

The perception and administrative effect of Internet usage in Jordanian university libraries

Abdul Razeq Mustafa Younis

The author

Abdul Razeq Mustafa Younis is Associate Professor at the University of Jordan, Amman, Jordan.

Keywords

Internet, User studies, Perception, Academic libraries, Jordan

Abstract

Reviews the extent of Internet utilisation in Jordanian university libraries. Discusses: its use, benefits, services, and applications; the effect on acquisitions, the libraries' organisational structure, administration, cost, and services; problems and solutions. The study investigated 13 libraries linked to the Internet. They employ it for technical functions, information services, and Web pages. Head librarians perceive the Internet as a supplement to libraries' collections, as a substitute for databases on CD-ROMs, and a way of saving on subscription charges for printed journals, but not as a replacement for printed books. They perceive the Internet's main administrative effect is on staff's satisfaction, motives, speed and ease of services, users' satisfaction, and turnouts, but it has the least effect on libraries' budgets. Lack of experience, misconceptions about the Internet, misuse of Web sites, information inauthenticity, censorship, copyright, insufficient high quality terminals, and language problems are, *inter alia*, prime reasons limiting the optimal use of the Internet.

Electronic access

The research register for this journal is available at <http://www.emeraldinsight.com/researchregisters>

The current issue and full text archive of this journal is available at <http://www.emeraldinsight.com/1468-4527.htm>

Introduction

It was not until 1962 that the first higher education institution in Jordan, the University of Jordan, was established. That year marked the threshold of the country's "march to higher education" movement. By 1999 there were eight state universities, along with one technical engineering college. In addition, ten private universities and one academy were established during the 1990s.

The trend of establishing higher education institutions in Jordan came about to meet the demands of the ever-increasing number of secondary school (commonly called *Tawjihi*) graduates for higher education. As a result of this growing interest, there was a need for a mechanism to properly plan, control and supervise higher education institutions in the country: a government body that would also expand higher education subject areas and specialised fields. It should also see how higher education would accommodate students' abilities and capabilities on one hand, and the society's needs for certain specialisations, on the other. Hence came the idea for the Higher Education Council (HEC) which was established on 1 May 1982.

Libraries and information centers in Jordan have realised the value and importance of automation in order to improve their services to users. "As computer systems have been introduced to government departments and private sector firms, libraries and information centers have, as well, started to use computer systems by the beginning of the 1980s" (Younis, 1990).

Jordanian librarians, especially those who are working in an academic environment, have realised that information technology grants libraries a unique opportunity and exciting possibilities to enhance the quality of knowledge, thus expanding their outreach services. Besides, the implementation of information technology requires the implementation of new advanced approaches in the process of selection and acquisition of library materials, methods of subscription to periodicals and reference services, and online searching of remote databases in networks. Consequently this gives access to types of information and full-text documents which may not be otherwise attainable. Thus the

Refereed article received 1 February 2002

Approved for publication 14 February 2002



Online Information Review

Volume 26 · Number 3 · 2002 · pp. 193-208

© MCB UP Limited · ISSN 1468-4527

DOI 10.1108/14684520210432477

implementation of computerised information systems will enable libraries and information centres to achieve the benefits they desire, and to provide better services more cost effectively.

Therefore, academic libraries in Jordan started to use automated systems by 1986, when only one state university library, among a total of three, was automated (Younis, 1990, p. 22). Ever since then, academic libraries in Jordan have witnessed a remarkable advancement towards automation. By the end of the twentieth century, all university libraries – state as well as private – were automated. They have evolved from traditional practices to advanced functions and services. This is evidenced by their acquisition of non-traditional sources of information such as CD-ROMs and subscriptions to online databases and services.

A recent study indicates that all university libraries in the country are computerised. Findings of this study revealed that these libraries use either the integrated Arabicised information systems; such as MINISIS and CDS/ISIS software packages, or a customised system (Younis, 1998). Competition among them for superiority and the optimal utilisation of the new technology is serious. Head librarians, as well as university top administrators, are very much in favour, as they are convinced of both the value and the necessity of library automation.

However, systems functional applications is still mostly exclusive to the traditional technical processing (cataloguing and classification) of library materials, and the production of automated catalogues (OPACs). Therefore, information services are basically focused on using these catalogues, and a little use of periodicals, reference services, and lists of bibliographies. It should be noted, however, that after over a decade of computerisation in Jordanian libraries, the effect of automation seemed notable in the academic libraries' organisational structure. All state university libraries, and almost two-thirds of the private university libraries, have established a special department for computer applications, consequently producing an impact on their administrative routine, and enhancing levels of service performance (Younis, 1999).

This research paper is concerned mainly with the utilisation of the Internet in

Jordanian university libraries. It is also concerned with the effect of the Internet on the acquisition of information sources; electronic or printed. The Internet's administrative effect on the organisational structure, cost and services; its problems and solutions, will be investigated.

To set the stage for this study, a brief look on the emergence and development of state (government) and private universities in Jordan will be outlined.

Jordanian universities: a brief introduction

A total of eight state and 12 private universities have been established in Jordan by the end of the academic year 2000/2001. All award undergraduate degrees, post-graduate vocational and high diplomas, and Masters degrees in different fields including the arts and sciences, humanities, social sciences, applied sciences, medical sciences, agriculture and engineering, etc. PhD degrees are awarded in the fields of arts, literature and education on a limited scale at the University of Jordan in the capital city of Amman.

Table I is a list of state and private universities in Jordan. It shows location,, years of establishment, number of faculties; scientific and humanities, the grand number of faculty members and students in each university for the academic year 2000/2001 (Jordan HEC, 2001).

State universities

The University of Jordan was the first one established in the capital city of Amman in 1962. It is the largest and most important in the country. The University focused on the fields of humanities, education, agriculture, medical sciences and engineering. The 1980s was marked by the establishment of other medical faculties; the faculty of pharmacology and dentistry. These components have become, with the establishment of the faculty of business administration in 1997, the faculty of rehabilitation science, and the faculty of information technology. In the academic year 2000/2001, there were 17 faculties and more than ten centers for research and studies in computers, continued education, manpower and human resources developments, strategic studies, and water resources.

Table I State and private universities in Jordan

University	City	Year	Sc. faculty	Hum. faculty	Faculty members	Students
State						
University of Jordan	Amman	1962	9	8	918	23,629
Yarmouk University	Irbid	1976	3	8	623	19,455
Mu'tah University	Karak	1981	5	6	421	15,513
Univ. of Science & Technology	Irbid	1986	9	1	555	11,718
Al-El-Bait University	Mafraq	1994	2	5	174	6,664
El-Hashmiyah Univ.	Zarka	1995	4	5	226	6,795
Balka' Applied Univ.	Salt	1997	3	3	87	1,584
Al-Hussein bin Talal Univ.	Ma'an	1999	1	2	58	1,504
Total			36	38	3,062	86,862
Private						
Amman Private Univ.	Amman	1990	4	5	178	4,222
Applied Science Univ.	Amman	1991	6	5	309	7,610
Petra Univ.	Amman	1991	5	5	142	2,026
Isra' University	Amman	1991	5	4	119	2,457
Philadelphia Univ.	Amman	1991	4	4	188	4,711
Zaituna Univ.	Amman	1993	3	3	131	3,546
Irbid Private Univ.	Irbid	1994	1	3	117	3,244
Jerash Private Univ.	Jerash	1994	3	3	116	3,929
Zarka Private Univ.	Zarka	1994	2	5	109	3,272
Princess Sumaih Univ. College	Amman	1991	2	0	50	1,023
Jordan Academy of Music	Amman	1990	-	1	16	43
Amman-Arab University for Higher Studies	Amman	2000	^a	^a	^a	^a
Total			35	38	1,475	36,083

Note: ^a Information not available

The University of Jordan Library grew and developed along with the growth of the university itself. Its collections exceed 650,000 items (including monographs, periodicals, AV, microforms). In addition there is a collection of electronic databases on CD-ROMs.

Yarmouk University is the second largest university in the country. Established in 1976 in the city of Irbid, (90km north of Amman), the university focusses on arts, science, education and the humanities. It also stressed the various aspects of contemporary life in science and technology and services to the community. Its establishment came about to meet the rapid increase of the social and economical development demands for skilled and professionally trained staff in the country, including the northern region. It has 11 faculties and a number of centers for research and studies similar to those of the University of Jordan.

The University library has a collection of over 300,000 items of monographs and other

types of library materials. In addition it has a good collection of electronic databases on CD-ROMs. This library was the first of its type in the country to use an advanced automation system in its operation (Sotari, 2001).

Mu'tah University, Jordan's third institution of higher education was established in 1981 to serve the southern region of the country. It, unlike the other two forementioned universities, was conceived as a military college to offer training in martial arts and police techniques, along with a curriculum of academic disciplines and civic specialisations (Younis, 1987). As the university focused its attention towards scientific fields, five faculties in computer science, agriculture, nursing, civil engineering, and natural sciences were established, raising the number of faculties to 11, in addition to other centers for research and studies.

The establishment of Jordan University of Science and Technology in 1986 gave science

and technology the priority it deserves. The faculties of engineering, medicine, public health, pharmacology, nursing, dentistry, veterinary medicine and agriculture formed the core. The university has recently established the faculty of mathematics and computer science.

Nevertheless, the philosophy, aims and objectives of both of Al-El-Bait University (established 1994), and the Hashmiyeh University (established 1995), do not differ from those of the other universities in Jordan. Rather their mission is to cater for the Eastern region of Jordan.

The Balka' Applied University, established in the city of Salt (20km west of Amman) in 1997, is an umbrella institution for all (about 16) government community colleges scattered in different cities all over the country. Its major interest is in information technology and applied sciences. The university has recently integrated under its mandate the Amman University College for Applied Engineering (established in 1989) about 10km east of the capital city of Amman.

Al-Hussein bin Talal University (established 1999) is the most recent. Located in the city of Ma'an (about 200km south of Amman), the establishment of this university fulfills the Jordanian government's objectives to consolidate the southern region's social and economic development. The faculties of educational sciences, humanities, and computer science formed the core of the university's course of action. It has 58 faculty members and a student body of over 1,500 students.

Private universities

Private universities in Jordan were defined, by Bylaw No. 19 of 1989, as: "every university, higher institution, or a college where the course of study is no less than four years, or its equivalent, provided that it awards at least the BA degree. It is to be established, owned, managed and supervised by a non-government body". The bylaw articulated private universities' aims and objectives. Article 5 of the higher education bylaw stated "a private university enjoys autonomous governance, with financial and administrative independence".

Amman Private University (established 1990) was the first one of its kind in the country. There are now ten private universities awarding undergraduate degrees

in fields including education, social science, pure and applied sciences, law, arts and literature; and one academy awarding a BA in music. Amman-Arab University for Higher Studies (established June 2000) is the latest, but the first of its kind in the country. It offers graduate degrees in education and law. Future plans include graduate studies in LIS. It is still under consideration for accreditation by the HEC.

The Internet in Jordanian universities

Recent years have witnessed a proliferation of Internet use in academic libraries. The perception of the Internet as a provider of answers to all queries has increased its popularity and created demand. The increased demand for online information has forced libraries to question the role of the Internet in their individual institutions. Academic libraries face the challenge of exploring the information super-highway to provide reference services to their clients.

In fact, universities have contributed positively to the growth of the Internet, as more and more academic institutions have rushed to become linked to the Web. In a growing number of colleges and universities throughout the globe, Internet access is viewed by users (faculty members, staff, and students) as a core resource and a basic right, similar to a library catalogue.

In the light of these developments, directors of academic libraries in Jordan, and certainly in other parts of the world, are re-evaluating their future plans. Some time ago, librarians were shifting their focus from holdings to access. As information sources are becoming more easily available via more convenient media, libraries are quick to adapt to the new trends. So, as libraries have changed emphasis from ownership of printed forms, to the access to online databases or LAN systems based on CD-ROMs, the trend is heading towards linkage with the Internet as a prime gateway to information sources. It is perceived that accessing information sources on the Internet is becoming more convenient and less costly than the other alternatives. Besides, many CD-ROM databases are outdated as soon as they are published or soon after. It is perceived that only on the Internet can users interact and be updated continuously in a text-based, real time environment.

Realising this challenge and its leading academic role in the community, the University of Jordan was the first of its kind in the country to have an Internet connection. It signed a bilateral agreement with the National Information Center (NIC) for the connection. Other universities, state as well as private, have followed suit and signed similar bilateral agreements with NIC.

The University of Jordan computer center, established in 1976, facilitated connection to the Internet by upgrading its equipment and improving its network connection capabilities. One of the center's main improvements took place in 1996 when a Vax-8530 with DEC-Alpha computer system was installed (Mafalha, 1998). Later, in 1997, the center replaced the university's old network facilities. The new system is open-ended with a speed ten times faster than the old one. The new system expanded and upgraded the university's net capabilities from shared media LAN to switched ethernet LAN within seven nodes (Mafalha, 1998). Thus, the center improved linkage with the Internet to all university buildings, comprising all of the university faculties, scientific centers, administrative departments, the library, and all computer laboratories on campus. The university library started to provide Internet services to users in 1998 mainly for Telnet (for connections with other universities' OPACs, databases, and online systems), file transfer protocol (ftp), and e-mail (El-Shafi', 1998). It is worth noting that the University of Jordan has started a new registration method for its students via the Internet commencing the second semester of the 2001/2002 academic year.

Most universities in Jordan have Web pages on the Internet, each of which provides brief information about the respective university's objectives, faculties and academic departments, administrations, subject areas of study, degrees offered, credit hours and requirements, tuitions and costs of study, registration procedures, the library, location, facilities and services, and correspondence and contacts, etc.

Related studies

Local

The 1980s are considered the beginning of the automation era as far as libraries and

information centers in Jordan are concerned. Several studies on the use of computer-based systems in Jordanian libraries have been conducted. However, a review of the literature revealed that none of them was on the use of the Internet in academic libraries in the country.

Regional

Survey studies on the use of the Internet in Arab academic libraries are scarce. A review of the literature uncovered a limited number of studies, which were conducted between 1998 and 2001. The first of which was Elayan and Al-Qessi's (1999) study on the use of the Internet at the Bahrain university library. The study revealed that 95 per cent of the respondents use the Internet for information searches, e-mail, browsing newspapers, the news, and entertainment. Most (73 per cent) of the respondents use Yahoo!, Lycos, Excite, Infoseek, and AltaVista search engines.

Bu-Merafi's (2001) study aimed to assess the use of the Internet by Al-Sharqa university faculty members, and to find which problems limit their use of the Web. The study showed that about one-third of the 70 respondents use the Web for e-mail, while the other two-thirds use it for information searches, using other libraries' online catalogues (OPACs), browsing the Web, subscriptions to e-journals, electronic publishing, and entertainment. Lack of training, lack of time, the Web's slow response time, difficulty in obtaining and/or lack of the needed information, language difficulties and the abundance of, and unorganised information, are the main problems that hinder their use of the Web.

Abdallah (1998) described several issues confronting private academic libraries in Lebanon after the civil war, one of which was the impact of technology. The study noted that Lebanese American University libraries have 14 Web stations for student use. Faculty, staff, and administrators access the Internet and e-mail either from the library or from their own offices. The study concludes that full access to the Internet and some online services was not yet possible in most academic libraries because Lebanon was still very low in bandwidth.

In Morocco, Clark and Lai (1998) revealed that Al Akhawayn University in Ifrane (AUI) established Morocco's first Internet connection. The study surveyed 124 users (38

faculty, and 86 graduate students) who had Internet access for at least one complete semester. Results indicated that although most respondents (34 per cent of faculty, and 78 per cent of graduate students) had no prior experience with the Internet, they were heavily utilising Internet services for business, academic, and personal purposes.

Respondents who had used Internet facilities prior to AUI expressed high satisfaction, while the major reason for faculty or students' dissatisfaction with Internet service(s) was related to their misunderstanding of how the system works.

Askhita's (2000) study presents a comprehensive overview of the most important current and future Internet projects in Syria. The most notable of which is the project carried out in cooperation with Unesco. The project has a wide scope of applications that allow higher education and research institutions to benefit from the services of information networks, and the Internet in particular.

International

A review of the literature revealed an abundance of writings on the Internet and its uses in various types of libraries. For the purpose of this study a selection of studies on the use of Internet by academic libraries in different parts of the world, are reviewed. Internet user studies are excluded.

Rosenthal and Spiegelman (1996) surveyed 139 academic reference librarians' use of the Internet at the reference desk at two-year and four-year colleges and universities throughout the state of New York. Their purpose was to gather information about the usefulness of the Internet as a reference tool, identify Internet users, determine usage patterns, identify personnel behaviour, evoke both positive and negative reactions to Internet use, and detect system strengths and weakness. Participants' responses overwhelmingly indicated that the Internet expanded resources beyond their collections, including other OPACs, databases, and government information. They also expressed satisfaction as to the convenience and availability of both up-to-date information and data not found elsewhere. However, respondents expressed the need for organisation, standardisation, and uniformity, as well as improved response time. They also desired better search and access tools, authority control, and advanced

training. Many reference librarians viewed the Internet as promising, while others remained skeptical as its "usefulness is yet to be determined".

Saeed *et al.* (2000) examined the status and use of the Internet in 40 university (29 public, and 11 private) libraries in Pakistan. The study revealed that half of the university libraries in Pakistan have access to the Internet and it has become an essential part of library services. The study concluded that the Internet is heavily used for reference work, classification and cataloguing, document delivery service, subscription to online journals, etc. Study results revealed that acute shortage of resources, insufficient funds, insufficient computer terminals, connectivity problems, and shortage of skilled staff restricts university libraries from gaining optimal benefits from Internet access. The study concluded that there was a desperate need to develop an IT infrastructure in both of the private and public universities. However, results indicated that the Internet in the private sector is much better than in its public counterpart.

In a paper presented to the 65th IFLA conference held in Bangkok, Thailand in 1999, Begum and Jean (1999) described the extent of Internet connectivity and usage in libraries in five countries in the South-east Asian region, (Malaysia, Singapore, Thailand, Indonesia and Brunei), and how many of them were using the Internet to provide electronic information resources and services through their homepages. The paper presented a case study of the University Sains Malaysia (USM) library's strategy in promoting the use of the Internet among the university's academics and students. Some of the steps taken include developing their homepage into a gateway to electronic resources in the library and on the Internet, and conducting subject-specific training workshops geared towards the needs of academics and researchers. The study concluded that home pages exist for all the major academic libraries in each country, almost half of the libraries surveyed provide access to the library's OPAC and databases via the homepage, and libraries in Malaysia and Thailand provide network library resources in English and their national languages. One academic library in Thailand has its home page in Thai.

McNab and Winship (1996) examine some of the current applications of Internet technology and networked information in British academic libraries. The study observed that the availability of library catalogues across the Internet was one of the earlier uses (since the mid 1980s) and is seen as an important application. The study noted that academic librarians largely see the Internet as a publishing medium and they have used it in that way, particularly in relation to the campus wide information service (CWIS) set up in the last few years in many universities. Librarians also provide a current awareness service to teaching and research staff, to inform them of new Web sites and discussion lists.

Weessies and Wales (1999) surveyed the head of reference librarians at the main library of 247 mid-sized academic (mainly undergraduate) institutions in the USA. Their aim was to identify the decisions libraries have made concerning Internet use, to get a general sense of these institutions' experiences with Internet access, and policies in the reference area. Of the 193 (78 per cent) respondent libraries, 97 per cent provide patron-accessible Internet workstations in the reference area. All respondents indicated that students, faculty, and staff have access to these workstations. The vast majority (91 per cent) offers access to community users, 96 per cent to alumni, while ten respondents provide Internet access to "anyone who walks in the door". The study revealed that about half of the respondent libraries have a written policy governing Internet use. The majority has placed some restrictions on e-mail, chats, and games; about half have restricted the viewing of pornography in the reference area. A large number of libraries employ a variety of access restrictions, including age, time and appropriate use restrictions. The other most commonly restricted activities include word processing; non-research related, viewing of offensive materials, activities in violation of state and federal laws, computer programming, online shopping, and viewing of "sexually harassing materials".

Abdoulaye and Majid (2000) investigated in their study the effect of the Internet in Malaysian academic libraries. Their objective was to find how the integration of the Internet has affected reference professionals and

services. The study also investigated respondents' perceptions of the importance of the Internet in reference work. The study included a sample of 40 library professionals working in the reference departments of nine Malaysian academic libraries. Respondents felt that the Internet has contributed positively to reference work and has enhanced their effectiveness and efficiency. The majority of respondents believed that the Internet should not completely replace traditional reference tools. They also felt that reference librarians should possess good computing and Internet use skills for providing effective reference services.

The study

Objectives

This study is mainly concerned with the extent of Internet utilisation in Jordanian university libraries. The study also aims to investigate the administrative effect of the Internet in academic libraries in Jordan. The effect of the Internet on the acquisition of traditional and non-traditional information sources (i.e. CD-ROMs), problems and solutions, will be discussed.

Population and sample

The population of the study consisted of all university libraries in Jordan (state and private) with degrees of no less than four academic years, and awarding, at least, the BA degree. Private universities must be accredited by the Higher Education Council (HEC) of Jordan.

Official statistical sources of the Ministry of Higher Education in Jordan indicated a total of 20 universities met the conditions of the study. For the purpose of this study, 18 university libraries – eight state and ten private – were selected. Two private university libraries were excluded. One is a non-academic institution, where music is the prime discipline of study, and the other has just started operation at the beginning of the academic year 2000/2001 and was in the process of establishment. Furthermore, it was not accredited by HEC at the time this study was in progress.

Research methodology

This survey is primarily concerned with gathering factual data on the utilisation of the

Internet in Jordanian university libraries. Therefore, the study attempts to investigate the following:

- the use of Internet: benefits, services and applications;
- the effect of Internet on the acquisition of information sources: electronic or printed;
- the administrative effect of the Internet on the organisational structure, administration, cost, and services; and
- problems and solutions.

Data collection

The type of information sought guided the application of the research techniques and instruments deemed appropriate for the study. They are:

- a written questionnaire;
- personal interviews;
- field visits; and
- review of the literature.

The questionnaire

The questionnaire used for this study was designed by this investigator, and was based, in part, upon an instrument designed for earlier studies in this capacity.

The initial questionnaire was tested by five referees, three were professional librarians known to the investigator for their knowledge and experience in online systems use and applications in libraries and information services. The other two were colleagues of university professors who specialised in testing and statistics, and research design.

The questionnaire was modified where necessary. The final version (see Appendix) included a set of questions on the Internet, and its administrative effect on the organisational structure, administration, cost, and services. Sets of questions covered all areas of investigation referred to earlier.

Responses

Copies of the questionnaire were either mailed or handed in to target libraries. In total, 15 (83.3 per cent) libraries have responded and returned the questionnaire with usable data. Of these, seven out of eight (87.5 per cent) are state university libraries (SUL), and eight out of ten are private university libraries (PUL). Table II shows the number and percentages of responses, and the

number and percentages of respondent libraries using the Internet. The table shows that 13 (86.7 per cent) of the respondent libraries indicated that they use the Internet, where only two (13.3 per cent) do not. It should be noted that SULs represent 46.7 per cent of the overall respondent libraries, while PULs represent 53.3 per cent.

Data analysis

Analysis of the questionnaire responses along with data gathered from field visits to a number of libraries, and personal interviews with head librarians provided an overall idea about the issues (services, benefits, effect on acquisition and administration) concerning the utilisation of the Internet in Jordanian university libraries.

The use of Internet: benefits, services and applications

Benefits

Head librarians were asked to outline what benefits were achieved from the Internet. Respondents' consensus was concentrated on the following collective points:

- provides access to other libraries' catalogues (OPACs);
- promoted the concept of library cooperation, and resource sharing;
- provides access to an abundance of recent information sources in a variety of subject fields more conveniently;
- provides access to recently published studies in full-text electronic journals;
- provides faculty with current news on current/ongoing research, and research trends in teaching;
- complements the local library's collections by providing access to information sources that are not readily available at the library;
- serves as a substitute for subscription to databases on CD-ROMs, and saves on the subscription charges in paper journals, as well;
- serves as a means to answer sophisticated reference queries coupled with flexibility in doing bibliographic/literature searches;
- provides direct online connections with other universities and academic institutions; and
- provides faculty and students training opportunities on the use of the WWW.

Table II Responses and use of Internet

University type	Responses					Use of Internet			
	No.	(%)	No.	(%)	% of type	Yes	No	No.	(%)
State	8	44.4	7	46.7	87.5	7	100	0	0
Private	10	55.6	8	53.3	80	6	75	2	25
Total	18	100	15	100	83.3	13	86.7	2	13.3

Services and applications

Most of the respondent libraries (84.6-92.3 per cent) connected to the Internet use the Web in their main technical functions and direct services to users. Table III shows that all but one SUL (85.7 per cent) utilise the Internet in all six functions and services listed in the questionnaire. All SULs have Web pages on the Internet. The same applies for PUL respondents, with the exception of one case in two of the functions; online searching and Web pages.

The effect of Internet on the acquisition of information sources – electronic or printed

Head librarians' views were solicited on how they expect the Internet would affect the acquisition of information sources, both electronic and printed. Some head librarians stressed that the Internet would have no effect in this respect. Others argue that it would not have much effect especially since many faculty members and students are still not very much acquainted with this new technology.

Therefore, they prefer books and journals in printed form rather than electronic. However, these librarians anticipate that the Internet would have more effect on the acquisition of reference works such as directories, statistical sources, and the like. They added: "To judge the Internet effect in this respect, more time is needed for this experience to be evaluated". But, "if a database is available on the Web

and costs less, then the Web form would be preferred".

Other librarians are convinced that "the Internet has a relative effect at this time, even though it would lessen the acquisition ratio of printed forms, or other sources". And that "the use of Internet will make libraries less dependant on using CD-ROMs, thus limiting subscription in this and the printed forms". They also perceived that "the Internet would not have an effect on the importance of printed books", and "academic libraries will acquire journals in both forms; printed and electronic". However, "the increased availability of information sources on the Web, especially full-text journal articles, will make libraries more inclined to decrease their holdings in printed forms". However, "journals and other sources and/or library materials that are not available on the Web, must be purchased in printed form".

The more optimistic librarians argue, "the Internet has a positive effect on the acquisition of information sources as there will be an integrity between online information sources and the printed and the non-printed sources". One head librarian foresees that in the long run "the Internet will have an adverse effect on acquiring materials in paper form or on CD-ROMs". This also holds true as far as electronic journals are concerned. State university librarians revealed that they tend to turn to electronic journals and newspapers available on the Web. Private university librarians share the same argument

Table III Functions and applications the Internet is used for

Functions	SUL (7)				PUL (6)				Total (13)			
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Acquisition	6	85.7	1	14.3	6	100	0	00	12	92.3	1	6.7
Class. and cat.	6	85.7	1	14.3	6	100	0	00	12	92.3	1	6.7
Online search	6	85.7	1	14.3	5	83.3	1	16.7	11	84.6	2	15.4
Ref. services	6	85.7	1	14.3	6	100	0	00	12	92.3	1	6.7
E-mail	6	85.7	1	14.3	6	100	0	00	12	92.3	1	6.7
Web page	7	100	0	0	5	83.3	1	16.7	12	92.3	1	6.7

that “it is possible that subscription in electronic journals available on the Web would limit, lessen, or lead to cancellations of subscriptions in journals in paper form, and databases on CD-ROMs”. Consequently, fewer burdens will be placed on the library staff especially when enough terminals are available in the library.

The majority of librarians agreed that “subscriptions to publications on the Web cost less than subscriptions to CD-ROMs or printed materials”. One librarian argues that “the Internet has a positive effect on the users, and it provides libraries with opportunities to access most recent information sources at a less cost”. Others see that “it saves on purchasing cost, and libraries may pay less charges, [which] consequently eases the burden on the library budget”. However, some caution that “some subscriptions cost more via the Internet”, and “the high expense of subscriptions to some journals and other publications on the Web forces libraries to provide them in printed forms”.

In the final analysis, academic librarians in Jordan have realised that the Internet has eventually materialised the concept of “Library without walls”, which was developed in early 1980s, and most recently known as the virtual library. They also realise that recent trends now are to make all information sources available electronically on the Web, and libraries must keep up with this development. This trend, some argue, will have a somehow negative effect on publishers since libraries will become less dependant on purchasing publications in paper form. In conclusion, the majority of respondent librarians’ consensus is that “the Web will have a positive effect in all cases”.

The administrative effect of the Internet on the organisational structure: administration, cost, and services

The effects that the Internet has produced in respondent libraries’ organisational structure – administration, cost, and services – are shown in Table IV. Respondents were asked to estimate (on a scale of five degrees) the extent which each of the factors listed has affected each of the administrative category. Factors are arranged in a descending ranking order as indicated by the means and the standard deviation of each factor/service. The higher the mean indicates a greater effect on the factor/service, while the lesser the

standard deviation, refers to a greater consensus on the importance of the factor/service and its effect, as well. The administrative effects of the Internet are divided into three main administrative categories: user services; staff and organisation; and cost.

User services

The means and standard deviations of the user services in Table IV reveal that the use of the Internet in respondent libraries has produced the utmost effect (first rank) on speeding up services, and, second, ease of providing them to users evidenced by a high means of 4.77 for the former and 4.69 for the latter factor. Also, these two factors attained the highest consent of all others as to their importance and effect, evidenced by a standard deviation of 0.44 for the former and 0.48 for the latter factor.

Results indicate that the effect which the Internet has produced on users’ satisfaction on the services provided, as a result of meeting their information needs, has consequently led to a higher turnout to use the service (3rd, 4th, and 5th ranks, respectively). However, the stress on “meeting users’ information needs”, even though ranked 4th, seems to be the most important of these three factors as it attained a standard deviation of 0.62, while the 5th factor comes second with a standard deviation of 0.69. Even though the 3rd factor received the lowest consensus of them all, it attained a moderate standard deviation of 0.78.

Nevertheless “introducing users to a new technology” occupied the second lowest rank (6th) of all services, it attained a moderate consent as to its importance and effect among all others with a standard deviation of 0.82. However, the mean 4 of this service does not differ too much from those of the 4th and 5th ranking factors. Meanwhile, the consent on these services was very close, as indicated by a scant difference in the standard deviation indicators of them all, which ranged between 0.44 and 0.97.

Staff and organisation

Results show that the Internet has contributed most effectively in respondent libraries, in the first ranking place, on “staff’s satisfaction”, and “increasing staff effectiveness” in dealing with this system, evidenced by a high equal mean of 4.23 for each. The consensus on the importance of

Table IV The administrative effect of the Internet

Rank	Administrative effect on	Means	Standard deviation
User services			
1	Speeding up services	4.77	0.44
2	Ease of providing services	4.69	0.48
3	Users' satisfaction	4.54	0.78
4	Meeting users' information needs	4.25	0.62
5	Users turnout	4.12	0.69
6	Introducing users to a new technology	4	0.82
7	Ease of databases use and/or other libraries' catalogues	3.54	0.97
Staff and organisation			
1	Staff's satisfaction	4.23	0.44
2	Increasing staff effectiveness	4.23	0.59
3	Training opportunities	4	0.58
4	Establishing a new department in the library	3.85	0.89
5	Increasing staff motives (devotion to work)	3.69	0.48
6	Creates new job opportunities in the library	3.46	0.78
7	Provides opportunities to attend specialised conferences	2.92	1.19
Cost			
1	Increasing cost on library budget	3.38	0.96
2	Decreasing cost on library budget	3	0.91
3	Increasing library income	2.38	0.77

these two factors is also high, evidenced by a standard deviation of 0.44 for the former and 0.59 for the latter. The next most important factor, ranked 3rd, is the "training opportunities" with a high mean of 4, and a standard deviation of 0.58.

However the factor "increasing staff motives/devotion to work", ranked 5th, attained the second highest consensus on its importance and effect with a standard deviation of 0.48. Moreover, it received a high degree on its effect with a mean of 3.69. It is noticed, however, that "establishing a new department in the library" responsible for online systems has occupied a middle ranking position (4th) with a mean of 3.85, but it attained a moderate consensus as to its importance, evidenced by a standard deviation of 0.89.

Although the factor "creates new job opportunities in the library" ranked next to the lowest (6th), the consensus on its effect and importance is high, evidenced by a mean of 3.46 and a standard deviation of 0.78 which does not differ much from those of the previous two factors. It seems that the factor "provides opportunities to attend specialised conferences", ranked 7th, has the least effect and importance of all others. It attained the

lowest mean of 2.92 and the least consensus of 1.19 standard deviation.

Nevertheless, the consensus on the effect and importance of all the factors come close, and does not differ much, except for the last one, from one to the next, where the means ranged between 4.25 and 3.46, and the standard deviation ranged between 0.44 and 0.89.

Cost

Respondent libraries collectively agreed that the Internet had rather increased the burden on their library budgets in the first ranking place (mean of 3.38). Consequently, this did not reduce the library's cost, nor did it increase the library's income. These two factors, ranked 2nd and 3rd, attained a moderate mean of 3 for the former, and a low mean of 2.38 for the latter. Moreover, respondent librarians agreed that the latest factor had a very low effect on their libraries' income, evidenced in a moderate consensus of (0.77) standard deviation.

An overall view of Table IV reveals that Internet has its utmost effect on services to users in terms of speed and ease, which in turn fulfilled users' satisfaction and is reflected in their participation. On the contrary, it has the least administrative effect on the libraries' budgets. While it did not

reduce cost, it increased the burden on them, and did not contribute, by any means, to their income. This may be attributed to the fact that libraries in Jordan, in general, and the academic ones in particular, usually provide free services to their respective users.

However, the effect on libraries' staff came in the highest ranks, as evidenced by the means ranged between 4.00 and 4.23, and the standard deviation indicators, ranged between 0.44 and 0.59. This may be attributed to the training opportunities that library staff might have had in the past few years, as a result of introducing these systems to respondent libraries. Consequently, technically trained staff performance is reflected in the information services, speed, ease, and users' satisfaction. This, in turn, increased, to some degree, the effectiveness looked for.

Problems and solutions

Respondent librarians were asked to list in an open-ended question the problems that they face and believe to have an impact obstructing the effective applications of the Internet in their libraries. Another open-ended question solicited suggested solutions which respondent librarians deemed necessary to overcome these obstacles.

Problems

Problems limiting the optimal use of Internet in respondent libraries may be divided into three main categories: the Web; equipment; and the users:

(1) *The Web:*

- The Net's slow response and connections cut-offs with ISP servers.
- Communication problems and busy lines at peak hours.
- The availability of fewer connection lines than are actually needed.
- Distractions on the Web: commercials, advertisements, ... etc.
- Language difficulties: most available materials needed for academic purposes are mainly in English, whilst most users are Arabic proficient.
- Limitation of access to some databases because of censorship or copyright. Besides, full-text journal databases cannot be accessed without subscription fees.
- Large amount of retrieved information, or no information found.

- Many information sources lack authenticity and accuracy.
- The subscriptions to some electronic databases are expensive.
- The high cost of connectivity and subscription to the Web.

(2) *Equipment:*

- Insufficient number of high quality computer terminals installed to access the Web.
- Computer terminals' inefficiency to connect properly with the Web.
- Inability to cope with increased connectivity pressure, especially at peak hours.
- Telephone lines' poor connectivity and lack of capability to cope with the Web.

(3) *Users:*

- Users' lack of experience, or inability to access the needed information on the Web. This obliges library staff to spend some time and effort training users on the Web.
- Some users attempt to access undesirable Web sites (pornography, gambling, drugs, ...).
- The need of supervision over users to ensure appropriate use of the Web.
- Some faculty members' inability to comprehend the value of the Web.
- Users' inability to evaluate the authenticity of retrieved information.
- Users' eagerness to use the Web, with insufficient number of terminals to meet their needs.
- Lack of enough trained information specialists capable of providing Web services to users.

Solutions

Solutions suggested by respondent librarians may be summarised as follows:

(1) *The Web:*

- The use of protection tools (fire-walls) to prevent access to undesirable Web sites.
- Continuous monitoring to insure proper connectivity and activities on the Web.
- Promote cooperation among academic libraries to share subscription expenses to electronic databases available on the Web.

- Allocate sufficient funding to cover subscription charges to electronic databases on the Web.
- Promote the publishing of journals issued by Arab universities and academic institutions on the Web in Arabic.

(2) *Equipment:*

- Provide libraries with a sufficient quantity of high standard computer terminals able to cope with the Web.
- Provide libraries with modern servers and sufficient high-speed connectivity lines to ensure continuous connection to the Web.
- Provide continuous maintenance of equipment to ensure proper performance and connectivity with the Web.

(3) *Users:*

- Encourage users to attend training courses on the use of Internet.
- Provide college students with a compulsory introductory course on LIS, with the use of Internet forming a primary part of it.
- Make a schedule for students/users to use the Web for a defined limited time.
- Promote the Internet culture and its benefits to users, and to faculty members in particular, to encourage them use the Web.
- Provide sufficient number of trained information specialists capable of providing Web service to users.

Assessment of findings

Analysis of the findings of this study reveals that academic libraries in Jordan are keeping up with the advances in information technology. Previous studies indicated that all of these libraries are automated. This study revealed that the majority (13 or 86.7 per cent) of them are linked to the Internet

The change in the perceptions of academic librarians in Jordan towards the new advances in information technology is obvious. It is noticed that academic libraries in the country are passing the phase of transition. They are changing from the traditional online search to the most advanced trend of the Internet culture. Academic librarians, despite some reservations, view the Internet as a more convenient medium to access an abundance of information quickly and easily.

Respondents felt strongly that the Internet has contributed positively to their libraries' functions. The majority (11-12 or 84.6-92.3 per cent) of respondent libraries employ the Web in their technical functions and information services. Besides, the Internet has helped them provide quality reference services, introducing their institutions to the world, and improved their staff performance.

Academic librarians' views on how they think the Internet will affect the acquisition of information sources, traditional or otherwise, vary. Some felt strongly that the Internet would not be a substitute for the conventional forms of printed books or journals. This could be attributed to the sentimental value of books, and the familiarity with printed sources of most users, who still prefer paper copies of whatever sources they use over the electronic versions. Other possibilities could be that many users are still not familiar with the Internet, are cautious in dealing with it, or are skeptical of its sources' authenticity. On the other hand, some view the Internet as a good replacement for reference works.

Some librarians felt strongly that the Internet will have a positive effect on the acquisition of information sources. They perceive it will limit libraries' subscriptions to printed journals and databases on CD-ROMs. Consequently, it would ease the burden on library staff and the budget. They also feel that the Internet will facilitate unlimited access to full-text information sources, mainly journal articles, as it brought the concept of the virtual (global) library to reality. For this reason, some respondents argue that the Internet will have a negative effect on publishers. They support their argument with the trend towards access rather than holdings. Nevertheless, some librarians expressed the need for "more time for this experience to be evaluated".

Data analysis reveals that the Internet has its utmost effect on libraries' staff satisfaction. This may be attributed to the training opportunities that library staff might have had as a result of introducing online systems to their respective libraries. Consequently, staff performance is reflected on the information services' speed, ease, and users' satisfaction. This, in turn, increased, to some degree, the effectiveness looked for.

On the other hand, the Internet has the least administrative effect on the libraries'

budgets. While it did not reduce costs, it increased the burden on them, and did not contribute to their income. This may be attributed to the fact that academic libraries in Jordan provide free services to users, except for minimal charges for online search results.

However, despite the fact that all respondent libraries have established a new department responsible for online systems, the effect of the Internet on this factor occupied a middle ranking position (4th), but it attained a moderate consensus as to its importance, evidenced by a standard deviation of 0.89. Nevertheless, library staff seems more concerned about new job opportunities rather than attending conferences on this system. It seems that librarians' concern is more about staff motives to work in order to achieve high standard services to users.

However, the fear of the Internet culture in Jordan cannot be denied. The use of the Internet in the academic environment has its limitations. Lack of experience, misconceptions about the Internet culture, the misuse of some Web sites (pornography), lack of information authenticity, censorship, copyright, insufficient number of high quality computer terminals installed are prime reasons limiting the optimal use of the Internet. The slow response and connection hassles, busy lines, language difficulties, and high cost of connectivity are other inherent limitations obstructing the use of the Web. Training, supervision, the promotion of the Internet culture to academics, and precautionary measures (fire walls) are part of the suggested solutions to overcome these problems.

Recommendations

In the light of the findings of this study, the author suggests the following recommendations, which originate from his practical experience in the field, and from the suggested solutions provided by respondent librarians. If fully, or partially, implemented by the academic authorities, it is believed they would have a positive impact on the full utilisation of the Internet, as well as the computerised systems, at a proper and acceptable level:

- Train users on the use of computers, and the Internet to educate them about its importance.
- Organise training courses for staff working in automated systems, in order to upgrade their level of working standards.
- Make available the necessary trained manpower capable of operating the Internet and using the automated systems employed in libraries.
- Allocate sufficient funding to support purchasing the needed number of computer terminals and equipment necessary for the systems' effective functioning.
- The establishment of a Library and Information Science Programme at the Masters' level, emphasising library automation and computer applications in information services, at a state university in the country.
- Promote cooperation among academic libraries to share subscription expenses to electronic (digital) databases available on the Internet.
- Allocate sufficient funding to cover subscription charges in electronic databases on the Internet.
- Promote the publishing of journals issued by Arab universities and academic institutions on the Internet in Arabic.
- Provide libraries with a sufficient quantity of high standard computers/terminals able to cope with the Internet.
- Provide libraries with modern servers and sufficient high speed connectivity lines to ensure continuous connection to the Web, and to avoid disconnections.
- Provide college students with a compulsory introductory course on LIS, with the use of Internet forming a primary part of it.
- Promote the Internet culture and its benefits to users, and to faculty members in particular, to encourage them use the Web.
- Promote cooperation among university libraries to exchange and disseminate automated library collections records (OPACs) through the Internet.
- Develop a plan to connect all databases in Jordanian University libraries in a National Information Network.

Conclusion

A close look at the academic libraries' situation in Jordan reveals the positive trends towards keeping up with current developments in information technology. The change in the perceptions of academic librarians in Jordan towards the new advances in this area is obvious. It is noticed that academic libraries in the country are passing the transitional phase. They are changing from the traditional online search to the Internet culture. If this is any indication, it means that academic libraries in the country are sparing no efforts to keep their place in the age of information technology.

References

- Abdallah, F. (1998), "Challenges facing private academic libraries in post-civil war in Lebanon", available at www.ala.org/work/international/intlpprs/abdullah.htm
- Abdoulaye, K. and Majid, S. (2000), "Use of the Internet for reference services in Malaysian academic libraries", *Online Information Review*, Vol. 24 No. 5, pp. 381-8.
- Askhita, H. (2000), "The Internet in Syria", *Online Information Review*, Vol. 24 No.2, pp. 144-9.
- Begum, R. and Jean, W.S. (1999), "Internet use in libraries in South East Asia with special reference to the role of the Universiti Sains Malaysia Library in promoting the use of the Internet for teaching and learning", 65th IFLA Council and General Conference Bangkok, Thailand, 20-28 August.
- Bu-Merafi, B.M. (2001), "Use of Internet by the teaching staff at the University of Al-Sharqa", *Risalat Al-Maktaba*, (The Message of Library), Vol. 36 Nos 1/2, pp. 74-90.
- Clark, J.G. and Lai, V.S. (1998), "Internet comes to Morocco", *Communications of the ACM*, Vol. 41 No. 2, pp. 1-3.
- Elayan, R. and Al-Qessi, M. (1999), "The use of Internet at university libraries: a case study of Bahrain University library", *Risalat Al-Maktaba (The Message of Library)*, Vol. 34 No. 4, pp. 4-28.
- El-Shafi', M.A. (1998), "Automated information systems at the university of Jordan Library: a future look", paper presented at the Symposium on Information Technology and the Library of the Future, Tunisia.
- Jordan HEC (2001), *A Statistical Summary on Higher Education, 2001*, leaflet prepared by the Directorate of Studies and Research, Department of Statistics, Amman, (in Arabic).
- Mafalha, M. (1998), "A report on the Intranet applications at the University of Jordan", unpublished report (in Arabic).
- McNab, A. and Winship, I. (1996), "Internet: use in academic libraries", *Library Association Record*, Vol. 98 No. 12, pp. 636-8.
- Rosenthal, M. and Spiegelman, M. (1996), "Evaluating use of the Internet among academic reference librarians", *Internet Reference Services Quarterly*, Vol. 1 No.1, pp. 53-67.
- Saeed, H., Asghar, M., Anwar, M. and Ramzan, M. (2000), "Internet use in university libraries of Pakistan", *Online Information Review*, Vol. 24 No. 2, pp. 154-60.
- Sotari, A., (Deputy Library Director, Yarmouk University Library) (2001), personal communication, 3 September.
- Weessies, K. and Wales, B. (1999), "Internet policies in midsized academic libraries", *Reference & User Services Quarterly*, Vol. 39 No. 1, pp. 33-41.
- Younis, A.R. (1987), "Jordan libraries", in Allen Kent (Ed.), *Encyclopedia of Library and Information Science*, Vol. 42, Marcel Dekker, New York, NY, pp. 339-62.
- Younis, A.R. (1990), "Library automation in Jordan", *International Library Review*, Vol. 22 No. 1, pp. 19-29.
- Younis, A.R. (1998), "The use of Arabised software packages in Jordan university libraries", *International Information & Library Review*, Vol. 30 No. 4, pp. 311-40.
- Younis, A.R. (1999), "The effect of automated systems on Jordanian university libraries' organisational structure", *Library Review*, Vol. 48, Nos 7/8, pp. 337-49.

Appendix. The questionnaire

Dear Colleague:

The attached questionnaire is intended to gather information on opinions for a study aims to investigate the extent of Internet utilisation, administrative effect, perception, benefits, and applications in Jordanian university libraries.

I appreciate your kind efforts to provide factual information that reflect the real situation in your library, and return the questionnaire to my address at your earliest convenience.

A General:

1. Is your university: 1. State
2. Private
2. Year of establishment

B The use of Internet:

1. Is your library subscribed to the Internet: 1. Yes 2. No
2. If the answer is yes, please circle which function(s) you use the Internet for:
 - a. acquisition of library materials
 - b. cataloguing and classification
 - c. online searching of databases

- d. reference services
 - e. E-mail
 - f. Web page
 - g. other(s), please specify
 - 3. Please specify the benefits which your library achieves from the use of the Internet:
 - a)
 - b)
 - c)
 - d)
 - 4. What effect, in your opinion, will the Internet have on the acquisition of Information sources (books, printed journals, CD-ROMs):
 - a)
 - b)
 - c)
 - d)
 - 2. What, in your opinion, are the problems which limit the optimal use of the Internet in your library:
 - a)
 - b)
 - c)
 - d)
 - e)
 - 3. What, in your opinion, are the solutions to these problems:
 - a)
 - b)
 - c)
 - d)
- C The administrative effect: Please check mark in the appropriate space (in Table AI) the degree that the Internet has affected the administrative structure, services, and cost in your library.

Table AI

Administrative effect on:	Very much	Much	Moderate	Little	Very little
A. User services					
Speeding up services					
Ease of providing services					
Users' satisfaction					
Meeting users' information needs					
Users' turnout					
Introducing users to a new technology					
Ease of databases use and/or other libraries' catalogues					
B. Staff and organisation					
Staff's satisfaction					
Increasing staff effectiveness					
Training opportunities					
Establishing a new department in the library					
Increasing staff motives (devotion to work)					
Creates new job opportunities in the library					
Provides opportunities to attend specialised conferences					
C. Cost					
Increasing cost on library budget					
Decreasing cost on library budget					
Increasing library income					