world-class standard private institution moved toward the library automation with the help of extended use of ICTs (Kumar and Biradar, 2010). Kanwal (2011) highlighted that the emerging academic culture and growing use of ICTs in libraries has brought challenges as well as opportunities to librarianship. They also found that the library services are significantly affected from the basic infrastructure to human resources.

3. Rationale of The Study

In educational institutions and universities, automation of libraries is very important for the sharing of knowledge. Usually, the automation and digitization

of library take one or more years to implement and many institutions prefer outsourcing as it allows them to use the latest technology, expertise and service value at competitive costs. There exist many problems in implementing such software that includes lack of technological capability, complacency, lack of data and information flow, and mistrust. A number of studies have been conducted on the above mentioned parameters, however the key i.e. "readiness of software users" has not been studied a lot especially in Indian context, which is very crucial for the success or acceptance of technological advancement. Thus, the present study analyzes the technology readiness amongst the various stakeholders like faculty, students and library staff in educational institutions for the automation and digitization of library.

4. Research Methodology

The present study was undertaken to analyze the usage of library automation in education institutions with regard to technology readiness. The study aimed to compare the perception of the faculties, library staff and students on the basis of technology readiness for the usage of library automation in educational institutions. The perception has been compared on the bases of four dimensions: Optimism, Innovativeness, Discomfort and Insecurity of Technology Readiness Index (TRI) scale developed by Parasuraman (2000).

TRI is a scale based on 36-items, covering four dimensions: Optimism, Innovativeness, Discomfort and Insecurity. Optimism and Innovativeness are the positive drivers, which persuade users to make use of technological products and services, and to hold an optimistic approach towards technology. Discomfort and Insecurity are the negative thoughts.

They make users unenthusiastic to employ technology. The TRI scale has demonstrated high internal reliability and the coefficient alpha scores range from 0.74 to 0.81 across the four dimensions of the scale.

In order to ensure proper response, a wide number of academic institutes situated in two major cities (Indore and Bhopal) of Madhya Pradesh, India have been selected. The target respondents were mainly faculty members, students and library staff of management and engineering institutes. A total of 400 respondents were targeted for the responses and provided tool for data collection for their response. Out of 400, around 261 respondents were considered on the basis of complete response. In the received response, number of faculty respondent was 78, library staff was 94 and rest 89 were of students.

The overall response rate was 65 percent approximately.

5. Results and Discussion

It has been observed that almost all institutions were using library automation software for library mechanization work, few of them started use of partial digital library; however most of the institutions were either in the early adoption stage of digital library or planning to start digital library. Four hypotheses were formulated and tested using one way ANOVA (F-Test) with the help of SPSS 18.0. In some hypotheses, Tukey test has also been applied for Post Hoc Multiple Comparisons.

H01 – Automation and digitization of library is perceived to be optimistic by faculty, library staff and students ($m_1 = m_2 = m_3$)

Table 1: ANOVA Results for Optimism

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.019	2	.008	.022	.867
Within Groups	85.988	258	.355		
Total	86.007	260			

Test statistics resulted in the acceptance of hypothesis and thus highlighted that respondents from different categories i.e. faculty members, library staff and students were perceived to be optimistic about the automation and digitization of library in the educational institutions (Table 1). They were positive for the library automation as it offers many advantages like convenience of operations, time savvy and transparency of operations. Jaroliya et al (2014) revealed that use of ICTs in educational institutions increases convenience as well as results in timely completions of assigned work. In a study conducted by ECAR (2007), the majority of respondents agreed

that information technology improves learning, results in more prompt feedback, helps in terms of collaboration and communication, and allows better control. Optimists use more active coping strategies than pessimists and these strategies are more effective in achieving positive outcomes (Taylor et al., 1992). Nair and Jeevan (2004) examined the results of ICTs adoption in 18 premier libraries in the Thiruvananthapuram, city of Kerala state and revealed that the libraries were very positive about the use of information technology in libraries and many of the libraries were looking for library automation in coming years.

H02 – Automation and digitization of library in educational institutions is perceived to be innovative by faculty, library staff and students ($m_1 = m_2 = m_3$)

Table 2: ANOVA Results for Innovativeness

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	116.135	2	58.585	103.899	.000
Within Groups	133.628	258	.569		
Total	249.763	260			

Table 3: Means for Groups in Homogenous Subsets (Tukey HSD) for Innovativeness

Respondents	N	Subset for alpha = 0.05	
		1	2
Staff	94	2.5326	
Faculty	78		3.897
Students	89		3.878
Sig.		1.000	.984

In case of innovativeness, the hypothesis was not accepted and thus showed that there exists some disagreement amongst respondents of different categories (Table 2). While analyzing carefully, it has been observed that faculty members and students were having different view from the library staff regarding innovativeness in digitization of library in the educational institutions (Table 3). Faculty and students perceived that automation and digitization

of library is an innovative task, in which plenty of new ideas could be implemented. On the other hand, library staffs were perceived that library automation to be the more or less similar to the traditional working of library. Rogers (1995) found that the adoption of the innovations and acceptance of new technologies is not an easy task for library staff. Therefore it has been observed that almost all the institutions keep on training and motivating their employees time to time to counter the adverse effect of change. According to Walczuch et al. (2007), possible explanation is that innovative people are more critical towards technology, since they are aware of the newest developments and possibilities and expect all technology to fulfill highest demands.

H03: Automation and digitization of library in educational institutions leads to discomfort amongst faculty, library staff and students ($m_1 = m_2 = m_3$).

Table 4: ANOVA Results for Discomfort

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	113.001	2	54.993	82.887	.000
Within Groups	158.989	258	.672		
Total	271.99	260			

Table 5: Means for Groups in Homogenous Subsets (Tukey HSD) for Discomfort

Respondents	N	Subset for alpha = 0.05	
		1	2
Staff	94	3.998	
Faculty	78		2.455
Students	89		2.449
Sig.		1.000	.971

It has been observed that the hypothesis regarding discomfort was not accepted (Table 4) showed a disagreement amongst faculty, staff and students (Table 5). The result showed that there exist a feeling of discomfort amongst library staff relating to automation and digitization of library. They were perceived that they are already burdened with library activities as the number of staff was not adequate in many libraries. They also had a belief that with automation of library, faculty and students would be

on demanding side and library staff on the serving side. Being faculty and students large in number, library staff will be in a never ending loop of demand/service. According to Chung (1997), if an educational institute has developed an automated library system, but the process of searching the relevant data or doing any other activity is slow then a user gets irritated because of the unnecessary time involvement. Nfila et al. (2005) explained in their study that changing the mindset of staff is one of the challenges in library automation. Any sudden change is hard to accept, until there is no proper guidance and training for the employees. According to Lin and Hsieh (2007), many people avoid technology if they are not comfortable with, and not ready to use, the technology. Therefore, as new technologies are developed, it is important to explore customer readiness to use them.

H04: Automation and digitization of library in educational institutions is perceived to be insecure by faculty, library staff and students ($m_1 = m_2 = m_3$)

Table 6: ANOVA Results for Insecurity

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.236	2	.122	.351	.704
Within Groups	82.993	258	.350		
Total	83.229	240			

The fourth hypothesis related to insecurity was accepted that showed that there exist no difference in the perception of faculty, library staff and students about library automation relating to insecurity. All of them perceived it be secure and safe as usually in library automation and digitization, rarely any major financial transactions takes place. However, they were concerned about the sharing and distribution of intellectual property or copyrights via digitization of library data. Kwon and Chidambaram (2000), high-

lighted that insecurity results in individuals avoiding the use of computers due to their innate fear of technology. The reasons for this might lie in the skepticism people have to new technologies. According to Walczuch et al. (2007), insecure staff perceived IT as less useful and less easy to use.

5.1 Proposed Step Up Model for Library Automation

From extensive literature review, the major factors affecting automation of library have been analyzed carefully and the ways to control these factors have

been identifies. Finally, step up model has been proposed by the authors, which is as follows:

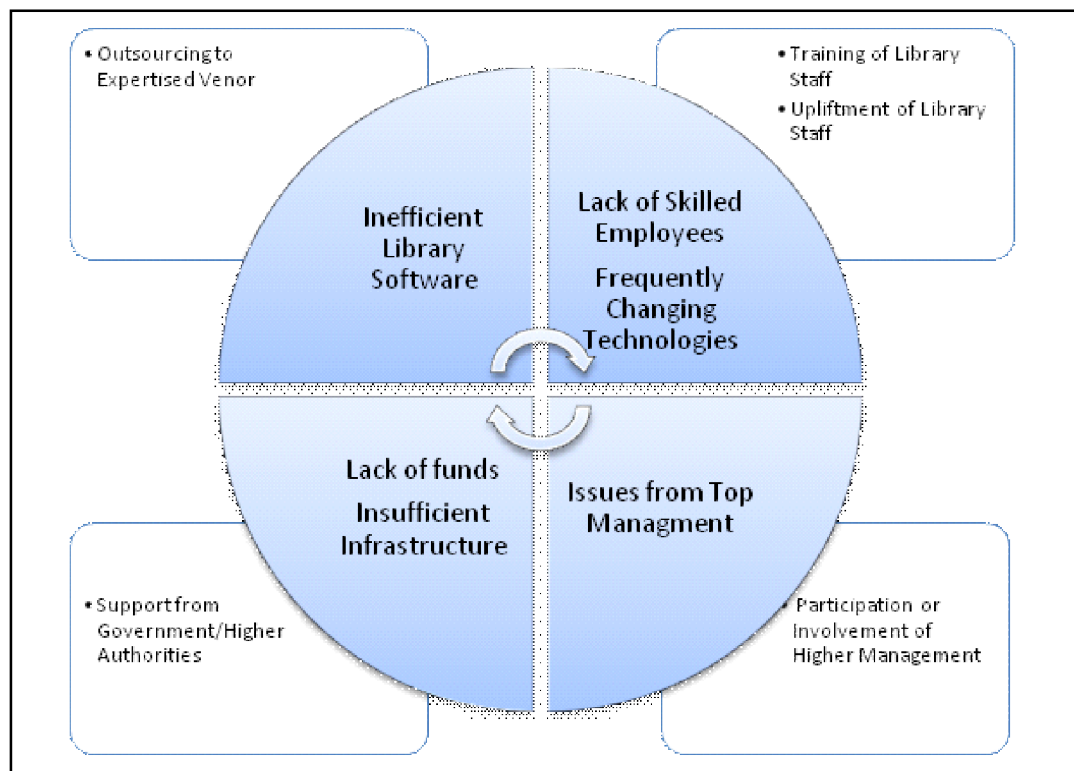


Figure 1: Proposed Step Up Model for Library Automation

6. Conclusion

Many institutions are in the process of library automation and digitization, but facing a lot many problems such as limited pedagogic training or experience for librarians, frequently changing technologies, diversity in electronic resources service providers, adequate backup for electricity supply, because all the computerized activities were depend on electricity. The study concludes that the faculty, library staff and students are having an optimistic

approach towards automation and digitization of library as it offers many advantages like convenience of operations, time savvy and transparency of operations. They were also concerned about the sharing and distribution of intellectual property or copyrights via digitization of library data. Beside this, library staffs were perceived that library automation to be the more or less similar to the traditional working of library. It was observed that there exist a feeling of discomfort amongst library staff relating to automation and digitization of library. They were

perceived that they are already burdened with library activities as the number of staff was not adequate in many libraries. They also had a belief that with automation of library, faculty and students would be on demanding side and library staff on the serving side. Being faculty and students large in number, library staff will be in a never ending loop of demand/service. It has been found that many factors were hindering the progress of library automation and for the successful automation and digitization of libraries; library staff should be trained in such a manner that they should be clear about the plethora advantages of library automation.

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