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EVALUATION OF ELECTRONIC INFORMATION SERVICES IN ACADEMIC LIBRARIES IN SAUDI ARABIA

by

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A Doctoral Thesis

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Dedication

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Abstract

This study aims to investigate the strengths and weaknesses of the information technology services in academic libraries in Saudi Arabia and to propose ways in which these services could be developed.

The methodology applies theoretical models, questionnaires and structured interviews. Two models were developed to investigate the behaviour of academic staff and students, the first representing users' cognitive attitudes and the degree of user-satisfaction with the services provided. The second model examines interactions between the university administration, computer centres and libraries. Questionnaires and interviews have been used to generate empirical findings.

The main findings concentrate on the following issues. Most respondents had used computers either on or off campus. Use of computers at the selected universities was found to vary significantly. Respondents from science faculties were found to use technology more than other users. IT systems, network infrastructure and the availability of qualified staff were, to varying degrees, found to be a constant source of concern and a hindrance to the provision of effective services. There was no consistent pattern of use and there was frequently a failure to provide any service at all. The only means for academic staff and users to gain access to the Internet was through departmental provision as, at the time of this research, this was not available in the libraries. A lack of funding, qualified staff, programmers and connections to the computer networks are regarded as major reasons for not providing efficient electronic services to users.

The main recommendations of this study are that coordination and co-operation between libraries, making full use of technology, should be established. Universities should lobby the Finance Ministry to argue for a change in the regulations to allow libraries to generate their own revenue in order to enhance existing services. University administrations, computer centres and academic departments should establish formal procedures to provide effective electronic services to users. The present provision of training facilities for both staff and students needs to be extensively reviewed and enhanced.

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Chapter 1

Introduction and Background

1.1 General introduction

It is only in the last twenty years that computer technology and telecommunications have been used to any significant degree in information services. However, in that relatively short period, the development and growth of electronic information systems and services have vastly increased the size of the audience and have brought about a reduction in costs.

Libraries, too, have been affected by these advances in technology and now even the smallest libraries have some level of automation, however modest. Technology may enable libraries to offer sophisticated search mechanisms, to access vast online catalogues and request loans or photocopies via a computer terminal. Automation may regulate the record-keeping activities of libraries from circulation, acquisitions, the generation of card catalogues and the provision of online catalogues Ingwersen, et al., (1986).

There has been much concern in academic libraries in recent years about the implications of the adoption of various kinds of electronic information services onto the university campus. One reason for this is that advanced information technology (IT), networking and communication systems, for example, LAN-to-LAN and LAN-to-WAN connections with access to OPAC and to CD-ROM, are increasingly feasible. The second reason is that campus-wide users need to use this advanced technology to get instant access to information from any place, at any time, and in any format they want. Therefore, the academic library infrastructure is becoming a collection of multiple technologies, including online, networks, CD-ROM, Internet, etc.

Academic libraries are now offering a vast amount of access to searching information to support their users when such services had not previously been possible. The development of electronic information has accelerated more than is imaginable. Yesterday, academic libraries were attempting to build up their databases by helping each other to provide a vast amount of information to users, but today the situation has dramatically changed. Academic libraries can access many library databases around the world via the Internet. Today, it is impossible for libraries to provide services without using IT. Therefore, academic libraries today emphasise not only the need to save user time and effort in obtaining information, but also the need to improve the quality of search results by providing an optimal approach to training.

It is useful in the beginning to clarify that the researcher has worked for more than twelve years in the KAU library, working as a librarian before reaching the position of Director of Administration and Finance. Therefore, many of the observations have been drawn from his own experience.

1.2 Aims

The purpose of this work is to investigate the strengths and weaknesses of the information technology services in academic libraries in the Kingdom of Saudi Arabia and to propose ways in which these services could be developed.

1.3 Objectives

More specifically, it aims to contribute to a better understanding of how to provide a fast, efficient and easy-to-use service via electronic library services to increase user-satisfaction. From this point of view, the following objectives have been established:

1. To compare the range and level of electronic services in the academic libraries of the Kingdom.

2 To investigate the difficulties faced by academic staff and students in handling electronic information.

3 To investigate which groups of users make the greatest use of electronic information.

4. To investigate users' attitudes and reactions to electronic services.

5. To investigate to what extent library staff deal with information technology, and discover whether there is a specific plan to develop their skills.

6. To suggest ways of developing electronic information services in the academic libraries of the Kingdom which would improve the quality and delivery of these services.

7. To find out how, when and why academic libraries evaluate their services.

8. To study how electronic information services, such as OPAC, CD-ROM, databases, and the Internet, are changing in the academic libraries and to look for future trends.

1.4 Hypotheses

For the purposes of the study, the following hypotheses will be tested:

1. There is a large discrepancy between the quality of the electronic services offered by the different academic libraries.

2. There is no long-term planning for electronic academic services in academic libraries.

3. Some groups of users in academic libraries make better use of electronic services than others because they are allowed to use these services or because they are provided with effective training.

4 There is a lack of professional librarians amongst the library staff.

5 There is a lack of expertise in information technology (IT) amongst the librarians in the academic libraries.

6 There is a lack of funding for development of electronic library services.

7 There is a lack of user training in the use of electronic library services.

1.5 Significance of the study

It is indisputable that Information Technology (IT) is becoming increasingly important in every sector, but particularly it is becoming one of the most important services to users in libraries, enabling information to be accessed easily and speedily. These information services cannot retrieve information efficiently without using IT.
It is necessary to discover whether universities provide a networking system to access their databases from within and beyond the campus; whether this technology is used effectively; and whether universities plan to enable communication via the campus network amongst all members of the university. This study considers library services and users, and this provides a comprehensive picture of the requirements for library development. It is also crucial to gauge attitudes and levels of satisfaction towards electronic services to understand whether or not these services are satisfactory. Finally, the study will provide recommendations and suggest an action plan for the development of electronic services. In order to understand the situation in libraries in Saudi Arabia, research must be carried out there to study the current situation.

1.6 Background

1.6.1 Saudi Arabia

Geographically, Saudi Arabia is the largest country in the Middle East. It is bordered in the north by Jordan, Iraq, and Kuwait, on the east by the Arabian Gulf, Qatar, the United Arab Emirates, and the Sultanate of Oman. To the west, it is bordered by the Red Sea and to the south by Yemen. It is separated from Africa by the Red Sea and from Asia by the Arabian Gulf as shown in Figure 1.1. The total area of the Kingdom

is 900,000 square miles. The coastal territory between the Gulf of Agaba in Jordan and Madena, Islam's holiest city after Makkah, is known as the Higaz. Jeddah, one of the cities, has become the capital of trade in the region. The heart land of Arabia around the capital of Saudi Arabia (Riyadh) is called Najd. Al-Hasa, or the eastern province, and is the region of oil refineries and industry. The Asir region, which is in the south and which houses the government, is a summer resort area because of its good weather compared with other regions in the summer season. Finally, in the northern region the temperature ranges from very hot in the summer to quite cool during winter months.

Politically, the government is a monarchy. Executive and legislative authority is exercised by the King through the Council of Ministers and within the framework of Islamic law. Saudi Arabia is one of the few states to use the Qur'an as its constitution. King Fahad is the head of government and chief of state. Most of the ministers in the cabinet are young and highly educated.

Economically, Saudi Arabia has the largest oil reserves in the world, having 25% of the world's total. The policy of the Kingdom is to develop a viable economy based on refined petroleum products (Abdrabboh, 1984). Oil reserves in Saudi Arabia are set to rise within the next two decades and the government has recently announced that a new well has been discovered in the Rub 'al-Khali desert. Production began in the first quarter of 1996. The source contains 14 billion barrels of raw oil and more than 25 trillion cubic feet of gas. The daily production of this well is said to be more than the combined production of several countries (Middle East Newspaper, 1999). Saudi Arabia has started a massive development programme with long term objectives to diversify the economy and build a strong private sector.

Figure 1.1 Saudi Arabia Map

1.6.2 Development Plans

In the period from 1955 to 1957, Saudi Arabia faced a serious financial crisis. Because of large budgetary deficits, the government was forced to borrow substantially from the Saudi Arabian Monetary Agency (SAMA). The crises were caused primarily by the inability of oil revenues, and the foreign exchange derived from oil, to keep pace with the rate of government spending (Ministry of Planning, 1970).

In response to the crises, the late Anwar Ali was appointed as head of the SAMA and he submitted proposals to the government aimed at achieving economic stability. From his recommendations, a committee of financial and economic advisors was set up in 1958. A further development was the decision of the King in 1960 to request a study of Saudi Arabia's economic problems by the International Bank for Reconstruction and Development (IBRD). The recommendations from both of these initiatives gave rise to the Ministry of Planning which set up a development plan every five years (El Mallakh, 1982). The descriptions below concentrate on the points relevant to the present investigation.

- The first development plan (1970-1975)

The first development plan was from 1970 to 1975. This developed an intra- Kingdom communication network that would be in operation by the end of the period. International communication would be possible via coaxial cable with Kuwait, by microwave with Bahrain, and by satellite with the rest of the world. The Kingdom, in the first five-year plan, emphasized the steady expansion of the economy, particularly for infrastructure. There was attention to human resource development in the first plan. Therefore, it was allocated some $ 3 billion for this purpose (Ministry of Planning, 1970).

- The second development plan (1975-1980)

The second development plan sought to develop human resources through education, training and research (The Saudi Arabia National Centre for Science and Technology-

SANCST- was established in 1977) and continued to expand and improve the physical communication infrastructure. There was continued emphasis in the second plan to invest more effort in human-resource development and for that reason, it was allocated $ 22.76 billion for this purpose. The allocation was almost eight times the amount provided under the first plan. Alongside this, the selection, use, transfer and management of foreign technology continued, although much of this technology was originally created for needs and conditions very different from those in Saudi Arabia. [Efforts are now being concentrated on adapting, modifying or controlling the quality of foreign technology in order to reach a level which is at least comparable or preferably above what similarly developed countries can afford even through many of these countries do not have the superior financial resources of Saudi Arabia.] (Ministry of Planning, 1975).

- The third development plan (1980-1985)

There were two objectives for the third development plan concerning science and technology which were, firstly, to change the physical circumstances of society through the implementation of science and technology and, secondly, to promote human and natural resources for the Kingdom by reducing its reliance on oil and foreign manpower. There was a continued development of all Saudi infrastructures, such as telecommunications. As a result of SANCST, the third development plan was intended to provide information and establish the results of research. There was emphasis in the third plan on providing suitable training for the workforce to enhance its ability to deal with technologies (Ministry of Planning, 1980).

- The fourth development plan (1985-1990)

In the fourth development plan, the Ministry of Planning indicated that technology was to play a pivotal development role in the Kingdom. In Saudi Arabia, where there is substantial wealth but a shortage of human skills, industrial processes which are capital- intensive are of prime importance. Although it is unnecessary to keep up to date with every technological advance in civilian life, new technology is vital in the production of goods and services and, in Saudi Arabia, where production activities are proliferating, new technology is becoming more and more important. The Kingdom's

interest in, and commitment to technology is over- riding and Saudi Arabia has been fortunate in having been able to invest in first- rate technology rather than having to compromise with the second- rate in order to preserve foreign exchange, protect jobs or accommodate domestic labour. In this, Saudi Arabia has achieved advances second to none, but it also necessitates raising society's understanding and generally improving skills in the new technological environment (Ministry of Planning, 1985).

- The fifth development plan (1990-1995)

There was an emphasis in the fifth development plan to continue the work of the previous two decades of introducing advanced technology to develop processes in Saudi Arabia. Owing to high demands for technological services, a telecommunication network was installed for the transmission of written data (telex and computer) based on PSPDN (Package Switched Public Data Network). So, the introduction of the computer as a helpful tool in the educational process was widespread and users enjoyed utilising the latest technology. It was now essential to upgrade the level and quality of education by using powerful scientific and technological tools which would ensure further development. Providing better information services, a patent protection system, and greater public awareness and understanding of science and technology would be to no avail if the infrastructure of science and technology was not improved (Ministry of Planning, 1990).

- The sixth development plan (1995-2000)

This plan focused on the need to apply the latest available technology that is appropriate to the national economy. However, the most pressing need concerned bridging the gap between the level of technology at present in use in Saudi Arabia and the rate at which new systems can be adapted or produced. In spite of the tangible development of technology in Saudi Arabia, there is still a severe shortage of qualified people in the workforce, especially in science and technology. There is no doubt today that information is important for all sectors of the Kingdom. As a result of this, the Ministry of Planning decided to implement an information network for all government agencies in the kingdom (Ministry of Planning, 1995).

1.6.3 Telecommunication infrastructure

Saudi Arabia is currently undergoing a complete transformation of its existing telecommunication infrastructure. The project began in late 1994 when a $4.2 billion contract was awarded to AT&T; this project is to be completed by 2001. Currently, the country has around 2 million phone lines in place, which translates into 10.64 phone lines per 100 inhabitants. This statistic places the country among the last few in the region. In addition to the wire-based phone lines, Saudi Arabia has a wireless network (analog and digital) with a current capacity of about 200,000 lines.

- The existing network

The existing backbone of the Saudi long-distance network was formed by an extensive, mostly analogue, microwave radio, consisting of some of the initial 4 and 6 GHz microwave systems. The existing network also includes approximately 4,000 km of analogue coaxial cables between Riyadh and Dammam and between Riyadh and Jeddah; approximately 1,200 km of digital coaxial cable; and approximately 2,000 km of optical fiber systems, including a multimode fiber system between Makkah and Taif (PDH optical fiber systems).

- Telephone network

Saudi Arabia's telecommunication sector continues to grow at a remarkable rate, with the expansion of both facilities and services. The country's telephone system is already one of the world's most modern and efficient, and new microwave links with Arab countries have been opened to strengthen regional communication.

- Microwave network

A domestic microwave service between smaller towns supplements the 9,300-mile 550-station microwave system.

- Submarine Cables

Submarine cables complement Saudi Arabia's wire and satellite network to make the country an international hub for communications. The currently existing coaxial cables are part of the SEA-ME-WE (Southeast Asia/Middle East/West Europe) project; this cable connects the Kingdom to Egypt. Two other cables link the country with Bahrain and Djibouti. These cables are connected to earth stations distributed around the country.

In April of 1998, the Kingdom reached a formal agreement with FLAG (Fiberoptic Link Around the Globe) Telecom. The agreement will add the Kingdom to a list of 11 other countries already online. This cable links the UK, Spain, Italy, Egypt, the United Arab Emirates, India, Malaysia, Thailand, China (at Hong Kong and Shanghai), South Korea and Japan. Jeddah will be the landing point of the cable. FLAG uses Synchronous Digital Hierarchy (SDH) technology, which means that the country will enjoy the benefits of high-speed, high-quality digital communications with Europe and Asia.

- Satellite and Coaxial

The Kingdom's seven standard earth stations link up with the Intelsat, ARABSAT and INMARSAT Satellite Systems, allowing subscribers to dial 185 countries directly. These stations are also used for television and radio transmissions. Currently, Saudi Arabia has more than 6,000 satellite circuits. The country also has 3,100 miles of coaxial cables. Telex has also seen impressive growth, with the number of lines increasing to 9,800, linking over 152 cities and villages to countries around the world.

When looking at Saudi Arabia, no competitive advantages from information technology can be identified at this time. The country has fallen behind in terms of IT when compared to its neighbours in the region; only now is the country starting to catch up. The only advantage the country might have is that it has the potential of become the region's communication gateway in a few years if planning is effective. The FLAG access point, the earth stations and several private joint ventures are capable of putting the country in such a position. On the other hand, the only strength

which can be identified regarding country's IT is the current infrastructure. Being the most modern in the region, it lacks many of the weak areas the others have.

Another strong area of IT in the country is the software and hardware industry; currently Saudi Arabia develops and produces a high percentage of software used in the country and in the region. If such an industry were allowed to flourish, it might soon become a second source of income for the country. Regarding the hardware industry, Saudi firms have achieved a level of reliability that has allowed them to be identified as OEMs. This is a first in the region, but can only be sustained by future government incentives. FDI must be encouraged in Saudi Arabia for such industries if being an IT power in the region were to be a goal.

The main reasons why Saudi Arabia lags behind in the area of IT can be attributed to several factors. These include:

- Computer illiteracy
- Lack of government incentives to attract businesses (free-trade zones/subsidies)
- The absence of an adequate infrastructure to support industry
- Poor enforcement of intellectual property and copyright laws
- Lack of resources

These are just some of the reasons why Saudi Arabia is far behind many countries in the area of IT, and, unless some of these issues are dealt with, progress will be hindered (Information Technology in Saudi Arabia, 2001).

1.6.4 King Abdulaziz City for Science and Technology (KACST)

As mentioned previously, the Saudi government started to plan a national network infrastructure in 1977. This was concentrated on the Saudi Arabian National Centre for Science and Technology (SANCST). The major aim in establishing this institution was to facilitate the application of science and technology in furthering the Kingdom's long- term development goals (Ministry of Planning, 1985). In December 1985, the name of SANCST was changed to King Abdulaziz City for Science and Technology (KACST). KACST has the following responsibilities:

- To promote research and co-ordinate the research efforts of scientific organisations.

- To align research with Saudi Arabia's development requirements.
- To assess and acquire foreign technology.
- To support joint research programmes between KACST and international scientific institutions to keep abreast with the latest scientific developments in the world, either through grants or by conducting joint research.
- To develop Saudi Arabia's own technology (Siddiqui, 1992).

- National network development

The National Academic Network was placed under one directorate, called the General Directorate of Information Systems, to provide information support services to KACST's directorates and institutes. In addition, it provided a wide variety of information services to scientists and researchers in various research centres and academic institutions in the Kingdom. It also coordinated information activities with other concerned bodies in the Kingdom. The Directorate accesses international and national databases and KACST's own national databases for the retrieval of information. KACST has built a wide area network (WAN) which is called GULFNET in order to provide for the exchange of data, information, and messages between scientists and researchers in the Kingdom and Arabian Gulf countries who have access to computers connected to the network. It also serves to stimulate informal communication and promote cooperation in research projects.

- GULFNET

GULFNET is the first computer network in the Arab world for academic and research institutions in the Arab Gulf countries. It was established in May 1985 and the main node at KACST is connected to the participating nodes through leased telephone lines. In each member institution, a computer is linked to the principal node at KACST, which also provides other central services to out- lying members. Currently, there are 13 member institutions linked to GULFNET, as shown in Figure 1.2.

- Uses of GULFNET

GULFNET is a user- friendly, multipurpose electronic mail system which is designed to permit transmissions from one node to another and is used to transfer programmes, data, files and other forms of communication. Information services at KACST are able to use this facility for online searching and so can search national and international databases, afterwards transmitting results back through the network. Users can also send interactive massages through any computer which is part of the network. The system has aided co- operation and collaboration between institutions. Furthermore, members of GULFNET can also access KACSTNET.

- International connection

GULFNET is connected to international networks such as BITNET (USA), EARN (European Academic and Research Network), NETNORTH (Canada), and DFN (Germany). It also offers bulletin board and conferencing facilities.
Online searching of national and international databases is one of the facilities available, with KACST now able to access numerous databases, such as DIALOG, INKA, STN, SDC, NEWSNET, BRS, EDVENT, LEXIS, NEXIS, AEROSPACE, and ESA / IRS. Requests for searches are also free to all researchers.

- Recent developments

Accessing the Internet started in Saudi Arabia in December 1998. KACST is uniquely responsible for providing this service and it is impossible to access the Internet through other nodes in Saudi Arabia. Since providing this service, there is no need for researchers and institutions to use GULFNET, for the following reasons:

- The GULFNET connection was via leased telephone lines, while the Internet connects via dedicated cables.
- The connection via the Internet is cheaper than GULFNET.
- All services, which were provided by GULFNET, are now available via the Internet.
- The Internet is easier to use than GULFNET.

1.6.5 Higher Education

An expansion in higher education led to the formation of a Ministry of Higher Education in 1975. The Ministry is responsible for the development and overall supervision of programmes of higher education and other national programmes in various fields. Its other duties are to supervise scholarships and educational offices outside Saudi Arabia. The Ministry also co-ordinates international university relations. One of the features of the development of higher education is that many universities have developed their computer facilities and programmes in order to provide useful services to their students. Some universities have built integrated computer networks to provide optimum use of the computers available in various centres (Ministry of Education, 1990).

- Relative importance of the universities

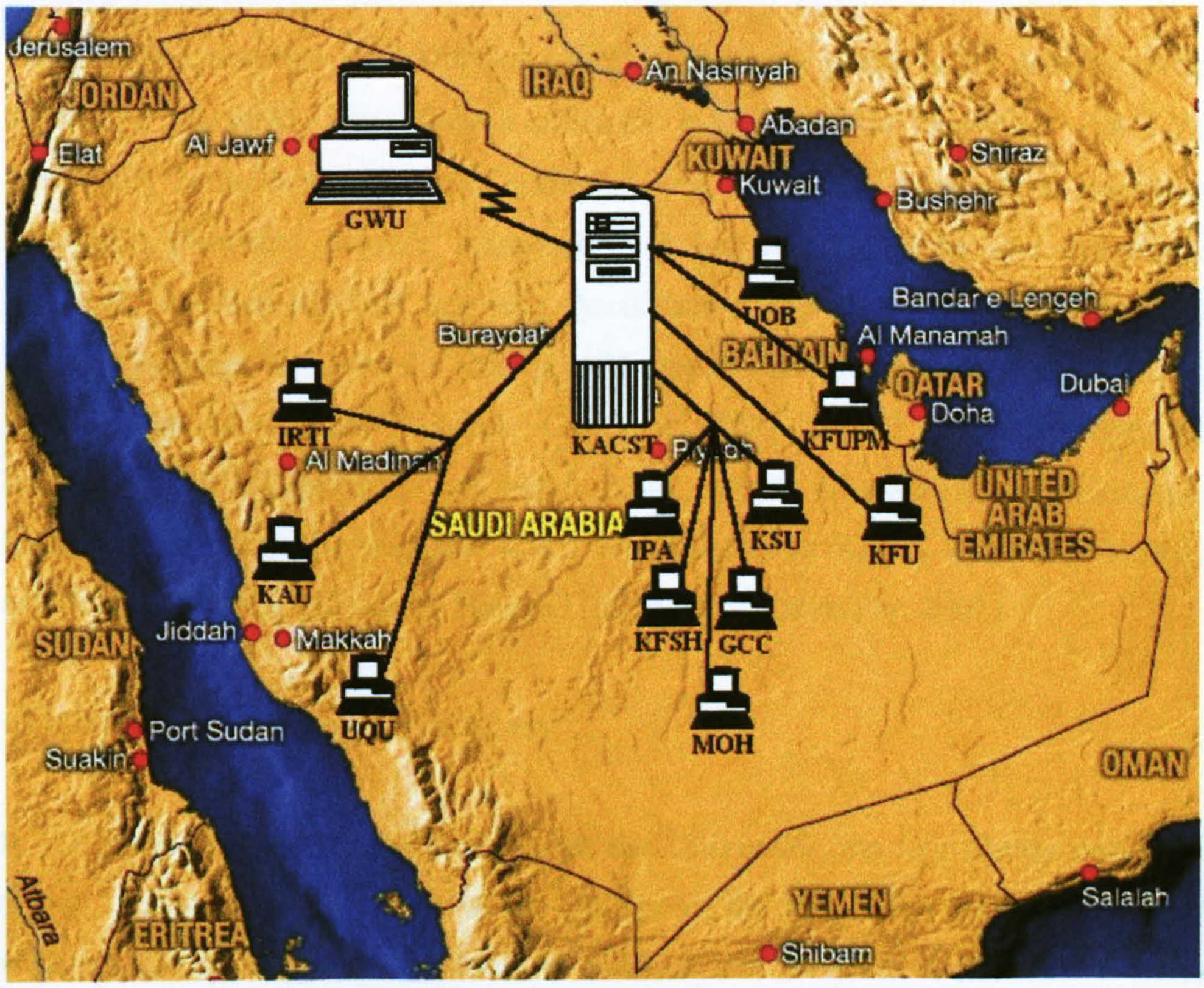
There are seven universities in Saudi Arabia, which are under the responsibility of the Ministry of Higher Education. These are: King Saud University (KSU) in Riyadh, King Abdulaziz University (KAU) in Jeddah, King Fahad University for Petroleum and Mineral (KFUPM) in Dhahran, Um-Al Qura University (UQU) in Makkah, King Faisal University (KFU) in Al-Hasa, Imam Mohammed Bin Saud University (IMSU) in Riyadh, and the Islamic university (IU) in Madena.

This study will investigate four academic universities in the Kingdom. The universities are KSU, KAU, KFUPM, and UQU. These universities were selected for the reasons outlined below:

- They were selected geographically, as KSU is located in the middle of the Kingdom, KFUPM in the east, KAU and UQU in the west.
- The others do not provide electronic information services facilities for their users.

This selection should ensure an overview of the real situation regarding the provision of electronic information services.

Figure 1.2 GULFNET wide area network operation centres in Saudi Arabia



KACST	King Abdulaziz City for Science and Technology
KSU	King Saud University
IPA	Institute of Public Administration
GCC	Gulf Cooperation Council
MOH	Ministry of Health
KFSH	King Faisal Specialist Hospital and Research Centre
KFUPM	King Fahad University for Petroleum and Minerals
KFU	King Faisal University
KAU	King Abdulaziz University
IRTI	Islamic Research and Training Institute
UQU	Umm Al-Qura University
UOB	University of Bahrain
GWU	George Washington University

1.6.6 Universities to be investigated

- King Saud University (KSU)

King Saud University was founded in 1957. The new phase in its mission started when the University campus was officially inaugurated in December 1984. The University includes the following colleges: Arts, Education, Agriculture, Pharmacy, Medicine, Dentistry, Science, Administrative Sciences, Computer and Information Sciences, Applied Medical Sciences, Architecture and Planning, Engineering, the Arabic Language Institute, the College of European Languages and Translation, and the College of Graduate Studies. Currently, KSU consist of 19 colleges and institutions, 13 colleges in Riyadh, two in Abha, three in Gaseem and one in Gazan. It includes two university hospitals which are called King Khalid University Hospital and King Abdulaziz University Hospital (King Saud University, 2001).

- Electronic Services at KSU Library

In the same year as the establishment of the University, the first library opened its doors. This is called the library of the College of the Arts. After that, other libraries were opened based in the faculties. In 1964, it was decided to establish a central library to provide services to all users. The first stage for providing the automation in the library was in 1984. The DOBIS/LIBIS system is employed for the automation of all departments in the library. The library provides an online search facility through KACST and a CD-ROM service (King Saud University, 2001).

- King Abdulaziz University (KAU)

King Abdulaziz University, which came into being in 1967, is one of the premier institutions of higher education and research in the Kingdom, having the second highest number of student enrolments after KSU. It offers Bachelor programmes in 87 disciplines, Masters programmes in 34 disciplines and a Ph.D. programme in 9 disciplines (King Addulaziz University, 2001).

- Electronic Services at KAU Library

The central library was established in 1965. The automation project of the library was started as early as 1977, but nothing materialised until 1988, when the University finally decided to allocate funds for this project from its research budget. It was decided to use the DOBIS/LIBIS integrated library programme in this library. In March 1989, a cataloguing module of the DOBIS was the first to be introduced (Basager, 1995). The system needs regular database maintenance by an expert. Sometimes, if a particular terminal/line/controller/multiplexer goes down it is understood that DOBIS could be down for several reasons, as it runs on the mainframe computer (usually the mainframe is in the computer centre). This mainframe is used only by the library but because other important system also runs on it, such as Student Systems, the Personnel System, etc., the computer centre tries to solve the problem as soon as possible. DOBIS programmes are written in PL/I macros, Assembler 370 language. Extensive knowledge of JCL (a batch jobs language used by mainframe computers) and sort/ Merge utilities, etc. is necessary. In this case, an experienced DOBIS system analyst / programmer is required to keep the system running and to make local modifications from time to time as required by the library. According to Mian Khalid, senior manager in the Deanship of Library Affairs, the library subscribed to the MEDLINE database in 1988 as a first step in exploring the use of this database. This was successful; the subscription to CD-ROM databases reached 28 by the end of 1996 and was raised to 35 in 1998. The library has built a local area network (LAN) to provide a useful service to all academic staff and postgraduates. In order to overcome the problem of providing whole text to users, the library has also subscribed to five full-image databases. Online services are provided to users and they can access national databases produced by KACST through GULFNET. The library also provides online access to 600 international databases through DIALOG or Night Rider, which has been renamed "UNCOVER". In addition, the "UNCOVER" bank can provide full images (King Abdulaziz University, 1998).

- King Fahad University for Petroleum and Minerals (KFUPM)

The University was established on 23rd September 1963, and at that time was called the college of Petroleum and Minerals. In 1975 it was renamed the University of Petroleum and Minerals and, finally in 1986, its name was converted to King Fahad University for Petroleum and Minerals. The university is divided into eight academic units principally concerned with instruction and research. These units are the College of Applied Engineering, the College of Engineering Sciences, the College of Sciences, the College of Industrial Management, the College of Environmental Design, the College of Computer Science & Engineering, and the Preparatory Year Programme. Programmes of study leading to Bachelor degrees are currently offered in these colleges. The university offers Masters degree in 16 disciplines and Ph.D. programme in eight disciplines. It has concentrated on Science and Engineering programmes. The university set up goals to provide effective training programmes in order to provide a good administrative and professional qualification for the Kingdom in the fields of science, engineering and management, and in addition, to develop research in order to disseminate information concerning these fields (King Fahad University for Petroleum and Minerals, 2001).

- Electronic Services at KFUPM Library

The central library was established in 1964. It played a pioneering role in library automation and in the electronic retrieval of information. The library was the first university library in the Kingdom to sign an agreement with IBM, under which the University got the DOBIS/LIBIS system in 1980. This became operational in 1981. In 1987, an Arabized version of DOBIS was developed locally to provide access to the Arabic collection using Arabic script. The library has provided online searching since 1979 through the international telex network. The service was enhanced in January 1981 through International Database Services with a low-speed modem. Presently, the library has online access to more than 450 international databases through DIALOG and ORBIT search services. The library also has access to national databases produced by KACST through GULFNET. Although online searching is expensive, the library pays all costs, including telecommunication charges, in order to support the university curriculum and research. The library also provides CD-ROM services.

- Um-Al Qura University (UQU)

This is the oldest university in Saudi Arabia. It was established in 1949. It was called at that time the College of Sharia and Islamic Studies and it was joined to King Abdulaziz University. In 1981, it became the Um-Al Qura University. The university contains seven colleges in Makkah and one in Taif. These colleges are Shariah and Islamic Studies, Arabic, Education, al Dawa and Usul al-Dein, Applied Science, Social Science, Engineering and Islamic Architecture, Medicine and Medical Sciences. It consists of the institute of Arabic Language and one college in Taif (Umm- Al Qura University, 2001).

- Electronic Services at UQU Library

The central university library was opened in 1971. It consisted of one hall and contained nearly 10,000 volumes. The library is now located on three levels. The library acquired the DOBIS/LIBIS system in 1987, but has not yet automated any of the library operations and services due to a shortage of human resources and a lack of coordination between the library and computer centre. In 1998, the library signed another agreement with Saudi Advanced Systems to install the HORIZON system in the library. This utilises the latest technologies and concepts in the computing technologies. In addition, it is a fully integrated library management system. It enables remote users to log into the system from their locations as if they are local users and remote users can dial-up from anywhere in the world using available communication networks like the Internet. It is a powerful support for the MARC format, US MARC, UNI MARC and can support any other MARC implementations. The system has both an English and an Arabic version. Finally, the library preferred this system as it was supported locally. This guaranteed the smooth running of the system, especially as there is a shortage of skilled employees for customisation, troubleshooting, and system maintenance. The library has access to national databases produced by KACST through GULFNET.

1.6.7 Other universities

- Islamic University (IU)

The Islamic University in Madina is an international Islamic institution, established in 1966. There are more than 100 nationalities enrolled at the university with no more than 20% of the total being Saudi students. It gives Muslim students the opportunity to be educated in the holy city. The University includes five colleges: Holy Qur'an and Islamic Studies, Hadith and Islamic Studies, Arabic Language, Al Dawah and Usul Al-Dein and Sharia. The University offers nine Master degrees in nine disciplines and a Ph.D. programme in nine disciplines as well (Islamic University, 2001).

- Immam Mohammed Bin Saud University (IMSU)

The university was established in 1974, but some colleges were established before that time. For instance, the Sharia College was opened in 1953 and, after a year, the College of Arabic Language was opened. The University emphasises research and teaching in subjects related to Islam, and offers a diploma, masters and Ph.D. programmes in many disciplines in the fields of Arabic and Islamic studies (Ashoor, 1992).

- King Faisal University (KFU)

The University was established in 1975, with its headquarters being based in Al-Hasa. It consists of faculties of Medical Sciences, Architecture and Planning, Agriculture and Food Sciences, Veterinary Medicine and Animal Resources, Education, Administrative Sciences and Planning. It was decided to place a branch of the university in Dammam because of the density of population and because it is one of the major cities in the Kingdom. It is the headquarters for Architecture and Planning, Medicine and Medical Sciences. The University offers many programmes for Masters degrees, doctorates and fellowships in many disciplines (King Faisal University, 2001).

1.7 Summary

This chapter has provided a general introduction to the role of information technology and academic libraries. It sets out the main aims and objectives of the thesis, which are to investigate the present levels of electronic services in Saudi Arabian university libraries and to make recommendations for their future development.

Some background information about Saudi Arabia in general, and its main universities, in particular, has been given, as well as a brief description of some of the main information services.

Chapter Two

Literature review

This chapter reviews the main relevant works relating to various aspects of this research. Firstly, it intends to explore ideas which are relevant to the work (use of OPACs, CD-ROMs, the Internet, other electronic sources of information, and availability of skilled staff) by looking at developed countries such as the UK and the United States. Secondly, it examines the developing countries, and finally, Saudi Arabia.

Indisputably, in order to examine developing technology specifically, it is necessary to go directly to the UK and the US literature to explore completed research in this field. Therefore, it is important initially to concentrate on existing advances in developed countries in general and particularly in the UK and the US, to learn what is going on in these countries, compared with developing countries, including Saudi Arabia.

Clearly, studies which looked at IT services in academic libraries were most relevant to this work, therefore, a large percentage of the literature reviewed has concentrated on this area. The search was carried out by checking many relevant sites via the Internet, using numerous university databases, such as LISA and ERIC in order to gain valuable articles and information, and using Loughborough university library's OPAC in order to select any materials such as books, journals, proceedings, government documents and theses. The final stage was to look through the current issues of journals in order to ensure that searching was kept up-to-date.

The most significant limitation regarding the literature which was covered was that much has been written on this subject which was not available in the university library. Some of these items were accessed via the Internet and library loans.

2.1 Use of OPACs

There is no doubt that there is growth in the use of OPACs in libraries in the USA and the UK, as they provide faster access to the catalogue (database) from any location in the university campus or beyond, using many access points and powerful search commands. Today, an OPAC can provide access to many library databases through the Internet so as to find useful information.

2.1.1 Types of system

A review of the literature shows that there are many research projects which have been carried out into the use of OPACs. I have chosen references which reveal a detailed picture of what is going on concerning OPACs in the developed countries, to shed light on the continuous development in this area and to recognise the separation between what exists in developed countries and developing countries. One such paper (Stevens, 1998) discussed ideas regarding three types of catalogue in libraries of the future. The three catalogues are the librarian's, the general user's, and the individual user's catalogue. He suggests these in the hope that further discussion of this important issue will be stimulated. These three catalogues are not the only alternatives. He emphasises that these catalogues do not have the weaknesses and limitations of card catalogues but will not replace them completely. The design of new catalogue systems must take into account what is already known about the strengths and weaknesses of present systems; it must also consider the needs of users.

Stevens discusses some ideas about the functions of these catalogues, such as enabling users to locate the materials they need. He also includes some advice about the possible composition of these catalogues. He describes three general forms:

Firstly, there is the librarian's catalogue, which he defines as the fullest and most comprehensive form. This maintains the online catalogue, provides the fullest and most complete access to full bibliographic records and provides more access to increase the records of the augmented or multi-source catalogue; it is quick and gives direct access

through search keys for sophisticated users. There is also a prompt, or menu, to facilitate access by the learner.

Secondly, there is the general user's catalogue, which he defines as providing only enough information to find the item and locate it on the shelf. He mentions that the brief catalogue information is enough to meet user needs. The users can access this catalogue for known documents or unknown ones such as author or title.

Thirdly, there is the individual user's catalogue, which he defines as a large and complex catalogue containing information about a large amount of materials. It consists of full catalogue records, identified by users, which are relevant to their interest and use. In some cases, items in a specific field can be searched via this catalogue even if the library does not maintain departmental library collections. The catalogue is flexible enough to provide more information and records for librarians and individual users.

Stevens explains certain features of this catalogue such as: users might be able to add their own bibliographic records, the library could notify users if there are any current materials which have recently arrived in the library, and users might notify the library if they want to borrow materials from the library or via inter library loans through the individual user's catalogue, etc. This catalogue should provide for all the needs of individual users and give them the access they need to any particular records. Eventually, it can serve as an effective interface between the personal and formal information systems. These catalogues become a theory which, in the end, leads to practice.

The development of OPACs in developed countries, especially in the USA and the UK, has been accelerated in order to provide a significant level of services to users such as graphical catalogue interface, cooperation between libraries by networks, and improvements to the library's ability to produce customised management information. Conversely, some libraries have changed their OPACs because of the cost of hardware and software, and the maintenance of running the old system which might be higher than the current cost of the new system. Funding reductions in some universities is another problem which has led to loss of library staff which in the end makes them strongly consider replacement of their OPAC systems to help them offset these staff cuts.

One of the developments of the OPAC system, COPAC, was discussed by Cousins (1997). COPAC was established in November 1995 and is a new union OPAC which provides free access to the information of a number of academic research library collections. These universities are: University Library of Cambridge, Glasgow; Edinburgh; Leeds; Oxford; Trinity College, Dublin; Imperial College of Science, Technology and Medicine; and London University (Senate House). The aim of COPAC is to provide access to the resources (5.5 million MARC records) of many different libraries, to make it easier to find specific materials and to discover the range of documents available across different collections. As COPAC receives a very large number of search- requests, experiments have been carried out with "tree- searching" in order to alleviate this problem. Tree-searching allows users to search instantly by combining phrase and keyword searching which is introduced automatically. Tree-searching can provide the user with the opportunity of seeing a list of similar words and he/she can select one or more words from the list. In addition, it provides spell-checking. The web interface has been produced using commercial software. The reaction to COPAC, whether from staff or users, has been positive and many are using COPAC for a variety of reference tasks. The main criticisms from users are that they require more libraries to be included in COPAC since the majority of users come from the UK, the EC, and North America.

In recent years, the scope of what is offered by OPAC systems has expanded in the USA and the UK. These enhancements include access to the Internet and the catalogues of other libraries, locally mounted databases and/ or network access to a variety of other databases. Matthews (1997) has remarked that OPACs may even provide direct access to all the Internet's resources as a search option. OPACs could be improved by bettering existing library databases, installing software- based improvements, and by adding new databases. Libraries can improve their OPACs by cleaning up their machine-readable databases.

Libraries could purchase a copy of authority records linked to other bibliographic records and could enhance MARC bibliographic records which are available commercially from Blackwell North America. They could create their own expanded records during the

cataloguing process. It should be possible to scan library materials especially when cataloguing software moves to a Windows environment. The cataloguer would be able use the cut and paste within Windows to move information quickly into the MARC bibliographic records.

Systems should be designed based on behavioural models of how users ask questions. Search trees should be developed by one-word, two-word, and multi-word queries. It should be made possible for OPAC software to construct a "user interest profile". This would allow a user to indicate an area (or areas) of interest and request the system to search for similar matches by analysing subject headings, authors and title key-words. Other related records could then be retrieved in ranked order and the user could evaluate their suitability to his/her needs. This system could be utilised again and again until the user is satisfied with the result. Search software needs to be upgraded to allow the user to enter a search request as a natural language expression, providing a variety of search aids (e.g. spelling correction, synonym tables, use of stemming algorithms) and suggesting traditional strategies to the user.

The most successful OPAC enhancements of recent years have involved adding new databases to automated systems. OPAC users need to be provided with a Front- end database that helps them understand the information landscape and the possibilities that it contains. OPAC could also contain a thesaurus, a complete Library of Congress Subject Heading and associated cross- references to allow users to browse and learn about the relationship between words and topics before a direct search takes place. MARC bibliographic records could then link to the subject clusters. It should provide a new database to solve the problems encountered when users find hundreds, if not thousands, of records that allow the OPAC user to navigate a linking database prior to searching the bibliographic database which is called "WordFocus". The users should learn more than one method to achieve optimal retrieval results.

Jordan (2000) examines a personalised component of the Information Gateway, known as My Gateway, in use at the University of Washington libraries. This system allows users to create their own views of the database created from the libraries' OPAC and to

integrate their own URLs into these views. Thus, users can create their own catalogues or they may "subscribe" to public categories created by library staff. Libraries themselves can use 'My Gateway' to put together lists of URLs which can then be "published" as Web pages or which may be available for users to include on their own pages. Testing carried out to evaluate the usability of 'My Gateway' found that users showed a definite preference for databases over other types of resources. 29 out of the top 30 records included on 'My Gateway' pages represented databases or catalogues. The system was also integrated with other request services in order to offer content delivery as well as resource discovery. Because, however, of certain limitations such as users have no automated way to transfer URL lists between their browsers and 'My Gateway' or between 'My Gateway' and other services, future developments are planned in order to make the system easier to use.

Web-based online public catalogues (OPACs) began to appear in the late 1990s and have advantages over traditional OPACs in terms of remote access by users and their ability to integrate a number of document types and sources via a single interface. They often possess sophisticated searching capabilities and link the catalogue with internal and external databases.

Babu and O'Brien, in their study 'Web OPAC interfaces: an overview' (2000), examined six popular Web interfaces, namely, Talis, INNOPAC, WebCat, Voyager, GeoWeb and ALEPH, with regard to their functions.

They concluded that the most important features of Web OPACs were those which emphasised access and integration, and asserted that though little evaluation has as yet been carried out, the features most highly rated by users were the ability to access the system remotely, to select and download search-results and to integrate references into users' personal documentation. The researchers felt that further addition of full text and direct access to locally held and external sources would also be favourably received by users.

In Saudi Arabia many researches have been carried out in the same field.

Since KFUPM was the first in Saudi Arabia to introduce library automation, quite a number of articles have been published by the staff of this library. Deemer (1982) was the first to publish on the subject of information technology. He describes how the KFUPM started dealing with DOBIS/LIBIS and what obstacles there are in the infrastructure of Saudi Arabia to maintaining a computer system and workforce e.g. that 75% of the labour force is foreign. He indicated that KSU and KFUPM had already started to implement online library information systems. The library staff training began in April 1981, using films, graphics, and locally produced tutorial text. Ashoor (1983) adds that in March 1979 the KFUPM library concluded that DOBIS/ LIBIS was the most suitable system for the KFUPM library. The reason for selecting DOBIS/LIBIS was to provide computer assistance for library operations in acquisitions, circulation and searching. As it was compatible with MARC formats, it was usable on data processing equipment which was already installed at KFUPM and finally, maintenance was available locally.

The use of libraries in Saudi Arabia has expanded due to new technology. Thus, new applications such as automation and networking have been created (Al-dosary and Ekrish, 1991). They concluded that DOBIS/LIBIS and MINISES are the most widely used software packages in academic libraries. The conversion of material into the Roman alphabet is easier than Arabic due to the use of some tools such as MARC Tapes. The automation of acquisition is slow due to the decline in the rate of acquiring new materials compared with the boom years. The circulation and serial control are slower than other functions. OPAC exists in eight out of fifteen information centres.

2.1.2 User attitudes

In order to provide useful services in the future to users, libraries often try to examine user attitude towards new OPAC systems to find out if these systems are easier to use, have fewer system problems, a better response time, whether users find them satisfactory and whether they increase the use of the library. The Park-Davis Pharmaceutical Research Library in the USA studied user satisfaction with the new GUI-based Dynix Marquis, as compared with the text-based Dynix Classic OPAC (Zorn and Marshall,

1995). They point out that one third of respondents (87) were extremely satisfied with the Marquis system, compared to only 7% who were extremely satisfied with the Dynix system. The majority of users preferred the Marquis system, most agreeing or strongly agreeing with statements favourable to Marquis. However, the majority only "somewhat agreed" or "strongly disagreed" with statements which were favourable to the Dynix OPAC system. As for the GUI of Marquis, almost half of the respondents strongly agreed that they preferred the GUI of Marquis to the Dynix interface. Respondents who felt they were less experienced with GUIs preferred the text-based Dynix system, or even preferred the Marquis system to a lesser degree. At the beginning of the research 50% of GUI users felt that they strongly disagreed with the statement that the Marquis system was more user- friendly. However, 80% of the same sample stated that they preferred the Marquis to the Dynix. Library research through OPAC has increased since migration to the Marquis system. A three month average of hourly use shows an increase of 886% despite the fact that the information accessed by both systems is still the same. Problems with the network connection to Dynix OPAC were greater than previously realised and many users may have been frustrated and stopped using the Dynix OPAC network. Zorn and Marshall conclude that GUIs are preferred to text-based or DOS interfaces. Users find the GUI easier to use, find it requires less training, use the OPAC more, and users are more satisfied with GUI.

In another example, the ELINOR system at De Montfort University (DMU), which developed and implemented a working electronic library system for student use, is discussed by Davies (1996). She aimed to re-examine user perceptions and problems regarding the ELINOR system. The survey was conducted with undergraduate and postgraduate students at the Milton Keynes campus of the University. Questionnaires were distributed to students who had used the ELINOR system and to students who had not used it. She points out that less than 6% of the students (109) gave a negative response when they were asked how much they liked using computers in general. She found that computer usage in the School of Computing was slightly greater rather than in other schools. 27% of the responses stated that they felt more comfortable reading from paper. Three- quarters of these had never attempted to use the system. Students expressed

satisfaction with reading on- screen and their reactions were varied when they were asked about the traditional library. 34% of students who used the ELINOR system appeared to have been influenced by preconceptions, but of different types. Students who were frequent users of other computer software such as OPAC found certain usability aspects of ELINOR more problematic than users with less experience of other systems. Students who had experience of OPAC rated ELINOR as " unnecessarily complex". Users who used PC and Windows software found the ELINOR software to be less well integrated than those with less PC experience. She observes that some of the present problems with the system, such as accessibility and navigating searches, may be overcome by use of the World Wide Web (WWW). Use of the web would offer the flexibility of using both document images and electronic text. She concludes that the electronic library should provide good access to other formats of documents. The library should focus on all types of student and all types of task in order to provide good usability of electronic services.

Looking now at research from developing countries, Arellano (1996) discusses how the introduction of an online catalogue into the library of the National Autonomous University of Mexico (UNAM) changed user attitudes and behaviour after it was implemented. His study sample consisted of 600 library users and 1200 catalogue users. He began by studying typical users of online catalogues. After introducing the online catalogue, user satisfaction changed. There was an increase in the use of the library catalogues and collections. Users consulted the online catalogue frequently, and they found relevant materials in their searches. They were satisfied with search results, preferred the online catalogue to card catalogues, and said that it was easy to use the online catalogue without formal instruction. He points out that during the use of the card catalogue (first phase) 46% of the users visited the library more than once a week, while when the online catalogue was introduced (second phase) this percentage increased to 55%. The number of catalogue users was greater after the introduction of the online catalogue than before. 66% of the users stated that they used the catalogue during the first phase, while in the second phase it was 80%. Library users reported more positive opinions about library services after the introduction of the online catalogue. In the second week of the survey, 71% of the users sampled judged the services to be good and

26% as ordinary, just 3% described them as bad. In both phases of the study, 24% and 26% of searches respectively were searched by author and 33% and 28% were searched by title, therefore, the association between these variables was indicated as weak. 83% of catalogue users indicated in the first week that the catalogue was easy to use, while in the second week the percentage increased to 87%. During the first week, 68% of the users found information on items searched and this increased to 78% during the second week.

In another developing country, the capabilities of graduate students to use effectively library sources and services available to them at the University of Botswana Library was examined by Fidzani (1998). He points out that more than half of the respondents (233) rated themselves good or very good in their ability to use the traditional tools such as dictionary, card catalogue, encyclopedias, and bibliographies. 42% of the respondents rated themselves good or very good in their ability to use the OPAC.

In Saudi Arabia, Ashoor and Khurshid (1987) consider the results of an OPAC user survey at KFUPM library. They point out that users attempted to search for library materials using subject terms in the subject file. 42% of the users searched the subject file, 31% the title files, 20% the name file, and 7% the shelf list or call number files. Users were most satisfied with three access points i.e. author 83%, title 84%, and subject 84% while users who searched by call number totalled 7% from all searches. As for the level of satisfaction with online catalogue search, 83% of users found their search very satisfactory. Only 17% of users failed to get what they were looking for and rated their search as unsatisfactory. 68% reported that they came across items of interest other than what they were looking for. 95% of the users were positive about the online catalogue while only 83% considered the computer search was satisfactory. User reliance on the online catalogue was demonstrated when the system was not available for some reason. Many preferred to wait for use of the online catalogue rather than use the card catalogue. Some users even chose to leave the library and come back later when the system was up again.

In another institution in Saudi Arabia, Hafiz (1991) studied the situation in KAU library. He considered only undergraduate users of the library. He took a sample of 543 students from various faculties. In his survey, he found that only 31 of the total student population used the OPAC. At that time, only about 5% of the total collection of the library was computerised. Therefore, it was quite natural that students would prefer to use the card catalogue more than the OPAC.

2.1.3 Experience and its influence

The effectiveness of the computer-based tutorial which was employed to train potential OPAC users in search methods at University of Toronto was evaluated by Cherry, et al., (1994). They found that the tutorial seemed to make no significant improvement to users' ability to conduct searches. The team conducted a second experiment using a total of thirty students at the University. Half the students viewed the tutorial; the other half were used as a control group and received no instruction at all. They found that the group who had used the tutorial did not perform significantly better when working through the search tasks but they felt that the instruction had helped them and, as a result, felt more confident. They concluded that users with a high level of computer literacy probably benefited least from tutorial instruction while those who benefited most were likely to possess lower information technology skills.

Effective decision-making by those in charge of library information technology is hindered when the skills and characteristics of users are not fully understood. Park (1997) looked at the user characteristics of Korean students in order to assist system managers in the selection of OPAC systems and to determine if there any groups of users who make better use of OPAC in selected academic libraries in Texas. It is noted that there was no significant difference among specific users (84 respondents) in the distribution of their knowledge about how to use a particular OPAC. 30-32 year old student users knew the greatest number of searching methods and the freshmen users knew the least number. There was no significant skill difference in using the five online catalogue systems. Student users had a better success rate and were quicker than other users in searching the

different OPACs. The freshmen users had the poorest success rate and spent the most time. The male users had a better success rate than the female users, but spent more time than the female users. 60% of the respondents knew an average of five searching methods. The most common method of learning to use the OPAC was "by following the instructions on the menu" (39%), while 1% (the least common method of learning the OPAC system) was "completely self- taught". The correlation between the number of OPAC users and the years of experience of using computers was higher than any other correlation. The frequency of use of computer and online catalogue use was higher than the frequencies of library use and manual card catalogue use. The age of respondents and their academic major (Humanities, Social Sciences and Pure Sciences) was highly significant. There was a highly significant connection between user gender and the evaluation of learning operations towards OPAC systems.

It is pointed out that system designers should prepare more specific instruction about other searching methods and focus on the design of the system menu, especially since users prefer to learn by this method. The manual card catalogue in the academic library would disappear, if the library became automated.

2.1.4 Ability to use the system

The BLCMP's Talis system which was installed in Loughborough University in 1994 includes: acquisitions, cataloguing, circulation, an OPAC and serials control. During that period the information across the University network was initially carried out by a Gopher 'Information Gateway' . This was replaced in 1994 by a World Wide Web server. The BLCMP system is planning to offer help to those libraries which would like to use the WWW OPAC but which do not have local expertise in using the WWW. Hypertext Markup Language (HTML) can be used to enliven the appearance of the OPAC. Library staff can view the subject headings that are associated with a particular classmark. The Web has been used to provide additional services such as graphical interface. The OPAC is searched using a Web browser whether from Mosaic or Netscape. The library can provide user hyperlinks both internally within the WWW OPAC or externally to information services on the Web across the world. Local and more distant collections,

such as music and video, can be provided via the WWW OPAC through the multimedia facilities of the Web client software. Cataloguing of remote-access computer facilities in accordance with AACR2 is quite straightforward (Arfield, et al., 1995).

Medeiros (1999) examines what he terms "second generation web design" which, he explains, moves the design of web pages from little more than a brief public relations exercise or form of cheap advertising, to a more informative, "content-rich" approach. He advocates a team approach for the design of a library site and strongly advises a commitment to the needs of users by the provision of fast and logical navigation as well as training and instruction on how to use the systems. Acknowledging that there is a problem with searching for relevant information on the web since frustrating "false drops" are a frequent feature of information retrieval, Medeiros briefly examines Metadata which, he feels, will pave the way for a third generation of web development. This initiative should aid libraries to catalogue the resources to which they gain access via the web.

In Saudi Arabia, several libraries have acquired and implemented the arabized version of DOBIS/LIBIS, thus making it the second most popular system in the region after MINISIS (Khurshid, 1992). Users were very excited about the catalogue because it is more complete and gives more Arabic information than the card catalogue; it also has almost the same search features as the English catalogue. Khurshid (1983) adds that DOBIS/LIBIS was the best system to fit their needs, the least expensive one and the vendor (IBM) support is available locally. He indicates that there are a few obstacles remaining in the development of computer technology in Arab countries. The obstacles are the work force, standards, and library cooperation. He mentions that DOBIS/LIBIS has network capabilities and thus, accessing through it will save the staff time, money and effort which would be involved in the introduction of a new system. Cooperation between Arab countries is necessary in order to solve common problems. Basager (1995) states that the circulation module of DOBIS was unsuitable and an in-house circulation system was developed. Ten terminals, five for Arabic and five for English were placed near the central entrance for OPAC. Printers connected to OPAC were also installed for

the benefit of users. KAU library is the first institution in the Middle East and one among only a few institutions in the world to upgrade to DOBIS/LIBIS 2.2, the latest version of this integrated library system.

2.2 Use of CD-ROMs

Compact Disk Read Only Memory (CD-ROM) is one medium which can store a vast amount of data. It was developed by Sony and Philips and was launched in 1980. There has been a growth for this medium in the USA and the UK especially within the last 10 years and especially when libraries using telecommunication networks wish to access large quantities of computer- readable bibliographic data stored in remote online databases. The needs of researchers to obtain full information forced companies to produce full text CD and later full images. The CD-ROM today has become faster and the cost of CD-ROM drives, microcomputers, and printers in recent years has made it much easier for libraries to move more towards the use of CD-ROM. Currently, CD-ROM is the most predominant and commercially successful optical storage technology. Therefore, the goal of libraries now is to provide the best access to information for the majority of users.

As this aspect is important in the field of libraries, a great deal of research has been done on the use of CD-ROM in libraries. One of these pieces of research in the developed countries was carried out by East and Leach (1998). They indicate the continuing prominence of CD-ROMs in British academic libraries. They point out that by 1996, 75% of the total money spent on CD-ROMs was spent by higher education. Through the last decade, the number of CD-ROMs per university library has risen from under 3 (1988) to 43 (1996). Currently, approximately 50% of CD-ROM holdings are networked in university libraries for three reasons: firstly, because CD-ROM databases are becoming a burden. Secondly, there are many databases available in this medium and thirdly, because of the lack of uniform compatibility standards. Networked access to OCLC first search service has become available to British academic users. The annual expenditure for CD-ROMs rose from 51.8 £ in 1995 to 64.8 £ in 1996, an increase of 25%. 76% of

institutions with networking facilities have networked the Guardian database. Only one institution had no facilities at all, and five institutions were only able to network between one to three CD-ROM databases. Some institutions still have problems with technical and software incompatibility due to lack of staff expertise, budget shortage and the cost of networking licences. Some academic libraries have subscribed to BIDS, which has since become available via the Web. Many of these universities can also access electronic journals via the Web. They emphasise that the Web will be the standard for the future.

2.2.1 User behaviour

The searching behaviour of 79 end–users of CD-ROM databases was studied at the University of California Los Angeles (UCLA) campus libraries by Efthimiadis (1994). The sample population consisted of 48% undergraduates, 32% graduates and 9% doctoral students, 1% faculty, 3% researchers, 4% representatives of the population external to the University and 6% others. 46% of the samples rated themselves in the mid-scale (value 3) when they assessed their knowledge of CD-ROM, 23% gave themselves the value 2, 3% indicated that they knew nothing and 19% of the users were confident about their knowledge. The users showed that more than 82% had limited knowledge of the subject they were searching. 42% of the users used broad searches while 58% used a narrow search. 68% of the users used CD-ROMs for course-related essays or term projects. 52% of the users had never had mediated online searches done for them before. 48% of respondents had searches done for them, 17% had 1 to 3 searches done for them, 22% had 4 to 10 searches done for them on a CD-ROM database, and 10% had more than 11 searches done for them. 25% had never searched a CD-ROM database, 22% had done 1 to 3 searches, 28% had searched 4 to 10 items, and 25% had done more than 11 searches. The user satisfaction toward CD-ROMs was 11% "excellent", 38% for "good", 33% for "satisfactory"; dissatisfaction was indicated by 13% for "poor" and 5% for "bad". 24% of the users replied "satisfactory" when they were asked to comment on what was seen during the research, 34% commented good, 8% excellent and 15% had negative feelings about the results. 39% of the users found that it was "less than expected" when they searched to retrieve references. 32% of the users said results were "as expected" and 28%

said the number of references retrieved was "more than expected". 25% of end-users indicated that there were no problems about their impression of the search according to a scale from 1 to 5, where 1 meant no problems encountered and 5 meant that there were many problems. 28% of the users were in the rank 2, 23% in the rank 3, and 18% in the rank 4, while only 5% said there were too many problems. Efthimiadis concluded that, overall, users lacked sophistication in their ability to conduct searches. He noted the following difficulties: users did not fully comprehend Boolean operators and their effect on what was retrieved; they found difficulty in using system features and lacked understanding of search formulation and record structure. In short, users' research may finally be ineffective because they lack the basic knowledge of how to carry out searches.

The user behaviour towards the POPLINE CD-ROM database through organisations in developing countries was discussed by Kaser (1998). This system is produced by the Population Information Program at the Johns Hopkins University (JHU / PIP). The data collected for this study is from the usage data file which is automatically copied onto a floppy disk that users send to JHU /PIP in Baltimore every six months. These data are used to evaluate and improve the data structure, user interface, operating software and training activities. The other methods, which were used to collect data to understand the technological constraints of POPLINE users' operating systems used a direct mail survey of users and user technology questionnaires. During the period 1992-96, he points out that 21% of users came from Africa, 9% from the Arab States, 3% from Eastern Europe and 21% from Latin America. From 180 searches in each six month reporting period he indicates that the heaviest users of the POPLINE CD-ROM database were academic organisations. The research of government and non- government organisations was less significant. The United Nations' Agencies' searches were least frequent. Academic organisations and the United Nations' Agency used more sophisticated searching behaviour than other users. Users in Asia employed more sophisticated searching than users from other parts of the world. 84% of the users were satisfied with the database despite the fact that many POPLINE CD-ROM users were infrequent users. He recommends that POPLINE CD-ROM database users, particularly academic

organisations, should help by providing primary documentation and essential training tools.

An investigation into the use of CD-ROM databases in developing countries was carried out by Oyinloye (1999). He mentions that CD-ROM databases are available in many Nigerian universities despite the fact that there is a lack of infrastructure. He views this as no excuse for not embracing new technology such as creating one's own databases. He recommends that librarians in the fields should be computer literate. They should be trained in databases and networking. The curriculum of library schools should mirror the information age. Academic libraries in Nigeria should coordinate with other institutions such as the Computer Association of Nigeria (COAN) and the Nigerian Internet Group (NIG). They should join electronic network projects in the country as, if they fail to do so now, the cost of entry may be too high in the future.

Oduwole (2000) investigates the use of CD-ROM databases in academic libraries in Nigeria. He distributed ten questionnaires to identify from preliminary studies the extent of libraries' CD-ROM collections, together with their use. Oduwole asserts that the greatest obvious defect of the CD-ROM products available in the libraries is that most are not relevant to the universities' needs. He mentions that Nigerians must develop systems tailored to the needs of their immediate users but he recognises that this is not a major issue in science and technology, since the users of science and technology information are generally interested in information of a universal nature. A lack of money was one of the problems that academic universities faced in enhancing their CD-ROM services. Extending this service required foreign currency and this is hard to come by. Another problem is that some users did not find relevant documents relating to their subjects. Inadequate and unreliable systems were another problem for not running CD-ROM products on a network within the country. Shortage of manpower, poor computer literacy and difficulty in recruiting information technology specialists were further difficulties associated with the use of CD-ROM in Nigerian academic libraries. Oduwole recommends that there is a need for donor agencies to cooperate with CD-ROM publishers in order to develop databases which relate to the needs of scientists and

technologists in Nigeria. Agencies need to collaborate with the publishers in the production of CD-ROMs especially those which use the Internet. Academic libraries should subscribe to full text abstracts in CD-ROM format in order to provide easy access to efficient Interlibrary loan. Subscribing to full texts can also be arranged through donor agencies. CD-ROM publishers should try to make their products more user-friendly because many CD-ROM database users are not highly computer-literate.

Another piece of research in developing countries was carried out by Fidzani (1998). He points out that more than one third of the respondents (223) at the University of Botswana library rated themselves bad or very bad in using CD-ROM. 28% did not use CD-ROM services due to a lack of knowledge and difficulties in using them.

In Saudi Arabia, Mirza and Siddiqui (1993) found that, during the period between July 1991 and December 1992, in KFUPM library a total of 2378 CD-ROM searches were conducted. Undergraduate students conducted the largest number of searches, 45%. Graduate students conducted 25% of searches. Faculty and research assistants conducted only 30% of searches. 16 departments of KFUPM conducted all CD-ROM searches. The Chemical Engineering department topped the list with 15% of searches. The Electrical Engineering and Mechanical Engineering departments secured second and third place in the list with 14% and 13% of searches respectively. Together, these three departments conducted 42% of the searches out of the total of 2378 searches conducted. The remaining 13 departments conducted 58% of the searches. Online searching, bibliographic instruction, and Interlibrary loan are some of the services which are affected by the addition of this new end user technology. Selection decisions can be made more easily using data gathered on use, cost, and scope of coverage. The CD-ROM search record be a useful analytical tool and can provide guidelines to improve library services.

In another investigation about CD-ROM databases at KFUPM library, Kanamugire (1994) points out that over 75% of the users at KFUPM library, indicated that they had identified relevant references. During the period July 1991 to June 1992, when

undergraduates were not encouraged to use the CD-ROM services, undergraduates accounted for 319(41%) searches out of the total of 770 searches. After July 1992, when undergraduates were allowed to use the CD-ROM services there were 770 searches in 1992-93 which increased to 2,884 searches during the period July 1992 to July 1993. A total of 1,502 (52%) searches were performed by undergraduates, while only 1,383 (48%) searches were carried out by other major user categories- graduate, faculty, research assistants and staff. Since the introduction of CD-ROM database searching, despite the fact that undergraduates were not encouraged, online searching declined dramatically; only 79 searches were performed in 1992-93. Studying the impact of CD-ROM database searching on interlibrary loans over a one year period (September 1991 to August 1992) has revealed that there was an increase of 15% in interlibrary loan requests; and approximately 25% of all requests were prompted by CD-ROM database searching. Kanamugire points out that a CD-ROM service should clearly include networking, not only LAN, but also a WAN to facilitate the optimal use of CD-ROM based information. Although he acknowledges that networking is very expensive, he did not give a clear picture to what extent it is necessary to build WANs. Changing user needs and expectations should be concentrated on. Users in developing countries, who could not search online databases in the past, can now easily and conveniently search CD-ROM versions in- house. Finally, a CD-ROM service in the library leads to more work pressure on library staff; it exposes weaknesses in library collections, and it causes more demand for improved equipment, other material and financial resources, and services.

Ashoor and Kanamugire (1996) point out that the majority of the respondents in their survey had used CD-ROMs at the KFUPM library. Out of 817 questionnaire forms, approximately 66% of the respondents indicated that they had used CD-ROMs, and only 21% had never used it then 7% indicated that they did not use CD-ROM because they were not aware of the availability of the service while 8% showed that they did not need to use it. The rest of respondents stated that they had not used CD-ROMs since they had joined the university. Other respondents cited a lack of CD-ROM searching skills. 75% of the faculty and researchers were "satisfied" or "very satisfied". 46% attributed dissatisfaction to the retrieval of very few citations. 34% were not satisfied because of the

non- availability of documents as well as delays in receiving documents ordered through inter- library loan. 64% found staff assistance and CD-ROM search guides satisfactory. Of the 465 respondents who were asked about training, 73% agreed that there was a strong need for training, only 10% disagreed, and approximately 17% were not sure. They recommended that if there was to be any enhancement of CD-ROM services, it would be crucial to make provision for extra terminals and other computer accessories. It is important to plan budgets for purchasing CD-ROM databases of different types in order to provide good user training and financial support.

2.2.2 CD-ROM network

It was emphasised by Simpson, et al., (1994) that all users at the Manchester Business School (MBS) must choose the right CD-ROM product for their needs in order to be able to produce the required result from searching. They indicate that MBS has included a description of each of the services on the main menu screen and users can ask library staff if they need help and advice. They discuss the benefits of using networking and how the search software is important to provide many services such as security, saving documents, searching choices and usage statistics. Students can access the system 24 hours a day, seven days a week, and thus, they find their study easier. The access through the network is faster than standalone. CD-ROM networking saves a lot of queuing at the inquiry desk and there is no need to change disks for each user.

Brown (1995) discusses an overview of three approaches to connecting CD-ROMs to a Local Area Network (LAN). He explains the benefits of using a LAN for libraries are that several users may have access at the same time to different titles, reliance on organisations may be reduced and CD-ROM database titles may be updated centrally. He discusses some problems regarding the use of a LAN on behalf of users, such as: they are not aware how they can access it and which databases are relevant to their fields; they feel that their skills are insufficient in order to gain best access and use of resources; they are also aware of the time taken when they use the network. He shows what is required to develop the response to the LAN. He emphasises that if the network is not fast, the

performance will be poor and responses from users will be negative towards the network. Users may assume that the network has failed and has not provided information swiftly enough if it takes more than 30 seconds. The network should be unloaded to obtain a good response from users as they can access their information quickly. In summarising, he states that libraries should examine their CD-ROM databases to be sure that all these databases are used to shorten response time. The network should be fast to provide a good service to users.

2.2.3 Requirements for the system

CD-ROM is becoming essential in all libraries, and these libraries are coming to depend on networking. CD-ROM networking is now in demand by home users and students for use on their own machines because of their high cost and the fact that this would save time. Some CD-ROMs contain information which users might use briefly rather than for a long period. Libraries should be providing these services to all users so that these services can be utilized as much as possible. Libraries can save shelf space and increase their services to users by providing remote access options and improvements to searching. Therefore, user expectations of these services are important as users must feel comfortable with them. An interesting development would be if the libraries could make CD-ROM search networks compatible with the World Wide Web (WWW) and Netscape. The major problem with networking hardware is that it is difficult to upgrade Windows and multimedia CD-ROMs to terminal PCs. In such cases new machines have to be purchased to support sound, video and graphics.

Yeates (1995) emphasises that libraries which have insufficient technical expertise in the field of networking, should utilize a specialist local supplier for the installation of the system. He clarifies some CD-ROM network problems, such as license conditions, the cost of CD-ROMs, the slowness of network servicing, WAN improvements which still do not speed up access and the fact that many systems do not integrate with all types of terminal. He suggests some ideas to overcome the problems such as; Client and the server must run on many types of hardware and software, servers should be able to operate with

individual CD drives, towers or jukeboxes; suppliers should not charge for hard disks or software support; database suppliers should offer Internet access to avoid a need for local disk storage; CD-ROM networking is good when it is used as a LAN, not as a WAN, and finally, Windows NT is a good solution for avoiding the need for IT support and for CD-ROM towers.

2.2.4 Advantages and disadvantages for developing countries

Some challenges and strategies in planning, implementing and managing CD-ROM services in developing countries are discussed by Kanamugire (1997). He begins by discussing why libraries in developing countries have been able to access CD-ROM. The major disadvantages of CD-ROMs are: cost, lack of search interface compatibility, content relevance, end-user misconceptions, endless demands for quantitative and qualitative CD-ROM system enhancements, document non- availability and delays in document delivery. He discusses the criteria for selecting databases such as user needs, and language. He points out that the implementation of CD-ROMs has often failed owing to lack of adequate planning and an inappropriate implementation strategy. Financial resources are also one of the big challenges in developing countries to meet the growing demands for providing better CD-ROM services. Libraries and information centres in developing countries should conduct feasibility studies prior to deciding to implement a CD-ROM project. Cooperation should be fostered with local and international institutions. Library information systems should make the best use of CD-ROMs and should provide access to CD-ROM network services.

In Saudi Arabia there has been a great deal of research done in this field. Almost all university libraries in the Kingdom are using CD-ROMs for two reasons. First, online searching is very expensive and time-consuming. Second, the library is committed to providing the latest technological developments to benefit library users. In November 1990, five CD-ROM stations were purchased by KFUPM for use in the library. In 1992, it was announced that three more CD-ROM stations were being purchased to be installed in the reference information services division to meet library users' future demand

(Siddiqui, 1992). Siddiqui mentions that at that time there were ten CD-ROM databases: five in the science, engineering, and business management areas and five databases to be used in various parts of the library. In addition, several databases were under review and would be purchased when funds were available.

In another article, Siddiqui (1992) mentions that KFUPM library added end-user CD-ROM technology in November 1990. It provides 10 non-bibliographic databases on CD-ROM for use in various divisions. The major user community at the KFUPM library comprises faculty, researchers, graduate and undergraduate students. Finally, he discusses how the reference librarians need time to learn this new technology and the different search commands for each database, to train faculty and students.

The status of CD-ROM services and resources in the KFUPM library and the future direction of the CD-ROM services are discussed by Kanamugire (1994). He indicates that at that time the library did not have a separate budget for CD-ROM database acquisition. It used the library materials acquisition fund. He mentions that, in the beginning, only faculty, researchers, and graduate students were encouraged to use the service. The library organised training for research engineers, new faculty staff and lecturers; some graduate students asked for training in CD-ROM search techniques. Among the university libraries of the Kingdom, in 1993 KAU library had the largest number of CD-ROM databases i.e. 21. CD-ROM was budgeted for to the sum of 94, 595 pounds Sterling (Basager, 1993). It was the only university library which had four full-image databases. A CD-ROM Local Area Network was established to deliver information to end users at their locations from any points on the campus and also from beyond, for the ease and convenience of students.

One description of the installation of a CD-ROM network at King Abdulaziz University (KAU) is that of Al-Suraihi and Gomosani (1997). It is, however, a descriptive account rather than a scientific survey. The CD-ROM databases which were available in the University departments of High Studies and Scientific Research are discussed. Network databases in KAU library are also described. They recommend a periodic evaluation of

the network and its services in order to guarantee its continued development. They also recommend staff development for librarians by attending conferences and training courses. It was recommended that research should consolidate all efforts in order to provide useful information. It should also concentrate on one place instead of repeating similar efforts in several institutions. University libraries are the most suitable places for studying these information services.

2.3 Use of the Internet

Bao (1998) discusses user satisfaction towards information services, provided through the Internet's World Wide Web at Seton Hall University in New Jersey. Services and resources, which are provided to users, include the library online catalogue (Seton Cat), a periodical database, CD-ROM listing, and a description of various library services. He points out that from the whole sample (786), 40.2% of the respondents used the Web on a daily basis while 38.3% used it weekly. This means that about 80% of the respondents used the Web on a daily or weekly basis. 10.7% of the respondents used the Web monthly and 10% said they seldom or never used the Internet. On the scale of five levels of satisfaction where level one is used to indicate the highest level and level five is used to indicate the lowest level, 73.1% of the respondents rated the Internet at level two and three while only 7.7% rated it at level one and the rest, about 15%, rated it at level four or five. 23.6% of the respondents spent 11 to 20 minutes searching to obtain satisfactory results. 30.7% spent 21 to 30 minutes and 33.5% spent over 30 minutes. Only 5% of the respondents found satisfactory responses in less than 10 minutes. The major problems for users when they used the Internet were: that 49.2% did not find the information they needed; 43.7% found there was not full text information available and for 38.5% there were too many hits. Most respondents (44.5%) addressed the responsibility for teaching them how to search the Internet effectively to university computing services themselves, while 39.5% felt the responsibility lay with their academic college, 18.7% felt it lay with the university librarian faculty and 18.7% with other agencies.

Bao emphasises that the Internet has become an important source for providing useful information to users. Academic librarians should assist students in finding effective ways of using the Internet and should provide effective Internet search training. He discusses whether libraries should provide an Internet service to users, especially now that all users use the Web on a daily or weekly basis. Academic librarians need to reallocate budget resources to expand electronic resources for users. Internet access reduces the need for CD-ROM towers and provides updated information within 24 hours. Academic librarians should foster a good relationship with the institution's computing services to provide Internet training. Academic librarians should provide training to students in classrooms of the faculties. He suggests that Seton Hall University library should conduct Internet search strategies and study levels of satisfaction. The training which moves from academic librarians to users should be studied. The usefulness of the Web page of the library in providing bibliographic instructions should be studied as well as Internet search engines.

While studying the impact of library innovation on library staff at Tilburg University in the Netherlands, Gelijinse (1996) focuses on two human aspects: firstly, the user and the electronic library, and secondly, library staff and organisational issues. He emphasises that members of the library management should express their views and ideas for the future, and specify new jobs and new tasks. The electronic library needs specific skills from staff, especially in information management, information technology, subject knowledge and communication. So the libraries' staff have to be re-educated and trained. The involvement of staff is important to encourage them to achieve new goals and objectives for the library. The library should facilitate access to the electronic services in the library. A shift from technical services to public services is likely. In public services, the focus will be on subject-oriented skills, while in technical services, the focus will be on electronic information, such as managing, cataloguing, classifying electronic documents and Internet resources. He recommends that every single staff member should dedicate 15 to 20% of his or her job to activities with a special or innovative content. He notes that the electronic library creates a more interesting working environment than the traditional library. However, it can also widen the gap between professional and non-

professional staff. It may even make redundant certain jobs which were once at the heart of library organisation.

Using a case study approach, Grimes and Boening (2001) investigated whether students use unauthenticated web resources, whether they evaluate the resources they access and whether there is a mismatch in the quality of resources expected by teachers and those used by students. While acknowledging that the project was small-scale and that therefore the results must be treated with caution, the researchers found that students do often use web resources with little or no sense of discrimination or evaluation; they rarely if ever sought help from campus librarians regarding the suitability or authenticity of resources. There was also found to be a considerable gap between the expectation of teachers in terms of resources used by students and the actual resources that students selected themselves.

Grimes and Boening suggest that librarians need to emphasize evaluative criteria so that students become more discriminating, to guide students towards worthwhile resources on the web and to provide instructional programmes covering search strategies. In order to do this, librarians need to have a greater physical presence in the library, offering assistance and suggesting sites. Furthermore, Web pages posted by librarians should be attractive and easy to use and online library catalogues should include links to Web pages.

The Internet in the developing countries is discussed by Wanjun (1998). He mentions that because there are many part-time students in Shanghai Second Polytechnic University, students learn how to use the Internet or Intranets partly to provide course work and homework. She emphasises that the University gives lessons on document retrieval to small groups to interact with their colleagues and other students; they can access the system from home or work. The resource guides are provided to staff and students to help them to obtain the appropriate resources. She concludes that the Internet can provide access to resources which might otherwise have been unavailable. Students require good training in order to promote their research and information skills. Still, only a small number of staff are accessing the Internet.

The home pages in thirteen libraries in eleven Sub-Saharan African countries are discussed by Chisenga (1998). He mentions that a large number of these countries still have limited access to the Internet. There are also shortages of skilled systems operators. Universities have been among the first institutions to establish connections to the Internet. The only service which is utilised through the Internet is E-mail communication. He points out that three libraries only indicated that they had an E-mail address and three libraries also provided access to electronic versions of their internal news- letter and bulletins. Six libraries provided access to their internal OPACs through their web page or the Telnet. All seven South African universities provided links to external OPACs on the home pages. Three libraries had links to databases within South Africa or outside Africa. Six libraries provided a list and detailed information about CD-ROM databases available in the library, but none provided links to databases through the web page or telnet protocol. Seven libraries had links to other Internet resources. Use of the World Wide Web (WWW) in university libraries is greatest in South Africa institutions because it has a strong economy and well established library, telecommunication and Internet infrastructures. He concludes that every library should transmit, own, and receive information by way of the Internet in order to enlarge their library collections. Librarians must participate actively in the establishment of the information superhighways if these libraries are to create electronic libraries.

Oyinloye (1998) indicates that the use of the Internet in Nigeria is problematic and slow because telecommunication facilities are very poor; there are low levels of computer literacy even within academic communities; government regulations mitigate against its use and there is a weak infrastructure. He mentions that the National Universities' Commission (NUC) is implementing an electronic network which includes all Nigerian universities, named the Nigerian Universities' Network (NUNet). NUNet will connect all Nigerian universities and university centres on a national network (Intranet) with a gateway at NUC and, after that, connect to the Internet through ICTP Trieste, Italy. He mentions that many other networks have been connected around the country. He recommends that Nigerian libraries must provide the Internet service in order to be prepared for the new challenges of the virtual library, virtual universities, electronic

publishing and be able to support the information society. He further notes that the Internet is permitting new opportunities in the packaging and delivery of information.

Oyinloye (1999) discusses the role of libraries in Africa for providing access through the Internet. He mentions that funding is regarded as the critical success factor for establishing effective computer networks in Africa. Internet usage there is still far below the world average. The total population of Internet users in Africa is estimated at between 700,000 and one million people throughout the countries. Oyinloye mentions that South Africa alone accounts for about 600,000 (or 85%). The developments in the use of the Internet in Africa have been spreading over the last 24 months but the level of usage is still at about one Internet user for every forty people. African governments are taking considerable steps in order to establish effective computer networks. Many universities in Africa today provide many degrees via the Internet with a teaching methodology which includes electronic discussions and assignments. He mentions later library networks and possible objectives if a library is trying to build up this facility. Oyinloye discusses the electronic networking in some African university libraries and institutions such as university libraries in Ghana and Nigeria, and the Foundation of Tertiary Institution in Northern Metropolis. He asserts that libraries should build up computer networks in order to exploit the tremendous potential for sharing knowledge via the Internet. Computer network publishers can provide new additions to libraries as frequently as necessary. Libraries in the future will be electronic libraries using computers and accessories and library staff of the future will be human beings using IT tools to provide efficient library services. Scientists will use the Internet to participate in international research. The late start of the Internet in Africa is regarded as an opportunity to build up a new infrastructure such as satellite communication, fibre optics cables and Wireless Local Loop (WLL) which would allow Africa to compete with developed countries. African governments should create an enabling environment for Internet investment. Institutions and the private sector would liaise to make Africa an integral part of the global information society.

Saeed, et al., (2000) discuss the status and the use of the Internet in university libraries of Pakistan. Questionnaires were sent to the head librarians of central libraries in all 40 universities and degree-granting institutions as approved by the University Grants Commission of Pakistan (UGU). There are 29 such universities in the public sector and 11 universities/institutions in the private sector. A total of 20 universities returned the questionnaire which constitutes a 50% percent response rate. The researchers found that half of the respondents did not have Internet facilities while the other university libraries were connected to the Internet. Six libraries had dial-up connectivity while the remaining four were connected by leased lines. Most libraries were using more than one E-mail package. Five libraries used Pine and two were using Eudora. Five libraries were using Microsoft Outlook Express. Other programmes used were Webmail and Sdnpk inbox. Nine respondents reported using the Internet for reference services, five for acquisition and five for cataloguing and classification, six for collection departments, two for Interlibrary loan and four for document delivery services. All libraries strongly agreed that the Internet is an essential element for modern library services and resources. The reference department showed the heaviest use of the Internet, followed by collection development, and cataloguing and classification. There are many problems that libraries encounter when using the Internet such as a lack of terminals and a lack of staff training. Two libraries reported that their OPAC was searchable via the Internet. They concluded that there are very few university libraries in Pakistan with access to the Internet and those which have access suffer from a shortage of resources. A lack of funding was the major problem that facing university libraries and caused them to restrict the benefits from such access. It is necessary to develop an IT infrastructure in the university using both the private and public sectors as the higher education sector must provide resources and access to them. To achieve the desired objectives, training must be arranged for the workforce.

Abdoulaye and Majid (2000) investigated the effect of the Internet on reference services in Malaysian academic libraries. The objective of the study was to find out how the investigation of the Internet has affected reference professionals and services. The study population consisted of professional librarians working in the reference

department or those librarians whose primary responsibility was providing reference services or information services at nine Malaysian public sector academic libraries. A total of 70 questionnaires were sent to chief librarians with the request to distribute them to library professionals working in their reference departments. 40 questionnaires out of 70 were returned; the results of these are presented in their analysis. They discovered that 27.5% of the respondents possessed a high level of computing skills; 55%: good; and 15% had a fair level of computing skills. It was found that professionals with high qualifications possessed better computing skills. With regard to Internet skills, 40% had very good or better Internet skills; 12.5% were reported as having fair or poor Internet skills. 68.4% of 38 respondents reported that they had attended Internet training programmes. It was found that 91.6% who had attended Internet training belonged to the age of group of 41-50 years while there were 12 respondents who had not attended such training. 55% of the respondents used the Internet frequently while 35% used it very frequently. None of the respondents reported using the Internet rarely or never. 39% of the respondents disagreed that the Internet had increased their workload. 43.6% agreed or strongly agreed with the Internet. 95% of the respondents agreed that the Internet had enabled them to work more effectively and efficiently. 53.1% of the respondents reported that one to five users sought their assistance for searching via the Internet on a daily basis and 34.3% helped six to ten users a day. 9.3% of the respondents reported assisting 21 or more users daily to search for information through the Internet. 95% of the respondents agreed or strongly agreed that the Internet had provided more options and opportunities for reference librarians. 97% of the respondents agreed or strongly agreed that the Internet was highly necessary for today's reference services, while one respondent did not express an opinion. 95% of the respondents agreed or strongly agreed that the Internet had enhanced reference services a great deal. 95% of the respondents reported that reference librarians should possess good Internet skills. 67.5% of the respondents disagreed that the Internet should replace traditional printed reference tools. 80% of the respondents agreed or strongly agreed that reference librarians could save time by using the Internet.

The researchers concluded that the general opinion of respondents was that the Internet had provided definite benefits: it has improved reference services and also enhanced their own performance, although a number felt that the Internet was not capable of replacing traditional tools completely. This could be explained, however, by the respondents' greater familiarity with printed reference tools. Also, because most libraries in the survey had only recently used the Internet for reference queries, it may take time for librarians for familiarise themselves with the possibilities of what the Internet can offer and therefore it may take time for printed tools to be replaced. However, more and more library operations are being performed by the Internet and library professionals need the skills to make best use of the opportunities. As a result, libraries in developing countries need to consider the existing skills of their workforce and must make efforts to improve and develop the skills and abilities of their professionals.

Houissa (2000) examines Internet problems in the Middle East and North Africa. He mentions that until early 1995, Internet access was very limited or completely non-existent in the Middle East and North Africa. However, the number of hosts identified by country rose from 2797 in January of 1996 to 11209 in July of 1997. This represents an increase of 300%. Egypt and Kuwait boast the highest numbers of private service providers and Internet users from among all the Arab Countries. Only 4% of users were women but institutions and government departments used the Internet more than others at work. According to a satisfaction survey, Kuwaiti users (38%) were the least dissatisfied with their services while Jordanian users (73%) were the most dissatisfied. This could be explained by the fact that, in Jordan, Internet connection fees are very expensive compared to costs in Kuwait, when income and the standard of living are compared. Arabic sites with Arabic text were shown to be on the increase and were getting more visitors. Houissa also found that the high cost of access was the major problem which prevented users from accessing the Internet. 200 companies in Saudi Arabia are in competition to develop the Internet for users. This indicates that demand for Internet services and the number of new users is on the increase. Sales of personal computers are increasing, particularly in Saudi Arabia and Egypt. The price of a computer in both countries, which includes the basic operating systems and some software, can be as low

as US $600. Houissa indicates that the quality of online services and networked access in the Middle East and North Africa varies widely from country to country according to the quality of the post, telegraph and telephone lines. He adds that another major problem that users are facing is the English language barrier. The development of Arabic software for the web and the Internet is helping to increase the use of the Internet by non-speakers and non-readers of English. However, anxieties regarding security and the influence of other cultures and religions have made governments consider censorship. He recommends that governments need to make more effort to control the contents of materials on the Internet and to provide free access, especially since the Internet and related information technologies have significant economic consequences at all levels. In Middle Eastern and North African countries, there are difficulties in separating economic information from political issues. This could lead to a situation where such countries are not attractive to foreign investment because of their poor economic performance.

2.4 Electronic sources of information

Today libraries can connect with other libraries and send e-mail through online systems (Tenopir, 1997). People today expect online interaction at home with the Internet and to America Online. The number of people who search the Web today is increasing. The number of people in the USA who browsed the web in 1997 totalled nearly 40 million which is 21% of Americans adults. 75% of people currently using the Web have trouble locating sites and need help. Over and above the 40 million regular users, 9.3 million others have tried 'surfing the web' but do not see themselves as regular users. Reasons for this include poor access to the facility and confusion concerning how to use the Web. Libraries, therefore, have an important role to play in alleviating these difficulties by providing access to the Web for those who, at present, do not have it and by helping those who do to access it more effectively. This help could be direct by providing formal classes or a point of reference service. It could also be indirect by, for example, offering a link from a library's homepage. Librarians are the people who should provide useful services from commercial online services. The library should offer online services 24 hours a day. Libraries today are struggling to decide whether or not to implement policies

prohibiting access to negative materials. Many libraries try to guide their users rather than restrict them.

By monitoring a group of law students at Toronto University over a one-year period, Yuan (1997) examined the effects of users' search experience on subsequent searching behaviour. The students used an online information retrieval system called QUICKLAN and their searching habits were examined to monitor the following: searcher commands and feature repertoires; error patterns; patterns of language usage; speed of searching; learning approaches, and user attitudes. Yuan found that certain language patterns changed as there were significant differences in the frequency with which certain commands and features were used, there was an increase in search speed, a change in learning approaches and an increase in users' commands and feature repertoires. Yuan also concluded, however, that experience did not result in the users making fewer errors.

Wiberly and Jones (2000) identify and describe the use of electronic information technology by humanists at the Carnegie Research University. They explain four different conceptions of time that librarians can use to understand how humanists interact with electronic information technology. They interviewed ten humanists in their mid-to late career stage. The average number of years since obtaining their Ph.D was between twenty seven to thirty four years. This was an older group and it is widely assumed that younger scholars use electronic information technology more than older ones. They spoke also with three scholars who had received their Ph.D fewer than seven years earlier. After that they talked with thirteen scholars, ten of them from six departments: Anthropology (two), English (three), History (two), History of Art (one), Political Science (one), and Women's Studies (one). All of these were full professors. The three younger scholars were assistant professors in English, German and History. The researchers mention that in the late 1980s and early 1990s almost all of the scholars had at least one computer. There were usually computers they had purchased themselves, some having only one machine which was at their home. They found that word processing was the activity the most heavily and widely practised by scholars. The second most used electronic information technology was E-mail. Some of the scholars

indicated that they were sent twenty to thirty messages per day. The third most used electronic information technology was the OPAC. Scholars used the Internet particularly for E-mail but also for searching library resources, especially the OPAC. Most humanists interviewed indicated that they had a desktop in their office and another at home. It is interesting that some humanists did not have Internet access despite the fact that they already had computers at hand. The researchers found that one reason for the heavy use of computers in science and social science departments was because a great deal of time was spent in such areas working with quantitative data. In Humanities' departments, however, quantitative data are not so widely used and so statistical packages may not be widely or frequently used. Electronic information technology is more useful for manipulating and analysing quantitative rather than qualitative data. One of the most important uses of electronic information technology is to access primary sources of information, whereas social scientists and scientists have data which they themselves have helped to create through field work, surveys or experiments. Such information can be recorded effectively and efficiently by using computer technology. For humanists, however, computer technology may be of immense benefit by enabling them to read surveys using a digital version. In time, this will probably become commonplace, enabling humanists to study and comment on specific and quantifiable data from sources they access. The researcher found that senior scholars used electronic information technology more, normally beginning with the OPAC in their libraries. They then used word processing followed by administrative assignments since they were regular E-mail users and finally they searched bibliographic databases. The study finally suggests that bibliographic databases may join online catalogues, word processing and E-mail as baseline competencies for humanists. It was felt that humanists would gradually become more involved with electronic information technology. However, their involvement will always be less than for those who study in areas where data is quantitative rather than qualitative and where scholars are directly involved in the creation of their own data sources. Librarians can be most helpful in encouraging scholars to use electronic information technology effectively. However, they will be more help if they are aware how important the time factor is for humanists.

In Saudi Arabia, the King Abdulaziz City for Science and Technology (KACST) plays a significant role in providing a wide variety of support services to the academic and research community in the Kingdom. Siddiqui (1992) describes the KACST database retrieval system which was initiated in 1982 and now has 14 CD-ROM databases, nine of them accessed directly by users, Only authorised users can access the other databases. KACST can provide many databases through GULFNET, the academic research network dedicated to universities and research institutions throughout the Gulf countries. Also, KACST has access to more than 200 international databases to provide these services to researchers. He notes that KFUPM library began conducting online searches of international databases in January 1979. The library pays all costs, including telecommunication charges from the library budget. Users of online at KACST in 1980-81 were primarily scientists at the college and universities throughout the Kingdom.

Munshi and McRoberts (1982) indicated that in 1980, 32 searches were ordered from KAU, 174 searches from KSU and 44 searches from KFUPM while in 1981 there were 116 searches at KAU, 195 at KSU and 30 at KFUPM. The KSU was a principal requestor of online searching as it is very close to KACST. In 1980, 2,115 documents were delivered to scientists. In 1981, the total number of documents delivered was 3,918. The record of these two years indicates a very acceptable achievement because online searching was a new approach in a developing country. In conclusion, they recommended that for the future, a Network system should be provided to all areas of the country in order to assist scientists in their research and development pursuits. Two institutions are involved in database production; King Abdulaziz City for Science and Technology (KACST) and King Faisal Research Centre for Islamic Studies (KFRC) (Al-dosary and Ekrish, 1991). Also, KACST has the supporting role of providing access to online information search services such as DIALOG, SDS, STN and DATA STAR. In addition, it provides document delivery services. Hardware, software and standardisation in academic libraries and information centres are still problems which need to be addressed to make the automation more effective and efficient.

The perception of faculty members at King Abdulaziz University (KAU) towards online search services is discussed by Marghalani and Hafez (1993). They point out that during 1989 and 1990 the largest number of requests was made via online searches by the Faculty of Engineering. Users from the Department of Medicine were found to be the heaviest users. 61% of Assistant Professors, who were Chairmen of departments at that time, were involved in online searches more than the other groups, followed by Associate Professors, 31% and Professors 8%. 45% of respondents used online search services to conduct personal searches. 30% used online service with their colleagues and 25% used it to help students. 54% of respondents stated that they had learnt online search services through colleagues and 23% became aware through KAAU library. The rest of the respondents (23%) had found out about it through various ways. They recommended that online search services should be publicised to all users. There was a need to collect statistics on the use of multiple databases to satisfy user needs. The online search service should be extended to include graduate and undergraduate users. There was a need for trained search intermediators and an appropriate database for searching should be selected. The search result should be reviewed later.

Khurshid (1998) mentions why several libraries in the Arab Gulf countries are considering system migration. Some of the reasons are that library systems cannot remain reliable more than five years without significant modification, users complain about system performance, the lack of information technology expertise, and the high cost of enhancing or maintaining the current system. He points out that due to the lack of skilled staff one of the university library projects in Saudi Arabia did not even take off and after some time caused the departure of some members of the team. For any system to be successful in the region, it must offer full Arabic support. The main problem with DOBIS/LIBIS and MINISIS is that users have not been happy with the system design and the lack of vendor support. In addition, downsizing the computer hardware has prompted the libraries to consider system migration. He considers that, in order to make full use of the new systems, good computer skills will be required, thus, this problem will be overcome by effective training of staff.

How information technology (IT) in seven university libraries in Saudi Arabia has evolved rapidly is reviewed by Siddiqui (1997). He points out that four out of seven universities (KAU, KFUPM, KSU, and UQU) automated their library function through the DOBIS/LIBIS system. So, in this case a network of these four universities may be established and thus, a union catalogue of participating libraries could be created to share production and utilization of publiographic data. Only KFUPM and KSU libraries are presently accessing CD-ROM NET. However, KAU, KFU, and UQU libraries are planning to use this in future. Three academic libraries (KAU, KFUPM and KFU) are using online databases produced by vendors in the USA and Europe. The remaining libraries are using online databases, but through KACST. 74 databases in CD-ROM format (bibliographic 57, non-bibliographic 8, and full text 9) have been acquired through four libraries (KAU, KFUPM, KFU, and KSU) while KACST acquired 80 bibliographic, numeric and full text databases for its CD-ROM NET to be used by different libraries. The present trend in academic libraries indicates that they prefer to acquire CD-ROM databases, because online databases are costlier to search. The important step is the connection to the Internet for all universities in the Kingdom to provide fast and easy transfer and exchange of information so that library users can retrieve more up- to- date information.

2.5 Availability of skilled staff

Staff training must come first because staff could provide services to any user that might seek help. There is no doubt there is a difference between professional and non-professional trained staff in giving user support. So, in order to enhance the knowledge and skill for each staff member it should provide a training strategy to identify them. Training is necessary for staff to keep up-to-date with newly developed technology. Training must be effective and staff must be informed if they are to provide efficient services to users and promote a good library image. Training must keep all staff aware of what is happening in library development.

2.5.1 Staff training

The current training practices within the Minnesota State College and Universities (MnSCU) are discussed by Kirpatrick (1998). Seventeen out of twenty-three libraries responded to a survey. The surveys were addressed to a librarian at each library. Kirkpatrick directed his study to three areas: the types of technology in which staff receive training, the method being used to train staff in technology and what professional and paraprofessional staff receive from training. He states that there is a need for library staff who are well-trained in information technology. There is a shortage of training provided for library staff. The academic libraries are facing technological change today and thus, they must prepare their employees to use technology effectively.

Marmion (1998) asked if libraries provide training in technology and computer skills for their staff. He states that there is a lack of professional librarians, support staff and a lack of computers in many libraries.

The advantages to librarians and academics in creating a teaching and learning tool to benefit students and themselves at the University of the West of England (UWE) via the ResIDe electronic reserve (or electronic short loan system) is discussed by Dugdale (1999). She begins by discussing the services provided by UWE. There are many electronic services provided by ResIDe, such as open learning, print short loan, scanning material into a networked electronic reserve and access to a secure network 24 hours a day. This is provided to students at the same time so it is possible for a large number of students to access the same material simultaneously and independently. All materials are available in the electronic reserve. There is access from any network terminal in the University, whether in the library, laboratories, teaching rooms or student accommodation. Students can access directly instead of going to the library or contacting the library staff.

At Manchester Business School the library staff and students need training to keep their skills up to date (Simpson, et al., 1994). Training programmes are offered to staff in new

products but probably not often enough. Staff must know about the networking products because users will certainly need help.

Ocholla's study (2000) compares manpower development and training for information services in various Library and Information Studies (LIS) departments in Africa. He notes that libraries were first set up to cater for the needs of colonial settlers without thought to training African librarians and, secondly, that there has been tremendous dependence on foreign governments for the development of libraries and LIS training programmes. Finally, most libraries which were established were either public, academic or special, with LIS education being developed largely after 1960. Ocholla compares the main trends in LIS programmes in Africa, the programmes and curriculum content offered, accreditation, fieldwork studies and the opportunity for continuing education for librarians and library staff. Finally, he examines and compares the problems experienced by libraries, including lack of funding, inability to attract suitable staff, poor equipment and a lack of computer laboratories within departments. In spite of these and many other difficulties, he reports that many African countries have developed their LIS programmes and that this growth has been particularly significant in English-speaking countries.

The report by Robinson, et al., (2000) covers the course "Libraries and the Internet" which has been run during the 1997, 1998, 1999 summer university programme at the Central European University (CTU) in Budapest. The course, lasting ten days, accommodates 30 participants per year from libraries of various kinds (academic, national, public etc.) from central and eastern Europe and Asia. The aim of the course is to help participants to develop the skills of effective communication and to equip them with the knowledge and skills that they will need to understand and make effective use of the Internet. Various methods are used to identify, use and assess resources which are Internet-based. However, the course has now moved beyond the "mechanics" of how to use the Internet and, while still promoting the necessary skills, has moved towards considering the role of the library and the librarian in society.

Basefsky's paper, 'The Other Client" (2000), addresses the needs of administrators of university libraries in order to increase their productivity by enabling them to use sophisticated systems creatively, and demonstrate that the library can increase its university's competitiveness by providing training and consultation services. He offers advice to administrators regarding reference services, accessing online databases and organising Web Sites in order to improve the services which are offered to users.

- The need for training

The first step in a training programme is to be aware of the knowledge and skills of the staff and after that to advance to the pre-determined desired level (Kirkpatrick, 1998). Two methods have been used to train library staff in information technology. Kirkpatrik (1998) points out that 80% of libraries surveyed provide training for both professional and paraprofessional staff on all types of technology (PCs, automated systems, E-mail and the Internet). 94% of libraries provide automation training. Training on E-mail and the Internet was available to all staff members in 82% and 76% of the libraries. 70% had training available on PCs. 5.9%, which represented one library, offered Internet training to professionals only. At the same time, 5.9% of the libraries admitted to providing access to the Internet to professional librarians only. 100% of the libraries were using one method to train staff members at least once. 64% of libraries used individualised instruction methods provided by co-workers and 76% used training methods on an automated system. 41% of libraries used automated system training only. 47% of libraries used the method of training by supervisors. Also 47% of libraries used teaching workshops outside the library while 44% used in-house services. 19% used workshops conducted by the vendor. The percentage using E-mail in in-house workshops and PCs was 52.9%, while the Internet was used by 41%, but 29% were not training on an automated system. The most frequently used training methods for both professionals and paraprofessionals were: individualised training by a co-worker (54.9), in-house workshops (35%) and individual training by a supervisor (31%). 94% of the libraries indicated that there was no in-house trainer who regularly provided training to library staff members, other than those he or she supervised. Only one library (5.9%) had an in-

house trainer. The percentage of libraries that offered PC training was less than the number of libraries that offered training on other technologies.

Kirkpatrick noticed that many staff within these libraries had not received training in basic computer competence. He indicated that a personal skill assessment is important to evaluate staff skills in each individual technology. Interviews should be conducted with the system librarians to learn their views of their skill levels in each of the technologies. Library administrators should create a positive environment for learning and change by developing technological projects, good communication and meeting technical needs.

Cooper (1998) says that "Technology is rapidly changing and therefore requires a great deal of effort to keep pace". He emphasises that a technological orientation would enhance abilities and improve the attitude to the library among users and other groups; thus managers and administrators who have the power to do this should create a suitable atmosphere. Administrators should allocate technological tasks for all library staff based on the stage they are at within the change process. e.g. a person who has very little knowledge about technology should contribute to a simple task such as turning on workstations or learning to use a mouse. Other persons who have more experience or enthusiasm would be suited to more involved projects such as searching databases or loading software. Library administrators should focus on many developments for staff members such as training, equipment, and technical support to create a positive environment for change. He points out that staff should be encouraged to become more familiar with this equipment. Training goals should be devised, not only for learning how to use the technology, but also to eliminate stress and then increase confidence. Sessions should be fun and carefree. Administrators should work within financial constraints to handle the goals of the library efficiently and also to make sure that equipment is appropriate. Staff should be involved with the technology whether they are beginners or professionals. Today, library staff members cannot work as librarians without dealing with computers and so they must know how to use them.

Marmion (1998) recommends that librarians should know how to copy and paste data between applications, how to copy and move a file from one location to another and learn the software application that they use daily. Lack of training invites disaster. A good deal of money should be spent on training to allow the librarian to become capable of imaginative innovation. A base level of computer competence should be stipulated in job descriptions and candidates rejected who do not meet requirements. It is vitally important that the library profession reaches a high level of computer competence if resources are to be well utilised and a high level service is to be offered to customers. Marmion concludes that without the above, the service risks obsolescence.

Academics and librarians are able to provide students with a wide range of advice on learning skills (Dugdale, 1999). Materials should be easily and quickly retrieved by building hypertext links to relevant internal and external databases by library staff. As a result, students will be able to read a very wide range of materials. The library staff are happy to provide information in a pre-packaged format to students because the students know that analysis is becoming more important than searching. Academic staff will save time and effort by using an electronic reserve for information such as a bulletin board. The administration is now committed to the design, development and promotion of the library system. The electronic environment in the library creates cultural change within an organisation and new responsibilities, roles and relationships throughout the institution. Staff must work in multi- skilled teams if the electronic information provision is to be effective. There is a relationship between IT support and library staff while a system is becoming operational. During the early stages after implementation, academics can also help library staff to promote electronic reserve. Electronic reserve is able to provide useful information to a number of students effectively at any given time. Academic staff and librarians need to discuss all the problems that they have faced and thus they can understand how to help each other. They can make life easier for each other and also ensure that information is widely and easily accessible to users. Library staff know much better which databases are most used for each course and how they can encourage their use. Supporting information provided via web pages can be more efficient for students. Library and academic staff need to explore further possibilities of

adding video- clips, E-mail links and video conferencing. Direct E-mail links from ResIDe would enable students to get their bibliographic data directly. All these facilities need the provision of a training programme for all users to use them effectively.

This study by Fidishun (2000) notes that most instructions designed by librarians on the use of electronic resources. It suggested that, for adult students in most institutions of higher education, librarians might bear in mind the advice given by Lawler (1991) in her "Six keys to facilitating adult learning". These are: -

- Understand and reduce anxiety.
- Elicit and incorporate student expectations.
- Acknowledge and utilise student experience.
- Provide and encourage active participation.
- Identify and incorporate relevant content.
- Facilitate change and growth.

These are designed to encourage adult learners and to build confidence as well as expertise in a group of students who might well feel at a disadvantage in the modern technological age.

The academic librarians' perceptions of their continuing professional development needs in Malaysia are discussed by Anwar (1998). He talks about how information and communication technology (ICT) developments change the ability of LIS professionals to learn new skills and make appropriate adjustments, and discusses increased user demand on limited available resources. He states that rising costs of information resources and a lack of funding are forcing librarians to learn and practise better resource management techniques. He emphasises that the weakest point in library management is the knowledge, skills and attitude of library staff to meet the current challenges. He investigates all nine academic libraries, which are members of the conference of the National and University Libraries (PERPUN). He used two questionnaires to collect data: one for chief librarians and the second for other librarians. Two out of the seven university libraries confirmed that their libraries have a written policy. One library stated that it was being prepared. 86% of the respondents (116) considered continuing professional development to be very important. All chief librarians replied in the

affirmative when they were asked if the library management encouraged staff to participate in any continuing development programmes. 66% of the librarians were encouraged by their managers to participate in continuing professional development programmes. Of the 118 respondents, 51% attended continuing professional development activities. Fourteen items were listed to show which professional skills are most important to respondents. They gave the electronic information sources and user education the top two ranks. The respondents ranked the Internet application service the highest, followed by microcomputer application, and telecommunications and networking. At the opposite end of the scale, expert systems and desktop publishing had the lowest ranking. CD-ROM and online database searching were a low priority due to the fact that these skills can be developed on the job quite easily. He recommends that each library should issue a staff development policy and make it known to all staff in the library. Each library should provide a training programme for all staff members. The library should plan their activities at a suitable time for their users and avoid activities which take more than three days. The library should design a suitable training programme for users, especially in some major areas which are important for them.

- Professional education and training of library staff in Saudi Arabia

In Saudi Arabia, Ashoor (1983) reported that the KFUPM library encountered some problems before the implementation of the DOBIS/LIBIS system, such as the lack of expertise and the lack of effective communication among project team members. At the beginning of the installation, it was necessary to provide training for library staff in order to provide useful skills and knowledge to implement and use the software on the one hand, and to use the developed library information system on the other. The library has designed an in-house training programme for library staff to develop their basic skills for using the DOBIS/LIBIS system. Tameem (1988) adds that hundreds of new libraries have been opened but many of these libraries are not working effectively due to a shortage of qualified and trained staff. Libraries are growing more quickly than the number of qualified staff needed to run them. The lack of Arabic literature in Library and Information Science is one of the difficulties which affects the shortage of professionals.

There remains a lack of staff training which could be partially overcome by library professionals who should provide continual education programmes and training to improve the standard of SA libraries. Cooperation between academic libraries still does not exist because of the lack of network utilities.

Qari (1998) represents a clear picture of how the Arabian Gulf regional libraries appear today and how the libraries' educational system can meet the change to provide skilled and trained librarians to manage, operate, and plan future electronic library systems. The real impact of IT started in the mid-1980s when local area networks (LANs), wide area networks (WANs), and new microcomputer technology appeared. In the 1990s libraries built CD-ROM networks, providing full multimedia systems, and recently the libraries have started to link to the Internet. He mentions that students have to know how to use the library systems and how to handle information activities effectively. Libraries must consider enhancing librarians' skills and knowledge by training or educating them to use IT applications effectively. He points out that more than 50% of library staff at King Abdulaziz University are not LIS graduates. Thus, there is an absence of skilled LIS graduate staff that can deal with electronic services, multimedia, the Internet, etc. Training programmes to keep staff current with the changes in IT do not exist.

2.5.2 User training

There is a basic relationship between users and staff because staff need to illustrate the necessary procedures and tools used in the library and then leave users to find their requirements (Andalleb and Simmonds, 1998). Effective training of users means that they can be introduced to the vast amount of available information. Libraries cost a lot of money to equip and run.

If these libraries are used by only a small proportion of potential users, it means these libraries do not provide a useful service to all users and thus it would be a worthwhile investment to increase the use of the libraries by the provision of training.

Academic libraries now provide online information, multimedia products, document delivery services, and other competitive sources of information to become libraries which are evolving with new technology. Academic libraries have to play an effective role in the creation and delivery of a service with which their users are satisfied. The availability of resources can satisfy users. Therefore, the quality of resources is important as whether the library can provide access to materials when and where users need them. Users need academic library staff to be knowledgeable and provide materials quickly and efficiently. If users have confidence in the library staff, they will feel that problems will be easily resolved and they will be satisfied with the services. Academic libraries have to provide resources to users by providing access to information. Academic libraries must monitor the academic environment to provide customer- focused services such as teacher resource needs, and student information packages (CD-ROMS, Internet, etc.). Librarians must provide a variety of information access options to users. The library users, especially students, accord significant importance to the behaviour of library staff. Training programmes for library staff must continuously stress the need to provide competent library services by library management. The need to provide high quality services to users is based on the experience of library professionals who have long known about these needs.

A paper by German, et al., (2000) examines a first year undergraduate experience programme at the University of Albany, SUNY. Acknowledging libraries at the start of the year, the researchers produced a Web-based instructional module for first-years. This lasted for one class session. The module was then used by one group of students while a second group received instruction from a librarian. In order to analyse the effectiveness of the two modules, tests were carried out both before and after instruction and the results compared. It was found that instruction per se made a significant difference in students' ability to use the library effectively but that the method of instruction made little or no difference to the end result. The researchers decided to use the Web-based instruction but to include a second session with a librarian as they recognised the importance of personal contact and advice.

A paper reports on the GAELS Project, a two-year project which promotes collaborative information services to researchers in Engineering at Glasgow and Strathclyde Universities. Joint, et al., (2000) consider the role of user-education in the modern library and how that role should be developed in the future by the teacher librarian. This project conducted initially an information audit on the use of information by engineers in both universities and also designed course software which provides research engineers with networked information retrieval skills that will decrease their dependence on their local collection. Pre- and post-task questionnaires were used to measure user confidence; other measures employed were usability and usefulness questionnaires, expert review, user observation and subject librarian questionnaires. An evaluation of the resulting data concluded that the learning outcomes were positive though, while the information retrieval skills which were being taught were being successfully passed on, the content of the syllabus was not always precisely composed to reflect user needs. Other conclusions reached were that browsing, rather than searching, increased current awareness, that other methods were required in the literature searching syllabus, the objects retrieved were more important than the retrieval techniques and that departmental coursework and library Web pages should be used as task-based interfaces to courseware.

Urquhart (2000) reported on research being carried out in the Development of Information and Library Studies, University of Wales, Aberystwyth, into the impact and effectiveness of information technology training for professionals in the health sector. In this article, the writer points out the necessity for some sort of measurement of baseline conditions and of actual needs as well as outcomes. She reports that a number of studies are presently being carried out at Aberystwyth including a study of with information skills are required by student nurses and another which concerns long-term follow up of the effectiveness of a training session on database searching.

The study carried out by Curl, et al., (2000) concerns the development of the course that would teach students how to locate, evaluate and present information in an electronic environment. This led to the design of an asynchronous version that was

Web-based and this was included in the course schedule for spring 1999 at the Purdue University, West Lafayette, USA. An initial evaluation revealed that some students had expressed a certain sense of confusion and frustration and it proved necessary to meet these students in-person or via the WebCT chatroom. A later, redesigned course in 1999 included a face-to-face meeting as a fixed part of the course. It was found that the most successful students visited the course Web-site for ten to fifteen minutes on a number of occasions each week. Also, those student who were able to use their own computers achieved better results than those who were able only to use computer labs. The researchers noted that cooperative and collaborative learning was a key issue. "The instructors taught the students, the students taught each other, and the instructors learned from the students".

Wen-Hua Ren's (2000) considers the effect of training on students' ability to use electronic information searching methods. Using the experience of 85 undergraduates on the introductory English Composition course at Rutgers University in 1999, the researcher asked the participants to complete a questionnaire regarding their own experience and confidence in using electronic sources before instruction began. A second questionnaire was given to the students after training and after they had carried out an assignment in the library. Subsequent analysis of the findings showed that students' ability and confidence, their "self-efficacy", was significantly greater after they had received instruction. The study stresses the need for students also to have sufficient practice and experience success with their efforts. Negative emotions such as confusion and frustration do not help to build confidence and skills. The researcher points out that instruction can persuade students to search on their own but that then practice and success will reinforce each other.

In a paper from a developing country, Fidzani (1998) points out that 93% of the respondents (223) at the University of Botswana library agreed or strongly agreed that they need more instructions on how to use information resources in their subject areas. He points out that some students had a lack of basic skills and thus they need adequate

training to improve the use of the library resources and services. Graduate students should learn about the services which the library provided and how to use these services.

Hamade (1995) started his article by describing how computer technology was flourishing rapidly in the Kingdom of Saudi Arabia and how DOBIS/LIBIS, MINISIS, and STAIRES systems were becoming a familiar part of Saudi libraries and information centres. Hamade emphasises that the percentage of expatriates holding professional and technical jobs in Saudi libraries and information centres was low. Giving an example, he explains that expertise ranged from 9 percent at the library of the Institute of Public Administration in Riyadh to more than 80% at the library of KFUPM in Dhahran. Speeding up the Saudization process with extensive training of Saudi nationals and acquiring a good command of the English language can solve staffing shortages. Language barriers are another problem in the effective use of computer software and integrated information systems, as is the lack of cooperation with other institutions to exchange information and solve common problems. Hamade (1995) and Tameem (1984) both strongly agreed that the libraries and information centres in the Kingdom have a great shortage of qualified Saudi professionals in the field, especially in the areas of administration, automation, online searching, reference services and networking because there is still a reliance on professional expatriates from around the world.

Khalid's study (2000) investigates the use of new technology in university libraries in Saudi Arabia with particular reference to housekeeping and bibliographic searching. By the application of the postal survey, the researcher discovered a low level of use of electronic systems for these services and then turned to a literature study to examine possible reasons for this. He concludes that the lack of the national information policy and a shortage of trained staff are two reasons which contribute to this low level of use. Khalid recommends that users need training in order to make effective, efficient and independent use of library and information sources, resources and services. However, most university libraries do not have organised education programmes for users in Saudi Arabia.

2.6 Conclusion

There is no doubt today that there is a significant demand for information in libraries, especially now that users are involved with technology more than ever before. However, there is an ever-widening gap in the development of the OPAC between the USA and the UK, and the developing countries. There is a need to enhance OPAC systems by upgrading them, to create new systems if the old systems do not fulfil users' needs, to access many library databases by building up a unique and vast database and finally, to access other databases through the Internet.

In developing countries, more specifically in Saudi Arabia, many services still do not exist for many reasons:

- They are still entirely dependent on foreign technology systems such as DOBIS/LIBIS which are used in various university libraries despite the fact that circulation and acquisition models of DOBIS/LIBIS are unsuitable for providing effective services.
- There is a lack of national vendors.
- There is a shortage of Saudi professionals in the area of information technology.

Therefore, in the near future, libraries must provide new kinds of OPAC systems or must upgrade the existing systems to provide for at least a minimum of user needs.

Regarding the use of CD-ROMs and online in Saudi Arabia university libraries, there is equal interest in these facilities to provide effective information services compared with the provision in the USA and the UK. At present, CD-ROM and online databases in Saudi Arabia are used in all university libraries with different levels of service. For example, KSU has access to many databases through KACST which has a higher number of these services than other libraries because of the close physical proximity of the university to KACST. Some universities are trying to develop their collections of CD-ROM databases in order to provide useful information for users.

Developed countries have taken large strides in the field of the Internet compared with developing countries. Therefore, electronic services in developing countries will need to be connected to the Internet. All these technology services need to provide training to both users and staff whether in developed or developing countries in order to achieve

progress. In Saudi Arabia there is a need to provide comprehensive training in order to enhance the ability of users in the field of information technology, especially where there is a lack of literacy in English.

It is obvious from the literature reviewed that developed countries depend on day to day use of OPAC via the Internet more than developing countries. Some developing countries have started using this service in their libraries while others need to access the OPAC but have problems in doing so such as:

- Lack of communication infrastructure.
- The OPAC system is not compatible with the Internet. in such cases, this needs to be replaced.

Differences in the use of CD-ROM services between developed and developing countries is evident. Libraries in developed countries depend on computer networks for using this service by providing multi access while developing countries are suffering for not providing an effective service to users for the following reasons:

- Lack of communication infrastructure.
- Shortage of IT professional.
- Lack of funding.
- Lack of training.

There is a large discrepancy between using the Internet in developed and developing countries, including Saudi Arabia. Developed countries depend on this service widely, as mentioned previously and all electronic services in libraries are available via the Internet. Most library users access this service without any problem. The use of the CD-ROM service in developing countries is still in the infancy. Most libraries which used this service used it for browsing the OPAC system. The Internet can still not access all electronic services in libraries for the following reasons:

- Lack of communication infrastructure.
- Lack of knowledge.
- Shortage of IT professionals.

- Lack of funding
- Lack of training.

Chapter Three

Research Methodology

3.1 Introduction

This chapter introduces two models which have been chosen to aid the design of the questionnaires and interviews undertaken in this thesis. The rationale behind the choice of these models in discussed, as is their use in the study. The design and application of the questionnaire and the interviews is then explained, relating these to the selected models.

3.2 Definition of a system

A system can be defined, in general, as a series of interrelated elements that perform some activity, function, or operation (Semprevivo, 1976).

The term " system " can refer to such diverse phenomena as the skeletal structure of an animal, a business enterprise, an electronic computer, ecological phenomena, and libraries. The system approach defines a system as " a set of parts coordinated to accomplish a set of goals" (Busha and Harter, 1980).

"Model" is an umbrella term used to embrace a number of similar, but not identical approaches, all of which try to provide a picture of the system. While the structure of the model does not fully reflect what is going on in the organisation it helps to represent a picture of what the organisation should be. Usually the model is made by way of a rational process. All the options are considered and evaluated in terms of the objectives of the organisation (Bush, 1986).

The conclusion of this is that the model is usually built by the researcher him/herself. Generally, any model is not meant to represent actual reality. However, to be effective, it has to mirror the basic elements of the system being modelled. In short, it

might be possible to create many models for one system, but not all models necessarily accurately represent the system.

3.2.1 Types of systems

Leimkuhler (1966) revealed how acquisition, circulation, storage, loan period, duplication policies, and patterns interact, showing that it is possible to develop models and theories that describe the operation of an information system. However, although these models can be used to refine the objectives of library administrative policy, they are not concerned with user reaction and behaviour towards information services in the libraries. These models are not applicable to the current study because they are concerned with mechanical library activities and not with human activities in the library, which in this study are important. Further, these models are still too simple to be precise estimators of actual library performance, and through these variables, there is no variable concerned with user reaction or behaviour. Their theories are still tentative and incomplete.

Adams, et al., (1991) provide three models which contain a configuration of an Integrated Information Centre (IIC) which provides services and technologies to assist faculty and staff in performing their information-processing activities. The three models which were developed were: a basic model, an intermediate model, and an advanced model. These three stages were represented depending on the requirements of the academic unit and the resources which were available, and are grouped under the general areas of information acquisition, information storage, information manipulation, communication, and user education. The IIC provides services and technologies to help faculty and staff in performing their information-processing activities. While each of these models has many functions which do not exist in the remaining two, none of them mentions the attitude and reaction of users and therefore, these models are not applicable to this research.

Wyllys (1979) used techniques to design systems for handling information. Here, the system uses creative and imaginative thinking, and, rather than just structuring a model, it is necessary to ask what the best system will be in order to perform all the

requirements. He divided the system into: internal design, which concerns those parts of the system that will be entirely controlled by the organisation operating the system; environmental interface design, which deals with those parts of the system that are not under the control of the operating organisation; component design, which deals with how the functions, equipment, and procedure of the system are grouped to sub-systems; and system test design, which is concerned with the evaluation of the system performance and procedure. Tests are carried out during the production and the implementation.

The system developed by Heseltine (1982) shows that the essential task is specifying the existing structure of a system and the influences at work in it. The technique is very straightforward and clarifies how all variables, which are present in the systems, are incorporated. These variables are connected by arrows which indicate the direction of influence or causation. The rate of completing service to users is clearly dependent on the current search capacity which depends on the number of available terminals in the library, on how long it takes at the terminals to perform a search, and on the allocation of staff time to the electronic information services. Finally, it shows the feedback, which produces significant variations in the behaviour of the system. The academic staff plus students are identified as a user community. The physical structure of the system is of interest in itself, as it may highlight issues which deserve further consideration, especially at the stage of the setting up of the system.

Branin and Finn (1991) describe the academic unit for which the model IIC was designed to serve at the Hubert H. Humphrey Institute of Public Affairs at the University of Minnesota. The IIC served three separate systems: university libraries that provide scholarly information; systems which provide academic computing and information services; and administrative computing and information services. University libraries and administrative information services provide access to an Online Catalog called LUMINA (Libraries of the University of Minnesota Integrated Network Access). The mission of academic information services is to manage the administrative information system for the university plus support these systems. The academic information services take the place of administration in Saudi universities, which are responsible for the general policy in universities.

They have begun planning for the provision for additional information services to end-users, such as providing access to machine-readable databases which are located in the university campus or through the vendors. Academic computing services and systems (ACSS) provide for the computing needs of staff and students and the university, which, in this case, offer the same functions provided by the computer centre in Saudi Universities. The users were, at the time of the publication, demanding that the university change its composition from the supporter of mainframe computing to database and telecommunications support. Thus, in this case, ACSS is the competent authority responsible for providing these services to users.

Wyllys (1979), Heseltine (1982) and Branin and Finn (1991) were chosen because they clarify the real view of what is going on in the university campus in Saudi Arabia. They help in thinking about how libraries work, and how they are used. Furthermore, they clarify the computing skills available to users. Finally, these three models are applicable to the subject.

3.3 Discussion of models chosen for the study

Two models were developed to inform the design of the questionnaire and interviews. The first model to be discussed (Figure 3.2) is based on Wilson (1981). This is an information acquisition model, and depends on the individual's information-seeking behaviour and the fact that obtaining the right information is important to him / her.

The second model (Figure 3.3), which was designed for this study, is based on Wyllys, Heseltine, and Branin and Finn with some modifications and is an organisational model. The model is intended to define a cognitive function which can be represented as groups rather than individuals.

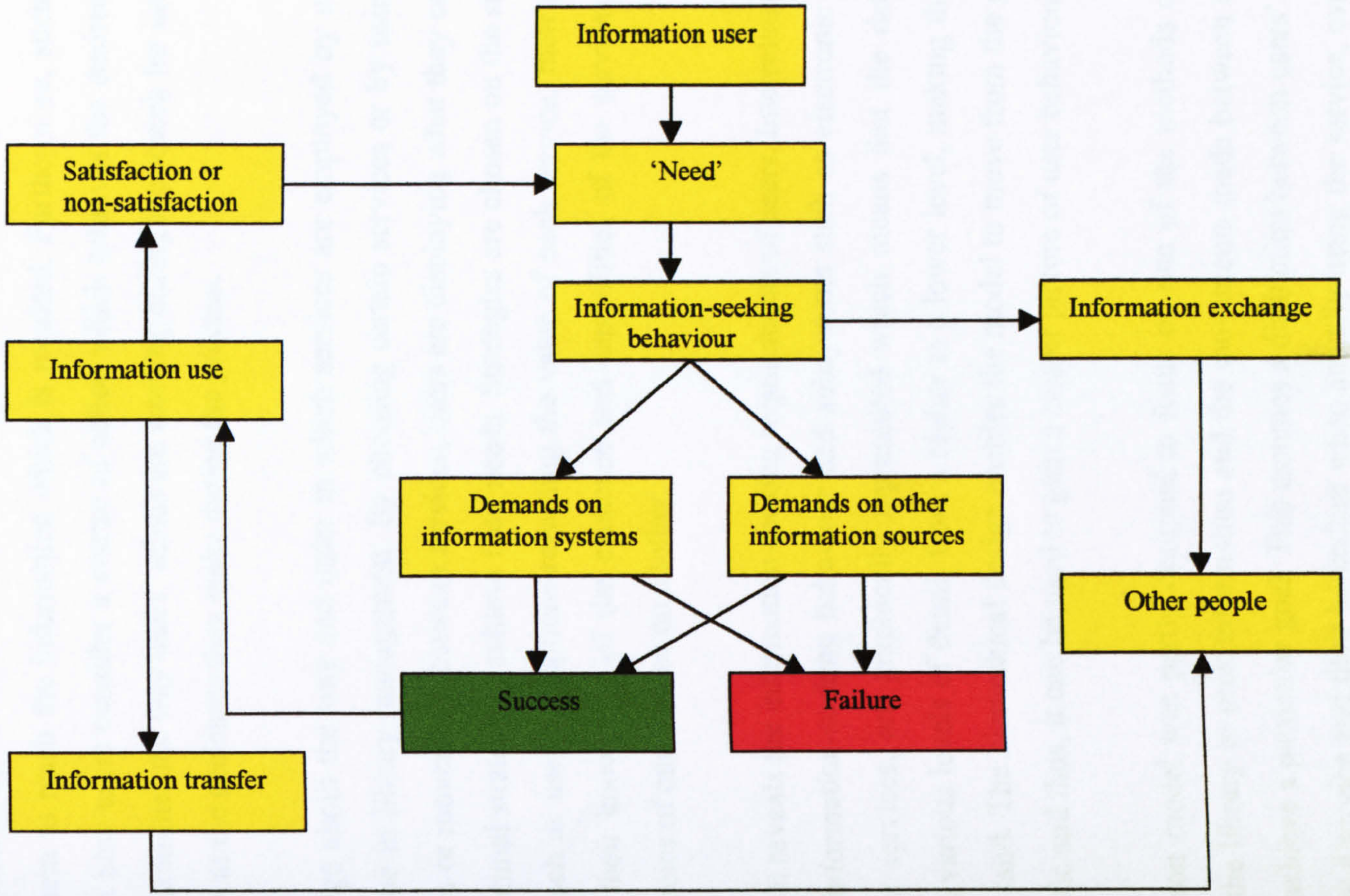
The first model was selected because it shows the attitudes and reactions of users which is very important in the research investigated while the second model shows the most communicated variables in the university campus in order to provide effective electronic services to users by using computer networks. These two models were used to give an overview of how and when IT services are provided to users by librarians and how these services are enhanced, as well as showing how users' and

librarians' skills are developed.

Wilson presents, in his model shown in Figure 3.1, a way of considering user studies and points out that this is not intended as a method to model information-seeking behaviour which is an extremely complex issue but as a way of drawing attention to the connections and interrelationships involved in the process. Wilson asserts that information-seeking behaviour is the result of a user recognising or perceiving some need and that this, in turn, results in behaviour which may take a number of forms: these may be in making demands on formal library systems, such as online databases; referring to systems whose primary function may not be that of providing information; or seeking the desired information by human interaction, that is, by asking other people. From whatever source the information is sought and however it is sought, the information will, at some point, be used, even if this only to be evaluated to discover its relationship to the user's perceived need. In this, the information satisfy, or fail to satisfy this need or may be "transferred" to fulfil the requirements of another person. If the information found does not satisfy the user's need or information is not located at all by using the information-seeking strategies adopted, then the model shows this as a failure and other methods will be tried or other sources searched. In Wilson's model the term "information" may be understood as facts, advice or opinions and these may be received in a written or an oral form (Wilson, 1981).

Wilson's model has been adapted for this present study in that the model used here concentrates only on information-seeking behaviour which turns to library systems for satisfaction, these systems being reduced to electronic and non-electronic sources. As such, the adapted model has narrowed the concept of information paths as described by Wilson in order to concentrate on library users and the specific paths open to them as opposed to the wide environment encapsulated in Wilson's "universe of Knowledge". This adaptation falls in line with the purposes of this research which is to examine the use of electronic services within the academic libraries in Saudi Arabia.

Figure 3.1: Wilson's model of information-seeking behaviour



3.3.1 Information acquisition (Model 1)

The information acquisition model, as seen in Figure 3.2, seeks to understand which needs trigger information-seeking behaviour, and then how users choose to seek and select information. It also examines how users extract meaning from data which allows them to reach the information which is required. Furthermore, such a model considers how users consider a course of action which achieves the desired goal. In short, it examines the way users' minds are working during the search for information and looks at the decisions they make during the process.

Knowledge about the way and order in which services are employed by users is of great value in library management. By choosing certain services or by using certain sequences or movements between services, users are displaying what they consider to be the optimal strategy to achieve their needs. Strategies are chosen on the strength of factors such as user perceptions regarding the value of each service, their perceived success, their knowledge of the existence and capabilities of the services, and the dependencies of one service on another.

The model reveals the information-seeking requirements of users. Interrelated systems such as information-seeking behaviour and subsystems such as electronic and non-electronic services, are graphically represented which means that the data can be shown at various levels of detail, from a higher to a lower level, making them easier to understand. The hierarchical design enables the model to move from the general to the specific and thus, it can be used to gain a clearer picture of user behaviour.

The Wilson model was partly designed to focus on one of the methods chosen by users in the library to seek information and the movements made between options in order to achieve a particular goal. This assumes a distinction between users' decisions to employ a service and their behaviour when actually using the service, even though this distinction is sometimes difficult to make (Heine, et al., 2000).

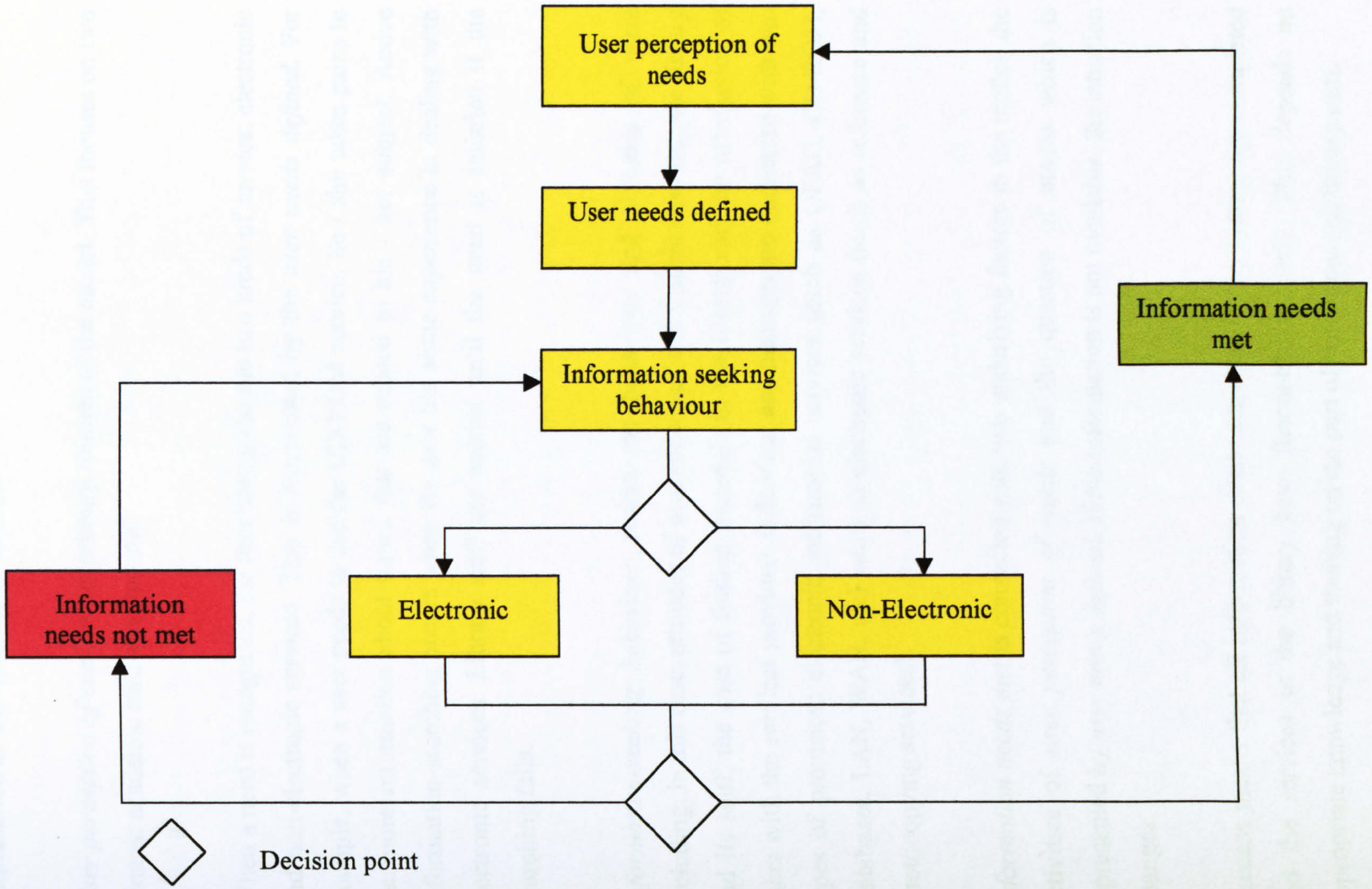
Information need, as pointed out by Wilson, is difficult, perhaps impossible, to model since the concept of need is highly subjective and only present in the mind of the individual concerned. As a result, it is not directly accessible to outside scrutiny but

may be discernible by observing behaviour and making deductions or via reports from the individual him / herself.

Need is, after all, a psychological concept, referring to a state or states of mind and, as such, is highly subjective (Sheffield University, 2001).

The main idea of the information acquisition model is to relate the users to the services provided by the academic library. Thus, cognitive attitudes and reactions of users towards the library are represented. The degree of user-satisfaction with the library services can be investigated using this model. In this model, there is a group of interrelated subsystems, each designed to perform a particular task at one time. Each rectangle represents a component of the system. These are linked by arrows, which show how, and in what direction, information flows through the system.

Figure 3.2: Model of information acqusition



The explanation of this model is as follows: -

1. *User perception of needs* is the primary element of the model. This focuses on two groups: academic staff and students.

2. When a need is recognised, the user may go to use two kinds of service: electronic and non-electronic services. This is represented by the *user needs defined.* For example, when a user needs to use the CD-ROM service, he / she takes pains to get more information about topics that are related to his / her subject. Active information-searching occurs when the user has some experience in dealing with electronic services. Library staff are needed until the need is satisfied if the searching fails.

3. *Information-seeking behaviour* covers the behaviour and attitudes of users including, in this case, attitudes of academic staff and students towards the library and its staff, the ease of finding materials in the library and the satisfaction of users with the services provided. Behaviour and attitudes are connected with two types of provision: electronic information services (such as OPAC, CD-ROM, Databases, LAN, WAN, etc) and non-electronic services (such as reference and photocopying services).

4. *Information needs met* is connected with two underlying factors in the model: the activities of *user perception of needs* and the question of access which is represented by *user needs defined.* If the information is not available, the situation changes.

5. Success means that all information needs activities in the system are completed and the services in the library have functioned properly. This depends on appropriate knowledge and training on the part of both users and library staff.

6. Failure is not due simply to poor system response time or poor system reliability. It may include, for instance, inaccurate information sources, an inadequate number of staff, or user access problems.

3.3.2 University organisation (Model 2)

The second model which was designed for this study, is shown in Figure 3.3. The model is intended to define a cognitive function which can be represented as groups rather than individuals. The ways in which users make use of IT facilities among the various sectors of an organisation and the problems which they encounter need to be understood by the decision-makers in the organisation in order for them to make effective plans to enhance the level of IT in these sectors. They also need to understand the interactions and relationships among the sectors they control and the facilities they provide. The main idea of this dynamic model is to give an indication of interactions with the university administration and how the administration supports the library on the campus which, in this case, represents the formal communications in the system. The model shows how data moves through the organisation, the processes or transformation that the data undergoes, and what the outputs are. The function of the information system is information transfer, which is a result of a dynamic interaction between the four variables (administration, users, library and the computer centre). In order to be successful, this interaction requires the production of an image which is recognisable to all the participants. This means that the model shows graphically the relationships between users and services. As mentioned previously, the university administration plays an important role in decision-making to support and sustain library services; this means that the university administration has complete control over users, libraries, computer centres and services in the university campus. The computer centre is the only institution in the university responsible for establishing and making the connection between users and the library. In addition, it is concerned with software, hardware and networking, as well as the library.

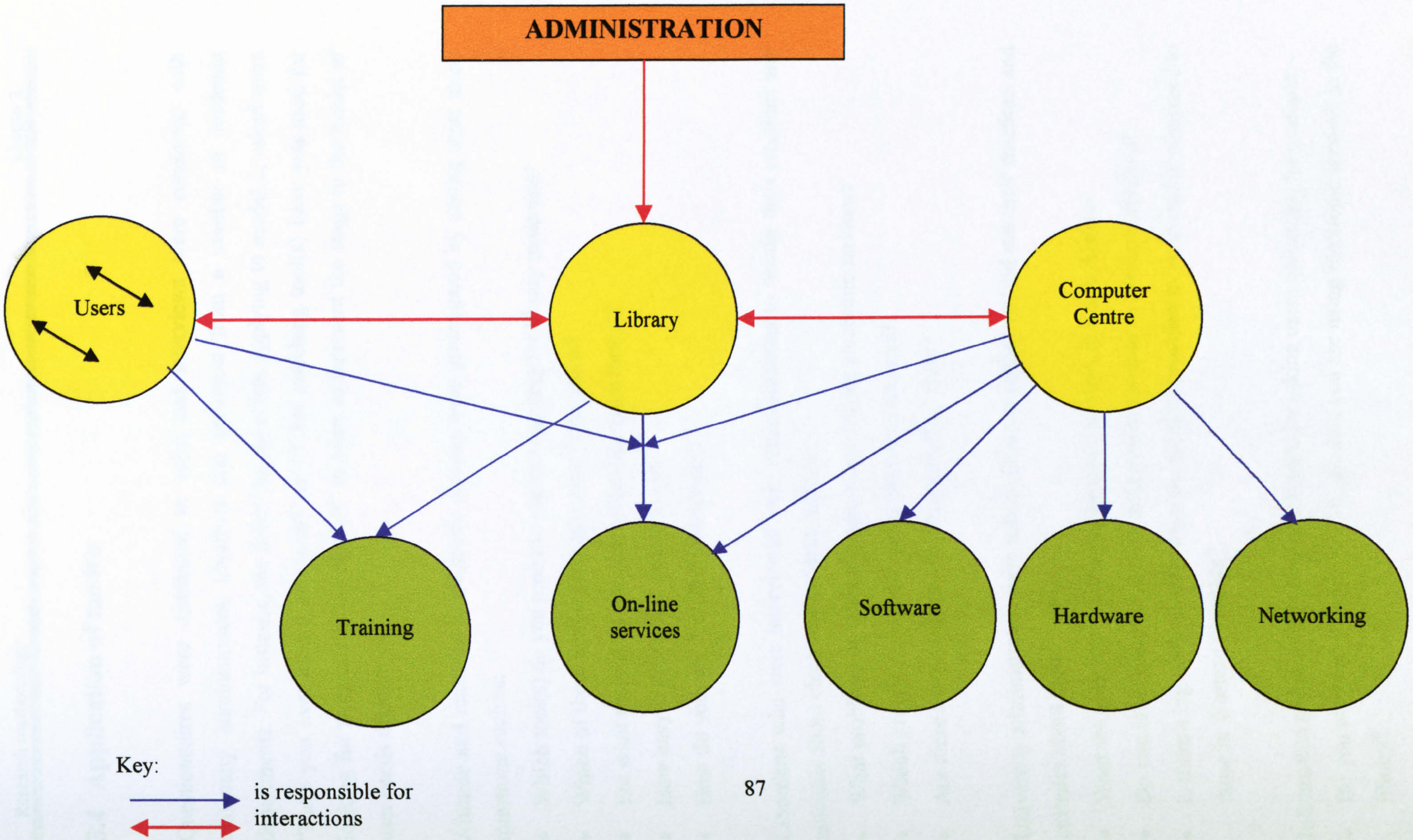
The importance of electronic information systems will increase very rapidly in the next few years. There is a need for long-term planning if the service is to be successful, aiming at an efficient service capable of reaching targeted levels of use. The model in this case, suggests ways of improving electronic services in the policies used in universities to control the system.

Models make it easy to break down the variables of electronic information services into an effective framework. Thus, the set of elements used in these models are:

(i) Organisational activities. (This element concerns electronic information and services provided to users on the university campus.)

(ii) Organisational structure. (This element is used to determine decision-making factors related to the planning of electronic information services and the impact of these electronic services on the communication system between users, the library, and the computer centre.)

Figure 3.3: Model of university organisation



3.4 Application of models

Questionnaires were distributed to users and interviews were conducted with university administrators, librarians and personnel from a number of academic departments. For instance, the following questions, applying to model 2, asked users "Have you ever used a computer?" or "What searching tool(s) have you used for looking for materials in the library?" in order to represent the stage in the model of user needs defined.

Attitude and reactions to electronic services were investigated by asking users many questions such as:

- Which tool(s) do you prefer to use for searching for library materials?
- Which of these tool(s) gives you most information?
- For what reasons do you select this/these main tool(s)?
- How easy is the OPAC system to use?
- How do you rate the CD-ROM service?

Librarians who were interviewed were asked questions to obtain their reactions and attitudes about electronic services, such as: -

- What problems do users encounter in accessing electronic services?
- Which groups make most use of electronic services?
- Are there any problems with library staff IT skills?

University administrators were asked certain questions to find out their reactions and attitudes about their libraries: -

- What are your impressions of electronic services in Saudi Arabia?
- Do you know about electronic information services in Western libraries?
- Is there a big difference between the services provided in your library compared to those in Western countries?

Information needs not met was investigated by asking users questions, for example: -

- Do you ever feel that you need help while you are using electronic services in the library?

- Is there a training programme available in the library for electronic services?
- Do you want further expansion to provide more electronic services?

In order to find out which problems that faced libraries librarians were asked to reflect on information needs not met, in questions such as: -

- Are there problems with funding electronic services?
- What limitations (internal, external) are likely to restrict the future expansion of such services?

Also, university administrators were asked, for example: -

- What is your plan to assist academic staff in dealing with rapidly changing information technology?
- What steps have you provided to help students become familiar with electronic information?

To investigate the information needs not met in the academic departments, heads of departments were interviewed and were asked a number of questions such as: -

- Do you think that the existing IT within the department (hardware, software) is adequate in order to provide a good service to members?
- What electronic services can a user access from your department?
- Do users receive any training on electronic services, or do they teach themselves?

Some objectives of this study will be investigated in this model such as: -

- The difficulties faced by academic staff and students in handling electronic information.
- Users' attitudes and reactions to electronic services.
- How electronic information services, such as OPAC, CD-ROM, databases, and the Internet, are changing in the academic libraries and how libraries are looking at future trends.

Also, certain hypotheses were examined in this model, for example: -

- There is a large discrepancy between the quality of the services offered by the different academic libraries.

- Some groups of users in academic libraries make better use of electronic services than others.
- To compare the range and level of electronic services in the academic libraries of the Kingdom.

Because university organisations (Model 3) play an important role in decision-making and in the support and sustaining of library services, they were asked questions in order to investigate the present IT situation on their university campus. They were also asked how they were developing and enhancing the electronic services on their campuses in general and in the libraries in particular, by using such questions as: -

- What is happening about the current development of the campus network connection with internal and external networks?
- How successful is the library with regard to introducing electronic services?
- Is there any long term planning aimed at enhancing the electronic services on the campus / in the library?

Librarians were asked, what IT services were available in their libraries and how users gained users access to these services easily with questions such as: -

- Which electronic services do you provide?
- Can electronic access to the library be obtained from elsewhere on the campus?
- How do you provide user access to CD-ROM and online databases?

Heads of academic departments were asked to consider the IT facilities which were available in their departments, by asking them certain questions such as: -

- Do you provide stand-alone or networked services for academic staff members?
- Does your department distribute E-mail for all academic staff?
- What kind of IT support do you provide to academic staff?
- How do IT activities in the department relate to the university IT activities?

Some objectives of this study were investigated in this model such as: -

- How, when and why academic libraries evaluate their services.
- To what extent library staff deal with information technology, and to discover whether there is a specific plan to develop their skills.

The organisational model was examined by some of the hypotheses such as: -

- There is a lack of professional librarians and expertise in information technology amongst the librarians.
- There is a lack of funding and user training.

3.5 Methods

There are various types of research methods that can be used for collecting and analysing data, such as experiments, observation, questionnaires, and interviews. The most suitable one for any piece of research is dependent on the research objectives, and the type of data which needs to be collected. In this section, some of the methods which are applicable to this work will be discussed.

3.5.1 Experimental research

In experimental research, the researcher usually concentrates on an independent variable to observe the effect of this consideration on the other variable called the dependent variable. The intention is to eliminate other variables by controlling the background. Experimental research has only limited application in social research because it would involve too many restrictions on human activities, or because the environment is simply not responsive to direct manipulation. Many important variables such as age and position fall into this non-controllable category: in such cases correlations have to be sought (Krausz and Miller, 1978). Clearly, experimentation is not possible in the present study.

3.5.2 Observation

Observation is a technique that is used to study the activities of the participant. There are two main techniques that can be divided into participant observation and non-participant observation. Participant observation, as the name indicates, is when the researcher participates in the environment he/she is observing, whereas in non-participant observation, the researcher remains removed, and watches and records what is going on. The major disadvantage in this method is that it is very time-

consuming. The observer may spend a great deal of time observing irrelevant activities. Without a discussion of motives, observation may only give a superficial impression of the problem. In addition, a full overview of the problem is needed, it may be necessary to increase the number of observers. In such a case the people being observed may behave differently (Moore, 1983). In view of the type of questions that need to be asked for the present project, observation does not seem to be an efficient technique to use.

3.5.3 Questionnaire

"Questionnaires are an information- gathering technique that allow systems analysis to gather attitudes, beliefs, and characteristics from several key people in the organization who may be affected by the current and proposed systems" (Kendall and Kendall, 1992).

Many questionnaire surveys seek to establish a quantitative approach to the research topic and so, almost all questions are entirely factual and, in this case, closed questions will predominate. The advantage of a quantitative approach is that it is possible to measure the reactions of users and in addition, quantitative data are generally easier to analyse.

A qualitative approach is involved in this study side by side with a quantitative approach by using open-ended questions to collect answers to questions such as: Which sort of database(s) would you like to access?

There are many areas which can be investigated:

1) How users use their university library.
2) What sort of electronic information services are preferred by users.
3) What kind of assistants are provided by the library to encourage use of the library.
4) Are users satisfied with the electronic services provided by their library?

Questionnaires remain the principal means used to learn about what is happening in libraries and how people respond. However, it is important to ensure that the questionnaire accomplishes what it sets out to do, i.e. that the data collected are both valid and reliable. In addition, caution must be exercised when making inferences

from the data (Bookstein, 1985). Furthermore, the data collection must be completed within the required time scale. It is not easy to design a good questionnaire, which achieves a high rate of response. It is also necessary to avoid the use of specialised vocabulary as far as possible, giving the definitions where necessary, such as:

Use of OPAC (Online Public Access Catalogue)

How often do you use the OPAC?

- At least once every week ☐ • At least once every month ☐
- At least once every 3 months ☐ • Rarely/Never ☐

The researcher must be sure that all the questions are read and understood by the respondent in the way that was intended. Any ambiguity in a particular question leads to different interpretations by different respondents. Questionnaires are extremely flexible and can be used in any topic to gather information from a large number of users.

3.5.4 Interviews

In interviews, information is gathered from persons who are able to provide research data on the basis of their background. The information may be concerned with their experience, opinions, attitudes, reactions to services, etc. (Busha and Harter, 1980). Through this method, more information is collected at a specific time.

In an interview, certain opinions of the person being interviewed are sought. Opinions are more important because the interviewee knows the organisation better than the interviewer does (Kendall and Kendall, 1992). There are two main types of interview: structured and unstructured. In an unstructured interview the respondent is allowed to talk about what he or she thinks is significant rather than what the interviewer thinks is important. In a structured interview the interviewer ensures that all topics which are considered crucial to the study are covered and no others (Bell, 1987). If the structure of the interview is tightly controlled, the interviewer will gain more factual answers and the bias will be less (Martyn and Lancaster, 1981). In practice, most interviews are somewhere on the continuum between completely unstructured and completely structured. Interviews are both more personal and more interactive than questionnaires and thus a wider range of information can be collected. Their

drawback is that they can very time-consuming, especially if the respondents are widely spread in geographical terms (Kendall and Kendall, 1992).

3.6 Sampling

Having selected the method of data collection to be used, it is necessary to consider next what sampling approach to take. This is considered below.

3.6.1 Case study

The main purpose for using the case study approach is to obtain comprehensive information about the research objects by concentrating on a particular example (Busha & Harter, 1980). It is usually used when the researcher is attempting to understand the problems which exist in an organisation. It can also study one aspect of a problem in some depth within a specified time scale. The major disadvantage of this approach is that it can be a time-consuming process, and so the research may spread over a number of months or years (Bell, 1987). It may be difficult to form generalisations from case studies though they produce more practical and detailed information that may be difficult to obtain otherwise. Some researchers view case studies as one of the less effective methods of data collection and, in extreme cases, they may even be invalid. However, in other circumstances, they may prove invaluable (Losee and Worley, 1993). In the present project, which involves a broad investigation over a limited period of time, a case study approach did not seem appropriate.

3.6.2 Systematic sampling

This is the most frequently used method when the researcher is unfamiliar with a particular sampling frame. He/she will divide it into equal parts and afterwards take different random starts and selection intervals. This method is used to obtain a systematic sample to work out a sampling fraction by dividing the population size by the required sample size. This technique can use, for example, the alphabetical name or address and then systematically select these. The main problem here is in finding the starting point. Another drawback of systematic sampling can occur if there exists a

natural periodicity in the sampled items. For example, if a researcher tries to select every ninth member from a list of staff in an organisation where there are only eight managers, this could result in no managers being included in the sample. Bias will appear when the researcher's technique produces conclusions which are more likely than others. It may occur that the researcher does not realise that a sample is biased and this will affect the nature of a sample or it may be that the researcher is simply unable to compensate for this. In these cases, a real problem arises (Losee and Worley, 1993).

3.6.3 Stratified Sampling

Stratified sampling is a method designed to limit the variables in any given sample by separating the sampling frame into homogeneous strata, (that is, categories which share the same characteristics) and then sampling each of these in turn. This results in a greater degree of certainty by allowing overall the sampling of a wide frame while, at the same time, lessening the number of variables, since in these strata there will be fewer differences than in the sample as a whole. For example, a researcher might divide a sample frame into strata by age or gender or may sub-divide the frame into proportional sub-groups. This method can be used to ensure that specific segments, or significant but relatively small groups, are included in the sample frame. Thus, stratified sampling can deal with variables independently. Clearly, in the present project, stratified sampling seems to be possible. Academic staff were numbered on each questionnaire according to the staff list to be sure who returned questionnaires. At the same time, this facilitated the chasing-up of questionnaires. The most appropriate departments were selected for investigation such as technical services, users services and automation departments in academic libraries, as these usually deal with IT in order to firstly, gain a clear picture of what is going on in these departments and secondly, what IT problems staff faced and thirdly, to find out the experience of staff in this field.

3.7 Participants

In order to obtain more information on the current situation, three groups of participants who are concerned with electronic services in university libraries will be considered for the survey as follows: -

3.7.1 Librarians

These are people who are involved with electronic services in the library and, at the same time, have extensive experience of what is going on, whether with IT or with the services provided by the library.

The questions which might be addressed to them cover many aspects:

1) What is the background of the university library?
2) What sort of electronic information services are provided to users?
3) What is the user attitude towards the electronic information services?
4) What are the difficulties which face both the library and the library staff?
5) How productive is the co-operation between university libraries?
6) What are the future trends regarding electronic information services?

3.7.2 Administration

These are people who are in charge of the universities' strategic planning and who are in charge of the management of finance, staffing and general planning. It means that they are the decision-makers in the universities. Two basic types of questions might be asked:

1) What is the policy planning which may provide good electronic information services to users?
2) How is the university trying to provide effective communication between the library, academic staff and users?

3.7.3 Heads of academic departments

These are people who are responsible for providing and enhancing IT services in their academic departments. Three questions, which might be asked to them, cover the following:

1) What is the general IT background in departments?
2) What kinds of IT policies are used in departments?
3) What kinds of activities are provided for users?

3.8 User methods

Questionnaires and interviews were selected for this study. Their value is that they gather information about past behaviour and experiences, private actions and motives, beliefs and values (Foddy, 1993). Furthermore, questionnaires and interviews can be used in conjunction to complement each other and to acquire a fuller picture of the information required. Questionnaires and interviews are probably the most flexible and generally useful devices for gathering information (Webb, 1967).
The decision to use the interview method was made on the basis that it is the most appropriate way of collecting comprehensive detailed information from a small number of interviewers, whilst the questionnaire method was chosen for collecting information from a large number of respondents.

In order to obtain more accurate data from the sample about all variables of the population, stratified sampling seems to be an appropriate sample approach to use.
Large numbers of questionnaires must be designed to collect data from two groups: academic staff and students. In order to get a perspective of the information provider, comprehensive interviews must be carried out amongst several academic librarians and administrations to investigate problems existing in the university libraries.
Questionnaires will be distributed to a stratified sample of four academic libraries in Saudi Arabia. The universities are King Fahad University for Petroleum and Minerals, King Abdulaziz University, King Saud University and Umm Al-Qura University. These universities were selected largely as mentioned before.

The questionnaires should be easy to complete by asking users a question and requiring them to answer it by choosing between a number of alternatives (Moore, 1983). For example, How often do you use a computer(s)?

- Daily ☐ • At least once a week ☐ • At least once a month ☐
- At least once every 3 months ☐ • Rarely/Never ☐

What searching tool(s) have you used for looking for materials in the library?

- Card catalogue ☐ • OPAC ☐ • CD-ROM ☐
- All of them ☐ • Others ☐ • None ☐

Respondents can look through the whole questionnaire before committing themselves to a response and a pilot study can be conducted to check that nothing has been overlooked.

3.9 Pre-tests (Pilot test)

Before a survey is attempted, it is advisable to conduct pre-test surveys and a pilot in order to pre-empt problems before they occur in the full-scale survey itself. The likely benefits are listed below. An effective pilot survey will have been preceded by a number of preliminary tests and trials and it is considered standard practice to execute these before the full-scale survey is attempted. Specifically, pre-test and pilot surveys can provide useful insight and information on the questionnaires, interviews or issues common to both.

3.9.1 Pre-test questionnaires

The Pre-testing of questionnaires is crucial for the following factors:

- The likely cost and duration of the full- scale survey. If the survey is thought to be too expensive or time- consuming, economics may be planned ahead.
- The effectiveness of the questionnaire itself. Pre-testing should indicate problems that may be linked to the handling of the questionnaire or the responses made to it. For example, ambiguities, misunderstanding and inaccuracies in the questions should be highlighted.

- The codes that will be selected for the full-scale survey. Alternative answers to open questions may be recorded in pre-tests to allow these to be pre-coded in the final survey. This increases the efficiency of the organisation and communication between the work being done in the field and that in the "central office".

There were some slight modifications to the original questionnaire after collecting these questionnaires from participants such as:

Do you think the number of CD-ROM workstations in the library is sufficient for the number of users?

Yes ☐ No ☐

Is there a training programme available in the library for electronic services?

Yes ☐ No ☐

The participants gave suggestions as the following:

Do you think the number of CD-ROM workstations in the library is sufficient for the number of users?

Yes ☐ No ☐ I do not know ☐

Is there a training programme available in the library for electronic services?

Yes ☐ No ☐ I do not know ☐

3.9.2 Pre-test interviews

The pre-testing of interviews tries to identify questions that were hard to read as written or that were hard for respondents to understand. The following information will be kept in mind when carrying out the pre-testing interviews:

- The variables within the population to be studied.
- How well the interviewers themselves handle the questionnaire. The interview schedule will consist of a number of specific questions to obtain qualified answers whether via probing or prompting by open-ended questions. Furthermore, interviews depend on interaction between the interviewee and interviewer while questionnaires depend on distribution. The pre-tests and pilot study can be used as part of the interviewers' training.

All interviews questions were be tested by participants identified that all questions are cleared to read as written and thus there was no changing in these questions.

3.9.3 Common features

There are some benefits of using pre-tests on both questionnaires and interviews these are that it is possible to discover: -

- Whether the sampling frame which has been chosen adequately reflects the selected population.
- The likely non- response rate. Possible ways of reducing this can then be considered for the full- scale survey.
- Whether the method selected for the data collection is efficient.

Although a pilot will not necessarily highlight all the problems of the major survey, it almost always results in improvements and therefore contributes significantly to the overall efficiency of the process (Moser and Kalton, 1971).

The researcher cannot verify that all responses are accurate and so he/she cannot change anything in the questionnaire after it has been distributed.

In order to test and polish the questionnaires, a pilot study was conducted in Saudi Arabia in November and December 1998. The questionnaire was distributed to 10 academic staff in four universities in the realm, which are King Fahad University for Petroleum and Minerals, King Saud University, King Abdulaziz University and Umm-Alqura University. The pilot sample was selected on the following criteria:

1) Highly qualified users of electronic information services.
2) Extensive users of electronic information services.
3) When approached, the user indicated a high interest in participating in this pilot study. However, some participants may have felt that the questionnaire was easy to answer, while others may have felt that the questionnaire was too difficult to complete.

3.10 Conduct of survey

1,977 questionnaires were distributed and 60 people were selected to be interviewed to give the real picture of what is going on in the university libraries in Saudi Arabia and to fit with the objectives of the study. The procedures for data collection were as follows:

3.10.1 Questionnaire distribution

The questionnaires were distributed in 1999. (See Appendix I.) 2373 questionnaires were sent out to four universities in Saudi Arabia, with an overall response rate of 83%. This response subdivided into 42% from academic staff and 58% from students. Each university distributed 600 questionnaires. The total of 600 questionnaires were divided into 300 questionnaires for academic staff and 300 questionnaires for students.

For academic staff

The questionnaires were distributed for academic staff as follows:

- Questionnaires were distributed on the first occasion to four departments in each faculty on the basis of 15 questionnaires for each department.
- A staff list was obtained from the secretary of the departments to tick off which academic staff had been selected.
- Academic staff were numbered on each questionnaire according to the staff list to be sure who returned questionnaires. At the same time, this facilitated the chasing-up of questionnaires.
- A reminder letter was sent to respondents who had not replied after two weeks and a second questionnaire was enclosed.

Some questionnaires were translated into Arabic because some academic staff did not know English. They had their degrees in other languages such as Arabic, French, German, etc. Questionnaires were distributed and collected by hand. The reason for this was because of the problems posed by other forms of distribution and the fact that most respondents do not return questionnaires if they are not collected individually. This entailed a great deal of travelling between universities and departments in order to collect questionnaires through personal contact. In confirmation of this, the response rate of questionnaires which were distributed and collected from secretaries on the first occasion was very poor. In fact, the response rate in some departments reached only 10%.

On the second occasion of distribution, this researcher went personally to each academic staff office to remind them to complete the questionnaires and return them to the department's secretary. It was necessary to go to each one once, twice and even three times to remind them to complete the questionnaires and return them personally. This actually increased the response rate in the end.

For students

A different method of distributing the questionnaires to students was used. Questionnaires for chosen students were distributed as follows:

- A student list was obtained from the secretary of the departments to tick off which students had been selected.
- It was arranged with the students to return the questionnaires to the department's secretary or personally to the researcher in a prearranged place inside each department.
- 300 questionnaires were distributed for all students by year. Each student was asked which stage he had reached before the questionnaire was given for the response.
- The total number of distributed questionnaires was recorded, together with the number sent to individual faculties. It was important to know how many had been distributed and how many had been collected.
- Questionnaires were distributed to four departments for each faculty on the basis of 15 questionnaires for each department.
- On the first occasion, the distribution of questionnaires in all departments took place in the library to students who were actually using it.
- On the second occasion, questionnaires were distributed to students in departments who might not use the library.

3.10.2 In-depth interview

The interviews were set up on the same basis as the questionnaires in order to gain a picture of the present situation and the needs of the universities in Saudi Arabia. The interview process was developed in 1999 in order to cover management and

automation. The rationale behind this was to look at the related questions of how electronic information services are used and how these services can be utilised to improve electronic information services on the university campus.

Interview questions (see Appendix II) were devised for librarians who were in charge of the libraries and directors of libraries who might not be library professionals but are responsible for management aspects of the libraries. The deans of the libraries usually appoint the directors.

Librarians' interview

Librarians' interview questions covered six aspects of the library:

- Background questions
- Electronic information services
- User attitudes
- Productive co-operation with other libraries
- Difficulties
- Future trends

Administration

Questions were asked of administrative officers in the universities. These are people who are in charge of the university's strategic planning and also general planning in the campuses; they are also in charge of the management of finance. The following issues (Appendix III) were covered:

- The existence of electronic information services and the university's policy regarding their purchase and funding.
- Internal and external networks.
- Future planning with regard to the use of electronic information services.

Heads of departments

Questions were put to two heads of departments in each university (Appendix IV) to discover:

- The general information which was available within departments regarding electronic services such as networking, E-mail, etc.
- Financial resource policies and the policies regarding equipment (software, hardware).
- User activities in the departments (E-mail, Internet, etc.) and the training provided by department for students.

3.11 Conclusion

This chapter has considered the research methodology on which the thesis is based. In order to fulfil the primary aim of the study, which was to investigate the strengths and weakness of the IT services in academic libraries in Saudi Arabia and to propose developments for such services, two models were used in order to direct the design of both the questionnaires and interviews.

The first model, an information acquisition model, was based on Wilson (1981), while the second, an organisational model, was based on Wyllys, Heseltine, Branin and Finn. These models were used in the design of the questionnaire which was distributed to the range of users at the academic libraries and in the interviews which were conducted with university administrations, heads of academic departments and library personnel. The rationale behind the choice of questionnaires and interviews as research tools was firstly, to ensure that all questions which were answered applied to the objectives and hypotheses of the study and secondly, to ensure that all respondents' answers would apply to the two models which were chosen to analyse them. It was also necessary to make sure that these were applicable to Saudi academic libraries.

Finally, at the end of the chapter the organisation of the pilot tests and the actual surveys were explained.

Chapter 4

Results of the questionnaires

4.1 Introduction

This chapter presents the results of the survey into the use of electronic information services in Saudi Arabian universities, as derived from the questionnaires collected. The purpose of the survey was firstly, to find out how the academic staff and students in the Saudi universities deal with electronic services which are provided by libraries.

The questionnaires were designed to allow the respondents to answer by simply ticking "yes" or "no" for some questions, in others to tick appropriate box (es) or by responding to open-ended questions by adding comments. The data were entered on a personal computer using SPSS. The square test was used for all variables that will be investigated. Respondents were asked to respond to six topics. The first involved use of the university library. The second concerned the use of OPAC in the library. The third looked at how the respondents used CD-ROMs in their libraries while the fourth concerned the use of the Internet whether in or outside the library. The fifth asked what electronic resources were available in the library and the sixth asked respondents to give their opinions about the training and electronic services in their libraries and their assessments about their libraries compared with other university libraries. This chapter consists of the responses to these questions, together with a statistical analysis of their significance.

In total, 2372 questionnaires were sent, and 1977 questionnaires were returned.
This gives a satisfactory overall response rate of 83%. The response rate from each university is shown in Table 4.1.

Table 4.1: the percentage of response rate from each university

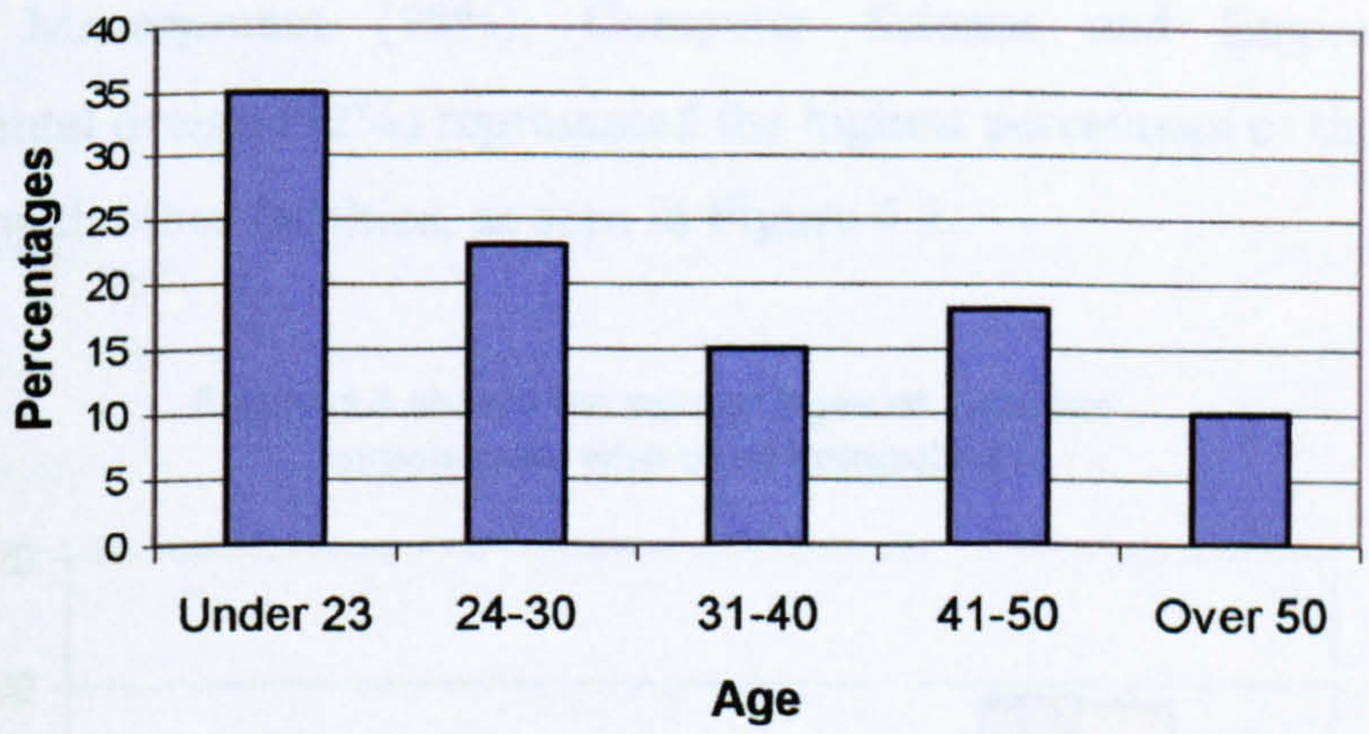
University name	No. issued	No. returned	% returned
UQU	600	461	77
KAU	600	508	85
KSU	600	498	83
KFUPM	572	510	89

4.2 Background variables

4.2.1 Age

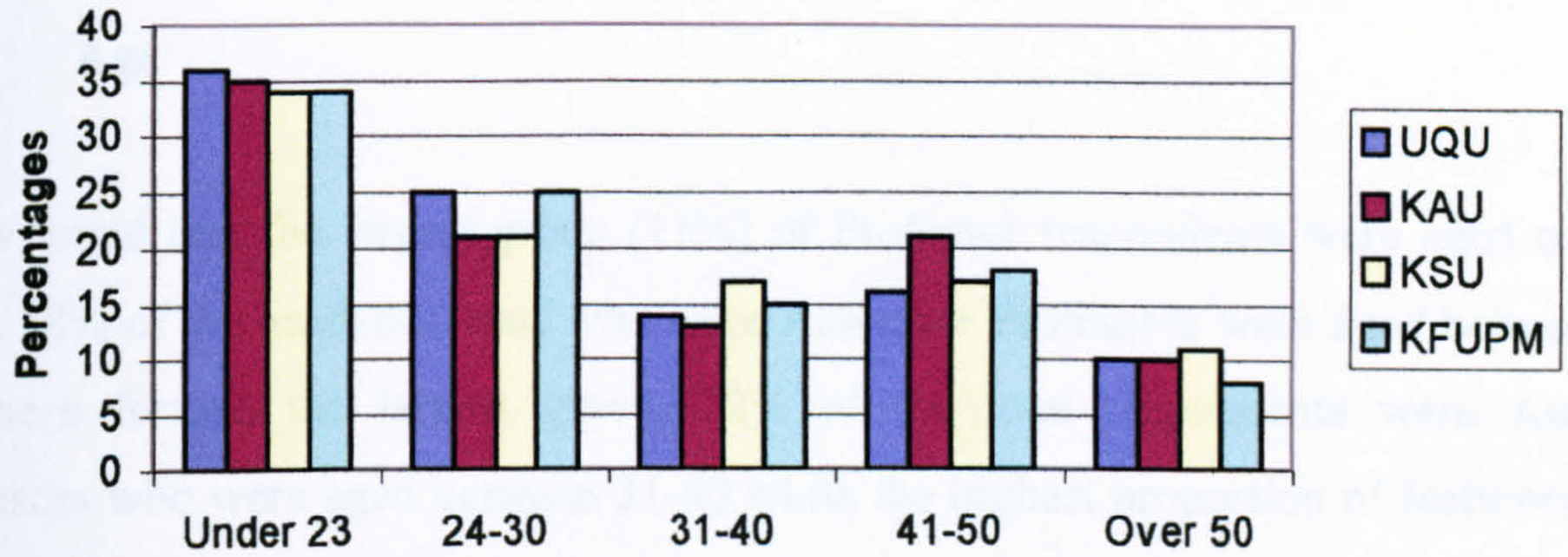
The majority of the total number of respondents (35%, N=1977) were aged under 23 years while 10% were aged over 51 years, as shown in Figure 4.1

Figure 4.1: age of respondents



Respondents at UQU (36%, N= 461) who were less than 23 years of age were of the greatest proportion compared to other universities, while in KAU (21%, N=508) those aged between 41-50 years formed the largest group. It was found that those over 51 at KFUPM comprised the smallest group (8%) compared to those from UQU, KAU and KSU. Figure 4.2 shows the percentages for each age group in universities.

Figure 4.2: the percentage of ages in universities

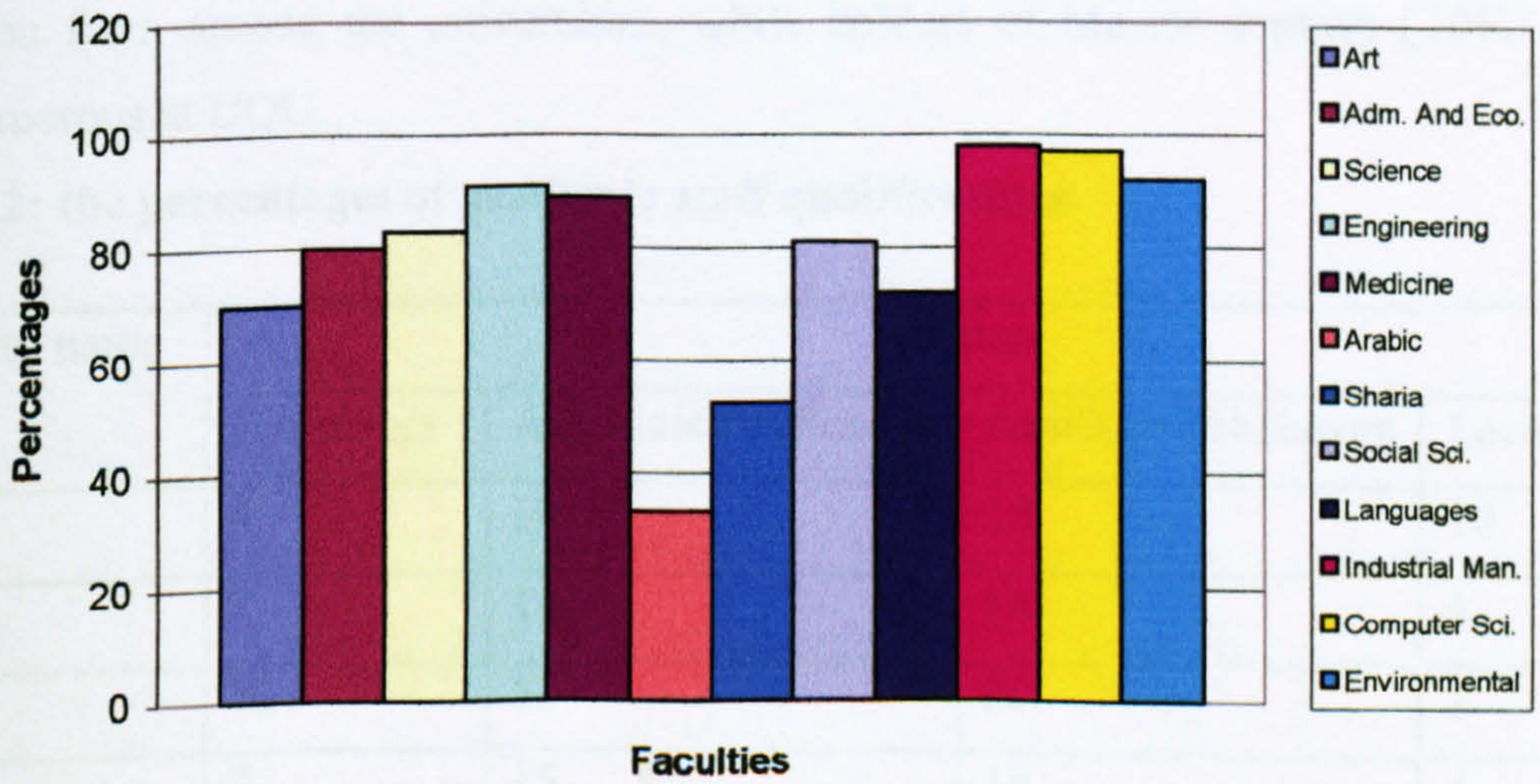


4.2.2 Faculties

Respondents from Humanities and Social Science faculties used computers less than respondents from Science faculties. It was found that 70% of the Art faculty used computers while 80% of the respondents from Administration and Economics used computers. Respondents from Arabic (33%) and Sharia (52%) faculties represented the lower percentages among all the faculties for using computers.

Respondents from Science faculties such as Engineering (91%), Medicine (89%), Industrial Management (98%), Computer Science and Engineering (97%) and Environmental design (92%) represented the highest percentage of those using computers compared with other faculties, as seen in Figure 4.3.

Figure 4.3 shows the percentages of faculties` respondents who used computers



4.3 Academic staff

4.3.1 Age

It was found that the largest group (11%) of Professor respondents were aged over 50 years. 18% of the academic staff who were Associate Professors were aged between 41-50; these formed the largest group. 22% of the total respondents were Assistant Professors who were aged between 31-40 while the highest proportion of lecturers (4%) was aged between 31-40.

4.3.2 Qualifications

Before considering the qualifications of academic staff, it is necessary to point out that the hierarchy of qualifications in Saudi Arabian universities is somewhat different from that in UK universities. In Saudi universities, Professors are at the top of the academic hierarchy, followed by Associate Professors, Assistant Professors and then Lecturers.
The results from the questionnaire showed that 38% of the academic staff respondents had a PhD and only 5% held a Master's degree. The data showed that Professors represented 7.5% and Associate Professors represented 13% while Assistant Professors (17%) were more numerous than other posts. From Table 4.2 it was seen that KSU had the highest percentage of Professors (12%) while KAU had the highest percentage of Associate Professors (15%). Assistant Professors at KSU (20%) were the highest proportion from among the universities, while holders of Master degrees (10%) were more numerous at UQU.

Table 4.2: the percentages of academic staff qualifications

University name	Position			
	Professors	Associate Professors	Assistant Professors	Lecturers
UQU	4	10	18	10
KAU	7	15	16	4
KSU	12	13	20	1
KFUPM	7	15	16	4

The survey showed that the older the respondents, the higher the qualifications they held. ($P < 0.01$, N=1977).

4.4 Student Status

It was found that from the total number of respondents, 56% were undergraduate students while only 1.9% were postgraduate students. Around 58% (N=510) of the KFUPM students were undergraduates which was the highest proportion within the universities, while 3.3% (N=508) represented the highest proportion of postgraduates at KAU who had an MA or MSc.

4.5 Use of computers

The results show that the majority of the respondents (81%) indicated yes when they were asked to specify if they had used a computer before, while only 19% had not used computers. On the one hand, 96% of the respondents at KFUPM indicated that they used computers, while on the other, only 25% of the respondents at KSU indicated that they had not used computers before. It appears that KFUPM encourages its academic staff and students to use the computer more than other universities. This will be discussed further in the conclusion of this chapter. The statistics showed significant differences between the age of the respondents and the use of computers. It was found that the younger the respondent, the more the computer was used, while the older the respondent, the less the use.

In this study, respondents were asked how long they had been using a computer. The results indicated that 79% had used a computer from one year to more than five years while the rest (21%) indicated that they had used computers for less than one year. The survey revealed that there is a relationship between respondents who had already used a computer and age. It was found that respondents who were younger than 23 years of age had used computers for less than one year. The respondents between 41-50 years had used computers for more than five years. ($P < 0.01$, N=1977).

Respondents, when asked how often they used a computer, indicated that 41% used a computer daily. 36% indicated they used a computer at least once a week, while 17% indicated they used a computer at least once a month. 41% (N= 461) at UQU used a computer at least once a week and 13% used a computer rarely. The table below shows the percentage of respondents who used a computer for each institution.

Table 4.3: the percentage of respondents who used a computer for each institution.

University name	How often do you use a computer?				
	Daily	At least once a week	At least once a month	At least once every 3 months	Rarely
UQU	22	41	15	9	13
KAU	34	35	19	5	7
KSU	34	41	13	7	5
KFUPM	65	30	3	1	1

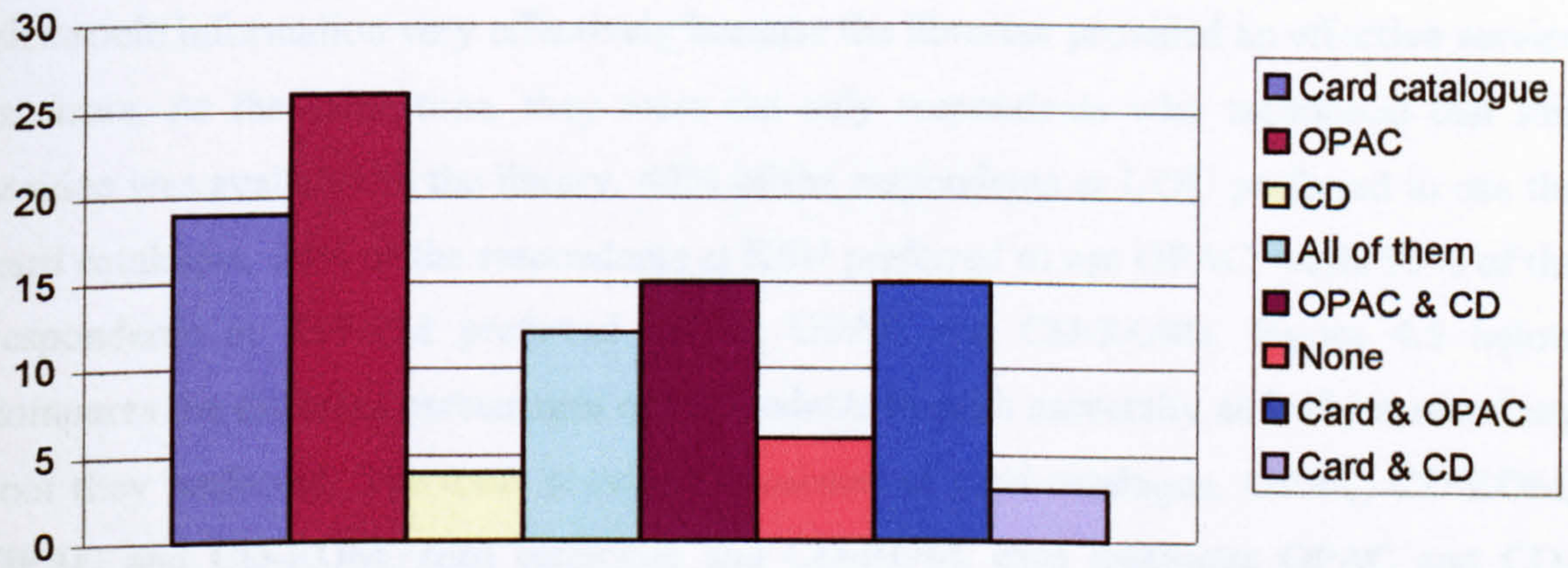
4.6 Use of the library

Respondents were asked about how often they used the library. 37% indicated that they used the library at least once a week, while most of them (53%) indicated that they used the library once a month or at least once every three months. The results indicated that 8% at KAU respondents used the library daily. 79% at KFUPM indicated that they used the library at least once a week or once a month. 36% at UQU indicated that they used the library at least once every three months or rarely. This high proportion of respondents who did not use the library was probably due to the fact that electronic information services were still not available in the library. In fact, at that time, only about 20% of the total collection of the library was computerized. In addition, from interviews which were conducted in this library (this will be discussed further in the following chapter) it was found that a shortage of funding and staff was considered to be one of the problems that faced the library and resulted in it not providing useful services to users. Respondents

who used CD-ROM databases at UQU used this tool in the Institution of Research at UQU or through other universities or institutions in the Kingdom.

When respondents to this research questionnaire were asked what searching tool(s) they had used for looking for materials in the library, 19% indicated that they used the card catalogue, while 4% used CD-ROMs. The majority of the respondents (26%) used OPAC. Figure 4.4 below shows the percentage of different searching tools used for looking for materials in the library.

Figure 4.4: percentages of different searching tool(s) used for looking for materials

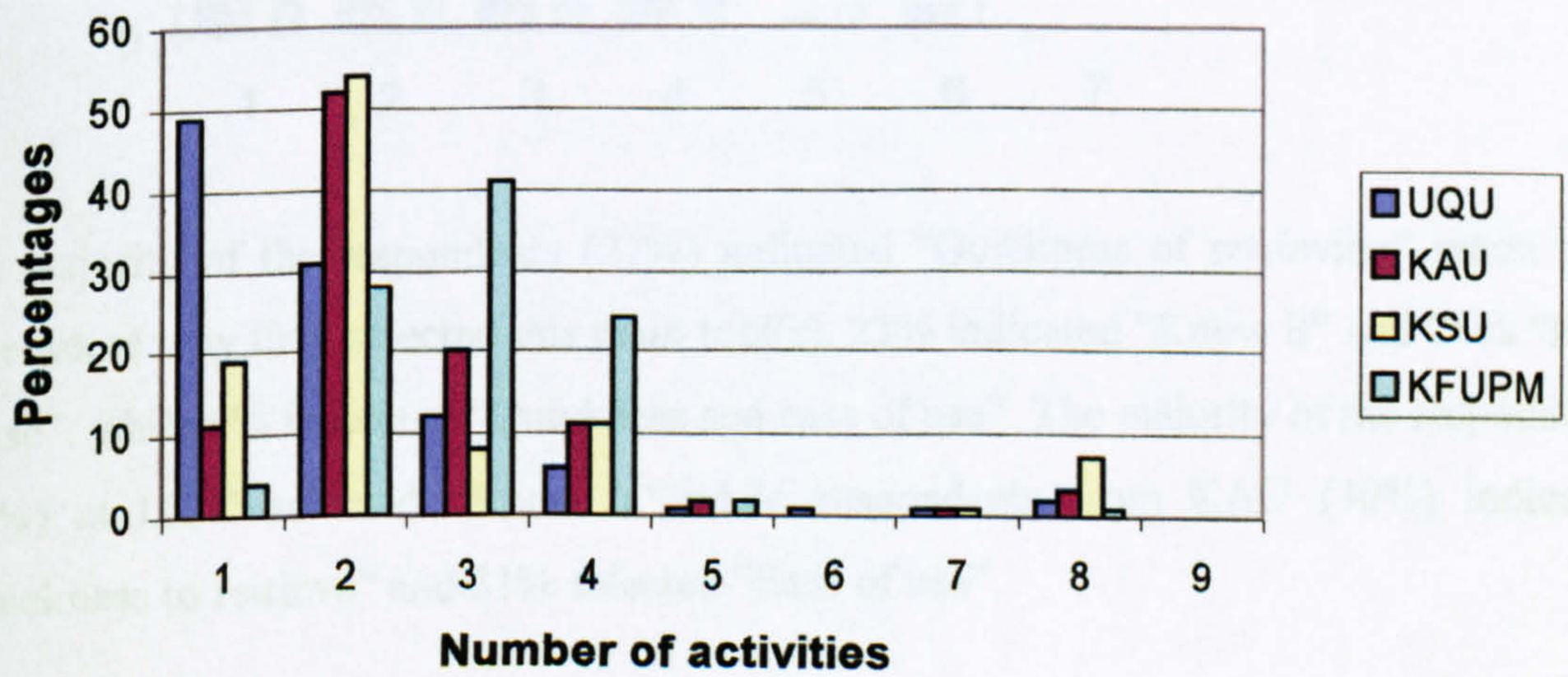


44% of the respondents at UQU indicated that they used the card catalogue when searching for materials in the library. In addition, they indicated that 35% used the card catalogue and OPAC. This means that the majority (78%) of the respondents at the university used the card catalogue because there was no complete tool to search in the library except the card catalogue. The library has just started to implement an OPAC and only 20% of the total collection of the library is computerized, and for this reason, most of the respondents at UQU preferred to use the card catalogue. The majority of respondents at KAU (45%) indicated that they used OPAC while 89% of the respondents at KFUPM used OPAC and CD-ROMs.

The data showed that there is a relationship between the respondents who used materials in the library and age. It was found that respondents who were under 23 years of age used the card catalogue and OPAC more than other tools. The respondents who were aged between 31-40 years used OPAC and CD-ROMs more than other tools, while respondents who were aged over 51 years used the card catalogue more than other tools. ($P < 0.017$, N=1977).

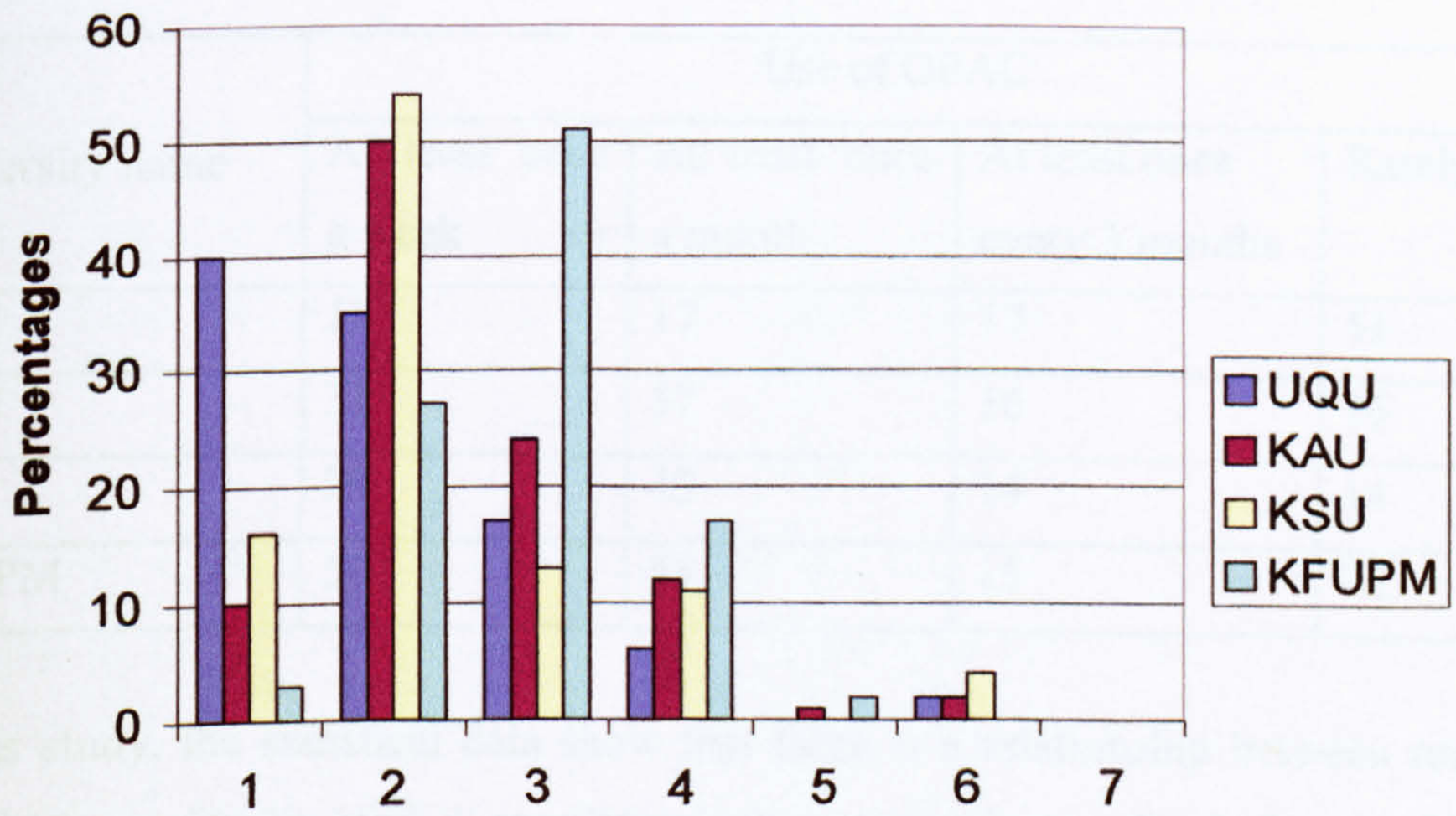
When the respondents were asked what searching tools they preferred, they indicated that 41% preferred to use OPAC, 20% preferred to use CD-ROMs, 20% preferred the card catalogue while 13% preferred to use OPAC and CD-ROMs. Only less than 1% of the respondents at KAU preferred to ask a librarian. This is because they did not use the electronic information very effectively because the librarian provided an effective service to users. At the same time, they were the only respondents who mentioned that this service was available in the library. 49% of the respondents at UQU preferred to use the card catalogue. 54% of the respondents at KSU preferred to use OPAC, while 93% of the respondents at KFUPM preferred to use OPAC and CD-ROMs. Figure 4.5 below compares the different percentages of respondents in each university and which searching tool they preferred. The tools provided consisted of card catalogue, OPAC, CD-ROM, OPAC and CD-ROM, card catalogue and CD-ROM, card catalogue OPAC and CD-ROM, self search, card catalogue and OPAC and ask librarian, numbered 1 to 9 respectively in Figure 4.5.

Figure 4.5: university respondents: searching tools they prefer



In this research, respondents were asked to indicate which tool(s) gave them most information. Results show that the majority of respondents (42%) indicated the OPAC. 27% of the respondents indicated CD-ROM. 16% indicated the card catalogue while 12% said OPAC and CD-ROM. At KFUPM, more than half of the respondents (51%) indicated CD-ROM was the only tool which gave them most information while respondents highest proportion (40%) at UQU indicated the card catalogue. It is likely that this is because most respondents cannot evaluate other tools which are provided in other university libraries because they do not use them. The majority at KSU (54%) and KAU (50%) indicated that OPAC was the tool which gave them most information. The tools provided consisted of card catalogue, OPAC, CD-ROM, OPAC and CD-ROM, card catalogue and CD-ROM, card catalogue and OPAC and ask librarian, numbered 1 to 7 respectively in Figure 4.6.

Figure 4.6 shows the percentage of tools which give most information



The majority of the respondents (27%) indicated "Quickness of retrieving" when they were asked why they selected this main tool(s). 23% indicated "Know it" and 25% "Ease of use", while 9% indicated "Quickness and ease of use". The majority of the respondents (38%) at UQU selected "Know it" while respondents from KAU (30%) indicated "Quickness to retrieve" and 31% selected "Ease of use".

4.7 Use of OPAC

Respondents were asked to indicate their usage of OPAC. The results show that most of the respondents (63%) used the OPAC at least once a week or at least once a month, while only 16% used the OPAC at least once every 3 months. 21% of the respondents used the OPAC rarely or never. Table 4.4 indicates that 31% of the respondents at KAU used the OPAC at least once a week. The majority of the respondents (43%) at KSU and KFUPM used the OPAC at least once a month. Most of the respondents (68%) at UQU used the OPAC at least once every 3 months, rarely, or never, due to a shortage of information in the system. In addition, respondents were still not familiar with OPAC because the system had only been installed for a short time.

Table 4.4: percentage of respondents who used OPAC

University name	Use of OPAC			
	At least once a week	At least once a month	At least once every 3 months	Rarely / Never
UQU	15	17	17	51
KAU	31	37	16	16
KSU	29	43	14	14
KFUPM	30	43	15	12

In this study, the statistical data show that there is a relationship between respondents who had previously used a computer versus respondents who had used OPAC and respondents who said they had more experience in using a computer. It was found that respondents who had used a computer before and had more experience in using a computer, used OPAC more frequently than respondents who said they had not used a computer before. ($P < 0.01$, $N=1977$).

When respondents were asked about the amount of information on available the OPAC, 16% indicated there was too much information on the OPAC. Most respondents (74%) indicated that it was acceptable, while 10% indicated there was too little information. Table 4.5 shows how the respondents rated the amount of information on the OPAC in each university.

Table 4.5: percentage of amount of information on OPAC

University name	The amount of information on OPAC		
	Too much	Acceptable	Too little
UQU	28	52	20
KAU	15	77	8
KSU	14	81	5
KFUPM	9	80	11

Respondents at KFUPM (9%) indicated that information which was contained on OPAC was too much. Most of the respondents (81%) at KSU indicated that it was acceptable while 20% of the respondents at UQU indicated there was too little information on the OPAC.

The survey revealed that 38% of the respondents said that the OPAC system which was available in the library was easy to use. 57% indicated it was fairly easy while only 5% indicated that it was difficult to use. The statistics showed a relationship between the use of the OPAC versus respondents who had used a computer before and respondents who said they had more experience in using a computer. The data show that respondents who had used a computer before could evaluate the OPAC more easily than respondents who said they had not used a computer before. In addition, respondents who had less experience in using a computer, found it more difficult when using OPAC. ($P < 0.01$, $N=1977$).

The final question in this section of the research survey concerned the OPAC and obtained respondents' satisfaction about the number of OPAC terminals in the library. 41% of the respondents indicated they thought that the number of OPAC terminals was sufficient to prevent delay when they attempted to access them, while 59% indicated there were not enough terminals. Most of the respondents (56%) at KAU were satisfied with the number of OPAC terminals which were available in the library, as shown in Table 4.6, while the respondents from other universities were not satisfied with the number of OPAC terminals and thus, they were demanding the provision of more terminals in their libraries.

Table 4.6: percentage of respondents versus terminals in the library

University name	Are there sufficient terminals in the library?	
	Yes	No
UQU	37	63
KAU	56	44
KSU	35	65
KFUPM	36	64

4.8 Use of CD-ROMs

The sample was first asked whether they used CD-ROMs. 37% of the total number had used CD-ROMs while 63% had not used them. 81% of the respondents at KFUPM used CD-ROMs while only 10% of the respondents at UQU had used CD-ROMs, as shown in Table 4.7.

Table 4.7: the percentage using CD-ROMs in each university

University name	Use of CD-ROM	
	Yes	NO
UQU	10	90
KAU	33	67
KSU	20	80
KFUPM	81	19

As seen from Table 4.7, the majority of the respondents at KSU and KAU had not previously used CD-ROMs because these universities did not permit undergraduate students to use this service or because many undergraduates have poor language skills in English. The high proportion of respondents using CD-ROMs in KFUPM is because KFUPM encourages the whole university community to use this service. In contrast, KAU and KSU do not use this method. As previously mentioned, UQU had not yet provided this service in the library but respondents could use it in the university Institution of Research or other university libraries or institutions. The results show that there is a relationship between the use of CD-ROMs by respondents and their positions. It was found that Assistant Professors used CD-ROMs more than other positions. ($P<0.01$, $N=1977$).

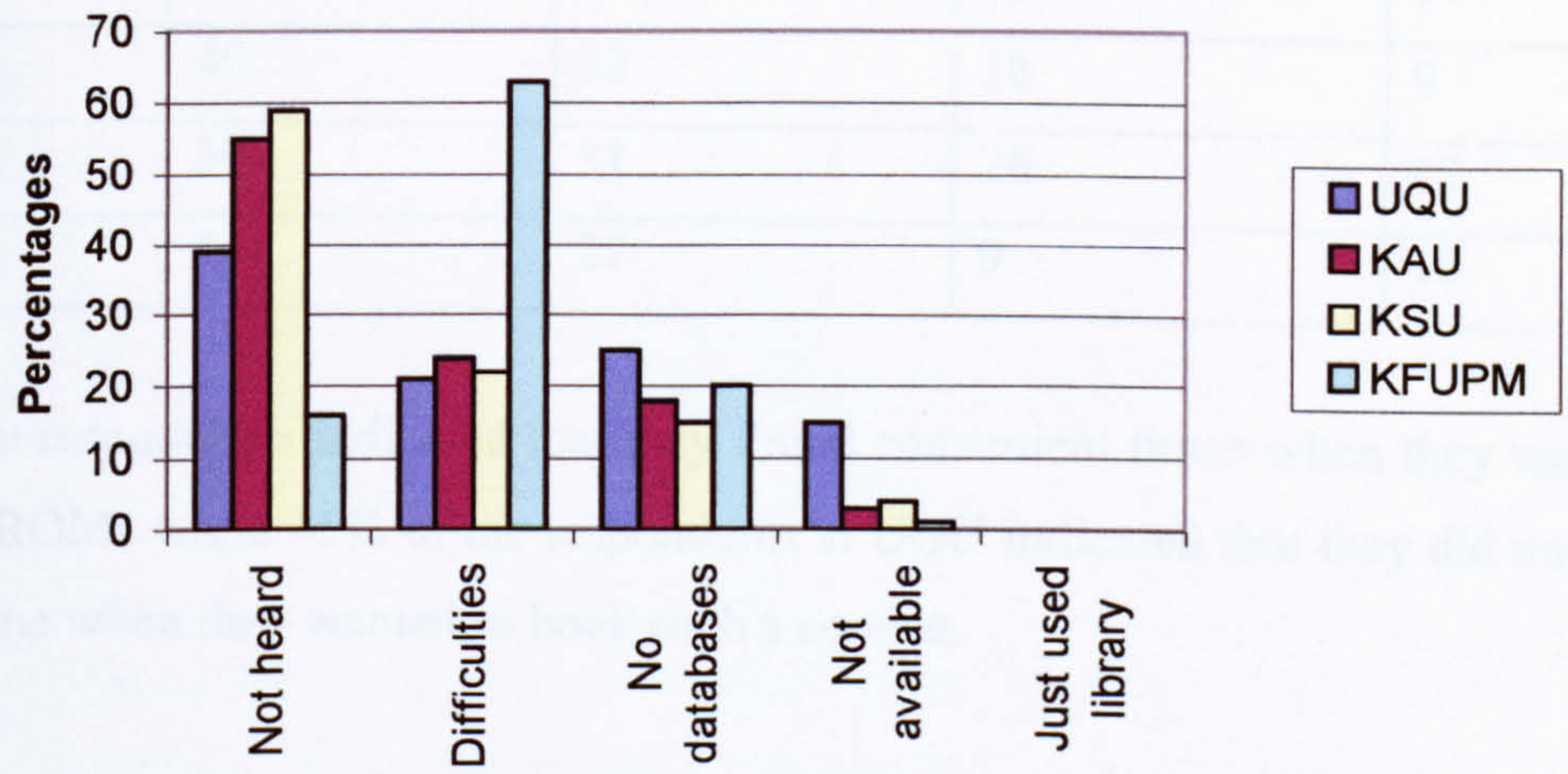
Respondents were asked to indicate why they did not use CD-ROMs. The data show that 48% of the total number indicated that they had not heard about this service. 26% indicated that there were difficulties in using CD-ROMs. 19% said there were no databases in their fields. 7% of the respondents indicated that they had just started using the library because they had just graduated from outside the Kingdom or they had just joined the university.

From Figure 4.7, it was seen that most of the respondents at KSU (59%) indicated that they had not heard about this service while 63% of the respondents at KFUPM indicated that it was too difficult to use this tool. 40% of the respondents at UQU indicated that

there were no databases in their fields and also that this service was not available in their library.

Figure 4.7 shows the percentage of respondents and their reasons for not using CD-ROMs.

Figure 4.7: percentage of respondents and their reasons for not using CD-ROMs



Respondents then were asked how often they used CD-ROMs. 47% of the respondents used CD-ROMs at least once a month. 28% used CD-ROMs at least once every 3 months. 14% used CD-ROMs at least once every 6 months while 11% used CD-ROMs rarely or never. As seen in Table 4.8, most of the respondents (47) 47% at UQU used CD-ROMs at least once a month. 33% of the respondents at KAU used CD-ROMs at least once every 3 months. 26% of the respondents at KSU used CD-ROMs at least once every 6 months while 17% of the respondents at UQU used CD-ROMs rarely or never.

Table 4.8: the percentage of respondents and how often they used CD-ROMs.

University name	How often do you use CD-ROMs?			
	At least once every month	At least once every 3 months	At least once every 6 months	Rarely / Never
UQU	47	17	19	17
KAU	40	33	18	9
KSU	30	31	26	13
KFUPM	45	27	9	10

71% of the respondents indicated that they found convenient times when they wanted to book CD-ROMs while 45% of the respondents at UQU indicated that they did not find a suitable time when they wanted to book such a service.

Table 4.9: The percentage of respondents who found a convenient time when they wanted to book CD-ROMs

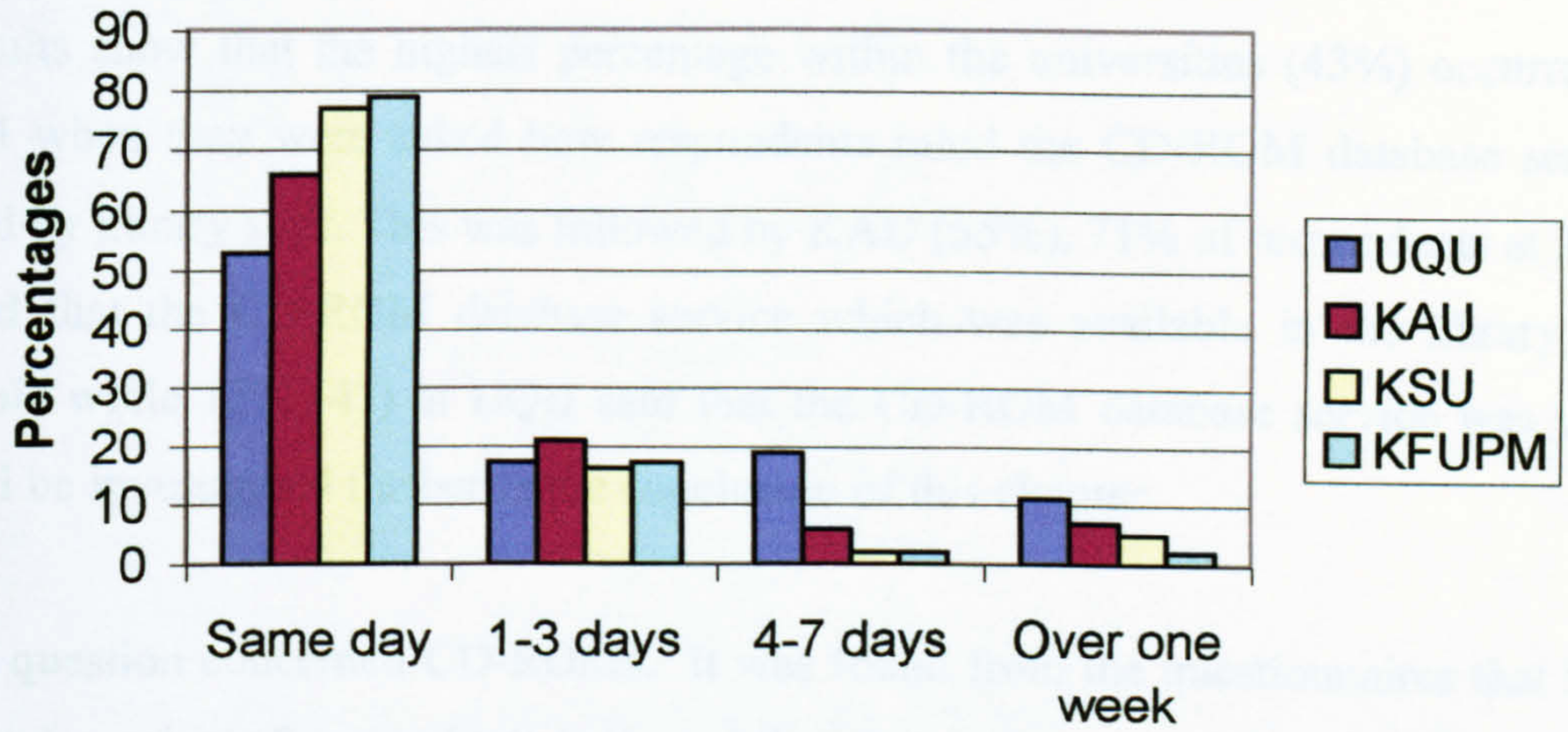
University name	Did you always find a convenient time when you wanted to book CD-ROMs?	
	Yes	No
UQU	55	45
KAU	78	22
KSU	75	25
KFUPM	69	31

The survey showed that most respondents (74%) indicated that they had to wait to consult a CD-ROM on the same day. 18% indicated that they waited from 1 to 3 days while 4% revealed that they waited from 4-7 days and over one week.

As shown in Figure 4.8, most of the respondents at KFUPM (79%) were able to consult the CD-ROMs on the same day. Respondents at KAU (21%) indicated that they waited to

consult the CD-ROMs from 1 to 3 days while 30% of the respondents at UQU had to wait for CD-ROMs for at least 4- 7 days and over one week.

Figure 4.8 shows respondent percentages of time to consult a CD-ROM



When respondents were asked if the number of CD-ROM workstations in the library was sufficient for the number of users, 64% of respondents said that they were insufficient. Most of the respondents at KAU (56%) were satisfied with the number of CD-ROM workstations which were available in the library while 75% of the respondents at UQU were dissatisfied with the number of CD-ROM workstations in the library, as shown in Table 4.10.

Table 4.10: the percentage of respondents who were satisfied with the number of workstations in the library

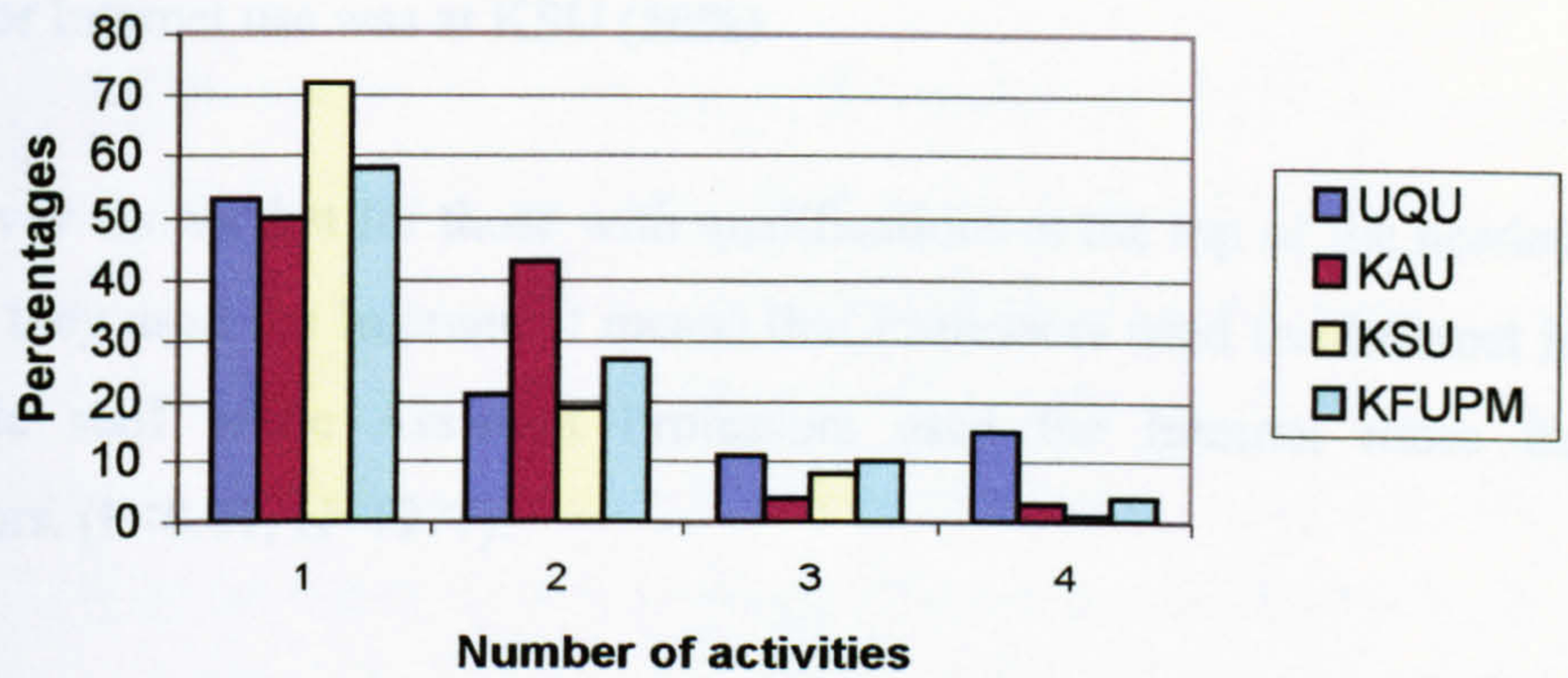
University name	Do you think the number of CD-ROM workstations in the library is sufficient for the number of users?	
	Yes	No
UQU	25	75
KAU	56	44
KSU	38	62
KFUPM	30	70

It was found that the majority of respondents (54%) rated the CD-ROM service in the library acceptable, while only 37% of the respondents rated the CD-ROMs as a good library service.

The results show that the highest percentage within the universities (43%) occurred in KFUPM when they were asked how respondents rated the CD-ROM database service provided by library staff. This was followed by KAU (35%). 71% of respondents at KAU indicated that the CD-ROM database service which was available in the library was acceptable while 13% (47) at UQU said that the CD-ROM database service was poor. This will be investigated further in the conclusion of this chapter.

The last question concerned CD-ROMs. It was found from the questionnaires that 58% of the total number of respondents indicated that there were several CD-ROM databases relevant to their topics. 30% indicated that help was available from the library staff when they used this tool. 9% of the respondents indicated that they did not find any CD-ROM databases relevant to their topics while only 4% indicated that help was not available from the library staff. As shown in Figure 4.9, 72% of the respondents at KSU indicated that there were several CD-ROM databases relevant to their topics. The highest percentage within the universities (43%) appeared when the respondents at KAU indicated that help was available from the library staff when they used this service while 15% of the respondents at UQU indicated that help was not available. Also, 11% of the respondents at UQU indicated that they did not find any CD-ROM databases relevant to their topics. Because this service is not available in the university library, it might be that UQU respondents evaluated the Institute of Research which contained this service or evaluated other libraries in the Kingdom. The reasons provided consisted of there are several CD-ROMs relevant to users' topics, help is available from library staff, users did not find any CD-ROMs relevant to their topics and help is not available from library staff, numbered 1 to 4 respectively in Figure 4.9.

Figure 4.9: the percentages of respondents` most important reasons for using CD-ROM



4.9 Use of Internet

Before considering the use of the Internet in all university libraries, it is necessary to point out that the Internet did not exist in any university libraries in the Kingdom in the period when the questionnaires were distributed. KFUPM library started to provide this service to users by establishing the Faculty Online Search Lab which gives faculty staff access to all local digital resources and to the Internet. This has happened in the last week before the questionnaires were selected.

The first question was put to respondents to know if they had used the Internet or not. 55% of the total indicated that they had used the Internet while the rest of the respondents (45%) did not use the Internet.

From Table 4.11, it can be seen that 42% of the study sample at KAU had used the Internet while 37% at UQU also used it, despite the fact that UQU is regarded as one of the best equipped universities in the Kingdom which has an Internet infrastructure and such facilities as Fibre Optic cable. This is because the computers are not well distributed throughout the university. This will be considered later in the chapter which deals with the results of interviews, when this matter was discussed with administration personnel and heads of academic departments in universities. The highest proportion among the

universities for using the Internet appeared at KFUPM (82%) while the second largest group for Internet use was at KSU (56%).

The survey shows that for those with qualifications at the top of the academic hierarchy, the less they used the Internet. It means that Professors used the Internet less than other academic staff while Assistant Professors used the Internet more than Associate Professors. ($P<0.01$, $N=1977$).

Table 4.11: the percentages of respondents who used the Internet

University name	Use of the Internet	
	Yes	No
UQU	37	63
KAU	42	58
KSU	56	44
KFUPM	82	18

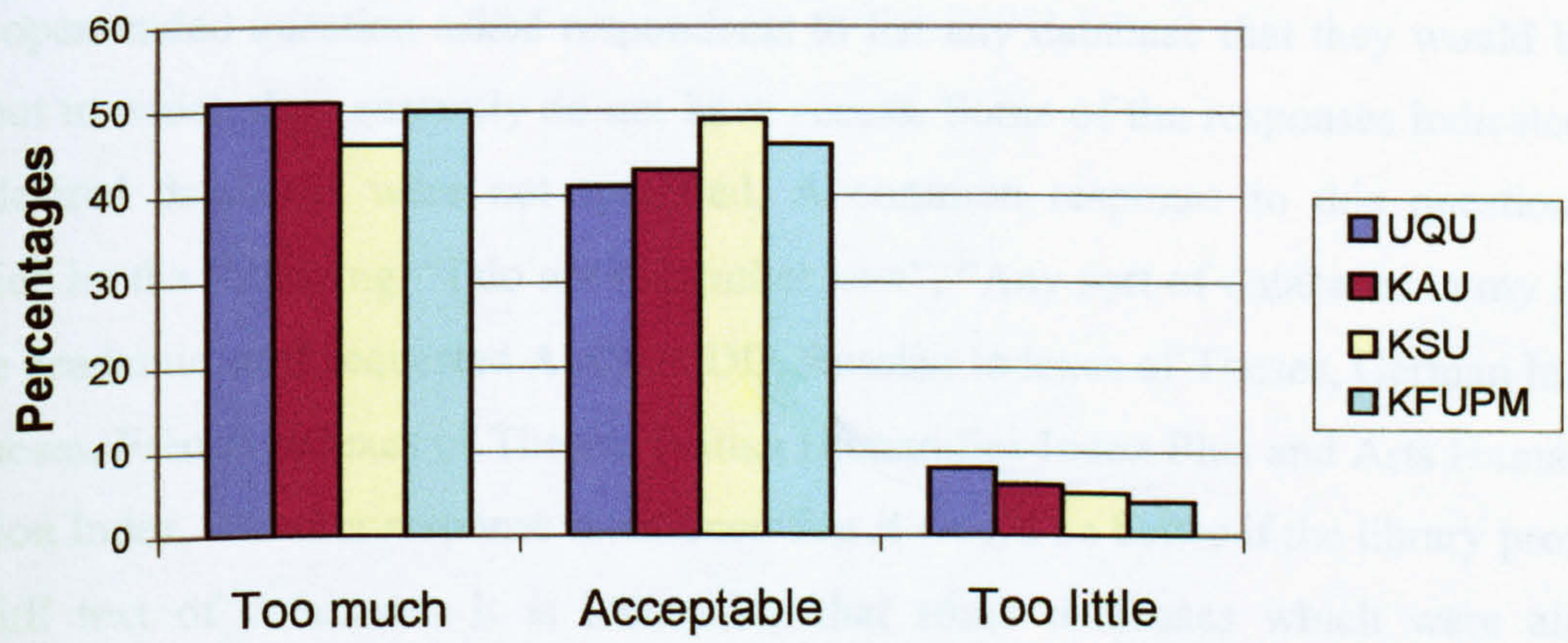
When the respondents were asked where they had used the Internet, most (97%) indicated that they used the Internet elsewhere rather than in the library. The intention behind this question was to discover if this service was available in the library or not. 100% of the respondents at KFUPM and KSU indicated that the Internet service was not available in their library while 98% at KAU indicated that the Internet was still not available in the library. 16% of the sample (170) at UQU indicated that the Internet service was available in their library.

The overwhelming majority of the total number of respondents (98%) believed that the Internet was useful when they accessed it. This suggests that this service is becoming indispensable in libraries and thus the provision of this service is important in order to provide prompt access to useful information. 100% of the respondents at KSU confirmed that they found the Internet useful when they used it, while 99% of the respondents at

KAU and KFUPM confirmed this. 91% of the sample (170) at UQU confirmed that they found the Internet useful when they accessed it.

It appears that the lowest rating among the universities was at UQU (8%) when they were asked to rate the Internet. They indicated that the information which they obtained was too little while 51% of the respondents at KAU indicated that the information which they got from the Internet was too much. These results suggest that respondents at UQU rated the information in the Internet as too little because they had little experience of using the Internet or they did not know how to access different sources for their topics. 49% of the respondents at KSU indicated that the information which they obtained from the Internet was acceptable, as seen from Figure 4.10.

Figure 4.10: the percentages of respondents and their rating of the Internet



4.10 Electronic sources of information

80% of the respondents were satisfied with the databases which were available in the libraries when they were asked if there were any databases they were unable to access through the library that they would like to access. 22% of the sample at UQU indicated that they would like to access other databases while most of the respondents at KSU, KAU and KFUPM (82%, 81%, 79% respectively) did not wish to access any database because they felt that the databases which were available in their libraries satisfied their needs.

Table 4.12: the percentage of respondents who said they would like access to databases.

University name	Is there any sort of database you cannot access through the library that you would like to access?	
	Yes	No
UQU	78	22
KAU	81	19
KSU	82	18
KFUPM	79	21

One open-ended question asked respondents to list any database that they would like to use but to which they currently do not have access. Some of the responses indicated that the desired databases were not specified. A common response to this question was typified by the following: "I do not remember now", "Any sort of databases in my field". Some academic staff requested AMS, ICDD, Russian Indexes of Theses, German Indexes of Theses, French Indexes of Theses, British Humanities Index Plus and Arts Humanities Citation Index. Another response mentioned that it would be better if the library provided the full text of databases. It is interesting that some databases which were already available appeared as desired items, such as GEOREF and Dissertation Abstracts. The findings seem to confirm a lack of knowledge about current services and resources which the libraries provide to users. So, libraries in this case should inform users by providing brochures, an awareness day, especially at the beginning of each term, and by short training courses.

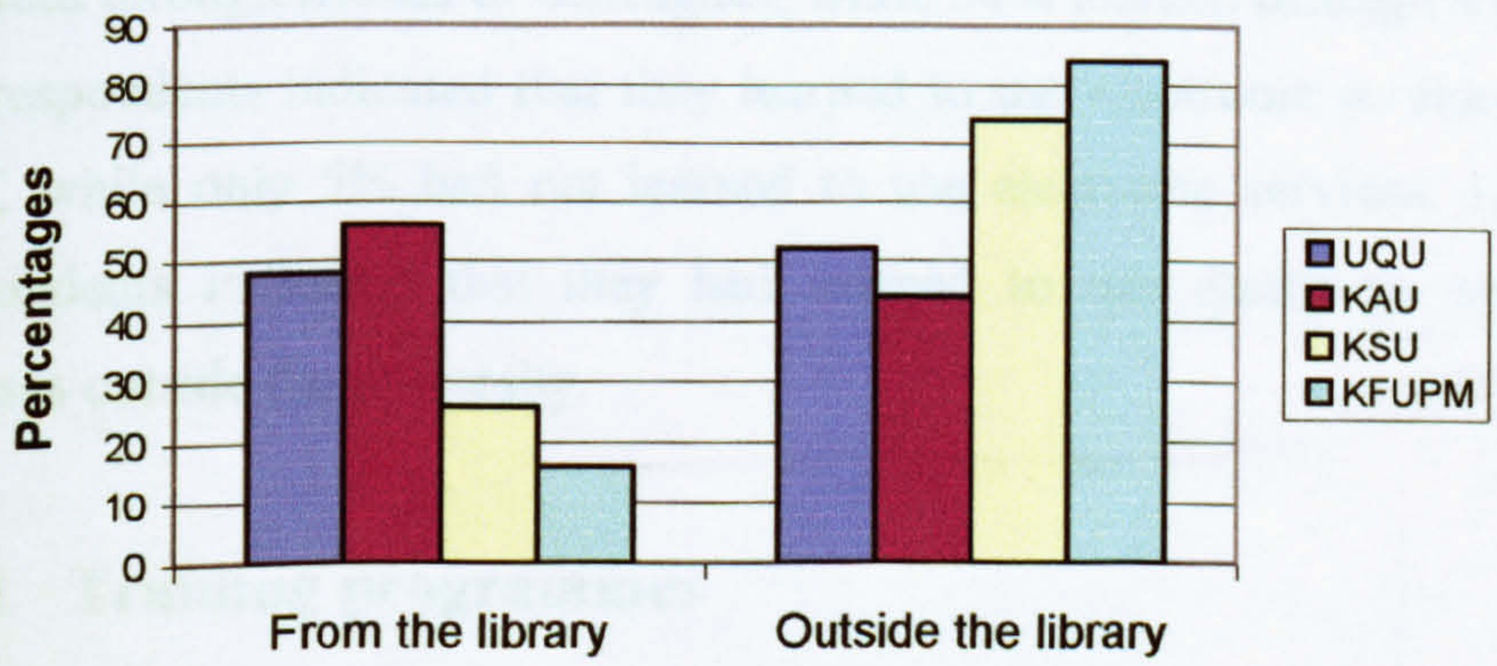
When the respondents were asked if they had accessed KACST, only 16% of the total number indicated that they had done this. 12% of the respondents at UQU had accessed KACST which represented the lowest proportion among universities, while 23% of the respondents at KAU represented the highest proportion who said they had accessed KACST, as shown in Table 4.13.

Table 4.13: the percentage of respondents who had accessed through KACST

University name	Do you access through KACST?	
	Yes	No
UQU	12	88
KAU	23	77
KSU	14	86
KFUPM	14	86

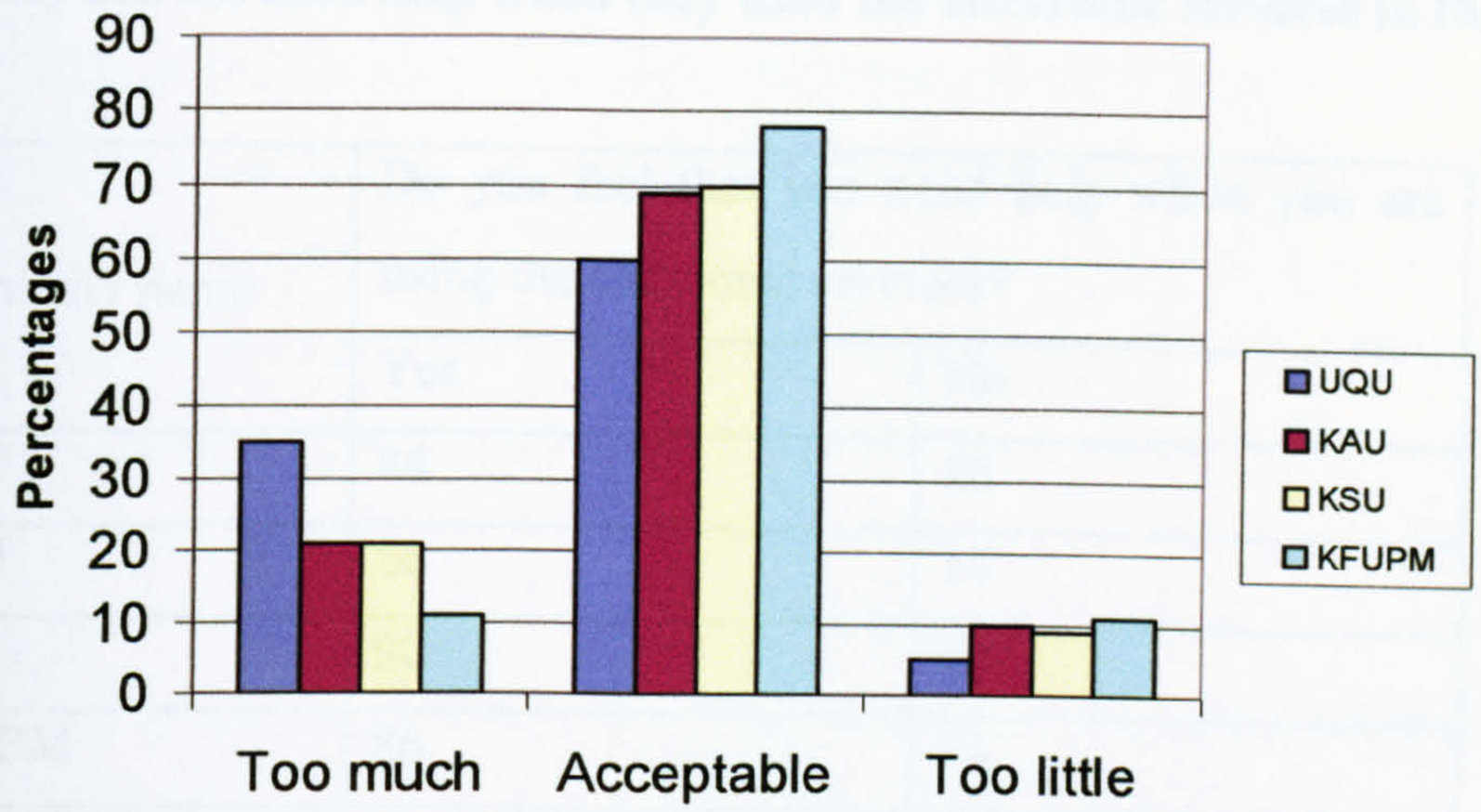
Most of the respondents (66%) indicated that they had accessed KACST from outside the library while 34% of them accessed KACST from the library. As shown in Figure 4.11, 56% of the respondents at KAU had accessed KACST from the library. This means that most of the study sample knew that this service was available in the library as this service was advertised by library staff. 26% at KSU had accessed KACST from the library, while 84% at KFUPM had accessed it from outside the library.

Figure 4.11: Percentage of respondents who had accessed KACST



22% of the respondents indicated that the amount of information from KACST was too much while most (70%) indicated that the information which they obtained from KACST was acceptable. Only 9% of the respondents indicated that the information which they got was too little. It was seen from Figure 4.12, that 35% of the respondents at UQU indicated that the information which they got from KACST was too much. 78% of the responses from KFUPM indicated that the information which they obtained from KACST

Figure 4.12: percentage of respondents and their rating of KACST



was acceptable while only 5% at UQU indicated that the information which they got from KACST was too little.

The majority of the total sample (42%) indicated that they learned to use electronic services through friends or colleagues, while 34% learned through trial and error. 19% of the respondents indicated that they learned to use electronic services assisted by library staff, while only 5% had not learned to use electronic services. Less than 1% of the respondents indicated that they had learned to use electronic services by attending courses outside the university.

4.11 Training programmes

Most of the respondents (87%) revealed that they needed help while they were using the electronic services in the library. So in such cases, libraries should extend their support to clients by providing several training methods to encourage them to use the services available in their libraries. Most of the respondents at KSU (90%) needed help when they used the electronic services in the library, while 16% of the respondents at UQU indicated that they did not need help while using such services.

Table 4.14 shows the percentages of respondents who felt that they needed help or felt that they did not need help when they used the electronic services in the library.

University name	Do you feel that you need help while you are using the electronic services?	
	Yes	No
UQU	84	16
KAU	86	14
KSU	90	10
KFUPM	86	14

The majority of respondents (67%) indicated that there were no training programmes in their libraries while 15% indicated that they did not know whether or not there was a training programme provided by the library. This proportion represents the highest among university libraries, while only 8% of the respondents at KSU indicated that there was a training programme available in the library. At the same time, 19% of the respondents at KSU indicated that they did not know if a training programme was available or not in the library, as shown in Table 4.15.

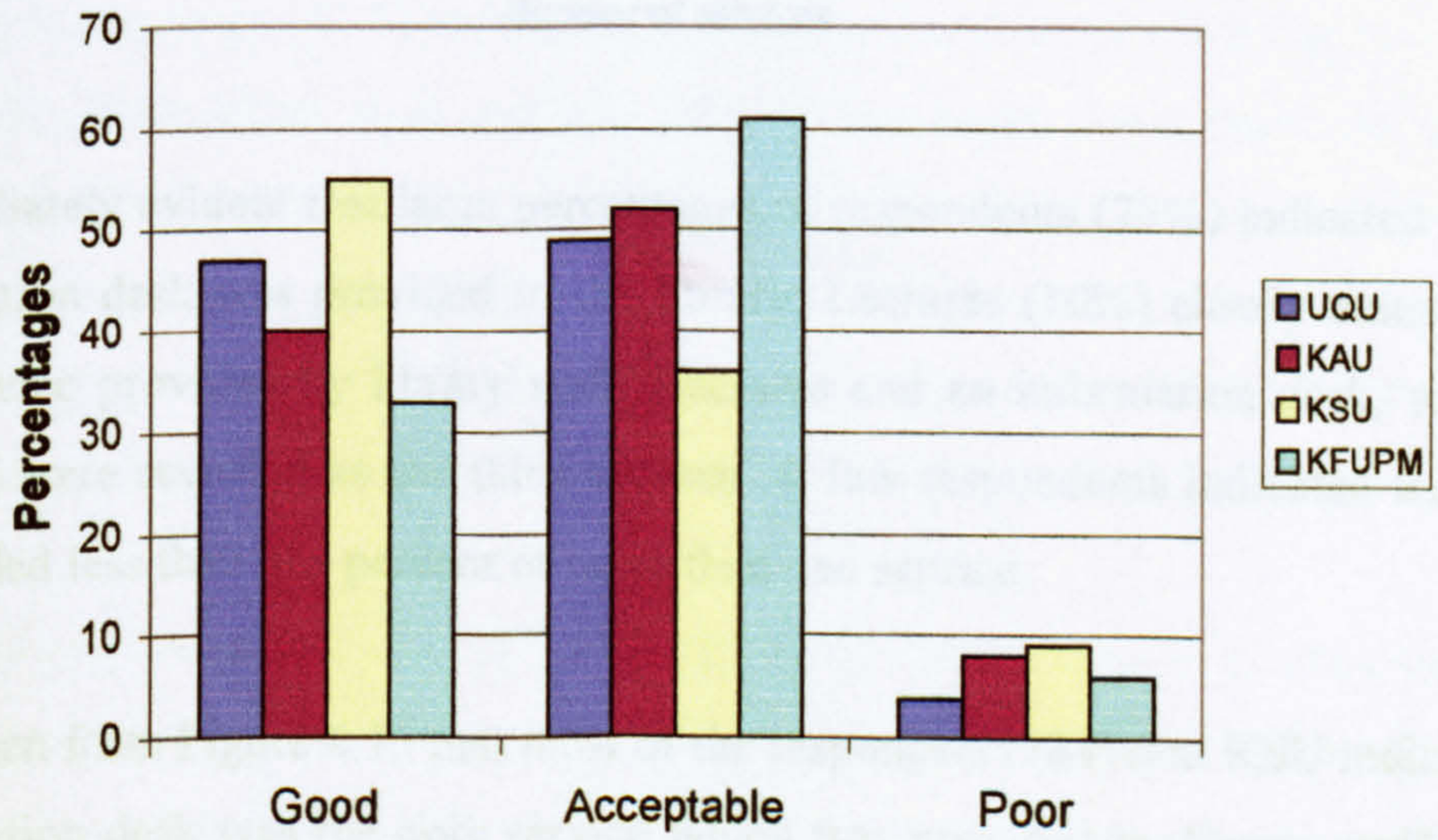
Table 4.15: percentage of respondents who indicated if there is a training programme in the library.

University name	Is there a training programme available in the library for electronic services?		
	Yes	No	I do not know
UQU	18	69	13
KAU	14	67	19
KSU	8	73	19
KFUPM	30	59	11

94% of the total number of respondents (1850) indicated that they did not attend any training programme from the library to help them use their electronic services. Only 6% of the respondents (127) indicated that they attended a training programme organised by the library. 10% of the sample (46) at UQU indicated that they attended a library training programme. This proportion represents the highest among the universities. 9% from the respondents (47) at KFUPM, only 4% from the 25 responses at KSU and 2% out of 11 at KAU indicated that they attended training programmes in their libraries. These responses would seem to suggest that libraries did not made much effort to teach users to use information more effectively.

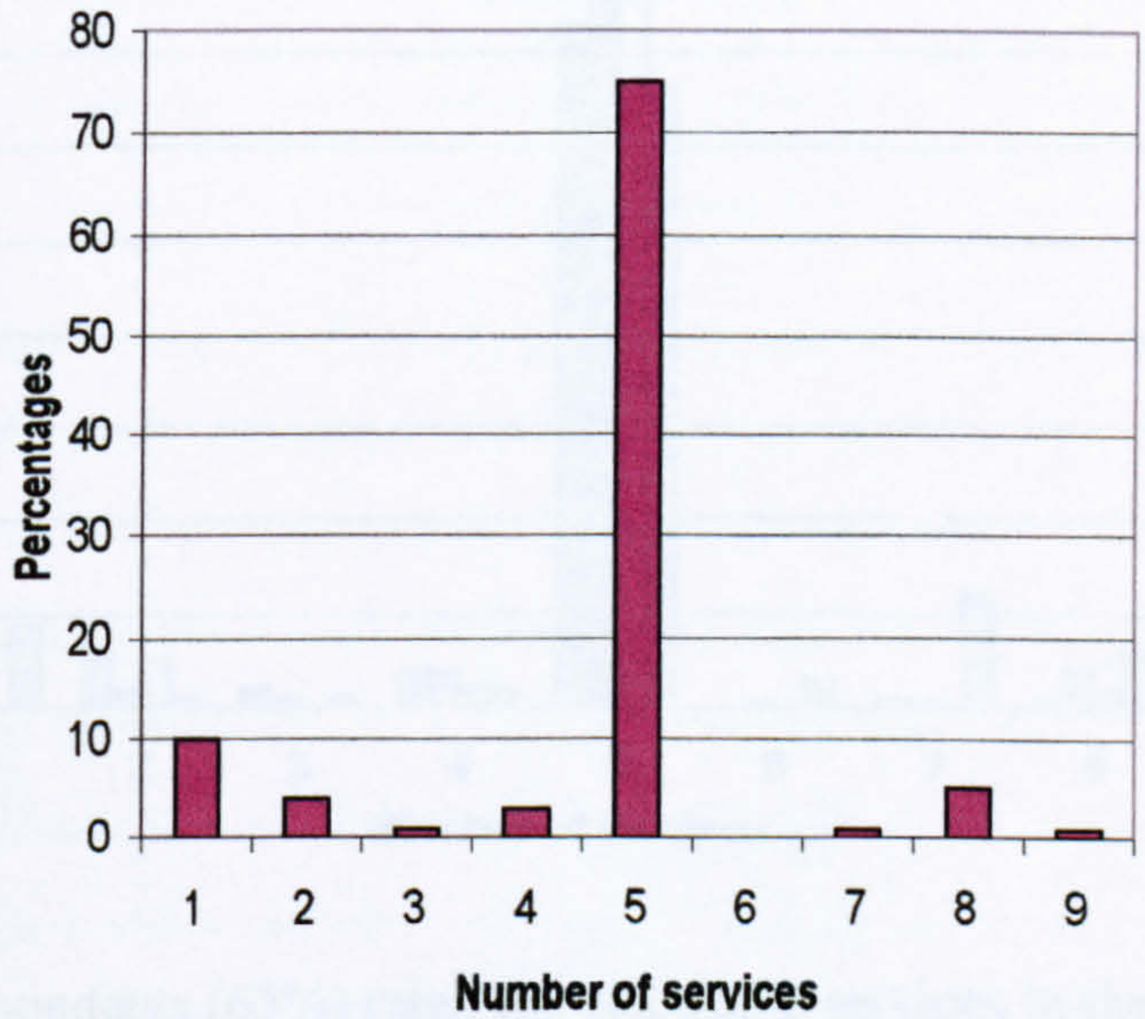
More than half of the respondents (53%) indicated that the training programme which was available in the library was acceptable, 41% indicated that it was good while only 6% indicated it as poor. As seen from Figure 4.13, most of the respondents (55%) at KSU assessed the training programme which was provided by the library as good. 61% of the respondents at KFUPM assessed the training programme as acceptable while only 4% of the respondents at UQU assessed the training programme as poor.

Figure 4.13: percentage of respondents who assessed the training programme in the library



Respondents were given a list of nine kinds of assistance which were provided by library staff. Also, they were asked to indicate if more than one service was provided by library staff. The nine kinds of assistance were lecture, workshop, tutorial on a floppy disk, E-mail, information desk, while the rest of services were mixed, such as E-mail and information desk, lecture and information desk, and workshop and information desk. These services are numbered one to eight respectively in Figure 4.14. Only 3 respondents said that they did not have any idea which represented less than 1% (service 9). Figure 4.14 provides the percentages of respondents indicating which service(s) was provided by library staff.

Figure 4.14: percentages of assistance which library staff provided

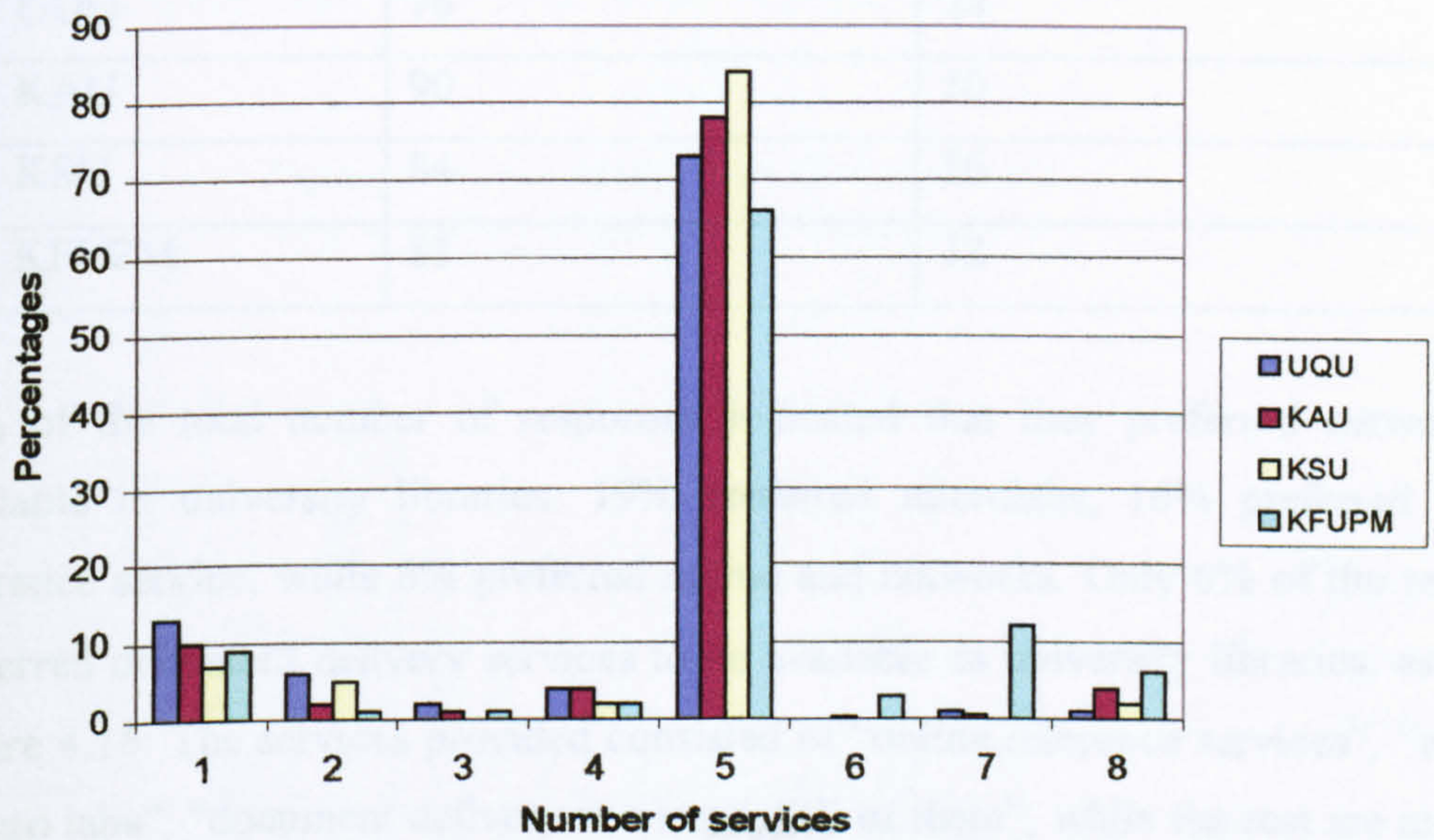


It is immediately evident that large percentages of respondents (75%) indicated that only an information desk was provided in the library. Lectures (10%) clearly emerge as the second service provided by library staff. Lectures and an information desk, workshop, and E-mail were revealed as the third choices. A few respondents indicated that library staff provided less than one percent of more than one service.

It can be seen from Figure 4.15 that most of the respondents (84%) at KSU indicated that the information desk was the only service which was provided by library staff. 19% of the respondents at UQU indicated that lectures and workshops were provided for users.

12% of the respondents at KFUPM indicated that there was lecture and information desk services provided by library staff. The services provided consisted of lecture, workshop, tutorial on a floppy disk, E-mail, information desk, while the other services are mixed, such as lecture, E-mail and information desk, lecture and information desk, workshop and information desk, numbered 1 to 8 respectively in Figure 4.15.

Figure 4.15: the percentage of respondents who received assistance from library staff



Most of the respondents (63%) rated the electronic services in the library as important for acquiring the information they needed. 36% of the respondents rated the electronic services as fairly important while only 6% rated the electronic services as not at all important. The highest percentages (66%) rating electronic services for acquiring information appeared from KFUPM and KSU, while respondents (481) at UQU rated the electronic services as fairly important or as not important.

Most of the respondents (85%) indicated that they want further expansion to provide more electronic services. The majority of the sample (90%) at KAU indicated that they want further expansion. This proportion represents the highest proportion among the universities, while on the other hand, 24% of the respondents at UQU indicated that they

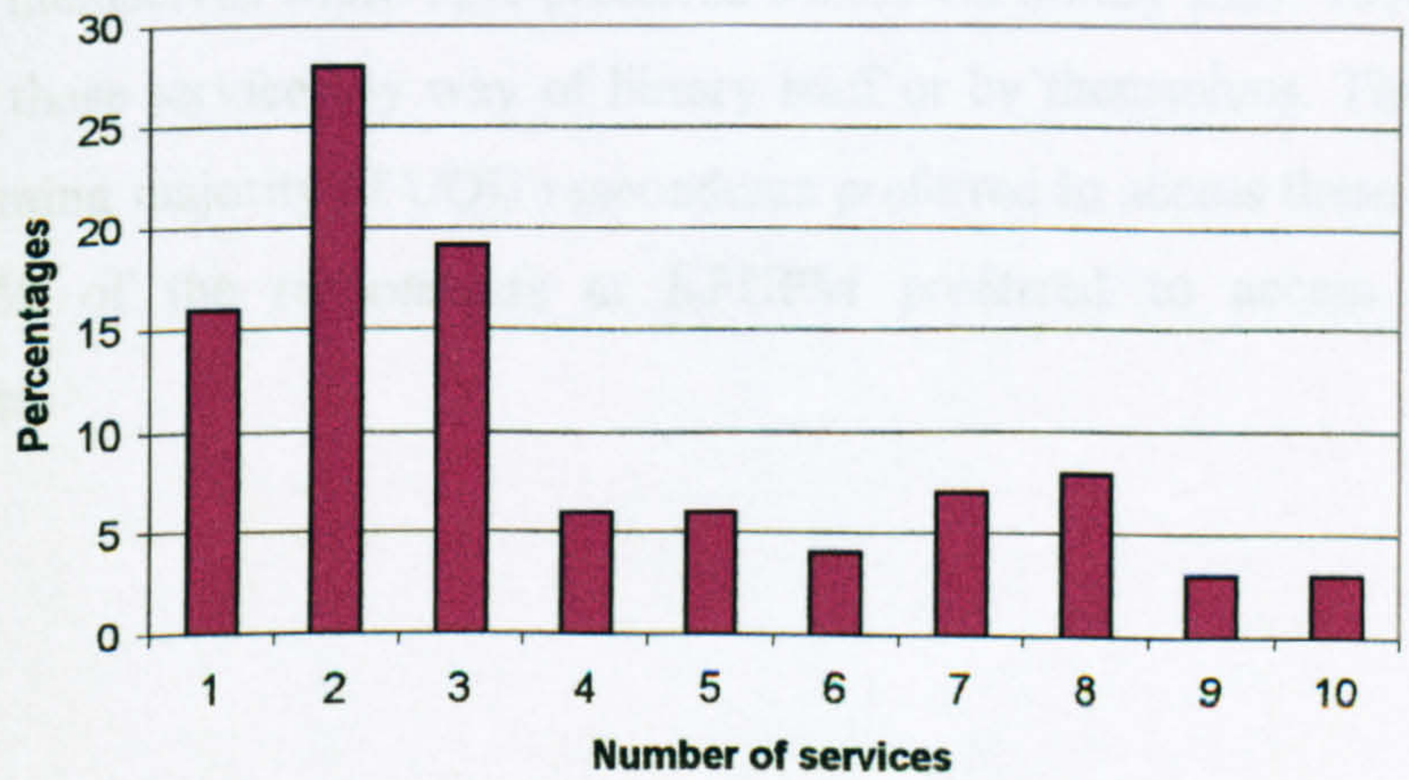
did not want further expansion to provide more electronic services. This is shown in Table 4.16.

Table 4.16: percentages of respondents who want further electronic services.

University name	Do you want further expansion to provide more electronic services?	
	Yes	No
UQU	76	24
KAU	90	10
KSU	84	16
KFUPM	88	12

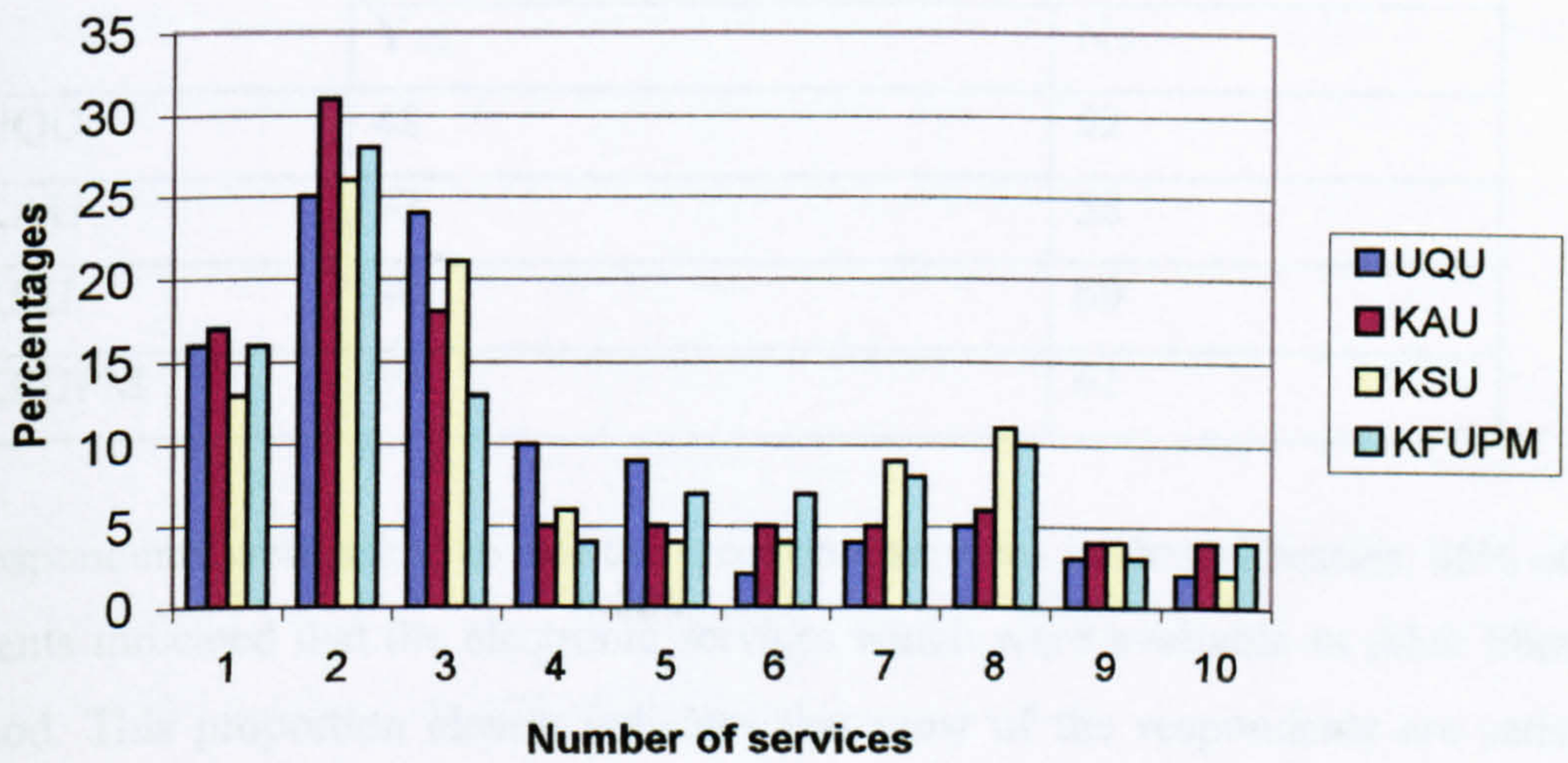
28% of the total number of responses indicated that they preferred networks to be available in university libraries. 19% preferred microlabs, 16% preferred an online reference service, while 8% preferred online and networks. Only 6% of the respondents preferred document delivery services to be available in university libraries, as shown in Figure 4.16. The services provided consisted of "online reference services", "networks", "micro labs", "document delivery services", "all of them", while the rest are mixed, such as "online and document delivery services", "online, document delivery and networks", "online and networks", "networks and document delivery", "networks and micro labs", numbered 1 to 10 respectively in Figure 4.16.

Figure 4.16: Percentage of respondents who said they preferred electronic services



18% of the respondents at KAU preferred online reference services to be available in the university library. In addition, 31% of the respondents from the same university preferred a network service to be available on the university campus. 24% and 10% of the respondents at UQU preferred microlabs and document delivery services respectively to be available in the library, as shown in Figure 4.17. The services provided consisted of online reference services, networks, micro labs, document delivery services, all of them, online and document delivery services, online and document delivery services and network, online and networks, networks and document delivery services, networks and micro labs, numbered 1 to 10 respectively in Figure 4.17.

Figure 4.17: the percentage of respondents who specified which service they preferred



It is clear that most of the total sample (54%) indicated that they preferred access to these services via the library staff or directly by themselves. 34% of the respondents preferred to access themselves while 12% preferred access via library staff. 73% at UQU preferred to access these services by way of library staff or by themselves. This indicates that the overwhelming majority of UQU respondents preferred to access these services via library staff. 43% of the respondents at KFUPM preferred to access these services by themselves.

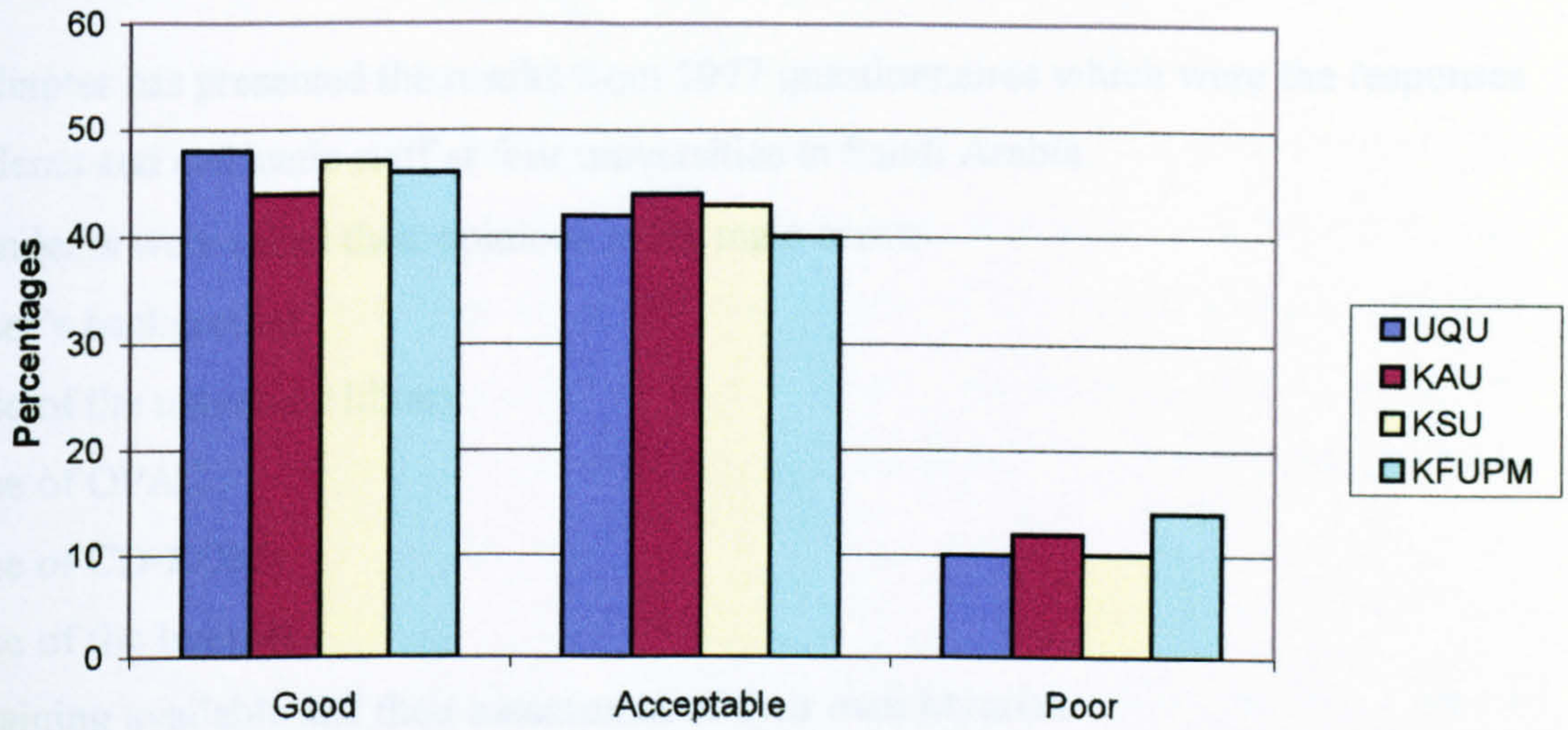
Most of the total sample (58%) indicated that they did not use another library when they were asked if they could evaluate the electronic services which were available in their libraries. Most of the respondents (61%) at KFUPM did not use other libraries, which represented the highest proportion among the universities, while 48% of the respondents at UQU used other academic libraries, as shown in Table 4.17. This seems to confirm that electronic services at UQU library need to be developed in order to embrace developments in this field.

Table 4.17: the percentage of respondents who used another library

University name	Have you used another academic library (or libraries)?	
	Yes	No
UQU	48	52
KAU	42	58
KSU	40	60
KFUPM	39	61

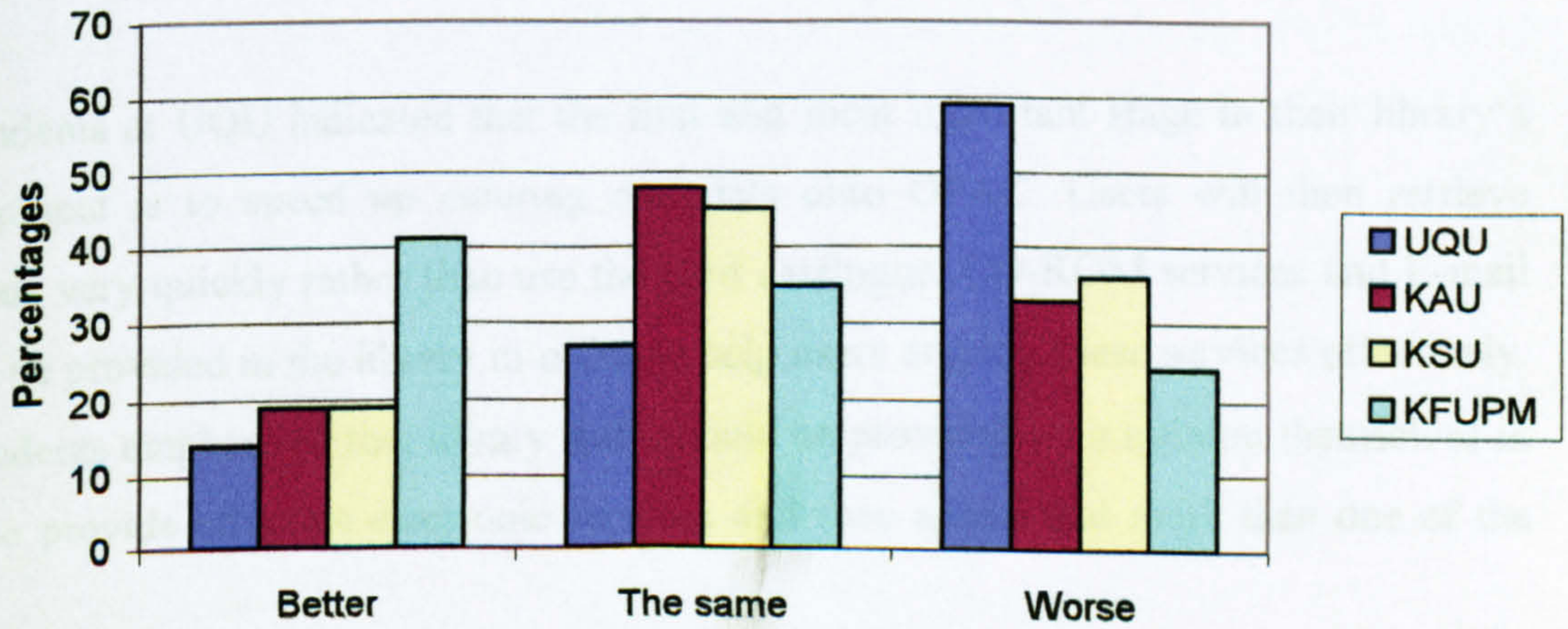
When respondents were asked to rate the electronic services in these libraries, 46% of the respondents indicated that the electronic services which were available in other libraries were good. This proportion clearly indicates that most of the respondents are satisfied with the electronic services which are provided by these libraries. 42% rated the electronic services as acceptable, while only 12% of the respondents rated the electronic services as poor. As shown in Figure 4.18, most of the respondents (48%) at UQU indicated that the electronic services which were available in other libraries were good while the respondents (44%) at KAU indicated that the electronic services which were available in other libraries were acceptable. The respondents (15%) at KFUPM were dissatisfied with the electronic services which were available in other libraries.

Figure 4.18: percentage of respondents who rated another academic library



Only 23% of the respondents indicated that the electronic services in their libraries were better compared with those in the other academic libraries. 38% indicated that electronic services in their libraries were the same compared with those in other academic libraries, while 39% indicated that electronic services were worse compared with other libraries. This proportion was the highest among the universities. As seen from Figure 4.19, 41% of the respondents at KFUPM indicated that the electronic services in the library were better than those in other academic libraries. 47% of the sample at KSU indicated that the electronic services in the library were the same as in other academic libraries while most of the respondents (59%) at UQU indicated that the electronic services in the library were worse than those in other academic libraries.

Figure 4.19: percentage of respondents and how they rated their libraries



4.12 Summary

This chapter has presented the results from 1977 questionnaires which were the responses of students and academic staff at four universities in Saudi Arabia.

Respondents were asked their opinions in six main areas:

1. User's background.
2. Use of the university library.
3 Use of OPAC.
4. Use of CD-ROMs.
5. Use of the Internet.
6. Training available and their assessment of their own libraries.

In this chapter, their responses are analysed and are presented together with a statistical analysis. Although a detailed analysis of the final results is offered, together with recommendations; in chapter Nine, it is which emerged from the questionnaires.

Respondents mentioned the Internet more frequently when they were asked if they had any suggestions or comments on the development of electronic services in their libraries. Training was one of the most important topics which was discussed, whether for students or for academic staff. Also, self-training was discussed by giving details of the electronic services and how to use them. Some of the respondents indicated that library staff should be trained better. A lack of terminals was one of the problems which respondents faced in university libraries except in KAU library. Libraries should stay open later during weekends by increasing working hours.

Respondents at UQU indicated that the first and most important stage in their library's development is to speed up entering materials onto OPAC. Users will then retrieve materials very quickly rather than use the card catalogue. CD-ROM services and E-mail should be provided in the library in order to help users employ these services effectively. Respondents emphasised that library staff should be provided with training themselves in order to provide effective electronic services and they added that more than one of the

assistant library staff should be available to help users with these services. Brochures should firstly be issued to let users know what is going on regarding electronic services in the library and secondly, to encourage them to use the electronic services effectively. Some of the students indicated that academic staff should encourage students to use the library. One of the students suggested that one lesson should be compulsory for all university students to help them to use the library and the electronic services. Another suggested that student training should be organised over several periods or at weekends, while many academic staff indicated that access to the library databases should be from homes or offices.

Respondents at KAU indicated that access should be provided to these services from the department or from individual offices to increase the depth knowledge. Workshops in the library should be increased.

Indications at KSU revealed that the library should provide training courses for learning to use the Internet and networks. These courses should be scheduled at separate times to help users to join. More full text databases in all disciplines should be added and, at the same time, each department should be provided with at least one terminal from which the library database is accessible.

Respondents at KFUPM indicated that OPAC must be changed because it is out-dated. It uses the keyboard to access the functions, while current computers use the mouse to facilitate functions. Some of the respondents indicated that CD-ROM databases are not up-to-date. Library committees should be organised to survey their library for an annual up-date. One of the respondents said that their library suffered generally from a lack of funds. The administration must realize that the body (the university) cannot function well without a healthy heart (the library).

Chapter 5

Discussion of questionnaires

5.1 Introduction

In this chapter, the results of the questionnaire surveys into the academic libraries in Saudi Arabia will be discussed. This chapter includes seven main sections. The first covers the use of computers, the second covers the use and the functionality of the OPAC. The third consists of a discussion regarding CD-ROMs, the fourth concerns the Internet, and the fifth discusses training facilities available in university libraries while the sixth looks at the user demand for electronic services. The final section evaluates academic libraries.

5.2 Use of computers

The results of this survey indicated that most respondents (academic staff and students) had used computers either on or off the university campus. It clarified that KFUPM used computers more frequently than the other universities. The policy of the university is for students to use computers in the first year of their education. The aim of this policy is to make all students capable of dealing with the latest technology and to ensure that no one graduates without experience in this field. One of the academic staff in the System Engineering Department at KFUPM confirmed this statement when he indicated that because most students and academic staff used computers effectively, many academic staff encouraged students to get more content information from Internet sites. It was shown that only 5% of all respondents did not use computers at all which represented the smallest percentage among the universities. This percentage would seem to reflect the fact that the aim of the university's policy toward IT focuses on encouraging as many students and staff as possible to use the facilities.

Despite the fact that there is a lack of computers at KAU in academic staff offices and laboratory departments, most respondents indicated that they had used computers. This

indicates that respondents may have used computers outside the campus or in the computer centre and reflects that most of them understood the importance of the computer today and in the future. At the same time, the survey shows that many academic staff took their own PCs into their offices in order to fulfil their duties or use whatever electronic services were available. 20% of respondents did not use computers at all. This may be due to the absence of effective training courses, the shortage of qualified IT staff and a lack of computers.

KSU was third in the ranking concerning the use of computers despite the fact that KSU had the biggest budget from among the universities. One reason for not using computers as effectively as some of the other institutions was that few academic staff were trained and thus this reflected on their students' ability to use computers. There were no effective training courses in the computer centre for academic staff and students and there were no specific courses in the use of computers in many departments. 33% of respondents did not use computers at all; most of these were students. This high percentage when compared with the large budget available to the university confirms the weaknesses in the training provided, (73% of the survey respondents did not have any training while 20% did not know if there was any training) plus the lack of IT qualified staff. The results of the study show that some electronic services which were available to users in departments, especially to academic staff, were cut off, in their opinion, without any justification. The reason for this is the lack of IT qualified staff in the computer centre. Some academic staff indicated that they gained access to the KACST service via their offices but did not know why this service had become unavailable. Allowing all respondents to use all available electronic services would help to increase the use of computers.

The situation at UQU is different. At this university, computers are little used due to the absence of facilities, such as the availability of networks, the past experience and skills of users, and a lack of training. It is obvious that the absence of these facilities reflects on all users whether academic staff or students. Some academic staff used computers more because some of their subjects are related to computers, such as Civil Engineering and

Computing. However, others did not use them at all (42%) because their jobs did not require them to do so such as staff in the departments of Sharia law and Arabic studies. Students do little of their work on computers and so have only basic skills; many may not even be computer-literate.

There is a lack of computers at UQU and KAU as mentioned previously, because, until recently, a personal computer was not available for every member of the academic staff. The situation is the same for students. There is a lack of computers in laboratories and therefore some students did not complete work in the laboratory departments but finished it elsewhere, for example, in the computer centre. The lack of computers for academic staff and students, without doubt, does not help in developing educational progress, especially since today, in developed and developing countries, computers are an important part of the process of education.

Building computer networks in the universities, without doubt, will help academic staff and students to make use of computers, on or off the campus. In addition, providing more Arabic software will help users to use computers especially since many students and a few academic staff members in universities (with the exception of KFUPM) are not familiar with the English language.

The results presented reflect the fact that respondents from the Science faculties used computers more than those from Art or Social Science faculties, because computer work is part of the research that is undertaken. Computers are mostly used for scientific calculations in research laboratories and universities (Johnson, 1999). Furthermore, in most curriculum science faculties in Saudi universities, work is carried out in the English language and therefore, because their English skills are good, most students have the ability to access IT resources which are almost all in English. In addition, most academic staff graduated from Western countries and thus are already familiar with modern technology.

5.3 OPAC

The library tool which was most heavily used in all the libraries was the OPAC. This is probably because firstly, users are familiar with it and most libraries provide many training courses to users in order to enhance their skills. Secondly, they have little or no experience of other tools. Third, there is no other way for respondents to obtain information about library materials such as books, journals, etc. except by using the OPAC.

The majority of the total sample who said they did not use the OPAC was from UQU. They did not use the OPAC because there is a lack of terminals. Respondents indicated that the library only provided two terminals. In fact, most respondents did not deal with electronic services because most of these services were unavailable in their university. Respondents felt that there was a shortage of content information in the OPAC. The shortage is due to the lack of qualified staff and the entering of information, especially since only 20% of the total collection of the library is computerised. Lack of funding was regarded as the most important factor for not providing useful services to users. These problems will not be solved unless the library can convince the university administration to provide more funds, especially since the library budget at UQU is the smallest among university libraries.

The researcher believes that the library does not provide users with instructions on how to use the system because there is a shortage of staff, a lack of suitably qualified personnel and staff have only just begun the course of training provided by the vendor.

Some respondents commented that they were unable to gain useful information from the OPAC. This could be attributed to the fact that libraries do not provide suitable training. The use of information on the OPAC is still poor, especially since most of the respondents did not know how they could access it locally. In addition, there is no access to the OPAC via the Internet. Also, respondents at KAU, KSU, and KFUPM found it difficult when attempting to retrieve Arabic materials, especially when dealing with

certain Arabic letters. These letters must be written with a space after them and another space must be made to divide them from the next word; many respondents did not know how to deal with this process. Today many respondents at KAU, KSU and KFUPM consider the DOBIS/LIBIS as out-dated.

The lack of OPAC terminals was one of the problems which was mentioned by respondents at UQU, KSU, and KFUPM. The most important reason for not providing sufficient terminals is due, primarily, to a lack of library funds. Other reasons include increasing demands from users, especially since the number of students is increasing every year and thus they need more terminals to satisfy their needs. There is also a lack of space for expansion.

5.4 CD-ROMs

The study shows that most student respondents at KSU did not use CD-ROM databases. The CD-ROM service is provided only to post-graduates and academic staff at this university and thus, this service is not available to the entire university community, in spite of the fact that this university contained a large collection of CD-ROM databases among Saudi universities. Kanamugire (1994) clarified this point when he indicated that during the period of July 1991 to June 1992, when undergraduates at KFUPM library were not encouraged to use the CD-ROM services, undergraduates accounted for 319 (41%) searches out of a total of 770. After July 1992, when undergraduates were allowed to use the CD-ROM services, there were 770 searches in the period 1992-93 which increased to 2,884 searches from July 1992 to July 1993. A total of 1,502 (52%) searches were performed by undergraduates, while only 1,383 (48%) searches were carried out by other major user categories: graduate faculties, research assistants and staff. So, in order to make greater use of this service's potential, KSU should allow graduate students, as well as other users, to access this facility. In addition, this university could encourage the use of the library by offering electronic services for improving scientific research.

It would appear that effective CD-ROM services are not provided to users at KAU and KSU because of the following reasons:

- There is a lack of staff skills in providing an effective use of CD-ROM databases.
- There is a lack of knowledge about what is available in the CD-ROM database department.
- There is a lack of training for both academic staff and students.
- A further problem at KAU is that, technically, there is still a communication access problem. Occasionally, there are difficulties in accessing remotely, especially with modem access, speed and shortage of telephone numbers.

The lowest rate concerning the number of CD-ROMs which were relevant to their topics among universities appeared at KAU library. Respondents were dissatisfied despite the fact that KAU library had the biggest collection among the Saudi universities. The situation here is that the library usually evaluates the database before the end of the annual subscription period by the amount of users who used it and thus, the library decides whether or not the database is important. In this case, KAU library needs to inform all departments what databases are available and to what kind of databases they need to subscribe. The training programmes are important in order to clarify what kind of databases are available in the library and to teach users how these databases could be used in order to get useful information. In this way, databases could be accurately evaluated. Staff help is important in order to provide useful services directly to users and for users to gain a positive impression of the databases available to them.

The researcher believes that publicising services is one of the important factors for marketing. Despite the fact that KAU library spent most of their budgets on CD-ROM databases, half of respondents still had not heard about this service. This indicates either that library did not publicise this service effectively, that respondents found it difficult to use, or that they lacked the confidence to use this service.

Results showed that more respondents at KFUPM were not satisfied with the help that was provided by the librarians despite the fact that, at this university, the number of

respondents represented the largest proportion of those who used electronic services compared with other universities. A shortage of staff was regarded as one of the major problems that the library faced, especially since both academic staff and students were allowed to use this service creating a large number of users. Therefore, developing and enhancing the skills of existing staff is imperative in order to provide good quality services to users.

The results of the survey show no real frustration regarding the use of CD-ROM databases in the universities (except UQU library, which has not yet used the CD-ROM service). There is no great demand for workstations but the fact is, as mentioned previously, undergraduate students (with the exception of those at KFUPM) were not allowed to use this service or because many undergraduates have poor language skills in English. The overwhelming majority of respondents at KFUPM, (academic staff and students), when asked about the number of CD-ROM workstations in the library versus the number of users, were dissatisfied with the quantity of CD-ROM workstations which were available in the library. This indicates that a shortage of CD-ROM workstations might have appeared in all libraries if undergraduate students were allowed to use this service.

The survey indicated that most academic staff at KFUPM were familiar with the CD-ROM database service which was available at their library. This indicates that there is coordination between the library and faculty departments in this area. Respondents faced few problems in dealing with CD-ROM databases, especially since all databases are written in the English language. Also, this system is popular with users because it offers much better searching facilities and takes up very little space. In the past, searches could only be carried out by one person at a time. This limitation regarding CD-ROMs has now changed by using multiple subscriptions or by computer network access.

All libraries are trying to provide more image (full-text) CD-ROM databases in order to provide a complete list of publications rather than the surrogate information of bibliographic citation and possibly an abstract. Because of funding shortages and the lack

of cooperation between libraries, university libraries will be encouraged to subscribe to CD-ROM services to increase their facilities.

The CD-ROM service presently is used largely by academic staff. It shows that academic staff in all universities used CD-ROM databases more than students for the following reasons:

- Most academic staff have used this service when they studied in Western universities.
- Some academic staff who did not use this service become more highly trained than students by attending the training courses which are made available by libraries.
- Training for students to learn and improve their skills was not provided.

The survey shows that the situation at UQU differs from that of other universities as a CD-ROM service is not available at the present time. The lack of funding and a lack of staff are regarded as major problems for not establishing a CD-ROM database laboratory. However, according to respondents, there are demands from many disciplines in the university such as Engineering, Medicine, Science, and Social Sciences to provide this service. UQU library should accelerate the building-up of a CD-ROM laboratory to provide this important service to their users by explaining the importance of its provision to users to the university administration. The library needs to start training their users, raising their confidence so they become familiar with the use of this medium. At the same time, UQU should start from the point that other developed libraries have reached, in order to, first, provide good quality services, and second, provide prompt access to current information.

5.5 The Internet

It is necessary, at the start, to point out that, until recently, the Internet was unheard of in Saudi Arabia. This service was only provided in December 1998. The reason for this is that it was necessary to specify roles in order to prevent the accessing of indecent sites. The government agreed that KACST should be uniquely responsible for providing this

service and that all universities, institutions and the private sectors could not use this service without access through KACST.

5.5.1 Universities

In spite of the fact that most respondents did not use the Internet in their universities, most of them had used it outside their universities. The survey showed that the absence of networking, effective training, shortage of IT qualifications, restrictions, and weaknesses in respondents' ability to use the English language were regarded as major problems that faced respondents when using the Internet.

The use of the Internet in universities differs from one university to another in terms of providing this service. The ITC at KFUPM trained all students in the foundation year by providing IT courses, as mentioned previously, also providing an E-mail and an Internet account. In addition, some of the academic staff were well trained in using the Internet because they had used this service when they were educated abroad in countries such as the UK or the US. Others taught themselves by trial and error or were taught by friends. ITC also provides some seminars and workshops for academic staff related to the use of the Internet and thus, most academic staff and students at KFUPM used the Internet. The computer centres at UQU, KAU and KSU should follow KFUPM's example by providing the opportunity for the whole community to attend training courses on the campus in order to teach them how to get suitable information from the Internet.

5.5.2 Departments

KFUPM was an exception since most academic staff and students accessed the Internet from their departments while other universities did not allow students to use this service. UQU did not provide this service to their academic staff effectively, as most of them did not have the availability to access it. Many of the academic staff were able to access the Internet from the offices of their heads of departments, from laboratories or from the computer centre. The computer centre provides each department with a maximum of two

PCs at the present time in order to access the Internet. This shows that UQU is making significant progress but the major obstacle to the speedy expansion of this service is due to lack of money.

The situation at KAU appears to be unsatisfactory. Most respondents indicated that until now computer networks were not connected to their departments. In addition, all respondents indicated that the university did not provide PCs for each member of the academic staff. It is clear that these computer networks are the most important reason for not providing PCs to all academic staff. Academic staff and students were not allowed to access the Internet from any location in the university campus except from the computer centre or through a few laboratory departments. The lack of funding and the shortage of IT staff were regarded as other major factors for not providing this service to respondents.

5.5.3 Libraries

Most of the respondents had not used the Internet in libraries because accessing the Internet started in Saudi Arabia only in December 1998, as mentioned previously, whereas the data collection for this survey was carried out between September and November 1999. This means that the Internet service was in its early stages of entering Saudi Arabia at this time. There is no doubt that this service will eventually be introduced into libraries. The shortage of money, a lack of space and a lack of specialist people will be the greatest problems that these libraries will encounter when they introduce the Internet.

5.5.4 Users

The confirmation from respondents that they got a lot of valuable information from the Internet indicates that Internet information was very useful and thus this service is important to users. The ability to access the Internet is essential for all university communities in order to get useful information.

The value of information that respondents received from the Internet reflects the importance of this service and so, providing this service will allow users to access information faster, more easily and more cheaply compared with other electronic services such as CD-ROM and online. Using the Internet would give the opportunity to respondents to access KACST services such as KACST official forms, KACST CD-ROM databases, Web Interface, etc. especially since most had not previously used the KACST system.

5.6 Training facilities

It seems clear from the study that training at university libraries still needs to explore new techniques to make training more effective and to prepare users to meet the changing needs of the future. On the one hand, university libraries still use traditional methods such as the information desk and lectures for assisting users. This conclusion has been drawn from the fact that the overwhelming majority of respondents from all the universities indicated that only an information desk was provided in the libraries, followed by lectures (10%). On the other hand, 3% of the total sample indicated that they used E-mail from libraries which is a small proportion compared with Western countries. In approximately five years the academic libraries in Saudi Arabia will account for a significantly larger proportion of E-mail use because today most students know how to use computers. At the same time, most of these students can use E-mail via the Internet. Spending money on equipment and software will be wasted without suitable training in their use and application. Staff development is essential as librarians are responsible for training programmes at all levels. Libraries should ensure that all library staff are well trained and keep their skills up-dated by providing in-depth relevant programmes for the staff, designed to cover all electronic services available in libraries. Continuing Professional Development (CPD) for librarians is important. Library administrations need to encourage librarians to participate in local, national, and international CPD in order to upgrade their knowledge, skills and attitudes. In the researcher's opinion, the lack of opportunity, and, in some cases, the resistance of staff to undertake CPD, combined with a lack of finance, were regarded as major problems.

The researcher believes that specific short courses are important to users, especially since most of the respondents indicated that they needed help when they used the electronic services in the library. Most academic staff and students did not attend long courses because they felt that they had no time for attending these courses due to teaching load or studying. In addition, there is a lack of staff in all libraries which has an effect on the library services. Therefore, providing new techniques or methods to users, such as knowledge of local campus networking, access to the Internet and the design and implementation of Web pages for a wide variety of users, is essential. All university libraries did not take the trouble to provide training services for users in spite of the fact that it is inevitable, if these services are not provided, users will not have the confidence to use electronic services in the library or that they will be unable to use the services effectively.

Workshops and seminars are regarded as two useful methods for providing information to users, especially when undergoing a long training period. A major problem here is that most academic staff do not attend the training programmes, especially those from any department related to the computer such as Computer Engineering, Information and Computer Science and System Engineering because they are specialists in the same subject. However, computer-based teaching via CD or a floppy disk is regarded as a most important training technique especially since most users of today know how to use computers. This result shows that some preferred to take CDs or floppy disks to their offices or homes especially when academic staff did not have time to train for long periods of time in the library.

In the researcher's opinion the onus of acquiring electronic services is seen by users as a responsibility of library staff and users. Users expect that library staff will be well-educated and that they will provide the appropriate information such as a particular index or whether a subject is available through the electronic information services to satisfy their needs. Users expect that if they have a problem in dealing with automated services such as replenishing printer supplies, dealing with paper jams in printers or loose connections, library staff will be able to solve any of these problems. Users expect library

staff to give them independence especially since users deal with electronic information which enables them to use printed tools by themselves. Users also expect libraries to provide many electronic service courses, whether to beginners or professionals, in order to promote their skills and to let users feel that they are capable of using the electronic services more effectively without seeking assistance from library staff. Frequent training courses are required for users and library staff, especially since this field is changing rapidly and thus libraries need to capitalise on the new electronic services.

5.7 Electronic information services

5.7.1 Computer networks

The survey analysis shows that most of the respondents indicated that they preferred computer networks to be available in university libraries. This represented the highest percentage from among the other electronic services. The survey selected this tool because they realised that they could communicate faster and more conveniently with a wider group of users; they could also obtain useful services using different methods and in a more convenient way. At the same time, all these services are secured by restricting access via user names and passwords. An obvious benefit of setting up a network is that it enables the cost of equipment such as printers, faxes, modems or scanners to be shared among members of a workgroup. Data security can be achieved when storing information by attaching an optical back-up device or a tape to the server. Regular back-ups can then be performed. With more complex devices, other administrative tasks can be accomplished more easily and efficiently. Users prefer networks because, through these, they can obtain many services such as the downloading of data from corporate databases, communication between the PC and the outside world and other networks, access to the Internet, use of E-mail etc. They may prefer this service to transmission and receipt of their data over long distances without obligation.

According to the survey, the novice users' lack of skill in using computers makes most students prefer to use microlabs. Libraries need to teach students how to use computers

starting with which keys to press to how to get information out of computers. All students were convinced of the importance of using the computer today and in the future. Without doubt, libraries will face many problems if they decide to provide such a service to users. To begin with, libraries need to train their staff in order to provide effective training for users by offering more workshops and lectures in the computer centres in the universities or by sending staff abroad to gain more knowledge. Microlabs will also need more staff despite the fact that libraries already suffer from a staff shortage. In this case, libraries need to liaise with university administrations in order to clarify what is going on in the libraries and what students are looking for. Libraries should then firstly, persuade them to recruit more newly qualified staff or secondly, develop the skills of the existing staff.

5.7.2 Online

Some of the respondents preferred an online service because they thought that there was a lack of extensive collections in their libraries, especially periodical collections. Before providing this service in libraries, it is necessary to consider that all libraries are suffering from a lack of finance. Libraries need to decide if this service should be free or paid for by sharing costs. They need to consider what and how many documents will be ordered by users. The main obstacle for libraries in this case is that the government finance policy states that no libraries can use money that comes from users. Any money raised usually goes back to university treasuries and is afterwards returned to the government. Libraries will not, therefore, benefit from the money. Also, staff in this department need professional training in order to be able to understand and respond to queries or resolve a wide range of problems.

The development of electronic information services means that all libraries are looking for new services to provide to clients. Advances in technology offer more options for delivering and managing services differently and better than before. Today, all users want instant access to information and they require good quality services, especially since electronic products are becoming cheaper with an improvement in the quality of the products. The major difficulty for all libraries is that they are provided with insufficient

resources to purchase the new technology. Occasionally, university administrations do provide more money to libraries but unfortunately, this may be at the wrong time. They may provide money at the end of the financial year and thus libraries do not get time to purchase from the overseas market, especially if the new technology is not available locally. Despite this, academic libraries today must move towards electronic formats which supersede traditional formats; library facilities must be replaced by networks and workstations. Academic libraries must make all formats accessible, both physically and bibliographically (Beckman and Black, 1995).

5.7.3 Interlibrary loan

In the current situation in Saudi universities there is an increased demand for Interlibrary Loan (ILL) for the following reasons:

- Every library is trying to develop its collections to provide an effective service to users. However, the increase in the amount of information means that these libraries have to rely on access to the collections of other libraries to meet the needs of their users.
- Increases in the price of serials and monographs force many libraries to cancel subscriptions in order to remain within budget, or to subscribe to different titles.
- Libraries have been affected by financial and academic pressures which stem from within their own organisations. In spite of this, most libraries today are looking to place more demands than ever before on the budget. However, all libraries are suffering from a decrease in funding.
- Users themselves are becoming highly adept in the use of new technology which means that they gain access to information in their fields; they are demanding physical access to match (Finnie, 1998).
- The Internet has encouraged users to get more information and thus, users are looking to get this information by a document delivery service, whether via phone, fax, or mail to gain access to it more quickly.

- Searching bibliographic databases of CD-ROMs and Online gives users access to these new technologies and gives a huge amount of information. This information will put increased demand on the document delivery service.

Some of the respondents preferred document delivery services to be available in university libraries because there is a lack of materials such as articles from journals, theses, patents, reports, conference proceedings, etc. in their stocks. Previously document delivery was done manually, a service which was costly in terms of both time and effort.

5.8 Library evaluation

The evaluation of electronic services is important to assess the performance of these services and this clearly indicates the necessity of testing the services or the systems for effectiveness and efficiency. The results of the survey seem to indicate that there are weaknesses regarding the use of the libraries. The absence of good collections, the weakness of electronic services and training courses and the lack of qualified staff are regarded as major factors that have an impact on the use of the libraries. Other issues include the fact that academic staff at universities do not encourage students to use the libraries or to retrieve materials from their own libraries. If they did, there would be no need for them to go to other academic libraries. Opening libraries until late to increase working hours, or permitting access to users at weekends will give students and academic staff the opportunity to use the libraries. Furthermore, training courses on weekdays and also at weekends will promote users' skills and encourage greater use of their library. In such cases, libraries will face obstacles because of funding and thus, if the university administrations do not allocate more funds, the library could keep open by organising staff in shifts. Some staff would be allocated to the morning period and others to the evening.

Because there is no electronic information service at UQU, the survey gives a strong indication that most of the respondents at UQU used electronic services which were available at other libraries. This unwillingness to use their library stemmed, without a

doubt, from the fact that all users were not satisfied with the services which were available in the library and so they went to other libraries which offered them better services. Also, poor collections and a lack of funds and staff were regarded as major factors which affected users' willingness to use their own library. Encouraging users to go to the library requires more effort from the library itself as well as the administration which must provide the appropriate electronic service(s) to users.

The highest positive indication from users regarding the electronic services available in their library came from KFUPM. This may suggest that their library staff were better trained than staff from other universities. All staff at KFUPM were better educated and their English language skills are good. In addition, most of them had got more experience than other staff and so, they could handle and provide electronic services more efficiently.

Libraries need to evaluate their electronic services by testing out the use of these services. To do this, they must consider the views of users of these facilities. The weaknesses surrounding the use of electronic services must be discussed as the less these facilities are used, the more likely it is they will be scrapped or never installed at all. When libraries evaluate their services to get feedback about the shortcomings of what they offer, they often discover that these problems come down to lack of funds since feedback often indicates that there is a shortage of equipment such as terminals, PCs, etc. or there is a need to upgrade the system. This problem will not be solved if there is not enough money. A lack of funding in university libraries will lead these libraries to concentrate more on staff training courses to increase their knowledge and skills in order to change the negative view of libraries.

5.9 Summary

This chapter has presented a discussion of the findings concerning the academic libraries in Saudi Arabia and has also included relevant literature references which shed light on the survey findings.

The six services below were considered.

1. The use of computers.
2. OPAC.
3. CD-ROMs.
4. The Internet.
5. Training facilities.
6. Electronic services.

Certain major findings emerged during the discussion of this chapter. These are used to make the later recommendations which are offered in chapter Nine but can be summarised as follows:

This study has demonstrated some clear differences between the universities, the library facilities that they have and their use of IT systems. These differences, which are summarised below, are helpful in understanding the recommendation which will be made later in Chapter 9. The results of the survey show that KAU spent most of its library budget in providing CD-ROM databases and thus the CD-ROM collection is the biggest among the universities. There are some problems at KAU in the provision of services due to:

- Shortage of funding. This is regarded as the major problem affecting the use of IT. This shortage comes about because most of the university budget goes on construction work.
- Most academic staff and students did not use the Internet.
- A few academic staff use the Internet via the computer centre or a few laboratory departments.
- There is a lack of qualified IT staff in the computer centre and libraries.

- There is a lack of training courses for library staff and users.

The situation at KSU is regarded as better than that at KAU. The obstacles that KSU faces in the provision effective services are:

- The use of the CD-ROM service is confined to academic staff.
- Accessing the CD-ROM database service is carried out via LAN and there is no access through PCs and modems.
- There is a lack of qualified staff in computer centre and libraries.
- There is a lack of training courses for staff and users.

UQU library is trying to catch up in its provision of good quality services. The IT situation at UQU is completely different from that of the other three universities for the following reasons:

- More than 85% of departments or disciplines in the university are in the Social Science or Sharia law departments.
- Lack of funding is the major problem for not providing effective IT services especially since most of the UQU budget goes towards construction on the new campus.
- The OPAC facility is still not provided very effectively to users because 20% of the total amount of materials (at that time) was not entered on the library database and thus, users feel that the retrieval of these materials is inadequate.
- CD-ROM databases and online services are still not available in the library and so, a sense of frustration and alienation is emerging among users, especially among academic staff.
- Accessing the Internet is still not effective because the provision of terminals to academic staff offices and departments is still very limited.

It appears, finally, that KFUPM library has achieved considerable success in implementing effective electronic information services. The reasons for the greater use of IT facilities at KFUPM over any other university in Saudi Arabia can be summarised as follows:

- The university management encourages the use of IT for academic staff by providing a personal computer for each member in his office.
- Students and academic staff are encouraged to use computers by the organisation of IT courses in the foundation year which educate them in the use of IT services.
- Most of the students have better spoken and written English skills than other university students in Saudi Arabia and thus, they have less trouble in dealing with IT.
- The university itself is regarded as a scientific university which is interested in research fields and so, the community uses IT to produce more researchers.
- Most academic staff have graduated from Western countries. As a result, they already deal with new technology.

Chapter 6

Results of the Interviews

6.1 Introduction

Interviews were conducted in order to establish a detailed picture side by side with the questionnaires, to collect valuable data and to clarify the situation in some areas of the study. Thirty-four respondents were invited to participate, and all of them agreed to be interviewed. Interviews were conducted with three main groups within the universities: the administration, the librarians and the heads of departments. In order to structure the interview response, fourteen topics were initiated to examine the current situation and problems generated by the three groups as follows:

6.2 Administration

- The management and decision-making structure which affected the degree of electronic services.
- Networking and communication systems between the computer centre and other information units such as libraries and departments.
- Future plans to help users (academic staff and students) to deal with rapidly changing information technology.

6.3 Librarian

- The availability of electronic services in libraries.
- User attitudes towards the electronic services provided.
- The effectiveness of cooperation among Saudi universities.
- Library problems, such as funding and purchasing.
- Future plans, including internal and external restrictions on such plans.

6.4 Heads of departments

- Electronic services provided to academic staff and students via departments.
- Policy of departments regarding IT decisions and purchasing.
- Electronic service activities such as training provided to users via departments.

6.2 Administration

In order to see how the universities have established and implemented the network on campuses, it was necessary firstly, to consider the present structure of the university network. Secondly, the policies in these universities were considered and thirdly, the decision-making for the future.

6.2.1 Network development

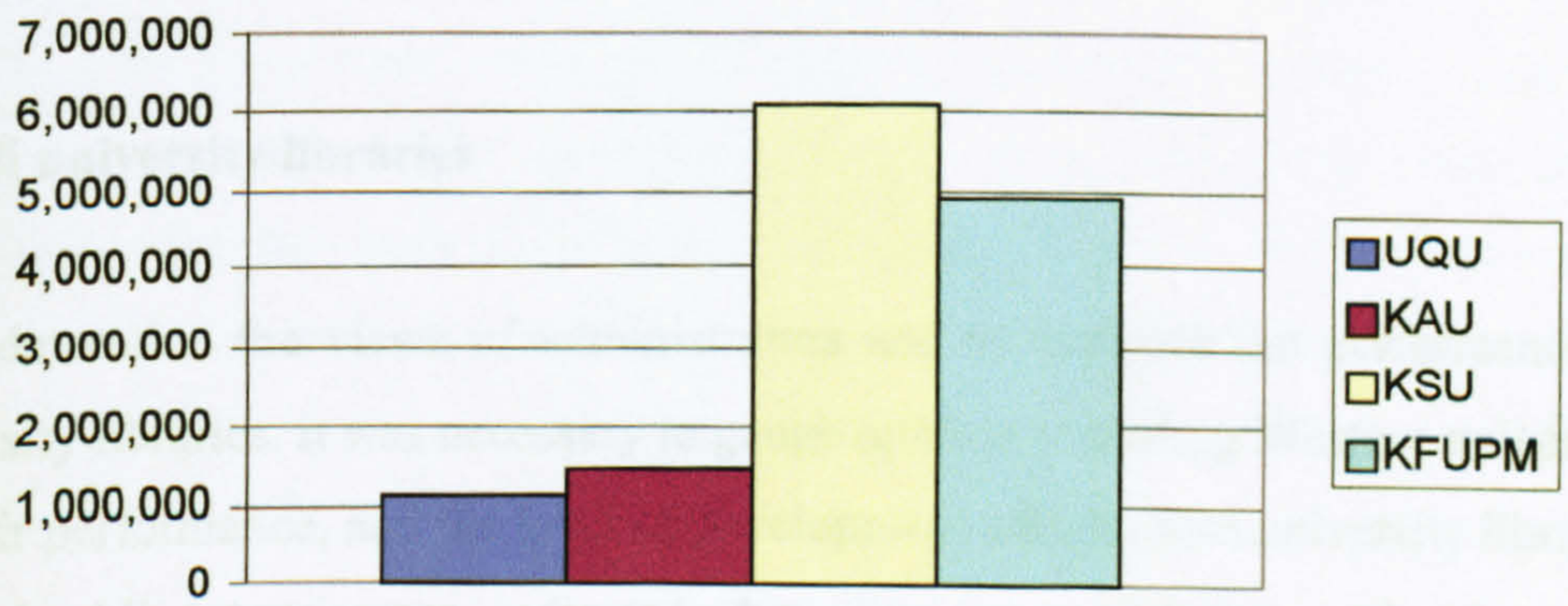
Respondents were asked what is happening regarding the current development of the campus network connection with internal and external networks. The UQU respondent indicated that all buildings were connected by fibre optics. Ethernet is already used by way of a LAN to connect with several hundred devices. The respondent at KAU indicated that 50% of their buildings were already connected and operating a token ring fibre optic network backbone. He also added that the PC labs were connected to certain buildings to provide faculty staff and students with faculties for educational purposes. In general, KAU had a partial campus network with three Ethernet LANs in the computer centre building. The respondent at KSU indicated that they were already connected to Asynchronous Transfer Mode (ATM) to accommodate the high transmission rates associated with data, speech and video. Their LANs had been designed to use Ethernet architecture. The first two LANs cover the College of Pharmacy and Dentistry, College of Medicine and the University Hospital, the Administration building and the Central Library. The second two cover the College of Science, College of Computing, College of Art, College of Education, College of Administrative Science, and the Audio-Visual

Centre. In addition, KSU supplied approximately 3000 new points for users (for academic staff, administration affairs and labs). These services established an effective infrastructure. One of the interviewees at KFUPM indicated that currently all academic buildings and almost all administrative buildings are connected to the university central system. Most of the buildings are connected using fibre optic cables while a few remote buildings are connected using DHSL. Almost all KFUPM buildings are internally cabled in such a way that each room has a network connection that allows a PC in that room to access any computing resource on the network. He added that in few months the university would upgrade their backbone from token ring (16 MB/sec) into Gigabit/sec. This will increase the Internet bandwidth and improve the traffic between the buildings. The university also intends to change all 10-based hubs into 100-based switches which will improve the traffic within the building.

6.2.2 Funding

It can be seen in Figure 6.1 that KSU library receives the most money. Budgets in the universities are calculated according to size in terms of student population, teaching staff, administration personnel, and faculties. KSU receives the largest budget (S.R. 6,087,549) because it is the biggest university in the Kingdom while UQU has the smallest budget (S.R. 1,100.000) from among these university libraries. This reflects the size of collection and the operation, as mentioned previously.

Figure 6.1: central libraries' budgets



S.R.= SAUDI RIYAL

Respondents were asked if they thought that the amount the libraries received were enough to keep up with the rapidly changing situation. All of them stated that all libraries suffered from a lack of funds and they strongly believed that the libraries should get a very substantial budget to cope with the advanced technology of library automation.

UQU respondents indicated that their library is still not providing successful electronic services to users especially in the present rapidly developing environment of information technology. There is no complete OPAC service available to users, as has been mentioned previously, and still only 20% of the total collection of the library is computerised. CD-ROM and Internet services are not provided up to the present time. KAU and KSU libraries do not provide an Internet service to their users. CD-ROM databases at KSU library are not available for undergraduates to access despite the fact that users have the capabilities to access them. An interviewee at KFUPM stated that KFUPM library is very advanced in the introduction of technology to the campus. An E-mail and Internet account is provided for each member of the university community and other services, such as accessing CD-ROM databases through the Internet, will be introduced shortly.

All universities, with the exception of KSU, indicated that there is no overlap between electronic information services in the libraries and in the computer centres. KSU indicated that there is an overlap between the computer centre and the library due to the fact that all central databases exist in the computer centre.

6.2.3 Saudi university libraries

In order to determine the views of administrators and to evaluate the performance of Saudi university libraries, it was necessary to gauge opinion regarding Western university libraries, their performance, and the level of development which these university libraries have reached. All interviewees indicated that they were familiar with electronic information services in Western libraries as they achieved their Ph.Ds from the United States or the United Kingdom. The present situation in their own university libraries can

then be evaluated and organised and plans put into operation in order to develop these libraries.

An interviewee at UQU indicated that there is a big difference between the services provided in his library compared to those in Western countries while interviewees at KAU and KSU indicated that there is a slight difference. An interviewee at KFUPM gave an indication that he believed the library services there are comparable to those provided in Western universities.

All universities agreed that electronic services in their libraries are insufficient. One of the interviewees indicated that one of the major problems which libraries face is that there is no effective cooperation among libraries in order to provide speedy and useful services, solving the weaknesses in what is available presently. Libraries need greater understanding of what cooperation means, and how far this cooperation can reach. Another problem that faces UQU, KAU, and KSU libraries was promotion. In academic libraries, there are three groups of workers. In lower management positions are library assistants. These usually had no experience when they were first recruited to the library and are trained to do some work such as shelving and sticking labels onto the library materials. This group faces tangible obstacles because there are limited positions for them and thus, promotion is very difficult. The second group is classified as middle management positions, such as librarians and IT professionals. This group faces a serious problem in that there are many staff in similar positions but there are not enough vacancies. The third group represented are the upper management positions. This group are heads of departments and the directors of the libraries. This group faced fewer obstacles than the other two in terms of promotion because there are few staff in similar positions compared with other levels. The government is responsible for recruiting and promoting staff and therefore, promotions depend on the number of vacant positions or the provision of new positions. This problem will be discussed more in the next chapter.

All interviewees indicated that they had no written evaluation to enable them to make comparisons with other Saudi university libraries. One interviewee indicated that evaluation usually took place by visiting other university libraries to examine what electronic services were provided to users at these libraries. Another indicated that other university libraries were evaluated when the library sent questionnaires to other libraries to discover what new electronic services were available in these libraries.

6.2.4 Future trends

All interviewees indicated that they did not have any written long-term plans aimed at enhancing electronic services on the campuses or in the libraries. They have important goals in developing their electronic services by providing the latest useful technology to the whole community according to the budget provided. Directors of each institution in the universities, such as Directors of Computers, are responsible for providing the latest technology on their sites. An interviewee at KFUPM mentioned that there is a committee at the centre. It consists of people from the centre and people from some departments who are nominated as departmental representatives by the centre. He added that, in general, there are plans to enhance and expand their IT networking capabilities.

The situations at KAU and KSU are different. These universities did not have a similar committee. Planning is usually instigated by the director of the institution. This happened because of a shortage of qualified personnel and technical assistance to share in the decision-making.

An interviewee at UQU mentioned that they have long term planning aimed at enhancing their electronic services. He mentioned that they would establish a Web page on the Internet and connect it with national and international libraries. There is a training programme divided into a number of stages for library staff for enhancing their skills. Training includes how to deal with the HORIZON system to develop both Arabic and English bibliographic database records according to needs and how to implement the

HORIZON system for all library functions, such as circulation, periodicals, etc. It also covers how resources can be specialised.

Respondents were asked about their plans to assist academic staff in dealing with rapidly changing information technology. An interviewee at UQU indicated that there is a seminar or workshop usually held in the computer centre for academic staff concerning the latest electronic services which are located on the university campus. An interviewee at KAU indicated that they were provided with lectures, seminars, and workshops to improve the skills of academic staff through the Development Education Centre. An interviewee at KSU indicated that there are usually workshops for aspects of new information technology available for their community through the computer centre. An interviewee at KFUPM mentioned that they have excellent services and support in their community. It was seen from the comments of a KFUPM interviewee that he was satisfied with the electronic services provided to students on the campus. He mentioned that students have computing access and services from their first year. Each student has E-mail and Internet account. He added that all new services are introduced to their community through an extensive awareness programme.

Respondents at UQU, KAU, and KSU, when asked what steps were provided to help students become familiar with electronic information, indicated that there are many steps which are provided for student communities, such as:

- Provision of more terminals in the libraries to let the users search the OPAC and retrieve the materials.
- Providing more labs to students to help them access the Internet and to use E-mail in order to reach these electronic services easily.

6.3 Librarian

6.3.1 Libraries` background

It was found that KSU has the largest staff population while UQU has the smallest population among the universities, as seen in Table 6.1.

Table 6.1: Distribution of librarians by universities

University	Librarians
UQU	23
KAU	60
KSU	180
KFUPM	47

It was shown in Table 6.2 that KSU has the largest user population whether from academic staff or students who are already registered or already use the library. On the other hand, UQU has the lowest user population amongst all the universities. More than half of users at UQU came from the Social Science and Sharia Law departments.

Table 6.2: User Populations

University	User population	
	Academic staff	Students
UQU	700	More than 6000
KAU	1156	9108
KSU	2800	32000
KFUPM	936	8656

Interviewees from KFUPM and UQU indicated that the information technology centre (ITC) and the computer centre are responsible for all programming in their libraries while the KAU and KSU libraries indicated that the automation department in the library and a committee of professionals from the deanship of library affairs led by the Dean were responsible for all programming in the library.

Interviewee librarians indicated that all cataloguing was done in-house. Despite this, all of them confirmed that there is a shortage of qualified librarians and programmers in the libraries. KAU was the biggest cataloguer among the universities (6 staff in the Arabic department and 3 in the English department) while UQU and KFUPM were the smallest cataloguers among the universities (2 in the Arabic department and 2 in the English department). There are 6 cataloguers in the technical services department at KSU, plus 2 assistants.

6.3.2 Electronic services

Most of the respondents indicated that they provide OPAC to users though UQU library employs a system (HORIZON) which is different from the system (DOBIS/LIBIS) which is used in other university libraries, as mentioned previously. The librarians at KAU library added that they also have a CD-ROM database service (Indexes and Abstracts) and full text databases.

The librarians at KSU indicated that, including OPAC, there are many services which are provided to users such as CD-ROM databases, Online and the Internet which is provided only for academic staff. The situation at KFUPM is more advanced than at other universities. KFUPM library provided OPAC, CD-ROM databases (bibliographic), full text databases, the Internet to both academic staff and students, and Online searching with Alwaseet via Bahrain Telecommunication (BT). Academic staff can access this through the Internet via CD-ROM databases such as ABI and Business Periodical Ondisc (BPO).

Respondents were asked about the sufficiency of terminals in their libraries. All of the interviewees indicated that there is no lack of terminals in libraries despite the fact that most of the respondents (academic staff and students) indicated in the previous chapter that there was shortage of terminals for accessing OPAC. The situation at KAU library is different, especially because most respondents indicated that the number of terminals in the library was sufficient. A senior manager at KAU library indicated that there are 32 OPAC searching terminals in all other sections such as Cataloguing, Acquisitions, Periodicals etc.

Librarians were asked if electronic access to the library could be obtained from elsewhere on the campus. All librarians agreed that users can access OPAC from elsewhere on the campus but librarians at UQU library added that OPAC is the only service provided to users in their library. Librarians at the other libraries indicated that OPAC could be accessed from any terminal connected to the mainframe network.

The second electronic service in these university libraries is the CD-ROM database service. KFUPM library was the first university in Saudi Arabia to establish CD-ROM databases. Table 6.3 shows the databases that have been subscribed to by KFUPM library.

Table 6.3: CD-ROM databases at KFUPM library

S. No.	Resources	Period
I	Bibliographic	
1	ABI/Inform	1971-
2	Applied Science & Technology Index/ Abstract	1983
3	Chemical Abstracts Ondisc	1996-
4	Compendex	1985
5	Computing Archive	1991-1993
6	Dissertation Abstracts Ondisc	1861-
7	ERIC	1966-

S. No.	Resources	Period
8	LISA	1969-
9	MathSci. Disc.	1980-1993; 1999-
10	NTIS	1983-
11	Readers' Guide to Periodical Literature	1983-
12	Science Citation Index	1987-
II	Image (full-text)	
13	Applied Science & Technology Plus	1994-
14	Business Periodicals Ondisc	1987-
15	IEEE/IEE Electronic Library	1988-
III	Multimedia	
16	Britannica	Encyclopedia
17	Encarta	Encyclopedia
18	Grolier	Encyclopedia
IV.	Specialized	
19	CollegeSource	Current
20	The GCC Economic Databook	
21	SaudiDirect	1997-

A senior manager at KSU library mentioned that academic staff could access CD-ROM databases via LAN. In the future, academic staff will gain access via Modem and PC to faculties and branch libraries from outside the campus. In order to obtain feedback from these databases, academic staff and postgraduate students must complete an existing form and send it to the automation department at the central library or branch libraries with a 3.5-inch floppy disk. The central library sends the search result the next day from the receipt of the order. There are 27 CD-ROM databases, as seen in Table 6.4.

Table 6.4: CD-ROM databases at KSU library

S. No.	Resources
1	AGRIS
2	Applied Science & Technology Index
3	Baker & Taylor
4	Books in Print
5	Chemical Abstracts
6	C.C : Engineering, Computing & Technical
7	C.C. : Agriculture, Biology & Environmental Sci.
8	C.C : Clinical Medicine
9	C.C. : Life Sciences
10	C.C. : Arts & Humanities
11	C.C. : Physical, Chemical & Earth Science
12	Dissertation Abstracts Ondisc
13	Ei Compendex +
14	ERIC
15	Georef
16	ISA (Information Science Abstracts) +
17	INSPEC Physics (Institution of Electrical Engineering)
18	LISA + (Library and Information Science Abstracts)
19	MathSci Disc
20	Medline, Standard
21	Medline, Standard
22	Sociofile
23	Ulrich's International Periodical Directory
24	Wilson Art Index
25	Wilson Humanities Index
26	Wilson Social Science Index
27	ABI / Inform on Disc Global

As seen from Table 6.5, KAU presently has the biggest collection of databases in Saudi Arabia. A senior manager at KAU library mentioned that library users have access to the LAN via workstations that have been made available for them in the library or via any PC connected to a modem and phone line on or off campus. The remote communication system allows more than 130 users to access simultaneously the CD-ROM LAN.

Table 6.5: CD-ROM databases at KAU library

S. No.	Resources	Period
I	Bibliographic	
1	ABI/Inform	1974-
2	Information Science	1966-
3	CABCD	1973-
4	FSTA-Food Science and Technology Abstract	1969-
5	POLTOX1 : Pollution and Toxicology	1966-
6	Water Resources Abstracts	1983-
7	Dissertation Abstract	861-
8	Midline Express	1966-
9	Analytical Abstracts	1980-
10	E.I. Compendex	1970-
11	Engineering & Applied Science	1980-
12	Fluidex	1974-
13	Geography	1990-
14	Georef	785-
15	ISMEC: Mechanical Engineering Abstracts	1973-
16	MathSci Disc	1940-
17	World Textiles	1970-
18	ERIC	1966-
19	Linguistics and Language Behaviour Abstracts	1973-
20	PAIS International	1972-

S. No.	Resources	Period
21	Political Science Abstracts	1976-
22	Sociological Abstract	1963-
23	LISA	1969-
II	Images (Full text)	
24	EIU Country Report	1993-
II	Images (Full text)	
25	Wilson Business Abstracts	1982-
26	ASFA: Aquatic Sciences and Fisheries Abstracts	1978_
27	Books in Print with Book Reviews	1979-
28	Wilson Library Literature and Information Science	1984-
29	Environment Plus	791-
30	Wilson Applied Science & Technology Abstracts	1984-
31	ECONLIT	1969-
32	Wilson Social Sciences Abstracts	1983-
33	Aquatic Sciences and Fisheries	1978-

Librarians at KAU, KSU and KFUPM libraries indicated that the OPAC system, called DOBIS/LIBIS which is used in these three libraries was very weak. (DOBIS was developed by the University of Dortmund in Germany, and LIBIS was developed by the University of Leuven in Belgium) They have found many deficiencies in the OPAC system especially in the Arabic version such as:

- Occasionally, when searching for a title record which is already catalogued, it does not find it in the title file but it may be found if it is searched via Author or the record number. The reason for this is not known.
- The cataloguer cannot access another operation such as acquisition in order to find specific information and, in this case, he or she cannot do any thing until he / she exits from the operation.
- In some cases, albeit seldom, the alphabetical file was out of order.

- Occasionally, only one number was found for two records, with one record in Arabic and the other in English.
- There is no special file for series` titles.
- The system is slow.
- The system is old and cannot be accessed via the Internet using a browser or a mouse.
- There are difficulties with the interface. Access can be made to an English version through the PC when an Arabic version should be accessed through the terminals.

A senior manager at UQU library indicated that the HORIZON system which is located in the library is good and they did not find any deficiencies in the system until recently. (The two systems will be discussed further in the next chapter.)

One of the questions was addressed to senior managers at these university libraries to obtain more information about how these university libraries provide user access to CD-ROM and Online databases. A senior manager at UQU indicated that this service is not available at the moment while a senior manager at KAU library said that there is a communication server attached with modems to the CD-ROM network. Users can access CD-ROM databases from offices and homes using a normal phone. The communication software is Windows-based and is easy to use. A senior manager at KSU library indicated that all university users can gain access if they have permission, while a senior manager at KFUPM library indicated that users can use bibliographic databases through PC workstations via a LAN and the library's LAN connection to the KFUPM server.

6.3.3 User attitudes

A senior manager at UQU library reported that there are no problems at all at the moment with the HORIZON system when asked what problems users encounter in accessing electronic services. Librarians at KAU library indicated that there are some problems whether from academic staff or graduate students such as:

- Many academic staff are advanced in years and so they are somewhat hesitant in using the electronic services.
- For graduate students, language is a barrier, as all databases are available in English.
- There is a lack of computer literacy.
- Users cannot gain direct access to the borrowing system via OPAC.
- Some users do not know how to use search key words.
- There is inadequate technical support.
- Accessing and using electronic services is slow.

A senior manager at KSU library indicated that there are no real problems except for the usual ones, such as maintenance or unexpected damage while librarians at KFUPM library indicated two problems:

- There are problems if the system is down or needs maintenance.
- Lack of knowledge of search features and search engines.

Most of interviewees, with the exception of those at KFUPM library, confirmed that student users used OPAC more than academic staff who used other electronic services. Interviewees at KFUPM library said student users are using all academic services in the library more than academic staff.

A senior manager at UQU indicated that a personal interview is the only method used to obtain user feedback on services while a senior manager at KSU library indicated that they were informed by users. A senior manager at KAU library indicated some methods by which the library obtained user feedback on services:

- Personal interview
- Meetings of users are organised to teach them how to use OPAC.
- Questionnaires are distributed after a limited time to get their feedback and to know what problems they have encountered in using the library.
- User complaints.

A senior manager at KFUPM library indicated that some of the methods used were:

- Personal questionnaires.

- Questionnaires.
- Box suggestions.
- Interaction.

When an interviewee at UQU library was asked if such feedback was used, he indicated that individual efforts were made by heads of departments. A KAU interviewee indicated that all feedback is discussed to find solutions and he added that policies could be changed or systems up-graded to improve the quality of services. A KSU interviewee said that they solved whatever they were able while a KFUPM interviewee indicated that feedback was reviewed and change implemented accordingly.

6.3.4 Training programmes

Respondents at UQU indicated that there are training courses on how to use the library while respondents at KAU indicated that training courses for new students take place at the beginning of the first week of each semester. Training courses are available for academic staff on how to make connections with the electronic services in the library. Such courses also cover how to use CD-ROM databases, download or print.

KSU library provides training on how to use OPAC and it intends to provide more training programmes which relate to modern electronic systems. Respondents at KFUPM library indicated that there are orientation programmes for new students and new academic staff as well. There are orientation programmes by request. UQU library provides training programmes for staff on how to use OPAC. These are offered by the provider (Arabian Advanced System) but in general the training programmes are carried out by the Institute of Public Administration (IPA). KAU library offered many programmes on job training such as:

- Library staff were trained to use Online systems.
- Branch library staff were trained to use CD-ROM databases and OPAC.

Some training programmes take place outside the library such as:

- Enrolling some staff to learn the English Language at the English Language Centre in the university.
- Enrolling some staff to train in the same field at the IPA.
- Staff attend conferences in Library and Information Science in Saudi Arabia or abroad.
- Training new staff to deal with electronic equipment.

Respondents at KSU library indicated that library staff are trained to use all electronic systems which are available at the library and they were expecting to expand these programmes in the future. Respondents at KFUPM library said that there are many programmes for job training, such as seminars and short courses.

All interviewees in the libraries mentioned that there are many problems with the IT skills of library staff such as:

- They still need to improve their knowledge.
- They need to provide a continuous programme of training courses.
- They need to reduce routine.
- Some library staff members lack IT skills and thus, are hesitant in using technology. They prefer the traditional ways of doing things.
- The language barrier is one of the difficulties and, in addition, work pressure.
- There is no-one responsible for providing maintenance for networks.

All respondents in all university libraries agreed that they have problems in the recruitment of new, computer-literate staff. These problems include the following:

- Lack of local staff. In addition, there is a shortage of new staff who have useful experience in networking.
- The weakness of salary, especially because new, computer-literate staff are looking for a good salary which they can find in the private sector.

6.3.5 Productive co-operation

A senior manager at UQU indicated that electronic links with other universities, Saudi Arabian or otherwise, are not available now despite the fact that OPAC can provide this service. Senior managers at KAU and KSU libraries indicated that there is a link with each other plus with KFUPM library. A senior manager at KFUPM library confirmed that KSU and KAU can access KFUPM through DOBIS but this access is only one way. So, the co-operation within Saudi universities is very limited. Saudi universities have E-mail links with other Gulf universities such as Bahrain University, Kuwait University and Sultan Qaboos University in Oman.

A senior manager at UQU was asked which of these were co-operated with the most. He emphasised that co-operation existed only with IMSU which has the same OPAC system while KAU library co-operated with KFUPM library. KSU library indicated that all Saudi universities are connected to Gulf-Net and it is expected to co-operate more with these universities when they provide sites for these universities on the Internet. KFUPM indicated that there was co-operation with Kuwait University and Sultan Qaboos University.

Respondents were asked what was the purpose of the co-operation. All university libraries agreed that there are many benefits of co-operation, such as:

- Efforts are consolidated.
- Services to users are facilitated.
- Some classification and cataloguing problems are solved.
- Universities participate in the provision of inter-library loans.
- Resources are shared and information is exchanged.
- Universities participate in acquisition and for technical services.

6.3.6 Difficulties

All respondents in the libraries completely agreed that the main problem which faces them with funding electronic services was the difficulty of financial resources, especially since electronic services are very costly to buy and to maintain. It needs a lot of funds to buy new things or to up-grade existing materials or equipment. All respondents thought this problem could be solved in many ways, such as: by special funding, trying to convince higher administration by providing excellent services to library users or by cancelling some services.

6.3.7 Future trends

Interviewees were asked about any formulated plans regarding their the future of their library's provision of electronic services. Interviewees at UQU library indicated that they are planning to open a CD-ROM lab plus an Internet service. Interviewees at KAU library indicated that the library is planning to up-grade its existing library system so that it can provide better electronic services such as linking the library system to the Internet. The library is planning to set up an Internet lab in the library. At KSU library, there is a committee called "The Committee for Developing Automation Systems in University Libraries" which had, as members, many professionals in the library and in the university. The head of this committee is the Dean of Library Affairs. Interviewees at KFUPM library indicated that they are planning to increase Internet stations for their researchers as much as they can.

All respondents, when asked what limitations (internal and external) are likely to restrict the future expansion of such services, reported that firstly, financial problems constitute the major factor which affects their libraries' services. The second limitation is human resources, especially for UQU library and KFUPM library, and thirdly, technical support.

The senior managers at libraries agreed that the new service which they would most like to introduce is the Internet. Senior managers at KSU library added that they would like to

acquire more CD-ROM databases, to provide full text CD-ROM databases, and to store manuscripts and documents in an electronic medium. Senior managers at KAU and KFUPM libraries emphasised that their libraries will move soon from the DOBIS/LIBIS system to another new system which would be ready for the 21st century.

6.4 Heads of departments

In order to consider how academic staff and students used information technology in their departments, it was necessary, firstly, to highlight what are the major sources of information technology provided in these departments such as: software, hardware, networks, etc. Secondly, it was important to know what information technology policies these departments followed and to consider who is responsible in these departments for purchasing and determining when and where this equipment is used. Thirdly, it is necessary to know what technical services are provided to users.

6.4.1 General background

Respondents were asked whether they thought IT within the department (hardware, software) was adequate in order to provide a good service to members. The general response in all university departments except KFUPM was that it was unsatisfactory. Respondents at KFUPM indicated that the existing IT facilities within the departments are, to some extent, adequate when compared with the resources of similar departments elsewhere. Each and every faculty member has a PC loaded with varieties of software and with free access to the Internet. A PC lab is dedicated to graduate students and there is also an additional PC lab for teaching purposes.

All respondents in all departments indicated that they provide networks for their members with some level of effectiveness. In UQU departments, members used this facility for a limited time; it is used for one or two members only. Stand-alone and networked services are provided for academic staff members at KFUPM.

The respondents revealed that all academic staff had internal network services while external network services are catered for via the World Wide Web. The situation for students in all other university departments is different from that for KFUPM students. All these services are offered to students at KFUPM while these are not provided for any students in the other universities.

Interviewees at KFUPM and KSU indicated that they distribute E-mail for academic staff. One head of department at UQU indicated that there is one PC in his department and thus, distribution and accessing are difficult. In addition, the English language is a barrier, especially since some academic staff do not know it. Interviewees at KAU indicated that this service was not available until recently. One of the interviewees at KAU indicated that all academic staff in his department can only use E-mail via the department lab but they are not able to use it from their offices because until now the university did not provide PCs to all academic staff. So, the use of this service differs from one university to another. The most useful application of this service came from KFUPM. Academic staff and students have E-mail addresses which are issued by the ITC.

Interviewees at UQU and KAU indicated that academic staff in the departments did not get any kind of IT support. They added that the departments did not provide PCs for all academic staff but some of them provided PCs individually. Interviewees at KSU and KFUPM indicated that their departments could provide IT support to academic staff such as:

- Maintenance of computer hardware.
- Up-grading of the operating system.
- Installation of PC software from the network.
- Printing services.
- Training on latest tools and technologies.
- A LAN to cater for the immediate needs of academic staff.
- Providing Internet, Intranet and E-mail.

Interviewees at UQU and KSU indicated that there are no IT activities in the departments which relate to the universities' IT activities while the situation at KSU and KFUPM has changed. They mentioned that the IT activities in the department are highly related to the IT activities at the university level. Support for PCs in various computer labs and faculty offices is provided in conjunction with the university computer centre. In effect, the computer centre co-ordinates IT activities in the department.

6.4.2 Policies

When the respondents were asked if it was their policy to acquire equipment on a regular basis, or if equipment is acquired by occasional major purchases, all of them indicated that the department seeks avenues to acquire IT facilities when there is a need for them. The need could be due to an increase in student numbers, new software of direct relevance to the departments, upgrading of existing facilities, or when what is available is inadequate. So in effect, unfortunately, the purchasing policy almost always occurred on a regular basis via the computer centres.

The policies within departments are different regarding the purchase of hardware or software. One head of a UQU department indicated that until now they did not require IT equipment purchasing while another indicated that there is no specified person in the department at the moment. All heads of other university departments indicated that the head, in consultation with the departmental computer management committee, decided on hardware and software purchases. However, it should be pointed out that most of the purchases were not handled directly by the departments, but by the computer centres, while at KFUPM these were handled by the university computer utilization committee.

Interviewees were asked who determines how, when, and where equipment is used. The answers differed among departments. One department at UQU mentioned that there is an information unit supervisor in the department who is responsible for using this equipment while another mentioned that there is no specified person for this task. Interviewees at KAU mentioned that the committee departmental has the authority to determine how,

when and where a piece of equipment is used. Interviewees at departments in KSU and KFUPM mentioned that the heads of department determine how and where a piece of equipment is used. However, he may, if he so wishes, seek the advice of the computer management committee, the departmental PC lab supervisor, or the hardware coordinator. Regarding when a piece of IT equipment is used, this is left entirely to whom it has been allocated.

6.4.3 Users

Respondents at UQU indicated that there are no services available to students, either to undergraduate or postgraduate students. Respondents at KAU indicated that all students can use the department labs, they can access KACST via Gulfnet, and access OPAC and CD-ROM databases from the library. Respondents at KSU indicated that this is too limited as, at this time, students are using only word processors. Another indicated that electronic services which were available in the department were allocated to postgraduate students. Respondents at KFUPM indicated that students can access electronic services from the department. These include the E-mail service, the Internet, the university Intranet service, online library catalogue (DOBIS/LIBIS), access to UNIX server, downloading / uploading files from servers, and installation of PC software from the network etc.

Some departments at UQU indicated that there is no training for students on electronic services while others mentioned that there are one or two courses provided to students on the use of computers. On the other hand, KAU respondents indicated that all departments provided one, or a number of courses, to students to encourage them to use the electronic services on the campus effectively and to allow them to be confident when they tried to use these services. One head of department at KSU indicated that it was supposed that academic staff trained students on using electronic services while another indicated that the department did not train students but that they taught themselves. KFUPM respondents indicated that students received training on electronic services through the continuing education programme of the university ITC. The ITC conducts short courses

and organizes seminars, as well as an awareness day for the purpose of educating students. As for those students willing to teach themselves, there is huge amount of documentation Online for their use.

When respondents at a UQU department were asked to give a rough estimate or give a percentage of the students who used electronic information services, they mentioned that the overwhelming majority of students did not use the electronic services. Respondents at KAU and KSU mentioned that most students used the computers but few of them used the Internet or E-mail. Respondents at KFUPM mentioned that a sizeable number of students in the departments used the electronic information services available in the university but no student graduates from the department without having used some form of electronic information service. Since at any particular time, the departments will have freshers that have just joined, a conservative estimate of 60% is reasonable.

All respondents offered some comments and suggestions for developing electronic information services in their departments such as:

- Provision of PCs with fast processors.
- Provision of Internet and E-mail.
- Students effectively trained by academic staff in the use of electronic services.
- Utilising the Intranet for teaching (e.g. homework).
- Access to national and international libraries worldwide.
- Full access to journals Online relevant to the departmental faculty.

6.5 Conclusion

This chapter has offered the results of the interviews carried out with personnel in the universities from the library administrations, with the librarians and with the heads of academic departments. The interviews were conducted with these three groups in order to discover the present state of the electronic services provided in the libraries, the systems in operation, problems and obstacles, and future developments.

A detailed analysis of the responses is given in this chapter, and a discussion of the interview issues is given in the next chapter, and recommendations, in the light of these responses, are offered in chapter Nine. However, the main points which emerged from the interviews were as follows:

All universities agreed that the funding that received was insufficient to keep up with rapidly changing developments in the technologies available to libraries. Those interviewed were well aware of the stages of development in electronic services reached by Western libraries since most had studied in the USA and / or the UK. All noticed, to varying degrees, the disparity between their own libraries and those of the West. All universities agreed that their own systems were insufficient and suggested that greater co-operation among libraries in Saudi Arabia would help to alleviate this difficulty.

Human resources was also widely viewed as use the existing resources effectively and it was generally recognised that attracting suitable personnel and then providing adequate and appropriate training was vitally important.
A more detailed discussion of the interviews is offered in the next chapter.

Chapter 7
Discussion of Interviews

7.1 Background

This chapter discusses the results of the interviews which were examined in the previous chapter. It contains, firstly, discussions regarding the interviews carried out with administration staff. The responses of two groups of administration interviewees were discussed: the directors of general budgets and planning and the directors of computer centres. The assistant director of general budgets and planning was at KAU. Further interviews were carried out with the directors of budgets and planning at UQU and at KFUPM.

At KAU, the director of the computer centre was interviewed, as was his counterpart at KFUPM. An interview at UQU was carried out with the director of the networking department, while at KSU this was carried out with the coordinator of networking. It was decided to interview senior personnel to see whether their present activities and their perceptions of the future differed significantly from those of academic staff and librarians. Secondly, problems with the managerial and electronic information services in their libraries were discussed with senior managers and directors, as well as their attitudes toward the electronic information services which were provided. They were also asked to outline their future needs. Thirdly, discussions were carried out with the heads of academic departments in order to discover what electronic services were provided to academic staff and students via departments and also the policy of departments regarding IT decisions and purchasing. They were also asked about training provided to academic staff and students via departments.

7.2 Administration

It is evident that the university administration plays a very important role in developing information services around the campuses of all the universities. It is therefore, necessary to discuss what university administrations provide to users covering various aspects such as networks, funding, library policies and future trends in order to ascertain if the university administration accomplishes its duty to, firstly, provide enough money to the library, secondly, to discover to what extent they support IT facilities in the university campus in general and in the library in particular and, thirdly, to identify if they organise training programmes to enhance the skills of students, academic and library staff.

7.2.1 Network system

It was found that systems at KSU and KFUPM were more advanced than those at UQU and KAU. Computer networks at KSU and KFUPM are connected with most sites within their universities. The coordinator of networking at KSU indicated that they have just supplied 3000 new points to connect academic staff, administration and laboratories. The director of the computer centre at KAU indicated that there are many sites on the university campus which need to be connected by computer networks such as academic departments. The situation at UQU is the same as KAU where the networking director indicated that there are some sites in the university campus which need to be connected through computer networks such as the faculty of Engineering. The results of the questionnaire and interview surveys found that the utilisation of networking at KFUPM was regarded as optimal among the universities. This reflects the fact that academic staff and students at KFUPM used networks on the campus more than staff and students at other universities, as was revealed by the questionnaire survey. The use of electronic services at KSU is not fully exploited because most undergraduate students were not allowed to access this facility. The use of electronic services at KFUPM however, was better than that at the other universities. The networks were used more at KFUPM for the following reasons:

- The administration at KFUPM (as mentioned previously), regarding ITC, encouraged all users to use this facility and provided each user with E-mail and Internet accounts.
- There are more training courses in ITC and in academic departments for both academic staff and students on how to use the latest technology in computer network facilities.
- At KFUPM there are more qualified staff than at other universities.

A lack of access to the network and qualified IT staff were seen as the major problems regarding the provision of effective services to users at UQU and KAU. The campus networks at KAU and UQU were in the initial stages of development and recently the UQU campus network has made considerable advances towards building up an effective network for all users.

The use of IT facilities in departments and laboratories at KAU was found to be deficient because no computer networks exist in these areas at present. All interviewees indicated that the lack of funding and the lack of qualified IT staff were regarded as major problems with regards to the provision of this service at the moment. The researcher understands that UQU and KAU universities will upgrade their computer networks this year or, at the latest, next year, especially since the majority of respondents across all departments indicated via the questionnaires, a wish to use the Internet.

7.2.2 Funding

The universities get their budgets from two sources. Firstly, financial support is received from the government. All university departments and faculties are asked to prepare and provide estimates of funding required to run their particular programmes. These estimates are then examined by the main funding committee before being put before a government committee. The government then decides on the annual allocation the university is allowed. Secondly, the government has recently allowed all universities to accept donations from the private sector in order to encourage private sector participation in developing the cycle of education and culture and to enhance services in the universities.

With regard to the libraries, all libraries get their budget from the university budget system under two categories: "Office Supplies and Equipment" and "Books and References". Directors of general budgets and planning indicated that the budgets which are allocated to libraries are not sufficient to acquire all the necessary IT equipment, such as PCs, or to allow the replacement or upgrading of the OPAC system, etc. Neither are they sufficient to meet the needs of user services, especially since, at the time of the survey, there were problems with the "Office Supplies and Equipment" category which allocated funds for equipment. Because the amount in the category was insufficient, KAU and KSU tried to get more funds from other areas such as their "Researching" budget in order to overcome the shortage of funds.

All directors of general budgets and planning indicated that the lack of funding is a major factor that affects their ability to keep up with the rapidly changing situation. The results of the survey show that KSU library had the most extensive budget, followed by that at KFUPM. The ratios of the whole population to the amount of budget at UQU, KAU, KSU, KFUPM libraries were 148:1, 140:1, 175:1 and 550:1 respectively. This reflects that the services provided by KFUPM library to their users are regarded as the best because of the amount spent on each library user.

7.2.3 Library policies

The coordinator of networking at KSU was asked if there was any overlap between the library and the computer centre. He indicated that the library database which exists in the computer centre was regarded as one of the problems which faces KSU library. In this case, the computer centre holds the main database and the library sends copies to the computer centre. This transmission of data from the library to the computer centre takes place at the beginning of each day, with updates to the computer centre database at the end of the day. The researcher believes that centralised computing in Saudi universities would be better than a decentralised system because centralised computing is generally cheaper and easier to maintain. This is particularly important since all academic libraries suffer from a lack of funding and IT professionals. The interview surveys with the

directors of general budgets and planning show that there is overlap between the electronic information tasks of the libraries and the computer centres. KAU and KSU university libraries have their own policies which are organised according to their requirements. For instance, KAU and KSU libraries preferred not to deal with the computer centre for maintenance and the purchasing of PCs etc. because they wished to be independent. Another difficulty which these libraries face is a technical one which revolves around the issue of hardware and software compatibility. A further obstacle, related to the previous one, is that these libraries lacked consultants who could deal with such technicalities and therefore, if there was a slight problem with any equipment, software or hardware, these libraries had to inform the vendor in order for repairs to be carried out.

Other university libraries, such as UQU and KFUPM, preferred to deal with computer centres and then the computer centres are responsible for supplies and maintenance. In this case, the computer centres will provide most of the electronic equipment which is needed by libraries. In addition, any equipment failure which occurs will be dealt with swiftly and this enables these libraries to provide more effective services. One of the major difficulties which these libraries face seems to be the lack of qualified IT staff in computer centres which can result in delay in a problem being rectified once it occurs.

The interviewees with the administrations show that none of these academic libraries had made any evaluative comparison between themselves and other Saudi academic libraries. The researcher believes that such an evaluation would clarify the strengths and the weaknesses of the library and then an administration could use this evidence to promote its services to provide more funds for the library. Co-operation with other libraries could also solve problems such as interlibrary loan. Co-operation among the libraries in Saudi universities is thought to be very important especially since all administrations in the universities (with the exception of KFUPM) confirmed that their libraries are still not providing successful electronic services. This evaluation did not come haphazardly since all of the administrators achieved their Ph.Ds from the United States or the United

Kingdom and thus they are aware of the kinds of electronic services provided in Western libraries.

7.2.4 Future trends

It was found from the interviews with the directors of computer centres that there are programmes which have been planned to enhance the electronic services on campuses or in libraries by such means as providing more terminals in libraries and accessing the Internet via laboratories. According to administrative interviewees, all universities provide training courses to academic staff but these may or may not be adequate to fulfil the needs of staff members. In order to ascertain whether these courses are suitable, it is necessary to know if users are informed that training programmes are available; what kinds of training courses are provided and whether or not these courses are effective.

7.3 Librarians

7.3.1 Background

It was decided to interview directors of libraries and senior managers in order to gain a real picture of the problems which these libraries faced and how staffing provided solutions to solve these obstacles.

The interviews with staff were carried out with the Dean of Library Affairs at KFUPM library while others were carried out with the directors of libraries at KAU and KSU. The supervisor of automation at UQU was also interviewed. Further interviews were carried out with the senior managers at all the universities especially the heads of such departments as user services, cataloguing and classification.

7.3.2 Staffing

It is necessary from the beginning to clarify the relationship between the entire user population and the number of staff in each academic library. The real picture of the present situation in these academic libraries must be understood in order to clarify the average number of service workers in each library compared with the users. The ratios of the whole user population and the amount of staff at UQU, KAU, KSU and KFUPM libraries were 304:1, 171:1, 193:1 and 204:1 respectively. This reflects that there is a clear shortage of staff at UQU particularly and also KFUPM, KSU and KAU libraries in that order. The interview survey shows that a lack of library professionals and qualified IT staff specifically, was regarded as a most serious problem which affected the provision of effective electronic services to users.

The interview survey shows that the largest staff population (180) and the largest budget (S.R. 6,087,549) from among the universities was at KSU library. These two factors might lead to the expectation that the electronic information services in this library would be comprehensive. Unfortunately, 36% of the respondents from the same university, which represents more than a quarter of the total sample, were dissatisfied with the services available in the library. This large percentage of academic staff and students who said they did not use KSU library illustrate that the library is not perceived to provide effective services. Interviewees at KSU and KFUPM libraries believed that the electronic services which were offered to users were effective when they were asked to evaluate the services which were provided. Few interviewees at KAU library believed that the electronic services which were offered to users were not effective while interviewees at UQU library strongly believed that electronic services need to expand, especially since only one electronic service (OPAC) is available in the library.

The supervisor of automation at UQU library confirmed this analysis when he indicated that a lack of staff in general and qualified staff in particular was regarded as the major problem facing UQU library. He mentioned that a lack of staff, and particularly qualified staff, delays, for example, the entering of library materials onto the database. The

researcher asserts that these two obstacles, without a doubt, affect user services. The researcher believes that finding ways to solve this problem, such as to provide overtime to library staff would be one way that this library could solve this matter. Another solution would be for the library to encourage the private sector to be involved with IT programmes providing systems such as the Arabian Advanced System in order to enter more data, especially since this company is the vendor of the HORIZON system in the Middle East area. The first solution, that of providing overtime for staff, depends on the support of the university administration but the second, the involvement of the private sector, could be carried out without real cost to the administration. However, the library itself would need to encourage the participation of the private sector. Having the smallest staff population and a lack of qualified staff means that the library needs to seek funding help from the university administration at UQU in order to provide more electronic services to users.

The interview results show that the staffing problem was found to be less serious at KFUPM than at the other university libraries. Most of the library staff are well trained, speak English more fluently than staff at other universities and they had more experience. Most of the librarians at KFUPM are non-Saudis such as Indians and Pakistanis. This researcher is of the opinion that the library will face difficulty concerning staff experience in the future, since one of the main goals of the last development plan was the replacement of non-Saudi manpower by Saudis. Library management will need to find a way to replace non-Saudis by recruiting and training new Saudi staff without affecting the services provided to users.

Another problem that all libraries faced, as mentioned by UQU, KAU and KSU interviewees, was a lack of prospects for promotion. They noted that this problem caused a sense of depression and frustration. All interviewees, when asked what promotion meant to them, clarified this as moving from lower grades to higher ones and getting a higher salary. In fact, the interviewees indicated that staff in libraries, even if they learn new skills and perform at significantly higher levels than previously, cannot advance unless library management find vacant positions to promote them. The director of the

library at KAU indicated that until a year ago the library did not carry out any training programmes. This makes many librarians in general and IT staff in particular consider moving from their libraries to achieve better positions and salaries. This was confirmed by the senior manager at KAU library.

In conclusion, because there are departments at KAU and KSU libraries which are responsible for the automation of all tasks in-house and also because there is a shortage of qualified IT staff in these two libraries, these two factors combine to prevent them from providing effective and efficient services. Staffing in general was seen as a definite concern that affected academic libraries. A lack of library professionals, and qualified IT staff specifically, was regarded as the most serious difficulty which affected the provision of effective electronic services to users.

7.3.3 Electronic information services

The interview survey showed that the DOBIS/LIBIS system which is used at KAU, KSU, and KFUPM libraries needs to be changed rather than up-graded. Senior managers at KAU and KFUPM libraries indicated that there are many deficiencies in this system, as mentioned in the last chapter. Interviewees at KFUPM library confirmed these results when they added that users encountered many problems when they used the DOBIS/LIBIS system. Problems included: users cannot gain direct access to the borrowing system, and accessing and using DOBIS/LIBIS is slow. The system lacks the features of a second generation system; it is old and outdated and is, as a result, inefficient. As a senior manager at KAU library indicated, the system needs regular database maintenance by an expert. He adds that it is very difficult to upgrade or install a new version of DOBIS/LIBIS if there is no IT professional with DOBIS experience. Another difficulty is that new computer science graduates have no experience of old systems and thus dealing with DOBIS will cause many difficulties, especially since computer science graduates want to learn SQL, ORACLE and language programming such as JAVA. There is a further reason for the difficulty in upgrading to new versions or releases of DOBIS. It is relatively easy to upgrade the English part of the system but it is

very difficult to upgrade the Arabic part. In short the library should not try to upgrade DOBIS if the required technical staff are not available and if the library has already made extensive changes to the system. This is one of the reasons that KSU and KFUPM are both still running DOBIS 1.4 while KAU runs the DOBIS 2.2. This reflects that there is a shortage of qualified IT staff at KSU and KFUPM libraries. A senior manager at KAU indicated that the other problem that faces the libraries with DOBIS/LIBIS, is that the vendor of the system (ELIAS) is located in Belgium and thus, there is no technical support in the library to run DOBIS/LIBIS; problems occur in the system which cannot be rectified in-house. Because of this, the library has to sign a maintenance contract with the DOBIS vendor who charges about 16,000 US dollars a year for the maintenance contract. He adds that the vendors do not have local support in Saudi Arabia, so they will try to help the library IT staff remotely as best they can. They will not send a technician out as part of this contract; for that the library has to pay extra.

Another senior manager at KFUPM library indicated that reductions in funding in the university, together with the maintenance costs of running the DOBIS/LIBIS system, which is higher than the current cost of a new system, should make the university strongly consider the replacement of their DOBIS/LIBIS system. He added that the library management today is considering moving to a new system such as HORIZON. A senior manager at KAU library went further when he indicated that the libraries which have DOBIS/LIBIS should purchase a new system which is appropriate for the 21st century in order to encourage users to access resources more easily and to provide them with access to the resources of many different libraries. He added that the system would enable them to find specific materials and to discover the range of documents available across different collections. These results confirmed that many senior managers were dissatisfied with the DOBIS/LIBIS system and thus changing the system is imperative.

The researcher believes that co-operation among academic libraries would be more efficient if they were to purchase a new system such as HORIZON because this has some advantages over DOBIS.

The supervisor of automation at UQU library indicated that the HORIZON system which is located in the UQU library is regarded as a second generation, as opposed to the DOBIS/LIBIS system. Most of the respondents (academic staff and students) had not evaluated HORIZON because use of the system had only just begun and users themselves had no prior experiences in order for them to evaluate it accurately. Senior managers at UQU library indicated that there was no problem with using the HORIZON system. They added that the only difficulty which faced library staff is the training on the system especially since it has been installed for only a short period.

All interviewees indicated that there is no lack of terminals in their libraries, despite the fact that most of the respondents (academic staff and students) indicated that there was a shortage of terminals for accessing the OPAC. This indicates that there is a lack of user awareness by librarians or there is no feed back via suggestion boxes or by interaction between users and the libraries to evaluate their services. The results with the interviewees show that there were 2, 35, 33 OPAC searching terminals at UQU, KSU, and KFUPM libraries respectively. Assuming that each user in every university used the OPAC searching terminal for one hour a day and the library is open 15 hours a day, the ratios of the whole user population to the amount of OPAC searching terminals at UQU, KSU, KFUPM libraries were 233:1, 66:1, and 19:1 respectively. The researcher believes that a lack of terminals certainly leads to frustration on the part of users and thus, the library from the start, is seen in a negative light, especially since the questionnaire surveys showed that most respondents used this service. The analysis did not mention KAU library because most of the university respondents were satisfied with the OPAC searching terminals in their library.

The interviews with the senior managers at KAU show that the library had the biggest collection of CD-ROM databases (except for UQU library which does not have this service) followed by KSU and KFUPM libraries. Most of the budget at KAU library (80%) has been spent on subscriptions of CD-ROM databases while 15% of the total budget of KFUPM was allocated to CD-ROM databases. The researcher believes that KAU library needs to reconsider its policy regarding CD-ROM databases because CD as

a medium is not tailored to store and retrieve large masses of digital data. In addition, the limited storage capacity and the high cost of offering multiple access to numerous CD-ROMs by using current network technology is another problem. It is necessary, therefore, for the library to moderate its spending on CD-ROM databases services especially since another medium such as DVD would be strongly desirable.

Furthermore, the interview with the senior manager at KSU library showed that the policy regarding CD-ROM databases should be changed. He indicated that the library did not allow undergraduate students to use the CD-ROM facilities because there is a lack of computers. He stressed that, in the future, if academic staff and postgraduates intend to obtain information on CD-ROM from outside the campus they must complete an existing form and send it to the automation department at the central library or branch libraries with a 3.5-inch floppy disk. The central library sends the research result the following day from the receipt of the order. This is a time-consuming process when it would be possible to use the system to carry out the order. The researcher believes that this policy should be reconsidered in order to facilitate obtaining the information especially since researchers deal with modern technology. All researchers should send their orders to the automation department by completing the specific form via the computer rather than going to the central or branch library.

Therefore, when considering all the points made in this section, it can be concluded that the case for the replacement of the DOBIS/LIBIS system at KAU, KSU and KFUPM is very persuasive. The lack of OPAC searching terminals needs to be remedied and UQU, KSU and KFUPM academic libraries should take the advice of their users and increase the number of terminals. The policy regarding CD-ROM databases at KSU library should be changed. Undergraduate students should be permitted to use this service especially since this library is regarded as having the largest collection from among Saudi academic university libraries.

7.3.4 User attitudes

The interview surveys showed that a lack of IT knowledge and inadequate skills in the English language were the most important problems encountered by academic staff and students in accessing electronic services. A senior manager at KAU library indicated that knowledge of English is regarded as the greatest stumbling-block for undergraduate students, especially since all CD-ROM databases are available in English. He indicated that the lack of IT knowledge applied to both academic staff and students. There are many academic staff at KAU who are hesitant to use the electronic services. The absence of IT knowledge refers to the fact that there is a shortage of appropriate IT training programmes for users and library staff. The researcher believed that the library, academic departments and computer centres should provide suitable training for this group in order to enhance their skills and make them more confident in using these services.

The interviews with senior managers in all academic libraries showed that the use of electronic services varied from one university to another. Undergraduate students at KFUPM library showed the heaviest use of all electronic services while undergraduate students at the other universities used the OPAC more heavily. Academic staff were regarded as the heaviest users of the other electronic services. The expectation might be that undergraduate students would use the electronic services more than academic staff according to the population of the university. A lack of user knowledge and qualified staff together with restrictions were regarded as the major problems that undergraduate students encountered in accessing electronic services.

The results of the survey indicate that all interviewees have methods such as questionnaires, suggestion boxes, interviews and user complaint procedures in use to obtain user feedback on services. Interviewees at UQU indicated that heads of departments to whom they are responsible followed up feedback personally. The researcher believes that the most effective solution was by discussing feedback on services with a specific committee that is responsible for improving the quality of services in the library rather than by feedback being discussed individually. The reason

for this is that it is possible to study the problem from all sides and provide suitable solutions to solve specific problems.

In conclusion, in order for all users to make the most of the library services that they are offered, suitable training should be made available. The views and needs of users need to be taken into account by obtaining and following up user feedback.

7.3.5 Productive co-operation

The survey interviews show that there is a lack of productive co-operation among university libraries. This occurs largely because there are no written rules among libraries on how to deal with each other and therefore, co-operation between libraries depends on the person who is responsible for providing this service.

The survey interviews show that the co-operation between Saudi University libraries depends on the system employed in each library. UQU deal with IMSU because the former university uses the same system (HORIZON) which is available at UQU library. The other university libraries co-operate with each other because all of them use the same system (DOBIS/LIBIS). Hence, the researcher believes that co-operation between universities would fulfill the need for consultation if there were any problems with a new system which might be installed in order to provide appropriate solutions. Co-operation in this field, without doubt, is seen as useful but it should be expanded to include all user services and not be confined to library services which only concern two libraries. The university library services did not indicate any actual services, such as the ILL service, on which all the libraries co-operate with each other.

Providing more electronic services to libraries will increase the demand for services to supply documents, such as CD-ROM network services. Therefore, co-operation between libraries is important in order to provide these documents. The shortage of qualified staff in these libraries is generally regarded as the other major problem which hinders improvement.

In conclusion, close co-operation among the libraries would provide widespread support and would also save on cost. However, to be useful, all library services should be included in the co-operation and the number of qualified staff needs to be increased to make co-operation and consultation viable.

7.4 Academic departments

7.4.1 Background

It was decided to interview heads of departments in order to gain a real picture of the use of the electronic services which are provided in these departments and how these departments train their users. Furthermore, these departments were chosen because they had computing laboratories. The interviews were carried out with the heads of Library and Information Studies departments at UQU, KAU and KSU while others were carried out with the heads of Geography departments at UQU and KAU. The head of the Social Service department at UQU was also interviewed and further interviews were carried out with the heads of Chemistry departments at KSU and KFUPM. Finally, the head of Chemical Engineering at KFUPM was also interviewed.

It is necessary from the beginning to clarify the policy of computer centres as regards academic departments in Saudi universities. Computer centres are responsible in all universities for the provision of any IT equipment (hardware and software) because the policies of the universities regarding the acquisition of equipment for academic departments are the same. This is done by making any request through the purchasing management. Usually, departments send their requests to the purchasing management who fulfil the needs of academic departments according to the availability of funds in the article which is called the university budget system. This covers all campus expenditure and is allocated after the computer centre chooses what it sees as most appropriate. In conclusion, none of the academic departments can buy their equipment separately. Moreover, requests may take a long time before being fulfilled by vendors. A further issue is the provision of spare parts which sometimes take six months to arrive.

Maintenance is another source of concern. It is known that all new equipment is under guarantee for one year. However, most of this equipment cannot be checked after this period due to a lack of funding and IT staff.

The results of the interview show that there is no purchase policy in academic departments which states who, within the departments, consults and decides about what IT products (e.g. hardware, software) are purchased. Some academic departments indicate that their director of departments is consulted regarding IT purchases while others indicate that a committee is responsible for this.

The results of the interviews show that academic staff at KFUPM used computer networks in departments more than staff at other universities. In fact, all departments at KFUPM used this facility very effectively to access services such as E-mail which enables them to disseminate information among themselves. Also, this permitted them to access information speedily, there being no need for paper-based copies. Furthermore, they had access to online services and the Internet. The head of the Chemical Engineering department at KFUPM added that it was not only academic staff who used the electronic services; the non-academics had E-mail addresses which were issued by the ITC.

The whole community at KFUPM (academic staff and students) used this facility very effectively due to the training courses which were provided by the ITC and to the nature of study which encouraged academic staff and students to gain more information whether for study or research work. The ITC is responsible for providing users (academic staff and students) with all the IT activities in their departments such as the OPAC, online services, computer networks and the Internet. In addition, it supports PCs in departments whether in computer laboratories or faculty offices. A barrier to progress regarding ITC is a lack of funding and qualified IT professionals.

Interview results show that most academic staff at KSU used computer networks in their departments for using E-mail and the Internet. All departments provide PCs to all academic staff in order to facilitate the accessing of these services. In addition, the head

of the Chemistry department indicated that his department usually tries to provide suitable software to academic staff in order to encourage them to use the latest technology and to meet their academic needs.

The head of Library and Information Studies indicated that there is a lack of adequate software which is available to academic staff. The discrepancy here indicates that some respondents realised what is available in the computer centre while others were uninformed and thus the policy of the computer centre is not clear to all respondents. The computer centre is responsible for the maintenance of all electronic services such as computer networks and the Internet which are provided to academic staff. The head of Library and Information Studies indicated that electronic services are not provided for students at present because there is a lack of funding, qualified IT staff and computer networks.

The situation at UQU was seen from the interview results as better than that at KAU. Academic departments at UQU have started to provide computer network facilities to academic staff. The university has invested in this facility by providing two PCs in each department for the use of the available services such as the Internet and E-mail. Many, in departments such as the departments of Sharia Law and Arabic, did not use computers because they were afraid of using these services, thinking that they were very difficult to use. Furthermore, the department did not provide training programmes on how to use these services or persuade academic staff to use these services. Many academic staff have learned to utilise these services by educating themselves or have been taught by friends. Despite the fact that the number of PCs are still insufficient, it indicates that UQU is making significant progress as, in the near future, all academic staff will have a PC in their office and so will be able to use computer networks more effectively. A lack of funding is regarded as the most important factor for not providing this service speedily; a lack of IT staff is also regarded as a significant obstacle.

The results of the interviews at UQU and KAU show that the existing IT (hardware, software) within their departments is inadequate in order to provide a good service to

members. Arabic software is important, especially in some departments where most academic staff have started to deal with computers or where they do not use computers at the moment. Providing Arabic software could encourage them to use computers and to ensure their smooth and efficient operation. The results of the survey show that there is no co-operation between computer centres and departments. The only tangible service which the computer centre provides to departments is for supporting departments when the mainframe computer on the academic side goes down. Departments usually coordinate with vendors. This is because the centres and their suppliers negotiate any maintenance contracts for their PCs and so, when any machines go down in departments, those departments contact vendors directly, without first contacting the computer centres which causes difficulties.

7.4.2 Users

The results of the survey show that the present situation in academic departments at UQU and KAU is the same. Not all undergraduate students use electronic services. A lack of funding and a lack of connection to computer networks both affect adversely the provision of effective services to users. Related to the lack of funding is the fact that many PCs and terminals, which are located in laboratory departments, were not fully up-to-date. In addition, most departments suffered from a shortage of IT equipment. All these obstacles, without doubt, reflect on users, as does the level of education in departments. In such an environment users do not use electronic services and are not computer-literate. Academic departments do not develop themselves and do not provide any future plans to teach users to use electronic services effectively because the infrastructure of the computer network does not exist and IT equipment is not available. Academic staff too are less likely to use electronic services because of a lack of IT equipment and this does not encourage them or the other users to utilise electronic services. Most users did not receive training on electronic services from departments. Some departments provided training for their users in department laboratories on how to use the computer. This was part of one or two courses on the syllabus. Training on the electronic services in departments was not provided for users.

Despite the fact that most users did not use electronic information services in their departments, the majority of universities actually indicated that they did. The reason for this apparent contradiction may be because many respondents simply confused the use of electronic information services with the use of computers in their departments.

Some academic departments at KSU have allowed postgraduate students to use electronic services such as E-mail and the Internet. All students' laboratories are already connected with the new computer networks in order to allow all users to use electronic services with ease. Not all academic departments allowed undergraduate students to use electronic services in their departments due to a lack of IT equipment, computer networks and a shortage of qualified IT staff. The use of computers in academic departments was confined to using word processors, as the head of Library and Information Studies mentioned. Recently, most departments are educating students by offering one or two courses in the use of computers for education.

The situation in the academic departments in KFUPM is completely different from that in the other university departments. All users in the academic departments used electronic services which are located in their departments, such as accessing the library catalogue (DOBIS/LIBIS), E-mail and the Internet. This use is at the same level which academic staff have demonstrated. The results of the survey show that all interviewees are satisfied with the existing IT (hardware, software) within their departments and feel that good services are provided to members.

The computer centre at KFUPM provides laboratory departments with support for the use of PCs. All laboratories have internal network services which are available to users through university-wide Intranet services while external network services are provided via the World Wide Web. In addition, some laboratories are working as stand-alone systems. There are two laboratories in academic departments, one dedicated to undergraduate students and the other used for teaching purposes. Despite the fact that users receive training on electronic services through ITC, academic departments provide seminars to users in order to teach them how to access and gain valuable information

from certain electronic services such as online. The policy of providing training courses in departments is to promote user skills and to teach users about the latest technology which has arrived in the departments or on the university campus.

The results of the interviews show that users at KFUPM used electronic services while academic departments in other universities did not use these facilities because these services were not available. The training courses which were available from ITC for academic staff at KFUPM, without doubt, increase the use of electronic services which are available in the departments and on the university campus. The other reason for the increased use of electronic services differs with regard to academic staff. Most academic staff are well trained and thus they encourage users to use these facilities more.

7.5 Training

It is important in the beginning to clarify that the layout of this section on training is different from those of the previous sections. The present situation regarding training is generally the same in all academic libraries covered in this work. The difficulties which face these academic libraries are also very similar and therefore it is possible to discuss the libraries comprehensively in this section. The most important issue here is the quality of the training programmes which are provided.

The interview results show that all university libraries indicated that there were training programme courses in their libraries. The results of the survey show that the main problem was that the quality of these courses was still insufficient to provide courses which would effectively promote user skills. A further difficulty which faces these libraries (with the exception of KFUPM) is that most undergraduate students did not deal with the available electronic services such as CD-ROM databases effectively, due to the fact they were not allowed to use this service and also because of the weakness of their English. Another problem which faces the libraries is that many academic staff did not attend the training courses which were available in the libraries. In this case, KAU library holds a number of training courses on the development of CD-ROM network databases in

all university faculties to clarify, for academic staff, what improvements have been carried out on the campus and how they can access these services remotely.

The researcher believes that academic libraries should evaluate the present situation in the universities and try to provide effective training courses at the right time and in suitable locations for relevant users. Libraries could inform all users by brochures or E-mail. It is possible to inform most academic staff at KSU and KFUPM through E-mail because most of them have computers in their offices. As for the students, all students at KFUPM could be informed by E-mail because they are the only students in Saudi universities who have an E-mail account at their university. A problem at UQU and KAU was that most academic staff and students did not have the opportunity to use E-mail due to the lack of a connection with a computer network for academic staff in laboratory departments. The other reason is that there is a shortage of computers in academic staff offices and laboratories.

One of the ways in which libraries could improve staff skills is for all libraries to make arrangements with the private sector such as IBM to provide new IT equipment for libraries. Then, it is important that sufficient time is allowed for training in order to educate library staff in the use of this new equipment.

Interview results show that all university libraries carried out in-house training courses for their staff and users on how to use the OPAC (with the exception of UQU library). The users' training programmes at UQU were limited to how to use the library while only library staff were trained how to use the OPAC. Although KAU and KSU offered limited training for undergraduates in the use of CD-ROM databases more should be available especially since many students in these two universities did not use this tool. KAU library, as mentioned previously, goes further than other libraries as it provides this service via seminars in each faculty for all academic staff in order to notify them about the latest electronic services available in the library. Although this is a useful service, it still reflects that library policy concentrates on providing this service to academic staff rather than undergraduate students.

The results of the interviews show that libraries did not send their staff abroad. This is largely due to the fact that it is very expensive and the libraries lack the necessary funding. Therefore, staff did not have an opportunity, firstly, to improve their English language which was regarded as one of the problems facing them. Secondly, they were unable to improve their skills which would enable them to deal with the new technology and, thirdly, to understand methods and developments in the Western universities. Fourthly, they could not learn to what extent Western libraries have developed and intend to develop their libraries in the future.

Electronic co-ordination between libraries is essential in order to upgrade staff skills such as online and E-mail. Also, staff need to visit other libraries to gain some knowledge of new electronic services and how these services are provided, especially if these libraries are close to each other, such as UQU and KAU.

One of the problems which faced all libraries is that there is a lack of IT consultants to train the staff and to provide maintenance for electronic services such as networks. Staff need training courses and should be encouraged to attend conferences and seminars inside and outside the Kingdom in order to keep them up to date with emerging trends.

Chapter 8

Relating the models to the results of the questionnaire and the interviews

8.1 Introduction

The two models used were introduced in Chapter 3 (Figure 3.2 and Figure 3.3). The information acquisition model can be used to represent the individual's information-seeking behaviour while the university organisational model (interaction) can be used to diagnose and study the electronic services' infrastructure used by a group of related organisations.

The information acquisition model uses the responses to the questionnaires and interviews with administrators, librarians and users to investigate both the needs of users and the facilities available to satisfy these needs. The university organisational model largely uses the interviews with administrators, librarians and heads of departments to consider the present state of IT in the libraries, together with plans and policies for future enhancement. The two models will be investigated to analyse if they are applicable to Saudi academic libraries. Testing the hypotheses described in the first chapter will be considered in the two models to check how valid these are when measured against the results of this study.

8.2 Model of information acquisition (Model 1)

The model (Chapter Three, Figure 3.2) concerns the behaviour and attitude of users toward the electronic services provided via academic libraries. The use of electronic information services in the academic libraries in Saudi Arabia is presented in the first model by user needs defined. Regarding input (user needs defined), the major resources used are OPAC (DOBIS/LIBIS and Horizon), CD-ROM databases, online, computer networks and the Internet. The results show that there are many deficiencies in the DOBIS/LIBIS system. Most respondents were not familiar with the system despite the

fact that this system has been used at KAU, KSU and KFUPM in their academic libraries for a long time. The results show that there are many problems in the DOBIS/LIBIS system such as it is difficult to retrieve Arabic materials, it cannot give direct access to the borrowing system, it is slow and it is not compatible with the Internet. This is strongly indicated by Basager (1995) and Khurshid (1998). The result of this will lead users to move on in the information acquisition model to information needs not met and thus, the attitudes and behaviour of users toward the library will be negative. The active information searching occurs when a user has some experience in dealing with electronic services. The user will not have a good experience if there are not effective training programmes available via libraries which, according to the research results, are often not provided. Library staff require these training programmes in order to satisfy their users needs. All these activities are represented in Model 1 by user needs defined. According to the Horizon system which is used at UQU library, it seems that the model will be applicable to the system despite the fact that their system has been recently installed and therefore no major data show the effectiveness of its use.

In the case of other electronic information services, such as CD-ROM databases, online, and Internet services, Model 1 would indicate that policies need to be reconsidered because the provision of these services to users are not efficient in all academic libraries bar KFUPM. In addition, restrictions are another issue that users face. For example, whether or not services should be provided only to certain groups of users. The results show that these electronic information services are not provided for undergraduate students in all the universities which were investigated (with the exception of KFUPM). These results did mentioned in the literature reviews because nobody in these universities treats this point. These services which are not provided to users because of restrictions, would be represented in Model 1 by information needs not met. This reflects that KFUPM users are better off than users at other universities. Referring to the model, these results lead to satisfaction. This reflects that most of the information feedback at KFUPM library is transferred to the information needs met in the information acquisition model. Once users have been successful in this way, they return to the user perception of needs in the same model and will be encouraged to use the system again. This was thoroughly

investigated by Kanamugire (1994) when he found that searches at KFUPM were increased when undergraduate students were allowed to use the CD-ROM services.

The behaviour and attitudes in Model 1 are represented by information-seeking behaviour. In the present research, 59 % of respondents at UQU library were dissatisfied with the electronic services provided by their library. 33% and 36% at KAU and KSU libraries respectively were dissatisfied with the electronic services provided by their libraries. The results show that users still have trouble in finding materials in the libraries due to a lack of IT knowledge or absence of computer networks. All these factual results would be represented in the first model by the information-seeking behaviour. This reflects that the feedback of the information acquisition model will be transferred to information needs not met and thus the attitudes of academic staff and students towards the library will be changed. The lowest rate of users who were dissatisfied with their electronic services (24%) appeared at KFUPM library which, in this case, shows that the information that users obtained from the library met their needs. The dissatisfaction of users which is represented in Model 1 by information needs not met reflects that the electronic information services which are provided to users are not provided effectively. This is also indicated by Ashoor and Kanamugire (1996) when they mentioned that 34% of the respondents at KFUPM were dissatisfied because of the non-availability of documents as well as delays in receiving documents ordered through inter-library loan. The dissatisfaction of users does not indicate a poor system response time, or poor system reliability but it may include, for instance, inaccurate information sources, an inadequate number of staff, or user access problems. In this case, the managers of academic libraries need, firstly, to examine the existing electronic services which they provide for users. Secondly, they must examine their policies regarding services and thirdly, they must consider how to pass on the appropriate knowledge to enable users to access these electronic services efficiently.

One of the sources of feedback of information needs not met in Model 1 which is represented by the user needs defined, as mentioned previously, is that library staff need to promote their own skills in order to provide effective electronic services to users. If

these factors are not addressed, without doubt, electronic services will be a failure in the information acquisition model. The behaviour and information needs of users, and the question of access, are regarded as the two most important factors for success. Success means that all electronic information services in academic libraries will function effectively. In the present model, which covers all the aspects that have been investigated, the information acquisition model will be applicable to Saudi university libraries.
The evaluation of electronic information services in academic libraries is presented in the first model by user needs defined. This evaluation leads to the recognition of attitudes and reactions towards these services; these are represented as information-seeking behaviour. The negative attitudes and reactions to DOBIS/LIBIS, such as not finding information successfully, will reflect that most of the information feedback at KAU, KSU and KFUPM libraries is transferred to the information needs not met in the information acquisition model. Thus, the DOBIS/LIBIS system which is located in these libraries needs to be replaced or up-graded.

The results from the literature review indicated that most academic libraries in developed countries used the OPAC system via the Internet. This allows most users to use this facility without any difficulty and this information will be transferred to the information needs met in the information acquisition model. Thus, the OPAC system in the universities will be used effectively.

The evaluation of the CD-ROM service is different from one university to another. The results show that KFUPM library evaluated this service by the co-ordination within academic departments which indicated that in the end, most KFUPM respondents were satisfied with the CD-ROM databases which were available in their library. This was identified by Ashoor and Kanamugire (1996) when they mentioned that 75% of the faculty and researchers were satisfied or very satisfied when they used CD-ROM services. This reflects that most of the information in the information acquisition model will be transferred to information needs met and thus, respondents who said they were satisfied with this service will be returned to the user perception of needs in the same model and will be encouraged to use the system again.

The results regarding the use of the CD-ROM service at KAU and KSU indicated that there is a lack of staff skills, a lack of knowledge about what is available in the CD-ROM database department, insufficient training for both academic staff and students, and restrictions. These problems will lead to dissatisfied users when using this service. The information in the acquisition model will lead to information needs not met which represents the negative attitudes towards this service in these two academic libraries. This strongly mentioned by Al-Suraihi and Gomosani (1997) when they recommended that KAU library should enhance their librarian's skills by attending conferences and training courses.

It was shown from the literature reviewed that most academic libraries in developed countries used this service by using computer networks. This service is provided to all users without any restriction and thus, all information in this area will be represented in the information acquisition model as information needs met; this in the end, will encourage users to use the system again.

The evaluation of the Internet in the academic libraries in Saudi Arabia is obvious because this service still not available (at the time of this investigation) in all academic libraries. This reflects that all information in the model will be transferred to the information needs not met and thus the attitudes to and behaviour regarding the library will be negative. The use of the Internet in the academic libraries in developed countries is completely different from that in developing countries, including Saudi Arabia. Most developed countries used the Internet which is represented in the information acquisition model as information needs met and thus, all users who deal with this service in these libraries will be satisfied with this service and will be therefore encouraged to use the system again. This strongly mentioned by Bao (1998) when he indicated that 80% of the respondents at Seton Hall University in New Jersey were used the Internet on a daily or weekly basis.

8.3 Model of university organisation (Model 2)

The organisational model (Chapter 3, Figure 3.3) gives an indication of how to cover the four variables (administration, users, library and computer centre). Thus, the information obtained is almost always triggered by a need related to the goals and objectives of the organisations. The interaction in this model was achieved through the four main variables inside the university campuses. The four variables cannot be isolated from each other because each one is connected with the others. Any problem in any of the variables will affect the other elements (online services, software, hardware, networking and training).

The computer centres (see organisational model) are responsible for the implementation, maintenance and operation of three important elements on the university campuses: software, hardware and networking. Computer centres need to implement and maintain these three elements. It was found that there is a shortage of software programmes in many departments. In fact, some departments did not know whether or not there was software in computer centres that could ensure the smooth and efficient operation of the computer departments. The policy of computer centres in all university departments is the same. Computer centres are responsible for providing all software and hardware to all academic departments and thus, academic departments were unable to purchase any equipment without consulting the computer centres. A lack of funding was regarded as another problem that all computer centres faced, especially since computer centres are responsible for providing all equipment to academic departments as was mentioned previously.

University administrations are the most important variable for providing libraries, computer centres and academic departments with necessary funds and for creating general aims to enhance the electronic information services on university campuses. This can be seen in the organisational model. The administration plays an important role in decision-making which supports users, the library and the computer centre. The results indicate that university administrations need to develop ways of providing effective services to users. Academic libraries and computer centres had trouble in getting enough

money from their administrations. There is no clear policy between the variables for them to deal with each other and thus, coordination and co-operation is lost. In fact, there is no clear policy for coordination and co-operation among universities in order for them to access each other efficiently.

The academic libraries, as seen in the organisational model, are responsible for providing online services such as OPAC, CD-ROM databases and the Internet. In addition, they are responsible for providing effective training for their clients. It was found that the online services which are provided by the academic libraries need to be developed. This development must increase with the provision of extensive training programmes for both users and library staff, especially since it was found that there is a lack of skill in users and also in library staff. Academic libraries and departments are responsible for providing these training programmes in order to provide useful services as the model shows. A lack of funding and a shortage of qualified library staff were regarded as two important factors for not providing effective electronic information services.

Respondents need to establish successful computer networks to communicate with each other on or off the campuses without any problems. The results show that a computer network was used very effectively in one of the academic universities investigated (KFUPM) while this service, in most cases, was not well established and is typically very limited and restricted. The importance of effective links between services is demonstrated in the organisational model. The results show that KFUPM and KSU demonstrate a more effective use of computer networks than UQU and KAU. Computer centres in the latter universities need to improve the telecommunications over all the campuses.

The results of the survey show that university administrations need to develop ways of providing effective services to users. Academic libraries and computer centres in all investigated universities had difficulty in getting enough money from administrations. There is no clear policy between variables to deal with each other and thus coordination and co-operation is lacking. In fact, there is no clear policy regarding coordination and co-operation among universities in order for them to access each other efficiently. In

view of the responses to the objectives, hypotheses, questionnaires and interview questions asked, the organisational model seems to be an efficient model to use in Saudi academic libraries.

8.4 Testing the hypotheses and relating to models

As part of the design of this study, a series of hypotheses were generated (see Chapter One) to explore the effect of the university administration and academic libraries on the electronic information services provided by academic libraries.

The hypotheses behind this research stemmed from information-seeking behaviour and the interaction models. All the hypotheses which were generated in the first chapter were proven by using the Chi-square test or by using the relationship between the two variables to be investigated.

The first hypothesis was proposed to examine if there is any discrepancy between the quality of the services which are offered by the different academic libraries. The Chi-square test shows that the use of electronic information services at KFUPM library associated significantly with the use of electronic information services at UQU, KAU and KSU libraries ($P < 0.01$, N=1977). It was found that KFUPM library provides more electronic information services to their users than other academic libraries. One of the main IT policies at KFUPM is to train undergraduate students and academic staff to access the electronic services on or off the campus.

It was clarified that there is a significant relationship between academic libraries and long-term planning. The results show that all academic libraries had long-term planning in order to enhance the electronic services in their libraries. It was found that there is no written planning in all libraries (with the exception of KSU library) to organise their future activities.

The effective use of electronic information services in academic libraries is directly associated with the users since the results of the Chi-square test shows that academic staff use electronic services more than undergraduate students ($P. < 0.01$, N=1977). This is

partly because some of these academic libraries do not allow undergraduates to use these facilities and also because many undergraduates have poor language skills in English. KFUPM is an exception to this. In addition, most academic staff have graduated from Western countries and thus they are familiar with using such services.

A lack of professional librarians and IT staff was found to be associated significantly with the academic libraries. All academic libraries suffer from a lack of professional librarians and this therefore reflects on the electronic services provided in these libraries. UQU library suffers from this problem more than the other academic libraries and thus there is a delay in entering documents onto their database. A lack of IT expertise is regarded as another problem that academic libraries faced. Poor salaries are regarded as the most important factor that persuaded IT professionals from joining academic libraries especially since they could get a better salary with more incentives from the private sector.

There was a considerable level of association between the university administration and the funding. On the basis of the results, it can be calculated that all academic libraries suffer from a lack of funding. Most librarians and some academic staff emphasised that academic libraries cannot provide efficient services to users without sufficient money. A lack of funding, without doubt, reflects on the provision of effective services. KFUPM library suffers less than other academic libraries when library funding is compared with the number of users in the universities (academic staff and students). This is because there were fewer users at KFUPM than at other academic libraries.

The results show that there is a significant association between academic libraries, and academic departments regarding training. The Chi-square results show that there is a lack of user training in these two variables (P. < 0.03, N=1977). Libraries at the moment do not provide any electronic formats in order to enhance the electronic skills of users, especially since many users prefer to collect these formats because they have not time to train in libraries. Therefore, many users do not know if a training programme was available in their library. No academic departments at UQU, KAU and KSU provide any

training to their students and academic staff. All students in departments study computers as one of the syllabus subjects. The results show that there is a lack of qualified IT staff in libraries and academic departments and this is reflected in their lack of provision of efficient training for users.

Chapter 9

Conclusions and recommendations

9.1 Introduction

This final chapter presents the main conclusions of the research work, which have been developed as a result of the interviews and questionnaires regarding the use and development of Saudi university libraries. The chapter also presents certain recommendations which concentrate on the objectives which were outlined at the very beginning of the thesis. These were:

1. To compare the range and level of electronic services in the academic libraries of the Kingdom.

2. To investigate the difficulties faced by academic staff and students in handling electronic information.

3. To investigate which groups of users make the greatest use of electronic information.

4. To investigate users' attitudes and reactions to electronic services.

5. To investigate to what extent library staff deal with information technology, and discover whether there is a specific plan to develop their skills.

6. To suggest ways of developing electronic information services in the academic libraries of the Kingdom which would improve the quality and delivery of these services.

7. To find out how, when and why academic libraries evaluate their services.

8. To study how electronic information services, such as OPAC, CD-ROM, databases, and the Internet, are changing in the academic libraries and to look for future trends.

9.2 Conclusions

From the results and analysis of the questionnaire surveys with students and academic staff and the interviews with administration personnel, librarians and heads of academic department, a number of conclusions have been drawn which will give rise to the recommendations offered later in this chapter.

It appears that Saudi universities will need to devote a good deal of time and effort in order to establish effective computer facilities and services on their campuses in order to encourage and enhance the use of computers and the electronic services that are provided.

This study has revealed a number of short-comings or inadequacies in the equipment and facilities provided in the university libraries. Firstly, there is a problem in most centres with the computer networks that are available either because access to these is limited in most institutions and, in some cases, the computer networks themselves are not sufficiently utilised as users lack the necessary skills to take full advantage of them. Access generally to electronic services was viewed as a problem as well as a shortage in provision of actual hardware such as terminals and PCs.

There were a number of references to the inadequacy or unsuitability of software. A great deal of software that is available to users is in English and students whose English language skills are poor are unable to make use of this or may be unable to access it at all. Other software was regarded as out of date or inadequate for users' needs. Furthermore, many collections were thought to be extremely limited, not offering students the breadth or depth of information they required.

Similar complaints were noted concerning the services that were offered in the libraries. Many users commented on the shortage of information on the OPAC since

often data was not entered in a timely fashion due to staff shortages or a lack of expertise. There were also difficulties in retrieving Arabic materials via the OPAC which led to user frustration.

Access to CD-ROMs was found to be limited in most university libraries and almost non-existent in one case. There were also problems, as previously mentioned, with the relevance and suitability of some of the material available and a lack of coherent policies regarding spending in this area resulted, in some cases, in the provision of unsuitable material. Some libraries appeared to be spending a good deal of money on CD-ROMs when they might consider more useful alternatives, such as DVDs. Problems with the English language caused difficulties here, too, since the majority of CD-ROMs are in English, not Arabic.

The Internet was almost non-existent in Saudi academic libraries at the time the surveys and interviews took place. It is more current now although some departments had access. Even so, most users were keen to see the expansion of this service which they regarded as an exciting and modern resource which could be of great use to them. They were also concerned to widen their access to other electronic services, such as online facilities and electronic interlibrary loan services which, at present, they felt were not easily accessed or which were difficult to make use of.

As well as problems regarding the services and facilities offered by academic libraries, the surveys highlighted a number of problems regarding staffing. It was evident that shortages in library staff were regarded widely as an obstacle to efforts to provide effective library services. General staff shortages were exacerbated by the lack of suitably qualified staff in particular. This resulted in a lack of satisfaction with the services provided when users found that staff were unable to help them, either because they were too busy or did not have sufficient skill themselves. Staff, too, in some cases, felt rather frustrated by the lack of opportunities for advancement. Often they felt that they were unable to attend training to improve their own expertise and had few opportunities for promotion.

Training, in general, was a source of concern. It was clear from the results of the questionnaires and interviews that users were often unable to make effective use of

the services and facilities that were available as they lacked the necessary skills and were not always offered suitable training in order to improve their expertise. The provision of orientation programmes and training in the use of the library services was patchy and usually very traditional in nature. On occasions, where training was available, publicity was poor and users were unaware of it.

Staff training, too, was felt by many respondents to be inadequate in both quantity and quality. Few universities sent their staff abroad and often there were insufficient staff members who held suitable qualifications to man the services efficiently.

Certain difficulties which were made apparent from the results of this study originated from the lack of cohesive policy-making in some of the universities concerned. There was little or no co-operation between libraries when efforts made to co-ordinate efforts could result in the provision of more efficient services at lower costs. Many academic departments were unable to make purchases freely but had, instead, to work through a cumbersome process to improve their stock and faculties. Maintenance was also a problem with arrangements lacking any sense of cohesion or co-ordination; some libraries contacted outside vendors for support, others their computer centres.

Finally, the over-riding conclusion that can be drawn from the study is that many of the problems and difficulties which are faced by the academic libraries result from a lack of appropriate funding. A common reason given for the problems outlined above, such as poor facilities, inadequate opportunities for training and staff shortage, was that there was simply insufficient financial support and that, with judicious increases in funding, many of the difficulties perceived by respondents could be ameliorated.
The conclusions outlined above give rise directly to the recommendations below which comprise the final section of this thesis.

9.3 Recommendations

The aim of these recommendations is to suggest means of avoiding obstacles to the provision of electronic information services. These obstacles are discussed in Chapters Five and Seven and they are related to difficulties in providing services to

users. The recommendations outlined here concentrate on the major objectives of this work, as explained in the first chapter.

9.3.1 Overcoming computer network problems

Access to a computer network is the most important service for users. Universities need to support this idea by providing more funds. The computer centre needs to develop a campus network system to provide effective electronic services to users whether on or off campuses. Universities need to encourage students as well as academic staff to use the computer network. Therefore, university administrations, computer centres and academic departments need to liaise in order to find the means to provide this service and in order to make all users capable of accessing national and international information sources and services. Providing fully computerised networks to users, without doubt, would encourage them to use electronic services such as the OPAC, CD-ROM databases, online and the Internet which are available in their libraries. These can be used to ensure effective and efficient access to data whether in the present or the future.

9.3.2 Overcoming funding regulations

Universities need to diversify their financial resources and income, especially since all universities suffer from a lack of money. The private sector should be encouraged to participate, whether by offering donations or funding research projects.

9.3.3 Overcoming obstacles to the use of university computers

The results of this study indicate that there are weaknesses in using computers from one university to another. It was found that familiarity with computers depended, to a certain extent, on how available they were for use. Universities which faced this problem should provide more PCs in departments and laboratories to both academic staff and students in order to develop their skills and allow them to utilise the electronic services available on their campuses.

UQU should continue to provide more PCs to academic staff in order to encourage them to use computers, as mentioned previously, and to use the Internet service which, without doubt, would help to get more valuable content information that would help them in the education process. Despite the fact that most respondents at KAU had used computers before, KAU, at present, did not provide this service to users due to the lack of network connections. KAU must find a way of providing computer networks for each academic staff desk and all students laboratories.

9.3.4 Overcoming obstacles to the use of the OPAC

A lack of terminals was one of the major problems in the libraries; in institutions where there was limited access, the use was similarly limited. So, library management should add more terminals in their libraries to facilitate searching for users, to encourage users to return to libraries and to find the most effective way of using library materials. In spite of the fact that the DOBIS/LIBIS system has been used at KAU, KSU, and KFUPM libraries for a long period, there are still difficulties in using it. There are many deficiencies in the system and thus libraries should replace it and provide a new system that all users could deal with easily. At the same time, the new system should be compatible with the new generation of networks such as the Internet. The OPAC was heavily used but this was largely because this was the only tool available. However, the system was widely regarded as old-fashioned. Even so, some universities felt that access was inadequate and more terminals were needed.

The situation at UQU library is the same. The library needs to add more terminals, especially since respondents indicated that there were only two terminals in the library. Also, UQU library should inform all users about the new system (HORIZON). The library needs to think of providing alternative ways to solve the problems of entering data in the system, such as accelerating the process for entering more data by dealing with the private sector.

9.3.5 Overcoming obstacles to the use of CD-ROMs

KSU should allow students, as well as academic staff, to use the CD-ROM databases. In addition, this university could encourage the use of the library by offering IT

services for improving scientific research. All libraries should coordinate with departments in order to select which CD-ROM databases would be most useful for users' departments. The survey suggested that most respondents were keen to use CD-ROMs but many had very limited or no access to collections. Many of those who did have access were dissatisfied with collections and / or services. Lack of training, staff skills and funding were again a problem.

UQU should provide a CD-ROM laboratory, especially since there are demands from academic staff in the university to provide this service. These demands come from departments such as the Social Sciences, Engineering and Medicine. At the same time, UQU library should start from the point that other developed libraries have reached, in order to, first, provide good quality services, and second, provide prompt access to current information.

9.3.6 Overcoming obstacles to the use of the Internet

The results of the survey indicate that an Internet service was not provided for students at this time at UQU, KAU and KSU (with the exception of KFUPM). In order to encourage a greater use of the Internet, these universities must find a way of providing the Internet service to all students. Most respondents did not have the opportunity to use the Internet in their universities though this is viewed by this researcher as an essential future facility. When using the Internet, a shortage of IT qualifications, weakness in the ability to use English and restrictions in access, were all viewed as problems.

9.3.7 Overcoming obstacles to the use of other electronic services

Greater accessibility to services such as networks online services and inter library loan were in demand, as was the necessity for these services to be faster and more efficient. The researcher recommends that libraries should deliver documents via fax, E-mail and online for the sake of providing an effective service to users. The researcher, in addition, feels that libraries should cooperate with each other by improving interlibrary loan (ILL) services to allow users to gain more information

effectively, quickly and in a timely fashion. Investment in services is necessary if users' expectations are to be in any way met.

9.3.8 Overcoming staffing obstacles

In order to solve the weaknesses in the services (especially in computing) which these libraries face because of the lack of professional IT staff, new staff are needed with a knowledge of network management, interface design and software development. Such personnel could then up-date existing library staff and educate users on the latest technology in the area of public services to deal with digital cataloguing and metadata (Ashoor, 2000).

Most university libraries did not have qualified staff. KFUPM library experienced fewer difficulties in this area because most library staff are foreigners, as was mentioned previously. KFUPM library should therefore recruit new Saudi staff and it should train those staff by providing appropriate training programmes to improve their skills.

9.3.9 Changing policies

Policies regarding universities' purchasing should be changed, especially since the computer centre is the only area responsible for providing IT equipment to academic departments. In fact, most of these departments suffer from a lack of IT equipment and software applications. So, universities should establish a committee of departmental users and computer centres. This committee should have a representative from each university department in order to look at IT policies in terms of hardware, software, networks, and electronic services in their academic departments. A representative from the computer centre should be selected in order to evaluate the IT equipment and assess if there are any deficiencies or ascertain if needs are not compatible with the IT equipment available on the university campus. This committee should be at one of the top levels of administration in order to make final decisions and provide what IT equipment is necessary for each department. In this case, universities should create a new position for one person who is well- educated in the IT field, such as a Vice President. At present, IT duties are fulfilled in some

universities by a Vice President while at others, such duties are carried out by the Vice President for Graduate Studies and Scientific Research.

A lack of funding is regarded as the major problem that all academic libraries face. The universities should lobby the Finance Ministry to argue for a change in the regulations to allow libraries to generate their own revenue in order to enhance existing services. University administrations should realise the role which the academic library plays, whether inside or outside the university community. They must know that there is a change in the mentality of the whole community; the library of today has become an information centre which is indispensable. University administrations must allocate enough money to their libraries to support this orientation.

KSU library should change its policy and provide academic staff and postgraduate students with feedback regarding CD-ROM databases through computers rather than by filling in forms when they intend to obtain content information from outside the campus. This service should be adapted in order to guarantee a fast and easy way of obtaining content information. In addition, the library should allow undergraduate students, as well as other researchers, to access remotely because at the moment, undergraduate students are not allowed to access this facility.

Libraries need to develop coordination and co-operation among each other by issuing written rules for how and what kind of electronic materials could be accessed. Policies for co-operation between university libraries should be improved, especially since co-operation today will be more efficient than before with the development of electronic services which has made access easy through the Internet. Coordination in this case is essential especially since each library could subscribe to some CD-ROM databases to which others need not then subscribe.

Libraries need to change their policies in dealing with computer centres. University administrations should issue written rules to clarify the relationship between computer centres and libraries in order, finally, to provide effective services to users.

9.3.10 Overcoming training problems

Academic libraries must promote staff and users by providing appropriate training in order to develop their skills. University administrations must invest and allocate enough funding for training locally and abroad. They must carry out IT planning in order to enhance library staff skills. Staff who are interested in dealing with IT must be trained appropriately in basic IT skills. They must upgrade their knowledge on how to deal with electronic services such as CD-ROM databases, online, E-mail and Internet-searching.

Computer centres and libraries should be involved in developing and supporting the provision of special training programmes to academic staff and students to increase awareness in order to utilise the available electronic information services in these universities. Training was generally regarded as traditional and it was clear that both staff and users required more effective and up to date training programmes. Training programmes should be provided on weekdays and also at weekends to give students the opportunity to choose which time is most suitable for them. Libraries should evaluate their services to get feedback about their effectiveness and the extent to which objectives were met. They must gather the information required to assess the need for providing continued services to users. There is an important issue here, which should be considered by Saudi university library managements. New skills are required by staff in the libraries to ensure that they remain up to date to cope with any user who requires information. At the same time, they will need to provide greater support for users, some of whom may be remote or have problems with learning. Qari (1999) emphasised that libraries require training programmes to support the implementation and use of IT. All students who enter university will at least have some sort of acquaintance with computers, however tenuous. The "old" ways of confining students to one area of training must be changed as students need comprehensive training for work within the home, the classroom, the laboratory and the library.

The method for informing users about training in universities should be changed. All users (academic staff and students) should be informed in plenty of time of training courses. This should be done by E-mail within universities which are using this

facility or by leaflets within universities which do not use E-mail. Computer centres need to clarify with users what subjects are most important to them by distributing questionnaires or carrying out interviews in order to guarantee that many users will attend these courses. Hence, training courses need to fit the needs of all users in order to train beginners or professionals.

Computer centres, academic departments and university libraries should provide proper training programmes to users (academic staff and students). These should be more radical than merely teaching users how to use computers. They should cover how users can employ electronic services such as gaining access to the OPAC, online, CD-ROM databases and the Internet and how they can get valuable information from these facilities. In this way, they can improve the use of electronic services.

In such cases, the computer centre needs to be instrumental in providing these applications to all departments in order to encourage and facilitate the use of electronic services.

Full use of technology will not be established if there is no effective coordination and co-operation between libraries and Administration Institutions. Accessing among libraries will be easier and more speedy, especially since universities in Saudi Arabia such as UQU and KFUPM, for example, are located, in some cases, far a way from each other.

9.4 Marketing of libraries services

Marketing can be described simply as satisfying users' needs to allocate resources more effectively. These needs will arise from two major conditions: funds and training. These two factors combine with each other. It is now common knowledge that new technology in the libraries does not necessarily provide useful services. Furthermore, it has been confirmed that this technology will not convert these libraries into successful ones unless their staff and users are trained in order to retrieve the information more easily and quickly. The marketing here must concentrate on how to deliver a range of services to users without them going to libraries. In another

words, technologies can bring the library to the users. The most difficult job in academic libraries today is to convince the university administration that an effective information service is worth the money. In such a case, libraries should keep user statistics on facilities such as OPAC, CD-ROM, Online and the Internet in order to convince university administrations of the value of the library services. Libraries also need to market their services such as establishing a home page to encourage all users to use all the electronic facilities which are available through the Internet. Plus, they should advertise what other services are provided such as names and telephone numbers of those to contact, the description of training courses which they could offer, such as lectures, seminars, workshops, microlabs, etc.

Finally, providing effective marketing of library services in academic libraries without doubt will increase the use of electronic services which are available in these libraries and thus they can raise their profile and demonstrate their value to the educational process.

9.5 Changing technologies

It is indisputable that changes in technology are accelerating and therefore it is impossible to predict what is going to happen in the future. This affects libraries without doubt. Yesterday, libraries accessed OPACs through terminals while today most of developed countries access them through the Internet. Saudi academic libraries need to replace their OPAC systems to be compatible with the Internet in order to provide this facility to their users.

Most Saudi academic libraries depend on CD-ROM databases which as the time of writing, has the edge in market penetration. As far as changing technologies are concerned a new high-capacity CD was developed in late 1995 called DVD (Digital Versatile or Digital VideoDisk). It has a storage capacity which exceeds a conventional CD-ROM. In conclusion, optical disk technology such as CD-ROMs and DVDs have played an important role in the communication revolution. As more information is generated, these disks serve as effective storage and distribution media.

They are also cost effective and can accommodate a range of applications which, in the near future, might change.

Saudi academic libraries should depend on the Internet especially since most electronic services could be accessed through it. The Internet is an evolving network which means that most users can retrieve information around the world, 24 hours a day.

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Questionnaire

Dear Participant

This survey concerns your personal opinion about the use of electronic information services in academic libraries in Saudi Arabia. The information that you provide relates to your own library, so the more information you supply, the more benefit this research will be for your library.

Please complete the attached questionnaire at your convenience. There is no need to write your name when you complete this questionnaire, as this survey only requires anonymous responses.

I would like to confirm the confidentiality of the research study, and that your response will only be used for academic purposes. I would like to thank you for your time and your effort.

Would you kindly return your questionnaire as soon as possible to the circulation desk at your college library, or to the reference section at the central library.

Yours sincerely

Mohammed A. Basager
Department of Information Science
Loughborough University

USE OF ELECTRONIC INFORMATION QUESTIONNAIRE

Please fill in brief answers alongside the questions or tick the appropriate box(es). (Some questions may allow you to tick more than one box).

1. Personal Record

a) Faculty ..... b) Department .....

c) Age:
- Under 23 years old ☐ • Between 24 to 30 ☐ • Between 31 to 40 ☐
- Between 41 to 50 ☐ • Over 50 years ☐

d) Position:
- Professor ☐ • Associate Professor ☐ • Assistant Professor ☐
- Lecturer ☐ • Postgraduate ☐ • Undergraduate ☐

e) When did you get your last degree?
- Before 1975 ☐ • Between 1976 & 1985 ☐ • Between 1986 & 1995 ☐
- After 1995 ☐ • Not yet ☐

2. Have you ever used a computer(s)?
Yes ☐ No ☐

* If the answer is 'No' please go to question No. 5 *

3. How long have you been using a computer(s)?
- Less than one year ☐ • From one to five years ☐ • More than five years ☐

4. How often do you use a computer(s)?
- Daily ☐ • At least once every week ☐ • At least once a month ☐
- At least once every 3 months ☐ • Rarely / Never ☐

Use of your university library

5. How often do you use the library?
- Daily ☐ • At least once every week ☐ • At least once a month ☐
- At least once every 3 months ☐ • Rarely / Never ☐

6. What searching tool(s) have you used for looking for materials in the library?
- Card Catalogue ☐ • OPAC* ☐ • CD-ROM ☐
- All of them ☐ • Others ☐ • None ☐

7. Which tool(s) do you prefer to use for searching for library materials?
- Card catalogue ☐ • OPAC ☐ • CD-ROM ☐
- Other (please specify).....

8. Which tool(s) of these gives you most information?
- Card catalogue ☐ • OPAC ☐ • CD-ROM ☐
- Other (please specify).....

*** (OPAC) Online Public Access Catalogue**

9. For what reasons do you select this main tool(s)?

- Know it ☐
- Quickness of retrieving ☐
- Ease of use ☐
- Other ☐

* If you do not use the OPAC, please go to question No.14 *

Use of OPAC

10. How often do you use the OPAC?

- At least once every week ☐
- At least once every month ☐
- At least once every 3 months ☐
- Rarely / Never ☐

11.What do you think of the amount of information provided by the OPAC?

- Too much ☐
- Acceptable ☐
- Too little ☐

12. How easy is the OPAC system to use?

- Easy ☐
- Fairly easy ☐
- Difficult ☐

13. Do you think the number of OPAC terminals in the library are enough to prevent delay when you attempt to access the OPAC?

Yes ☐ No ☐

Use of CD-ROM

14. Do you use the CD-ROM service, which is available in the library?

Yes ☐ No ☐

15. If the answer is 'No', what are your reasons? (Please tick the most important reason)

- Have not heard about it ☐
- Difficulties of using ☐
- There is no database in my field ☐
- Other (please specify)……

* If you do not use CD-ROM, please go to question No. 22 *

16. How often do you use this service?

- At least once every month ☐
- At least once every 3 months ☐
- At least once every 6 months ☐
- Rarely / Never ☐

17. Did you always find a convenient time when you wanted to book the CD-ROM?

Yes ☐ No ☐

18. How long do you have to wait to consult a CD- ROM?

- On the same day ☐
- From 1 to 3 days ☐
- From 4 to 7 days ☐
- Over one week ☐

19. Do you think the number of CD-ROM workstations in the library is sufficient for the number of users?

Yes ☐ No ☐ I do not Know ☐

20. How do you rate the CD-ROM service?

- Good ☐
- Acceptable ☐
- Poor ☐

21. Did you give the above answer because? (Please tick the most important reason)

- You found several CD-ROMs relevant to your topic ☐
- Help is available from library staff ☐
- You did not find any CD-ROMs relevant to your topic ☐
- Help is not available from library staff ☐

Use of Internet

22. Have you used the Internet services?

Yes ☐ No ☐

* If the answer is "No" please go to question No. 26 *

23. Did you use the Internet?

- In the library ☐
- Elsewhere ☐

24. Did you find it useful?

Yes ☐ No ☐

25. How do you rate the information you get from the Internet?

- Too much ☐
- Acceptable ☐
- Too little ☐

Electronic sources of information

26. Is there any sort of databases you cannot access through the library that you would like to access?

Yes ☐ No ☐

27. If the answer is 'Yes', which sort of database(s) you would you like access?

(Please specify).....

28. Do you access through KACST?

Yes ☐ No ☐

* If the answer is 'No' please go to question No. 30 *

29. If the answer is 'Yes' how did you access?

- From the library ☐
- Outside the library ☐

30. How did you rate the information you got from KACST?

- Too much ☐
- Acceptable ☐
- Too little ☐

31. How did you learn to use electronic services? (Please tick the most important reason)

- Assisted by a member of library staff ☐
- Through trial and error (self-taught) ☐
- Friends/colleagues ☐
- Other (please specify).....

32. Do you ever feel that you need help while you are using the electronic services in the library?

Yes ☐ No ☐

33. Is there a training programme available in the library for electronic services?

Yes ☐ No ☐ I do not Know ☐

34. Did you ever attend a training programme from the library to help you use its electronic services?
Yes ☐ No ☐

* If the answer is 'No' please go to question No. 36 *

35. If the answer is 'Yes' how do you assess this programme?
• Good ☐ • Acceptable ☐ • Poor ☐

36. What other kind(s) of assistance do library staff provide?
• Lecture ☐ • Workshop ☐ • Tutorial on a floppy disk ☐
• E-mail ☐ • Information desk ☐ • Other (please specify).....

37. How do you rate the electronic services in the library for acquiring the information you need?
• Important ☐ • Fairly important ☐ • Not important ☐

38. Do you want further expansion to provide more electronic services?
Yes ☐ No ☐

39. If the answer is 'Yes' which of these electronic services do you prefer?
• Online-reference services ☐ • Networks ☐ • Micro labs ☐
• Document delivery services ☐ • Others.....

40. Do you prefer to access these services via the library staff or directly by yourself?
• Via library staff ☐ • Myself ☐ • Both ☐

41. Have you used another academic library (or libraries)?
Yes ☐ No ☐

* If the answer is ' No' please go to question No. 44 *

42. How did you rate the electronic services in that library?
• Good ☐ • Acceptable ☐ • Poor ☐

43. How do the electronic information services in your library compare with those in the other academic library?
• Better ☐ • The same ☐ • Worse ☐

44. Would you like to add any suggestions or comments that might contribute to the development of Electronic Information Services in your library?

.....

.....

Thank you for your co-operation
After your fill in the questionnaire, Could you please return it to the Circulation desk at your College library, or to the Reference section at the Central library.
Or send it to:
Mohammed A. Basager
P.O. Box 11033 Jeddah 21453
Saudi Arabia

خدمات المعلومات الإلكترونية في المكتبات الأكاديمية

عزيزي المشارك

تحية طيبة وبعد :-

هذا الاستبيان سيبين آرائك الشخصية في استخدام الخدمات الإلكترونية في مكتبة جامعتك، كما سيقدم معلومات بخصوص هذه الخدمات، وكيفية تقييمها، وما هي الصعوبات التي تواجهك عند استخدامها.

وسوف تستخدم المعلومات التي سيتم جمعها من هذا الاستبيان بعد معالجتها، في إجراء بحث لنيل درجة الدكتوراه. والأمل معقود على أن تسهم نتائج هذا البحث في تحسين الخدمات التي سوف تقدم لك ولمكتبتك.

أرجو التفضل بتعبئة الاستبيان المرفق بدقة والذي لن يستغرق اكثر من عشر دقائق.

ولا داعي لذكر الاسم عند تعبئة الاستبيان، مع رجاء تسليم الاستبيان بعد الانتهاء من تعبئته لخدمات الإعارة في مكتبة كليتكم أو في قسم المراجع بالمكتبة المركزية وذلك بأسرع وقت ممكن.

ومع شكري وتقديري الخالص لتعاونكم أود أن أؤكد لكم حرصي على المحافظة على سرية إجاباتكم لأنها سوف تستخدم فقط للأغراض الأكاديمية.

والله الموفق

الباحث

محمد احمد باصقر

قسم علوم المعلومات

جامعة لفبرا

استبيان عن خدمات المعلومات الإلكترونية في المكتبات الأكاديمية

فضلا أجب على الأسئلة الآتية بوضع علامة ☐ داخل المربع أمام العبارة المناسبة
(رجاء ا بعض الأسئلة تحتاج منك للتأشير عليها في أكثر من مربع)

1- المعلومات الشخصية

أ- الكلية..... ب- القسم.....

ج- العمر

- أقل من 23 سنة ☐
- بين 24- 30 سنة ☐
- بين31 - 40 سنة ☐
- بين 41- 50 سنة ☐
- أعلى من 50 سنة ☐

د- الوظيفة

- أستاذ ☐
- أستاذ مشارك ☐
- أستاذ مساعد ☐
- محاضر ☐
- طالب دراسات عليا ☐
- طالب بكالوريوس ☐

2- هل استخدمت الحاسب الآلي من قبل ؟

نعم ☐ لا ☐

إذا كانت الإجابة " لا " الرجاء التوجه إلى سؤال رقم 5

3 - كم سنة وأنت تستخدم الحاسب الآلي ؟

- أقل من سنة ☐
- من سنة إلى 5 سنوات ☐
- اكثر من 5 سنوات ☐

4 - كم مرة في العادة تستخدم الحاسب الآلي ؟

- يوميا ☐
- على الأقل مرة في الأسبوع ☐
- على الأقل مرة في الشهر ☐
- على الأقل مرة كل 3 أشهر ☐
- نادرا / إطلاقا ☐

استخدام مكتبة الجامعة

5 - كم مرة في العادة تستخدم مكتبة الجامعة ؟

- يوميا ☐
- على الأقل مرة في الأسبوع ☐
- على الأقل مرة في الشهر ☐
- على الأقل مرة كل 3 أشهر ☐
- نادرا / إطلاقا ☐

6 - ما هي أدوات البحث التي تستخدمها عند استخراج المواد من المكتبة ؟

- الفهرس البطاقي ☐
- الفهرس الآلي ☐
- أقراص الليزر CD-ROM ☐
- جميعهم ☐
- أدوات أخرى ☐
- لاشيء ☐

7- أي أدوات من هذه تفضل أن تستخدمها عند البحث عن المواد في المكتبة ؟

- الفهرس البطاقي ☐
- الفهرس الآلي ☐
- أقراص الليزر CD-ROM ☐
- أدوات أخرى (الرجاء حدد) .....

8 - أي هذه الأدوات توفر لك أكثر المعلومات ؟

- الفهرس البطاقي ☐
- الفهرس الآلي ☐
- أقراص الليزر CD-ROM ☐
- أدوات أخرى (الرجاء حدد).....

9 - ما السبب في اختيارك هذه الأداة ؟

- المعرفة بها ☐
- السرعة في الاسترجاع ☐
- السهولة في الاستخدام ☐
- أشياء أخرى (الرجاء حدد).....

استخدام الفهرس الآلي

10- كم مرة في العادة تستخدم الفهرس الآلي ؟

- على الأقل مرة في الأسبوع ☐
- على الأقل مرة في الشهر ☐
- على الأقل مرة كل 3 أشهر ☐
- نادراً / إطلاقاً ☐

11 - ما رأيك بكمية المعلومات التي تحصل عليها باستخدام الفهرس الآلي ؟

- كثيرة جداً ☐
- مرضية ☐
- قليلة جداً ☐

12 - هل الفهرس الآلي سهل الاستخدام ؟

- سهل ☐
- إلى حد ما سهل ☐
- صعب ☐

13 - هل تعتقد بأن عدد النهايات الطرفية في المكتبة كاف حتى لا يتم التزاحم والانتظار ؟

نعم ☐ لا ☐

استخدام أقراص الليزر CD-ROM

14- هل استخدمت (جرّبت) خدمة البحث في قواعد المعلومات على أقراص الليزرCD-ROM المتوفرة في المكتبة ؟

نعم ☐ لا ☐

15- إذا كانت الإجابة "لا " ما هو السبب في ذلك ؟ (الرجاء ضع علامة على أهم سبب)

- لم أسمع بها من قبل ☐
- لا توجد أي قاعدة معلومات في تخصصي ☐
- الصعوبة في الاستخدام ☐
- أخرى (الرجاء حدد) .....

إذا لم تستخدم خدمة البحث في قواعد المعلومات على أقرص الليزر CD-ROM الرجاء التوجه إلى سؤال رقم 22

16 - كم مرة في العادة تستخدم هذه الخدمة ؟

- على الأقل مرة في الشهر ☐
- على الأقل مرة كل 3 أشهر ☐
- على الأقل مرة كل 6 أشهر ☐
- نادرا / إطلاقا ☐

17- هل تستطيع استخدام خدمة البحث في قواعد المعلومات على أقراص الليزر CD-ROM في الوقت الذي يناسبك ؟

نعم ☐ لا ☐

18- ما هي أطول مدة انتظرتها حتى تتمكن من البحث في قواعد المعلومات على أقراص الليزر CD-ROM ؟

- في نفس اليوم ☐
- من يوم إلى 3 أشهر ☐
- من 4 إلى 7 أيام ☐
- بعد أسبوع ☐

19- هل تعتقد بأن عدد الأجهزة المتاحة لخدمة البحث في قواعد المعلومات على أقراص الليزر CD-ROM كاف لأعداد المستخدمين ؟

نعم ☐ لا ☐ لا أعرف ☐

20- كيف تقيم خدمة البحث في قواعد المعلومات على أقراص الليزر CD-ROM ؟

- جيدة ☐
- مرضية ☐
- ضعيفة ☐

21- ما السبب في إجابتك السابقة ؟ (الرجاء وضع علامة على أهم سبب)

- وجدت عدة قواعد معلومات لها علاقة بموضوعك ☐
- المساعدة متوفرة من موظفي المكتبة ☐
- لم تجد أي قواعد معلومات لها علاقة بموضوعك ☐
- المساعدة غير متوفرة من موظفي المكتبة ☐

استخدام الإنترنت

22 - هل استخدمت خدمة الإنترنت من قبل ؟
نعم ☐ لا ☐

إذا كانت الإجابة " لا " الرجاء التوجه إلى سؤال رقم 26

23 - أين استخدمت خدمة الإنترنت من قبل ؟
• في المكتبة ☐ • في مكان آخر ☐

24 - هل وجدت هذه الخدمة مفيدة ؟
نعم ☐ لا ☐

25- كيف تقيم المعلومات التي حصلت عليها عبر الإنترنت ؟
• كثيرة جدا ☐ • مرضية ☐ • قليلة جدا ☐

مصادر المعلومات الإلكترونية

26- هل توجد أي قاعدة معلومات ترغب استخدامها ولا تجدها في المكتبة ؟
نعم ☐ لا ☐

27- إذا كانت الإجابة " بنعم" الرجاء حدد هذه القواعد.....

28- هل استطعت الدخول من قبل لمدينة الملك عبدالعزيز للعلوم والتقنية والبحث في قواعد المعلومات التي توفرها ؟
نعم ☐ لا ☐

إذا كانت الإجابة " لا " الرجاء التوجه إلى سؤال رقم 30

29 - إذا كانت الاجابة " بنعم " فمن أي مكان قمت بعملية البحث ؟
• من المكتبة ☐ • من خارج المكتبة ☐

30 - كيف تقيم المعلومات التى حصلت عليها من مدينة الملك عبدالعزيز للعلوم والتقنية ؟
• كثيرة جدا ☐ • مرضية ☐ • قليلة جدا ☐

31 - كيف تعلمت استخدام الخدمات الإلكترونية ؟
• المساعدة من بعض موظفي المكتبة ☐ • من خلال الخطأ و الصواب (تعليم ذاتي) ☐
• الأصدقاء / الزملاء ☐ • أخرى (الرجاء حدد) .....

32- هل شعرت في يوم من الأيام بأنك تحتاج الى مساعدة عند ما كنت تستخدم الخدمات الإلكترونية ؟
نعم ☐ لا ☐

33 - هل هناك برامج تدريب متوفرة بالمكتبة لاستخدام الخدمات الإلكترونية في المكتبة ؟
نعم ☐ لا ☐ لا أعرف ☐

34- هل حضرت برامج المكتبة التدريبية وذلك لمساعدتك في استخدام الخدمات الإلكترونية ؟
نعم ☐ لا ☐

إذا كانت الإجابة " لا " الرجاء التوجه إلى سؤال رقم 36

35 - إذا كانت الإجابة " بنعم " كيف تقيم هذه البرامج ؟

• جيده ☐ • مرضية ☐ • ضعيفة ☐

36 - ما هي طرق المساعدة التي يقدمها موظفي المكتبة ؟

• المحاضرات ☐ • ورش العمل ☐ • دروس على الشريط الممغنط ☐
• البريد الإلكتروني ☐ • مكتب إرشاد وتوجيه ☐ • طرق أخرى (الرجاء حدد) .....

37 - كيف تقيم الخدمات الإلكترونية في المكتبة وفقا لتلبيتها لاحتياجاتك المعلوماتية ؟

• مهمة ☐ • مهمة إلى حد ما ☐ • ليست مهمة ☐

38- هل تريد مزيد من الإضافات لتقديم مزيد من الخدمات الإلكترونية ؟

نعم ☐ لا ☐

39 - إذا كانت الإجابة " بنعم " أي من هده الخدمات الإلكترونية أنت تفضل ؟

• خدمات مرجعيه عن طريق البحث المباشر ☐ • معمل لاستعمال جميع أنواع الحاسب ☐
• الشبكات ☐ • خدمات توصيل الوثائق ☐ • أخرى (الرجاء حدد).....

40 - هل تفضل استخدام هذه الخدمات بمساعدة وإشراف موظفي المكتبة أو بنفسك ؟

• عن طريق موظفي المكتبة ☐ • بنفسي ☐ • كلاهما ☐

41 - هل استخدمت أي مكتبة جامعيه أخرى من قبل ؟

نعم ☐ لا ☐

إذا كانت الإجابة " لا " الرجاء التوجه إلى سؤال رقم 44

42 - كيف تقيم الخدمات الإلكترونية في تلك المكتبة ؟

• جيده ☐ • مرضية ☐ • ضعيفة ☐

43 - كيف تقيم الخدمات الإلكترونية في مكتبتك مقارنة بالخدمات الإلكترونية في المكتبة الأكاديمية الأخرى ؟

• أفضل ☐ • نفسها ☐ • أسوأ ☐

44- هل تفضل أن تضيف أي اقتراحات أو ملاحظات لتساهم في تطوير الخدمات الإلكترونية في مكتبتك ؟

.....

.....

.....

شكرا على تعاونكم
بعد أن يتم تعبئة الاستبيان. رجاءا إعادته إلى مكتب الإعارة في كليتكم أو إلى قسم المراجع في المكتبة المركزية أو إرساله إلى:-

محمد أحمد باصقر
ص.ب 11033 جدة 21453
المملكة العربية السعودية

Librarian Interview

Background Questions

1. How many staff do you have in this library?
2. How many academic staff are registered in this library?
3. How many students are registered in this library?
4. Who does the programming?
5. Is all cataloguing done in-house?
6. How many cataloguers are there in the library?

Electronic services

7. What electronic services do you provide?
8. Is the library's provision of terminals sufficient?
9. Can electronic access to the library be obtained from elsewhere on the campus?
10. Have you found any deficiencies in the OPAC?
11. How do you provide user access to CD-ROM and On-line databases?

User attitude

12. What problems do users encounter in accessing electronic services?
13. Which groups make most use of electronic services?
14. How do you obtain user feedback on services?
15. How do you use such feedback?
16. What user training do you provide?
17. What library staff training do you provide?

18. Are there any problems with library staff IT skills?

19. Do you have any problems in the recruitment of new, computer-literate staff?

Productive co-operation

20. Do you have any electronic links with any other universities, Saudi Arabian, or others?

21. Which of these do you co-operate with the most?

22. What is the purpose of the co-operation?

Difficulties

23. Are there problems with funding electronic services?

24. How do you solve this problem?

Future trends

25. Does the library have any formulated plans regarding its future provision of electronic services?

26. What limitations (internal and external) are likely to restrict the future expansion of such services?

27. If there were no restrictions, what new services would you most like to introduce?

28. Is there anything else you wish to say about library automation?

أسئلة المقابلة الشخصية لأمناء المكتبات

1. كم عدد الموظفين في المكتبة المركزية؟
2. كم عدد أعضاء هيئة التدريس المسجلين في المكتبة؟
3. كم عدد الطلاب المسجلين في المكتبة؟
4. من المسئول عن إعداد البرمجيات (SOFTWARE) المكونات المادية أو الأجهزة (HARDWARE) في المكتبة ؟
5. هل عمليات الفهرسة تتم عن طريق موظفي المكتبة؟
6. كم عدد المفهرسين في المكتبة؟

الخدمات الإلكترونية (الفهرس الآلي، أقراص الليزر، البحث المباشر، الإنترنت،.....الخ)

7. ما هي الخدمات الإلكترونية التي تقدم للمستفيدين؟
8. هل أعداد النهايات الطرفية الموجودة في المكتبة تلبي احتياجات المستفيدين؟
9. هل يتم الدخول علي الخدمات الإلكترونية التي تقدمها المكتبة من أي مكان في الحرم الجامعي؟
10. هل هناك مشاكل من جراء استخدام الفهرس الآلي؟
11. هل هناك صلاحية دخول للمستفيدين حيال استخدامهم أقراص الليزر؟

موقف المستفيد

12. هل هناك أي مشاكل يصادفها المستفيد عند الدخول على الخدمات الإلكترونية؟
13. أي فئة من المستفيدين اكثر استخداما للخدمات الإلكترونية بصورة مكثفة تفوق استخدامات الفئات الأخرى؟
14. كيف يتم الحصول على آراء المستفيدين من الخدمات؟
15. كيف يتم الاستفادة من هذه الآراء؟
16. ما هي البرامج التدريبية المقدمة للمستفيدين؟
17. ما هي البرامج التدريبية المقدمة لموظفي المكتبة؟
18. هل هناك أي صعوبات تواجه موظفي المكتبة المسؤولون عن تكنولوجيا المعلومات؟
19. هل هناك أي صعوبات تواجهونها عند تعيين موظفين جدد على دراية بالحاسب الآلي؟

التعاون المثمر بين الجامعات

20. هل هناك أي تعاون إلكتروني مع أي جامعات سعودية أو غيرها؟
21. ما هي اكثر الجامعات تعاونا في هذا المجال؟
22. ما الهدف من هذا التعاون؟

المشاكل

23. هل الميزانية المخصصة للخدمات الإلكترونية كافية؟
24. إذا كانت الميزانية المخصصة غير كافية فكيف يتم حل هذه المشكلة؟

الاتجاهات المستقبلية

25. هل تم إعداد خطط مستقبلية بما يتعلق باحتياجات المكتبة من الخدمات الإلكترونية؟
26. ما هي العوائق التي قد تحول من التوسع في مجال الخدمات الإلكترونية لديكم؟
27. إذا لم يكن لديكم عوائق تحول دون التوسع في هذا المجال، ما هي الخدمات الجديدة التي تودون إدخالها في خدمات المكتبة الإلكترونية؟
28. هل لديك أي اضافه لم ترد في هذه المقابلة تود إضافتها؟

Administration Interview

1. What is happening about the current development of the campus network connection with internal and external networks?

2. What is the budget this year for electronic services and how is it divided?

3. Do you think that the amount, which the library receives, is enough to keep up with the rapidly changing situation?

4. How successfully is the library introducing electronic services?

5. Do you think that there is any overlap between electronic information tasks of the library and the computer centre?

6. What are your impressions of the electronic services in Saudi academic libraries?

7. Have you made any comparison with other Saudi universities to evaluate the situation in your library as regards provision of electronic services?

8. Do you know about electronic information services in western country libraries?

9. Is there a big difference between the services provided in your library compared to western countries?

10. Is there any long term planning aimed at enhancing the electronic services, on the campus / in the Library?

11. What is your plan to assist academic staff in dealing with rapidly changing information technology?

12. What are the steps have you provided to help a student become familiar with electronic information?

13. Would you like to add any further comments?

أسئلة المقابلة الشخصية مع الإدارة العليا في الجامعات

1. ما هي التطورات الحديثة التي حدثت أخيرا لربط الشبكات الداخلية والخارجية في الحرم الجامعي حسب وجهة نظركم؟
2. ما هي ميزانية هذا العام للخدمات الإلكترونية وكيف يتم تقسيمها؟
3. هل تعتقد بأن المبلغ المخصص لخدمات المكتبة كاف ليتواصل مع التغيير السريع في الخدمات؟
4. هل ترى أن المكتبة تقدم خدماتها الإلكترونية للمستفيدين بكل نجاح؟
5. هل تعتقد بأن هناك أي تداخل في مهمات الخدمات الإلكترونية بين المكتبة ومركز الحاسب الآلي؟
6. ما هو انطباعك عن الخدمات الإلكترونية في مكتبات الجامعات السعودية؟
7. هل تم في السابق أي مقارنة مع الجامعات السعودية ليتم تقييم الوضع الراهن في مكتبة الجامعة فيما يتعلق بتوفير الخدمات الإلكترونية؟
8. هل لك أي دراية عن خدمات المعلومات الإلكترونية في مكتبات الدول المتقدمة؟
9. هل هناك أي اختلاف بين الخدمات المقدمة في مكتبتكم مقارنة بما هو في الغرب؟
10. هل هناك أي خطة طويلة الأجل تهدف إلى رفع مستوى الخدمات الإلكترونية في الحرم الجامعي أو في المكتبة المركزية؟
11. ما هي خطة الجامعة المستقبلية حيال مساعدة أعضاء هيئة التدريس بالجامعة حتى يمكنهم التعامل مع التغيير السريع في تكنولوجيا المعلومات؟
12. ما هي الخطوات التي تم وضعها حتى يتمكن الطالب من استخدام الخدمات الإلكترونية بيسر وسهولة؟
13. هل تود أن تضيف أي ملاحظات أخرى .....

Heads of academic departments` interview

General

1. Do you think the existing IT within the department (hardware and software) is adequate in order to provide a good service to members?

2. Do you provide stand- alone or networked services for academic staff members?

3. What sort of network (internal, external) do you provide and can all academics access it?

4. Does your department distribute e- mail for all academic staff?

5. What kinds of IT support do you provide to academic staff?

6. How do IT activities in the department relate to the university IT activities?

Policies

7. Is there a policy to acquire equipment on a regular basis, or is equipment acquired by occasional major purchases?

8. Who within the department consults and decides about IT purchases (hardware, software)?

9. Who determines how, when, and where your equipment is used?

Users

10. What electronic services can a user access from your department?

11. 11. What provision of IT activities do you provide to students?

12. Do users receive any training on electronic services, or do they teach themselves?

13. Would you please roughly estimate or give a percentage of the students in the department who use the electronic information services?

14. What are your comments and suggestions for developing electronic information services in your department?

أسئلة المقابلة الشخصية لرؤساء الأقسام بالكليات

أسئلة عامة

1. هل تعتقد بأن تكنولوجيا المعلومات (البرمجيات SOFTWARE) أو المكونات المادية أو الأجهزة (HARDWARE) كافية من أجل تقديم خدمة جيدة لأعضاء هيئة التدريس بالقسم؟
2. هل خدمات تكنولوجيا المعلومات التى تقدم للمستفيدين تتم عن طريق الشبكات (NETWORKS) أو المحطات الداخلية (STAND A LONE) ؟
3. ما هي الخدمات التى تتم عن طريق الشبكات (NETWORKS) الداخلية والخارجية والتى يتم تقديمها للمستفيد؟
4. هل قسمكم يقوم باستخدام خدمة البريد الإلكتروني للمستفيدين (الطلاب،أعضاء هيئة التدريس)؟
5. ما هي أنواع الدعم لتكنولوجيا المعلومات التى يقوم بها قسمكم لدعم أعضاء هيئة التدريس؟
6. هل هناك تعاون أو علاقة بين أنشطة تكنولوجيا المعلومات في قسمكم مع أنشطة تكنولوجيا المعلومات الموجودة في الجامعة؟

السياسات

7. هل يتم تأمين الأجهزة الآلية عن طريق الشراء المباشر أو عن طريق وسيلة أخرى؟
8. من هو المسؤول في القسم عن شراء معدات تكنولوجيا المعلومات؟
9. من الذي يحدد كيف ومتى وأين هذه المعدات تستخدم؟

المستفيدين

10. ما هي الخدمات الإلكترونية التي يمكن للطالب أن يدخل عليها عن طريق القسم؟
11. ما هي الخدمات الإلكترونية التي تنوون تقديمها إلى طلاب القسم؟
12. هل يقوم القسم بتدريب الطلاب أو أنهم يقوموا بتعليم أنفسهم ذاتيا؟
13. هل بالإمكان إعطاء نسبة تقريبية لعدد الطلاب في القسم الذين يقومون باستخدام الخدمات الإلكترونية؟
14. ما هي مقترحاتكم وآرائكم حول تطوير خدمات المعلومات الإلكترونية في قسمكم؟