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Use of Information and Communication Technology (ICT) in Collection Development in Scientific and Research Institute Libraries in Iran: A study

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Abstract

The explosion of information communication technology (ICT) since the beginning of the 20th century has been rendering manual-based library system in academic, research, special and public libraries less relevant. This is because using and implementing information communication technology in the library depend largely on the librarian attitude toward the current digital age. This study examined the attitudinal correlates of some selected scientific and research institutes libraries in Iran towards the use and application of ICT in their various libraries. A total of ten libraries from all the forty nine libraries in Iran formed the study's population. It is observed that 'Internet/intranet etc' (1046; 67.5%) is the most important source through which the users become aware of modern information technologies used in their libraries. The vast majority of the respondents who answered electronic sources make it 'Easier' to gather and use information are (1313; 84.7%). The results indicate that there is a significant relationship between e-environment and collection development (χ^2 62.86, p=0.000). Findings further show that all of librarians (9; 100%) opined they feel that ICT application affects the collection development of library. Based on these findings, it is recommended that libraries in the developing countries should consider training those librarians who do not have knowledge of ICT in order to remove the fear and anxiety hindering them from developing good attitude towards the use of ICT in their libraries

Keywords Information, Communication technologies, Collection Development, Research Libraries

1. Introduction

Recent advances in science and technology in general and developments in the field of information technology in particular have vastly influenced the concept of collection development and have brought in sweeping changes in information collection, storage and dissemination. Factors like information explosion, budgetary constraints, complex requirements of users, rising cost of publications and other related factors as well as development of digital libraries, internet, e-mail, CD-ROM, electronic publishing etc., have forced the libraries and librarians to change the style and approach of their functioning. Libraries have slowly started

ISSN 2278-7763

giving importance to 'accessing the other libraries collection' rather than mere possessing almost all documents on a given subject i.e., shifting from 'owning' to 'access' and 'sharing'.

Collection development in libraries is tilting towards electronic documents / information sources using network facilities. The trend of printed materials is decreasing and need for accessing electronic information resources is increasing slowly day by day and the concept of collection development which implies building, growing, dealing with selection and acquisition of library materials is changing towards collection management. Combination of both print and electronic information resources like CD-ROM, On-line, internet is the dilemma faced by the libraries and librarians in recent past. 'Information mix' is the order of the day.

Studies on information technologies in Iran indicate that computerization of library systems and services in Iran started in the late 1970s and resumed after an apparent gap in 1980s. However, this trend has accelerated in the last decade especially in institutions of higher education due to the increased number of users, greater demand for the use of library materials within and outside the libraries, increase in the amount of materials being published, changes in the nature of reading material and the development of new and cheaper computers (Safahieh and Asemi, 2010; Farajpahlou, 2002; Ramzan, 2004).

Whatever the form the collection development takes, still it requires policies that would govern the acquisition of both electronic resources and traditional forms of documents. Hence, an attempt is made here to discuss Impact of ICT Application on Collection Development in SRI Libraries for this purpose (Gandhi, 2001).

2. Related studies

Mohsenzadeh and Isfandyari-Moghaddam (2009) performed a study to define the status of the application of information technology in academic libraries in Kerman, Iran. Results showed that the level of application of information technology in Kerman academic libraries was acceptable, but efforts should be made to improve their status to match with the ever-increasing demand for better library services at universities. The most important problem and serious difficulty was lack of educated librarians, which requires suitable investment and planning. Ramzan and Singh (2009) investigated the levels of information technology in academic libraries across Pakistan and found a low level of IT availability, especially the absence of computers, e-mail and internet. It was revealed that the respondent libraries needed to be fully automated using standard library software. However, access to online resources was found to be extensive and

ISSN 2278-7763

comprehensive. Haneefa (2007) carried out a study to examine the application of information and communication technologies (ICT) in special libraries in Kerala, India. The results indicated that library automation in special libraries in Kerala was largely commenced during 1990-2000. CDS/ISIS was used more in libraries than any other software. The library catalogue was found to be the most popular area for automation. Most of the libraries were hampered by lack of funds, lack of infrastructure, and lack of skilled professionals to embark on automation of all library management activities and application of ICT.

3. Scope and objective of the study

Based on 'Higher Education in Iran' (Moarrefzadeh, 2011), there are forty nine (49) scientific and research institutes affiliated with the Ministry of Science, Research & Technology (MSRT) Government of Iran, out of which ten Institutes were selected for this study. Since this study surveyed use of information and communication technologies (ICT) in collection development in selected ten scientific and research institute libraries in Iran, which are shown in table1.

Table 1

Scientific and Research Institutes covered under the study

Sl.No.	Name of Institute	Institute Website Address	Library Website Address
01	Institute for Research in Fundamental Sciences (IPM)	www.ipm.ac.ir	http://library.ipm.ac.ir
02	Iranian Research Institute for Scientific Information and Documentation (IRANDOC)	http://www.irandoc.ac.ir	http://www.irandoc.ac.ir
03	Iranian Research Organization for Science and Technology (IROST)	http://www.irost.org	http://library.irost.org
04	National Research Institute for Science Policy (NRISP)	http://www.nrisp.ac.ir	http://www.nrisp.ac.ir
05	Regional Information Center for Science & Technology(RICeST)	http://www.ricest.ac.ir	http://www.ricest.ac.ir
06	Institute of Standard and Industrial Research of Iran (ISIRI)	http://www.isiri.org	http://www.isiri.org

ISSN 2278-7763

07	Geological survey of Iran (GSI)	http://www.gsi.ir	http://www.gsi.ir
08	Iranian Fisheries Research Organization (IFRO)	http://en.ifro.ir	http://en.ifro.ir
09	Agricultural Biotechnology Research Institute of Iran (ABRII)	http://www.abrii.ac.ir	http://www.abrii.ac.ir
10	Soil Conservation and Watershed Management Research Institute (SCWMRI)	http://www.scwmri.ac.ir	http://www.scwmri.ac.ir

The aim of the study is to identify the impact of e-environment, on the collection development activities of Scientific and Research Institute (SRI) libraries in Iran.

4. Methodology

The research conducted a study on the collection development at ten scientific and research institute libraries by librarian, faculty, research scholars and expert. For the purpose of data collection, a well structured questionnaire was designed and administrated randomly to the 2,390 faculty, research scholars and expert and 1,550 questionnaires were returned that giving a response rate of 64.85%. The stratified random sampling technique was used in administrating questionnaire and interview with faculty, expert and the research scholars. Furthermore, it followed interview with the SRI librarians. In total 10 questionnaires were distributed in librarian of ten institutes in Iran and get returned 9 filled questionnaire. Thus, the investigator selected 9 questionnaires from scientific and research institute libraries from librarian for the analysis of data.

The filled questionnaires were organized, coded and analysed. They were interpreted in the light of the objectives and hypotheses. In analysing and interpreting the data, different statistical measures like Frequency, Percentage, χ^2 (Chi-square) test were utilised. Tables, charts and graphs were used to make the presentation clear and simple.

5. Collection Development

Collection development is vital activity of any library. An up-to-date, adequate and balanced collection both qualitatively and quantitatively to meet the ever changing needs of the user community effectively is the primary duty of any library. Collection Development has been defined as the planned purchase of materials in various formats to match the instructional and

ISSN 2278-7763

research needs of the campus within the current fiscal environment and resource sharing opportunities. The heart of a library is its collections. The buildings house them; the library personnel acquire and manage them and teach users how best to access and use them (Pandita, 2004***).***

Collection development is a wider term. It involves the formulation of a systematic general plan for the creation of a library collection that will meet the needs of that library's clients. Mannan Khan (2010) suggested:

Libraries should prepare a collection development policy manual (CDPM) for proper guidance of the whole collection development process and must prepare a collection development policy. A collection development policy should also be revised from time to time according to the need and situation of the library and the libraries should maintain a separate collection development unit. A separate specific post of collection development in charge (CDI) should be created in the libraries, which will be in-charge of the whole collection development process.

This paper attempts to study the collection development in Scientific and Research Institute Libraries of Iran managed by Ministry of Science, Research & Technology (MSRT).

6. Collection development in information technology (IT) environment

The recent advances in Communication Technology, Networking, use of Internet and Electronic Products have brought about a revolutionary change profoundly affecting the library's landscape. It has affected the selection, acquisition and information transfer process. The Technology is mainly being used for communication, database searching, bibliographic and full text searching. It has also changed the concept of archiving (Kumbar and Hadagali, 2005).

The organization of information, its storage, access, preservation and retrieval has become both – simplified as well as complicated. It is believed that information has become more garmented, piecemeal and disembodied, resulting into changing its face completely. According to Swan (1992), "we are no longer accessing the whole fabric of information, rather bits of data, sound bites and images torn from it". Currently "Economic forces and technological advances have combined together to create a new environment, where access to collective scholarly resources that no library could be ever afford, supersedes the historic quest for the great comprehensive collection" (Harloe and Budd, 1994).

ISSN 2278-7763

Collection development in libraries is tilting towards electronic documents / information sources using network facilities. The trend of printed materials is decreasing and need for accessing electronic information resources is increasing slowly day by day and the concept of collection development which implies building, growing, dealing with selection and acquisition of library materials is changing towards collection management. Combination of both print and electronic information resources like CD-ROM, On-line, internet is the dilemma faced by the libraries and librarians in recent past. 'Information mix' is the order of the day (Gandhi, 2001).

Whatever the form the collection development takes, still it requires policies that would govern the acquisition of both electronic resources and traditional forms of documents. Hence, there is a need for redefining a collection development policy on the following identified key issues.

(a) Balancing ownership and access;

(b) Co-operative efforts; and

(c) Continuous monitoring and evaluation (Gandhi, 2001).

7. Impact of ICT Application on Collection Development in Libraries

7.1 ICT application affects the collection development of library

The librarians were questioned do they feel that ICT application affects the collection development of library. Information so sought is analysed and presented in table 2.

Table 2

ICT application affects the collection development of library

Sl. No.	***Opinion***	***No.***	***%***
1	Yes	9	100.0
Total		**9**	**100.0**

It is observed from table 2 that most (100%) of the respondents opined 'Yes'.

7.2 Impact of ICT Application on Collection Development in Libraries

The librarians were questioned if they feel that ICT application affects the collection development of library. Thus the opinion of the librarians are presented in table 3.

ISSN 2278-7763

Table 3

Impact of ICT Application on Collection Development in Libraries

Sl. No.	*Statements*	*Yes*		*No*		*Total*		*No response*	
		No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
1	Affects of ICT	7	77.8	1	11.1	**8**	88.9	1	11.1
2	ICT takes major share from the budget	5	55.6	3	33.3	8	88.9	1	11.1
3	Operational costs are exceeding year by year	6	66.7	2	22.2	8	88.9	1	11.1
4	Annual maintenance cost of ICT products affects the collection development	7	77.8	1	11.1	8	88.9	1	11.1
5	Higher salaries for a trained staff is also affecting the collection development	6	66.7	2	22.2	8	88.9	1	11.1
6	Leads to balanced collection development	6	66.7	1	11.1	7	77.8	2	22.2

The librarians were questioned do they feel that ICT affects the regular budgeting provision. It is seen that librarians opined more 'Yes' (77.8%), followed by 11.1 percent saying 'No'. Whereas only (1; 11.1%) didn't answered to this question. The librarians were questioned do they feel that ICT takes major share from the budget. It is seen from table 3 that librarians opined more 'Yes' (55.6%), followed by 33.3 percent saying 'No'. Whereas only (1; 11.1%) didn't answered to this question. The librarians were questioned do they feel that operational costs are exceeding year by year. It is seen librarians opined more 'Yes' (66.7%), followed by 22.2 percent saying 'No'. whereas only (1; 11.1%) didn't answered to this question. The librarians were asked do they feel that annual maintenance cost of ICT products affects the collection development. It is seen from table 3 that librarians opined more 'Yes' (77.8%), followed by 11.1 percent saying ' No'. Whereas only (1; 11.1%) didn't answered to this question. The librarians were questioned do they feel that higher salaries for a trained staff is also affecting the collection development. It is seen from table 3 that librarians opined more 'Yes' (66.7%), followed by 22.2 percent saying ' No'. whereas only (1;

ISSN 2278-7763

11.1%) didn't answered to this question. The librarians were questioned do they feel that ICT leads to balanced collection development. It is seen from table 3 that librarians opined more 'Yes' (66.7%), followed by 11.1 percent saying 'No'. whereas only (2; 22.2%) didn't answered to this question.

8. Impact of Information Technology on Collection Development

In order to identify the impact of e-environment, on the collection development activities of SRI libraries, four questions were designed in the questionnaire i.e., Are you aware of modern information technologies used in libraries?; Do electronic sources make it easier or more difficult to gather and use information?; have you ever received any formal training or orientation as to how to search for scientific / technical information?. The results come in the following sections.

8.1 Communication Technology Facilities in Libraries

Users become aware of the existence of information technology communication in their respective fields through different means such as Computer and its facilities, Telecommunication and its facilities, Multimedia, Internet, etc. An attempt is made here to find out awareness of modern information technologies used in libraries for information storage and retrieval. The data so obtained is analysed and presented in table 4.

Table 4

ICT facilities in libraries (N=1550)

Sl. No.	*ICT Facilities*	*Rarely*		*Some Time*		*Frequency*		*No*	
		No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
1	Computer and its facilities	291	18.8	271	17.5	942	60.8	46	2.9
2	Telecommunication and its facilities	463	29.9	378	24.4	489	31.5	220	14.2
3	Internet / intranet etc	273	17.6	122	7.9	1046	67.5	109	7.0
4	Multimedia	453	29.2	259	16.7	560	36.1	278	17.9
5	Digitization	604	39.0	143	9.2	439	28.3	364	23.5
6	Satellite / modem	527	34.0	296	19.1	341	22.0	386	24.9
7	Video conferencing/ video text /tele text	733	47.3	194	12.5	294	19.0	329	21.2

ISSN 2278-7763

Data analysis from table 4 shows that 'Internet/intranet etc' (1046; 67.5%) is the most important source through which the users become aware of modern information technologies used in their libraries. 'Computer and its facilities' (942; 60.8%) is the second most sought after factor by the users to become aware of modern information technologies used in their libraries, followed respectively by 'Multimedia' (560; 36.1%) and 'Telecommunication and its facilities' (489; 31.5%). Further, 'Digitization' (439; 28.3%), 'Satellite/modem' (341; 22.0) and 'Video conferencing/video text/tele text' (294; 19.0) are the least preferred factor by users in becoming aware of modern information technologies used in their libraries.

8.2 Prefer to obtain journal articles / reference material

Print and electronic journals have their own advantages and limitations. Special libraries for the best collection development have to select proper format for subscription regarding their user's preferences. Thus, the investigator intended to know the users 'preferred format of journals'. In this regard, the participants were requested to indicate how they prefer to obtain journal articles /reference material and they agreed with each of three format. The data so obtained is analysed and presented in table 5.

Table 5

Prefer to obtain journal articles / reference material

Sl. No.	***format***	***No.***	***%***
1	Print copy only	87	5.6
2	Electronic copy only	194	12.5
3	Both : Print and Electronic	1269	81.9
	Total	**1550**	**100.0**

The above table shows that 1550 respondents answered this question. The respondents who prefer 'Both: Print and Electronic' to obtain journal articles/reference material are 1269 against 194 prefer 'Electronic copy only ' in this regard. They represent 81.9% and 12.5%, respectively. Thus, it can be concluded that the vast majority of the respondents (81.9%) prefer

ISSN 2278-7763

'Both: Print and Electronic' to obtain journal articles/reference material. Only (87; 5.6) prefer 'Print copy only'.

8.3 Advantages electronic sources

The users were asked about do electronic sources make it easier or more difficult to gather and use information. The data so obtained is analysed and presented in table 6.

Table 6

Use of electronic sources

Sl.. No.	*Opinion*	*No.*	*%*
1	Easier	1313	84.7
2	Difficult	237	15.3
	Total	**1550**	**100.0**

The above table shows that 1550 respondents answered this question. The vast majority of the respondents who answered electronic sources make it 'Easier' to gather and use information are 1313 against 237 who answered 'Difficult' in this regard. They represent 84.7% and 15.3%, respectively.

8.4 Formal training or orientation

Formal training, user's orientation, user guidance and assistance are important functions of any library. Scientists particularly need continues guidance and assistance in searching information, locating required documents and knowing about the sources of information. Librarians therefore have greater responsibility in orienting guiding and writing the scientists using the library primary orientation about the library, its sources and services, rules and regulations, do's and don'ts help scientists/users to make optimum use of library resources and services.

8.4.1 Formal training or orientation to search for scientific/technical information

The users were asked whether they have ever received any formal training or orientation as to how to search for scientific / technical information. The data so obtained is analysed and presented in table 7.

ISSN 2278-7763

Table 7

Formal training or orientation

Sl. No.	*Formal training or orientation to search*	*No.*	*%*
1	Yes	627	40.5
2	No	923	59.5
	Total	**1550**	**100.0**

As the table indicates, 923 respondents don't have ever received any formal training or orientation as to how to search for scientific/technical information, while, the respondents who have formal training to search at their libraries are 627, representing 59.5% and 40.5% of the total respondents, respectively.

8.4.2 Usefulness of training

The users were asked that such training was useful. The data so obtained is analysed and presented in table 8.

Table 8

Usefulness of training

Sl. No.	*Usefulness of training*	*No.*	*%*
1	Yes	1287	83.0
2	No	263	17.0
	Total	**1550**	**100.0**

As the table indicates, 1287 respondents that have ever received any formal training or orientation as to how to search for scientific / technical information think that such training was useful, while, the respondents who don't think that such training was useful are 263, representing 83.0% and 17.0% of the total respondents, respectively.

9. Testing of hypothesis: analysis and interpretation

In order to test whether e-environment has any association with the collection development of SRI libraries, the following hypothesis was framed:

ISSN 2278-7763

Hypothesis: There exists impact of e-environment in the collection development of SRI libraries.

This was tested with the help of χ^2 test. The test conducted for 23 degrees of freedom at the 0.01 level of significance shows that there was a significant impact of e-environment on the collection development (χ^2 =62.86, p=0.000). Hence, the research hypothesis is supported i.e., There exists impact of e-environment in the collection development of SRI libraries.

10. Summary of Findings

- All of librarians (9; 100%) opined they feel that ICT application affects the collection development of library (Table 2).
- A large segment of the librarians 77.8% opined they feel that ICT affects the regular budgeting provision, followed by 11.1 percent saying 'no'. Whereas only (1; 11.1%) didn't answered to this question (Table 3). It is seen that 55.6% of the sample opined they feel that ICT takes major share from the budget, followed by 33.3 percent saying 'no'. Whereas only (1; 11.1%) didn't answered to this question (Table 3). A good number of the respondents 66.7% opined they feel that operational costs are exceeding year by year, followed by 22.2 percent saying 'no'. Whereas only (1; 11.1%) didn't answered to this question (Table 3). Majority of librarians 77.8% of the sample opined they feel that annual maintenance cost of ICT products affects the collection development, followed by 11.1 percent saying 'no'. Whereas only (1; 11.1%) didn't answered to this question (Table 3). A good number of the respondents (66.7%) of the sample opined they feel that higher salaries for a trained staff is also affecting the collection development, followed by 22.2 percent saying 'no'. whereas only (1; 11.1%) didn't answered to this question (Table 3). It is seen that (66.7%) of the sample opined they feel that ICT Leads to balanced collection development, followed by 11.1 percent saying 'no'. Whereas only (2; 22.2%) didn't answered to this question (Table 3).
- It is observed that 'Internet/intranet etc' (1046; 67.5%) is the most important source through which the users become aware of modern information technologies used in their libraries. 'Computer and its facilities' (942; 60.8%) is the second most sought after factor by the users to become aware of modern information technologies used in

ISSN 2278-7763

their libraries, followed respectively by 'Multimedia' (560; 36.1%) and 'Telecommunication and its facilities' (489; 31.5%). Further, 'Digitization' (439; 28.3%), 'Satellite/modem' (341; 22.0) and 'Video conferencing/video text /tele text' (294; 19.0) are the least preferred factor by users in becoming aware of modern information technologies used in their libraries (Table 4).

- It can be concluded that the vast majority of the respondents (1269; 81.9%) prefer 'Both: Print and Electronic' to obtain journal articles/reference material against (194; 12.5%) prefer 'Electronic copy only ' in this regard. Thus, only (87; 5.6%) prefer ' Print copy only' (Table 5).
- The vast majority of the respondents who answered electronic sources make it 'Easier' to gather and use information are (1313; 84.7%) against (237; 15.3%) who answered 'About the same' in this regard (Table 6).
- It is observed that, 923 respondents don't have ever received any formal training or orientation as to how to search for scientific/technical information, while, the respondents who have formal training to search at their libraries are 627, representing 59.5% and 40.5% of the total respondents, respectively (Table 7).
- It is observed that 1287 respondents that have ever received any formal training or orientation as to how to search for scientific/technical information think that such training was useful, while, the respondents who don't think that such training was useful are 263, representing 83.0% and 17.0% of the total respondents, respectively (Table 8).
- In order to test whether e-environment has any association with the collection development of SRI Libraries, χ^2 (Chi-square) test was conducted for 23 degrees of freedom at 0.01 level of significance. The test shows that there is a significant relationship between e-environment and collection development (χ^2 value=65.86, p=0.000<0.05) (**hypothesis 2**). Hence, the research hypothesis is supported i.e., There exists impact of e-environment in the collection development of SRI Libraries.

11. Recommendations and Suggestions

- The library professionals should combine ICT and library and information science qualifications, skills, competencies, and expertise.
- Strive a right choice between printed and electronic resources

ISSN 2278-7763

- Provide electronic resources like e-journals, bibliographic databases, full-text databases, CD-ROM databases, multimedia databases, and access to web-based resources, etc.
- Need to educate and train the library professionals
- Internet, e-mail, on-line services must be provided to users.
- It is recommended that SRI libraries provide easy access to digital information, especially in the form of e-journals and datasets. They should also provide links to catalogues of other libraries and have portals on their websites directing academics and researchers to links they might find useful.
- Sufficient funds should be made available by the authorities for library automation, development of digital resources, and application of ICT.

12. Conclusion

Application of ICT in libraries has become inevitable in an era of information explosion and widespread use of digital information resources. Effective application of ICT in libraries helps in performing their operations and services most efficiently. This investigation has provided a useful summary of the application of ICT in scientific and research institute libraries in Iran. The Scientific & Research libraries have given due recognition and importance in terms of collection, budget, infrastructure facility, staff and users. In the Meanwhile they are using Information and Communication Technology, as a source for book selection, display of new arrivals for library publications and for database creations. These Research libraries have good infrastructure facilities to provide the services through LAN, Web based and through automated library and to continue the routine activities of the library. Majority of them have Internet servers that are used for various purposes. These Research libraries are using standards to create internal databases, which are used for information retrieval purposes. Some of research libraries mobilize the library funds through projects, running short-term courses, marketing the manpower and the sources and services. To overcome this unfortunate situation, library management in developing countries need to review their policies and, instead of heavily depending on traditional information resources, should set aside adequate resources for collecting digital information. They also need to give priority to staff training, and user education in regard to ICT-based resources and services. The study concludes that most of the scientific and research libraries in Iran need proper ICT infrastructure including Computer and its facilities, Internet/intranet etc, Multimedia,

ISSN 2278-7763

and human ware and library staff have to be trained properly to make use of the resources optimally both conventional and digital resources.

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