Information and Communication Technology (ICT) and its Application in State Universities KRC in Maharashtra

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Abstract: **Application of Information and Communication Technology in state universities KRCs in Maharashtra. The researcher has analyzed the data regarding Library Collection, Library Services related to ICT, Information and Communication Technology Infrastructure etc. The study used a combination of formal questionnaires, informal interviews with library experts and observations to evaluate the use of ICT in the selected universities library in Maharashtra state by investigating ICT infrastructure, current status of library automation, implementation barriers ICT as well. Attitudes of library staff regarding the use of ICT.**

Keywords: **Information and Communication Technology, ICT Infrastructure, Library Services**

I.INTRODUCTION

In this digital age, the role of libraries has become more complex and multifaceted. There are different types of electronic services, there are different modern methods / techniques and processes for obtaining and disseminating practical information and in addition, libraries need to improve their services and products in order to be used productively. The introduction of computers in libraries has enhanced the effectiveness of library services including efficient organization and information initiatives. Due to the use of information technology in libraries, the biggest challenge facing library managers is choosing a good library automation software package that can meet the needs of a particular library. The process of library automation began in India in the last decade of the last century. Many Indian as well as foreign software companies had entered the market. Nevertheless, only a few library automation software packages have succeeded in establishing their presence in the Indian market.[1]

One of the most pertinent consequences of ICT is the introduction of advanced communication networks or the Internet, which must change the role of educational libraries from proprietary models to access models, from print to electronic media, from libraries to archives, as an access point, and from data collection to data analysis and repackaging[2]. The shift from printed to digital information has a major impact on libraries, information centers and other organizations directly involved in the information process. The ability of computers to perform high-volume error-free repetition tasks at a faster speed than humans, with emerging developments in the field of computing; Telecommunications, networking and resource sharing, anytime, anywhere is possible[3]. Now in the educational environment the librarian has the role of mediator between the vast network of resources and its users, and the library, the access point that provides access to a wide variety of information resources.

An essential feature of the model is that they are inevitably imperfect and can be replaced or handled with relative ease. Thus, the model is a subtle representation of something, in which the social parts are in the right proportions; Sometimes, replicas of the same size. It must have standards and parameters for the overall requirements in combination with other facilities available in it.

Since the introduction of computer technology in libraries and information centers, studies in the LIS curriculum as well as in the LIS curriculum began to change. With the advancement of ICT, more emphasis has been placed on theoretical and practical subjects for all levels of LIS education. The use of ICT in the LIS business has led to the design and teaching of curricula based on traditional curriculum structure and education system knowledge to meet the challenges of the modern digital world. Technical services such as sorting, cataloging, etc. have also been greatly improved. In order to provide balanced education and training in all aspects of information technology applicable to LIS, adoption of ICT enhanced model curriculum for LIS education is a pre-requisite. The

purpose behind adopting such a course by LIS schools is that the offered courses should cater to the needs of modern libraries and information centers. The major problems in ICT-enhanced development are the availability of resources, diversity of regional languages, differences in LIS curriculum at each level of LIS education, academic flexibility provided by university law, traditional textbooks and teaching methods, lack of standardization and centralization. According to the report of UGC-Curriculum Development Committee (2001)[4], many LIS departments in universities in Maharashtra have improved their curriculum. They have equipped their departments with the necessary infrastructure with the financial support of U.G.C. The model ICT-enhanced LIS curriculum given in this case is based on today's needs and to achieve this objective, we need to develop model ICT infrastructure for departments in LIS schools / universities and / or LIS teaching institutions. While developing models for both Level ICT Infrastructure and ICT - Enhanced LIS Curriculum, the following factors are important to improve LIS education as an effect of ICT[4]:

II.SIGNIFICANCE OF THE STUDY

The present study will helpful for KRC in Universality to identify their several recent initiatives and developments programs offer due importance and focus on providing information and technology (ICT) system as an enable and access to information. It will emphasize that providing information and enabling ICT system. Information reside in capacity and capability to create knowledge from such Information for ICT to beneficial, it is imperative that we develop knowledge process capability at influenced the information services in the university libraries considerably and it is helpful to promote the quality of ICT Applications in university libraries.

III.OBJECTIVES OF THE STUDY

1. To study of Application of Information and Communication Technology in state universities KRCs in Maharashtra.
2. To know current status of ICT infrastructure in KRCs.

3. To comparatively analyse of ICT based applications used by universities KRC in Maharashtra.

IV.RESEARCH METHODOLOGY

The present study is based on both primary and secondary sources of data and a descriptive and qualitative research method has been used to knowing the applications of ICT in selected universities KRC. Researcher has selected ten non agriculture state universities in the state of Maharashtra as sample. The study used a combination of structured questionnaire for KRC directors, informal interviews with library experts and observations to evaluate the use of ICT in the selected universities library in Maharashtra state by investigating ICT infrastructure, current status of library automation, implementation barriers ICT as well. Attitudes of library staff regarding the use of ICT.

V.APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN KRCs

The explosion of computer and communication technologies, which are referred to as information communication technology (ICT) has affected almost all aspects of human life including the library. Libraries have been looking forward to better technologies even before the onset on the computers.

5.1 General Information of KRC

General information about KRC includes establishment year, website/web page, and total collection, professional staffs work under KRCs and LMS software used by KRC. The table-1 indicated that establishment year of KRC, KRC used website or webpage, total collection of KRC it included the books, and bound volumes of journals when compared to other libraries number of journals especially foreign journals, subscribed by University KRCs. All the University KRCs has access to consortia wise subscription to online journals through UGC Infonet. In addition to the online journals, libraries subscribe to print journals, thesis collection in the non-book material collection; it has a significant collection of Indian patents, being a depository of Indian patents, CDROM databases. It is also providing information about which of LMS software used by KRCs and number of professional staff working under KRCs.

Table-1 General Information of KRC

Name of the University	KRC Establishment year	KRC website/ web page	Total Collection	Total Professional staff	LMS software
SRTMU	1994	Web page	76,564	7	SOUL3.0
BAMU	1959	Web page	3,67,604	12	SOUL2.0
UM	1880	Web page	7,92,018	28	SOUL2.0
KBCNMU	1991	Web page	1,33,617	9	SOUL2.0
SPPU	1950	Website	5,11,748	18	KOHA
SGBAU	1983	Website	3,18,311	8	SOUL2.0
SUK	1962	Web page	3,74,304	7	KOHA
PAHU	2004	Web page	50,582	2	KOHA
RTMNU	1978	Web page	4,19,670	16	LIBSYS10
GUG	2011	Web page	13,500+	1	KOHA

Source: websites and web pages of KRCs

Note: SRTMU denoted Swami Ramananda Tirtha Marathwada University Nanded, BAMU denoted Dr. Babasaheb Ambedkar Marathwada University, Aurangabad; UM denoted University of Mumbai, Mumbai; KBCNMU denoted Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon; SPPU = Savitribai Phule Pune University, Pune; SGBAU = Sant Gadge Baba Amravati University, Amravati; SUK denoted Shivaji University, Kolhapur; PAHU denoted Punyashlok Ahilyadevi Holkar University, Solapur; RTMNU denoted Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur and GUG denoted Gondwana University, Gadchiroli.

It was found from table-1 that UM University of Mumbai is the oldest university in Maharashtra and its KRCs were established in 1880. followed by KRC of SPPU, which was established in 1950, KRC of BAMU in 1959, SUK in 1962; RTMNU in 1978; SGBAU in 1983; KBCNMU in 1991; SRTMU in 1994, PAHU in 2004; and KRC of GUG, which was established in 2011. All the nine KRCs do not have their own websites; they use web pages on the university website. Only the KRC of SGBAU and SPPU has their own website another eight KRCs have webpage. More than seven lakhs in total collections in UM; more than five lakhs in SPPU; more than four lakhs in RTMNU; more than three lakhs in BAMU, SUK, and SGBAU; more than one lakh in KBCNMU; and less than one lakh in total collections in SRTMU, GUG, and PAHU; SRTMU was used SOUL3.0 library management software; SOUL2.0 library management software was used by UM, KBCNMU, and SGBAU; SPPU, SUK, PAHU, and GUG University KRCs use KOHA library management software, and the KRC of RTMNU uses LIBSYS10 library management software.

Table-2 Computers available in the KRC

University	Category wise Computers			
	Server machines	Client computers	Laptop computers	Personal computers
SRTMU	Yes	Yes	No	Yes
BAMU	Yes	Yes	No	Yes
UM	Yes	Yes	Yes	Yes
KBCNMU	Yes	Yes	Yes	-
SPPU	Yes	Yes	Yes	Yes
SGBAU	Yes	Yes	-	Yes
SUK	Yes	Yes	-	Yes
PAHU	Yes	Yes	-	Yes
RTMNU	Yes	Yes	No	Yes
GUG	Yes	Yes	No	Yes

Source: Field Survey – 2020 -21

It reveals in the table-2 it was noticed that all the ten universities KRC having server machines; SRTMU, BAMU, UM, KBCNMU, SPPU, SGBAU, SUK, PAHU RTMNU and GUG having Client computers; UM, KBCNMU and SPPU having laptop computers and SRTMU, BAMU, UM, SPPU, SGBAU, SUK, PAHU, RTMNU and GUG having personal computer.

5.2 Hardware's / IT tools available in the KRC

Hardware is the primary requirement for library automation; different types of hardware are available in the market. A hardware specification depends on available budget ,size of the data to storeu ,sage load , required speed and features to upgrade when it required. Alsoeffective library automation depends on the selection of hardware, software andproper training to the library staff.[4] Researcher also asked this question to know hardware and IT tools availability in KRCs.

Table-3 Hardware / IT tools available in the KRC

Hardware / IT tools	Name of University									
	SRTMU	BAMU	UM	KBCNMU	SPPU	SGBAU	SUK	PAHU	RTMNU	GUG
Barcode reader	√	√	√	√	√	√	√	√	√	√
CD/DVD player	√	√	√	√	√	X	-	√	-	X
Digital camera	X	√	√	√	√	√	-	-	-	X
Facsimile(Fax)	√	X	√	X	√	X	-	-	-	-
LCD projector	√	√	√	√	√	√	√	√	√	√
Overhead projector	X	X	√	X	√	X	√	√	-	X
Photocopier	X	X	X	√	X	√	√	√	-	X
Printers	√	√	√	√	√	√	√	√	√	√
RFID technology	X	√	√	X	√	X	√	√	√	-
Scanner (Digital)	√	√	√	√	√	√	√	√	√	√
Television	√	X	X	√	√	X	-	-	-	X
UPS	X	√	√	√	√	√	√	√	√	X

Source: Field Survey – 2020 -21
Note: here (√) denoted Yes, (X) denoted No and (–) denoted no response

It was pinpointed from table-3 that, in the KRC of SRTMU have CD/DVD player, television, LCD projector, barcode reader, scanner (Digital), facsimile Fax) and printers; in the KRC of BAMU having Digital camera, Printers, RFID technology, LCD projector, UPS, Scanner (Digital), Barcode reader and CD/DVD player; In the KRC of UM having Digital camera, Printers, Facsimile(Fax), Scanner (Digital), Barcode reader, RFID technology, UPS, LCD projector, Overhead projector and CD/DVD player; in the KRC of KBCNMU having Digital camera, Printers, Scanner (Digital), Barcode reader, UPS, LCD projector, Television, Photocopier and CD/DVD player; In the KRC of SPPU having Digital camera, Printers, Facsimile (Fax), Scanner (Digital), Barcode reader, RFID technology, UPS, LCD projector, Overhead projector, Television and CD/DVD player; In the KRC of SGBAU having Digital camera, Printers, Scanner (Digital), Barcode reader, UPS and LCD projector; In the KRC of SUK having Digital camera, Printers, Scanner (Digital), Barcode reader, RFID technology, UPS, Photocopier, LCD projector and Overhead projector; In the KRC of PAHU having Printers, Scanner (Digital), Barcode reader, RFID technology, UPS, LCD projector, Overhead projector, and CD/DVD player; also in the KRC of RTMNU having Printers, Scanner (Digital), Barcode reader, RFID technology, UPS, LCD projector and In the KRC of GUG having Printers, Scanner (Digital), Barcode reader, UPS, LCD projector.

5.3 Automation of KRC
Library automation is the use of a computer to automate certain library processes, such as cataloging and circulation. In the process of library automation, the library uses computers and other technologies to support its systems and services. Library automation is the process of converting library functions from manual to computerized, such as card catalogs in OPAC or manual circulation cards in an integrated library system.[6]

Table -4 Automation of KRC

Areas of KRC automation	Name of University									
	SRTMU	BAMU	UM	KBCNMU	SPPU	SGBAU	SUK	PAHU	RTMNU	GUG
Acquisition	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Barcode generation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Cataloguing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Circulation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Database creation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Digitization of documents	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Financial management	Yes	No	Yes	No	Yes	Yes	No	No	No	No
Office file works	No	No	No	Yes	No	Yes	No	No	No	No
OPAC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reference services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security check gate	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No
Serial Control	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Stock verification	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No

Source: Field Survey – 2020 -21

It was noted from table- 4 all ten universities had automation in Circulation, Cataloguing, OPAC and computerized reference services; automation module use for Acquisition used in all except KBCNMU and GUG KRC; Digital library services are provided by all libraries except RTMNU and GUG. There is a definite improvement in the digitization of documents in University Libraries.

The automation software is used for finance management in SRTMU, MU, SPPU and SGBAU and for office file works in KBCNMU and SGBAU libraries. An important feature like barcode generation and OPAC is supported by all automation packages used in the Ten University Libraries. A stock verification module is available in SRTMU, BAMU, UM, KBCNMU, SPPU, SUK, PAHU. Stock verification is done with the help of computers in GUG, RTMNU KRCs. The automation packages supports security check gate function used in SRTMU, BAMU, UM, SPPU, SUK, PAHU Universities. It was clear that though all the libraries had used library management software for the automation of library operations such as circulation, cataloguing and OPAC. A researcher also found that entire universities were used automation modules in KRC except RTMNU and GUG universities.

5.4 KRC Service

The library services/facilities include Circulation Service, Reference Service, Online reservation of books, Recommendation of library material, Current Awareness Service, Inter Library Loan Service, Photocopying/Printing Service, Orientation and Information Sessions, Selective Dissemination of Information, Audio Visual Service and Multimedia Section. Services provided to their users by the library. This may include instructions on how to use and use library materials. Library Services/ Facilities include Circulation Services, Reference Services, Online Book Reservation, Library Content Recommendation, Current Awareness Services, Inter-Library Loan Services, Photocopy/Printing Services, Orientation and Information Sessions, Selective Dissemination of Information, Audiovisual Services, Web OPAC and Multimedia services. The library holdings are accessed by a computerized Online Public Access Catalog (OPAC). It allows searches for materials by key-words, or through several access points like author, title, subject and call number of publication. Our user-friendly OPAC enables searches to be conducted with ease and speed. Researcher asked this to know about which types of ICT Based Services Provided by the KRCs to their users

Table -5 ICT Based Services Provided By the KRC

Types of services	Name of University									
	SRTMU	BAMU	UM	KBCNMU	SPPU	SGBAU	SUK	PAHU	RTMNU	GUG
CD/DVD based service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Circulation of new additions list	Yes	-	-	Yes	-	Yes	-	Yes	Yes	-
Circulation service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Current awareness services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
E-books	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
E-journals	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Electronic documents delivery	Yes	-	-	Yes	-	Yes	-	Yes	Yes	-
E-theses	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
Library website	No	No	No	No	Yes	Yes	No	No	No	No
Multimedia service	Yes	-	-	Yes	-	Yes	-	No	No	No
Online databases	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plagiarism service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SDI services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Web OPAC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Field Survey – 2020 -21

In the table-5 indicated that ICT based services provided by the KRC, it was noted that all the ten universities KRCs provided current awareness services, circulation service, online databases, E-journals, E-books and plagiarism service; SDI services provided by BAMU, SRTMU, UM, SPPU, KBCNMU, SGBAU, SUK and PAHU; circulation of new additions list and electronic documents deliver services provided by SRTMU, KBCNMU, SGBAU, PAHU and RTMNU; multimedia service provided by SRTMU, KBCNMU and SGBAU; CD/DVD based service by all KRCs such as SRTMU, BAMU, UM, SPPU KBCNMU, SGBAU, SU, PAHU, PAHU RTMNU and GUG; Web OPAC service provided by all selected university KRCs, E-theses services provided by SRTMU, BAMU, MU, KBCNMU, SPPU, SGBAU, and only SPPU and SGBAU university KRCs have library website and other six universities KRC have web page.

VI.FINDINGS

1. It is found that all ten universities had automation in Circulation, Cataloguing, OPAC and computerized reference services; automation module use for Acquisition used in all except KBCNMU and GUG KRC; Digital library services are provided by all libraries except RTMNU and GUG. There is a definite improvement in the digitization of documents in University Libraries.
2. It is observed that all libraries providing E-journals E-books, Plagiarism service, CD/DVD based service, online databases, Circulation service, current awareness services; most of libraries provide reference services. However, the provision of other services like internet access, Library website, e- thesis services, NLIST database, multimedia service electronic documents delivery is available in a few libraries in the study area.
3. It is revealed that most of libraries in Maharashtra responding were automated all ten universities had automation in Circulation, Cataloguing, OPAC and computerized reference services automated system in the libraries. Some universities have partial automated system. On the contrary, some libraries in the study area have completed automated and equal numbers have partial automated and rest of the libraries have initiated automation of library operation.

VII.CONCLUSION

A study described that the libraries of the above 10 universities shows that the libraries of almost all the universities have been greatly influenced by information technology. All the universities are using various ICT tools for library management and this is increasing day by day. Effective use of information technology in the library transmits user satisfaction. The current situation demands up-to-date technology for fast and easy library services. Gradually, new technologies are developed; therefore the need to develop professionals skills and abilities to provide enhanced library services. Library resources should be used extensively. The success of libraries and library professionals always depends on the quality of service. The rise of ICT is a new model of enhancing library operations and services. Therefore, it is inevitable for library professionals to update with technology for their own survival.

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