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بسم الله الرحمن الرحيم

الأخ العزيز الدكتور أحمد بن عبد الله بن خضير

لقد سعدت كثيراً بمكالمتك الرائعة والجميلة

الذي اتصلت بتزفني فيه على حصولك على مرتبة الدكتوراه.

والحمد لله الذي كلل جهدك وعملك بالنجاح والتوفيق

فألف مبروك وأتمنى لك النجاح والسداد في

حياتك العملية .. وفقك الله حتى تحقق آمالك

وأهدافك في خدمة وطنك وأمتك

ويا ليت يا أخ أحمد أن من يستقيم في حياته

تستقيم له الحياة .

حفظك الله ورعاك .

صباح

د. رضا عبيد

٢٤/٦/١٤٢٦هـ

٢٠/٧/٢٠٠٥م

Health Sciences Libraries:
Information Services and ICTs

By

Ahmad A. Khudair

Submitted in partial fulfilment of the Requirements for the award
of Doctor of Philosophy of City University
2005

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Abstract

In Saudi Arabia the need is recognised significantly to move towards the concept of an Information Society, particularly for the benefit of the healthcare community. There have been some individual efforts, in this direction but they do not address the problem and related root issues. The problem is that the body and soul are not joined as one to formulate a single entity. The health professional is the body and the soul is the health information professional (health librarians). Health professionals spend a great deal of time in information searching, while the health information professional's role is underestimated.

This research is conducted to explore the state of health sciences libraries, and to investigate the strengths and weaknesses of the Information Services and Information, Communication Technology (ICT) in health sciences libraries in the capital city of Saudi Arabia, Riyadh. To accomplish this, a mixed method is used (qualitative and quantitative approaches) to collect related data. A framework is designed particularly for this research and a visionary organisational model is designed initially and developed throughout the research. This proposed model is to introduce a potentially possible successful paradigm for changing the health sciences libraries environment to encounter future challenges. In addition, for this research will contribute to the better understanding of how to provide fast, efficient and easy-to-use service to increase user satisfaction.

Changing the paradigm of health sciences libraries in Riyadh will facilitate better access, sharing and use of information resources from distant geographical locations, and increase participation opportunities. In addition, the proposed model considers the human and social needs of communication, and the exchange of feelings and reactions. Importantly, successful change will help healthcare environments to move towards the establishment of a flourishing health information society by popularising the use of electronic resources and demonstrating the benefits and advantages of continuous learning and development programmes. It is clear that access to fast, accurate and reliable health information and resources, may be, the difference between life and death.

Keywords: Health Sciences Libraries, Information Services, Information and Communication Technology, Health Information Network, Saudi Arabia.

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Dedication

My Father

I present to you one of your hopes, and I am on my way to achieving your other hopes. I am your son who is still learning and always will learn from you, a high quality of knowledge, attitudes and manners.

My Mother

Your supplications and prayers have been accepted; this completed thesis between your hands.

I can see your kindness and love will bring me back to you and I will tell you stories about my long journey, as you always tell me stories.

Mother, I am still your son, and I am always seeking your pleasure and satisfaction.

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For sure, purity, honesty, and passion are part of your quality and character that always surround me.

Special Word

Smiles always make me happy.

With each smile there is love and a contribution

to peace and heavenly life

A. Khudair

Quincy, 1995

Glossary

ADC	Access and Delivery Collaborative
AH	Islamic calendar
AHIP	Association of Health Information Professionals
BLDS	British Library Document System
BT	British Telecom
BU	Brown University
BUL	Brown University Library
CAS	current awareness services
CD-ROM	Compact Disc - Read Only Memory
CEHANET	Centre for Environmental Health Activities (EMRO)
CILIP	Chartered Institute of Library and Information Professionals (UK)
CISTI	Canada Institute for Scientific and Technical Information
CO-OPAC	Cooperative Online Public Access Catalogue
CPD	Continuing Professional Developments
DD	Document Delivery
EBM	Evidence Based Medicine
EMR	Eastern Mediterranean Region
EMRO	Easter Mediterranean Regional Office, (WHO)
ENHSL	Electronic National Health Sciences Library
GCC	Gulf Co-operation Council
GeoMap	Geographical Map
GOSI	General Organization for Social Insurance
GPYW	General Presidency of Youth Welfare
GULFNET	Gulf Network
HE	Higher Education
HR	Human Resource
HRM	Human Resource Management
HSL	Health Sciences Library
ICT	Information and Communication Technology
ICTS	Information, Communication Technology and Services
IFLA	International Federation for Library Associations

IGH	Iman General Hospital
ILL	Inter-Library-Loan
IP	Internet Protocol
IPAC	Internet Public Access Catalogue
IRM	Information Resources Management
ISP	Internet Service Provider
IT	Information Technology
JAHVH	James A. Haley Veterans' Hospital
KACM	King AbdulAziz City of Medicine
KACST	King AbdulAziz City for Science and Technology
KAUH/CD	King AbdulAziz University Hospital and College of Dentistry
KFSH/RC	King Faisal Specialist Hospital and Research Center
KFUPM	King Fahd University for Petroleum and Mineral
KKESH	King Khalid Eye Specialist Hospital
KKUH	King Khalid University Hospital
KSA	Kingdom of Saudi Arabia
KSU	King Saud University
KSU	King Saud University
LCRC	Learning and Curricular Resources Collaborative
LIS	Library and Information Science
LISM	Library and Information Services Management
MCH	Material and Child Health
MLA	Medical Library Association (USA)
MMA	Mixed Methods Approach
MODA	Ministry of Defence & Aviation
MOH	Ministry of Health
MOI	Ministry of Interior
MOP	Ministry of Planning
MVHL	Michigan Virtual Health Library
NeLH	National electronic Library for Health (UK)
NHL	National Health Library
NHS	National Health Service
NIS	National Information Society
NLC	National Library of Canada

NLM	National Library of Medicine (USA)
OCD	Organisational Change and Development
OD	Organisational Development
ODM	Organisational Development Model
OPAC	Online Public Access Catalogue
OSC	Organizational Support Collaborative
OVM	Organisational Visionary Model
PDA	Personal Digital Assistant
RAFH	Riyadh Armed Force Hospital
RAH	The Royal Adelaide Hospital (Australia)
SCH	Sulaimaniyah Children's Hospital
SCOT	Saudi Center for Organ Transplantation
SDI	Selective Dissemination of Information
SDP	Seventh Development Plan
SFH	Security Forces Hospital
SHIN	Saudi Health Information Network
SNG	Saudi National Guard
SRC	Scholarly Resources Collaborative
T.V	Television
THML	Tawam Hospital Medical Library (UAE)
UAE	United Arab Emirates
UIDLP	University of Iowa Digital Library Project
VHSL	Virtual Health Sciences Library
WHO	World Health Organisation
WWW	World Wide Web
Yamamah	Yamamah Hospital for Women and Child Birth

Chapter One

Introduction

POSITION IN THE THESIS

Chapter 1 Introduction	**Chapter 2 Background**	**Chapter 3 Research Design**
Chapter 4 Literature Review	**Chapter 5 Users and Staff**	**Chapter 6 Health S. Libraries**
Chapter 7 Education and Training	**Chapter 8 Information Services**	**Chapter 9 ICT**
Chapter 10 Information Provision	**Chapter 11 Change & Development**	**Chapter 12 SHIN Prototype**
Chapter 13 Conclusions	**Bibliography**	**Appendices**

Chapter One

1

Introduction

Information technology has evolved rapidly during the last few decades. New technologies have become progressively more prevalent in all areas of society in the developed world and increasingly in the developing world. The movement has headed towards the concept in communication of information technology. In addition, the emphasis has changed from the technical concept of information technology (IT) towards Information and Communication Technology (ICT).

This changing paradigm facilitates more access, sharing and use of information resources, reducing cost, and increasing of participation opportunities. Additionally, it considers the human and social needs of communication, and the exchange of feelings and reactions. Particularly, it has allowed widespread access to, sharing, use and

exchange of medical and health information resources from distant geographical locations. It is clear that this information has vital impacts which enhance the quality of clinical and medical decisions, and improve patient care. Rapid access to fast, accurate and reliable health information and resources, also may make the difference between life and death.

In the USA and the UK, as well as in other developed countries, it has been proposed that a national information infrastructure be used to convey medical and health information. Practical examples can be found in studies in Wisconsin, USA (Pemble, 1997) and Essex, UK (Health Report, 1999). In brief, many hospitals are planning and developing their infrastructure to link various health information users by using ICT. British Telecom (BT) started rolling out its largest NHS community project in 1999. This five-year project would link 300 sites and over 10,000 users within 10 NHS organisations across Essex (Health Report, 1999). Increasingly, health information and medical knowledge are becoming available digitally.

In view of the importance of access to health information, the health library has an important role to play as a part of the entire healthcare environment. Reid and Foster (2000) stated that the contribution this special library makes to the operational mission of the organisation, particularly hospitals and health organisations, must be made evident. The demands of health organisations and the sector as a whole certainly call for a combination of services and skills that is, in many ways, quite different from that required in public and academic settings. The library must be proven and seen to be as dynamic and vital as all other functions. More precisely, the special library is designed to serve specific professional needs. The users of the special library require information services mainly from it to support tasks and functions which are part of their work.

In very clear outlines, for most readers who have an interest in the field of health librarianship, Matthews and Picken (1979) explain that there has been a marked growth in the provision of health libraries in hospitals, especially since the early 1960s. This had two main causes: the establishment of postgraduate medical centres, and the extension of public library services to hospitals in their localities. Health

sciences libraries can be divided into numerous types with varying functions, and they differ considerably within each category.

Thornton (1963) pointed out that there are a great variety of health libraries but that they differ widely in size, scope and administration within the various broad groups. Matthews and Picken (1979) distinguished that the largest are not necessarily the best, and that smaller collections specialising in the more specific branches of medicine are sometimes the best administered. They define several types of health sciences libraries as follows: 1) Hospitals and postgraduate centres, 2) Universities and medical schools, 3) Private societies, 4) Government sponsored, 5) Pharmaceutical companies, 6) Research institutes, and 7) Other educational establishments. Carmel (1995), states that the fundamental aim of informatics and library services is to ensure that providers of health care have access to reliable, relevant and up to date information, enabling them to enhance the quality of care.

Interest in this field is also increasing in developing countries, particularly in the Kingdom of Saudi Arabia (KSA). Bukhari (1994) studied the impact of ICT on the Saudi academic environment, including the health science environment, and indicated that a number of complex issues arise due to the implementation of campus-wide network systems. These include training, and lack of professionals. Bukhari suggested that a new ICT strategy is essential to support and develop effective networks. Al-Zahrani (2001) investigated the ICT healthcare issues in Saudi University Hospitals. He suggested that the adoption and use of ICT in the country as a whole can be anticipated in the near future. The current use of computers and the positive attitude of health professionals toward computers in all Saudi hospitals are recognised, since ICT is needed for rapid economic development.

Recently, health sciences libraries in Saudi Arabia have been improved when compared to past decades. Generally, with the impact of the computer and Internet, libraries have been equipped with resources for information needs. Dosary and Ekrish (1991) and Al-Ogla (1998) mentioned that the special libraries, including health sciences libraries, play an essential role in automation projects. These libraries to some extent, and when compared with other libraries, receive better funding, staff and

equipment. The health sciences libraries have been affected by the advances in IT introduced into the country, especially that of the healthcare system.

In a relatively short period, of time IT has come to be used to a significant degree in library and information services in Saudi Arabia. Technology may enable libraries to offer access to vast online information resources and to the various library activities yet to be automated. In recent years, there has been a very real concern about the implication of adoption of various kinds of electronic information services into health sciences libraries. Therefore, the infrastructure of these libraries is becoming a collection of multiple technologies, including online databases, CD-ROMs, Internet, etc.

A weakness of libraries, however, is that generally they have grown up without being carefully planned to fit in with existing facilities and information and communication technology infrastructure. Moreover, their development has been ad hoc, without proper planning or co-operation with neighbouring libraries (Arif et al., 1998).

Furthermore, improvement is made difficult by the fact that very little research has been conducted to explore the health sciences libraries, their staff members, services, and users in Riyadh, Saudi Arabia. There is some research concerned only with physicians' information needs, ignoring those of other health professionals. Given the enormous amount of medical literature published annually, there is a need for constantly expanding efforts in conducting research related to health sciences libraries and their role in serving the entire healthcare profession and all groups of professionals within it.

1.1 Aim of the Study

The aim of this study is to explore the state of health sciences libraries, and to investigate the strengths and weaknesses of the Information Services and ICT in health sciences libraries in the capital city of Saudi Arabia, Riyadh. This research aims to increase understanding of how to provide a fast, efficient and easy-to-use service to increase user satisfaction.

1.2 Study Objectives

To accomplish the aim of this study, the following objectives were established:

1. To explore the current state of health sciences libraries in Riyadh.
2. To determine the adequacy or otherwise of the health sciences libraries' resources, services, and co-operative activities in Riyadh.
3. To identify the health professionals' information needs which determine the reasons for using the information sources provided by the health sciences libraries.
4. To identify the types of information sources used by health professionals and which of those sources meet their needs.
5. To investigate the type of difficulties facing health professionals in acquiring information and in accessing library resources and electronic information services.
6. To explore the perception of health professionals towards information provision and the use of information and communication technologies in health sciences libraries.
7. To explore the condition of the health library profession in Saudi Arabia and find out more about health information professionals working in Riyadh hospitals.
8. To encourage quality programmes for the training of health library staff to be able to provide the library and information services and to recognise their work as an important component of the healthcare system.
9. To develop an organisational model that will ensure good health sciences library practice for the smooth flow of health information to health professionals.
10. To take steps for mobilising and upgrading the existing library and information systems and services and initiating new development relevant to the national needs, taking advantage of information and communication technology.
11. To make appropriate recommendations; this will enable the government and its various agencies to support improvements in the existing health sciences libraries and information provision.

1.3 Context of Study

Three main focal elements are to be the discussion topics of this study and will shape its outcomes:

1.3.1 Health Sciences Libraries

Many demands are made upon the existing health sciences libraries in Saudi Arabia. However, these libraries, generally, have grown up without being carefully planned to fit in with existing facilities, and information and communication infrastructure. Moreover, their development has been on an individual basis without proper planning and co-operation with neighbouring libraries. Furthermore, very little research has been conducted about health sciences libraries.

1.3.2 Health Information Professionals

The enormous amount of medical literature published annually necessitates constantly expanding efforts to provide the healthcare environment with professionals who can deal effectively and efficiently with the information resources. Health information professionals (health librarians) are facing problematic issues such as lack of training and few promotion opportunities, and to some extent they feel they are ignored. In the matter of research, health information professionals are certainly ignored, as there is no research conducted concerning health information professionals in Riyadh or in the country as a whole.

In the present research, health information professionals (health librarians) in Riyadh are members of health sciences libraries located in hospitals and health research centres in the city of Riyadh.

1.3.3 Health Professionals

Health professionals are widely scattered in Riyadh. The great developments in medicine make it difficult for individuals to keep themselves up to date. In some cases, health professionals find their information needs in a place other than the health library, because the libraries do not satisfy their information needs. In addition, the little research available to date has been concerned only with physicians' information needs and information seeking, and has not involved other health professionals as part of the research investigation.

In the present research, health professionals in Riyadh are members of hospitals and health research centres in the city of Riyadh.

1.4 Value and Implications of Study

With the advent of Information and Communication Technologies and the increased establishment of electronic databases and resources in the developed countries, it has become important to discover their implementation and use in the developing countries, particularly in the field of health sciences librarianship. As mentioned earlier, there has been a relatively little research conducted relating to the health sciences libraries in the Kingdom of Saudi Arabia, in view of the fact that the information service is regarded as a vital facility offered by a library to users to facilitate access to and use of a wide range of resources.

This research plans to investigate the current situation of health sciences libraries and their information services and implemented ICTs within government hospitals in Riyadh. To accomplish this, the study will look at the use of electronic information services, and the levels of users' satisfaction towards those services and facilities. In addition, this study will highlight the role of the health information profession and the challenges encountered by professionals, which have never been discussed in previous studies related to the health sciences libraries in Saudi Arabia. As a final step, this research will provide a vision for development and recommend some changes.

1.5 Scope and Limits of Study

The research interest is to undertake an investigation and exploration of the condition of health sciences libraries in Riyadh. The investigation is based upon health professionals' perceptions as the potential users of these health libraries. Additionally, this investigation is dependent upon the judgement of health information professionals working in these health sciences libraries.

This study will attempt to benefit the country of the researcher with effective research providing a clear picture of the current condition of the research phenomenon, supported by practical solutions as a blueprint for development. It is not intended that this study will be comprehensive in coverage and exhaustive in depth, otherwise it

would be time-consuming and too lengthy. The study is based on existing knowledge and located within the general framework of information studies. It is specifically focused on governmental hospitals in the city of Riyadh which have health libraries.

There are certain parameters and considerations to be remembered:

1. Riyadh, not other cities. The focus of this thesis is upon Riyadh as the capital city of the Kingdom of Saudi Arabia, because the most significant governmental hospitals are located in Riyadh. Although the most significant governmental hospitals in other cities in the kingdom are either part of or branches of parent hospitals in Riyadh, it is clearly difficult to cover other cities comprehensively because of the size of the country. The Kingdom of Saudi Arabia has an area of 2,250,000 square kilometres, which is approximately equivalent to that of the UK, France, Germany, Italy and Spain combined.

2. Government, not private. The research is concerned with governmental hospitals only, and not private hospitals. As this research is funded by the government, the outcome of this research is mainly aimed at government hospitals, since they provide free healthcare to the people of Saudi Arabia.

3. Bureaucracy. Administrative bureaucracy affected the time taken for this study. A lack of co-operation and the long administrative procedures needed to approve the conducting of this study in hospital sites and library sites led to the need for conducting various visits prior to the actual field trip, as well as an extension of the time spent on field work.

4. Time factor. As well as the extended time required for this study, the research is limited by a time plan imposed by the sponsor (King Saud University).

5. Budget. The allocated budget designated has limited the researcher from further expansion, and in fact the researcher has occasionally had to pay from his own funds in order to make this study successful.

1.6 Motives of this Study

Although there were some difficulties and limitations facing this study, there are some factors which motivated and strengthened the desire for the researcher to conduct a study of this type.

These factors are:

1. The researcher has a particular interest in the area of health librarianship.
2. The study background of the researcher is in the field of information science.
3. The growth of the concept of services in the market, in particular services in libraries and health sciences libraries, is important and indeed vital in influencing the work progress of the parent organisations.
4. There has been a lack of empirical studies in the field of health librarianship specifically in relation to Saudi Arabia.
5. There have been few studies concerned with the entire range of health professionals working in government hospitals in Riyadh.
6. As an information professional, the researcher regards it as important to inform health information professionals of his research which includes their views, something not yet observed in existing research in the country of Saudi Arabia.
7. There is no base line for conducting research and findings into the development progress of health sciences libraries.
8. It is the researcher's strong desire and will to produce a successful research document which will add to the knowledge of health librarianship in the country of Saudi Arabia.

1.7 Thesis structure

The current thesis contains 13 chapters, opening with this introduction chapter and closing with the conclusions and recommendations chapter. In addition, it is followed by two important sections: bibliography and appendices. The thesis structure section illustrates the thesis structure from beginning to end (Figure 1.1).

Question?	Opening	Study Method	Explored Themes	Solution	Closing
	Chapter 1 Introduction				
	Chapter 2 Background				
How to conduct?		Chapter 3 Research Design			
What?			Chapter 4 Literature Review		
What and Why?			Chapter 5 Staff & Users		
What and Why?			Chapter 6 H. S. Libraries		
What and Why?			Chapter 7 Education & Training		
What and Why?			Chapter 8 Info. Services		
What and Why?			Chapter 9 ICT		
What and Why?			Chapter 10 Info. Provision		
How should?				Chapter 11 Change & Development	
How should?				Chapter 12 SHIN Prototype	
					Chapter 13 Conclusions & Recommendations

Figure 1.1: Thesis Structure

As an opening process, the first two chapters; Chapter 1: Introduction and Chapter 2: Background, provide the reader with a general introduction and background about the research topic and the country of Saudi Arabia. Chapter 3 explains the study method adapted for this research, and explains how this research was conducted. The following chapters, 4 to 10, present explored themes of the research. Chapter 4, a literature review, present concepts and themes generated by previous writers and researchers, and it tells what has been accepted and experienced so far. Chapters 5 to

10 discuss explored themes in this research and basically explain what is the case and why. The last two chapters, Chapter 11: Organisational change and development, and Chapter 12: Saudi Health Information Network Prototype, present a practical development and solution to the current situation, and suggest how the change process should be conducted. The thesis closes with Chapter 13: Conclusion and Recommendation. It summarises the whole work and presents recommendations for further improvement. It is important to note that this chapter highlights some important ideas for further exploration of issues that could not to be covered in this thesis.

Chapter Two

Background

POSITION IN THE THESIS

Chapter 1 Introduction	Chapter 2 Background	Chapter 3 Research Design
Chapter 4 Literature Review	Chapter 5 Users and Staff	Chapter 6 Health S. Libraries
Chapter 7 Education and Training	Chapter 8 Information Services	Chapter 9 ICT
Chapter 10 Information Provision	Chapter 11 Change & Development	Chapter 12 SHIN Prototype
Chapter 13 Conclusions	Bibliography	Appendices

Chapter Two

2

Background

2.1 Introduction

This chapter will provide background information to the study in terms of a general overview of Saudi Arabian health care and an introduction to health science libraries in Riyadh.

2.2 Profile of Saudi Arabia

The Kingdom of Saudi Arabia is within the Arabian Peninsula. It was founded in the latter period of the nineteenth century as a modern state. The Kingdom itself occupies approximately 2,250,000 square kilometres (868,730 square miles) it is bordered on the north by Jordan, Iraq and Kuwait; on the east by the Gulf, Bahrain, Qatar and the United Arab Emirates; on the south by the Sultanate of Oman and Yemen; and on the

west by the Red Sea. The capital city, Riyadh, is located in the Najd region, the central area of the kingdom (Figure 2.1: map of Saudi Arabia).



Figure 2.1: Map of Saudi Arabia

According to the 1974 (1393/94 AH) census, the Kingdom's population was just over 7 million. Since then, by all accounts, the population has grown dramatically. Preliminary results of the 1992 (1412/13 AH) census gave a figure for the total population of 16.9 million, of which 12.3 million were Saudi nationals. Of the Saudi national population, 50.4% are male and 49.6% female. Currently, it is estimated that more than half of the Saudi population is under the age of 20 (Saudi Arabia Information Resource, 2004a).

Arabic is the official language of the country. Although most people who live in Saudi Arabia speak Arabic, not all of them are of Arab origin. This is because Muslims have immigrated to the land (Saudi Arabia), particularly to the western region where the two holy cities are located. The country is strongly attached to Islam

since the prophet Muhammad (peace be upon him and upon all prophets) was born here and delivered his message mainly inside the Arabian Peninsula. Islam is therefore the way of life for the majority of people who live in Saudi Arabia, and they do not admit a significant separation between life-spiritual and life-mundane.

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 after the government has announced that a new well had been discovered in the Rub `al-Khali desert, and production began there in the first quarter of 1996. The source contains 14 billion barrels of crude oil and more than 25 trillion cubic feet of gas (Middle East Newspaper, 1998). Moreover, Saudi Arabia has started a massive development programme with long-term objectives to diversify the economy and build a strong private sector (Ministry of Planning, 2000).

2.3 Healthcare in Saudi Arabia

The health infrastructure of Saudi Arabia and its curative and prevention services have made important and increasing progress during the past decade. The delivery of a health service was developed to be integrated into regional and district health care systems to ensure that a health service is provided to all citizens and residents. This development achieved a better co-ordination and utilisation of available resources. The Saudi health system has also experienced a series of changes over the years as it has sought to respond to the demands and needs of its citizens (Ministry of Health, 1999; 2005).

Organised preventive health services in Saudi Arabia began in the early 1950s when the Ministry of Health (MOH), the Saudi Aramco oil company, and the World Health Organisation (WHO) launched the first campaign against malaria in Al-Qatif and Al-Hassa Oasis in the Eastern Province, the success of which led to the expansion of the malaria control programme to other provinces in the country (Al-Yousuf et al., 2002).

From 1970 to 1980, health services were predominantly curative, as most health professionals had received their training in patient-oriented, hospital-based medical institutions. Furthermore, there was a general population expectation of curative care

(Sebai, 1985). This care was delivered through a number of hospitals and dispensaries, while preventive care was delivered by health offices and, to some extent, through maternal and child health care centres. Disease control activities were handled by vertical programmes. Episodic outbreak control activities were managed through the health offices (Al-Mazrou, 1990; Al-Mazrou et al., 1995; Ministry of Health, 1999).

In the early 1980s, the concept of primary health care (PHC) became popular, with the WHO slogan 'Health for All' gaining recognition. The MOH led to the establishment of the health centres, administratively integrating the existing dispensaries, health offices and maternal and child health (MCH) centres into one unit (Al-Yousuf et al., 2002).

Some of the best hospitals in Saudi Arabia are owned and operated by the government. Healthcare in Saudi Arabia, traditionally provided by the Ministry of Health (MOH), is increasingly being shared with other public and private agencies. According to the latest available figures, by the end of 1999, the total number of hospitals in the Saudi health sector stood at 314 (45,729 beds). The MOH had 186 hospitals, the private sector 89, and other government agencies accounted for 39. The main provider of health care services to the general public is the MOH. Other government agencies, such as the Ministry of Defence & Aviation (MODA), the Saudi National Guard (SNG), and Ministry of Interior (MOI) operate separate hospitals for their employees (Ministry of Planning, 2000).

The security and military agencies provide high levels of health care directly for their staff and segments of the general public. The school health units provide immediate primary health care for students. The General Organisation for Social Insurance (GOSI) and the General Presidency of Youth Welfare (GPYW) provide health services to a large number of affiliated populations. The Kingdom's universities provide, through their medical colleges and hospitals, specialist curative services and medical education and training programmes, while they also conduct health research in collaboration with other research centres (Ministry of Health, 1999; Ministry of Planning, 2000).

The Saudi Red Crescent Society undertakes an important and effective role in providing emergency services at the pre-hospital stage, either at the scene of accidents or during the transportation of patients to hospitals. The Red Crescent also undertakes a unique task by providing such services for pilgrims (Saudi Red Crescent Society, 2005). In addition, the private sector provides health services through its health facilities including, hospitals, dispensaries, laboratories, pharmacies and physiotherapy centres throughout the Kingdom (Ministry of Health, 2005).

Health care is not limited to preventive and curative aspects only; it also extends to the domain of medical research. For illustration, the King Faisal Specialist Hospital and Research Centre (KFSH/RC) uses highly advanced technologies and acts as a reference hospital for cases that require advanced and special treatment, while it also conducts research on health issues in general, and those related to the Kingdom in particular. The KFSH/RC works hard to implement and apply these technologies in the field of medicine. The hospital has developed a satellite link with advanced hospitals and research centres in North America for Tele-conferencing, Tele-pathology, and Tele-radiology (KFSH&RC, 2005).

Saudi Arabia is the largest market for medical equipment and health care products in the Gulf, and the Ministry of Health is the largest buyer, representing around 60% of the market. In its 2003 budget, the Saudi government allocated $6.2 billion for health and social care (Ministry of Health, 2005). However, Saudi health care is facing new challenges as the government continues to finance health services for a population of 22.7 million, which is rapidly growing at 3% per annum. Financial constraints in the face of a growing population are now forcing the Saudi Government to re-evaluate this policy in order to ensure the continuous upgrading of health services for its people (Saudi Arabia Information Resources, 2004b). Accordingly, the MOH has privatised a few government hospitals, while encouraging and creating more opportunities for private sector participation in the health sector to lessen the burden on its budget. This is evident with the growing number of private hospitals as well as educational academies (Ministry of Health, 2005).

The Kingdom's health services are heavily dependent on expatriates, who provide around 80% of physicians and nurses (Saudi Arabia). This is because local medical

training programmes have not kept up with the growing demand for physicians and other para-medical staff. Therefore, the need for continuous improvement in, and development of, health sector products and services is increasing.

In the matter of planning and implementation, the recently implemented plan in Saudi Arabia called the Seventh Development Plan stresses the importance of establishing a national council for the coordination of health services. This council will be entrusted with ensuring there is optimal utilisation of health facilities and available resources in the Kingdom, conducting studies and research in the domain of health services at a national level, and coordinating educational and training institutions to meet the needs of Saudi workers in the health field. Another target of the Seventh Development Plan (SDP) is to ensure steady private sector growth in health care services, through greater participation in financing the establishment of health facilities, and increased investment in the manufacturing of medicines, pharmaceuticals and medical equipment (Ministry of Planning, 2000).

Al-Ofi, in *Al-Watan* newspaper (2002), reported that a planning committee in Saudi Arabia, involving professionals and experts, reviewed health information, and information communication and technology (ICT) in the Kingdom. This committee reached some vital conclusions and reported some urgent solutions to the problems which were highlighted in their report. The report highlighted nine important issues: 1) the need to establish a National Information Society (NIS) in 2004-2005, 2) a unique number (Personal Identification) to be used and applied to patient records, 3) each of the computer administrations to be connected to the high authority in the hospital or parent organisation, 4) creation of statistical databases for diseases and infections to be made available on the Internet for researchers, 5) the need to unite and define clinical computing and health information systems, 6) the importance of developing information infrastructure and a health information network among the Saudi Hospitals and research centres, 7) the desirability of considering the information services broadly as part of the information health process, 8) the need for automation in the health sector and its administrations, and 9) special concern regarding the payment system and the introduction of health insurance.

Al-Ofi, in his report, gave a brief description of the current situation, based on field visits and investigations. He found that the Saudi hospitals and health centres are the least fortunate sector in utilising the ICT and most of them have a poor information infrastructure. Most of these hospitals have no connection to the Internet and have no electronic mail service. There is no strategic plan for health information in the country. Essentially, there is no match between the needs in practice and the outcomes of educational programmes related to health science.

The report further revealed that most of the findings and recommendations of previous health committees and conferences since 1996 are still appropriate. In addition, Al-Ofi argued that the health information service should play an essential part of the national health system. The communication of health information has an important role in the delivery of quality health care. Quality information with timely delivery must be available to enhance quality performance. This supporting system of 'information delivery' is the focal task that the health sciences libraries should perform.

Al-Zahrani (2002) confirmed that the majority of hospitals in Saudi Arabia still rely on traditional working practices such as pen and paper, post, and some staff are involved in booking appointments for outpatients manually. This, he argued, leads to unnecessary delays, frustration for patients and staff alike, and the potential for errors. In these hospitals, there is generally very little use of ICT in the health care system functions. Additionally, health professionals do not have enough ICT knowledge, experience and skills to manage and use computers efficiently in the medical environment and, therefore, they cannot take full advantage of their computer information systems. Al-Zahrani argued that the responsibility rests with the department of human resources in the Ministry of Health for meeting the technology and information needs of health professionals and staff.

2.3.1 Healthcare in Riyadh

Riyadh is the capital city of the Kingdom of Saudi Arabia within which are the headquarters of government ministries, departments and organisations; several regional, national, as well as international organisations are also based in the city. In

addition to these administrative areas, Riyadh is the central point of the Kingdom's commerce, health, education and transportation.

The population of Riyadh stands at more than 3.4 million. Saudis comprise almost two-thirds (66%) of the population, the remainder being foreigners. The population of the city is projected to increase to 6.4 million by the year 2007. In 1994 the city had 26 major hospitals, including government and private hospitals, and 276 primary health care centres, with a total of 5,013 beds. That same year, Riyadh had approximately 2,607 physicians, 6,659 nurses, and 3,224 assistant technicians (Arriyadh Development Authority, 1999).

Furthermore, Riyadh is home to a number of internationally recognised hospitals, to which cases of serious disease are referred from many other cities in the country and many parts of the world, including the Arab world, Afghanistan, Africa, and Pakistan. In brief, Riyadh is considered to be the primary centre for health care facilities and medical research in Saudi Arabia. The health care industry is projected to be a growing and significant sector in the city due to high population growth and the proximity of a number of local manufacturers and medical products suppliers (Arriyadh Development Authority, 1999).

2.3.2 Hospitals in Riyadh

In Riyadh there are a number of famous and important government hospitals affiliated to various government bodies such as the Ministry of Health, universities, and others. The following are brief backgrounds of the major hospitals in Riyadh whose health sciences libraries have been investigated in this study.

2.3.2.1 King Faisal Specialist Hospital and Research Centre (KFSH/RC)

King Faisal Specialist Hospital and Research Centre (KFSH/RC) is an independent government health and medical institution founded in 1970, which opened in 1975 at the end of the First National Plan (Ministry of Health, 1999). This hospital, in the northwest section of Riyadh, has gone through a series of developments and expansions. The hospital seeks to establish the basis and rules for specialist medical services in the Kingdom by provision of advanced specialist medical services setting up and implementing higher studies programmes for training Saudi physicians and

qualifying them in degrees related to specialised medicine and conducting research into diseases peculiar to the environmental and climatic conditions of the Kingdom. The research centre comprises four sections: biological and medical research, biomedical physics, biomedical statistics and scientific computing, and radionuclide and cyclotron operations (KFSH&RC, 2005).

2.3.2.2 King AbdulAziz City of Medicine (KACM)

King AbdulAziz City of Medicine (KACM) in the east of Riyadh, is considered to be one of the major hospitals in Riyadh and in the Kingdom as a whole (Ministry of Health, 1999). The hospital opened in 1982 with the goal of providing the highest quality tertiary medical care to the National Guard personnel, eligible dependants, and other appropriate patients. The hospital has facilities for a full range of acute, tertiary, secondary and primary patient care services for both inpatients and outpatients. KACM supervises many educational events and conferences as a part of sharing and delivering of knowledge to health professionals within the hospital and from other hospitals (The National Guard, 1995).

2.3.2.3 Riyadh Armed Forces Hospital (RAFH)

RAFH is the most important hospital of the Ministry of Defence and Aviation (MODA) among 14 similar hospitals in the Kingdom. RAFH opened officially in 1978 and is located in the heart of Riyadh. It has a high reputation for the quality of its patient care, and is regarded as one of the most important hospitals in Saudi Arabia (Ministry of Health, 1999). The hospital provides its services mainly to military personnel and their dependants through a full range of diagnostic and health management facilities. The hospital also provides continuing education programmes and specific training programmes for Saudi nationals in various medical technologies. The hospital has a leading role in various medical specialities such as heart disease, organ transplants, and dentistry (General Directorate of Medical Affairs, 1998).

2.3.2.4 Security Forces Hospital (SFH)

Opened in 1981, the SFH is the sole hospital of the Ministry of Interior. It was established to provide medical and health care services for the ministry's personnel and their dependants. The hospital, in the centre of Riyadh, and is currently considered to be one of the largest and most advanced hospitals in the Kingdom. In addition to its main role as a tertiary centre for security forces personnel, there is a

strong focus on education at the hospital. The hospital regularly holds multi-media conferences, symposia and scientific seminars for Saudi Arabia (Ministry of Interior, 2002).

2.3.2.5 King Khalid University Hospital (KKUH)

The main function of the KKUH is as a teaching and training facility for students of the College of Medicine of the King Saud University. The hospital, within the King Saud University campus in the far north east of Riyadh (Ministry of Health, 1999), provides health and medical services to KSU faculty members, their dependants, and students, as well as others who are referred to this hospital from other primary clinics and health centres. The hospital opened in 1982 and is managed directly by the College of Medicine, KSU. The hospital has expanded since then, and now holds a high position in the health care system as one of the major and recognised top hospitals in Riyadh (King Saud University, 1996).

2.3.2.6 King AbdulAziz University Hospital and College of Dentistry (KAUH/CD)

The King AbdulAziz University Hospital (KAUH) and the College of Dentistry (CD) are part of the educational programmes run directly under the authority of the King Saud University (Ministry of Health, 1999). They are located in the heart of Riyadh, in one campus, and next to each other. Each of them has a health sciences library. The majority of trainees and students are female; some medical departments are run completely by females. As its speciality the KAUH/CD comprises the largest dentistry laboratory in the Kingdom for and run by females (Ministry of Health, 2005).

2.3.2.7 Iman General Hospital (IGH)

The IGH was recently established in the south of Riyadh by the Ministry of Health to cover demand, especially that of excessive demands on the Riyadh Central Hospital. IGH is designated to support the primary clinics in the south region of Riyadh. Attached to the hospital is the College of Medical Sciences. The hospital supports the educational programmes in the College and offers limited educational training for health professionals (Ministry of Health, 2005).

2.3.2.8 Yamamah Hospital

The Yamamah Hospital has been established in the west part of Riyadh by the Ministry of Health to specialise in obstetrics and gynaecological science. Some parts of this hospital are operated fully by female specialists and female health professionals (Ministry of Health, 1999).

2.3.2.9 Saudi Centre for Organ Transplantation (SCOT)

This specialist centre was established in 1983-1984 in the near west part of Riyadh for the supervision of organ transplants and related research in the Kingdom. SCOT co-operates with many hospitals in Riyadh and others in the Kingdom to facilitate the process of transplantations, and focuses on kidney diseases, donations, and transplanting. SCOT produces a recognised scientific journal in its particular field of medicine. The centre is concerned with health education, formation of qualifying programmes, and scientific symposia for those involved in organ transplantation. Additionally, it is focused on designing and revising constitutions to form other transplant centres in Saudi Arabia (Saudi Center for Organ Transplantation, 2003).

2.3.2.10 Sulaimaniyah Children's Hospital (SCH)

The SCH was established by the Ministry of Health in the mid-north of Riyadh to be a specialist hospital in children's illnesses and diseases within the limited scope of children aged up to ten years old. It is recognised widely in Riyadh for its speciality, and receives cases referred from primary clinics and public hospitals. The hospital supports educational and training programmes related to children's illnesses and is a popular place for internship of recent graduates (Ministry of Health, 1999).

2.3.2.11 King Khalid Eye Specialist Hospital (KKESH)

The KKESH is one of the top specialist hospitals with the objective of providing high quality services for ophthalmology, and ophthalmic surgery and medicine (Ministry of Health, 1999). The hospital opened in 1984 in the west part of Riyadh, and is designed to be a referral hospital that treats only patients with serious eye diseases referred by other hospitals, health care centres, ophthalmic clinics, and public medical bodies. In addition, the hospital serves as a regional research centre in the area of its specialisms and plays a major role in training students from faculties of medicine in Saudi universities (King Khalid Eye Specialist Hospital, 1992).

2.4 Health Sciences Libraries in Saudi Arabia

In general, health sciences libraries (physical or virtual) provide information and equal access to clinical information to many health professionals, regardless of location (Peterson and Harris, 2002). The health care literature emphasises the significant function of the health sciences library as an influential information centre (Darling, 1974; Roderer, 1993; Palmer, 1999; Bishawi, 2001). The health sciences library information services can have an impact on the way knowledge is put into practice (O'Connor, 2002). Al-Shorbaji and Nour (2001) highlight that the health sciences libraries support the education and research process, and recently adopted ICT to identify resources and provide intellectual access to knowledge. However, the need still exists to demonstrate that health sciences libraries do add value and that their services have a real impact on people's lives (Gorman and Helfland, 1995).

In Saudi Arabia, health sciences libraries have been improved when compared to past decades. The impact of the computer and Internet age has led to health sciences libraries being equipped with resources for users' information needs. Dosary and Ekrish (1991) mentioned that special libraries, including medical libraries, enjoyed an essential role in automation projects. However, health sciences libraries have evolved without being carefully planned to fit in with existing facilities. They have developed individually without proper planning, coordination, and co-operation with neighbouring libraries. This situation has been influenced by the growth and conditions of the parent hospitals and health organisations in the country. Mufti (2003) confirmed that no coordination exists among health provider agencies in Saudi Arabia. Facility and equipment planning in one sector rarely takes the resources of another sector into account. Even within a sector, joint use of resources is not widely practised. Duplication of resources and services is the direct result of lack of coordination between provider agencies, and contributes to the escalating cost of health services in the Kingdom.

Health sciences libraries in Saudi Arabia were founded concurrently with the foundation of medical teaching programmes and modern hospitals in major cities. The number of health sciences libraries is increasing with the establishment of new hospitals and universities around the country. Elaywah (1985) reports that there are 28 health sciences libraries supervised directly by the Ministry of Health, and 35 health

sciences libraries scattered around the Kingdom affiliated to other hospitals (governmental or private), institutions, and universities. AbuOuf (1995) considers that the real growth of health sciences libraries in Saudi Arabia was in the 1970s with the establishment of 8 health sciences libraries in the country (Table 2-1), while there was only one library in existence in the 1960s.

Table 2-1: HSLs founded in 1970s

Health Sciences Library	City	Date
King Faisal Specialist Hospital and Research Centre	Riyadh	1975
Riyadh Armed Forces Hospital	Riyadh	1975
King AbdulAziz University, College of Medicine	Jeddah	1975
King Fahd Military Forces Hospital	Jeddah	1975
King Faisal University, College of Medicine	Dammam	1976
King AbdulAziz University Hospital	Jeddah	1977
King Faisal Military Forces Hospital	Khamis Mushayt	1977
King AbdulAziz Military Forces Hospital	Tabuk	1978

The first health sciences library was founded in 1967 in the College of Medicine, King Saud University, Riyadh. Lately, with the move to the new university campus, it serves the King Khalid University hospital and the College of Medicine which are under the supervision of the King Saud University, the first university to be established in the Kingdom (King Saud University, 1996).

2.4.1 Health Sciences Libraries in Riyadh

Health sciences libraries in Riyadh are mainly concerned with collecting and organising health information sources. Their aim is to supply health professionals in their various specialisms with information sources to cover clinical work needs and for educational purposes. These libraries are varied in their scope, space, and advancement in using ICT, depending upon the emphasis of their parent hospital and institution.

Al-Ogla (1998) claims that all hospital libraries in Riyadh (15 hospitals under exploration) provide current awareness services (CAS), Selective Dissemination of Information (SDI), and Inter-Library-Loan (ILL) services. In fact, health information professionals (health librarians) are needed to deliver and provide health professionals

with various services. However, AlShaya (2002) and Al-Ogla (1998) both confirm that health sciences libraries in Riyadh experience profound shortages of skilled health information professionals.

Disappointingly, there is a lack of sources and not enough information related to health sciences libraries, i.e. contact information, electronic and printed resources, staff, and services available. It has not even been possible to determine basic facts such as the number of hospitals that have health sciences libraries in the capital city, Riyadh. For this reason, the researcher created a directory for health sciences libraries under exploration (see Chapter 6: Health Sciences Library and Appendix A).

2.5 Summary

The health infrastructure of Saudi Arabia and its curative and prevention services have made important and increasing progress during the past decade. Particularly, in Riyadh there are a number of famous and important government hospitals affiliated to various government bodies such as the Ministry of Health, universities, and others.

This chapter provides the necessary background in which to place health sciences libraries in Saudi Arabia in the healthcare context. The real growth of health sciences libraries can be seen from the establishment of eight health sciences libraries in the 1970s. In Riyadh, health sciences libraries focus on supplying health professionals in their various specialities with information sources to cover the needs of clinical work and educational purposes.

However, the need still exists to demonstrate that health sciences libraries do add value and that their services have a real impact on the healthcare environment. This requires further and continuous improvement, including technological change and organisational development in order for these libraries to provide advanced services. The two types of development will be discussed in later chapters in this thesis. The method by which this research was accomplished and a plan for development arrived at is described in the next chapter.

Chapter Three

Research Design

POSITION IN THE THESIS

Chapter 1 Introduction	Chapter 2 Background	Chapter 3 Research Design
Chapter 4 Literature Review	Chapter 5 Users and Staff	Chapter 6 Health S. Libraries
Chapter 7 Education and Training	Chapter 8 Information Services	Chapter 9 ICT
Chapter 10 Information Provision	Chapter 11 Change & Development	Chapter 12 SHIN Prototype
Chapter 13 Conclusions	Bibliography	Appendices

Chapter Three

3

Research Design

3.1 Introduction

The aim of this chapter is to consider the appropriate research methodologies required to fulfil the aims and objectives set out in Chapter 1. The data collection processes used are also described. In addition, cleaning and screening of the data prior to analysis is illustrated, along with appropriate data analysis methods.

Section 3.3 presents the research questions for the study, whilst section 3.4 discusses the methods appropriate to both the field and the current study. The use of mixed methods of both quantitative and qualitative research strategies, including surveys and interviews, is explored in section 3.4. The study framework is examined in detail in section 3.6.

The construction of the questionnaire as a mean of data collection is presented in section 3.7. The pilot survey, dissemination, is detailed in this section and qualitative data collection is also discussed, including interviews, staff fact sheet, and the library directory.

Section 3.8 considers the sampling strategies, whilst section 3.9 explains the ethical considerations applicable to the current study. The appropriate analysis of the collected data including cleaning and screening processes is discussed in sections 3.10 and 3.11. The chapter concludes with a summary of the appropriateness of the methodologies chosen and the data they have generated (section 3.13).

3.2 Previous Research Strategies

A review of the literature identified that there has been little research related to the issue under investigation in Saudi Arabia (Table 3-1). Two of these studies focused on hospitals in Riyadh (Al-Ogla, 1998; AlShaya, 2002), whereas Aseel (1996) and AbuOuf (1995) focused on hospitals located in Jeddah, in the western province of Saudi Arabia. Arif et al. (1998), in their study, comprehensively covered the inter-library-loan (ILL) services in the health libraries of Saudi Arabia.

Table 3-1: Previous research strategies

Author	Date	Type	Topic	Sample population	Methods
AbuOuf	1995	MSc Thesis	Physicians' use of information sources	1 private/3 government hospitals, Jeddah	Questionnaire
Aseel	1996	MSc Thesis	Physicians' attitudes towards the use of Medline database on CD-ROM in hospital libraries	3 government hospitals, Jeddah	Questionnaire
Al-Ogla	1998	Article	Health libraries in Riyadh	3 private/12 government hospitals, Riyadh	Questionnaire
Arif et al.	1998	Article	Inter library loan (ILL) services in health sciences libraries, Saudi Arabia	Documents and requests of inter-library loan for the year 1995	Document analysis Interviews, Informal personal conversation
AlShaya	2002	PhD Thesis	Saudi physicians' use of information sources	4 government hospitals, Riyadh	Questionnaire, Interview, Observation

Table 3-1 shows brief details of previous research strategies relating to the health sciences libraries in Saudi Arabia. Further details can be found in the literature review (section 4.5).

3.3 Research Questions

The present study attempts to answer the following research questions:

1. What is the current condition and work environment of health sciences libraries in Riyadh?
2. Do health professionals use health sciences libraries to meet their information needs?
3. What problems affect health professionals in using health sciences libraries?
4. Do health librarians receive a satisfactory educational programme related to their specialism?
5. Do health professionals receive a satisfactory educational programme related to their ICT skills needs?
6. Why do health professionals acquire information and what type of information sources do they prefer?
7. What is the level of satisfaction of health professionals in using information services and resources?
8. What is the level of satisfaction of health professionals with ICT implemented in hospitals and health sciences libraries?
9. What is the level of use of information tools?
10. What factors affect the development and implementation of ICT?
11. What is the health professionals' provision of information and communication technology, and services?
12. What is the health librarians' provision of health sciences libraries and services?

3.4 Study Type and Method

There are various types of research method that can be used for collecting and analysing data, such as observation, questionnaires, interviews, etc. The most suitable one for any piece of research is dependent on the research objectives and the type of

data that need to be collected. In order that each method is successful, a researcher should consider the availability and applicability of each method to each particular part of the study.

Mixed research methods involve the mixing of quantitative and qualitative methods or paradigm distinctiveness. The mixing of quantitative and qualitative research can take many forms. The concept of mixing different methods originated in 1959, when Campbell and Fiske used multiple methods (Creswell, 2003). This promoted other researchers to examine the new approach of data collection. Creswell confirms that despite the fact that 'mixed methods' do not stand as quantitative or qualitative methods, they do show a rationale and practicality within many researches.

However, the underlying rationale of mixed methods described by Greene and Caracelli (1997) is to understand more fully, to generate deeper and broader insights, and to develop important knowledge claims that respect a wider range of interests and perspectives. Several writers (Brewer and Hunter, 1989; Greene and Caracelli, 1997; and Creswell, 2003) agree that using mixed methods can offset the disadvantages that certain of the methods have when used by themselves.

Tashakkori and Teddlie (2003) explain that the "Mixed Methods" approach is superior to a single approach within three areas:

1. Mixed methods research can answer research questions that other methodologies cannot;
2. Mixed methods research provides better and stronger inferences; and
3. Mixed methods provide the opportunity for presenting a greater diversity of divergent views.

Greene et al. (1989) noted that the results of one method can help develop or inform the other method. Tashakkori and Teddlie (1998) state that mixed methods are useful if they provide better opportunities for answering research questions since the ultimate goal of any research is to answer those questions. Greene et al. (1989) and Tashakkori and Teddlie (2003) proposed that mixed methods lead to and generate multiple inferences that confirm or complement each other, and often reflect different voices and perspectives.

Mixed method research design is categorised according to (1) time order concurrent versus sequential and (2) paradigm emphasis equal status, versus dominant status (Burke and Larry, 2003). In the current study, both quantitative and qualitative data are collected in same phase (concurrent) and with equal priority, and they will be integrated in the data collection stage. Table 3-2 illustrates the choices of the criteria in the mixed method implementation strategy which was adopted from Creswell et al. (2003), Burke and Larry (2003) and Tashakkori and Teddlie (2003).

Table 3-2: Criteria employed for choosing mixed method strategy

Implementation	Priority	Integration
Concurrent QUAL+QUAN QUAN+QUAL	Equal Stratus	At data collection
Sequential QUAL→QUAN	QUAL Dominant	At data analysis
Sequential QUAN→QUAL	QUAN Dominant	At data interpretation

In this study, a Mixed Methods Approach (MMA) is used to answer the research questions and to meet the aim and objectives of this study. Six steps were followed (Figure 3.1) in applying the mixed methods approach in this study. As a priority, the research questions were designed. These questions comprise qualitative and quantitative questions. This led to the use of a mixed method due to its rationality and feasibility, and as such an approach had been used successfully in other research; it was also recommended by key writers in the field of research methods. In addition, this research needed to use a variety of methods to help in drawing a better and clearer picture of the current situation of health sciences libraries in Riyadh.

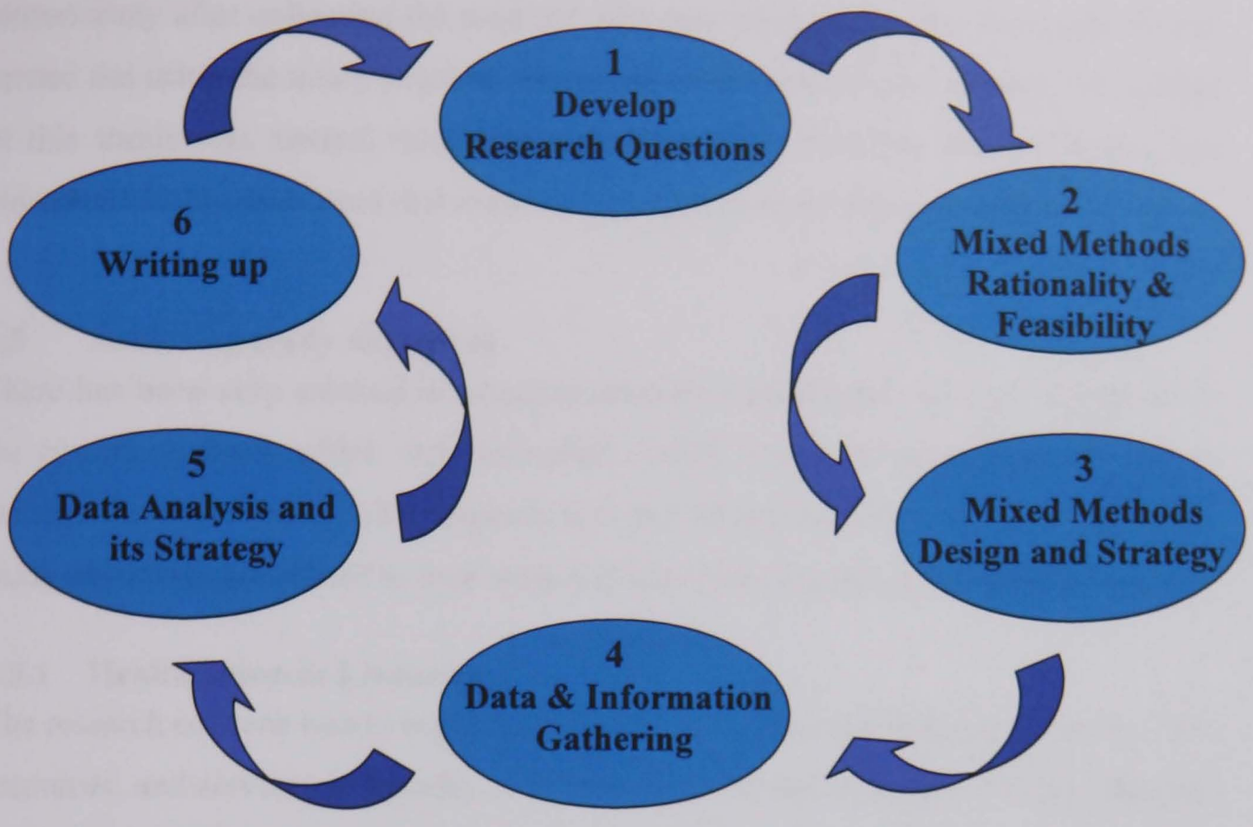


Figure 3.1: Steps for conducting the Mixed Methods Approach

This approach to gathering information gives a wide range and distribution of the sample. This provides adequate information on the current data on activities and services, as well as the health professionals' opinions and attitudes towards the health sciences libraries. It thus provides a deeper understanding of health information professionals' perceptions and views. The mixed methods approach (MMA) used to obtain research data consisted of a combination of techniques: analysis of related literature, users' questionnaires, library staff interviews, observation, library staff fact sheet, library profile form (directory), and document analysis.

The gathering of data and information required several trips to Riyadh and various visits to hospital libraries. Generally, this approach of "mixed methods" was applied to this study to obtain data that will give an accurate exploration of the current situation. Three broad categories of information are normally gathered and reported in library research: existing library conditions, comparisons between present conditions and desired standards or goals, and suggestions for the improvement of existing conditions. These three categories were included in this study.

Immediately after collecting the required data and information, the data analysis was carried out using the mixed method strategy adopted (concurrent). Finally, the writing of this thesis was started, then revised to ensure its findings match the aim and objectives of this study, and that it answers the research questions developed.

3.5 Achieving study objectives

There has been very substantial progress towards meeting the research objectives of the current research, which were identified earlier. The most appropriate strategy to achieve the objectives of this research was the mixed methods approach. However, study objectives are related to four main and important aspects, as mentioned below:

3.5.1 Health Sciences Libraries

The research concern was to explore the current state of health sciences libraries, their resources, and services in Riyadh, as well as other related concerns. Mainly, this was achieved through the first section incorporated in the users' questionnaire about health sciences libraries (see Appendix B), and other sections of the users' questionnaire concerning health professionals' evaluation of services and resources provided. In addition, a library profile form was designed to obtain further information about each library (see Appendix A). Importantly, interviews with health library staff were conducted to explore staff perceptions of issues (i.e. work environment) which concern them the most. Moreover, review of the literature and documents revealed some facts about the condition of the health sciences libraries in Riyadh which confirm the current research findings.

3.5.2 Health Professionals

The research attempted to identify the type of information sources used by health professionals and which of those sources meet their needs, and to investigate the type of difficulties which face users in acquiring information and in accessing health libraries and electronic information services. In addition, attention was given to exploring the perceptions of health professionals regarding information provision and the use and implementation of ICT in health sciences libraries. The users' questionnaire was designed and distributed mainly to achieve the identified objectives concerning health professionals. Generally, the literature review confirms the findings of the current research related to health professionals' use of library services and obstacles to access.

3.5.3 Health Librarians

The objective concerns were to discover more about health librarians (health information professionals) working in Riyadh hospitals, and to encourage quality educational and training programmes to enable them to provide adequate library and information services, and to recognise their work as an important component of the healthcare system. "Informal conversational interviews" were conducted with library staff in order to fulfil the objectives related to health librarians. One of the important issues raised was training and education. Interviewees' opinions were recorded. A review of relevant literature suggested that training increases the confidence of staff when providing information services and using ICT at work. This was confirmed in the current research by health library staff members.

3.5.4 Proposed Development

The need for development is recognised for Saudi Arabia in various aspects. In this regard, the increasing globalisation of knowledge has made it clear that domestic and national functions are not separable. The literature gives important emphasis to the utilisation of a health information network and the need for organisational change and development.

The findings of the current research can be used to develop a health information network prototype (see Chapter 12: Saudi Health Information Network) as a possible practical solution. This aims to satisfy the information needs of health professionals, and to improve these professionals through providing planned services and sources, and a channel for exchanging information and knowledge. Advances in ICT help facilitate the proposed national health network for Saudi Arabia and achievement of its vision. Particularly, the rapid development of Internet design and software technologies makes possible a quick and cost-effective design process.

Today, the Internet and the future developments in ICT offer new opportunities for the national health network to leverage their resources for strengthening national and global health information infrastructure. ICT infrastructure management will deploy and make effective use of computing and communication networks and technologies. This infrastructure should include advanced ICT, as well as related organisational and individual change and development. The analysis of the findings of the current

research led the researcher to propose a visionary organisational model for health sciences libraries in Riyadh which will support improvements in the existing health sciences libraries and information provision and organisational structure (see Chapter 11: Organisational Change and Development). The model proposed in this research provided useful elements which were analysed and discussed.

3.6 Study Framework

A framework was developed to suit the work process and to deliver successful research. The framework (Figure 3.2) comprises four steps: explore issues of concerns, identify current situation, identify relevant themes, and develop current situation. These steps are considered to be the "research process" for this study. On the other hand, there are two steps to ensure the success and development of the proposed project in the real world: testing and marketing, and managing product. However, the concern is only for the research process; anything else is not the concern of this study.

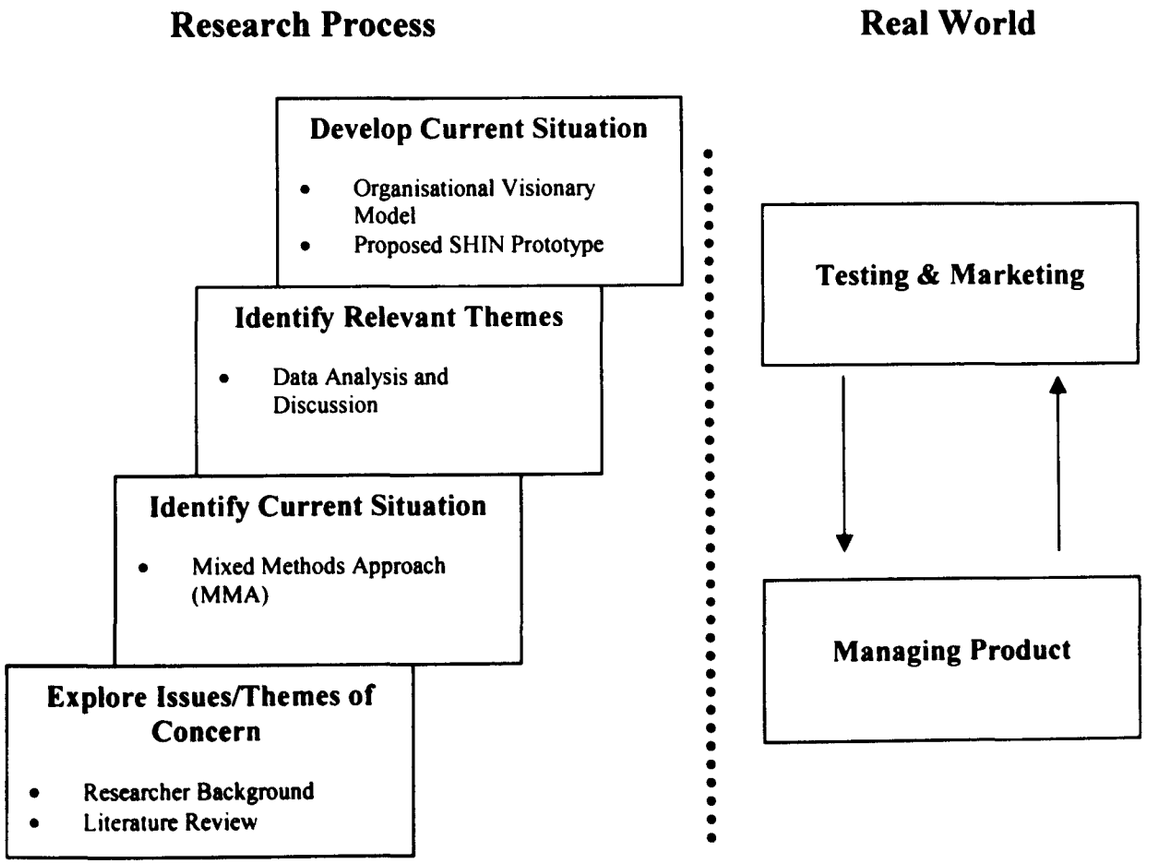


Figure 3.2: Study Framework

3.6.1 Explore Issues and Themes of Concern

Although the researcher has a background in the specialist area of library and information science, this research phase depends on the literature review. It began with a broad scope in order to reach a much narrower scope. The literature reviewed covered international practice within the field of study, the Arab countries, Gulf Co-operation Council (GCC) region, and literature produced or published related to Saudi Arabia (see section 3.7.1 and Chapter 4). The literature review played two roles: as an exploration of the issues and themes of concern, and as a method of collecting information related to the topic of the research. This process continued until the time of writing the thesis and, importantly, it supported the second step, particularly with so little previous literature being found that related to the field of study in Saudi Arabia.

3.6.2 Identify Current Situation

The current situation of the target studied is not identified clearly since there has been little research conducted related to the topic. Concurrently with the literature review exploring more about the issue, the mixed method aims to give a closer and deeper understanding of the issue (see section 3.4). Through a combination of quantitative and qualitative methods, the perspectives of users (health professionals) and library staff (health information professionals) were explored. Based on these and other strategies adopted in this study, i.e. library profile form and observation, the current situation was identified. Collectively, this step made the following step clearer and pinpointed major themes that needed more discussion.

3.6.3 Identify Relevant Themes

Themes are needed for better categorisation and recognition of the current situation. The data analysis of information gathered formed and generated major themes which concern the study and show the current situation. In addition, the data analysis and discussion chapters (Chapters 5, 6, 7, 8, 9, and 10) formalise the main study themes. These themes clarify and support other research findings, it affirm the need for developments to the situation, and show the way to the next step.

3.6.4 Develop Current Situation

The framework is designed not only to visualise and identify the current situation and practice in relation to the issue of concern, but to give recommendations for future development and further consideration. It produces practical solutions and contributes to reducing or solving the problems. This step of the framework is to propose development for the health sciences libraries, to exploit their potential role in the delivery of health information to their users, potentially the health professionals. Overall, the development step is an initiative procedure which aimed to present a simple and understandable illustration of possible change and improvement to authority, individuals of concern (i.e. health librarians) and health sciences libraries in Saudi Arabia.

This step comprises two interconnected proposals: a proposed prototype of a health information network in Saudi Arabia (see Chapter 12: Saudi Health Information Network: A proposed Prototype), and a proposed organisational visionary model for health sciences libraries in Riyadh (see Chapter 11: Organisational Change and Development).

3.6.4.1 Proposed Prototype

The general understanding and conclusion of the literature review indicated an important requirement of change in the current condition of the health sciences libraries. Generally, this is confirmed by several writers (Elaywah, 1985; AbuOuf, 1995; Aseel, 1996; Al-Ogla 1998; Al-Zahrani, 2001). Elaywah (1985) and Al-Zahrani (2001) suggested the need for health information networks to facilitate the access and delivery of information to the potential users. These suggestions encourage the plan and design of the proposed Saudi Health Information Network. A Saudi Health Information Network is proposed as a practical contribution (see Chapter 12: Saudi Health Information Network prototype). This proposed development is enriched with other international experiences and outcomes. In addition, this proposed prototype approved and presented at an international conference organised by the World Health Organisation-Eastern Mediterranean Regional Office (WHO/EMRO) in Cairo, Egypt, during the period 23-25 November 2004. The researcher received an acknowledgement and "thank you" letter from WHO/EMRO relating to his presentation and contribution (see Appendix E).

The implementation of the proposed network involves various issues. The priority is the assurance of its success. This required at the beginning more exploration of various practical experiences dealing with the new technologies and the possible organisational changes and development. In fact, using technology nowadays is not a complex stage; however, implementation might be time-consuming as a result of various factors in the implementation process (i.e. people barrier). However, openness to change, acceptance and success of new technology implementation is the really complex issue. Priestner (1995) noted that successful implementation is reliant on many interdependent factors: site characteristics, organisational structure, library mission, administration and, most importantly, individual employees. Furthermore, the objectives of each change in each case are different.

3.6.4.2 Organisational Change and Development

Organisational changes are essentially responses to advances in ICT. Organisational change and development is the most important and complex process. Libraries must be organised to deal with the extraordinary changes that are taking place worldwide, regionally, and in their own environment. This means that a successful library is designed to encourage innovation and change.

One of the successful practical organisational models investigated is the Brown University Library Model "Organizational Framework" (Brown University, 2000), which has been studied for this research. It has been chosen for its advantages, and also because it deals with various issues which are relevant to health sciences libraries in Riyadh (i.e. learning and staff development, coordination and co-operation, accessibility and services, ICT infrastructure). This model was modified, and simplified to produce a preliminary organisational visionary model for this research.

The following paragraphs give an explanation of the Brown University Library Model, and a brief note of the preliminary proposed Organisational Visionary Model for health sciences libraries in Riyadh used for this research. However, this visionary model is developed and discussed further in Chapter 11: Organisational Change and Development.

3.6.4.2.1 Brown University Library Model

At the start of the Academic Year 1995/96, Brown University Library (BUL) administration and librarians began a process to examine the Library's preparedness for adapting to the constant changes impacting on the academic, research, and information environments (Brown University, 1998). The examination covered changes that would be affecting the Library as the 21st Century approached, and ideas of how BUL could best progress while managing change. The participants reached the conclusion that it would be premature to assume that reorganisation would be the only way to achieve positive change at Brown University. The Organisation Study process was envisioned as a way of initiating widespread discussions, involving all staff throughout the organisation, of the key issues affecting "the library of the future" (Library Transition Management Group, 2000). This process revealed a great deal of commonality of beliefs about Library strengths and weaknesses, as well as desired directions for organisational change (Brown University, 1998; Library Transition Management Group, 2000). The study process thus resulted in formalisation of an "Organisational Model" (Figure 3.3).

The model comprises four major elements called "collaboratives". Each part of a collaborative focuses on a set of user-centred activities, and works with members of the user community and with other Library collaboratives to achieve its mission. There is a local technology support around each collaborative which is envisioned as a distributed network of trained staff members who provide local support for technology in the areas in which they work.

1 Scholarly Resources Collaborative

The mission of the Scholarly Resources Collaborative (SRC) is to identify and select information resources in all media that are critical to the current and evolving research goals of Brown University's (BU) academic disciplines; and to connect members of the university community with the intellectual resources in their own and related disciplines. The SRC assesses the information needs of users in the University's academic fields of research and study, understanding the scope of each discipline, placing these needs in the context of the broader discipline, while recognising the inter-relationships between and among fields. The SRC works in cooperation with other libraries and consortia to develop and implement a comprehensive and coherent

approach for building collections that supports, primarily, the research needs of BUL users (Library Transition Management Group, 2000).

2) Learning and Curricular Resources Collaborative

The mission of the Learning and Curricular Resources Collaborative (LCRC) is to create and develop both resources and services that are critical to the current and evolving faculty teaching, student learning, and curricular needs at the University; to connect the teaching/learning community with information resources; and to enhance both the classroom and life-long learning experience of members of the community as they seek, identify, and work with information resources in all media. To achieve this mission, the members of the LCRC assess the special and evolving information resources needs and services requirements related to the curriculum. The LCRC designs and delivers continually evolving Information Literacy programmes (Library Transition Management Group, 2000).

3) Access and Delivery Collaborative

The Access and Delivery Collaborative (ADC) intended to design intellectual access and organisation of the world of information resources at and beyond Brown University; to manage the physical organisation of BUL's collections whether on- or off-site; and to develop systems that deliver information, regardless of format, to members of the library's community of users. The ADC members acquire, process, describe, organise, store, and preserve library materials system-wide, regardless of format, location, or content. The ADC builds and continuously improves comprehensive knowledge management systems (i.e. Library Web structure) that optimise the searching and retrieval of information resources, whether traditional or electronic (Library Transition Management Group, 2000).

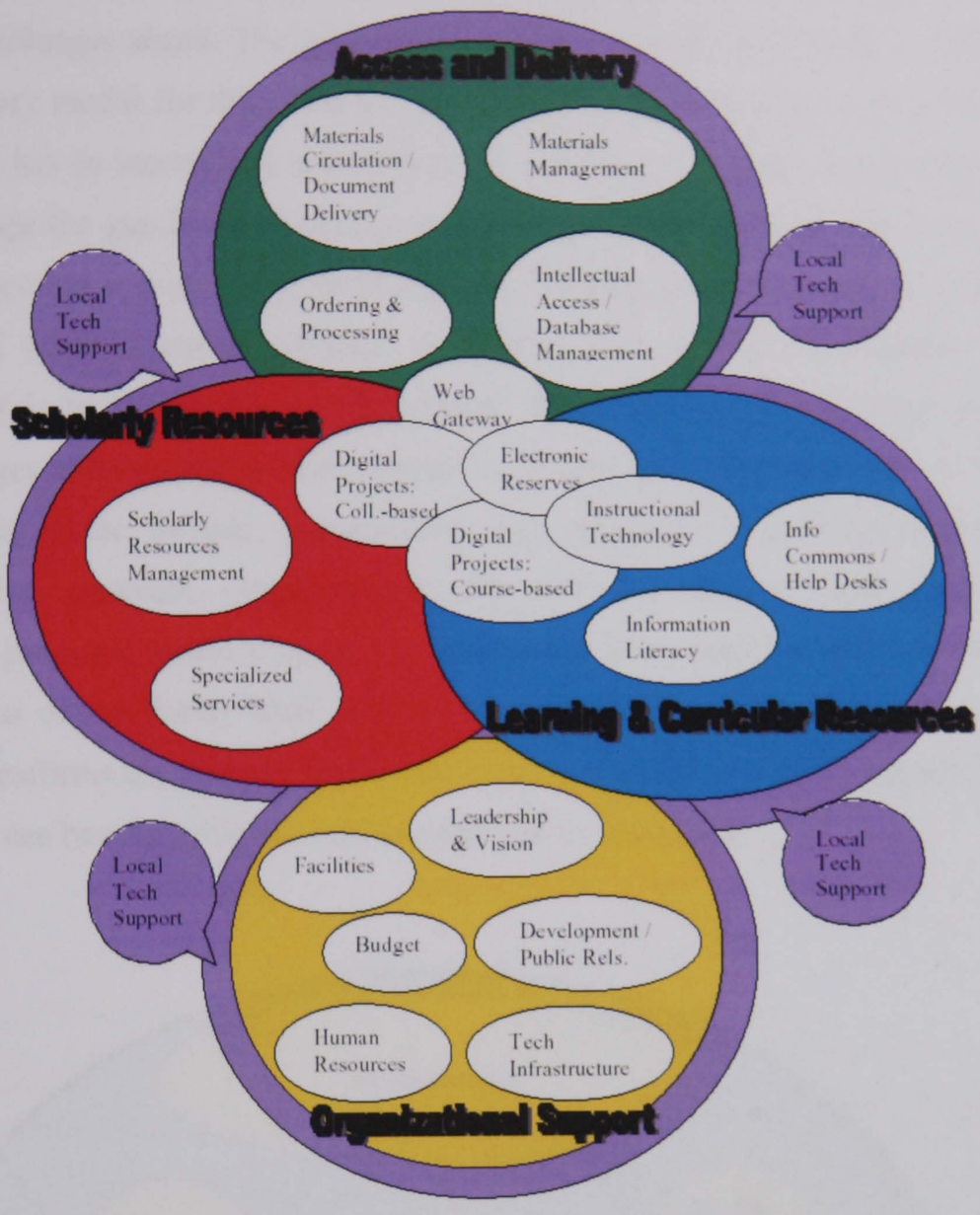


Figure 3.3: Brown University Library Model "Organisational Framework",

Source: Brown University (2000), permission obtained for reproduction, (see Appendix F).

4) Organisational Support Collaborative

The mission of the Organisational Support Collaborative (OSC) is to further the strategic goals of the BUL as a whole and to facilitate the work of the other collaboratives by developing a system-wide organisational infrastructure and coordinated support services to include planning, human resources, organisational and staff development, budget, financial, facilities and backbone technical systems management, and library public relations and fundraising (Library Transition Management Group, 2000).

3.6.4.2.2 Organisational Visionary Model (OVM):

There is a need for a model which matches the capability of an organisation to the tasks and challenges ahead. The proposed organisational visionary model (OVM) is the preliminary model for this research and appreciates complexity and diversity in situations. It has to incorporate a collaborative approach to change management in order to bridge the gap between change decisions and its progress in real time. The priority to develop a model is to participate in changing and improving the current condition of health sciences libraries in Riyadh. Part of this development and improvement is to assure that health sciences libraries adopt new cultures which accept changes and successful implementation of new technologies as part of their work process. These include: management style, advanced technology, improved communication channels, organisational and staff development, and teamwork setting. The proposed model (Figure 3.4) attempts to bring together and balance the internal focus of the library staff with an external focus on the library users and mission. It reaffirms the library's traditional mission while proposing changes in how that mission can best be achieved, utilising the new technologies.

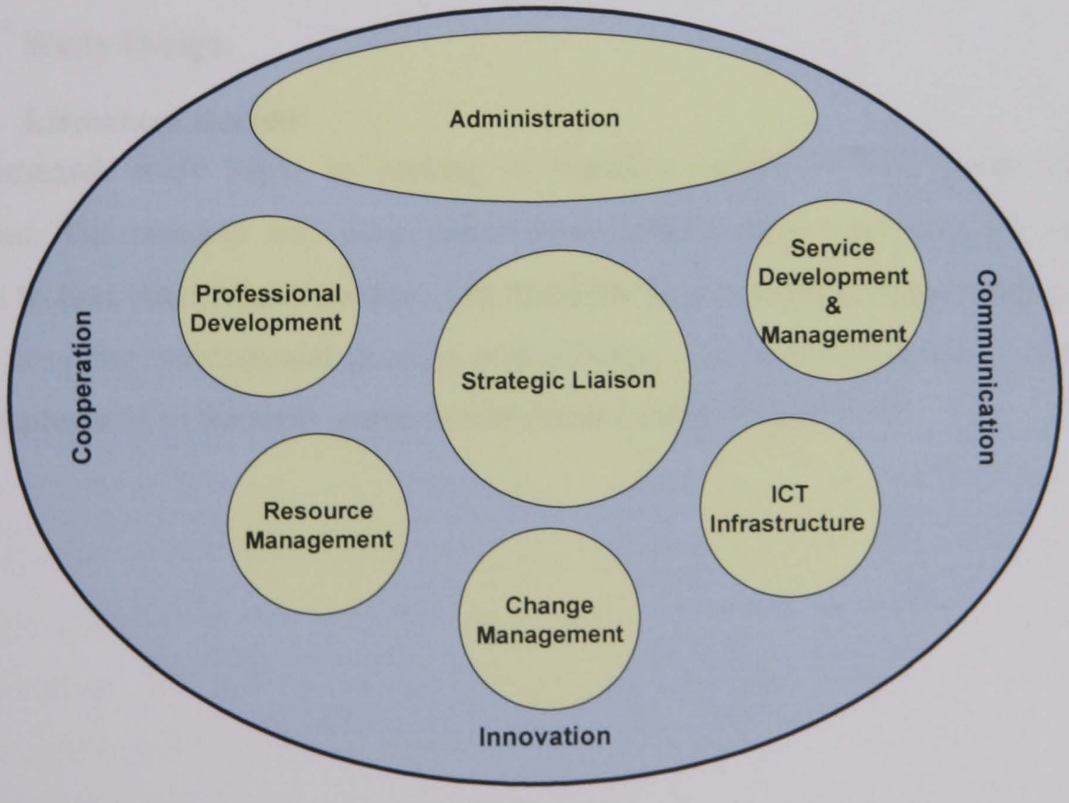


Figure 3.4: Preliminary Organisational Visionary Model

This model has fundamental values which include:

1. Create a social foundation for change within the organisation, considering collaboration, communication, and innovation
2. Show the importance of "Management Change"
3. "Administration" has a positive decision-making, and ensures successful plans and implementation
4. "Strategic Liaison" ensures co-operation amongst people and units in the health sciences libraries
5. "Service Development and Management" allows traditional services and new innovative ones
6. Greater concern for "Professional development" through training and educational programmes
7. Through "Resource Management", acquire and manage resources for better utilisation, and
8. Build and maintain the "ICT Infrastructure" to ensure the utilisation of new technology in performing the organisational operation and process.

3.7 Study Design

3.7.1 Literature Review

This research study began by looking at literature concerned with health sciences libraries. The research was done under many subject terms, covering all possible means to find other related studies. The literature search strategy began with a broad scope covering international practice and concept, and narrowed down to literature related precisely to the topic scope within Saudi Arabia (Figure 3.5).

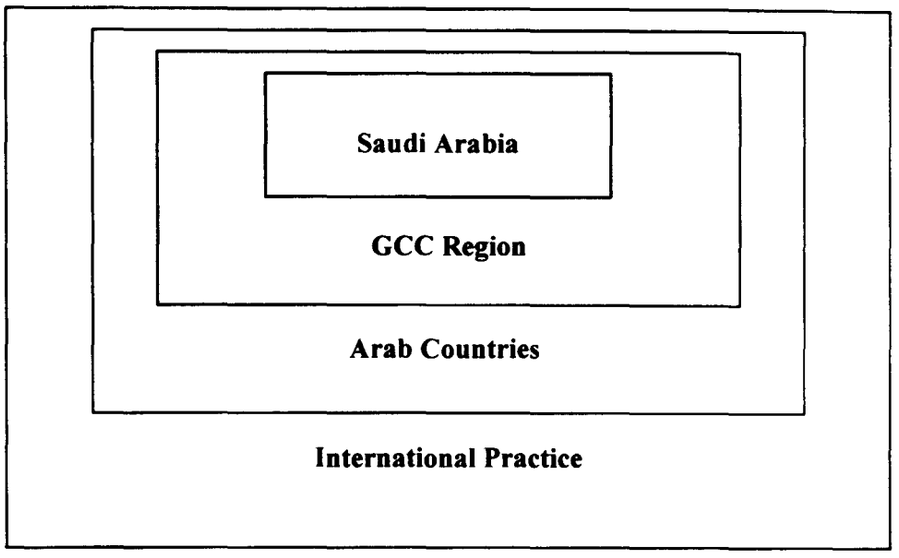


Figure 3.5: Scope of Literature search on Health Sciences Libraries

An extensive search was carried out using the major search tools relating to library and information science including City University library databases, Loughborough University OPAC, and other universities in the United Kingdom using OPAC and CO-OPAC services. Other databases consulted included Index to theses, Dissertation Abstracts, Library and Information Sciences Abstracts (LISA), King Fahd National Library database (Saudi Arabia), King Saudi University catalogue (Saudi Arabia), King Abdulaziz City for Science and Technology databases (IPAC) (Saudi Arabia), Cambridge Abstract (online), and other resources online via the Internet and printed journals (e.g. Health Library Review, Library Trends, Information Society).

In addition, a subscription was made to some electronic mailing groups which provide updated information and discussion on related topics, i.e. Eastern Mediterranean Regional Virtual Health Sciences Library List Serve, Saudi Doctors emailing group, Personal Digital Assistant (PDA) electronic group, and Australian Health Library Group. Subscription was also made to electronic services provided by organisations, publishers and electronic journals, i.e. SARA Alerting service by Taylor and Francis Group, Science Direct titles alert and Librarians Electronic Newsletter (SD Connect), and Elsevier Science Table of Content Service.

For the purpose of collecting related literature some trips were made to Cairo (Egypt), Riyadh and Jeddah (Saudi Arabia), and within the UK. For the same purpose some

trips were made to attend conferences and events related (see appendix E). Presentation and formulation of the most relevant literature is included in chapter four of this thesis (Literature Review).

The literature review formulates some aspects of the practice and organisational work within hospitals and health sciences libraries. For instance, it was clearly found that there is no formal co-operative interconnection and accomplishment in Arab countries in general, and in Saudi Arabia in particular. The only formal agreement for inter-library lending was finalised in 1987 by the Deans of university libraries in the Gulf region under the auspices of the Education Bureau of the Gulf Co-operation Council (GCC). A shortage of health information professionals (health librarians) exists in the GCC, and particularly in Saudi Arabia. There is not much literature found that relates to the health sciences libraries in Saudi Arabia. Several reviews and bibliographies of related works were also consulted to try and trace relevant literature.

3.7.2 Questionnaire

The questionnaire is an information gathering technique that allows systematic analysis to gather attitudes, thoughts, beliefs, and characteristics from general and key people in an organisation who might be affected by the current and proposed systems (Kendall and Kendall, 1992). Questionnaires are extremely flexible, and can be used for any topic to gather information from a large number of users. 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.

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 respondents and, in addition, quantitative data are generally easier to analyse (Bookstein, 1985).

The questionnaire designed for this research was for health professionals working in governmental hospitals in Riyadh. Its main purpose was to gather both quantitative and qualitative data, and to gain an accurate knowledge of present activities in health sciences libraries in Riyadh. In addition, the questionnaire focused on the level of user satisfaction as it related to health libraries and information services.

The questionnaire was designed to answer the research questions (Figure 3-4), and some questionnaires and findings from other research were also used in the design. The questionnaire was developed from several studies, mainly Basager (2001), Al-Zahrani (2001), Al-Mahroos (1998), Patterson (1994), Wakeley and Foster (1993), Gayas-ud-din (1992), Graham (1990), and Al-Werdi (1983). Questions extracted from other researchers' questionnaires and findings were modified wherever necessary to fit the nature and scope of this study. A qualitative approach was used in this study side-by-side with a quantitative approach by using open-ended questions to collect answers, and to give each respondent the opportunity to comment on those questions.

The questionnaire was designed in March 2001 and involved 16 questions. Based on this, a pilot study was conducted in Riyadh in May 2001. 50 questionnaires were distributed in two health sciences libraries, i.e. King Faisal Specialist Hospital and Research Centre (KFSH/RC), and King Khalid University Hospital (KKUH). The pilot study resulted in the questionnaire being expanded to contain 36 questions. Two hundred questionnaires, with the 36 questions, were distributed as a second pre-testing of the questionnaire to five selected health libraries in King Faisal Specialist Hospital and Research Centre (KFSHRC), King Khalid University Hospital (KKUH), King Abdulaziz University Hospital and College of Dentistry (KAUH/CD), Riyadh Armed Forces Hospital (RAFH), and Security Forces Hospital (SFH). Important comments were received which generated some potential questions to be added to the 36-question questionnaire.

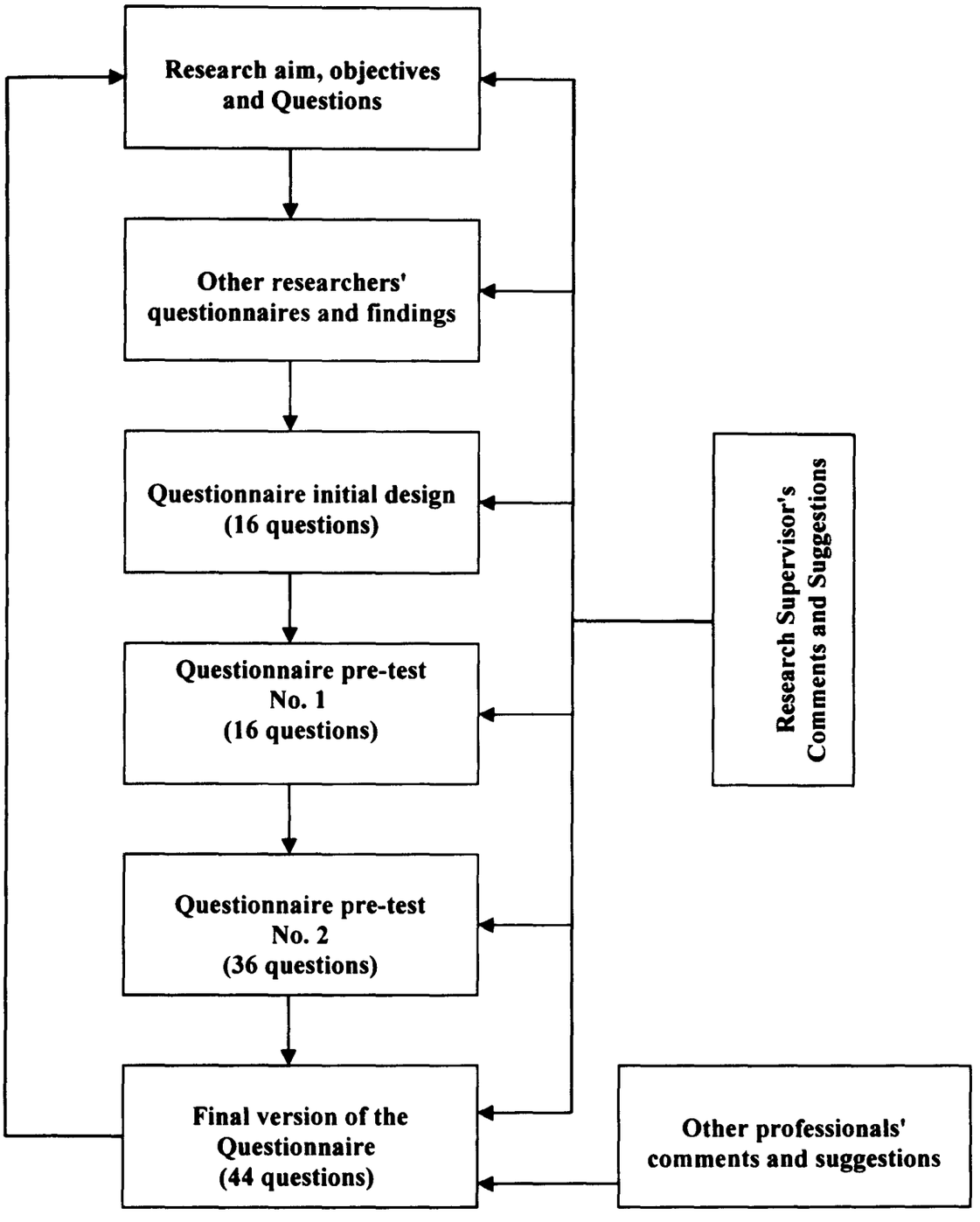


Figure 3.6: Questionnaire design process

The questionnaires were designed using boxes for the respondents to tick, and open-ended questions were also provided in order for each respondent to provide more detail. Open-ended questions were designed so that the respondents would describe and summarise their opinions. However, the last section (Q 44) was an invitation to respondents to add any information, comments, suggestions or complaints they regarded as relevant to the study.

This design was adopted to increase the number of health professionals answering qualitative questions. It was regarded as important to allow the respondents to express their opinions with a greater richness and spontaneity. The intention of the open-ended questions was to validate the research results and findings from the quantitative questions in the questionnaire.

Therefore, the final format of the questionnaire comprised 44 questions intended to collect information on the current situation, depending on users' perspective and satisfaction (see Appendix B). Further, questionnaires were accompanied by a covering letter explaining the purpose and importance of this questionnaire. Also, it confirmed to the respondents the confidentially of their feedback (see the covering letter, Appendix B). The questionnaire contained the following sections:

1) Health Sciences Libraries

This section aimed to establish respondents' view of the health library. They were asked to indicate the reasons for visiting the health library, and the frequency of their visits. Respondents were also asked if they faced difficulties that deterred them from visiting the library more often.

2) Information Services and ICT

This section consisted of questions regarding the reasons for information seeking and the type of information respondents preferred to search. Respondents were also asked about their view of the information services provided by the health library. The responses were on a five-point Likert scale ranging from 1 (*very good*) through to 5 (*poor*)

3) Education and Training

The training section consisted of six questions, asking respondents if the had had any computer training, the length of the training, and if they were satisfied with the training they had received.

4) Information Provision

This section consisted of ten questions regarding respondents' view of the future expected developments in the field, for example health information network,

expansion of electronic services in health science libraries, and information sharing amongst hospitals. Respondents were also asked about the problems encountered in introducing ICT in Saudi Government hospitals.

5) Personal Information

This section consisted of six closed questions to elicit information regarding the respondents' gender, age, job description, and qualifications.

The questionnaire was pre-tested to ensure clarity, appropriate language, and structure. The questionnaire design was discussed with Dr David Bawden (direct supervisor) and other professionals to assess its validity and reliability, and to receive suggestions and comments. As a result, there were some changes and modifications to some questions. The final drafts of the questionnaire were distributed in May 2002.

3.7.3 Library Staff Fact Sheet

Library staff members (health information professionals) in defined hospitals were included as a sub-population of the study. There were at the time of investigation 37 people working in 11 health sciences libraries. Since there is insufficient information such as a health information professionals' directory which would help to identify some staff characteristics, the researcher developed the idea of a Library Staff Fact Sheet (see Appendix C). The Library Staff Fact Sheet comprised several questions concerning gender, nationality, academic qualifications, job descriptions, professionalism, and work experience. This sheet simply helps to draw a clear picture of staff members working in the health sciences libraries.

3.7.4 Interview

Health information professionals are key for health library services, and their importance has increased with the development of information services and technologies. Realistically, staff advanced education and experience could play a major role in providing services. Staff work motivation and job satisfaction are needed for the improvement of information services and, the behaviour of staff has to be proactive in delivering those services. Therefore, the majority of those interviewed were health information professionals.

In interviews, information is gathered from persons who are able to provide research data on the basis of their background. By using this method, more information is collected at a specific time. In addition, interviewers have the flexibility to use their knowledge, expertise, and interpersonal skills to explore interesting or unexpected ideas or themes raised by participants.

Kvale (1996) defines qualitative research interviews as attempts to understand the world from the subjects' point of view, to unfold the meaning of people's experiences, to uncover their living world prior to scientific explanations. The information may be concerned with their experience, opinions, attitudes, reactions to services, etc. (Busha and Harter, 1980). 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 (Kendall and Kendall, 1992).

Interviews are both more personal and more interactive than questionnaires, and thus a wider range of information can be collected. The interview facilitates evaluating organisational settings by individualised perception and exploring individual differences between interviewees' experiences and outcomes. As a result, it gives a deeper understanding of the meaning of libraries to its staff. The interview technique has the advantage of eliciting a quality of data that is otherwise unobtainable. A drawback of the interview technique is that interviews can be very time-consuming, especially if the respondents are widely spread in geographical terms (Sewell, 2002; Kendall and Kendall, 1992). Other advantages and disadvantages of using interviews in research are shown in Table 3-3.

Table 3-3: Interview Advantages and Disadvantages

Advantages of Qualitative Interviewing	Disadvantages of Qualitative Interviewing
1. Allows the participant to describe what is meaningful or important to him or her using his or her own words rather than being restricted to predetermined categories; thus participants may feel more relaxed and candid	1. May be experienced as more intrusive than quantitative approaches; participants may say more than they intended, and later regret having done so
2. Provides high credibility and fact validity; results "ring true" to participants and make intuitive sense to lay audiences	2. May be more reactive to personalities, moods, and interpersonal dynamics between the interviewer and the interviewee than methods such as surveys
3. Allows evaluator to probe for more details and ensure that participants are interpreting questions the way they were intended	3. Training interviewers and conducting interviews can be expensive and time-consuming, because qualitative interviewing requires considerable skill and experience
4. Interviewers have flexibility to use their knowledge, expertise, and interpersonal skills to explore interesting or unexpected ideas or themes raised by participants	4. Analysing and interpreting qualitative interviews is much more time-consuming than analysing and interpreting quantitative interviews
5. Sometimes no existing standardised questionnaires or outcome measures are available that are appropriate for what your programme is trying to accomplish	5. More subjective than quantitative interviews because the valuator/researcher decides which quotes or specific examples to report
	6. Response bias through "Socially Desirable" answers (as the respondent sees them)

Source: Derived from Sewell (2002)

The researcher found that the most suitable way to conduct an interview with health sciences library staff was through friendly talks and informal chats in an "Informal Conversational Interview" (see Table 3-4), since most of the staff and workers did not feel comfortable with structured or recorded interviews. However, at the most basic level, interviews are conversations (Kvale, 1996).

The Informal Conversational Interview is a type of interview that may occur spontaneously in the course of field work, and the respondent may not know that an "interview" is taking place (Sewell, 2002). Questions emerge from the immediate context, so the wording of questions and even the topics are not predetermined (Table 3-4). The major advantage is that the interview is highly individualised and relevant to the individual. Thus it is likely to produce information or insights that the interviewer could not have anticipated.

Table 3-4: Informal Conversation Interview

Characteristics	Questions emerge from the immediate context and are asked in a natural way. Questions are not predetermined to certain topics or wording.
Strengths	Increases salience and relevance of questions. Interviews are built on and emerge from observations. Interviewee has steering power and opportunity to express whatever issue he or she thinks is important. Interview can be matched to individuals and circumstances.
Weaknesses	Less systematic and comprehensive if certain questions do not arise naturally. Possibility of different information collected from different people with different questions. Data organisation and analysis can be quite difficult.

Source: Derived from Frechtling and Sharp (1997); World Bank Group (2003)

This type of interview requires an interviewer who is very knowledgeable and experienced in the content area, and strong in interpersonal skills, since he or she will have considerable discretion in directing the interview. However, since different information is collected from different people, this kind of interview is not systematic or comprehensive, and it can be very difficult and time-consuming to analyse the data (Sewell, 2002).

The researcher was able to conduct informal conversational interviews with 22 health sciences library staff members. The time taken with these interviews varied, depending on the mood of the staff and time available. Unfortunately, the researcher was not able to conduct any interview at SCOT since it had no designated staff for the health sciences library at the time of this study.

The interviews, generally, highlighted the following topics:

1. Co-operation levels amongst Saudi health sciences libraries in Riyadh and with other libraries in the country.
2. Needs, expectations and developments related to the health sciences libraries in Riyadh.
3. Challenges encountered by health sciences librarians.
4. Type of planning required, especially with regard to the electronic information services in the health sciences libraries.
5. Role of health information professionals in developing and delivering information services to users.

6. Role and position of the health sciences libraries and health information professionals within the health care environment.

Contact was also made with some professionals and others concerned with the profession of library and information sciences in Riyadh and elsewhere to discover other views and perspectives.

3.7.5 Observation

Observation is a technique used to study the activities of the participant. There are two main techniques: participant observation and non-participant observation. Participant observation, as the name indicates, is when the researcher participates in the environment being observed. The researcher tried to conduct this type of observation, but some difficulties appeared, such as the longer time needed and some hospitals' restrictions. However, in non-participant observation, the researcher remains removed, and simply watches and records what is going on.

The observational approach is a method by which the observer gathers actual data on programmes, processes, or behaviours being studied (Table 3-5). It provides an opportunity to collect data on a wide range of behaviours, to capture a great variety of interactions, and to openly explore the evaluation topic (Sewell and Teitelbaum, 1986; Frechtling and Sharp, 1997). Direct observation of operations and activities, like those that were adopted for this study, allows the observer to develop a holistic perspective and understanding of the context within which the libraries are operated. Observation also provides an opportunity of learning about things of which the observed staff may be unaware, or that they may have been unwilling or unable to discuss in an interview or informal conversation. The main advantage of the Direct Observation method is that if observed individuals are not aware that they are being observed, then they are less likely to change their behaviour and compromise the validity of the evaluation (Dubois, 1992; World Bank Group, 2003). The advantages and disadvantages of observation as a data collection method are summarised in Table 3-5.

Table 3-5: Observation Advantages and Disadvantages

Advantages of Qualitative Observation	Disadvantages of Qualitative Observation
1. Provides direct information about behaviour of individuals and groups	1. Expensive and time-consuming
2. Permits observer to enter into and understand situation and context	2. Needs well-qualified, highly trained observers; may need to be content experts
3. Provides good opportunities for identifying unanticipated outcomes	3. May affect behaviour of participants
4. Exists in natural, unstructured, and flexible setting	4. Selective perception of observer may distort data
5. Allows awareness of important things that participants observed may ignore or omit willingly or unwillingly in an interview	5. Investigator has little control over situation
6. Permits observer to present more comprehensive views through combining his own as well as others' perceptions	
7. Helps understand and interpret activities by providing personal knowledge and direct experience	

Source: Derived from Frechtling and Sharp (1997); World Bank Group (2003)

The researcher carried out a great many visits to selected sites and noted some important views relevant to the study. Certain points are considered and observation outcomes are shown in (Figure 3.7). These are the setting of the physical environment within the health libraries; the human, social environment, which explores the ways in which health information professionals and health professionals interact and behave towards each other; and the implementation of services and facilities which explain the existence of those services and facilities, health professionals' interactions with services and resources, and the role of health information professionals in the libraries as potential providers of services. This would involve careful identification and an accurate description of relevant human interactions and processes.

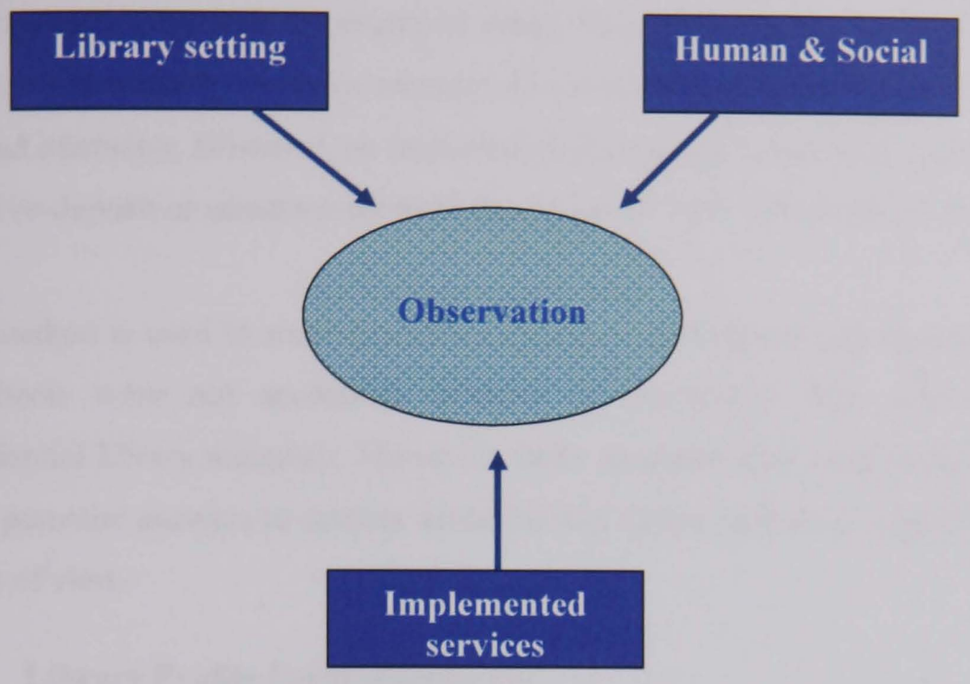


Figure 3.7: Observation focus

The observation procedure went beyond a simple recording of events. It provided an overall context for the data. The observation process enabled the observer to:

- Describe the physical setting
- Identify the characteristics of health information professionals as library staff members
- Identify the characteristics of health professionals as library potential users
- Describe the content of the intervention such as actual activities and the quality of services delivered
- Document the interactions between staff and users
- Be alert to and aware of unanticipated events that might require refocusing, distraction avoidance and removal

3.7.6 Document Analysis

Documents are a useful source of information on activities and processes, and generate ideas and views which explain some observed activities and interviewees' points of view.

A major advantage of this method is that documents were generated contemporaneously with the events to which they refer. Hence, they are less likely to be subject to memory decay or memory distortion when compared with data obtained from an interview. However, an important disadvantage is that they may be subject to selective-deposit or selective-survival bias (Sewell, 2002; World Bank Group, 2003).

This method is used to some extent according to availability and accessibility. Some documents were not accessible because of restrictions and were regarded as confidential library materials. However, those materials that were reviewed provided some potential answers to unclear activities and created a rational explanation of staff points of view.

3.7.7 Library Profile Form (Directory)

The researcher, through his investigations, field visits and data collection, could not find enough information about the health sciences libraries, i.e. contact information, electronic and printed resources, staff, and services. It was not even possible for him to determine basic facts such as the number of hospitals that actually have a health sciences library in Riyadh. The importance of creating a directory is derived from this current situation.

Therefore the researcher carried out another task to start a directory (see Appendix A) for the health sciences libraries under investigation, with the intention of enlarging and improving this directory in the future to include all health sciences libraries in the Kingdom. This might also introduce the project of a national survey to be sponsored by the Saudi Arabian government. The directory in its present format was adopted, with some modification, from the directory of the Gulf Countries Council, published 1994, in Oman by Sultan Qaboos University Medical Library. The directory forms were completed by the chief librarians of the health sciences libraries under investigation (see also Chapter 6: Health Sciences Libraries).

3.8 Population and Sampling

The process of defining a representative subpopulation to study is called sampling. A sample is a small subset of the population that has been chosen to be studied (Cox and West, 1986; Portney and Walkins, 1993). The sampling in this study aimed to decrease time and money costs as much as possible, and to increase the amount of

data and detail that can be obtained. It is important to increase the accuracy of data collection by preventing errors. However, in the real world of clinical research, true random sampling is very difficult to achieve, since time, cost and ethical considerations often prohibit researchers from making the necessary arrangements and securing the necessary clearances (Lunsford and Lunsford, 1995).

The population of this research is well defined as a "set" that has certain specific properties. The sample for distributing the questionnaire is a selection of a subset of the population that will represent the whole population. However, in order to accomplish the study within the aims of its sampling, inclusion criteria used to select the sample and exclusion criteria make some potential subjects ineligible to be in the sample. The inclusion and exclusion process helped in defining the sample of this research. Accordingly, the elements of the MMA were applied to collect information from the sample of this research.

Specifically, the study sampling was made based on the following steps of inclusion and exclusion criteria:

1. Define the target population. This study was devised with very specific inclusion criteria that outlined the geographic and clinical characteristics of the desired population. It was important to consider the research question and include factors that would enable a homogeneous selection of subjects. Thus, it was decided that the study was to include:
    - Government-owned hospitals
    - Hospitals located in the capital city of Saudi Arabia, Riyadh.
    - Hospitals with health sciences libraries which were officially open and providing services to their users.
2. Exclusion criteria were developed. These were applied to hospitals that broadly met the inclusion criteria, but had to be excluded because they could not complete the study or possessed unique characteristics that might confound the results. For example, Sahara Hospital was excluded, since it has no health sciences library. In addition, an important ethical consideration was the willingness to participate within the time frame required. For example, AlAmal Hospital and the Riyadh Central Hospital were excluded as well, since

they took more than five months merely to approve the distribution and collection of the questionnaire.

3. Once the accessible population had been defined, efforts were made to obtain subjects in the manner planned to define the sampling process and specific techniques for recruitment. Dynamic recruitment minimised the probability of error and bias. Indeed, the goal of recruitment was to obtain a sample large enough to enable valid statistical analysis and allow subjects to be selected in such a manner as to avoid bias.

Therefore, the first step was to define the research population. Cox and West (1986) describe a population as a well-defined group of people or objects that share common characteristics. This narrow specification and refining of the process is useful, since it more clearly defines the target as well as accessible populations, and has a direct impact on inferences to be drawn at the conclusion of the study.

Using the inclusion and exclusion criteria, 11 sites were defined as governmental hospitals located in Riyadh the capital city of Saudi Arabia. Therefore the research involved 11 health sciences libraries located in the following hospitals:

1. King Khalid University Hospital (KKUH)
2. King AbdulAziz University Hospital (KAUH) and College of Dentistry (CD)
3. Riyadh Armed Forces Hospital (RAFH)
4. King Fahd National Guard Hospital, later known as King AbdulAziz City of Medicine (KACM)
5. King Faisal Specialist Hospital and Research Centre (KFSH/RC)
6. King Khalid Specialist Eye Hospital (KKSEH)
7. Security Forces Hospital (SFH)
8. Yamamah Hospital (Yamamah)
9. Sulaimaniyah Children Hospital (SCH)
10. Saudi Center for Organs Transplant (SCOT)
11. Al-Iman General Hospital (IGH)

3.8.1 Sampling Methods

It is very important to obtain as many respondents as possible and to eliminate any potential bias inherent in selecting respondents in governmental hospitals in Riyadh. However, it is too costly and time-consuming. Cluster sampling is a method used to enable random sampling to occur while limiting the time and costs that would otherwise be required to sample from either a very large population or one that is geographically diverse (Currier, 1984; Cox and West, 1986; Hulley and Cummings; 1988; Portney and Walkins, 1993).

To avoid selection bias it was important to guarantee that each health professional in Riyadh hospitals had an equal opportunity for selection. That guarantee required subjects to be selected at random, or that *randomization* be employed. Randomization is important for two reasons: 1) it provides a sample that is not biased, and 2) it meets the requirements for statistical validity.

Therefore, the use of the "multistage sampling" cluster sampling approach was used for distributing the questionnaire. Thus, using this method, more than one level of randomization was applied, such that subjects from each of the randomly selected departments could themselves be randomly selected. This method involved three steps as follows:

a. Each hospital that met the inclusion criteria and was not to be excluded based on the exclusion criteria was identified.
b. Some health departments were selected randomly, based on the hospital's directory. Questionnaires were delivered to selected health departments in defined hospitals through the in-mail service.
c. Respondents (health professionals) were randomly selected and had an equal opportunity to be chosen, with no researcher or facility bias, depending on the guidelines provided to the management of each health department selected.

The help and support of hospital human resources departments, departments of public relations, or hospital authorities directly in the distribution process is acknowledged. These bodies sent the in-mail questionnaires to the health departments with an official letter to each explaining their approval of the questionnaire to be distributed, and how

the distribution of the questionnaires was to be managed. In respect of hospital regulations and policies, the researcher was not able to conduct the process of distribution himself. However, the above-mentioned departments (e.g. human resources) managed the process of sampling on behalf of the researcher and gave the assurance of random distribution of questionnaires as was planned and required. The researcher has confidence in their management of the process, as they have great experience in managing and conducting many previous studies internally (within hospitals) or externally (outside hospitals). Most suggested 100 questionnaires for distribution, while some 4 hospitals suggested fewer than 100 (Table 3-6).

Despite the confidence referred to above, there arose at this stage a potential limitation in the research. Although hospital authorities and related departments facilitated the sampling and distribution process, the researcher could not be completely assured that the distribution would be conducted properly in all respects. Therefore, many visits took place, which were carried out as part of the dynamic recruitment process to increase the number of respondents, as well as to make possible the randomisation of the sample. The researcher carried out the collection process as agreed with the above-mentioned authorities from various health departments in defined hospitals. The outcome was that of the 845 questionnaires distributed, 493 were returned completed, which gives an acceptable response rate of 58.3%.

Table 3-6: Questionnaire distribution and response

Hospital	Distributed	Returned	Percentage
IGH	50	26	5.3
KACM	100	54	11.0
KAUH/CD	100	51	10.3
KKESH	100	27	5.5
SCH	30	21	4.3
SCOT	15	7	1.4
KFSH/RC	100	87	17.6
KKUH	100	64	13.0
RAFH	100	59	12.0
SFH	100	70	14.2
Yamamah	50	27	5.5
Total	**845**	**493**	**100.0**

The informal conversation interviews took place in the health sciences libraries and during the researcher's frequent visits to the sites under investigation. Table 3.7 shows the number of interviewee samples and their distribution across parent organisations. The total number of interviewees was 22 (12 male and 10 female).

It was decided that each member of the library staff would have the opportunity to be interviewed and to contribute his/her own vision and views. They were informed personally of a flexible time zone and promised strict confidentiality of information revealed. However, 15 declined to be interviewed. Some of them gave the excuse of not being able to discuss any issues related to their professional work. The researcher is unable to give a clear justification of this attitude or of why other staff members were unable or unwilling to participate in the current research. However, there is a possibility that several subjects may have refused because the study seemed too difficult or sensitive; thus the researcher was left with only subjects who did not think the effort requested of them too difficult. In the case of subject refusal, bias is introduced; nevertheless, the reason for refusal is often universal and so will occur in many other researches. This implies that the remaining subjects may be more fit or healthy than those who refused. This is a threat to external validity and affects the researcher's ability to generalize.

Table 3-7: Interviewee distribution

Health Library	Library staff*	Interviewee	Male	Female
KFSH/RC	9	4	3	1
KKUH	4	4	4	0
RAFH	8	4	2	2
KKESH	3	1	1	0
Yamamah	1	1	0	1
SCH	2	2	0	2
SFH	4	1	1	0
KAUH/CD	2	2	1	1
KACM	3	2	0	2
IGH	1	1	0	1
Total	**37**	**22**	**12**	**10**

* Number of staff stated in library profile designed by researcher and completed by chief librarians

Further, The Library Staff Fact Sheet was distributed to all staff members working in the health sciences libraries under investigation. The majority of library staff members, 28 out of 37, responded to the Staff Fact Sheet designed, and Table 3-8 shows the number and distribution of respondents. However, no Library Staff Fact Sheet was sent to the SCOT since there were no designated staff working full-time in the health sciences library.

Table 3-8: Distribution of Respondents to Library Staff Fact Sheet

Staff library of	Library staff*	Responses	Percentage
KFSH/RC	9	8	28.6
KKUH	4	3	10.7
RAFH	8	4	14.3
KKESH	3	3	10.7
Yamamah	1	1	3.6
SCH	2	2	7.1
SFH	4	1	3.6
KAUH/CD	2	2	7.1
KACM	3	3	10.7
IGH	1	1	3.6
Total	**37**	**28**	**100.0**

* The total number of staff members quoted from the library profile forms (directory) designed by the researcher and completed by chief librarians.

3.9 Ethical Considerations

Several ethical considerations were observed during the research process, particularly at the time of data collection. These are summarised as follows:

- Permission and approval were obtained from hospital authorities to conduct this research.
- A covering letter was provided with the questionnaires to explain the importance of this research and that it would strictly observe respondents' information confidentiality.
- The researcher offered health professionals his name, telephone number, and e-mail address for requests for more information.
- The researcher considered the health professionals' work load and limited the study with a questionnaire related to them. However, the research also made use of open-ended questions.
- The researcher gave his word to provide defined hospitals in this study with free copies of this thesis when completed.

- The analysis and reporting of data were made anonymous.
- Promises and reciprocity. Interviewed library staff were promised a complete report summarising the whole thesis, particularly the main findings and themes.
- Communication will be maintained with those health information professionals who participated with a view to further co-operation and development in the future.

3.10 Screening and cleaning of data

It is essential to check the data for errors, since it is very easy to make mistakes when entering the data. According to Pallant (2001), checking the data before analysis is very important because errors can distort the result of correlation analysis. The data screening process involved a three-step process of checking for errors using either the frequencies or descriptive statistics options in SPSS, where minimum and maximum answers were displayed. Answers that were out of range were located and then corrected by referring back to the original paper questionnaire.

3.11 Data analysis methods

3.11.1 Quantitative

Data analysis is the process by which new and additional meanings are sought by comparisons between various aspects of the original data or by computations made with them (Goldhor, 1972). The surveys were coded and transferred for further processing, analysis and tabulation. The Statistics Package for Social Science (SPSS) was used in analysing and visualising the results. Descriptive statistical data analysis was used to make summaries, to describe the study data, and to elicit basic information regarding the demographics of the study respondents. The descriptive statistics include frequency, percentage, mean, and mode. For questions that had nominal variables which had no underlying order among the categories (for example, gender, age group, job description, and qualification), the mode, which is the point with the greatest frequency, was used. In contrast, the median was the appropriate measure of central tendency for questions that had ordinal measurement, where categories were ordered from high to low (Pallant, 2001)

The appropriate inferential statistical analysis used to explore relationships among variables was chi-square, since the majority of variables were nominal data. 'The chi-square test for independence is used to determine if two categorical variables are related' (Pallant, 2001). It compares the frequency of cases found in the various categories of one variable to the other. To describe the relationship, Phi-coefficient was used, which indicates the strength of the relationship. Phi value is an indicative of degree of relationship, and it ranges from 0 to 1, where 0.3 is small, >0.3-0.6 would be moderate, and >0.6 would be large (Cohen, 1988).

3.11.2 Qualitative

All qualitative analysis was undertaken manually, a decision based on the small number of interviews which took place. As the quantitative analysis was carried out using computer software, it would be of benefit to carry out the qualitative analysis manually to give an 'intimate familiarity with the data' (Moore, 2000).

Interviews were carried out by the researcher, who made notes immediately after each interview. When possible, shorthand notes were also taken by the interviewer, and in some cases word-for-word segments of responses were noted throughout the interview. This process was subject to the permission of the interviewee. The process of taking notes was adopted to allow the researcher to continue to carry on a conversation with the interviewee.

The analytical process adopted in the current research was:

- breaking down interviews into parts;
- looking at the relationship between those parts; and
- looking at the relationships of the parts to the whole.

In addition, interview transcripts were made by the researcher, who transcribed all of the shorthand notes and read all of the interviews. These transcribed interviews were broken down into coded segments representing complete thoughts and statements. This process contributed to the development of interview topics and themes within the context of the original study questions. Transcripts of some of the un-coded interviews were discussed further with library staff for clarification. A few un-coded

transcripts were not reviewed because the interviewees were not easily contacted afterwards.

The researcher conducted the initial coding of all interviews independently. A colleague then reviewed all coded interviews. When there was no agreement on a code, the decision was discussed in order to achieve consensus. If an existing code was not appropriate, additional themes were added when they were considered to be better descriptors of the interview. The transcribed interviews were coded according to themes that coincided with the major areas of questions.

However, the analysis of conversations and talks requires more than linguistic analysis. The researcher devoted maximum effort to recognising the position of the interviewees in terms of their class, ethnicity, occupational position, marital status, and so on. This enabled the researcher to understand the reasons why interviewees performed various actions within the particular situations in which they found themselves. Comments made in responses to the open-ended questions of the questionnaires, at interviews, and during observations were described and summarised manually. Some data collected from qualitative methods were transformed and quantised when the researcher believed this to be appropriate to visualise an issue.

Major themes that emerged were grouped together into logical categories. The purpose of this process was to obtain interpretations and/or explanations of the raw data in order to answer the research questions, and to meet the research aim and objectives. In addition, it will help readers to understand the issues, based on visible subjects and themes.

3.12 Research Process Roadmap

The research process roadmap aimed to visualise the relation and process of the following chapters from the start to the generation of findings and proposals for development (Figure 3.8).

Chapters 4 to 10 contain the main themes discussed, which contribute in creating an understanding of the current situation of the health sciences libraries in Riyadh, and

lead to a recognition of the need for development and improvement related to individual organisation change, as well the need to link these organisations (health libraries) in a health information network.

These themes and related understanding stimulated the development of two important chapters: Chapter 11 Organisational change and development, and Chapter 12 Saudi Health Information Network: A proposed prototype.

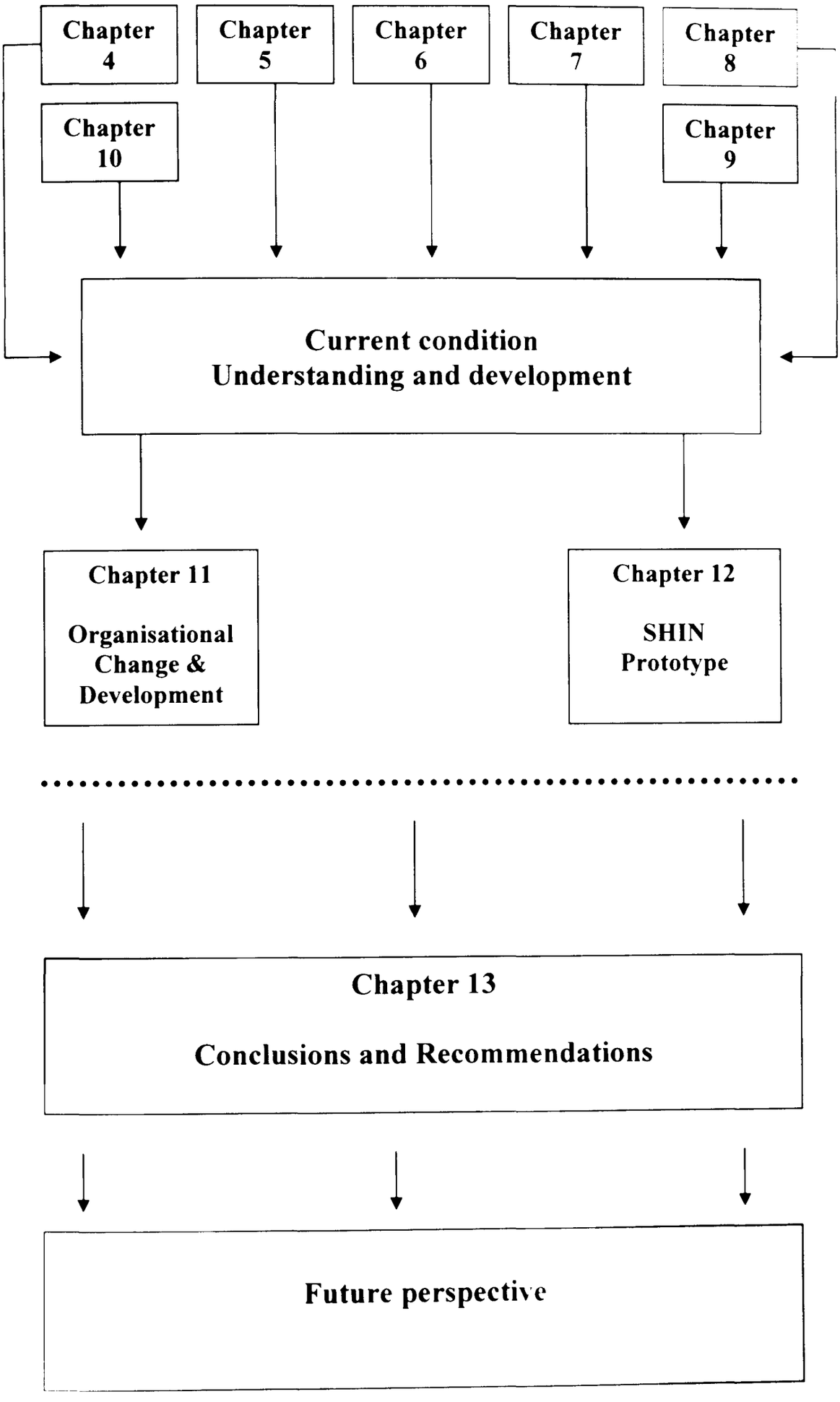


Figure 3.8 : Research Process Roadmap

These proposals were generated and developed by focusing simple and clear steps which led to the production of the final revised version (Figure 3.9).

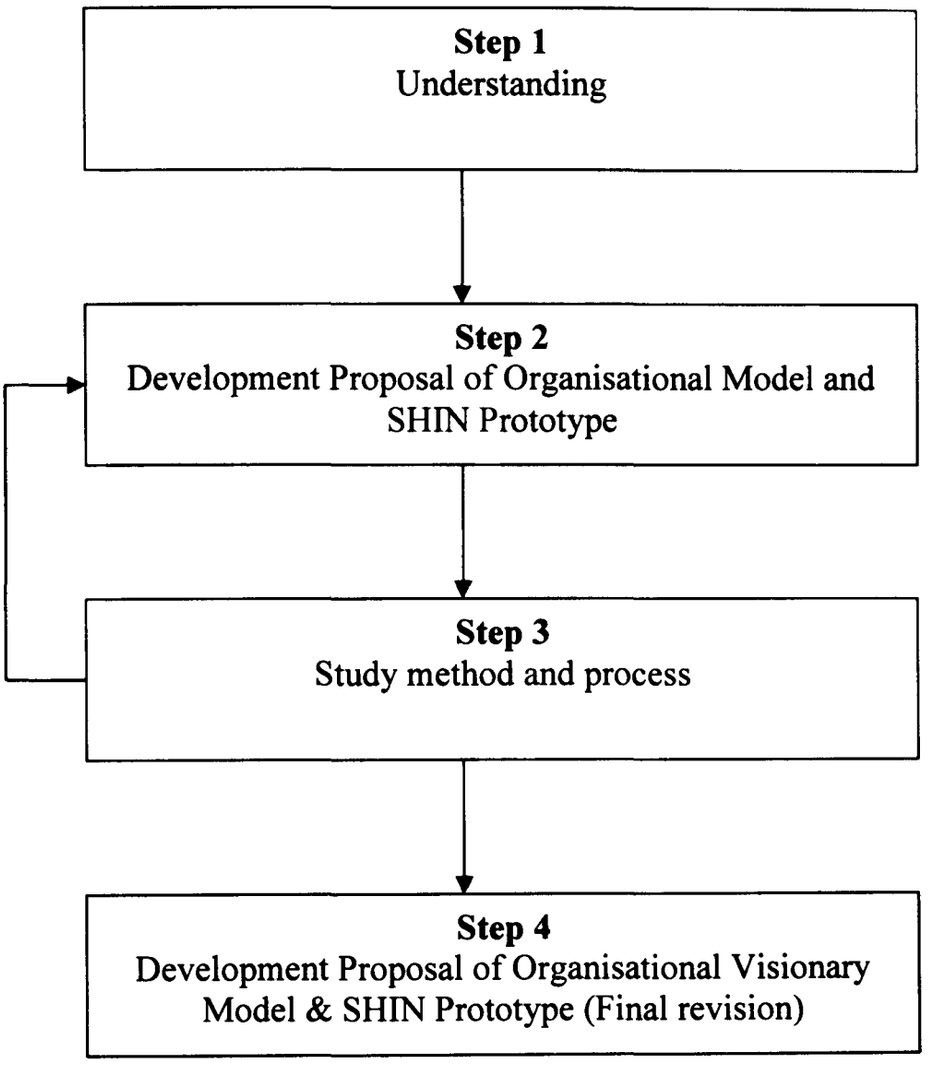


Figure 3.9: General development process

Chapter 13 Conclusions and recommendations, is presented to highlight important issues related to the topic of this research. Mainly, this chapter focuses on three elements mentioned earlier: Health sciences libraries, Health professionals, and Health information professionals. As a result, the findings of this research and themes discussed give rise to a future perspective of health sciences libraries in Riyadh. In part, this is expressed in suggestions for further research which might contribute to the field of knowledge and research, particularly in the country of Saudi Arabia.

3.13 Summary

This study intends to deliver a better understanding of the existing practices and current situation of the health sciences libraries in Riyadh, and their information services, through the perceptions of users and staff. Research questions concerning the issues were formulated with three dimensions: health sciences libraries, health information professionals, and health professionals.

The research design was described, highlighting its feasibility and rationality. Mixed methods and sampling procedures used were explained, as well as the pilot study and pre-testing of the questionnaire which was undertaken preceding actual distribution. It was also indicated that the implementation strategy for data collection was a concurrent strategy.

In order to obtain a picture of health sciences libraries, sources, and services available for health professionals, various steps and methods were adopted. Data obtained and information gathered were analysed and used to understand and validate some findings collectively.

A research framework was designed to guide the study from the exploration of the issue of concern to the development of the current situation. The framework ensured that development was taken further in order to reach the level of proposing practical solutions.

Chapter Four

Literature Review

POSITION IN THE THESIS

Chapter 1 Introduction	Chapter 2 Background	Chapter 3 Research Design
Chapter 4 Literature Review	Chapter 5 Users and Staff	Chapter 6 Health S. Libraries
Chapter 7 Education and Training	Chapter 8 Information Services	Chapter 9 ICT
Chapter 10 Information Provision	Chapter 11 Change & Development	Chapter 12 SHIN Prototype
Chapter 13 Conclusions	Bibliography	Appendices

Chapter Four

4

The Literature Review

4.1 Introduction

This chapter is structured to build a background for the present research issues. It reviews studies related to health sciences libraries, health librarianship in the Gulf Countries Council (GCC), and information and communication technologies, including five Saudi related studies. Five themes for this research are generated and summarised: 1) health sciences libraries, 2) education and training, 3) information services, 4) information and communication technology, and 5) information provision.

4.2 Health Sciences Libraries

Medical libraries, synonymous with health sciences libraries, fall within the general category of special libraries. The medical library is defined by Rietz (2004) as:

> *"A type of special library maintained by a university medical school, hospital, medical research institute, public health agency, or medical association to serve the information needs of students, researchers, and practitioners in the health sciences (medicine, nursing, dentistry, pharmacy, etc.), with collections that include print and online resources related to medicine and allied health".*

The main objectives of a health sciences library can be summarised as follows: (1) to collect the required medical information resources, (2) to organise the collected materials in a suitable way, (3) to retrieve the required information, and (4) to disseminate the retrieved information to the end user in a suitable time (Alian 1991, 1999).

Library and Information Services contribute to institutional development and support the goals and interests of institutions in the medical and health fields through the activities of information management, information technology and learning support (Watson, 1998; Peterson and Harris, 2002). The library services provide useful and equal access to clinical information to many health professionals, regardless of location (Nagle, 1996; Alian, 1999; Peterson and Harris, 2002).

The health sciences library can achieve most of its objectives by offering appropriate library and information services to its users at a suitable time and place (Alian, 1999). Florance and Matheson (1993) argue that libraries must redefine fundamental assumptions about their roles and services. They should examine management perceptions of libraries, and develop competitive strategies in basic services and in new arenas. Information professionals need to redefine the library as a concept and as a physical environment (Alqudsi-Ghabra, 1999).

Three major subgroups of health sciences libraries can be distinguished: academic health sciences libraries, hospital libraries, and special libraries serving medical societies or associations, commercial or industrial companies, or government agencies (Byrd, 1993; Alian, 1999).

Academic health libraries typically serve either a single professional college or a number of colleges and clinical facilities in an academic health sciences body (Alian, 1999). The primary function of this type of library is the discovery and dissemination of new knowledge to enhance health practice (Nagle, 1996).

Hospital libraries serve institutions ranging from small community hospitals to large teaching hospitals (Alian, 1999). The hospital library is unique in carrying out its parent body mission, yet there are few hospitals that contain real working libraries (Myers, 1998).

Medical society or association libraries serve local and/or national health organisations or associations of health professionals, (e.g. the American Medical Association). Commercial and industrial health sciences libraries exist in companies specialising in biotechnology products, hospital supplies, medical devices, and pharmaceuticals. These libraries typically support research and marketing activities, and place greater emphasis on information retrieval than on building their collection of information (Alian, 1999).

4.2.1 Importance and Impact

King (1987) investigated the impact of hospital library services on 176 physicians, nurses, and other health professionals in the Chicago area. King found that 77% of the physicians and 74% of all the health professionals handled their cases differently because of the library services provided to them. Marshall (1991) reports in her study of the direct impact of hospital libraries on clinical decision-making (in the Rochester area, New York) that information provided by hospital libraries is perceived by physicians as having a major impact on clinical decision-making. In another study, Marshall (1992) confirms the impact that library and information services provided to physicians had on their practice. Physicians indicated that the information provided to them by their libraries contributed to the avoidance of hospital admission (12%), surgery (21%), additional tests or procedures (49%), and patient mortality (19%).

The health care literature emphasises the significant function of the health sciences library as an information centre (Darling, 1974; Palmer, 1991; Roderer, 1993; Mayers, 1998; Bishawi, 2001). Many studies demonstrate conclusively that use of

appropriate information sources from libraries significantly influences physicians in their practice of medicine, and results in better patient outcomes and fewer medical errors (Marshall, 1992; Ali, 2000; Peterson and Harris, 2002).

Gorman and Helfland (1995) conclude that unanswered questions represent an important missed opportunity to educate physicians and improve medical practices. Libraries provide information that has a strong impact on physicians' clinical work and patient care (Oduwole, 1999). The information service provided by health sciences libraries is perceived by physicians as having a significant impact on their practice of medicine (King, 1987; Marshall, 1992; Breton, 1994; Urquhart, 1995; Oduwole, 1999; Ali, 2000; O'Connor, 2002; Peterson and Harris, 2002; Dalrymple, 2003).

The health sciences library information services can have an impact on the way knowledge is put into practice (O'Connor, 2002). Urquhart (1995) found that respondents revealed the information supplied by health sciences libraries had an effect on future clinical decision. In New Zealand, Burton (1995) sought the positive impact of health library information on patient care. O'Connor (2002) reports that the majority of respondents had used the information received from the health sciences library in association with a diagnosis, either to confirm (60.7%) or to change the diagnosis (32.1%). This clear influence increased scientific knowledge about the specific nature and extent of the impact of information provided (Marshall, 1992; Oduwole, 1999).

Bryson (1997), with consideration of the strategic influences on library and information services over the next decade, indicates an important point, in that it requires an analysis of the factors that would create the need for change or impact upon people and organisations. In support of Bryson's suggestion, the Library and Information Commission Research Committee (1998), in *The Value and Impact of Library and Information Services in the Information Society*, recognises the need to demonstrate that libraries do add value, and that their services have a real impact on people's lives.

The attention drawn to the Institute of Medicine's report on the number of errors occurring in USA hospitals serves to underscore the unfortunate reduction of library services in the clinical environment (Kohn et al., 1999). Ready access to data, information and knowledge is assuredly one of several obvious solutions for reducing errors and improving the quality of care (Brenneise and Marks, 2001). Musoke (2000) explains that information use usually leads to changes in the user's state of knowledge, behaviour, values or beliefs.

Perhaps the continuing relevance and usefulness of health science library depends on their ability to adapt to the dynamic environment. Libraries have undergone many changes during the last twenty years, several societal forces that have worked to shape health sciences libraries are the information explosion, computer technology, and telecommunications and economic pressures (Weise, 1993). However, health sciences libraries continue to be early adopters of the new technologies, applying them in innovative ways for the improvement of their services (Roderer, 1993).

With many changes in the health sciences libraries, a significant concern appears to be the future of the library and of the librarian. Darling (1974) wrote of the change in information delivery in health sciences libraries through the 1960s and early 1970s. She concluded that developments in those years pointed health sciences libraries towards information and communications. The library has a role to play as a communication centre working actively with informational materials of all kinds, close at hand or at a distance, for health profession users in the community as well as in institutions. In fact, the mission described by Darling still remains critical and continues to challenge.

4.2.2 Information Access and Use

The improvement of access to health information facilities has led to a maximum usability of sources (O'Connor, 2002). Information services require ready access to resources to be able to deliver on-time services, and any negative influence on any part of the information service chain can cause undesirable delays. Changes affecting suppliers' abilities to deliver services on time may also affect the delivery of information services (Bryson, 1997). Nicholas et al. (2001), mention that the National Health Service (NHS) in the UK, in a policy document entitled 'Information for

Health' is committed to the idea that 'access to the right information at the right time is a crucial ingredient of modern healthcare'.

The emphasis is very much on access to specialised information rather than to archives or holdings. Marketing, promotion and a strongly proactive approach have long been part of the range of skills required by the information professionals concerned (Reid and Foster, 2000). In a relatively short period of time, electronic resources have expanded to include the overwhelming amount of information available on the Internet. Within and between various environments, a clearly shared aim is to enable users to gain access to and use the information that they need (Bryson, 1997; Fecko, 1997). Also, in order to enable users to gain access to and use information, it needs to be determined who are to be served and what they are to be offered (Fecko, 1997).

For this purpose, it is important to analyse how information is used in decision-making, and also identify what people do with this information within the organisation, by its users and others within the boundary which has been chosen (Bryson, 1997). The library of the future will be about access and knowledge-management, not about ownership. The target is to help users make sense of, and gain access to, information sources (Hawkins, 1998).

Atkinson (1996) argues that the role of the library is to control a systematically selected subset of published information, and then to ensure that such a subset remains stable and accessible over time. The modern library is more likely to act as an access interface to the global wealth of information, the 'information universe' (Brophy, 2000b). The first exploratory stage in the Michigan Virtual Health Library identified the necessity of accessing the electronic resources, providing fast, affordable, high quality, simple and reliable information (Brenneise and Marks, 2001).

Many users have limited IT skills, and have difficulties in finding time and confidence. This unease is being exacerbated by the fact that many users perceive computers as irrelevant to their professional training (Garrod, 2001; Adams and Blandford, 2002). The importance of educating library users, mostly in the use of

technology, is apparent. It provides opportunities to make effective, efficient and independent use of libraries and information resources and services (Khalid, 2000).

In order to develop awareness of the use of technology in libraries, new approaches for the use of libraries within the staff and user-communities must also be developed. Libraries can organise seminars, workshops and conferences to develop this awareness, and can develop links with other professional bodies through formal and informal alliances. Al-Shorbaji (2000a) points in his study of the EMR virtual library that the important issue in the role of a librarian is to train the health professionals on how to access information. Stolt (1996) points out that utilisation of electronic resources will require continuous training programmes for end-users. Khalid (2000) explains that users need training in order to make effective, efficient and independent use of libraries and information sources and services.

Shelstad and Clevenger (1996) found that the majority of respondents believe their current ability to access biomedical information is adequate, despite frequently accessing their limited personal libraries for decision-making information. On the other hand, Cullen (1997, 2000) notes that doctors in general practice made little or no use of the health libraries to support clinical decision-making. Instead, they depended on a few limited reference resources.

O'Connor (2002) highlighted the barrier of the complex information needs of doctors. Dorsch and Landwirth (1994), Dorsch and Pifalo (1997) and Young (1999) mention that the major obstacle to the potential influence of information resources is the barrier of accessing and utilising online databases to support decision-making. Lindberg et al. (1993) found that what is needed for physicians to make decisions for patient care is rapid access and use of biomedical literature. To overcome the barriers of access and use, Haynes et al. (1994) refer to the optimal use of databases by health librarians and the ability to retrieve more relevant sources than physicians.
The National electronic Library for Health in the UK (NeLH) represents great opportunities for all kinds of health libraries (Toth et al., 2000; Turner et al., 2002). The key function of the NeLH is to provide fast and easy access to evidence-based information for practitioners and managers to assist in decision-making. Accessibility

and usability is an important consideration for the entire NeLH and public services (Turner et al., 2002).

The National Library of Medicine in the USA (NLM) is integrating its products and services for ease of use (Turner et al., 2002). A report produced by NLM (2001) showed that physicians use MedlinePlus to find general information for their patients, and to keep up-to-date on medical subjects outside of their fields. Other physicians refer their patients to MedlinePlus for authoritative information about their health conditions. The NLM Board of Regents in its 2000-05 plan recommended that the NLM takes a leadership role in ensuring permanent access to important digital information resources in biomedicine, working in co-operation with other national libraries. In order for the NML to fulfil this role, Turner et al. (2002) suggest that it needs an operational definition of the conditions that would allow responsible parties to believe that something published or converted to digital form would remain permanently accessible.

4.2.3 Information Services

The term 'service' has different meanings such as to work for somebody, to serve somebody, to help, to perform, to satisfy, etc. (Snoj and Petemanec, 2001). The basis of the services the library provides lies in its intelligence about both the user population and the information population. It plays an intermediary role, the essence of which is to use intelligence to create links selectively between user and information sources (Brophy, 2000a).

The purpose of information services is to provide a complex link of facilitating access or disseminating information to assist people and organisations in predicting future needs and making decisions. At a higher level, Bawden and Blakeman (1990) explain that information services provide support to those responsible for corporate policy and strategic decisions. The traditional nature of special libraries has been based on the design and management of information services that meet the strategic information needs of the individual or group being served (Spiegman, 1997; Marshall et al., 2002).

In an earlier period, Ashworth (1955) in his book *Handbook of Special Librarianship and Information Work*, and later other writers (Bryson, 1997; Al-Oqla, 1998;

Hawkins, 1998; Alian, 1999; Brophy, 2000a; Reid and Foster, 2000) agree that special libraries supply information rather than material, thereby drawing attention to its existence and so evoke a demand for it. This leads to special techniques connected with the filing and dissemination of information (Reid and Foster, 2000). Competitive advantage can be obtained by either being the first to market a product or having the ability to maintain the leading edge in a unique application of technology that delivers a specialised information service to users. The information service can also provide other services that can strategically position a parent organisation in a competitive marketplace (Bryson, 1997).

As mentioned earlier, Information Services contribute to institutional development through the activities of information management, information technology and learning support. Information services have a role in maintaining a healthy library and the 'multiplier' effect of such investment, in national, regional and local regeneration and development (Watson, 1998). It can be seen that the special libraries concern themselves, not only with collecting information objects and organising them, but also see, as part of their role analysing information, creating a summary of key information and disseminating this to users in the parent organisation (Brophy, 2000a).

Hardy et al. (1985) observed in their study the concept that the health library had begun to move from a predominantly medical support service to a wide range of services supporting the entire healthcare setting. This observation is supported by other writers who note that health sciences libraries are established to support the goals and interests of the institutions in the medical and health fields (Nagle, 1996; Alian, 1999; Peterson and Harris, 2002). Library services are becoming more complex entities of physical things and processes (Snoj and Petemanec, 2001).

Oduwole (1999) notes that there is a tendency towards a centralised medical library, facilitating the specialised supply of medical information, as the field of medical information is in a state of rapid change, and that users themselves have become specialised and demanding. Nagle (1996) clarifies that the role of the health sciences library is not on finding information but on obtaining the 'best' information available for a given situation. Its significance involves the ability to access, synthesise, and apply information in medical literature to the clinical situation.

There is an enormous amount of evidence from studies that show the quality of library information services enhances profitability, improves productivity and strengthens the competitive position (Anderson et al., 1994; Kandampully, 1998; Snoj and Petemanec, 2001; Donaldson, 2002). Schacher (2001) highlights the fact that many studies confirm the importance and value of supplementing the information in doctors' heads with information from the published literature delivered to the point of care. Schacher notes that most of the physicians interviewed in three studies (Chicago, New York, and the UK) said that the information provided a refreshed memory and improved confidence in clinical decisions.

Realising the importance of library and information services, many NHS trusts in the UK developed their agenda accordingly. Black and Bury (2004) highlight that the multi-disciplinary library and information services are considered to bring with them a climate of change for both those who manage and work in services today. The development of such new services needs to be carefully managed and developed, and this presents a challenge for librarians and service managers. However, it can be done and during 1999 and 2000, Aintree Hospital Trust, in conjunction with Edge Hill College of Higher Education, established a truly multi-disciplinary service based at its hospital site but managed by Edge Hill. This programme focused on the management of change, collaboration, and the development of a unique partnership between Higher Education and an NHS trust.

Moore et al. (2004) confirm that providing library and information services for an emerging community such as bioinformatics and computational biology presents special challenges for health libraries, including understanding needs, defining and communicating the library's role, building relationships within the community, preparing health information professionals, and securing funding.

In 1979, Matthews and Picken mentioned that there were three categories of service provided by the health sciences libraries. These categories are still considered to be applicable to current practice:

A) Direct request services: these are specific things that readers ask of library staff.

B) Services generated by library staff: these can sometimes be simply help in utilising what is already available in the library of which the reader is unaware, or can be items such as current awareness services.
C) General services: these mainly comprise information of a non-medical nature, but they round off the picture of the library as an information source.

The health sciences library service is greatly needed, since the majority of healthcare professionals lead exceedingly busy lives, preventing them from being physically able to come to the library and, if they manage to visit, it is only for a short time (Matthews and Picken 1979; Bopp and Smith, 2001; Schacher 2001). In another aspect, the library will establish, promote, and maintain a range of services that will support users and the parent organisation programmes (Fidzani and Oladokun, 2001).

There is a range of services provided by libraries to users. The most common information services that libraries provide to their users are as follows:

4.2.3.1 Reference services

The modern concept of the reference service is traced by historians to Samuel Green's paper "Personal relations between librarians and readers". In this he advised librarians that many users have neither the knowledge nor the time to search for the information they need, so the librarian should find the information and present it to them (Bopp and Smith, 2001). This task is the provision and organisation of the reference librarian (Prytherch, 2000). The reference service is defined by Keenan and Johnston (2000) as the provision of information in response to user requests. Many reference tools for ILS managers have been published, providing coverage of the literature to facilitate the service (Mackenzie and Sturges, 1999).

Campbell (1993) recommends libraries develop new models of user reference services in the context of the changing paradigm. In several meetings, the new foundations for reference services, the change process, services in an online environment, and new reference models have been discussed (Lipow, 1993). Calabretta (1994) discusses the breadth of knowledge, skills and attitudes necessary for quality services, and the effects of new technologies on reference services. Health sciences libraries, for several years, have experimented with new models of reference services.

The new technology has led to a paradigm shift and changes to facilitate the reference service and to reach all users' desktop (Sisson and Pontau, 1995). This technology has an impact on both the type of user and information sought. The largest group who need reference librarians are those who have an undifferentiated requirement for information; for example, a doctor who may be looking for hobbies to take his mind off medicine (Katz, 2002).

4.2.3.2 CAS and SDI

In early times, libraries generally provided Current Awareness Service (CAS) and Selective Dissemination of Information (SDI). Matthews and Picken (1979) found that these are commonplace in special libraries. It can be seen that services such as thses have only been made viable through automation and IT utilisation. Libraries are now finding themselves in the position of having to reassess and replace existing systems or add systems to complement their existing computer capabilities and services in order to meet new needs or to offer improved services (Morris and Dyer, 1998).

The web can be a marvellous medium for information dissemination, but it can only facilitate true learning if it genuinely meets the needs of those for whom it is employed (Williams et al., 2001; Williams and Nicholas, 2002). As an example, Musoke (2000) has demonstrated the applicability of information disseminated to practitioners in rural regions in solving medical and health problems.

4.2.3.3 ILL and DD

Dorsch and Landwirth (1993) pointed to eight rural hospitals in Illinois, USA, that carried out a project to enhance information services for health professionals, one of which was document delivery. The fax was used as the main transmission, and the project was successful. McCarthy and Slachta (1993) mention that the Canada Institute for Scientific and Technical Information (CISTI) and the National Library of Canada (NLC) have established ROMULUS, a CD-ROM product, which combines union lists and has a system for ILL messaging. Schoenberg (1993) and Barwick (1994) describe ROMULUS, stating that it gives good value for libraries, since it deals with the searching function and requesting. Barwick points out that this service could possibly be extended to be useful in non-Canadian libraries.

Many health sciences libraries provide a large proportion of their ILL service using electronic requesting methods (Plaice et al., 1997). Although electronic document delivery is a relatively new idea, in particular for document requests, it has been seen that one of the principal benefits of the electronic library is the ability to deliver information services to the user's desktop (Pugh, 2000).

4.2.4 Health Information Professionals (Librarians)

The provision of health sciences libraries staff is one of the most expensive factors in library costs; it is therefore very important that staff resources are used as efficiently as possible. Librarians and Information professionals have knowledge of and expertise in the information world. Health sciences librarians are librarians with a special interest in and knowledge of medicine. According to the Special Libraries Association (1996), health sciences librarians should combine the two skills of librarianship and knowledge of medicine to produce a very high level of service. Klein and Ross (1997) argue that the health sciences librarian's knowledge of medical terminology should combine with his/her experience in the use of sophisticated technologies.

The relative proportions of professionally qualified and non-professional staff should be balanced according to the needs of user groups. Without adequate staffing, it is impossible to provide an efficient service (Jackson, 1991). Library staff will play a central role in shaping the developing use of health library services. To realise this potential, staff need to be trained to develop new skills and abilities. In particular, they need to become familiar with ICT and to feel comfortable both when using it themselves and when helping others to make constructive use of it.

Skills required and acquired play a great role in developing information services. Pugh (2000) highlights the importance of such skills, saying that the electronic library is producing a new breed of professionals, many of whom have adapted their former traditional skills and approaches, with premium technological skills. There is a group of working professionals with a base of research skills who can add to their special technological expertise, and they hold the key to the future development of information services.

With the advanced development environment in the National Health Service (NHS) in the UK, there is a requirement for a shift in librarians' skills. Plaice (2000) detected three phases which may be linked to the effective use of IT. The first phase is the need to be able to offer advice on hardware and software at a fairly basic level, since the libraries possess IT equipment. The second phase is the ability to harness the use of numerical data systems as well as textual data systems in support of quality healthcare. The third phase is to acquire new skills such as the ability to frame questions, devise appropriate strategies, locate information, interrogate sources, recognise and reorder information, and present information to others, rather than selecting, organising, and making available the biomedical literature.

Maynard (2002) conducted the very first study on the training needs of NHS library staff in the UK, and provides evidence that adequate training, especially on ICT, was very important and greatly needed by librarians. However, Maynard did not survey users of the NHS library. It is important to know the needs of both the librarian and the user, and how the training given to the librarian will make the services provided by the library more efficient and effective.

Haycock (1997) applied the results of educational research in training and development to librarians' professional development. He emphasised that the focus of all staff development should be on the individual unit, such as in a library context. Distance learning must provide for follow-up practice and peer support in the implementation of new skills and behaviours, and he looked at the provision of free time to attend external training. He stressed the importance of providing time 'away from the regular responsibilities' to facilitate the sharing of understanding, to explore applications of the satisfied, and to incorporate new understanding into professional and personal perspectives. He urged library directors to recognise that change was a gradual and difficult process requiring adequate time and resources to produce verifiable results.

The effectiveness and efficiency of the use of ICT in the learning field imposes, supports and stimulates the re-engineering of the library. Librarians must be aware of the changing trends in education and training and the impact that these trends have on the delivery of library services. Using new technologies in the field of ICT has meant

continuously changing libraries according to the cultural contents offered to the access services, to internal organisation, and to skills. The evolution of libraries over the last few years, oriented and spurred on by the rapid innovation of technologies. gave these structures the ability to cope with the increasing needs of users and the new opportunities offered by technologies (Bargellini and Bordoni, 2001).

In reality, professionals in the field of health librarianship do not have an equal deal in comparison with other professionals. Weise and McMullen (2001) reported results of a study which sought to determine how health library professionals performing IT roles are compensated, and how their positions are designed when compared to IT staff in their institutions, in a sample of 550 health library directors in USA hospitals and academic health libraries. The results indicated that there is a gap in compensation between health library professionals and IT professionals performing similar functions using IT. Technology-intense library jobs are compensated at higher levels than more traditional jobs. Weise and McMullen suggested that managers of health library professionals need to be ever more cognisant of the employment practices of IT professionals in non-health library disciplines. It is best to ensure that IT-related jobs, accountabilities, and capabilities of the health library are known and understood by others, especially in the HR and IT staff departments in their hospitals.

This mean that librarians need to develop effective communication skills, to keep as many lines open with users as possible, and to make sure that the end-user is aware of the range of information available. Murphy (2000) states that health sciences librarians feel a need for better liaison, closer co-operation and improved communications between themselves and with other professionals. Wittwer (2001) recommends that librarians develop a profile as trainers on the best practices in Internet searching and the core end-user products. In this way, health sciences librarians should work and communicate more closely with computer professionals, which will facilitate the movement towards common goals on behalf of users.

Information is one of the most important assets of any type of organisations. Keeling and Lambert (2000) note that health sciences librarians need to look at new methods of managing and exploiting information resources and services in ways that contribute to the strategic aims of the organisation. The health sciences librarians' role has

moved from simply acting as locators and resource providers to being quality filterers, critical appraisers, navigator digital information disseminators, and even managers of change (Braude and Wood, 1993; Booth, 2000; Harris, 2000; Wittwer, 2001; Beverley et al., 2003; Dalrymple, 2003). Mead and Richards (1995) note how the information specialist is regarded as a partner in the research process, rather than just a passive provider of information for health technology assessment. Edwards (2000) argues that librarians have an important role to play in overcoming the digital divide, and make reference to global knowledge sharing.

Bernal (2002) highlights the importance of a proactive approach on the part of health information professionals. The current climate of accelerating change in health care in general, and in hospitals in particular, makes it essential that health information professionals adopt a proactive approach to the provision of knowledge-based resources and services. They must position themselves to be highly visible within their organisations, with the goal of being viewed by top management as an indispensable component of the hospital's patient care, educational, and research programmes. Bernal brought out the example of James A. Haley Veterans' Hospital (JAHVH) Library Service, Florida, as having successfully adopted this approach. The Service consists of two separate full service libraries: a Medical Library and a Patients' Library. Resources and services are also provided to eight satellite outpatient clinics throughout central Florida.

In addition, Wittwer (2001) believes that librarians should adopt a proactive approach to manage their own Continuing Professional Development (CPD). Programmes of staff development should go some way towards ensuring that staff members are able to exhibit a flexible and enthusiastic approach to the challenges encountered. Health sciences librarians should provide services to users in an informal and relaxed atmosphere to improve their information handling skills (Jackson, 1991). Librarians should develop themselves and be able to pro-act for the benefit of users' training and knowledge. This might require developing and providing reference services around the clock. However, with the development of the Internet, this task becomes visible and desirable.

Librarians should take the information resources out to clinicians to enable them to find answers to clinical questions, which then contributes to patient care. This task is to be facilitated by clinical librarians. The clinical librarians are integrated into specific multi-disciplinary teams with whom they meet at venues where information needs arise (Rigby et al., 2002). This includes team meetings, referral and educational meetings, and ward rounds. Clinical librarians bring a depth of contextual information to the searches they perform, making the information retrieved highly specific to the cases in question. The provision of the clinical librarian service enables clinicians to apply the evidence to their clinical practice, and ensures that the patient receives the best quality of health care possible. This trend calls for new health professionals (Plaice, 2000; Rigby et al., 2000; Dalrymple, 2003).

All levels of staff should become fully conversant with the new health sciences libraries' philosophies and trends toward the new technology in order to establish a distinctive reputation (Garrod, 2001). Improvement of librarians' conditions and skills will not be possible if they are not supported with professionally designed educational programmes.

4.2.5 Library and Information Science Educational Programmes

The Delphi study in North Carolina, USA, demonstrates a demand for more specialised curricula and for retraining opportunities to improve education for health science librarianship. In addition, the expert panels in the Delphi study rate the master's degree specialisation as the most valuable in terms of contribution to the preparation of challenged health science librarians (Libscomb et al., 1999). A pilot study at the University of Kentucky, USA, in 1999, found that Library and Information Science (LIS) had a poor image outside the field and that one needs to strengthen the understanding of the economic, political, and social environment beyond LIS, and identify trends from those areas that may impact on LIS (Allard, 2000).

The KALIPER project was to analyse the nature and extent of major curricular changes in LIS education. A study was undertaken between 1998-2000 by a team of twenty scholars from thirteen libraries and information science schools in the USA, Canada, and the UK. Six trends that are shaping curricula changes in library and

information science programmes were identified (KALIPER Advisory Committee, 2000; Pettigrew and Durrance, 2001).

These trends are as follows:

1. LIS curricula address the broad-based information environment and information problems.
2. The distinct core of the LIS discipline taking shape is predominantly user-centred.
3. LIS schools and programmes are increasing the investment and infusion of IT into their curricula.
4. LIS programmes are experimenting with the structure of specialisation within the curricula.
5. LIS schools and programmes are offering instructions in different formats to provide students with more flexibility.
6. LIS schools and programmes are expanding their curricula by offering related degrees at the undergraduate, master's and doctoral levels (Pettigrew and Durrance, 2001).

Brittain and Norris (2000) describe the situation in the USA, UK, Australia, and other countries where governments and health authorities have recognised the urgent need for a highly educated and trained workforce in information science and management, but universities have been slow to respond, until the last few years. Johnson (1999), who moved to the current availability of the Internet for Master's degree courses in LIS from the USA and Australia, suggests that future providers of professional education in the UK are as likely to be universities in other English speaking countries as existing UK schools and departments.

In the UK, the director of the Chartered Institute of Library and Information Professionals (CILIP) has identified the need for examination of the current state of research in the LIS domain (McKee, 2001). Booth (2001) clarifies this point when describing the existing research-practice gap. This has been created by the failure of practitioners to implement research findings, and the failure of researchers to address questions relevant to practitioners. McNicol (2002) found academics and practitioners working together on research projects, and indicated that this phenomenon is more widespread than it had been in the past. Johnson (1999) notes that in the UK, many of

the courses that have been introduced in LIS involve collaboration with other disciplines to produce the required depth of knowledge, and present new challenges in terms of ensuring that their teaching is of at least comparable quality.

In fact, as Garrod (2001) explains, it takes time to build ICT expertise and experience and it is often acquired through a variety of means, not just through formal training. Brittain and Norris (2000), however, point out that part of the problem in the UK is that so many people involved in the information revolution, who have come from the IT and computing side, are ignorant of the existing information and library services in healthcare. Johnson (1998) notes that in the UK there are published papers that emphasise the importance of professional education in the field of ICT, and at the same time, they offer critical opinions on the apparent lack of progress by the schools of librarianship and information studies. Johnson (1997) in a previous article, mentioned that the educators must make greater efforts to inform the practitioners' community about their efforts to keep the curriculum up-to-date and relevant, in step with changes in the job market.

Gannon-Leary et al. (2003) report on a study commissioned by the University Health Sciences Librarians group in the UK seeking to investigate the impact on Higher Education (HE) libraries serving nurses of the new curriculum based upon the government's 'Making a Difference' strategy for nurse education, and the responses that libraries are making to it. Libraries and information services were identified as increasing access to ICT; increasing the workforce; more flexible study programmes; longer placements; lifelong learning; continuing professional development; and evidence-based practice. Survey respondents describe how 'Making a Difference' has affected their services in relation to curriculum planning, increased student numbers, academic staff and student attitudes, user education, and increased student time on placement. According to responses, recommendations are made including: increasing the involvement of LIS staff in curriculum development; emphasis on IT skills of student nurses, integration of library user education into nurse education programmes, and liaison between HE and National Health Service (NHS) library staff.

Dyab (2002) highlights the growth of library schools in the Maghreb countries (Algeria, Libya, Tunisia, and Morocco). There are various opportunities for closer co-

operation among library schools in these countries. They can help educational, economic, cultural, political, social, and other organisations and institutions to overcome the obstacles they face in using IT in their services and activities, by organising in-service training programmes.

Na-Lamphun and Lee (2002) note that the graduate programme in LIS at Chiang University, Thailand, has been completely redesigned, based on the growing realisation that the LIS field should reposition itself from information management to knowledge management. As the LIS field is being restructured world-wide, Vaagan (2003) surveyed key institutions in Norway and relevant literature, which confirmed that ethics and the information age are becoming important components of LIS research and teaching. Vaagan points out that even the title of 'librarian' has never been legally protected. In Slovenia, the current situation in LIS education can be regarded as an indication of a crisis esoterically imposed by education founders and administration not convinced of the value of the discipline (Juznic and Urbanija, 2003).

A study was conducted in Kenya, Africa, by Odini (1999) on the changing information environment. Odini proposes that in order to meet the information needs of present-day users, library personnel should be made acquainted with the latest developments in the field of information services and information science. In this context, training institutions have to play a vital role in designing their curricula for the required education and training at the appropriate level.

Klobas and Renzi (2000) mention that the technologies being used to deliver the materials and allow communication will affect what learning strategies can be used, and how they can be implemented. In contrast, Robinson and Bawden (2002) give emphasis to the social structure when they note that the increased importance of distance learning has not arisen in isolation, nor simply as a result of technical advances, but in the changing context of society and of the place of learning within.

In health informatics education, Pearson and Urquhart (2002) conclude that education providers need to encourage students to adopt 'lifelong learning' behaviours, and to provide courses that meet the needs of graduates wishing to enter health information

management, or who wish to upgrade their skills and knowledge. However, meeting specialist and technical requirements of the health sector demands collaboration between the health sector and higher education to meet rapidly changing needs. Higher education needs to respond by ensuring that core skills (personal, technical and specialist) are included in curricula, and that the teaching and learning strategy reflects the needs of the student body for lifelong learning. On the other hand, traditional librarianship courses need to place more emphasis on numeracy and information analysis if their graduates are to stand a chance of competing successfully against business studies graduates for posts across the spectrum of health information management posts available.

4.3 Health Librarianship in GCC countries

The flow of information and knowledge distribution are reinforcing the importance of health librarianship. In the GCC, medical and health publishing has been increased. Lammers and Tahir (1996) highlight a comparison between the GCC countries in terms of scientific and medical publications. Although this study is now out of date and did not include publications written in the Arabic language, it confirms the significance of the number of publications in the medical field from the GCC countries. It indicates the positive impact on developing the health services for GCC citizens, and providing health professionals with advanced knowledge and updated technology in the medical field.

Importantly, health professionals need to browse and search in very well organised sources. This is possible with the effective and efficient participation of health librarianship. In the following literature review, two further important aspects are covered: 1) health libraries, and 2) LIS educational programmes in the GCC region.

4.3.1 Health Libraries

Al-Ansari and Al-Enezi (2001) report the setting up of 17 health libraries in Kuwait. Their study results show that the majority of health libraries were established during the 1980s. Their collections are relatively small, the majority of staff members are non-professionals, the majority of libraries provide only basic information services, and co-operation among libraries is limited. Survey results also indicate that a significant number of health sciences libraries are not automated. Another study

carried out in Kuwait by Mumtaz and Al-Jasem (2001) focuses on resource sharing in Kuwaiti libraries which, due to many factors, has now become an economic and information provision requirement. Results presented of a survey of the 17 libraries in Kuwait found that the participants strongly agreed on the importance of, problems in and benefits of, a resource-sharing system, and are willing to join a resource-sharing network. Libraries consider resource sharing very important for their libraries and are aware of its benefits. The National Library preferred to be designated as the co-ordinating agency for the resource-sharing network when established.

Al-Hummood (1998) found a lack of close relations and co-operative activities among libraries in Kuwait. She proposed a plan for the creation of a national bibliographic network comprising a group of libraries participating in a set of co-operating programmes, and working together under unified standards, methods and procedures.

The article by Al-Ansari and Al-Enezi (2001) cited previously mentions that the health libraries' collections are small. They attribute this shortage to the loss of some collections during the Iraqi occupation in 1991, which have not been returned or replaced, and the low financial support which causes a weakening of the library setting. In fact, this poor situation would not take more than a few years to recover, since Kuwait is considered to be one of the richest countries in the world. However, the actual cause of this problem is the inability of specialists in the field to present health libraries and their advancement as being important to the healthcare environment.

Boumarafi (1996) stated that health libraries provide good facilities and services in the United Arab Emirates (UAE) through the National Health Library. These facilities include access to MEDLINE and current contents for life sciences, inter-lending to libraries within and outside the country, and free photocopying. The library also supplements its collections by using the Information Delivery System of the British Library Document System (BLDS). The health library is important as a tool for information, communication, guidance, help and support for health professionals. However, despite the provision of some outstanding services by the academic libraries in the UAE, there are some drawbacks generated by poor staffing.

Alian (1999) surveyed the present status of ten health libraries in the State of Bahrain in terms of their history, collection, staff and services. He concluded the main problems facing health libraries in Bahrain to be budget and, poor collections and resources available in general with respect to quality and quantity. Due to the absence of qualified cataloguers, most of the health libraries were not catalogued or classified, while poor physical locations and lack of co-operation were the major problems facing these libraries in Bahrain. ICT and an on-line network were available in only three health libraries.

In a study conducted in Saudi Arabia, AbuOuf (1995) studied physicians' uses of information resources in hospital libraries in Jeddah. AbuOuf noted that physicians widely use specialised medical journals, medical references, theses, audiovisual materials, and medical T.V. and radio programmes. However, hospital libraries contain only basic resources, medical books, periodicals, encyclopaedias, dictionaries, conference proceedings, and reports and audiovisual materials. Physicians experience some difficulties in using health sciences libraries due to a conflict between the physicians' available time and library opening hours. AbuOuf indicated that health libraries have not computerised their information, and there is is a lack of information about other health libraries, and information centres.

Aseel (1996) studied the use of the MEDLINE bibliographic medical database on CD-ROM by the physicians of three hospitals in Jeddah. Aseel found that all the hospitals' libraries publicised the service when first started. As a result of this publicising, half of the physicians used the MEDLINE database. However, all hospital libraries lack an adequate number of workstations; each health library houses only one. None of the hospital libraries provides training programmes to instruct the physicians on how to use the database, which would minimise physicians' use of MEDLINE databases on CD-ROM.

Al-Ogla (1998) examined the status of 15 private and government hospital libraries in Riyadh. The study stressed the need to establish a library in each hospital, to develop greater international co-operation to improve library services, to shift the focus from ownership to access, and to hire professional librarians to improve information services for users. Al-Ogla mentioned that all health libraries provide services such as

CAS and SDI. However, he did not clarify in his study whether the results were based on the survey he had made or were from other sources, which would invalidate his findings. This generalisation lacks accuracy in reality; some of the libraries he examined do not provide some or any of the services noted in the study.

Arif et al. (1998) covered comprehensively the ILL services conducted in 1995 in the health libraries of Saudi Arabia. The study discusses various methods for providing ILL services, including direct inter-lending, lending through the union catalogue, and centralised lending. The authors concluded that there is a lack of official co-operation among health sciences libraries in Saudi Arabia, and most co-operation activities are based on personal communications and efforts. They also referred to some published references, which were not reported by Al-Ogla (1998). Although these two papers were published in the same year, Al-Ogla claimed that there were three articles to be found related to this field in Saudi Arabia.

AlShaya (2002) found two major problems, mainly: the lack of information sources provided by health libraries in Riyadh to physicians, and inadequate information education for physicians. AlShaya recommended extending physicians' access to electronic information sources, and enhancing information education opportunities for physicians, so they can learn to use IT and electronic information sources. He found several environmental factors can make quite large differences to the physicians' use of new technologies such as availability and accessibility of electronic information services, status of physicians, and information searching skills and training. AlShaya saw it as essential to develop and implement national policies and guidelines for the provision of electronic information services in hospital libraries in Saudi Arabia.

Moahi (2002) states that ILL in developing countries has been a very slow and painful process for those waiting for material. Participating in electronic document delivery services would go a long way towards improving this situation. Khalid (2000) confirms that co-operation and networking in library and information systems provide a wider access to collections, improve public and technical services and enhance operations by sharing resources, reducing duplication and offering more cost-effective services. Alian (1999) points out several obstacles facing co-operation among the GCC and Arab countries. These obstacles include an absence of clear national policy,

poor financial abilities, lack of government support for co-operation, and lack of communication.

4.3.2 LIS Educational Programmes

In 1993, Unesco and IFLA were instrumental in convening a meeting of 33 schools of library and information education in the Arab world. Johnson (1994) reports the recommendations of the meeting, pointing to the need for an improvement in the situation of faculty, the conducting of quality research, the establishment of a regional clearing house for literature, and the publication of an Arabic bulletin for professionals. Rehman and Al-Ansari (2003) reported that IFLA has been active in addressing many of the issue concerns. In June 2002, it co-sponsored a conference in Beirut, which provided an objective analysis of library education in the Arab world. It has made some valuable recommendations for the development of library and information education within research, publication and IT aspects.

Developments in ICT have introduced fresh provisions and challenges for new knowledge and skills for Continuing Professional Development (CPD). Continuing education is supplementary learning activities related to but separate from the work setting. So, there must be a training programme for every health science library, whether for in-service training or continuing education to ensure CPD (Itayem, 2001). At an institutional level, a strategic plan or mission statement, which sets out plans for the delivery of teaching, learning and research, must consider staff development (Al-Ofi, 2002).

Rehman et al. (2002) present a summative evaluation of the six schools in the GCC region covering aspects related to curriculum, students' enrolment and graduation, academic and administrative support, physical and computing infrastructure, and instructional policies. Al-Ansari et al. (2001) evaluated faculties in the six LIS schools and departments in the GCC region, three of which are in Saudi Arabia. The researchers found that these faculty members have an adequate amount of academic and professional experience. They have been teaching in the mainstream areas of traditional library operations and services. One point of concern, however, is that these faculty members have left no real mark on their academic and scholarly contributions. The contribution of a large majority of them to Arabic literature has

been weak. Another area of concern is that these faculty members seem to be quite inactive in the conduct of professional continuing education activities, and play no effective role in professional associations.

Rehman and Al-Ansari (2003) describe the situation in the majority of LIS schools in the GCC region as being deficient in the use of hardware, software, and other technological resources needed for the instruction of courses dealing with electronic systems, resources and facilities. For instance, three schools in Saudi Arabia did not have access to the Internet. Based on these results, it is apparent that many of them cannot claim to be actively and intelligently applying information technology resources.

Studies conducted by Margalani (1993), Siddiqui (1996), Al-Sereihy (1998) and Al-Ghamdi (2002) describe the overall situation of library and information education in Saudi Arabia. Al-Sereihy (1993, 1998) and Marghalani (1993) found that there is a lack of written CPD, lack of financial support, inadequate CPD activities, and a lack of organisation or institution-based CPD providers. Al-Ghamdi (2002) found several factors affecting the research and publication productivity levels of LIS faculty members at Saudi Arabian universities. These factors include age, years of experience as a faculty member, workload, perception of rewards, and perception of resources adequacy and availability. Some writers suggest that the Saudi Arabian Ministry of Higher Education needs to develop standards for an intensive evaluation of its schools, a development that may lead to discrete initiatives in those schools (Siddiqui, 1996; Al-Sereihy, 1998; Al-Ghamdi, 2002; Rehman and Al-Ansari, 2003).

Rehman and Al-Ansari (2003) commented that there is an apparent need for curriculum revision in LIS programmes in the GCC in order to reflect changes in the digital marketplace. Mumtaz and Al-Ansari (2002), in view of their findings, propose that there is a lack of strong LIS infrastructure, which can play an important role in the future development in the GCC. Many authors articulate a similar criticism of library education and training. They report that the library school's curriculum is very traditional and that there is an absence of IT aspects (Ashoor; 1996; Al-Ogla, 1998; Qari; 1998; Alian, 1999; Al-Shorbaji, 2001; Itayem, 2001). Itayem (2001) highlights the importance and the role of continuing education in the career development of

health librarians, saying that it also provides the difference to many aspects of continuing education and in-service training.

Ashoor (1996) argues that the current programme does not seem to match the needs of the information market in support of the fast-growing economy and rapidly developing education and research sectors of the region. He has found that employers are critical of the library's education programme in the GCC region for being traditional and superficial, and for lacking adequate education facilities, resources and evaluation.

Siddiqui (1996) describes the different levels of education and various types of libraries in Saudi Arabia. He reviews the state of professional library and information science education with particular reference to six library schools: King Abdulaziz University, Imam Muhammed ibn Saud Islamic University, King Saud University, Umm Al-Qura University; Girls College of Arts; and Institute of Public Administration. Siddiqui concluded that in spite of the fact that there are these library schools in Saudi Arabia, the library workforce in the country still comprises predominantly expatriates.

Although the two studies by Ashoor and Siddiqui were published in 1996, until now there has been no improvement in training or library education as is evidenced by other researchers mentioned above.

4.4 Information and Communication Technology (ICT)

Information technology is almost universally accepted as beneficial for individuals, organisations, and national economies (Hamadeh, 2000). For development, ICT can be seen as a trend and as a focal point for enthusiastic action by many kinds of actors concerned with development and with selling products in developing countries (Wade, 2001). The use of ICTs in the development process for most countries is on the rise and has been used extensively from their inception in the field of health and medicine (Fors and Moreno, 2002). Besides, technology is a facilitator not an end in itself (Lavagnino, 1998). However, Shani (2000) clarified that the information revolution has concentrated on the collection, storage, and analysis of data, with the emphasis on technology, not on information.

The definition of ICT has been quoted by Hughes et al. (2002, p.14) as:

> *"any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form."*

Heeks (1999, p.3) brought another definition of ICT as:

> *"the electronic means of capturing, processing, storing and communicating information."*

Although this definition by Heeks does not refer to the technical part which constitutes ICT, Fors and Moreno (2002) used it as a reference point. In essence, the prime function of ICT is the provision and dissemination of information and knowledge (Edejer, 2000; Fors and Moreno, 2002). Workers of any status have been enabled to disseminate information electronically without having to go through hierarchical channels (Larsen and McInerney, 2002; Katsirikou, 2003).

The enormous advantage of IT in easing the delivery of information around the world is reported by Jimba (1999). He claims that it may play a central role of information in the new global economy. Moreover, he forecasts that ICT will shape the dynamics of the future of the third world countries. This will happen once these countries have been encouraged to invest in IT. Of course, it should be implemented gradually, taking into consideration the cultural and structural differences between developed and developing countries.

Fors and Moreno (2002) note that there is sufficient evidence that understanding and enhancing policies and strategies based on the implementation of ICT in development projects are essential to improve people's lives, especially those of the poorest. Box and Engelhard (2001) and Cummings (2002) argue that there is a need for better co-ordination between international ICT initiatives in terms of regulatory environment. This type of co-ordination cannot be found at the moment, while foreign agencies

push their own agendas which can sometimes undermine or override consultative, privatisation, liberalisation, and open market access strategies.

4.4.1 Importance and Impact

Generally, ICT has been weighed through many studies in various concepts. Fors and Moreno (2002) note how access to information empowers people; this makes ICT strategies not only relevant but also important for a people-based development. Jones and Kochtanek (2002) describe the empowerment via virtual access to information, and less need for management overseeing in some areas. Furthermore, these technologies empower those who use information by providing them with a choice of information to be accessed in their own time (Edejer, 2000).

Technology plays an ever increasing role in all organisations, and libraries are no exception (Lavagnino, 1998). Cummings (2002) describes ICT as reducing isolation. ICT is also observed to facilitate international co-operation and provide access to vast amounts of information. While serious problems of access remain, Fors and Moreno (2002) explain that ICT has enabled larger amounts of information to be circulated with higher speed but at lower costs. ICT has become an important element in the working life of any healthcare service, and there has been a sharp increase in the amount of clinical information due to the use of advanced measurement technology (Hughes et al., 2002).

With the two views in favour of ICT use, Fors and Moreno (2002) explain that people believe ICT has great benefits in its application for development. They claim that it has a positive effect in bridging the information gap, will accelerate growth, improve education and healthcare, increase the efficiency of public administration, and encourage commerce and greater public participation. Those who are sceptical, however, claim that the application of ICT restructures inadequate resources away from more needy causes.

Certainly, with the invention of new technologies, libraries now reside in a complex service environment. ICT requires libraries to provide traditional services and resources such as physical space, printed materials, and face-to-face reference facilities, as well as network-based services such as web-based collections, online

databases and virtual reference services (Bertot, 2000; Fraser et al., 2002; Bertot and McClure, 2003). However, the difference between types of service online and physical services and resources is real, they are not comparable (Bertot, 2001; Bertot et al., 2002; Shim et al., 2002; Bertot and McClure, 2003). Bertot and McClure (2003) agree that ICT enables new services and resources to allow libraries to better meet the service and resource needs of their users.

New information technologies make it possible for libraries to make the transition from a traditional library facility in one location to a corporate information centre providing information products and services at the point of need. Health professionals and other information seekers no longer need to enter the physical library facility in order to take advantage of its services. In contrast, there are research efforts that do not separate network-based library services and resources from physical services and resources. For example, work by Hernon and Whitman (2001), and Hernon and Dugan (2002), missed substantive differences, and ultimately, the ability to determine library services and resource quality and outcomes (Bertot and McClure, 2003).

Carpenter (1999) defines good communication as a two-way interactive process. Good communication is a vital process in every organisation, as well as a skill; as such, it is subject to the same cultural, procedural and structural influences as other aspects of work. Computing and communication technologies were developed from the 1970s onwards to facilitate more co-operation in the sharing of resources beyond a national level (Johnson, 2002). Davarpanah (2001) suggests that broad-based co-operation and co-ordination are now even more necessary than before. Only a strong commitment to co-operation can enable libraries to use IT to give more and better services. Unfortunately, the culture of co-operation and sharing resources or information is not present in many developing countries as a result of their being developed in a culture of 'information starvation' (Nyaki Adeya, 2001).

The 21st century provides opportunities for librarians that are perhaps unparalleled in history (Marshall, 2000). Communication technology in libraries is how librarians might be able to network with other librarians in the world, and how they communicate with library users (Bishawi, 2002). This is a challenge for librarians, and an opportunity to move their activities and to enlarge their sharing to the scholarly

communication process (Lucier, 1993; Katsirikou, 2003). On the other hand, professional influences are equally strongly associated with use for communication and information purposes (Klobas and Clyde, 2001).

As an advantage of new technologies, Ahmed (2002) made it clear that library users value the services that they access from their desktop because those services save time. They also appreciate being able to access services at their convenience, without being restricted by the library's hours of operation. Farmer et al. (1999) support the hypothesis that new ICT can help health practitioners to keep up-to-date and find information to use in clinical problem-solving.

The management and arrangement of library content, as Bell (2002) mentions, contribute to increasing the use of information resources. Furthermore, librarians and information managers have emphasised not just tools and methods of access, but also the quality of the information resources and methods of evaluation (Ciolek 1997; McKenzie, 1997; Klobas and Clyde 2001). They, the librarians and information managers, have worked on the well-founded assumption that people will use relevant Internet information resources with high quality content and usability (Schrock, 1998, 1999; Joseph, 1999; Klobas and Clyde, 2001).

On the other hand, physicians, as main users, have become avid users of online journals (Torre et al., 2003, p.1). This is as an outcome of the library's active involvement in providing access to electronic journals, which has fostered users' expectations of an electronic environment that is instantly responsive to their research needs (Publicker and Stoklosa, 1999). In the future, physicians may need to enhance their computer proficiency to take full advantage of new online features. Medical journals, in turn, should consider the specific Internets of their readers when developing changes and offering new features (Torre et al., 2003). Publicker and Stoklosa (1999) discussed the ongoing development of the model used by the National Institute of Health (NIH) library staff for selecting electronic journals for use at the NIH.

Farmer et al. (1999) noted that a very important type of health science library users, i.e. nurses, place great value on electronic information resources. Farmer found that

nurses in both academic and NHS Trust sites thought that databases, on-line information and e-mail were very important, and that clinical information was valued highly by clinical nurses.

However, Fors and Moreno (2002) note that not all benefited equally; there is an alarming and growing digital divide, not only between but also within countries. Houissa (2000) explains that in order to close this recurring problem between the 'haves' and the 'have-nots' in a region it will require more than just hooking the country up to the Internet; it will also depend on guaranteeing unimpeded access to information.

4.4.2 ICT Impact on Health Sciences Libraries

O'Connor (2002) conducted an extensive literature review regarding the impact of health libraries and information on patient care, particularly in the USA, UK, Australia and New Zealand. In the review, he found no specific technique or methodology that could determine the level of impact on the performance of the library services. His study proved that health library information is very useful, as it can affect patients care outcomes in various ways, and has a high cognitive and clinical value when diagnosing and treating patients. With the information provided by the library, health professionals can become more accurate when giving treatment to patient. However, not all studies have involved non-professionals and how health library information could be of benefit to them.

Plaice (2000) confirmed the different levels of the impact of technology on Library and Information Services (LIS) in the UK NHS. He suggested that in the NHS, hospital libraries and computer departments should become amalgamated into single units. In the USA, the relationship between the hospital librarian and the information system can be of great significance to the success of the hospital library. Plaice's article shows the opportunities for health sciences library staff to work in partnership with other health information professionals. Librarians possess the knowledge and education to serve as a bridge between the available technology and its users through their obligation to service, their knowledge of healthcare information needs, and their awareness of and competencies in LIS and ICT systems.

Health services and hospitals have seen the use of IT in most of their activities. In his article, Khalid (2000) discusses the present weakness in Saudi Arabian libraries, generally in the use of the information techniques, despite the presence of a strong foundation in the communication system. In fact, the continuing emergence of new ICT brings tremendous changes to the library environment in general, and to its services in particular. Qari (1998) states that the library environments and the methods of providing services to library users are drastically changing with the availability of new technologies.

Martin (1998) states that health professionals and health information professionals should work together to link clinical information systems to consumer health databases, as well as design easy-to-use interfaces or single entry points to these resources in order to make the best information available that directly benefits consumers and their care-givers. The study shows that in 1997 there were as many as 12,000 medical Internet web-based consumer health information sites. This number is no doubt much higher now, in 2005. However, the numbers of quality medical websites, which allow access to the National Library of Medicine's MEDLINE databases are limited.

The Internet has become one of the main channels for the electronic publishing of health information, as stated by Tu and Zimmerman (2000), which includes abstracts of research findings, news and health guidelines. The Internet has allowed worldwide access to health-related information. However, the researchers found that health-related information on the Internet can be overwhelming, incomplete and inaccurate and this may be due to the lack of rules and regulations to control such information. Yet the Internet will continue to grow as a primary source of information in our culture.

Librarians and information professionals need to continue to seek ways of assisting users. The success of health promotion in the 21st century depends on adequate, accurate, and easy-to-use information (Tu and Zimmerman, 2000). However, Tu and Zimmerman's study supports the advantages and important issues of 'quality control' of health information and how to implement it by health librarians, specialists and

publishers of health information, and which is important for most people, in particular those interested and involved in the health sectors.

However, it is important to discuss how a set of basic quality standards can be developed and applied in an electronic context. Such standards must be built on the foundation of accountability. These principles amount to a framework for critical thinking, allowing consumers and professionals alike to reasonably judge whether what they are reading is credible, reasonable or useful, and to make measured, informed decisions about how to apply this information in the real world (Silberg et al., 1997). Websites and other Internet-based sources of medical and health information that fail to meet at least these basic standards should be regarded as suspect. Silberg et al. (1997) suggest that it should made clear to the user that information presented in a Net discussion group or on any medically-orientated website is designed to be part of, and not a substitute for, the relationship that is central to the healthcare decision-making process: the relationship between the patient and the professional.

4.4.3 ICT in Health Sciences Libraries

The most significant channel for change in health information provision has been the development of ICT (Lancaster, 2000). ICT has the potential to provide better access to health facilities and the promotion of a more efficient management and administration. Developing countries suffer from many disadvantages, part of which is the availability of local health information and sources. Thus, they are making use of services such as Web MEDLINE, and the Internet to link health professionals to provide access to medical information from other countries, which facilitates diagnosis and treatment. It is very important for policy makers and authorities to establish a comprehensive information policy, particularly a health information policy in the development process, by adding ICT and services to complement and expand the traditional structure and services.

In his literature review, Rashbass (2000) assures us that new technologies are empowering individuals and communities to gather and access information without the need to refer to experts for assistance. His review gives a brief introduction to IT, and how it may lead to the demise of the printed document and index catalogue. Users

may browse the Internet from their own computers for information access and use. Rashbass claims that the emerging technology will omit the need for health libraries based on journal needs only; in his words, "healthcare libraries are dying". Rashbass also argues that individuals do not need to go to a health library to access help, support and advice, as these new technologies empower the individual. It seems to be that Rashbass based his assumption on trained and well-informed ICT users, and not its applicability to the majority of users.

In reality, this is not the case, as users are equally trained and well informed. The other factor is the sharp change and expansion in ICT, software and hardware, almost on a daily basis. Therefore, as a practicality of time and effort, users cannot cope with changes and development in ICT. Although health libraries are needed, it may be that the role and function of the health library may change due to ICT changes. The claim by Rashbass (2000) that it is only five years to the "death of the health libraries" is exaggerated. Itayem (2001) commented that there is no sign of that, after more than three years from his claim. It is true that ICT is more than just another tool. Its potential for increasing the range, relevance and accessibility of information and communication in health libraries is very significant, as is its potential for supporting library staff in their everyday roles and in their continuing training and professional development.

ICT offers a new opportunity to build a confident, skilled and participatory community in terms of knowledge that includes health sciences libraries and health information centres. Marshall (2000) states that health sciences libraries become very important with the advance of technology in the health sector to extend the network related to the health information. Marshall outlines the headlines of the health science education in North Carolina at Chapel Hill, USA, and its training in health sciences libraries education. It might have been better if Marshall had highlighted the establishment of the programme of health libraries in the future, and possible methods of maintaining the strength of such a programme.

Adams and Blandford (2002) noted the importance of the World Wide Web accessible digital libraries on the wards, and how it can address the demands of Evidence-Based Medicine (EBM). However, the results of a study within a large

London-based hospital show that the use and acceptability of digital libraries resources on the ward has been lower than expected. This is due to a poor understanding of the context of use and the lack of appreciation of the social and organisational impacts of ward-accessible digital libraries for health professionals. From in-depth interviews and focus groups with 73 health professionals, it was found that clinical social structures interact with inadequate training provision. Findings also detail the perceived effectiveness of traditional and digital libraries, and the impact of health professionals' status on information control and access. One important conclusion has been that increased digital library usability, and adequate support and training for senior health professionals, would increase perceptions of digital libraries as support for, rather than replacement of, their clinical expertise.

D'Alessandro et al. (1998) emphasise the experiences of the virtual hospital in creating and sustaining a health digital library, using the example of the University of Iowa Digital Library Project (UIDLP). Emerging digital library technology looks promising for the creation of digital libraries and digital presses and distribution directly to users. Accordingly, it allows the university and faculty staff to better serve their constituencies. UIDLP used a methodology to overcome the technical, social, political, and economic barriers involved in creating, distributing and organising a digital library.

The Royal Adelaide Hospital (RAH) is the largest teaching hospital in South Australia. Peterson (2001) noted that the health library has been using intranet and the Internet as the delivery media for its services for some years. The immediacy and ready accessibility of the service has been enthusiastically received by the staff. However, Peterson concluded that the adoption of personal digital assistants PDAs in the clinical setting is only a question of time, and much health and medical material has already been adapted for Palm Pilots. The development of the use of (PDAs) is expected to bring major changes. Many Australian country doctors are taking them up, as they can have a virtual library of downloaded reference aids with them when they are away from networks and reliable Internet connections. As the technology develops, the PDA will become a part of the clinician's armoury, and the library will be ensuring that clinicians have access to the right information via the device at the bedside, or when they need it.

In the Arab region, the ICT infrastructure has improved dramatically in the last few years, as reported by Al-Shorbaji (2000a). All Eastern Mediterranean Region (EMR) countries are now connected to the Internet, and the number of trained computer and communication specialists has substantially increased. Health libraries are in a better situation than many other types of library. This is due to the fact that medical education requires libraries to support the education and research process. ICT is used for providing intellectual access to the content of these collections and for making available all or part of the collection needed. There is a fact that needs to be recognised in Al-Shorbaji's research, in that the vast majority of health libraries are controlled, managed and administered centrally. Central administrators' opinion, attitudes and wariness of ICT have a direct and indirect impact on the decision-making in favour of ICT implementation and upgrading.

Health libraries that might be rated as very good in terms of their collections, technology and services, use ICT for providing access to the content of their collections. Siddiqui (1996) notes that all types of library in Saudi Arabia are using GULFNET on the Internet Service Provider (ISP) to communicate with each other. Even with these developments, it is clear that the use of technology in libraries in Saudi Arabia is lower than in developed countries such as the UK, and in less developed countries such as Malaysia (Khalid, 2000).

In a study by Al-Ansari (1999), covering all libraries in the GCC (including health libraries), the author describes technology as being one of the major factors driving changes in the way people communicate, locate, retrieve and use information. Libraries and information centres have embraced this new technology more successfully than many other fields, and most are currently using some form of automated product or service. These technologies include new forms of media such as CD-ROM databases, interactive media, electronic journals and texts, online resources, integrated library systems, and the Internet. The Internet has become standard equipment in most libraries and information centres for their operations and services.

Bishawi (2001) describes the Tawam Hospital Medical Library (THML) in Abu-Dhabi, UAE, in the past and compares it with the present. The process it underwent to begin changing into a digital library is described. It is expected that the Tawam

Health Library will continue following the latest and up-to-date techniques in librarianship through communication with other libraries. Bishawi evaluated the THML according to the standards of the Medical Library Association (MLA). Using his experience, it is now possible for each specialist in hospital libraries to assess and evaluate hospital library services and healthcare by using development improvement programmes.

ICT could be divided into three broad categories: communication, Internet-enabled communications and computing, as proposed by Quibria and Tschang (2001). Such classification provides users or 'information players' (Nicholas, D. & Dobrowolski, 2000; Nicholas et al., 2000) with access to more and better information. It also facilitates new ways of representing, structuring and creating information, both collaboratively and at a distance. ICT has revolutionised, not only communication, but also commerce and computing in all fields, including scientific computing and business automation.

Libraries in general have introduced ICT into their functions, activities, and services. Some of these services, which are based on ICT, are highlighted as follows:

4.4.3.1 OPAC

There is no doubt that there is growth in the use of the Online Public Access Catalogue (OPAC) in libraries in the USA and the UK, as they provide faster access to the catalogue (database) from any location on 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 enabling the retrieval of useful information. The newly developed OPAC service offers a variety of interface options, including a range of listing devices and browsable filters that complement and enrich the search functionality of these powerful databases systems (Joint, 2001).

The advent of the library OPAC initially established searching as the main information retrieval technique of the electronic library. In this sense, the best OPAC interface is a service that presents itself as a friendlier searching and filtering interface, rather than just a simple search mechanism (Ayris, 1986; Joint, 2001). Recent innovations such as SFX show how important this development has become,

with a new emphasis on the creation of paths through extended services and browsing through a consultation chain (Van de Stompel and Hochstenbach, 1999).

The most successful OPAC enhancements of recent years have involved adding new databases. Ideally, OPAC users need to be provided with databases that help them understand the information landscape and the possibilities that it contains (Farmer et al., 1999). Ridgway (1996) proposed that computer access points could be made available within hospital trusts for practitioners' use to find literature and research.

In Saudi Arabia, a good deal of research has been carried out regarding the use of OPAC in academic but not health libraries. Since King Fahd University of Petroleum and Minerals (KFUPM) was the first university to introduce the OPAC service in its library, Deemer (1982) describes how it started dealing with DOBIS/LIBIS, and what obstacles exist in the infrastructure of Saudi Arabia in maintaining a computer system and workforce. He indicates that KSU and KFUPM have already started to implement online library information systems. The use of libraries in Saudi Arabia has expanded due to new technology. Thus, new applications such as automation and networking have been created (Dosary and Ekrish, 1991).

Ashoor and Khurshid (1987) consider the results of an OPAC user survey at the KFUPM library. As for the level of satisfaction with online catalogue search, 83% of users found their search very satisfactory. According to Hafiz (1991), in his study about library users' behaviour in Saudi Arabia, the majority of users were positive about the online catalogue, and many of them considered the computer search was satisfactory.

4.4.3.2 CD-ROM

Compact Disk Read Only Memory (CD-ROM) is one medium that can store vast amounts of data. It was developed by Sony and Philips, and launched in 1980. There has been continuing growth of this medium in the USA and UK, particularly 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 (Basager, 2001).

Wood (1993) describes health science as one of the first fields to experience large-scale adoption of CD-ROMs. She used the example of MEDLINE CD-ROM as it has been the most popular acquisition in health sciences libraries, with its advantages in access control and ease of use.

In his investigation into CD-ROM databases at the KFUPM library in Saudi Arabia, Kanamugire (1994) indicates that a CD-ROM service should clearly include networking to facilitate the optimal use of the CD-ROM workstation. He commented that 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 (Mirza and Siddiqui, 1993).

Aseel (1996) considered the attitudes of physicians in the city of Jeddah towards the use of the MEDLINE database on CD-ROM. She found that half the physicians used it, and of the total, 39.9% use it for preparing scientific research and reports. However, each hospital library has only one workstation. Aseel confirms that all hospital libraries lack an adequate number of workstations.

AlShaya (2002) investigates the usage and attitude of Saudi physicians towards CD-ROM, which showed a common use for them. Certain problems such as practice demands, limited availability, and cost were factors influencing non-use of CD-ROM sources. AlShaya confirms the use of CD-ROM mainly for literature searching, but instructions from colleagues or self-instruction is more attractive to physicians for learning how to use and search CD-ROM software.

4.4.3.3 Networks

In strategic planning, networks and other sources of information are used to obtain knowledge of the internal and external environments. Bryson (1997) asserts that global information networks would be used to market services and products and to obtain information for research. Another term, 'consortia', relates to a group of libraries of various strengths, power, age, collection, staff experience, and specialisation. Consortia enable libraries to share the expertise developed within the services of member libraries (Katsirikou, 2003).

Consortia and networks might be conceptualised and developed on the basis that this might be a productive approach to more effective co-operation (Forsman, 1998; Gorman and Cullen, 2000). The library, as a network in its own right, is a key to creating an internal culture; from this internal culture, it is then not such a major step to move on to effective external networking and co-operation (Gorman and Cullen, 2000).

An Intranet is a network of companies' systems that allows organisations to share information and interact electronically across organisational boundaries (Katsirikou, 2003). Peterson (2001) discusses how to deliver a library service via an Intranet. The main emphasis is on setting up a service to suit an online environment, designing user-friendly pages to ensure acceptance of the new services, and training users to make full use of it. Peterson highlights some potential points towards designing the Intranet that users need to consider: who they are, where they will use the service, when they will use it, and why they will use it.

Information networks enable participants to share research databases (Marshall and Haley, 2000; Bell, 2002), and provide the ability for groups and individuals in organisations to share documents and to work concurrently over a network (Nettle, 1998). In addition, Harrington and Li (2002) included time saved going to conferences, more control over the learning process, and the potential for networking and profession-wide reach. Shani (2000) proposes an aspect related to future medical networks which will not only allow physicians to seek information on puzzling cases, but will also allow them to pursue lifetime learning which should be a goal of every physician.

Franklin and Plum (2002), in their research, cover four geographically disparate academic health sciences libraries in the USA between 1999 and 2002. Their study demonstrates that remote usage of networked electronic services significantly exceeds the in-library usage of those same resources. There are approximately four remote networked electronic users for every in-house user. Furthermore, the remote usage of networked electronic services is for different purposes than in-library use of networked electronic resources. The users are also demographically different.

4.4.3.4 Internet

The latest technology is known as the Internet. It is a unique information medium allowing information to be accessed at any time from anywhere in the world. The features of the Internet have proven its priority and superiority over all other types of information resources and communication tools. Health professionals are enthusiastic to use the Internet for easy and accurate searches and fast communication (Khudair and Bawden, 2004).

Brophy (2000a) defined the Internet as follows: it is not a network but an interconnected network of networks that exchange data using internationally agreed standards like the Internet Protocol (IP). In a detailed definition of the Internet it is described as follows:

> *"Internet is a network of networks. A group of networks connected together by BRIDGES or ROUTERS so that data may be passed from one network into another, which allows users of all these networks to communicate and share data with one another. The Internet permits e-mail to be sent to and from anywhere in the world that has access to it via an Internet services provider".*
>
> *(Pountain, 2001, p.251)*

Nevertheless, the universal adoption of the Internet has created the opportunity for firms and other organisations to establish a collaborative network of partners with whom they may exchange strategic knowledge in order to achieve mutually beneficial objectives (Warkentin et al., 2001; Katsirikou, 2003). The Internet has become the largest and most important network of all, and has evolved into a global information superhighway. The Internet has also become a key platform for a rapid expansion of information (Khudair and Bawden, 2004).

Joint (2001) describes the Internet as a vast open information network. Simpson (1996) and Farmer et al. (1999) suggest that the Internet may replace information networks being developed to support community healthcare. Access to the Internet can enable up-to-date information and medical literature, as well as long-distance

training, consultation, collection of medical knowledge, which in turn can improve the quality of health care (Ekenberg and Asker, 1999; Fors and Moreno, 2002). However. Fritch and Cromwell's (2001) paper, addresses the problem that Internet information is frequently poorly evaluated, with the result that questionable information is used without assessment of its authority, and much good information is being disregarded.

End-user access to the Internet trebled in just over a year, according to a business information resources survey by Klobas and Clyde (2001), whereas online and CD-ROM services failed to achieve anything like this level of desktop penetration. In support, Hewitson (2002) notes that users rely on the Internet and search engines with which they are familiar, rather than interact with the information on subscription-based services. The majority of users were keen to praise the Internet for its ability to convey up-to-date information. The study found that the Internet was most extensively used because it is easy to access, is time saving, and gives instant results.

Agnew (1995) and Farmer et al. (1999) view the Internet as the way forward in providing nurses with access to information from the hospital ward. Farmer et al. (1999) report on a research project which explored the potential of the Internet and other networked information resources to improve access to information for nurses working in the remote Western Isles of Scotland. Several studies demonstrate that over time, as more library resources are offered via the Web, library collections' usage will increasingly occur outside the library (Franklin and Plum, 2002).

Cahoon and Marriott (1999) discuss the introduction of the MEDLINE database, delivered over the Internet with full-text electronic journals, to a National Health Service region in the UK. They assure us that this service improved the delivery of library services to the user's workplace, and ensured a common interface throughout the region for university and NHS users. In fact, Yeoman et al. (2001) and Booth et al. (2002), promote the term 'virtual outreach services' to include any services that enable health professionals to access pertinent information without physically entering library premises.

Web tools can assist users in acquiring and managing information or documents from the Internet by using these surfing data (Williams et al., 2002). According to their

intelligence and power, such tools can be divided into browsers, search engines, communication and push-delivery systems (Cheung et al., 1998; Chen and Tai, 2003).

However, browsing Web sites on the Internet has largely been an activity undertaken alongside, but not inside, the virtual space of the digital library. Similarly, inside the digital library, we do not yet find a full and whole-hearted exploration of browsable interfaces for electronic library services (Joint, 2001). Accordingly, new tools for searching processes are needed to allow clinicians to query the world's health and medical literature from the comfort of their own offices or homes (Sikorski and Peters, 1997).

The role of Internet search engines shows how the WWW needed to present itself through the medium of a search interface. Much of the nature of Internet search engine use remains closer to browsing than searching (Joint, 2001). In comparison, this contrasts with an OPAC or bibliographic databases search where the metadata of the document surrogate or catalogue record predominate and are viewed in full by the user, instead of the full text.

Medical literature expands rapidly, and disseminating that literature effectively to users is a major problem that has come to be known as medical information crisis (Smith, 1996; Detmer and Shortliffe, 1997; Ambrose et al., 2003). As a consequence, librarians have found the provision of web-based services to be a very worthwhile endeavour (Haloub, 1999; Ahmed, 2002). Users can acquire increasing amounts of information from Internet resources, but they also face the serious problem of information overload. Concurrently, web tools have become more important for developing better solutions to assist people in acquiring information easily and effectively (Adorf, 1995; Laine-Cruzel et al., 1996; Chen and Tai, 2003).

Khan and Khan (2001) describe the Internet as having revolutionised IT. Vast amounts of the latest information are available on the Internet to health professionals. Medical surfing is fast becoming part of a doctor's profession. In Najraan General Hospital, Saudi Arabia, Khan and Khan observed that the way of approaching the Internet and retrieving useful information from myriads of medical websites seems like a daunting task to many. As medical information is not restricted to books and

journals, providing Internet addresses of different medical bodies, with few salient features, will go a long way in helping attain the required information without wasting time. They suggest that the Internet will soon become a universal library and, importantly, medical surfing should be included in the curriculum of all medical schools and universities.

O'Reilly (2001) and Jones and Kochtanek (2002) suggest that Internet-based technologies are creating information overloads, where a major task of practitioners is to help mobilise those frozen by the overload of information. From a realistic point of view, Kling (2001) highlights that the Internet is one indicator of the challenge in technology, because many sincerely believe that they will soon be able to obtain whatever information or material they want exclusively from Internet sites.

The challenge for all library and information services is to develop processes and systems that produce data, with minimal overheads in terms of time, effort and resources, to enable continuing evaluations of services (Booth et al., 2002). In their paper, Chen and Tai (2003) suggest that users must refine and retrieve information to obtain their actual requirements after utilising a search engine. Thus, using a search engine cannot effectively solve such problems of information overload on the Internet (Chen et al., 1998; Fragouidis and Likothanassis, 1999; Mowshowita and Kawanguchi, 2002).

Chen and Tai propose an information push-delivery system, which applies fuzzy information retrieval and fuzzy similarity measurement, to avoid the information overload problem. Through an empirical investigation the proposed system has been implemented. The results show that the degree of satisfaction for the received information for all participants is as high as 71%, indicating that the proposed system can effectively provide correct and interesting information for users (Chen and Tai, 2002).

Zisman et al (2002a; 2002b) look at the root problem of the Internet information sources, as these sources are generally created and administered independently. Furthermore, Sadeh and Walker (2003) explain the current process of accessing several resources for the sake of seeking information, as it is cumbersome and

requires some knowledge of the various resources, their access mechanisms, the query interface they provide, and the type of results they return. However, in 1998, Tim Berners-Lee introduced the "Semantic Web" to overcome such a challenging information environment. The Semantic Web is an extension of the current Web, in which information is given well-defined meaning, enabling computers and people to work in better cooperation (Berners-Lee et al., 2001; Berners-Lee and Miller, 2002). The general set of semantic categories can be structured in a thesaurus-like fashion. It can also be shared by a wide variety of users, can be used to define a user profile, and can semantically characterise various parts of the documents and links (Martelli and Signore, 2002). Ding and Fensel (2002) describe this development as it weaves together, net linking incredibly large parts of human knowledge, and complements it with machine processability.

The rationale of Semantic Web attracted much interest in the last few years, and it led to the creation of a European project; Semantic Web Advanced Development (SWAD), which aims to highlight practical examples of where real value can be added to the Web through the Semantic Web (Matthews et al., 2002). Furthermore, in another project, Chelsom et al. (2002) proposed a new approach using Web Services. It aims to support multilingual access of data stored in various data sources, and automatic document generation. This approach is based on the use of an Information Bus to allow the exchange of data between various information sources implemented taking advantage of using different technologies. The project of the National Library of Medicine (NLM), Unified Medical Language System (UMLS) included the UMLS Semantic Network which is provided an ideal framework for federating disparate databases (National Library of Medicine, [n.d.]). Stone et al (2004) describe the current structure of the UMLS Semantic Network as most useful for scientific literature and clinical trial information.

The growth of the Internet has opened alternative channels such as e-mail and discussion fora to disseminate medical knowledge to physicians and other health professionals (Silverman, 1998; Caroll et al., 2002; Eysenbach et al., 2002; Ambrose et al., 2003). Ambrose et al. (2003) explain that the alternative Internet channels can enable superior dissemination of medical knowledge, and help alleviate the medical knowledge crisis (Winker et al., 2000; Fortin et al., 2002; Wilson 2002).

The electronic mail (e-mail) facility is a popular way to communicate on the electronic frontier. A document can be sent and delivered as an attachment to the e-mail message, with all-colour images and tables (Bishawi, 2002). As a communication method, e-mail allows two-way communications, enabling both to be communicated over the same channel (Ambrose et al., 2003). Moreover, the reach of e-mail is such that it can also dramatically shrink spatial distances, and is a cost-effective medium for interaction (Kruempel, 2000; Ambrose et al., 2003).

Kling (2001) states that the dynamics of professional electronic forums vary, but like many voluntary associations, their dynamism depends upon a slowly changing core group of highly active participants. In principle, such electronic discussion forums could be attractive to many professionals. A strategic challenge for librarians is to be creative and structure their electronic forums so that they are viable media for strengthening professional ties and fostering innovations (Kling, 2001). Clearly, these opportunities and challenges cannot be met effectively by the librarians of any single library; rather, they are best engaged by groups within the profession.

4.4.3.5 Personal Digital Assistant

Two individuals responsible for the development of what we know now as 'Palm' are Jeff Hawkins and Donna Dubinsky (Shipman and Morton, 2001). They founded Palm Computing in 1992 and began working on a Personal Digital Assistant (PDA) that was geared towards the consumer market. The term PDA was coined in 1992 (Girard, 2001). The Apple Newton version released in 1993 was considered to be the first truly functional PDA. However, Newton sales did not take off as expected, due to initial overpricing and poor input recognition, therefore production was soon cancelled (Girard, 2001; Shipman and Morton, 2001).

The potential uses of PDAs for research and as library management tools are discussed by Hattery (2001) who provides examples in medical, academic, and pharmaceutical libraries (Panteli and Dawson, 2001). Many health professionals are reaching for their palm-size computer or PDA as their latest indispensable health care instrument (Shipman and Morton, 2001). PDA popularity within the health care world is not a coincidence. Health professionals frequently practise within a mobile

environment going from private practice to medical centre rounds to ambulatory clinics, experiencing extreme time pressures (Shipman and Morton, 2001).

De Groote and Doranski (2004) conducted a study to determine how PDAs are used on an academic health sciences campus, to define the level of training and support that the library can provide to both faculty and students. Most survey respondents indicated they would like to learn more about the clinical resources for PDAs. Interestingly, 61% of survey respondents used PDAs. The address book, date book, and calculator were the most common uses reported for PDAs. Health professionals faculty members reported a high use of drug databases.

A study by Johnson et al. (2004) describes the system architecture and user acceptance of a suite of programs that deliver information about newly updated library resources to clinicians' PDAs. Participants completed a survey at the conclusion of the study to gauge their opinions about the service. Most users of the PDA Alerts software reported that they have learned about new medical developments sooner than they otherwise would, and half reported that they had learned about developments they would not have heard about at all. While some users liked the PDA platform for receiving headlines, it seemed that a Web database that allowed tailored searches and alerts could be configured to satisfy both PDA-orientated and e-mail-orientated users.

The market for the PDA grew dramatically each year, and it has a future for wide use (Girard, 2001; Shipman and Morton, 2001). Wireless technology will expand these applications, so that physicians, nurses, and other health professionals will be able to transfer PDA-drafted prescriptions directly to pharmacists, consult web-based databases, and communicate with patients using the PDA as a phone or a chat device (Shipman and Morton, 2001).

4.4.4 Virtual Health Sciences Library

Virtual or digital libraries have been developed to provide online access to a variety of full-text clinical information and journal articles to enhance information access among their users. Just as there is no universally agreed terminology for digital libraries, neither is there a common definition for this concept (Kahin, 1995). In the 1990s,

terms such as digital library, virtual library, and electronic library became widely used, but considerable uncertainty remains about what they actually mean (Kahin, 1995; Magnussen, et al., 2003). However, Bishop and Starr (1996) consider this confusion of definitions as healthy, because the digital library world is still emerging, and thus, has multiple agendas. The multiplicity of definitions ensures that no area is excluded (Bishop and Starr, 1996).

Digital libraries may be defined as follows:

> *"Digital libraries are electronic equivalents of paper collections or records. The concept of a digital library is an organised collection of electronic information disseminated to a designated community through network technologies providing easy access to data. Provided that a global, secure network can be established, digital libraries hold the potential of vastly simplifying the process of providing access to timely and complete collections. Digital libraries, accordingly, present an attractive alternative to the paper-based collections maintained today."*
>
> (Zielinski, 2001, p. 1)

The concept of the digital or virtual library has become increasingly popular over the last few years (Madge, 2000). The digital library was defined as organisations providing resources, including specialised staff, for selecting, structuring, accessing, interpreting, distributing, and preserving collections of digital works, so that they are readily and economically available for use by a defined community or set of communities (Bekele, 2002).

In earlier studies, Lancaster (1978) and Thomson (1982) predicted that by the year 2000, the large scale of electronic databases would have had a profound effect on libraries and that the nature of libraries would change (Klobas, 1997; Kebede, 2002). Klobas in particular commented that the technical advances have actually come about earlier, and are widely available through a uniform and relatively inexpensive interface from the Internet and Intranet.

One of the principal benefits of the digital library is the ability to deliver information services to the user's desktop (Madge, 2000; Pugh, 2000), empowering the individual to gather, access, and assess information (Rashbass, 2000). There is an increasing shift from ownership of materials to access. The shift from the physical entity to the virtual library created a new infrastructure for health sciences libraries and changed the way in which they function and provide services (Weise, 1993; Alqudsi-Ghabra, 1999; Bishawi, 2001).

Bawden and Rowlands (1999) mention that widely held views regarding services and use of digital libraries are that they will offer customised interfaces. They predict that there will be users who will depend on libraries for computational facilities and skills, particularly in the developing world. The first, exploratory stage in the Michigan Virtual Health Library (MVHL), USA, identified the need to access electronic resources by providing fast, affordable, high quality, simple and reliable interfaces (Brenneise and Marks, 2001).

The diversity within an electronic health science library, and the application of ICT, has made the building of a virtual library more difficult, but more challenging (Al-Shorbaji, 2000b). Libraries without walls include the growth and dramatic development of virtual libraries, locally, nationally, and indeed internationally (Booth et al., 2002). If physical library space is often allocated to certain tasks, then it is logical that virtual library space should be similarly allocated, thus maximising browsability and services (Joint, 2001).

Al-Shorbaji and Nour's (2001) article is about the EMR virtual health sciences libraries' perspectives and their need to join the network of the virtual libraries. Although it states the main required factors that are related to libraries, it does not clarify the objectives to promote or enhance the partnership or coordinate activities between the libraries of the USA, and how to achieve this by solving the problems for partnering in the virtual library. This should not only be by participating in the network but by developing and sharing information and knowledge.

However, Al-Shorbaji and Nour (2001) noted that the Eastern Mediterranean Region (EMR) *Index Medicus* started in 1987 to cover articles in health science journals published in the region since 1984. Indexing the backlog of the journal articles was completed in 1997, with five volumes having been published in printed form. The database is published on the Internet and includes 82,000 records. A document delivery service based on the indexed journals is also available, and trial issues of the *Index* on CD-ROM were produced.

The increasing demand for electronic publishing and dissemination of information over the Internet has led EMR to consider the development of a website to be used as a method for communication and dissemination of information to member states, interested agencies, and individuals worldwide. One of its objectives is to promote and enhance networking among health and institutions and professionals in the region (Al-Shorbaji, 2001).

Malkawi (2001) presented the CEHANET project, established in 1988, which concentrated its efforts on improving access to reliable environmental health information, regardless of its format; recently the focus has been put on electronic and multimedia formats. CEHANET realises the importance of information services using the Internet. Unfortunately, available resources are not sufficient to give full support to these services while maintaining the traditional ones.

4.5 Related Studies

This part of the literature review provides some focus on related studies concerning health sciences libraries in Saudi Arabia. It includes researches that cover some important issues and aspects that have an influence on the health sciences libraries in the country. This section will give details about each research, such as aims and objectives, methods of research, and main findings.

4.5.1 AbuOuf (1995)

AbuOuf, in her Master's degree dissertation, aimed to study physicians' use of information resources in hospital libraries in Jeddah, Saudi Arabia. The main objectives of this research were to find reasons why physicians search for information resources in hospital libraries, and specify the information resources used, and to

review the current state of the hospital libraries under investigation, which were King Fahd General Hospital, King AbdulAziz University Hospital, King Fahd Military Hospital, and Dr. Sulaiman Fakheeh Hospital. This research utilises the descriptive research approach. Two sets of questionnaires were used one was designed for physicians, and the second for health librarians.

Briefly, the main findings of this research are that hospital libraries contain basic sources, medical books, periodicals, dictionaries, conference proceedings, reports and audiovisuals, etc. However, physicians widely use specialised medical journals, medical references, theses, audiovisuals, and medical T.V. and radio programmes. 58.18% of physicians are staff in medical colleges, and hospitals use the information resources in their teaching. Half of the physicians use libraries' materials for carrying out research. However, 60.29% of the physicians are members of scientific societies, medical associations and specialised organisations, and regularly receive professional literature through these institutions. Critically, AbuOuf found that physicians face some difficulties in using the health sciences libraries, such as the conflict between the physicians' time and library opening hours. These libraries have not computerised their information, and there is a lack of information about other health libraries and information centres.

4.5.2 Aseel (1996)

Aseel, in her Master's degree dissertation, aimed to study the use of the MEDLINE bibliographic medical database on CD-ROM by the physicians of three hospitals in the City of Jeddah, Saudi Arabia. These hospitals are; King Fahd General Hospital, King AbdulAziz University Hospital and King Khalid Hospital for the National Guard. In addition, this research studied the MEDLINE bibliographic medical database on CD-ROM at the surveyed hospital libraries. The population studied comprised the physicians working in these three hospitals, as well the information professionals who are responsible for the health library management. Assel used survey, and the non random sampling method was chosen to determine the sample population. Questionnaires were used to gather data related to the research questions.

There were several findings: half of the physicians used the MEDLINE database. 39.9% of the total physicians use the MEDLINE database for preparing scientific

researches and reports. Aseel's research found a correlation between the use of the MEDLINE database on CD-ROM frequency and the physicians' academic degree. Importantly, all hospital libraries are lacking an adequate number of workstations. Each health library houses only one. These libraries publicised the service when it first started, but all of them do not provide training programmes to instruct the physicians on how to use the databases.

4.5.3 Al-Ogla (1998)

This article aims to investigate the hospital and medical libraries of the city of Riyadh, Saudi Arabia. It examines the status of 12 hospital libraries, their staff, and the academic qualifications of the head of the health hospital libraries. The study was based on mailed questionnaire. Al-Ogla claims that this study is the first of its kind in Saudi Arabia. In fact, little research has been done on health sciences libraries related to Saudi Arabia. Al-Ogla states that there were only three articles to be found before his research. Two of these articles were about the King Khalid Eye Hospital Library and focused on the library resources, collection development, technical services, and staff training (Southerland-Brown, 1986; Martin, 1988). The third was about co-operation among the six libraries of the Ministry of Defence and Aviation (MODA) and Inter-Library Loans (Brown and Blucker, 1988).

The study stresses the need to establish a library in each hospital, to develop greater international co-operation to improve library services, to shift the focus from ownership to access, and to hire professional librarians to improve information services for users. It was disclosed that there were four heads without university qualifications or library science training. The drawback of this study is that the author restricted his resource of data collection to only questionnaires.

Al-Ogla mentions that all health libraries provide services such as Current Awareness Service (CAS) and Selective Dissemination of Information (SDI), but he did not clarify in his study whether the results were based on a survey he had made, or other sources, which would invalidate his findings. This generalisation displays a lack of accuracy; in reality, some of the libraries he examined do not provide some or any of the services mentioned. He presents some valuable suggestions and recommendations for hospital libraries development. He recommends that hospitals authorise,

encourage and guide librarians to participate in seminars and workshops to improve understanding of library problems, and thereby reach solutions. It is very important that all medical libraries are headed by professionals in order to ensure the smooth and efficient operation of the library. International co-operation is strongly recommended to promote faster document delivery utilising new technologies.

4.5.4 Arif et al. (1998)

This study aims to investigate the current situation of co-operative inter-lending and resource sharing among medical libraries in the Kingdom of Saudi Arabia. Arif et al. cover the ILL services in the health libraries of Saudi Arabia comprehensively. The study discusses various methods for providing an ILL service, including direct inter-lending, lending through union catalogues, and centralised lending.

This study was conducted using case study methodology. In addition, it utilised documents, interviews, and personal conversations to provide more in-depth information. The study thoroughly focused its investigation on documents and requests for ILL for the year 1995. The researcher refers to many published references which were not reported by Al-Ogla (1998), even though these two papers were published in the same year.

The authors found that the form of bibliographic search and document delivery agreements was being concluded slowly between Saudi libraries and large providers of medical information outside the Kingdom. This study, which presents the need for co-operative inter-lending and resource sharing, is well recognised by almost all Saudi medical libraries, and can be seen in the growing number of Saudi medical libraries committing themselves to various resource sharing-plans. The authors recommend medical libraries in the Kingdom to take the initiative in establishing a joint, automated ILL request routing system, in order for them to satisfy the information needs of their users, and to prepare for the eventual implementation of electronic transmission of documents. It is essential for Saudi medical and other libraries to be involved in the new networking technologies. So, it is recommended strongly by the authors to join the Internet to create websites with full-text information covering specialised guides, directories, union lists of journal holdings, pointers to certain resources, and other services.

The authors agreed on the importance of the medical libraries in Saudi Arabia to work hard on improving the quality and quantity of their reading and research collections, especially journal subscriptions. They state that the last two decades have witnessed a significant increase in ILL services among Saudi libraries. Thus, a good portion of such activities has been pursued informally, and remains dependent on the whim, motivation, and goodwill of individual libraries and librarians.

4.5.5 AlShaya (2002)

Alshaya (2002), in a Ph.D. thesis, aims to investigate the use of information sources by Saudi physicians in four major government hospitals in Riyadh. The focus of the study is particularly on physicians' use of CD-ROM and the Internet. There were three main purposes of this study:

1. To examine the physicians' current use of CD-ROMs and the Internet for obtaining medical information,
2. To investigate physicians' expectations for CD-ROMs and the Internet as sources of medical information, and
3. To investigate physicians' attitude towards CD-ROMs and the Internet.

Quantitative data analysis techniques were used and were supported by qualitative methods. Furthermore, questionnaire and interview methods were used to collect empirical data, and these were supplemented by reference to several closely relevant published studies. The sample of librarians was drawn from those working in hospital libraries, and the sample of physicians studied was drawn from those working in four major government hospitals in Riyadh.

Alshaya found that physicians were quite traditionalist in their information-seeking pattern, considering books, journals, and libraries as their major providers of medical information. The level of physicians' use of electronic information sources was encouraging, but these sources were regarded mainly as gateways or guiding tools to locate needed information. However, Alshaya found several environmental factors that make quite large differences in the physicians' use of new technologies, such as availability and accessibility of electronic information services, status of physicians, and information searching skills and training. Alshaya recommends extending

physicians' access to electronic information sources, enhancing information education opportunities for physicians to learn to use IT and electronic information sources. He saw it as essential to develop and implement national policies and guidelines for the provision of electronic information services in hospitals in Saudi Arabia.

In brief, AlShaya study came at a critical time when information sources and communication technologies are witnessing rapid changes in their qualities and capabilities. Physicians and health professionals in Saudi Arabia and elsewhere are confronted with an increasing and challenging reliance on new electronic information sources and computerised communication methods for transmitting medical information.

4.6 Summary

The current study themes were derived from the literature review and summarised as follows:

4.6.1 Health Sciences Libraries

Health sciences libraries are a unique type of special library. They possess mainly health information resources with the function of organising and disseminating information adequately to users. Generally, health sciences libraries are designed and planned to contribute to the institutional development. Increasingly, these libraries have moved towards the concept of virtual or digital libraries which have been developed to provide online access. One of the principal benefits of the digital library is the ability to deliver information services to the user's desktop. Indeed, the shift from the physical entity to the virtual library created a new infrastructure and change in providing services. It is recommended that health sciences libraries should redefine fundamental assumptions about their roles and services, as well as revise management perceptions, and develop competitive strategies related to their services and environment as a whole.

4.6.2 Education and Training

Qualified health librarians combine the two skills of librarianship and knowledge of medicine to produce a very high level of service. However, they need to be trained to develop new skills. In particular, they need to become familiar with ICT and, when helping users, to make constructive use of it. On the other hand, health professionals

have limited IT skills, and have difficulties in finding time and confidence. ICT training provides opportunities to make effective, efficient and independent use of libraries and information resources. Therefore, the importance of education and training courses in ICT is apparent.

4.6.3 Information Services

The traditional nature of health sciences libraries has been based on the design and management of information services that meet the strategic information needs of its users, being individuals or organisations. In the present day, providing information services presents special challenges, including understanding needs, defining the library's role, and building communication within the community. The multi-disciplinary information services are considered to bring with them a climate of change for both those who manage and work in services today. The development of such new services needs to be carefully managed, developed and maintained to contribute to the strategic aims of the organisation.

4.6.4 Information and Communication Technology

The use of ICT in the development process for most countries is on the rise, and has a positive effect in bridging the information gap which enables new services and faster access to electronic resources. ICT makes it possible for libraries to make the transition from a traditional library facility in one location to a corporate information centre, and provide information products and services at the point of need. ICT visualised the universal conception and paradigm shift of library and information services. The shift from the physical entity to the virtual library has created a new infrastructure for health sciences libraries and changed how they function. In addition, the latest technology is known as the Internet. The universal adoption of the Internet has created the opportunity for firms and other organisations to establish a collaborative network.

4.6.5 Information Provision

The provision of information is a response to users' needs and librarians' expectations. Professionals expected the utilisation of ICT to facilitate international co-operation and provide access to vast amounts of information, facilitate information sharing and overcome problems of access. The rise of ICT implementation played the great role of improving the future outlook and development in various organisations. The

establishment of virtual and digital libraries (libraries without walls) facilitate the ability to deliver information services to the user's desktop, empowering the individual to gather, access, and assess information. Health professionals appreciate being able to access services at their convenience, at their desktop, without being restricted by the library's hours of operation. The clear vision is of the utilisation of ICT infrastructure for the future development of health sciences libraries and overcome problems and obstacles that prevent users from accessing the information they need.

4.6.6 Conclusion

In Saudi Arabia, the development process is slow in comparison to the economy and wealth of the country, and to the professional aspiration to development. Health sciences libraries have relatively small collections, the majority of staff members are non-professionals, the majority of libraries provide only basic information services, and co-operation among libraries is limited. In addition, health professionals face difficulties in using the health sciences libraries such as the conflict between the physicians' time and library opening hours. However, the level of health professionals' use of electronic information sources was encouraging. Related studies recommended development for health sciences libraries and health librarians in order to facilitate better information services for their users.

As reported in Chapter 3: Research Design, attempts were made to verify and build on the insights derived from the literature review by means of survey and interviews. Before presenting the outcome of the research investigation, respondents' characteristics will be described in the next chapter.

Chapter Five

Users and Staff

POSITION IN THE THESIS

Chapter 1 Introduction	Chapter 2 Background	Chapter 3 Research Design
Chapter 4 Literature Review	Chapter 5 Users and Staff	Chapter 6 Health S. Libraries
Chapter 7 Education and Training	Chapter 8 Information Services	Chapter 9 ICT
Chapter 10 Information Provision	Chapter 11 Change & Development	Chapter 12 SHIN Prototype
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Chapter Five

5

Users and Staff
Personal Characteristics

5.1 Introduction

The aim of this chapter is to give brief backgrounds of two focal elements of the health sciences libraries' environment, based on personal characteristics. The first is about the users of the health sciences libraries in Riyadh, based on responses given in the Personal Information section of the users' questionnaires; the second is to give a background of the staff members working in health sciences libraries in Riyadh based on a Staff Fact Sheet and some findings during observation and interviews. These backgrounds are important to draw an understanding of users of the libraries and the current setting of the staff members within those libraries in Riyadh.

5.2 Users

The users population was generated from 11 sites, which are governmental hospitals in Riyadh, the capital city of Saudi Arabia (see Chapter 3: Research Design – Sampling). 845 questionnaires were distributed and there were 493 usable returns. This gives a satisfactory overall response rate of 58.3%. The highest rates of responses to the users' questionnaires were from KFSH/RC (17.6%), SFH (14.2%), KKUH (13.0%), RAFH (12.0%), and KACM (11.0%).

Personal information was elicited on four main areas: gender, age, job description and academic qualification. Personal information gives statistical information about the nature of users of the health sciences libraries and services, which would not be available elsewhere. This information was necessary for investigating possible relationships between these characteristics and the use of the health sciences libraries and information services.

5.2.1 Gender

The results in Table 5-1 show that the number of male respondents to the questionnaires was 271 (55% of total), while there were 217 (44%) female respondents.

Table 5-1: Gender

Gender	Frequency	Percentage
Male	271	55.0
Female	217	44.0
No answer	5	1.0
Total	**493**	**100.0**

The responses relating to gender in this research showed that more responses were received from males than females. However, females showed a higher level of attendance and participation. The number of female respondents was more that of males in the following hospitals: KAUH/CD, KKESH, SCH and Yamamah. There is a great possibility that the environment of these hospitals has an impact on the frequency of respondents, since most of these hospitals are known to be female environments. Another factor is that the majority of nurses are female, and nurses are

the second largest group that responded to the users' questionnaires. Figure 5.1 shows that the majority of respondents were male physicians, followed by female nurses. Al-Zahrani (2001) found the opposite, i.e. that the highest responses were from female nurses, followed by male physicians.

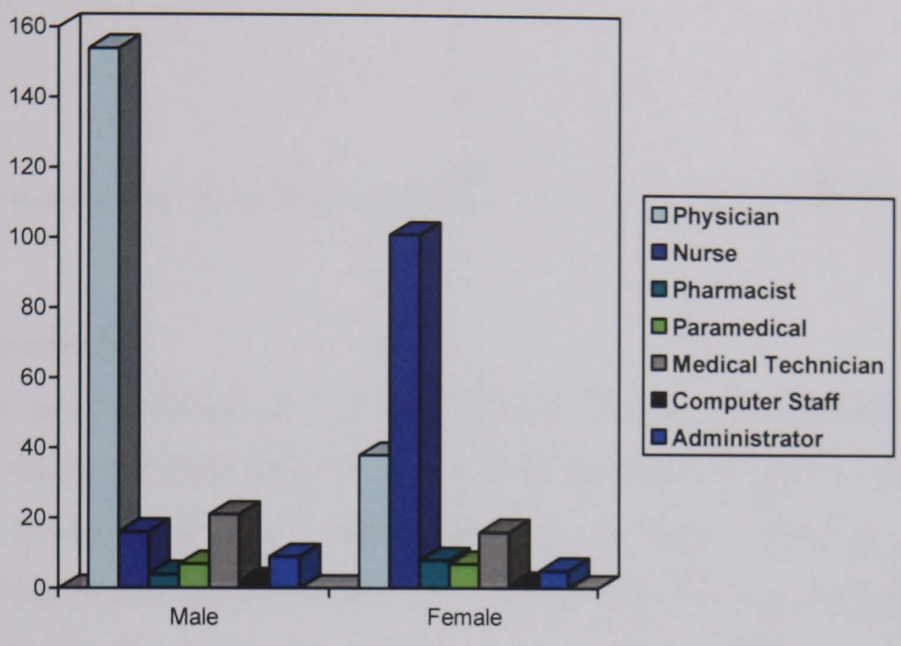


Figure 5.1: Respondent groups by Gender

These findings of the current study were consistent with those of AlShaya (2002) who found that there is a huge difference between responses from male (85%) and female physicians (15%). AlShaya noted that this reflected a predominance of male over female physicians in the healthcare environment in Saudi Arabia. The present research further supports AlShaya's findings of the predominance of female over male nurses in the healthcare environment in Riyadh hospitals.

5.2.2 Age

Respondents are divided into eight age groups, as shown in Table 5-2. The largest group of respondents were 30-34 years old, accounting for 21.1%, followed by 35-39 years old with 19.3%, and 25-29 years old with 16.2%. The highest concentration of responses from staff working in a healthcare environment was from those aged between 25 and 39.

Table 5-2: Age groups

Age	Frequency	Percentage
Under 20	3	0.6
20-24	43	8.7
25-29	80	16.2
30-34	104	21.1
35-39	95	19.3
40-44	66	13.4
45-49	53	10.8
50 or over	44	8.9
No answer	5	1.0
Total	**493**	**100.0**

5.2.3 Job Description

Seven groups were provided as job descriptions. The highest concentrations of responses to the users' questionnaires were from physicians (39.1%) and nurses (23.7%). The lowest group was computer staff (0.6%). More details are shown in Table 5-3. In fact, physicians and nurses have an influence over the responses, in that physicians and nurses form the majority of groups working in healthcare organisations and hospitals. A remarkable percentage of 17.8% is noted for *other*; many respondents choosing *other* indicated they were in fact students.

Table 5-3: Job description

Job description	Frequency	Percent
Physician	193	39.1
Nurse	117	23.7
Pharmacists	12	2.5
Paramedical personnel	15	3.0
Medical technician	37	7.5
Computer staff	3	0.6
Administrator	14	2.9
Other	88	17.8
No answer	14	2.9
Total	**493**	**100.0**

5.2.4 Academic Qualification

This has been divided into four groups, as shown in Table 5-4. The highest percentage is for respondents who hold a bachelor degree, with 44.4%, while the lowest is the PhD, with 6.7%, as detailed in Table 5-4.

Table 5-4: Academic qualification

Academic qualification	Frequency	Percentage
Medical degree (less than BD)	92	18.7
Bachelor degree	219	44.4
Master's degree	64	13.0
PhD	33	6.7
Other	70	14.2
No answer	15	3.0
Total	**493**	**100.0**

The majority of respondents to the questionnaires held a bachelor degree, followed by respondents holding a medical degree, master's degree, and PhD. The majority of nurses hold a bachelor degree. This tallies with logic and real life, i.e. that more bachelor degrees are obtained than master's degrees, and more people obtain master's degrees than PhDs. These results are consistent with those of Al-Zahrani (2001).

It can be concluded that the health professionals who responded to the users' questionnaire carry out various jobs; however, most of the respondents were male physicians and female nurses aged between 25 and 39. The male physicians were the largest group responding to the questionnaire compared with other groups, followed by female nurses. The majority of respondents held professional degrees: the highest percentage of users hold a bachelor degree and the lowest a PhD. It is worth noting that a very low response rate came from computer staff and administrators working in the government hospitals in Riyadh.

5.3 Staff in Health Sciences Libraries

In order to provide a wider picture of the health sciences libraries environment in the hospitals under investigation, library staff members in these hospitals were included as a sub-population of the study. There were at the time of investigation 37 people working in 11 health sciences libraries (see Chapter 3: Research Design – Sampling). The majority of library staff (health librarians/health information professionals) responded to the designed Staff Fact Sheet (N=28).

The Staff Fact Sheet aimed to collect personal information on six characteristics: gender, nationality, academic qualification, job description, professionalism, and

work experience. Personal characteristics give statistical information about staff members of health sciences libraries in Riyadh hospitals, which is not available elsewhere. This information is necessary for investigating possible relationships between these characteristics and issues related to staff members in health sciences libraries.

5.3.1 Gender

In this research, it was found that equal percentages of gender responded. As shown in Table 5-5, 14 male and 14 female out of a total staff number of 28 responded to the Staff Fact Sheet.

Table 5-5: Gender

Gender	Frequency	Percentage
Male	14	50.0
Female	14	50.0
Total	**28**	**100.0**

The staff members working in the IGH, KACM, SCH, and Yamamah health sciences libraries are females; however, there are no females working in the health sciences libraries of two hospitals, the KKUH and KKESH. It was observed that there are no differences between the number of males and females working in the health libraries. However, some female staff members were eager to learn, willing to provide more services to users, and hoped to improve and make some changes for the good of the library. For example, the chief librarians in Yamamah and IGH health sciences libraries were particularly interested in the current research, and noted their willingness to participate in future research and development.

5.3.2 Nationality

Table 5-6 shows that there were more Saudi staff members working in the health sciences libraries than those of non-Saudi nationality. This is based on responses to the Staff Fact Sheet.

Table 5-6: Nationality of Library staff

Nationality	Frequency	Percentage
Saudi	16	57.1
Non-Saudi	11	39.3
No answer	1	3.6
Total	**28**	**100.0**

In detail, from cross-tabulation (Figure 5.2), the staff members working in the health libraries of IGH and KACM were not of Saudi origin. In KAUH/CD and KKESH, half the staff members were not Saudis. In KFSH/RC and RAFH, there were more Saudi staff than non-Saudi staff. In SCH and Yamamah, all staff members were Saudis, two in the SCH health library, and one librarian in the Yamamah hospital.

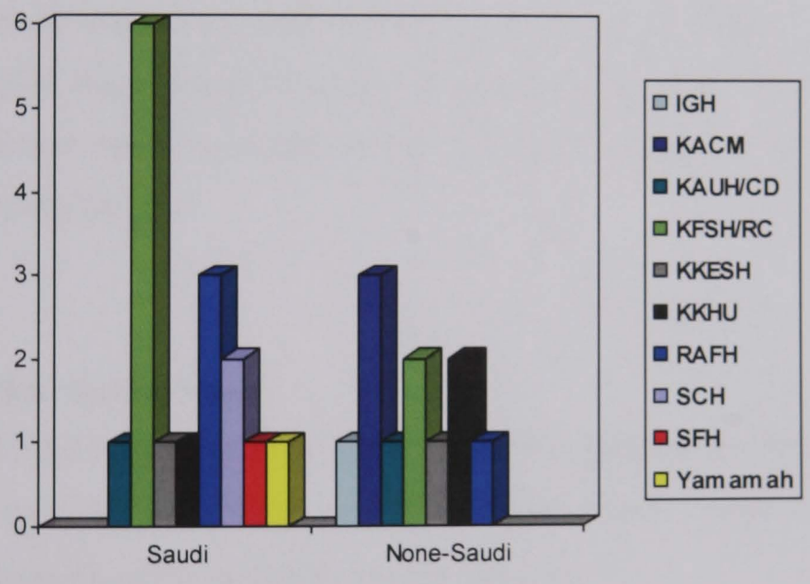


Figure 5.2: Nationality of Library staff in Riyadh Hospitals

The issue of nationality highlights the extent of the Saudi Government project which is called 'Saudisation'. This project is aimed to employ more Saudis and reduce the number of non-Saudi people in the public sector. In recent years, the nationality issue has become a serious matter, since many young Saudis have graduated with various specialities and are looking to be employed in the public sector. However, the number of unemployed Saudis is growing, as they fail to find positions while non-Saudis hold desired positions.

It has been observed that non-Saudi librarians greatly outnumber the Saudi librarians. However, only 11 non-Saudi staff participated in this research. In this context, some Saudi staff working in the health libraries highlighted the issue of Saudisation. They argued that it is incumbent upon governmental hospitals to hire Saudis, especially those who are qualified for such positions.

One Chief librarian emphasised his own view on this issue:

> *"I work for this library, I do the best of my ability to improve and avoid difficulties, I try to initiate and introduce things that might help in this regard even if this is not required, and I do not have to do so, while, with respect to my non-Saudi colleague, he is not doing anything extra!! He does what he has to do and things that he will be asked for!! Yes, I know... but if he was a Saudi he would do a better job, and I would work with him very closely to improve things, which is better than only me!!"*

5.3.3 Academic Qualification

The majority of staff members working in the health sciences libraries in Riyadh were not qualified, since they held less than a university degree. Table 5-7 shows more details of staff qualification categories and frequencies.

Table 5-7: Staff Qualification

Qualification	Frequency	Percentage
Below University degree	9	32.1
University degree	8	28.6
P/dip degree	4	14.3
Master's degree	6	21.4
PhD	1	3.6
Total	**28**	**100.0**

Al-Ogla (1998) and AlShaya (2002) suggested that the library should distribute employment between professionals, para-professionals and non-professionals. However, the findings of the current study do not support the previous research. In

fact, some chief librarians in health sciences libraries in Riyadh hold less than a university degree (i.e. KKUH, KAUH/CD), and other non-professionals hold positions as health library professionals (i.e. KACM, SCH).

The finding of Al-Ogla's (1998) study showed that there were four heads of health libraries without university qualifications or library science training. These results indicate that there is insufficient attention paid by authorities to human resource management and development. Some interviewees expressed aspirations to improve themselves through obtaining a higher degree in the field of health librarianship, or at least to be involved in continuing training in various subjects related to work.

One librarian expressed her wish, saying:

> *"I want to continue my education, I finished my bachelor degree in the field of library and information sciences, and now I want to study my master's degree in the field of medical librarianship, Not many have specialised in this field in the country, I want to be among the pioneers."*

However, some difficulties arise. One particular problem that interviewees indicated, and emphasised, is the lack of education and training policies and programmes (see Chapter 7: Education and training). There is a possibility that hospital management have contributed to the existence of unqualified health librarians.

One chief librarian said:

> *"In this environment, I can not achieve my plan of continuing my education, they do not offer me a suitable training programme and they do not make it easy for me to finish my bachelor degree. And if they do offer a suitable training programme, for sure the timing is never good for me. They want me to work all day and go to a training programme at night!! So, what left is for my wife and children?"*

5.3.4 Job Description

The majority of respondents were chief librarians (N=11); in fact, all chief librarians filled out the Staff Fact Sheets distributed. Table 5-8 shows the distribution according to the job positions.

Table 5-8: Job Description

Job Description	Frequency	Percentage
Chief Librarian	11	39.2
Clerks	1	3.6
Data enterer	4	14.3
Medical Librarian	5	17.9
No Specification	3	10.7
Total	**28**	**100.0**

A cross-tabulation is used for Job position, Table 5-8, and Nationality, Table 5-6. There was one non-Saudi working as a clerk in the health library of KKUH. Four Saudi staff were working as data-enterers in the KFSH/RC and SCH health libraries. There are four library assistants: three were Saudis working in the KFSH/RC and KKESH health libraries. Three out of five health librarian positions were held by non-Saudis in the KACM and KKUH health libraries. Only 45.4% of staff members who were of Saudi nationality were working in health libraries as chief librarians.

In another cross-tabulation for Staff Qualification, Tables 5-7, and Job position, Table 5-8, it was found that the highest percentage of staff members held less than a university degree (N=9): 2 chief librarians, 1 health librarian, 2 library assistants, and 4 data enterers. Eight staff members in health libraries had a university degree: 4 chief librarians, 1 health librarian, 1 library assistant, and 2 staff members who did not specify their positions. Four staff members had a diploma: 2 chief librarians, 1 library assistant, and 1 staff member who did not indicate his/her position. Six staff members working in the health libraries had a master's degree: 2 chief librarians, 3 health librarians, and 1 clerk. Only one chief librarian had a PhD, and he was a Canadian working in KFSH/RC.

It is strange to find a librarian who holds a master's degree in the LIS field and working as a clerk. He attributed this situation to poor management and poor attention paid to the human resources.

The Library clerk commented:

> *"I have lost the spirit of innovation and improvement. I am looking to retire within a few years. I cannot give to a place when they do not care about me from the beginning."*

5.3.5 Professionalism

The need for specialised employees in the health sciences libraries is recognised as just as important as in all other specialisms. In the health libraries in Riyadh, however, the case is sensitive, because almost half of the total staff members who responded were not professionals in the LIS field.

Table 5-9 shows details of staff professionalism. Only half of the health libraries' staff indicated that they were professionals in the LIS field.

Table 5-9: Professionalism

Professionalism	Frequency	Percentage
Library & information science	14	50.0
Other	13	46.4
No answer	1	3.6
Total	**28**	**100.0**

A cross-tabulation was made to view qualification degrees held by specialised staff in the LIS field related to their work organisation. It shows that 2 staff who had obtained less than a university degree were in KAUH/CD and RAFH health libraries, 1 with a diploma worked in Yamamah health library, 4 with university degrees worked in IGH, KACM, KKUH and SFH, and 6 with master's degrees worked in KACM, KFSH/RC, KKESH, KKUH and RAFH health libraries. Two of the six staff members with master's degrees worked in KKUH, and 1 who had obtained his PhD worked in the KFSH/RC health library.

However, three chief librarians and four library assistants were not LIS professionals. In fact, all staff members were 'health librarians' by work experience. Only one

member of staff noted that he had studied some courses in the field of health librarianship, and he is working in the KFSH/RC health sciences library.

5.3.6 Experience

As mentioned, most staff members working in the health sciences libraries did not hold qualifications in the field of health librarianship, but had acquired their profession through work experience. The largest concentrations of respondents (Figure 5.3) have 7 years or more of work experience in health sciences libraries.

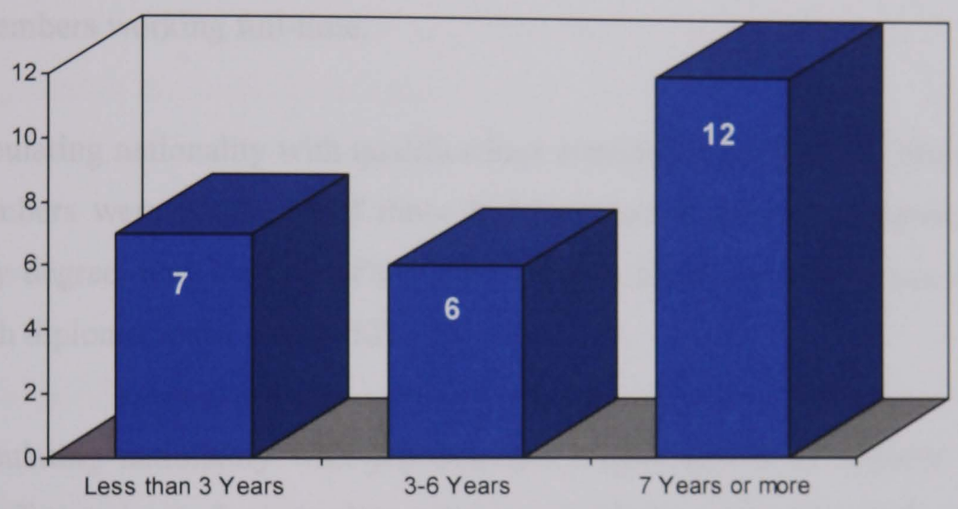


Figure 5.3: Staff work experience in health sciences libraries

A large number of staff members working in health sciences libraries had work experience of more than three years, but the majority had seven years or more.

Using some cross-tabulation revealed that most staff who have less than 3 years' experience working in the health sciences library were male (N=5), and there were only 2 female staff. Males and females had equal experience (more than 3 years) working in health sciences libraries. Three chief librarians had less than 3 years' experience working in health sciences libraries in KAUH/CD, SFH, and Yamamah. Three staff members out of seven (42.8%), considered to be LIS specialists, had less than 3 years' experience. Five chief librarians had more than 7 years' experience working in health sciences libraries in KFSH/RC, KKESH, RAFH, and SCH. This

includes the second chief librarian working in KAUH/CD health sciences libraries. Eight staff members out of twelve who had 7 years' experience working in health sciences libraries (66.6%) were considered to be LIS specialists.

As an overall evaluation of health sciences libraries staff, AlShaya (2002) and Al-Ogla (1998) suggested that KFSH/RC has the best human resources in terms of numbers and qualifications when compared with other health sciences libraries in Riyadh. In contrast to earlier findings, however, no evidence of KFSH/RC health sciences library having the best human resources was detected. A closer look at the findings of the current research showed that the KFSH/RC health sciences library has 9 staff members working full-time.

Cross-tabulating nationality with qualifications provided the following information: 6 staff members were Saudis; 4 of those had less than a university degree, 1 had a university degree, and 1 a master's degree. Two staff members were non-Saudis; 1 had a high diploma, and 1 had a PhD.

Cross-tabulating nationality with job description gave results as follows: of the 6 Saudi staff members, 3 were data enterers, 2 library assistants, and 1 a health librarian. Of the two non-Saudis, 1 was a chief librarian, and 1 a library assistant.

Cross-tabulating nationality with professionalism showed the following: of the 6 Saudi staff members, 5 were not specialised in the LIS field, and only 1 was. Of the 2 non-Saudis, 1 was specialised in the field on science, and 1 was not.

In addition, in 2004, the chief librarian had ended his contract with the library and it remained with no official chief librarian. One female Saudi was hired in the same year; however, she had only a high school certificate. Accordingly, the staffing status was inadequate in terms of job description, qualifications, and professionalism. This was confirmed by one member of staff who held a health librarian position, had more than 15 years' work experience in the health sciences libraries, and was the only Saudi member of staff who held a master's degree in the LIS field:

> *"... Possibly we here in KFSH'RC have the richest health sciences library in Riyadh and in the Kingdom. But unfortunately, I am lacking sufficient health information professionals working with me... This has caused fewer services to be provided... especially in critical information services such as Current Awareness and SDI... really I need more professionals for the survival of information services."*

Library and Information Science professionalism should be considered as a condition of employment in health libraries for specialist positions required for such information services, since librarians and information specialists are more expert and knowledgeable in the field. This is evident from the quality of services they provide when compared with non-specialist people working in the libraries.

The present research confirms what has been noted in the literature review that the LIS educational programmes in Saudi Arabia have little influence and impact upon real life work, and on improving and directing the condition of Saudi librarians and information specialists (see Chapter 7: Education and Training). In addition, there is a lack of Continuing Professional Development programmes that staff members are eager to join. If the issue of staff education and training is not considered by the Saudi Authorities, then no further improvement is likely. This poor state of affairs was observed, and many staff members complained and requested immediate improvement and development.

The chief librarian in Yamamah hospital had prepared a proposed plan for improving both her library conditions and her own continuing professional development. The plan received little attention from the hospital management, and no professional organisation was found to support this matter. Another female chief librarian (IGH) highlighted the possible improvements if a Continuous Professional Development programme were available within a convenient time schedule.

5.4 Summary

This chapter highlighted the background of two important groups in the health sciences libraries' environment: users (health professionals) and staff (health librarians).

The majority of health professionals are male physicians and female nurses. There is a clear predominance of male over female physicians, and of female over male nurses in the healthcare environment in Riyadh. The majority of health professionals are qualified and hold a bachelor degree in their field, and are aged between 25 and 39.

Health sciences libraries in Riyadh have an equal proportion of male and female staff. Non-Saudi staff working in the health sciences libraries outnumber Saudis. The majority of staff in general held less than a university degree. Only one member of staff could be considered as a qualified health librarian. Of the others, half held a qualification in the general LIS field, and the other half had another speciality, other than LIS. Most librarians acquired their professionalism through work experience. These findings suggest that the LIS educational programmes in Saudi Arabia have little influence and impact upon the real life process of health sciences libraries.

Following this profile of the two population groups investigated in this research, the context of their interaction, namely the health science library, is explored in the next chapter.

Chapter Six

Health Sciences Libraries

POSITION IN THE THESIS

Chapter 1 Introduction	**Chapter 2 Background**	**Chapter 3 Research Design**
Chapter 4 Literature Review	**Chapter 5 Users and Staff**	**Chapter 6 Health S. Libraries**
Chapter 7 Education and Training	**Chapter 8 Information Services**	**Chapter 9 ICT**
Chapter 10 Information Provision	**Chapter 11 Change & Development**	**Chapter 12 SHIN Prototype**
Chapter 13 Conclusions	**Bibliography**	**Appendices**

This chapter has answers to the following research questions:

- **What is the current condition and work environment of health sciences libraries in Riyadh?**
- **Do health professionals use health sciences libraries to meet their information needs?**
- **What problems affect health professionals in using health sciences libraries?**

Chapter Six

6

Health Sciences Libraries in Riyadh

Health library users generally are already occupied with full-time work elsewhere, for which they need the support of the library, be it with clinical, research or administrative problems. At the same time, it is very difficult to generalise and state that all users of health libraries need all services. However, librarians can be most helpful in encouraging users to use the library effectively. They can be even more helpful if they are aware of how important the time factor is for users in general, and potential users in particular. Whatever the level of library staff, it is desirable that they should be able to relate individual user needs to the library resources that are available and be competent in the use of all types of information resources.

The aim of this chapter is to highlight some important elements generated by the health sciences libraries profile (directory) which put particular emphasis on the current condition of health sciences libraries (see Appendix A). It also explores the work environment of the health sciences libraries from the library staff members' perspective. It is essential to emphasise the importance of health sciences libraries in Riyadh from the health professionals' perspective and use. This information is derived from the first section of the users' questionnaire entitled 'Health Sciences Library'. In addition, the results aim to help in giving a clear picture of the current settings of health sciences libraries in Riyadh. The results might also help when considering future plans, and libraries improvement and development of health sciences in Riyadh.

6.1 Health Sciences Libraries Profile

6.1.1 Library Profile

Library profile forms were distributed and filled in by chiefs of the health libraries in Riyadh (see Chapter 3: Research design). These profile forms provide information not available elsewhere, especially as there is a lack of accurate annual reports or publications.

The main fields of the health sciences libraries profiles were summarised and generated in a table format (Table 6-1). which clarifies some concepts, and draws a clearer picture of these health libraries' setting in Riyadh. Currently, there are 17 staff members who work in the health libraries as professional health librarians. On the other hand, there are 20 staff members who work as non-professionals. The numbers of professionals and non-professionals generally seem to be reasonable; however, the categories are not evenly distributed. For example, staff working in the KACM health libraries are all professionals, but those in the SCH health library are all non-professionals (see Chapter 5: Users and Staff).

Table 6-1: Health Sciences Libraries Profiles

Library	Staff	Readers	ILL policy	Data retrieval	A/Vs	No. of PCs	Internet	Website	E-Journals	CAS/SDI
KKUH	2 P 2 NP	Staff/Students	No	Dobis/Libis OPAC	Yes	14	Yes	KSU	150	No
KKESH	1 P 2 NP	Not specified	Yes	Manual	Slides	4	Yes	No	25	CAS(Req) SDI Yes
KACM	3 P	Open	Yes	Ultraplus	Yes	Not specified	Yes	-	50	No
IGH	1 P	Staff/Students	No	Manual	Yes	1	Yes	No	Yes	No
RAFH	4 P 4 NP	300 per day	Yes	Inmagic & OPAC	Yes	15	Yes	RAFH	-	No
KFSH&RC	2 P 7 NP	H Staff	Yes (personal)	Horizon	Yes	8	Yes	KFSH	Yes	No
SCH	2 NP	H Staff	No	Manual	No	1	Yes	No	No	No
KAUH	1 P	U&H Staff	No	Dobis/Libis	Yes	5	Yes	KSU	Yes	CAS Yes SDI(Req)
CD	1 NP	Open	Yes	Dobis/Libis	Yes	6	Yes	KSU	No	No
SFH	2 P 2 NP	H staff & Researchers	Yes	Manual	No	2	Yes	No	150	No
Yamamah	1 P	H staff	No	Manual	No	No	No	No	No	No
SCOT	1 NP (soon)	Open	No	Manual	Yes	No	No	SCOT	No	NO

Each health library serves and supports its users who are mainly employed by the parent body or hospital. In the case of Riyadh, theses libraries serve and support health professionals working in the parent hospitals, and in the case of the academic health libraries also serve the entire academic community, including faculty and students. A few health sciences libraries are open for external users, such as KACM and SCOT. However, other libraries would allow external users to use the library services only after a formal application has been approved.

The Inter Library Loan (ILL) is an indication of the extent of co-operation amongst libraries. Half of the health libraries in Riyadh have an ILL policy, while the others have no documented ILL policy. This study produced results which corroborate the findings of Arif et al. (1998) and confirm that, in the main, co-operation amongst health libraries in Saudi Arabia depends upon personal efforts and communication with others. This findings is further supported by the chief librarian in the KFSH/RC library. KFSH/RC is considered to be one of the pioneer health libraries in the Kingdom, as it has a policy for its ILL service, but still depends upon personal efforts and communication.

Half of the health sciences libraries in Riyadh use card cataloguing as a manual method to search and locate materials in the library. The other half use automated systems for data retrieval. Academic health libraries use the Dobis/Libis automated system. The KFSH/RC health sciences library recently switched its current automated system (GLAS) to the Horizon automated system. This clearly shows the digital gap amongst health libraries in Riyadh.

Most health sciences libraries in Riyadh (N=8) have audio-visual materials as part of their collections; a few have none (N=3). However, some librarians commented that these collections are neither updated nor accurately organised. The audio-visual collections in some libraries are moved to be under the authority and supervision of educational departments, as is the case with KFSH/RC.

Most health sciences libraries have personal computers and Internet connection (N=9), and a few have no personal computers and no Internet connections (N=2). for example, the Yamamah and SCOT health libraries.

Most health sciences libraries have no websites; a few have only a linked web page, as part of the parent body website. However, these web pages have no functionality concepts, they just give some information about the library, working hours, special announcements, etc. Some websites of parent bodies do not operate or function in full mode. This condition may be a major factor in delaying any programme of remote access that may be adopted in future.

Most health sciences libraries (N=8) subscribe to e-journals to be accessed by users. Although there is a high demand for such access, some health libraries (N=4) do not provide any service at all.

In relation to information services (Al-Ogla, 1998) confirmed that health sciences libraries in Riyadh provide information services based on current awareness and selective dissemination of information. However, the findings of the current study do not support that previous research. In fact, the majority do not provide any of these services to users, as was confirmed by chief librarians in the health sciences libraries in Riyadh. Only two libraries indicated that they provide information services: KKESH library provides SDI services and, upon request, it provides users with CAS, while the library located in the KAUH provides CAS and, upon request, it provides SDI.

In conclusion, a digital gap and information divide were noticed amongst health libraries in Riyadh. The lack of services provided is due to a lack of health information professionals. In most cases, libraries cannot afford to provide wider services since they would need more professionals in the speciality of health information services, and the number of existing professionals would clearly be unable to carry out such services for a long time. It is highly recommended that health libraries in Riyadh establish a strong co-operation programme, automate their library systems, and activate remote access to their information sources.

6.1.2 Health Sciences Libraries Environment

This part explores the work environment of the health sciences libraries from the library staff members' perspective. It gives an overview of health libraries in the healthcare environment, establishment, staff work life, satisfaction, and work relationships. The researcher was able to conduct informal conversation interviews with 22 health sciences library staff members. The time of interviews depended very much on the staff mood and time available (see Chapter 3: Research Design).

During the interviews, librarians generally expressed the same issues and concerns (see Chapter 3: Research Design–Interview). In addition, some library staff members listed the advantages of working in the health sciences libraries, while others mainly expressed the disadvantages, noted in sections 6.1.2.1 and 6.1.2.2.

Senior library staff (N=8) regarded the establishment of their health sciences libraries as due to a desire for organising existing materials and publications. The majority (N=11) noted that the main function of their libraries is to collect and organise materials. A few staff in the health libraries (N=4) noted the importance of their libraries to provide possible information services for health professionals. Some (N=6) indicated that individual efforts at the beginning had influenced the establishment of health libraries. Only two staff members indicated that their management had a realistic picture of what a library could or should do for them.

Demands and pressure might influence the establishment or revival of libraries. The majority of health library staff members were able to identify one or more specific pressures which had led to the establishment and revival of their libraries. The most frequently mentioned pressure was the increased demand and need for information resources. A few library staff members (N=4) indicated the desire to meet the kind of professional standards for health libraries derived from American professional standards.

AbuOuf (1995) mentioned the establishment of health libraries to accompany the establishment of modern hospitals. However, some librarians (N=6) indicated that, in a few cases, the library had been planned as a component of the establishment of hospitals. All library staff members obtained their jobs in their health libraries through

non-library-connected channels of communication. Hiring was mainly through personal contact or word of mouth, newspaper advertisements, and government employment offices. None of the staff was hired through library channels with library school contacts or the Saudi Library Association.

Most staff members (N=18, 8 male, 10 female) were satisfied with their work in the health sciences libraries. In fact, none of the female staff indicated any dissatisfaction regarding the principle of working in them. However, some staff, both male and female, explained that they were satisfied with the workplace as an environment, but not satisfied with the salary levels and promotion opportunities (e.g. training). For example, a health librarian noted his satisfaction with working in the health library, but complained only about the low salary, and one chief librarian indicated his passion for his work but disliked the inattention to training policy. Some library staff members (N=8) had been promised training and promotion, but had received no such training related to their work in the health libraries.

Staff aspired to continue working in the health library, although some difficulties were encountered. The majority (N=21) wanted to continue professionally in the health libraries. Only one person indicated that he was not planning to continue working in the health library and would like to find another job, more closely related to his interests and profession. Most of the staff members were looking to improve themselves by obtaining higher positions and more qualifications/degrees.

Fortunately, all staff had a good relationship with their colleagues. Moreover, most enjoyed a good relationship with their bosses, except for two in KFSH/RC and two in RAFH who expressed the view that they did not. The chief librarian in RAFH noted that he believed that he was friendly with other staff members, but could not give a judgement about other staff in the library sharing the feeling. It is important to note that, at the end of the researcher's field trip, KFSH/RC had appointed a new chief librarian, and staff members hoped to experience a good relationship with him .

In contrast to the overall friendly environment, a very high number (N=20) of the total staff did not receive what was stated in their job contract. This situation was related mostly to salary, training facilities, and official position. The serious condition

regarding the 'official positioning' is that the researcher noticed that some staff jobs were different from the official and designated positions. For example, a health librarian in the KKUH mentioned that he came to work in the health library as training programme director but in reality he performed most of the library activities and services, and was not allowed to practise his speciality. In another case, a chief librarian came to the hospital with a contract to work as a nurse.

It is important that health library staff are assertive and able to promote the library effectively. Staff recognised that factors which depended on their initiative, such as learning about the health environment and its information needs, developing information services, and communicating with management and users, were highly important matters. Moreover, all library staff indicated they were attempting to use their initiative in this way. However, some chief librarians (N=5) indicated a lack and poor condition of information services. They referred to two factors: 1) the lack of professionals in the field of health information who are fluent with medical terminology, and 2) the number of health library staff is not commensurate with the number of health professionals working in the parent hospital.

As in any work environment, there will be advantages and disadvantages. The following comments indicate those of the health sciences libraries in Riyadh highlighted by members of their staff.

6.1.2.1 Work Advantages

Health sciences library staff members commented on some of the advantages they found in their work. These advantages relate to their experience, knowledge, and working environment. One library staff member highlighted the quality of work and users in health sciences libraries:

> *"I find the quality of work in the medical libraries one of the great advantages, and the quality of users we deal with."*

A chief librarian mentioned the advantage of working in the health sciences library as he gained more knowledge and experience:

> *"I gain more experience and knowledge out of my work in the medical libraries."*

Another chief librarian showed his agreement with both of the above respondents when he commented:

> *"I received more knowledge and experience about the special libraries and in particular the medical library. It's very important to mention the type of professionals and researchers that we meet every day!"*

One librarian described the working environment as being the reason for his satisfaction with working in the health library:

> *"I like working in this medical library because of the team-work spirit, which I could not find elsewhere."*

These comments, as well as other similar ones, indicate that staff members working in health sciences libraries in Riyadh are very attached to their work. The majority of them mentioned that they would like to continue working in their health sciences libraries for various reasons. Indeed, they considered knowledge, experience, quality of users, and working environment to play an essential role in recruiting librarians. However, there are some disadvantages that need to be considered and addressed for the benefit of our health librarians and the entire profession in Riyadh.

6.1.2.2 Work Disadvantages

Health librarians provided some verbal comments which highlighted the disadvantages and problems which exist in health sciences libraries. These suggest a desire to develop their working process and environment.

As mentioned earlier, health sciences libraries are in need of more information resources. Accordingly, health professionals are calling for more updated resources. One chief librarian saw this as a problem of timescale:

> *"The materials ordered take too long to arrive."*

Another chief librarian highlighted the complaints that health sciences libraries lack sufficient professional staffing and are unsuitably located:

"There is a shortage in the number of qualified staff. The place located for the library is not suitable as well, as it is very small"

This problem, as mentioned earlier, may create a barrier for health professionals to visit and consult their health sciences library regularly. In addition, another chief librarian confirmed the existence of such problems:

"My library is suffering from the small space, poor collections, shortage of PCs, and a lack of the Internet service."

Health librarians were generally satisfied with the progress of teamwork in their libraries; however, this was not considered good enough for an ideal environment. One assistant librarian commented on her right as an individual working to develop herself:

"The 'working time' is very long. I do not receive what I deserve, such as upgrading work level or salary."

One library assistant brought up the issue of the relationship with her boss, which, along with the related question of communication between staff members and the person in charge, is a critical point for the success of such organisations:

"I personally complain about the restrictions that have been made by the chief librarian who causes low productivity from my side; he is the type of boss who does not show me any appreciation of what I accomplish. It's very important to have a good relationship with my boss but not to disagree over the principles of work ethics."

Although these comments reflect serious problems, health librarians are seen to be willing to continue working in health libraries. Importantly, they are looking for immediate change and development initiated by authority. One health librarian declared himself dissatisfied with the current condition of his health sciences library:

"I am not happy with the low progress of the development of my library generally, and for the medical library collection in particular. As well, I am not satisfied with poor attention given to improving the library both technically and technologically."

Thus, hospital managements may be aware of the need for change and development, but they are not likely to have a realistic understanding of how a health library should function. Since health sciences libraries lack health information professionals, the establishment and revival of libraries has become a process of trial and error for both the hospitals they serve and the health professionals. The message that needs to be communicated should focus on the improvement of management perceptions of the role and status of health libraries and their librarians, as they are the health information professionals.

6.2 Health Professionals' Use of Health Sciences Libraries

This topic explores the importance of the health sciences libraries in the life of health professionals in the healthcare environment. Through several questions it covers several topics: seeking information, purposes of visiting the health sciences libraries, communication with the health sciences library, frequency of library visit, and the type of difficulties that prevent users from visiting health sciences libraries on a regular basis.

6.2.1 Seeking Information

Table 6-2 shows the seven sources the user can refer to in order to gain a specific piece of information. The most used was the health library (45%) as the first choice for users to get the information they needed, followed by private online search (25.8%). The least used was specialist meetings (0.8%).

Table 6-2: Seeking information

Source	Frequency	Percentage
Health Sciences library	222	45.0
Specialist meeting	4	0.8
Own collection	55	11.2
Online search	127	25.8
Department collection	30	6.1
Colleagues	33	6.7
Other	20	4.0
No answer	2	0.4
Total	**493**	**100.0**

Although some respondents indicated that they referred to the Internet, as it is a faster and easier way of getting information, this priority given to the health sciences libraries indicates their importance and impact on the health professionals' practice. This is in agreement with previous research findings which have demonstrated conclusively that use of appropriate information sources from libraries significantly influenced health professionals, particularly physicians, in their practice of medicine, and has resulted in better patient outcomes and fewer medical errors (Peterson and Harris, 2002; Ali, 2000; Marshall, 1992). The health sciences library information services can have an impact on the way knowledge is put into practice (O'Connor, 2002).

Graham (1990) found that the department's collection has a priority in some hospital departments in the UK. The results in the current research show that the health library is of great value to users in the field of medicine, while a department's own collection is regarded as less important than that of the health library, online search, and users' own collections. Some respondents noted, regarding the use of technology in Saudi Arabia, that health professionals in hospitals are becoming motivated and inspired by online search facilitated through the health libraries or through private connectivity and access.

In addition, a department's collection and the health libraries of hospitals in Riyadh are sustained officially by the same administration and policy, which focuses mostly on the health library rather than the department's collection. This leads the departmental collections in Riyadh hospitals to be of little value. Through observation, some hospital departments' collections contained some old resources which had probably been deposited and provided by senior doctors and other department members, and were no longer of relevance.

Looking at respondents' views according to hospitals, it is clear that the highest number of respondents would consult and visit the health library for their information needs, excluding SCOT and KFSH/RC. Table 6-3 illustrates that in both those bodies, respondents referred to online searches as their number one priority for seeking information. The KFSH/RC hospital made the Internet and other information sources accessible from all departments and most offices, whilst SCOT health care centre

provided Internet access to its health professionals in all of their offices. Moreover, SCOT health science library had no designated health librarian who could help in providing library services and promote more visits to the library.

Table 6-3: Seeking information for SCOT and KFSH/RC

Source	SCOT	KFSH/RC
Health Sciences library	0	22
Specialist meeting	0	1
Own collection	1	9
Online search	4	43
Department collection	0	4
Colleagues	2	1
Other	0	7
No answer	0	0
Total	**7**	**87**

It is worth mentioning that the greater number of respondents using the health libraries in KAUH/CD, SCH, and Yamamah were female. This reflects the nature and environmental conditions in these hospitals. For example, in KAUH/CD, there is a complete building for and run by female staff for particular specialities. Yamamah hospital is known as the hospital of 'Obstetrics, Gynaecology and Women's Health', where the number of female staff would be likely to be higher than male. Similarly, SCH is a children's hospital; therefore, the same explanation given for Yamamah applies.

6.2.2 Purpose of visit

Table 6-4 lists purposes of visiting the health library. Visiting for reading material was cited by 39.6% of the respondents, followed by borrowing material (25.1%). Photocopying was the least cited purpose (11.2%).

Table 6-4: Purpose of visit

Visit for	Frequency	Percentage
Borrowing	124	25.1
Photocopying	55	11.2
Reading	195	39.6
Literature search	88	17.8
Other	26	5.3
No answer	5	1.0
Total	**493**	**100.0**

In relation to individual health sciences libraries, located in IGH, KAUH/CD, KKESH, SCH, SCOT, KKUH and SFH, these were mostly visited by users for the purpose of reading materials. Borrowing, however, was practised by more respondents in the health libraries of KACM, KFSH/RC and Yamamah. In RAFH, the main purpose of visits was to carry out a literature search, while the respondents visited the library to read materials slightly less. Female respondents in the KAUH/CD, SCH, Yamamah and KKESH used the health libraries in general and for reading materials more than males.

KAUH/CD and SCH have places for reading, which is more convenient for female users to be able to use the health libraries for reading. In contrast, KKESH library has a lack of space, which makes it an unsuitable environment for female users to meet their reading needs. As a result, female users in KKESH would rather use the health library for carrying out literature searches and for borrowing materials. Many female respondents in the KKESH demanded that the health library should provide a proper designated reading area for them. The structure of the female society in Saudi Arabia keeps women separate from men, except in a few working environments if that is necessary. Female hospital staff are major users of the health libraries, and their requests should be considered.

The functions of reading, borrowing and literature search are shown as the main reasons to visit and use any library, since these are a major part of its services. This places a serious demand upon health libraries to consider avoiding difficulties which prevent some users from visiting the library (see section 6.2.5). One of the main difficulties has been identified as the opening hours, since most current reading, borrowing and literature search functions can obviously only be accomplished while the library is open.

6.2.3 Communication with Library

Table 6.5 shows how users communicate with the health library to make use of its services. The most frequent method of communication was personal visit by users themselves (92.2%). Other means of communications were rarely used.

Table 6-5: Communication with library

Communication	Frequency	Percentage
Go myself	455	92.2
Telephone	9	1.8
E-mail	11	2.2
Third party	6	1.2
Other	6	1.2
No answer	6	1.2
Total	**493**	**100.0**

To investigate whether job description is related with the way respondents communicate with the health library, the chi-square statistic was used. Categories in this section were reduced for the purposes of cross-tabulations telephones, e-mail, and third party, were all grouped together to form *other*. The result indicates that there was no significant association between job description and the method of communication with the health library ($\chi^2 = 1.19$, df = 2, N = 493, p < .552).
However, the existence of various means of communication and technologies, such as the telephone, e-mail, etc., enables the health library and its services to be consulted and utilised. Despite the fact that the health work environment is known to have overwhelming agendas, the majority of users went to the library by themselves rather than utilising other means of communication. Respondents' preference to communicate with the health library personally can be explained by users' need to borrow, read materials and use other services, which required them to go to the library in person.

On the other hand, some users had difficulty in communicating with libraries through other means. For example, one library user commented that health librarians do not show a willingness to provide services when they are contacted by telephone.

6.2.4 Library Visit Frequency

Table 6-6 highlights how often users go to the health library. Visiting the library once a month was the median, with more than 22% of respondents reporting paying a visit to their health library once a month. The response 'once a week' was given by 24.9% of respondents, making this the most frequent response. Daily visits were made by 12.4% and, 'rarely/never' by 16.2%.

Table 6-6: Library visit frequency

Frequencies	Frequency	Percentage
Daily	61	12.4
Once a week	123	24.9
Once a month	111	22.5
Once every 3 months	74	15.0
Rarely/never	80	16.2
Other	41	8.3
No answer	3	0.6
Total	**493**	**100.0**

In a cumulative percentage, over half the total percentage (59.8%) of health sciences library users contacted the library at least once a month, once a week, and on a daily basis. On the other hand, a notable percentage (16.2%) of respondents expressed that they visited or consulted the health library only on rare occasions, or never (16.2%). Respondents who cited 'Other' were 8.3%, and indicated that their visits were according to their needs.

The percentage of those who rarely or never visited the health library can be considered high when compared with Graham (1990) who found only 3.6% of his sample to be non-users of the health library. Observation and some comments provided by respondents indicated that there were some difficulties that prevented some health professionals from consulting their health library, among them their overwhelming work load and health libraries' opening times (see Section 6.2.5 Difficulty in visiting the library).

It is important to view which libraries were visited more than others. Cross-tabulating the visits variables (daily, once a week, once a month, once in three months, and rarely) with the names of hospitals resulted in the following descriptions, explained in Figure 6.1.

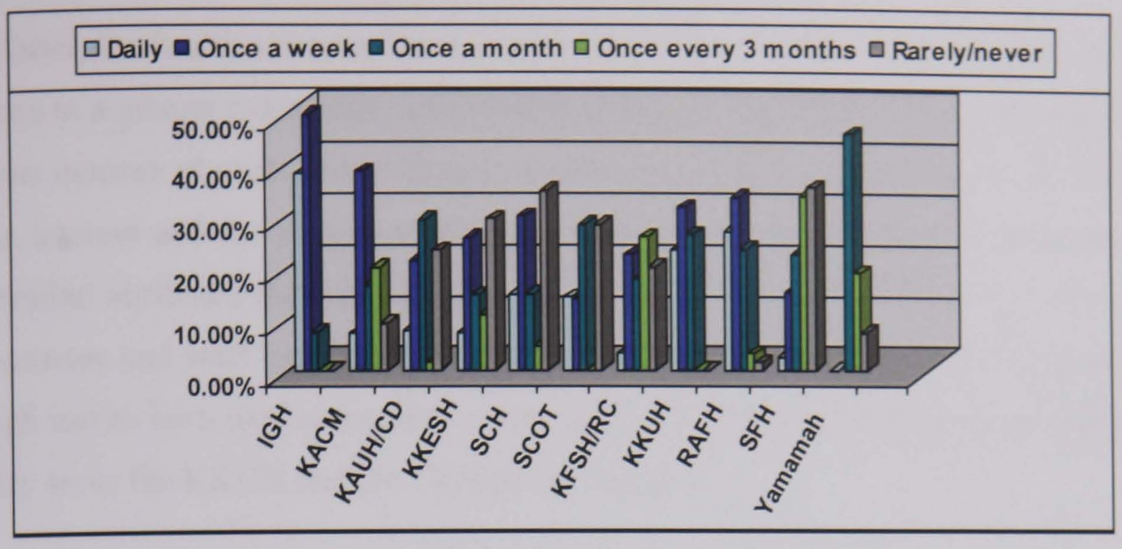


Figure 6.1: Library visits breakdown according to hospitals

Daily: The highest percentages of respondents who visited the health library daily were in IGH (38.4%), RAFH (27.1%), and KKUH (23.4%); none of the respondents in Yamamah hospital made their visits to the health library on a daily basis; and only 2.8% of respondents visited the health library in SFH on a daily basis.

Once a week: The highest percentage of respondents visiting weekly were in IGH (50%), KACM (38.8%) and RAFH (33.8%) indicated that they visit the health library once a week; only 1.4% of respondents in the SFH visited the library once a week.

Once a month: The highest percentages of responses visiting monthly were in KAUH/CD (29.4%), and SCOT (28.5%); only 7.6% of respondents in IGH visited the library once a month.

Once every 3 months: The highest percentage of responses in SFH (34.2%), KKUH (26.1%), and KACM (20.3%) indicated that they visited the health library once every three months; no respondents in IGH and SCOT indicated they visited the library once every three months.

Rarely/never: The highest percentage of respondents in SFH (35.7%), SCH (35%), and KKESH (29.6%) showed that they visited the health libraries on rare occasions or never; none of respondents in IGH and KKUH visited the health library rarely or never.

In brief, the health sciences libraries in IGH, RAFH and KKUH were used on a daily basis to a greater extent than other health libraries. The IGH chief librarian reported a great number of visits to her library, as it is one of the appointed places for accessing the Internet and the provision of medical resources. In the case of RAFH, the chief librarian attributed the high level of use of the facility to the richness of the medical resources and staff helpfulness. Similarly, the chief librarian of KKUH ascribed the high use to both the information resources and to the surrounding community, since they serve the KKUH and the College of Medicine.

In addition, in a cumulative percentage, almost one third of the total respondents noted that they managed to visit and contact the health library only once every three months, rarely, or never. This might be explained by Schacher (2001), Matthews and Picken (1979), Graham (1990) and other writers, as the majority of health professionals lead overloaded lives, which means they are physically unable to go to the library or, if they do, it is only for relatively short periods. Moreover, in this study, many respondents indicated their work load was a major obstacle to visiting the library regularly and on a daily basis as needed. This observation can be added to the findings regarding the difficulties that might prevent users from visiting or contacting the health libraries, which might also conflict with the health libraries' opening hours. So, any system that could speed up their use of the health library and information resources would be advantageous.

6.2.5 Difficulty in Visiting Library

This section explores the difficulties which might face users and prevent them from greater use of their health library on a regular basis, covered by two questions in the questionnaire.

Table 6-7 shows that 52.1% of users did not face difficulties in accessing the health library, whereas 45.0% users did face some difficulties which constrained them from gaining access.

Table 6-7: Facing difficulties

Difficulties	Frequency	Percentage
Yes	222	45.0
No	257	52.2
No answer	14	2.8
Total	**493**	**100.0**

It is a serious matter that 45.0% of the total respondents revealed that they faced difficulties which prevented them from going to and consulting the health library on a regular basis. Inevitably, there will be some difficulties which, are of varying importance, but this high percentage gives a negative impression regarding the health libraries in Riyadh and their effort to reduce the difficulties.

Respondents who indicated that they experienced difficulties in visiting and using the libraries on a regular basis in the KACM, KKUH, SFH and Yamamah were higher in number than those who claimed that there were no difficulties. In the other hospitals, the opposite was the case.

Table 6-8 shows that 22.0% of respondents referred to the 'opening hours' as giving the greatest difficulty, whilst 18.9% referred to the library's collection, as it did not fulfil their needs i.e. 'There are not enough resources'. The location of the library in the hospital was cited as a difficulty by more than 16.7%. However, 24.3% indicated that they face 'Other' difficulties, such as their workload in the hospital.

Table 6-8: Type of difficulty

Difficulty type	Frequency	Percent
Do not understand the system	17	7.7
I do not know how to get info. Myself	13	5.9
The location of the library	37	16.7
Opening hours	49	22.0
There are not enough resources	42	18.9
Other	54	24.3
No answer	10	4.5
Total	**222**	**100.0**

Respondents in this research mentioned that their workload was high and they could not contact the health library on a regular basis during current opening hours. In fact, they suggested that libraries should expand their working hours on working days,

weekends and holidays. These opening time problems prevented users from using the health libraries on a daily basis, as is also explained in (Section 6.2.4).

Graham's research (1990) derived similar results, and also identified difficulties in relation to opening hours, the required books were not held, and the respondents did not understand the system. Health professionals in such hospitals as IGH, KACM, KAUH/CD, SCH and Yamamah expressed a view that the difficulty was more to do with the health libraries' collections as "there are not enough resources". Some users commented that the libraries had poor collections in specific areas.

In relation to individual hospitals, respondents from KACM, KKUH and Yamamah, mainly indicated that the health libraries did not have the resources they needed, while in the case of SFH, SCOT, KFSH/RC, a high number of respondents claimed that the actual location of the library was the major difficulty. Some respondents in various hospitals mentioned other reasons, such as the users' limited computer skills.

The researcher has found that the main difficulties encountered by the health library users focused on the library opening hours, library resources and collections, library location, and the systems used. It is possible that these problems play a role in preventing non-users of the health library amongst the hospital staff from using the library or cause its usage to be infrequent. One suggestion from various library users, and non-users, shows the need for the health library to offer its services 24 hours a day to respond to important needs and to be available for consultation in the healthcare environment. This would increase the possibility of using the information sources and reduce the effect of heavy workloads preventing health professionals from using the health sciences libraries.

6.3 Summary

The health sciences libraries in Riyadh were established and revived based on increasing demands, pressures, and a need for information sources. These libraries lack health information professionals who are able to deliver effective and accurate health information services. Hospital management staff are not likely to have a realistic understanding of how a health library should function.

Results of this research shows that the health library is of great value to users in the field of medicine. However, these libraries are greatly in need of a revision of their policies and strategic plans in order to advance their development, more precisely, to reduce factors which prevent users from using the libraries, and to improve the quality of staff professionalism and health information services.

Many comments were received from users and library staff members about how to improve the health libraries setting. This is highlighted in the following points:

- Adopt practical views and planning to form a unique environmental setting for the present and the future of health sciences libraries.
- Examine the management perceptions of libraries, and develop competitive strategies.
- Improve the competency of staff members through a continuous training facility (Continuous Professional Development).
- Establish a higher criterion for staff hiring, ensuring the number of staff equates to the required work tasks.
- Increase the accessibility of libraries for users, in particular the opening hours.
- Relocate health libraries to be in a more suitable location for most of their users, and expand the space of such libraries to cover a greater number of needed functions (e.g. reading, searching, and photocopying).

Although this chapter raised some issues related to physical constraints, shortage of staff was another consideration. Moreover, the success of health science libraries in meeting users' needs will depend to a great extent on the calibre and professionalism of the staff available. For these reasons, the education and training of library staff is the focus of the next chapter.

Chapter Seven

Education and Training

POSITION IN THE THESIS

Chapter 1 Introduction	**Chapter 2 Background**	**Chapter 3 Research Design**
Chapter 4 Literature Review	**Chapter 5 Users and Staff**	**Chapter 6 Health S. Libraries**
Chapter 7 Education and Training	**Chapter 8 Information Services**	**Chapter 9 ICT**
Chapter 10 Information Provision	**Chapter 11 Change & Development**	**Chapter 12 SHIN Prototype**
Chapter 13 Conclusions	**Bibliography**	**Appendices**

This chapter has answers to the following research questions:

- **Do health librarians receive a satisfactory educational programme related to their specialism?**
- **Do health professionals receive a satisfactory educational programme related to their needs of ICT skills?**

Chapter Seven

7

Education and Training

This chapter deals with issues relating to education and training of health library staff (health information professionals) and the users of health sciences libraries (health professionals). Education and training is needed for health information professionals in order for them to be able to provide effective and efficient information services to health sciences libraries users. Education and training specifically related to ICT is of great importance for health professionals. However, health professionals may not have received enough ICT related courses during their formal education, although the need is acknowledged.

This chapter is divided into two parts:

The first part is about health library staff, and their education and experience, which looks at library staff needs for educational programmes and explores their computer and Internet skills. The literature review of this study (Chapter 4) highlighted the important need for educational programmes that help in developing professional librarians and information specialists. The need for training programmes is increased for the profession of health librarianship, since only a few programmes exist around the world which cover the needs of health sciences libraries.

The second part of this chapter is about the health professionals and ICT literacy. It explores the health professionals' literacy in computer and electronic source usage: how they learned to use electronic sources, for how long they received computer training if applicable, from where they gained advice in case of computer problems, and finally, the level of satisfaction of health professionals related to the IT education and training services they had received.

7.1 Health library staff

The need for specialised staff in the health sciences libraries, as in other specialisms, is recognised. In the Riyadh health libraries, the matter is a sensitive one (see Chapter 5: Staff and Users), since almost half the total staff are not professionals in the LIS field. In fact, all staff members were found to be 'health librarians' by work experience, and had not been involved in any formal education and training related to health librarianship. Only one member of staff noted that he had studied some courses in the field of health librarianship as part of his master's degree from the USA. The majority of staff members working in the health sciences libraries in Riyadh are not qualified academically, since most of them hold less than a university degree.

Some librarians expressed their appreciation of training programmes that they had attended, as they increased the exchange of experiences amongst health librarians in Riyadh. A chief librarian noted that she had attended a training course in KFSH/RC library, and that this had led to types of co-operation between her library and KFSH/RC. However, the majority of librarians interviewed in this study highlighted

some important topics of concern to them, such as the need for professional education and training courses certified by accredited educational organisations in the country.

They expressed their need for skills development and to keep-up-to date with the profession. Some librarians referred to their poor experience using personal computers, and the Internet in particular, and with the use of search engines. In fact, all health libraries' staff interviewed expressed the importance and need for training programmes.

Most interviewed staff members (N=19) mentioned their need to receive periodic training or short courses related to their field of work. Several staff members (N=8) expressed their initiative and aspiration to improve themselves through obtaining a higher degree in the field of health librarianship, or at least to be involved in a programme of training, tackling various work-related subjects.

A librarian in RAFH expressed her wish, saying:

> *"I want to continue my education. I finished my bachelor degree in the field of library and information sciences, and now I want to study my master's degree in the field of medical librarianship. Not many are specialised in this field in the country. I want to be among the pioneers."*

Some staff members (N=7) mentioned that they always sought help from the computer department regarding computer problems, since they located the required skills. This might suggest a connection to the finding that some health professionals prefer to consult hospital computer staff in case of computer problems, even when they are in the health sciences library (see section 7.2.3).

A health librarian commented:

> *"To be honest... I seek help from the computer service department in the hospital when I need to... For a long time now, I have requested a training programme to learn more about the computer and Internet but the case remains the same... I believe my time of*

retirement will be reached and I will still be waiting for this course of training!! Do not laugh please!!"

Some staff members wanted to improve themselves and suggested a training strategy which includes more than one type of learning, since they faced some difficulties with one process of learning. One of these problems that interviewees indicated and emphasised was the lack of education and training policies to regulate this matter, facilitate the training, and assure its suitability and diversity. A lack of policies makes the issue more complicated, and it might contribute in creating conflicts between library staff members and hospital managements.

A chief librarian said:

"In this environment, I cannot achieve my plan of continuing my education. They do not offer me a suitable training programme and they do not make it easy for me to finish my bachelor degree. And if they do offer a training programme, for sure the time of this one is never going to be good for me. They want me to work all day and to go to a training programme at night!! So, what time is left for my wife and children?"

A chief librarian said:

"It's a frustrating and annoying situation. Training courses offered by the hospital authority are outside working hours. I wish they would eliminate this sadness and establish flexible, suitable training policies and programmes."

A librarian in KKUH health sciences library indicated a similar situation. He drew attention to his learning process and emphasised that he had started losing the desire to make any effort to continue his higher education or further learning. He explained that the main obstacle which prevented him from continuing to attend training programmes was his social responsibilities, as well as the timing and the style of training, which were not convenient for him. A few health librarians found that there was not enough time during the working day to complete the training, and therefore

they had to give up personal time, which affected their social life in one way or another. A female chief librarian highlighted possible improvements if a Continuous Professional Development programme were available in a convenient time schedule. Overall, then, it can be concluded that health librarians in Riyadh hospitals suggest a need for more education and training programmes, at convenient times, and including aspects attractive to all learning styles, so that individuals can find at least one way of learning they enjoy, rather than following one approach exclusively directed to one learning style.

On the subject of computer and Internet skills, several library staff (N=7) were proud of this experience in using computers and searching the Internet. However, the majority (N=12) expressed a need to develop their skills in those areas. In particular, the two staff members in the SCH health sciences library mentioned that they did not have experience in using PCs and the Internet. In general, most health librarians indicated that this need of improved skills is related to the issues for improving their library services and helping users in their search. Since information services nowadays rely heavily on using information technologies, this has an influence on the quality of service provided.

In this matter, a librarian noted:

> *"I have very little experience in using computers and the Internet... and none of my colleagues in the library is able to help me or to help any users on computer issues, even for small things."*

A chief librarian stated:

> *"You would not believe it... I tried to avoid users' enquiries regarding the Internet because I possess very little experience on search engines and other application in the Internet."*

Unfortunately, a health librarian in RAFH expressed her pessimism regarding the prospect for any further development to the health sciences human resources. She said:

> *"Indeed I love working in this place. But since I have worked here I have received no training. So, where is the claim that hospital management are so keen on the Human Resources!!"*

As an important issue, health librarians constantly worry about the overall condition of their health sciences libraries. Some expressed the issue in terms of a gap between them and hospital management. In particular, they noted that hospital management were not aware of training issues. They suggested a closer monitoring process for their cases in order for their voices to be heard with no side effects. Health librarians' comments suggested that the current condition of poor training and human resources development was attributed to hospital management, and to some extent to the lack of an organisation that they would rely upon in case of similar problems in their career and profession.

It is an important fact that the majority of staff enjoyed working in the health sciences libraries (see Chapter 5). However, hospital management in Riyadh must utilise this advantage and recognise the responsibility for professional staff training and development in the field of health librarianship and ICT management. In fact, evaluating training programmes would be a starting point for hospitals and health libraries to develop their training services. On the other hand, a professional LIS qualification must be considered as a condition of employment in future for health libraries for certain positions, in order to provide better service quality.

The interviews and observation in relation to those issues are similar to the findings of previous researches covered in the literature review: Rehman and Al-Ansari (2003), Al-Gamdi (2002), Al-Ogla (1998), Al-Sereihy (1998), Qari (1998), Ashoor (1996), Siddiqui (1996), and Margalani (1993). LIS educational programmes in Saudi Arabia have little influence and impact upon real life work and towards improving the conditions of Saudi librarians and information specialists in general, and health

librarians in particular. While health sciences libraries in Riyadh are in critical need of health information professionals (health librarians), the educational curricula provide no immersion in the culture or methodologies of health sciences librarianship and health information research. These educational programmes are to direct students only to general practice and research. In addition, the traditional paradigm of education is practised, whereby the focus is on depositing knowledge and procedures into the students and learners. Educational methods, learning objectives, resources, and evaluation criteria are all decided and controlled by teachers and instructors, and involve no input from the learners. This method practised in LIS has produced poor learning.

In addition, health librarians confirmed that the staff in LIS academic programmes do little towards delivering Continuous Professional Development programmes for health librarians, although respondents were eager to join such programmes. Braude (1997a) hypothesised that, without significant changes in health sciences librarians' educational preparation, this territory would soon be claimed by competitors. He stressed that specialised education is the key to differentiating the territory of health sciences librarianship from the larger information science field.

This research, like others reviewed earlier, concludes that the academic programmes in the country are in need of development in order to be able to deal with new technology challenges and needs. This requires well designed formal educational programmes and continuous training courses. There is a need for more specialised curricula to improve the education of health science librarianship staff.

In brief, health sciences libraries in Riyadh suffer from shortages in professional staffing. This is a negative factor that has an impact both on health library services and on progress in training users to utilise library electronic resources and services. In addition, many health professionals during the survey commented that health library staff members are not sufficiently well trained, and felt strongly that libraries should have major concerns regarding staff education and training.

7.2 Health Professionals

IT skills are needed for a person to be able to access and use information sources. Health professionals in this study noted that they needed to improve their computer skills in order to make better use of the computer and electronic information services. AlShaya (2002) and Al-Zahrani (2001) similarly confirmed that health professionals in Riyadh are in need of IT skills and appropriate training courses related to this area of expertise.

This section is divided into three subsections, as follows:

1) Learning to use electronic sources.
2) Computer training
3) Seeking advice on computer problems.

7.2.1 Learning to Use Electronic Sources

Respondents were asked to indicate their method of learning how to deal with electronic resources and services. The methods of learning are shown in Table 7-1. 34.7% of respondents learned to use electronic sources and services with the assistance of friends and colleagues, while 29.8% of respondents did so by trial and error or were 'self-taught'. Respondents who learned to use e-sources with the assistance of the health librarian accounted for 21.2%, while 6.3% reported learning through their participation in private training courses offered outside the hospital environment.

Table 7-1: Learning to use e-sources

Learn to use e-sources	Frequency	Percentage
Assisted by staff	105	21.2
Self-taught/trial and error	147	29.8
Private training	31	6.3
Friend-colleague	171	34.7
Other	19	3.9
No answer	20	4.1
Total	**493**	**100.0**

More than half of the respondents had learned how to use the electronic sources by using trial and error, were 'self-taught', or had the assistance of friends and

colleagues. Less than a quarter of the total respondents, which is considered to be a low percentage, learned how to use the electronic sources with the assistance of health library staff, and some people went through private training courses. Generally, the majority of respondents have learned about the electronic sources and services in the health libraries through ways other than with the assistance of health library staff. This might suggest that health professionals were not dependent on the training courses and tutoring offered by the health libraries, since the majority of them indicated that the training services offered by the library were poor (see Chapter 8: Information services).

In regard to individual hospitals, the largest concentration of respondents in IGH learned to use the electronic sources with the assistance of the health library staff, followed by those who were self-taught. Similarly, in KACM, the largest group had learned to use the electronic sources with the assistance of the health library staff, followed equally by self-taught, and learned from friends and colleagues. Health professionals in IGH and KACM depended mostly on their health library staff. Through observation, health library staff members in these two hospitals showed more helpfulness and proactiveness towards the library users and a willingness to overcome any possible difficulties.

Respondents in KAUH/CD, KKESH, SCH, KKUH and SFH hospitals depended more on learning how to use the electronic sources from their friends and colleagues, whereas in RAFH and KFSH/RC hospitals, respondents more often learned by themselves. It is worth mentioning that some respondents in KACM, KFSH/RC, and RAFH went through private training courses, while some others indicated that they learned how to use electronic sources elsewhere, such as in their home countries, in the case of non-Saudis.

Figure 7.1 shows that health professionals in government hospitals in Riyadh in different age groups mostly learned about the use of electronic sources with the help and assistance of friends and colleagues and through being self-taught.

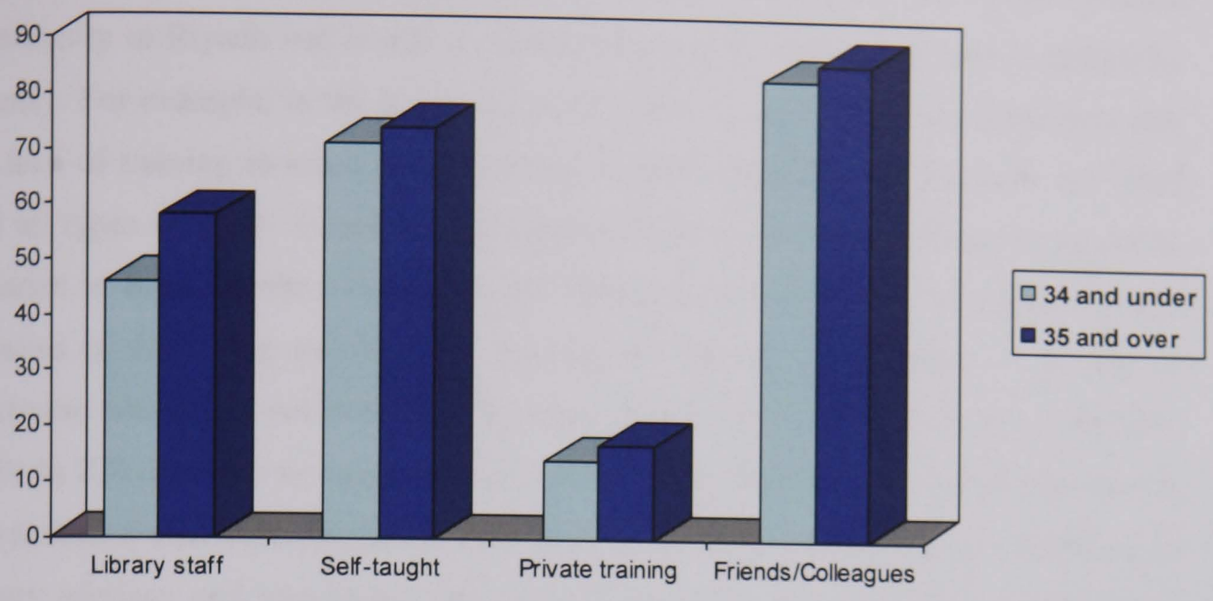


Figure 7.1: Learning use of e-sources by age groups

Analysis found gender differences in the way respondents learned to use electronic resources and services. Male health professionals were more likely than females to be self-taught, as shown in Figure 7.2. However, there is little difference between the proportions of male and female health professionals who consulted their friends and colleagues in the use of e-sources. Female health professionals who learned to use e-sources with the assistance of health library staff were slightly greater in number than males.

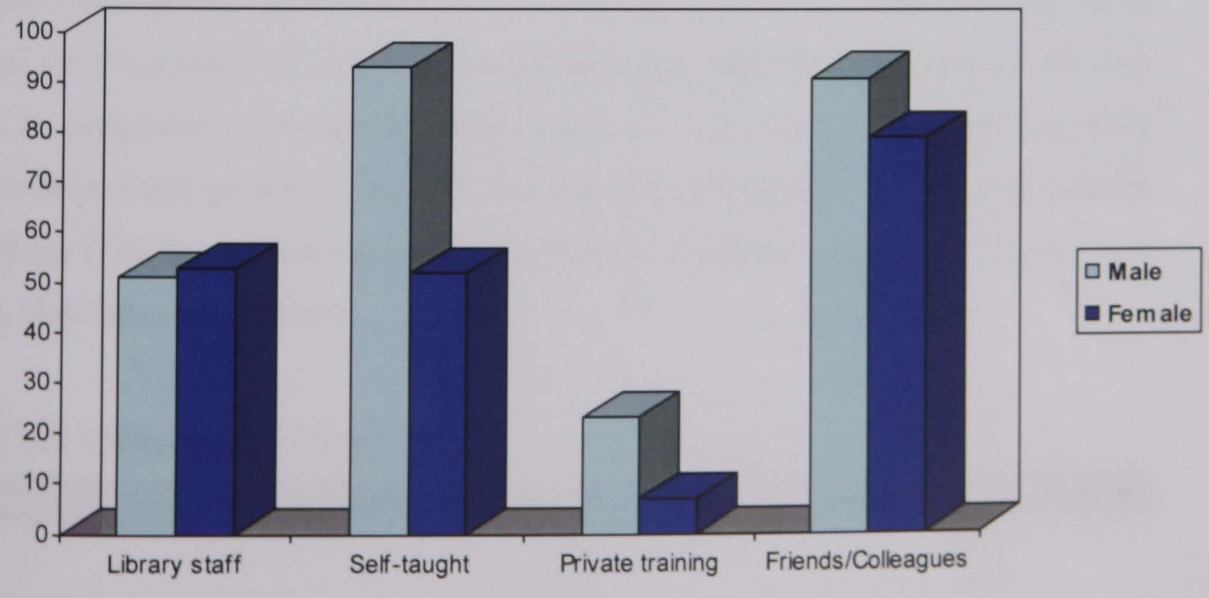


Figure 7.2: Learning use of e-sources by gender

The issue of poor training programmes does not only concern the health libraries community in Riyadh but is also a serious problem in other communities within the country. For example, in the academic environment, Basager (2001) commented that the lack of training in some areas and poor training programmes generally for 'staff and all types of users' is one of the disadvantages that could be found in academic libraries in Saudi Arabia. However, the issue of poor influence of health sciences libraries in delivering training and tutoring for health professionals to get use of electronic sources is two-fold. Firstly, there is a need to develop health librarians' skills in ICT in order to improve their ability to support users with training courses and technical and technological advice. This would improve the positive influence of library services and provisions. Secondly, there is a need overall to develop ICT training courses for health professionals in Riyadh hospitals which should be managed by hospital management. This would increase the accessibility and use of electronic resources and services.

7.2.2 Computer Training

In this section, attention is focused on the computer training and its duration. It also highlights the health professionals' overview of educational and training programmes provided by hospitals.

Analysis revealed that 40.2% of respondents had received computer training (Table 7-2), while the majority (58.8%) had not. Al-Zahrani (2001) found that the majority of hospital staff had received 'some' computer training, which was not adequate for their needs. In comparison, the current research has a wider range of hospitals, including less developed and growing hospitals. However, in Al-Zahrani's study, a remarkable percentage (28.4%) of hospital staff received no computer training which, to some extent, highlights the problem.

Table 7-2: Computer training

Computer training	Frequency	Percentage
Yes	198	40.2
No	290	58.8
No answer	5	1.0
Total	**493**	**100.0**

There is a gap in frequencies between health professionals who received computer training and those who did not. A chi-square test was made with gender related to computer training. The value generated was =0.783, with an associated significance level of 0.37. In this case, the value is larger than the alpha value of .05. Therefore it can be concluded that this result is not significant. This means that the proportion of male health professionals who did not receive computer training is not significantly different from the proportion of female health professionals who did not receive it.

Another chi-square test was made with physicians and nurses related to computer training. The value generated was =0.229 with an associated significance level of 0.6. Again, the value is larger than the alpha value of .05, from which it can be concluded that this result is not significant. This means that the proportion of physicians who did not receive computer training is not significantly different from the proportion of nurses who did not receive it.

These results suggest that the low opportunity of computer training has no significant relation to gender or job description. As a result, the majority of health professionals in Riyadh hospitals depended on their own efforts to learn to obtain ICT skills, particularly in relation to computer usage. In this matter, various respondents made comments expressing their need of computer training.

For those staff who had received training, the duration of training was investigated. The response options were: days, weeks, months, and years. Table 7-3 shows that the highest percentage (38.4%) of respondents received months of training, while 33.3% received only weeks periods of training. 'Days' of training were reported by 18.7%, and the lowest percentage was for 'years' with 8.6%.

Table 7-3: Training period

Duration	Frequency	Percentage
Days	37	18.7
Weeks	66	33.3
Months	76	38.4
Years	17	8.6
No answer	2	1.0
Total	**198**	**100.0**

Hospitals in Riyadh offer computer-training programmes, which vary in length from days up to years. In detail, most respondents who had received training (196 out of 198) indicated the time period of their training programmes. Respondents in IGH, KACM, SCH, KFSH/RC and KKUH mostly received months of training, while respondents in KAHU/CD, KKESH, RAFH, SFH, and Yamamah mostly received shorter training programmes, with durations measured in weeks.

In general, the diversity and length of time for training programmes did not necessarily achieve users' satisfaction (Table 7-4). In fact, 51.0% (N=101 out of 198) of respondents who received training programmes indicated that they were not satisfied with the programme in terms of timing, length, and quality, while 48.0% (N=95 out of 198) were satisfied.

Table 7-4: Training satisfaction

Satisfaction	Frequency	Percentage
Yes	95	48.0
No	101	51.0
No answer	2	1.0
Total	**198**	**100.0**

In detail, in IGH, KACM, SCOT, and KFSH/RC, more respondents were satisfied with the computer training received than were dissatisfied. In other hospitals, the KAUH/CD, KKESH, SCH, KKUH, RAFH, SFH and Yamamah, in contrast, dissatisfied respondents outnumbered respondents those were satisfied. In fact, these results are consistent with previous research about health professionals in university hospitals in Saudi Arabia, which found that programmes offered by some hospitals were not satisfactory (Al-Zahrani, 2001).

To investigate whether or not respondents' gender was related to their satisfaction level regarding training programmes offered by hospitals in Riyadh, a chi-squared test was carried out. The result indicated that there was a significant association between the two variables ($\chi^2 = 4.46$, $df = 1$, $N = 194$, $p < .035$), where male respondents were more satisfied with the training programmes than females (Figure 7.3).

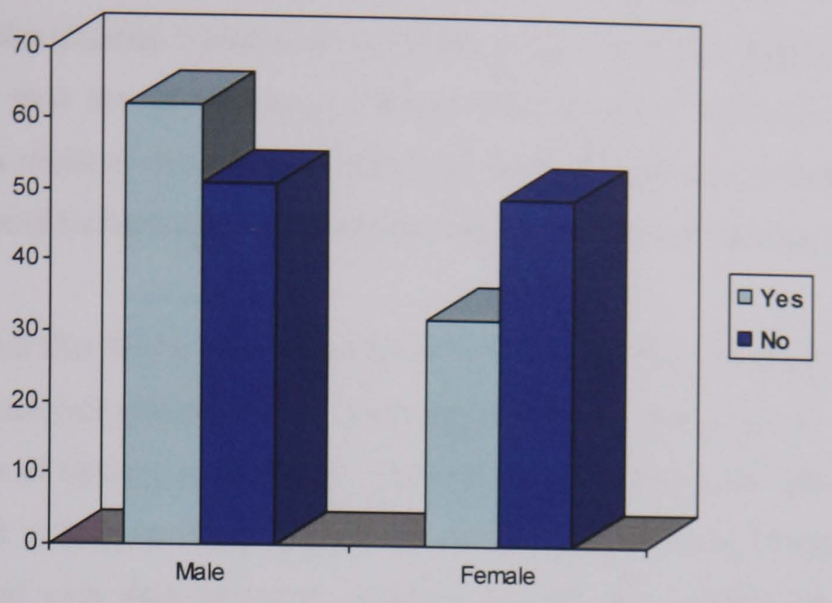


Figure 7.3: Training satisfaction by Gender

Respondents' job description was found, using a chi-square test, to be significantly associated with their level of satisfaction with training programmes offered by Saudi hospitals. Categories in the job description variable were reduced for the purposes of cross-tabulations: *IT/IS computer staff*, *administrators*, *pharmacists*, *paramedical personnel*, and *medical technician*, were all grouped together to form *other*. The result indicates that there was a significant association between job description and satisfaction with training programmes; (χ^2 = 5.35, *df* = 1, *N* = 102, *p* < .021). Physicians were more likely than nurses to be satisfied with training programmes.

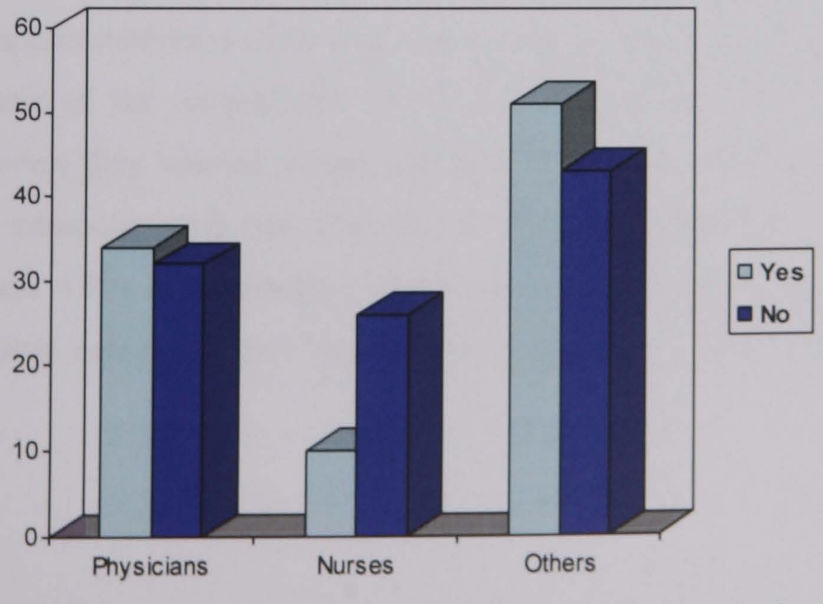


Figure 7.4: Training satisfaction by Job description

Respondents who were not satisfied with the training programmes or courses indicated that as the training was limited to certain topics, it did not fulfil their needs. Others indicated that the programmes offered were very old and not up-to-date. Respondents, as a result of their dissatisfaction, found their own way of learning more about computers and technologies, such as by enrolling on private training courses.

It can be concluded that health professionals mainly ascribed their dissatisfaction with the training programmes offered to poor training quality and inconvenient timing. As regards the matter of timing, some health professionals demanded frequent and up-to-date training, and to have more time to focus on training, as most of the time they were overwhelmed with their hospital workload. Indeed, they needed more time to practise their newly acquired skills. However, it is necessary for hospitals in Riyadh in general to explore new techniques to make training more effective, including the preparation of users to accept and learn about new technology changes and challenges, since training clearly gives users confidence when using PCs, and in how to utilise the information services available. In line with the assumption that training would influence attitudes to ICT, some health professionals who were satisfied with training commented that as a result of valuable and relevant training they had become more positive, and more confident in using ICT.

7.2.3 Seeking Advice

In this section, respondents were asked to indicate where they went to seek advice regarding computer problems while they were in the health libraries. Table 7-5 shows that almost half of the respondents (47.3%) indicated that they consulted health library staff when they wanted advice and help with these problems. Seeking help from hospital computer staff was cited by 19.9% of respondents, while 17% asked their colleagues. 4.9% of respondents preferred to use the computer manual. Some other respondents noted that they depended on themselves in solving any computer problem.

Table 7-5: Seeking advice

Seeking advice from	Frequency	Percentage
Computer staff	98	19.8
Colleagues	84	17.0
Library staff	233	47.3
Computer manual	24	4.9
Other	19	3.9
No answer	35	7.1
Total	**493**	**100.0**

A high number of respondents from all hospitals would seek advice from the health library staff in the case of a computer problem, with the exception of respondents in SCH, SCOT and Yamamah. It has already been mentioned that SCOT and Yamamah health libraries have no PCs. As a result, none of the respondents in these two hospitals indicated that he/she would seek advice from the health library staff. The highest number of respondents in SCH would ask for advice and help from the computer staff when they faced computer problems, even while they were in the health library. Interviews and observations indicated that the staff in the SCH health library did not have a solid background of PC knowledge. As a result, they would not be able to help with difficult or major computer problems, and this explains why health professionals in SCH would seek technical advice from hospital computer staff. Indeed, the percentage of health professionals who seek advice from library staff in case of computer problems would increase if health librarians were able to solve technical and technological problems. This would not be possible with the existing poor conditions of training.

7.3 Summary

Health librarians in Riyadh hospital possess the willingness to develop their skills and to use ICT. Some issues affecting perceptions of the value of ICT were identified, including lack of quality training programmes, shortage of time and heavy workload, and lack of management awareness. In addition, there is a strong need for academic programmes in LIS to participate in the development of the profession. On the other hand, health professionals are influenced by the poor condition of training provided to health librarians, since health professionals cannot depend solidly upon health information professionals (health librarians) in their use of electronic resources and services. In addition, the condition of training programmes for health professionals

provided by Riyadh hospitals is not much better than what has been offered to health librarians. This issue of training, in general, is an indication of hospitals' insufficient concern for their human resources.

Although, the advent of electronic information sources has further enhanced the speed and reinforced the access and usability of information and knowledge, some access problems remain, related to lack of ICT skills. This situation can be avoided through further formal and informal educational courses and training. Such learning should be a lifelong process so that health professionals can enhance their knowledge and professional competence, and keep abreast of technology challenges. Hospital managements, including health library administrators, need to take responsibility for health professionals' and health librarians' training. Importantly, health librarians need to be familiar with advances in electronic information services and technologies. This cannot be achieved properly if there is a lack of or shortage in accredited training programmes.

Of course, the provision of suitable training requires an understanding of the role played by health science library staff, and this in turn necessitates awareness of the need of health professionals, and their preferred sources of information are to be considered.

Chapter Eight

Information Services

POSITION IN THE THESIS

Chapter 1 Introduction	**Chapter 2 Background**	**Chapter 3 Research Design**
Chapter 4 Literature Review	**Chapter 5 Users and Staff**	**Chapter 6 Health S. Libraries**
Chapter 7 Education and Training	**Chapter 8 Information Services**	**Chapter 9 ICT**
Chapter 10 Information Provision	**Chapter 11 Change & Development**	**Chapter 12 SHIN Prototype**
Chapter 13 Conclusions	**Bibliography**	**Appendices**

This chapter has answers to the following research questions:

- **Why do health professionals acquire information and what type of information sources do they prefer?**
- **What is the level of satisfaction of health professionals in using information services and resources?**

Chapter Eight

8

Information Services

This chapter evaluates and explores the importance of the information services provided by the health sciences libraries in Riyadh. Two important issues are related to the evaluation of information services:

1) Information needs
2) Information sources

These focus upon the need for information, and the reasons why health professionals search for and seek information. Additionally, these issues centre on what types of information sources are preferred during the searching process by health professionals, and whether they prefer electronic or printed tools. The overall evaluation is based on users' perspectives of the services provided by health sciences libraries.

8.1 Information Needs

The recognition of users' information needs plays a major role in the future planning and development of library and information services. Analysis revealed that respondents working in the healthcare environment look for information to meet different needs. The understanding and realisation of these differences in information needs will provide a basis for future planning for health libraries in the country to be able to fulfil and satisfy those needs.

Respondents reported the purpose of obtaining information during their work in the healthcare environment as shown in Table 8-1. The need to keep up-to-date with knowledge (44.4%) was the most frequently cited purpose, followed by the need for information for clinical work (31.2%). Respondents who searched for information for writing a paper were as few as 7.5%, while 'examinations' accounted for 5.1%, and 'teaching' 4.9%.

Table 8-1: Information needs

Information needed for	Frequency	Percentage
Clinical work	154	31.2
Up-to-date	219	44.4
Teaching	24	4.9
Examination	25	5.1
Writing a paper	37	7.5
No need for information	5	1.0
Other	23	4.7
No answer	6	1.2
Total	**493**	**100.0**

The result from this study confirmed what previous studies found. For example, Bryant (2000) asserts that information needs derived from the clinical care of individual patients is to keep up-to-date, and this is closely followed by a need of information for patient care. Gruppen (1990) noted through his observation that physicians are not uniform in their information needs. Palmer and Simpson (1995) prove the diversity of information needs, which is revealed by research and the variety of sources used by staff in general practice.

Respondents' job description was found to be significantly associated with their information needs, using a Chi-square test. Categories in this section were reduced for the purposes of cross-tabulation; the needs for information *for clinical work* and *to keep up-to-date*, were grouped to form *clinical and up-date,* while information for *teaching, examination,* and *writing,* were all grouped to form *education and research.* The result (χ^2 = 12.39, *df* = 2, *N* = 459, $p < .002$) showed that nurses' need for information for clinical and up-date was greater than physicians' need, while the need for information for education and research was higher for physicians than for nurses (Figure 8.1).

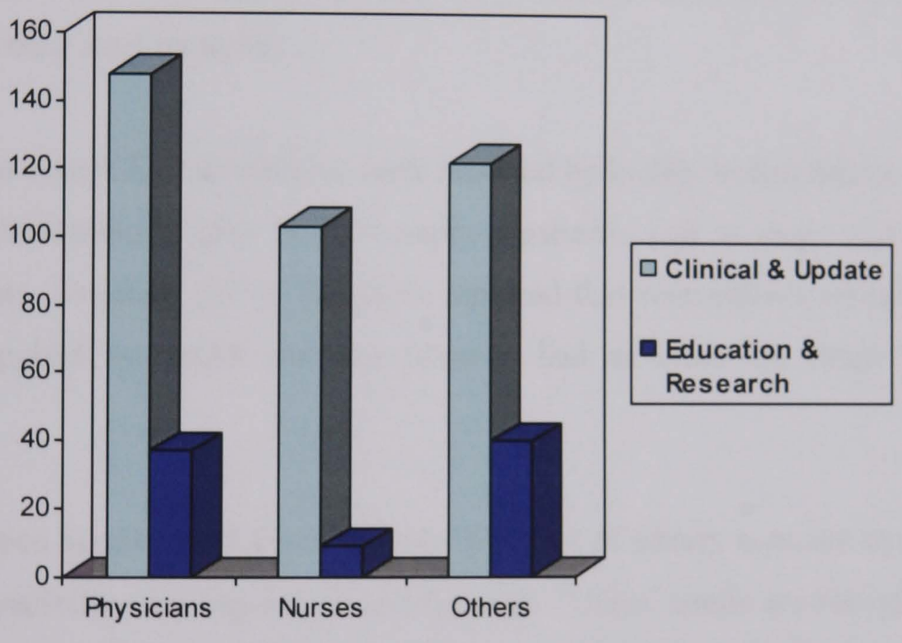


Figure 8.1: Information needs by Job description

Using cross-tabulation provides more descriptive details, whereby the respondents in IGH, KAUH/CD, SCH, SCOT, KFSH/RC, KKUH, RAFH and SFH presented their need for information as mostly to keep themselves up-to-date with new knowledge and information. This need to be up-to-date with recent developments in knowledge was a priority among the majority of users. However, more respondents indicated the need for information to be up-to-date in IGH and SFH than in other health libraries, followed by SCH and SCOT, which each had the same percentage of respondents indicating this choice.

Respondents in KACM, KKESH and Yamamah showed more concern for information on clinical work. Searching for information about clinical work is an important search, as confirmed by Bailey et al. (2000) who comment that the key issue at the Marie Curie Centre in Newcastle upon Tyne, England, is to look for the most advanced development of library/information services to support integration of the best possible care into clinical practice.

Respondents in SCOT, IGH and KAUH/CD showed a greater concern for exam preparation than other hospitals, whereas respondents in KACM and KFSH/RC showed a higher percentage for the need for information for teaching. Respondents indicating a need of information for writing papers were more numerous in KKUH, SCOT and Yamamah. In addition, some respondents indicated that they need information for their own research.

Other reasons to search for information were reported by health professionals, such as the need for information to give help, to support patients, and to make and finalise clinical decisions. Urquhart (1995) similarly reported that respondents revealed how information supplied by health sciences libraries had an effect on future clinical decisions.

Users' information needs could direct the development of library services in order to enhance their credibility and reputation among users. Users' needs are recognised by many writers. Brophy (2000a) specifies four clear needs of health practitioners, one of the potential groups of users in the healthcare environment: 1) better and more reliable search tools, 2) expert evaluation of published work, 3) additional information on the source and background to any published report, and 4) help to handle large volumes of data.

Many studies agree that the available information sources and their wide range are among factors affecting users' information needs (Devadason and Lingam, 1997; Kebede, 2002). Vickery (1997) argues that, from the user's point of view, information content can hardly be perceived outside the sources through which users come into contact with it. From another viewpoint, many writers consider the non-content aspect of information to be as important as the content aspect in meeting

users' information needs (Downs and Friedman, 1999; Middleton et al., 1999; Pullinger, 1999). Kebede (2002) argues that the current change from print and other forms to electronic forms in which information is made available, is bringing about changes in users' information needs.

8.2 Information Sources

The increased use of electronic information sources is noticeable and has become a common tool in most information search processes. Conversely, there are still many people who prefer the use of printed materials and tools such as card catalogues or printed indexes. The increase in electronic source use is explained by easy and fast accessibility to a specific piece of information, while rare or non-use of these sources and tools is explained by frequent interruptions and complicated interface. This is seen and observed, particularly in developing countries.

The new technologies and developments require various information and technological skills. Nicholas et al. (2001a) note that users with IT skills are identified as significant users of a system. Garrod (2001) explains, however, that many users have limited IT skills, and have difficulty finding time to improve their skills and build up confidence. As a consequence, this might lead people who lack IT skills to prefer printed materials for their information search.

Within the competitive environment there is a need to compare the use of printed sources and electronic sources. Respondents working in the healthcare environment in Riyadh (as seen in Table 8-2) show a greater use for printed materials and sources (56.0%), while electronic sources are preferred by only 38.9% of respondents. To explore these results further, a cross-tabulation test was used. It revealed that the percentage of respondents who preferred to use printed information sources was greater in all hospitals than those preferring electronic sources. In comparison, respondents in KFSH/RC, KKESH, SCOT and KACM indicated a great use of electronic sources, while in SCH, KAUH/CD, Yamamah and KKUH they indicated a great use of printed materials. Only the respondents in KFSH/RC showed a greater preference for electronic sources.

Table 8-2: Type of sources

Type of sources	Frequency	Percentage
Printed materials	276	56.0
Electronic sources	192	38.9
Others	11	2.3
No answer	14	2.8
Total	**493**	**100.0**

As for gender comparison, generally male respondents showed a greater use of electronic sources than female respondents, especially in KAUH/CD, KKESH, SCH, KFSH/RC, SFH and Yamamah. However, in KAUH/CD and SFH, female respondents used electronic sources more than males, and they showed equal use of electronic sources with males in KKESH and Yamamah. None of the female respondents in the SCH indicated her use of electronic sources.

A Chi-square test was used to investigate whether or not respondents' job description was significantly associated with respondents' choice of resources. Categories in this section were reduced for the purpose of cross-tabulations: *IT/IS computer staff*, *administrators*, *pharmacists*, *paramedical personnel*, and *medical technicians*, were all grouped together to form *other*. The result indicates that there was a significant association between job description and the type of resources used ($\chi^2 = 6.98$, $df = 1$, $N = 300$, $p < .008$). The result also indicates that nurses use printed resources more than electronic resources compared to the use of these resources by physicians and others (see figure 8.2).

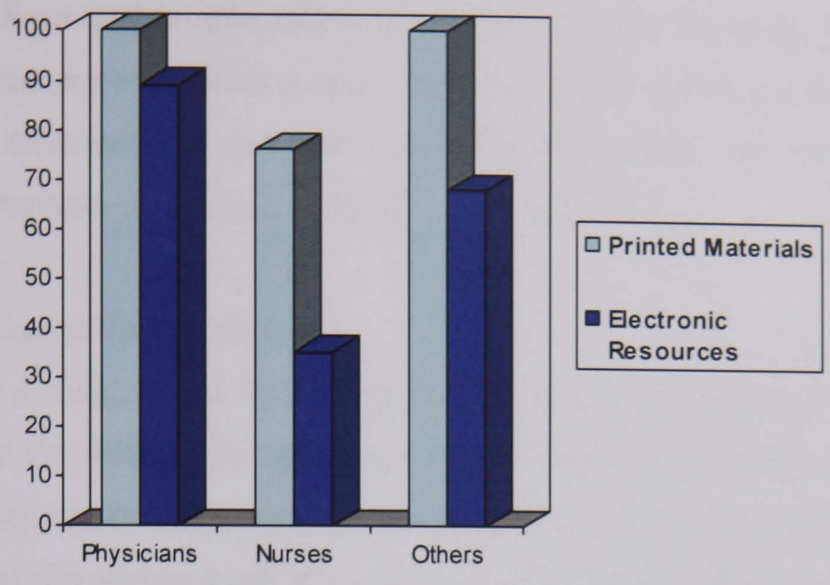


Figure 8.2: Type of resources by Job description

In a study on the use of electronic resources use in Saudi university libraries, Khalid (2000) noted that users need training in order to make effective, efficient and independent use of information sources and services. Moreover, Hewitson (2002) notes that many users emphasise the need for more time to explore and familiarise themselves with the electronic information services and sources. Kebede (2002) explains that the unique features of the prevailing information needs of users in electronic information environments arise from the state of personal and computational capabilities of users in relation to the ideal requirements of access to and use of electronic information services.

The researcher observed some specific factors which led to a greater use of printed materials than electronic sources. First, insufficient electronic sources were provided by health sciences libraries in Riyadh, i.e. some libraries did not provide electronic sources such as electronic journals (see Chapter 9). Second, there was a lack of sufficient training programmes provided in Riyadh hospitals to facilitate the use of electronic sources and services (see Chapter 6). Third, electronic connection to electronic services and resources in some health sciences libraries, such as the case in KKUH and KAUH/CD, was frequently interrupted.

A librarian in KKUH explained:

> *"We have had to subscribe to electronic journals through a local provider for more than a year. Unfortunately, we do complain as staff members, but our users also complain about the frequent interruptions for periods of weeks and months."*

The chief librarian in Yamamah noted:

> *"For a long time, I have presented the need for Internet service inside the medical library, and I am still waiting for the hospital authority to be convinced of the importance of such a service. The lack of this service leads users to go to other health libraries where they can receive such help, or to depend on the poor book collection that exists here in the library."*

A health professional in the RAFH hospital highlighted the problem by saying:

> *"Using and having access to medical journals online will minimise the use of printed materials and will solve the problem of non-availability of some journals."*

A fourth reason observed for the preferred use of printed materials over electronic materials was the small amount of equipment and tools provided to operate electronic and information sources. For example, it was noticed that there were very few PCs provided in health sciences libraries such as KKESH, SFH, IGH, KAUH/CD, SCOT, SCH and Yamamah (see Chapter 9).

Women's lower usage of electronic sources, although statistically not significant, does show that females use electronic sources less than males. Kennedy (2000a) stated that surfing the Internet and using electronic communication (ICT) successfully is not a one-size-fits-all exercise. Kaplan and Farrell (1994) claimed that many studies stress that a fear of technology is a significant obstacle women may face in their electronic communications practices. Women should get over IT fear by literally touching a computer and getting online (Kennedy, 2000b). Anxiety about computers might create a gap between male and female use of computers and the Internet. Some researchers say that there is a gender gap in using computers and technology, and this gap

continues to persist. In addition, computers are less attractive to women because of the social difference and male domination of the Internet (Maxwell, 1999; Hapnes and Rasmussen, 2000).

A female health professional from KACM hospital highlighted the issue of fear:

> *"I try to use the computer and the Internet in the health library many times. I get afraid and look to see if I am keeping other people waiting. So, each time I leave without getting any benefit from the service and never being able to find help!"*

A female health professional in KFSH/RC noted:

> *"I feel I cannot use computers provided in the library because of my very poor computer skills. I'm very, very slow, therefore I feel I would be blocking the system. Current computer classes offered at the hospital are not adequate."*

However, with training, either self-taught or formal training, users can utilise and benefit from a wide range of electronic information services. Accordingly, a female health professional in KKUH noted:

> *"I was not a fan of the Internet or computers at one stage of my life because I possessed too few technology skills. Eventually, though, I have found my way around the computer and now I could never afford to be without it."*

Stolt (1996) points out that utilisation of electronic resources will require continuous training programmes for end-users. Polson (1988) reported earlier a 100-300% reduction in training times for subsequent task training as a result of employing consistency within and across applications. Hewitson (2002) concludes that users tend to stay with the one service they feel confident using. Unique application interfaces lead to a decrease in usability and to difficulties remembering the unique methods used by different systems (Morris and Dyer, 1998). Garrod (2001) suggests that the electronic and virtual library interface should consider the end-user who may have to access resources from a variety of locations.

In recent years, the whole world has moved towards the use of electronic sources. This move varies from one country to another. It has also been noticed that this move is growing in the Kingdom of Saudi Arabia, and in the field of medicine in particular. This is due to the massive improvement of information technologies used in various fields and practices. Even so, the movement still encounters some obstacles and difficulties as mentioned earlier, such as a lack of proper educational and training programmes.

8.3 Information Services

The purpose of this section is to highlight users' evaluation and opinions regarding the services that appear to be available to them. Bryson (1997) describes users' evaluation as providing an indication as to whether existing information service users are satisfied with current services. Bryson draws another dimension in that user evaluation will determine which services need improvement in their performance and which services should be discontinued to make room for other, alternative services. Hernon and Altman (1999) suggest that libraries need to shift their attention from measures of reporting the volume of business, such as circulation totals and number of reference questions answered, to the more meaningful indicators of user loyalty and satisfaction.

Loyalty and satisfaction are a response to service quality; however, the concept of quality is simply a matter of a user's own understanding. The increasing pressure on libraries is to assess quality not merely on the size of collections but on a wider concept (Snoj and Petermanec, 2001). Salaun and Flores (2001) consider that the definition of quality information is the information that satisfies the criteria of appreciation specified by the user. They conclude that the product's appearance is the most important criterion for user satisfaction. The study of Ho and Crowley (2003) has further demonstrated the importance of user perceptions when designing and evaluating library services.

Respondents were asked to give a rating to the quality of service provided by their health library. A five-point scale ranging from 'very good' to 'poor' was used to evaluate health library services in relation to books, electronic books, current journals,

bound journals (old journals), electronic journals, on-line service, CD-ROM collection, inter-library-loan, photocopying, user training, and staff helpfulness. Since data in this section are ordinal, the median is the most fitting value. It is appropriate, because ordinal data creates order among the categories. The findings from this section could help in outlining a clearer picture of the services provided by health sciences libraries in Riyadh hospitals.

There are some important services which were not included in the evaluation, such as PDA, since health libraries in Riyadh hospitals do not offer them to users. Most of the health sciences libraries in Riyadh do not provide potential information services such as Current Awareness Service (CAS) and Selective Dissemination of Information (SDI). In fact, only two health libraries, KKESH and KAUH, provide CAS and SDI, and even there these services are only available upon request. A staff member in this library noted that these services do not reach all health professionals and are not provided all the time because of shortages of qualified library staff. The chief librarian explained that he used simple posters to announce the arrival of a new book or special journal issues that have been requested. Furthermore, he provided an SDI service upon special request, but only for a short time, as he was the only professional librarian working in the KAUH health sciences library.

8.3.1 Books

The median rating for book collections in health sciences libraries was 'good' (36%), while only 6% of respondents rated books as 'poor' (Figure 8.3). 24% of respondents rated the service as 'adequate', and 17% rated it as 'inadequate'. Respondents rating the service as 'very good' accounted for 17%.

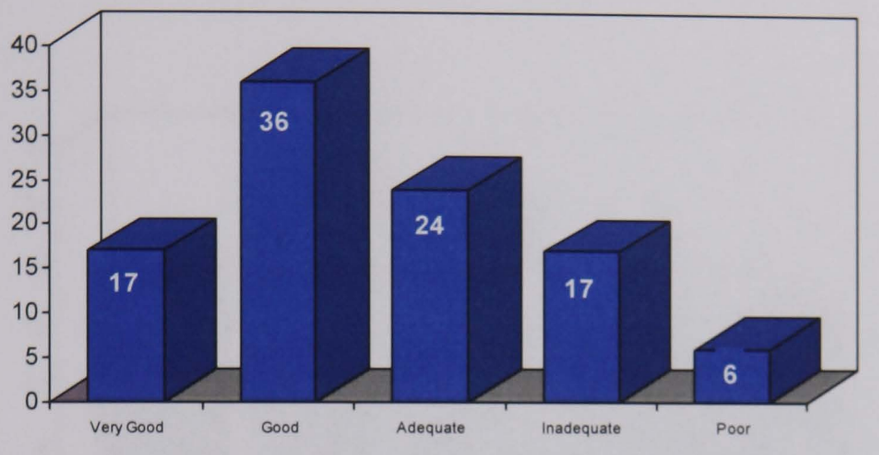


Figure 8.3: Quality of book collections

8.3.2 Electronic Books

Electronic books in the health libraries service were rated as 'poor' by 42%, and as 'very good' by 8% (Figure 8.4). Statistically, the median evaluation of electronic books in the health sciences libraries was 'inadequate' cited by only 13%, and 14% rated it 'adequate'.

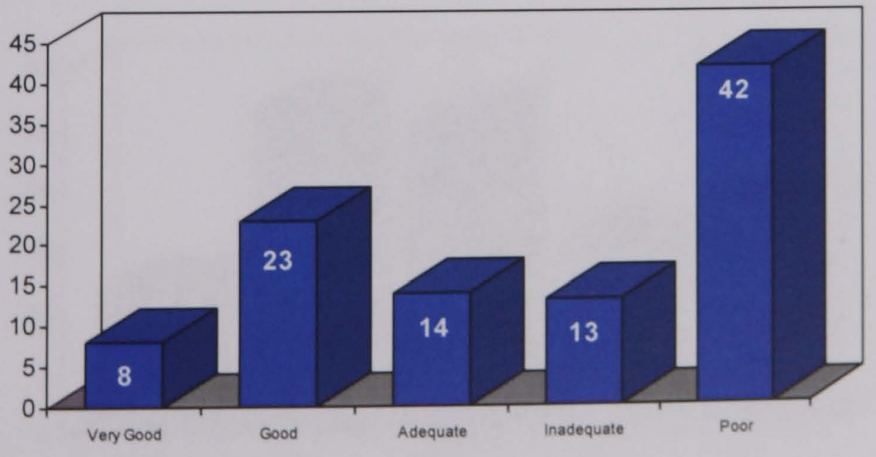


Figure 8.4: Quality of e-book collections

8.3.3 Current Journals

The proportion of respondents who rated the current journal collections in the health libraries as 'good' was 27%, and the lowest number of respondents rated them as 'inadequate' and 'poor' (15%) (see Figure 8.5). Statistically, the median of evaluation produced was adequate. 19% of respondents rated the current journals in the health sciences libraries in Riyadh hospitals as 'very good'.

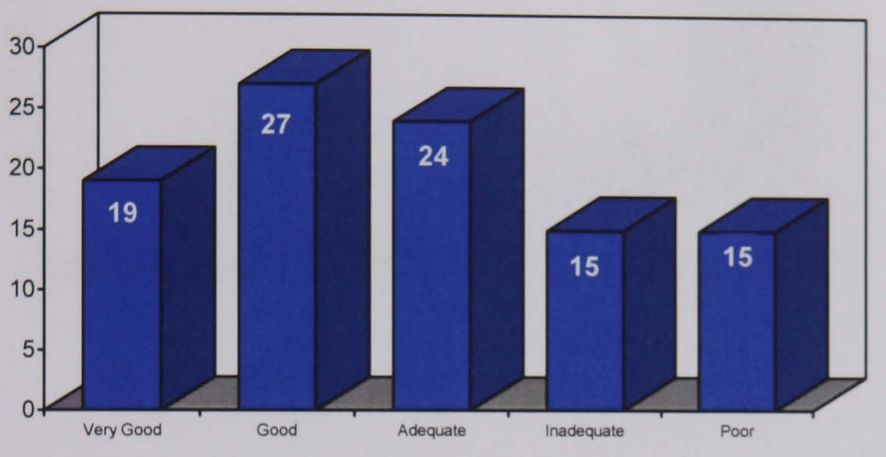


Figure 8.5: Quality of current journal collections

8.3.4 Old Journals (old issues)

The median rating of old journals (bound journals) was 'adequate' (26%) while a small percentage of respondents rated them as 'very good' (12%) (Figure 8.6). 27% of respondents rated old (bound) journals in health sciences libraries in Riyadh hospitals as 'good', whilst 16% rated them as 'inadequate' and 19% as 'poor'.

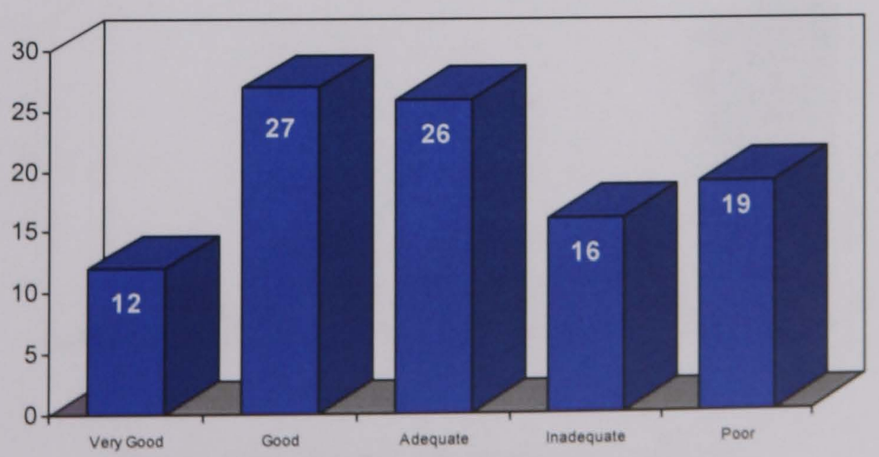


Figure 8.6: Quality of old journal collections

8.3.5 Electronic Journals

The median rating for electronic journals in the health libraries was 'inadequate' (14%). More than one third of respondents (45%) rated the service to be 'poor', only 7% rated it as 'very good', and 16% of respondents rated the service as 'adequate' (Figure 8.7).

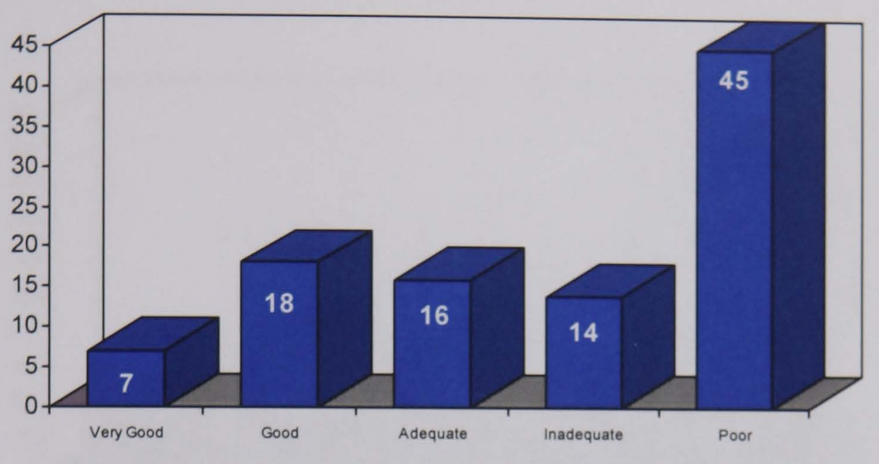


Figure 8.7: Quality of e-journal collections

8.3.6 CD-ROM Collections

In this section, the rating given by respondents was for the CD-ROM collections and not the CD-ROM workstations. The median rating given was 'poor' (52%), and the lowest percentage was for 'very good' (5%) (Figure 8.8).The collections in the health sciences libraries in Riyadh were rated as 'inadequate' by 16%, while 12% rated them as 'adequate'. Only 15% of respondents rated them as 'good'.

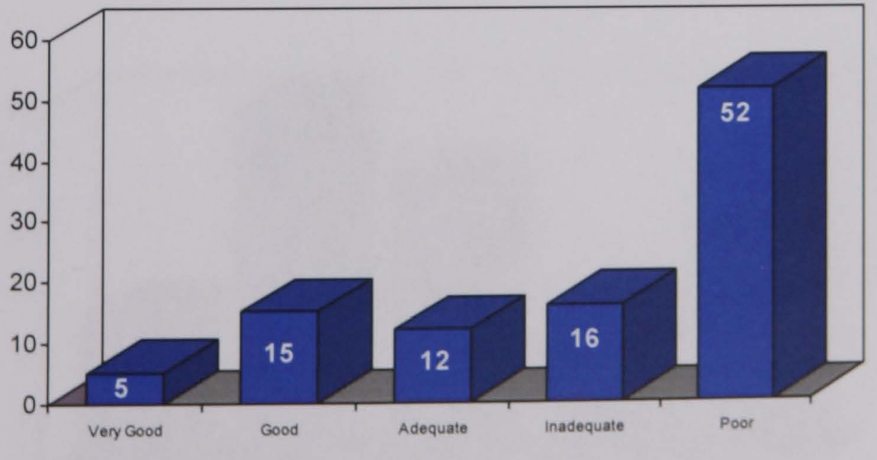


Figure 8.8: Quality of CD-ROM collections

8.3.7 Inter-Library-Loan (ILL)

The median rating for the Inter-Library-Loan service in health libraries in Riyadh was 'inadequate' (10%), and the lowest percentage was for the rating 'very good' (9%). Figure 8.9 shows that the majority of respondents rated the service as 'poor' (46%), only 18% rated it as 'good'. and 17 %t of respondents rated the service as 'adequate'.

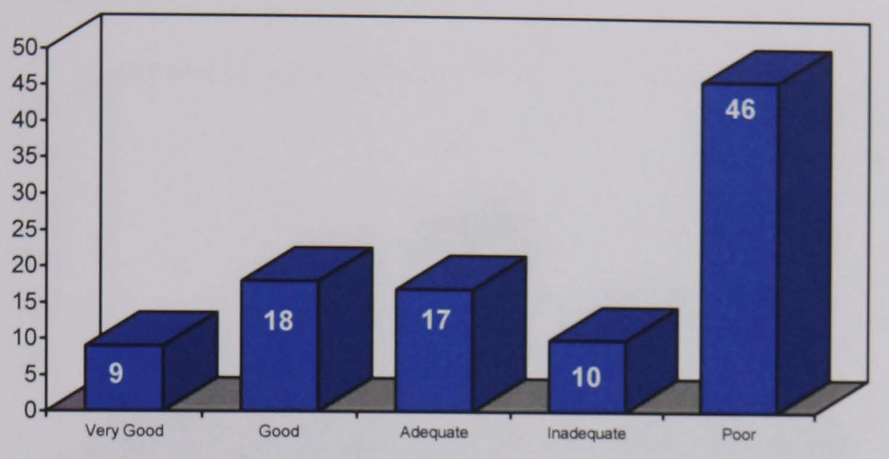


Figure 8.9: Quality of ILL services

8.3.8 Photocopying

In this section, respondents were asked to rate the photocopying services in the health libraries in Riyadh (Figure 8.10). The median rating for the service was 'adequate' with 24% of respondents choosing that rating. 30% of respondents thought that the service was 'good', while only 13% rated it 'very good'. Approximately a third of respondents (21%) rated the service as 'poor', and 12% rated it as 'inadequate'.

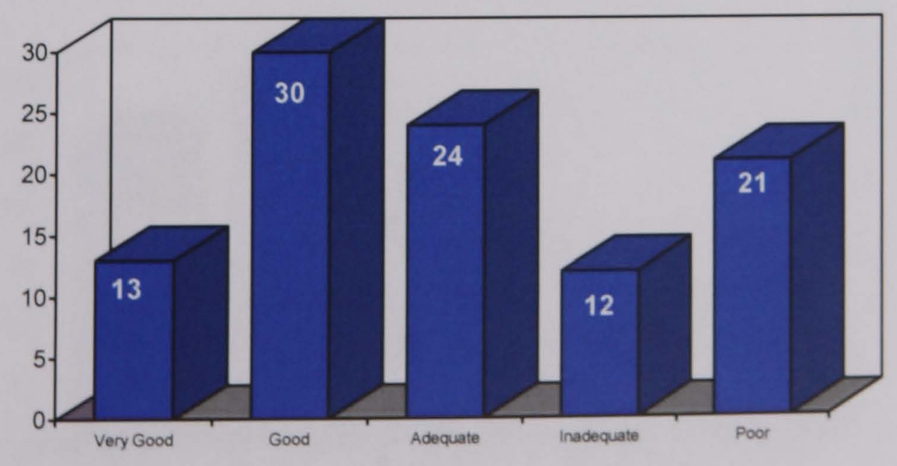


Figure 8.10: Quality of photocopying services

8.3.9 Training

Respondents were asked to rate the training programmes run by the health libraries in Riyadh. The median rating for the training programmes was 'adequate' (22%). In total, 49% of respondents were not happy with the service, with 35% rating it as 'poor', and 14% as 'inadequate'. Figure 8.11 shows that 19% of respondents thought that training programmes in their health libraries were 'good' and only 10% thought they were 'very good'.

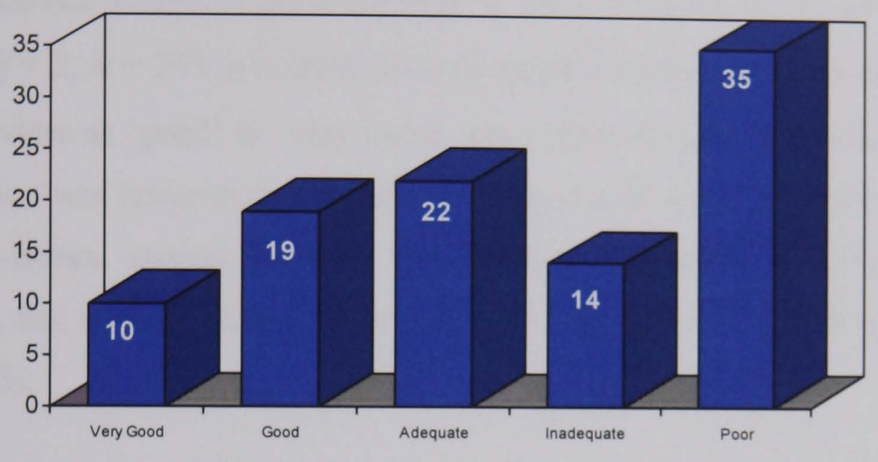


Figure 8.11: Quality of training in Health Science libraries

8.3.10 Staff Helpfulness

In this section, respondents were asked to judge the health library staff helpfulness. The median rating of staff helpfulness was 'good' (30%), and a quarter of total respondents felt it was 'very good' (25%). 23% rated the staff helpfulness as to be 'adequate'. At the other extreme of the scale, 9% thought that staff helpfulness was 'inadequate', and 13% thought it was 'poor' (Figure 8.12).

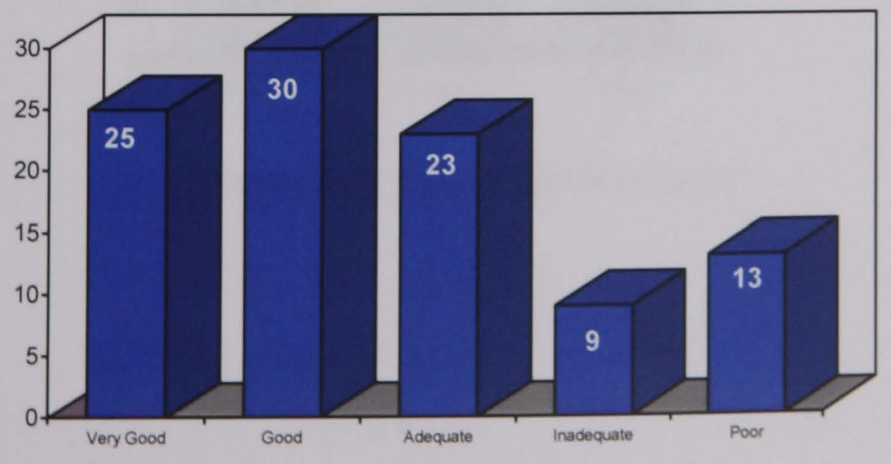


Figure 8.12: Quality of HSL staff helpfulness

To investigate whether job description is related with the quality of ILL services provided by the Saudi health libraries, a Chi-square test was used. Categories in this section were reduced for the purposes of cross-tabulation: *IT/IS computer staff*, *administrators*, *pharmacists*, *paramedical personnel*, and *medical technician* were all grouped together to form *other*. The result indicates that there was a significant association between job description and the perception of quality of ILL services. (χ^2 = 5.98, df = 2, N = 250, $p < .05$). Job description was also significantly associated with the perceived quality of photocopying services provided by the health libraries (χ^2 = 7.28, df = 2, N = 247, $p < .026$). In both cases, the proportion of physicians who rated the services as 'good' or 'very good' was higher than the proportion of nurses. Job description was however not significantly associated with the quality of services of books, e-books, current journals, old journals, e-journals, CD-ROM, training programmes, and staff helpfulness provided by the health libraries in Riyadh (Figures 8.14 and 8.15).

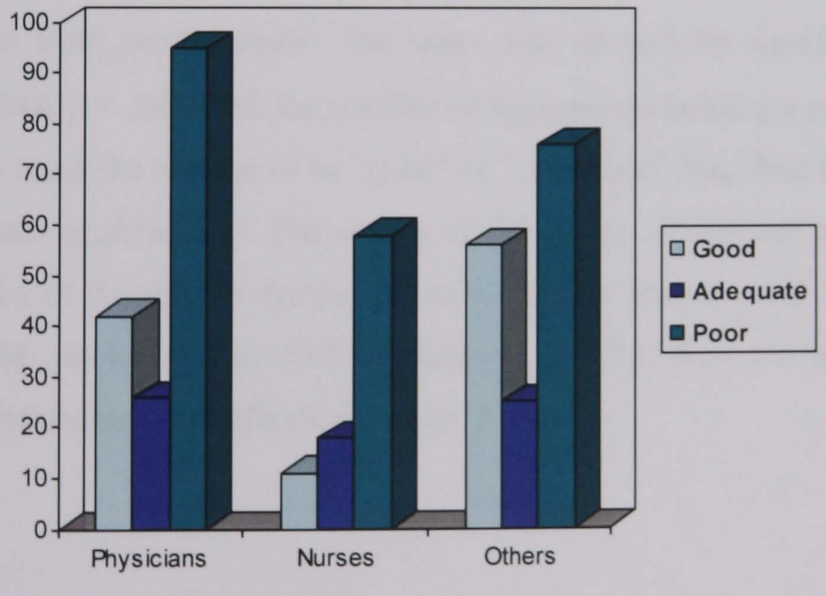


Figure 8.14: ILL by Job description

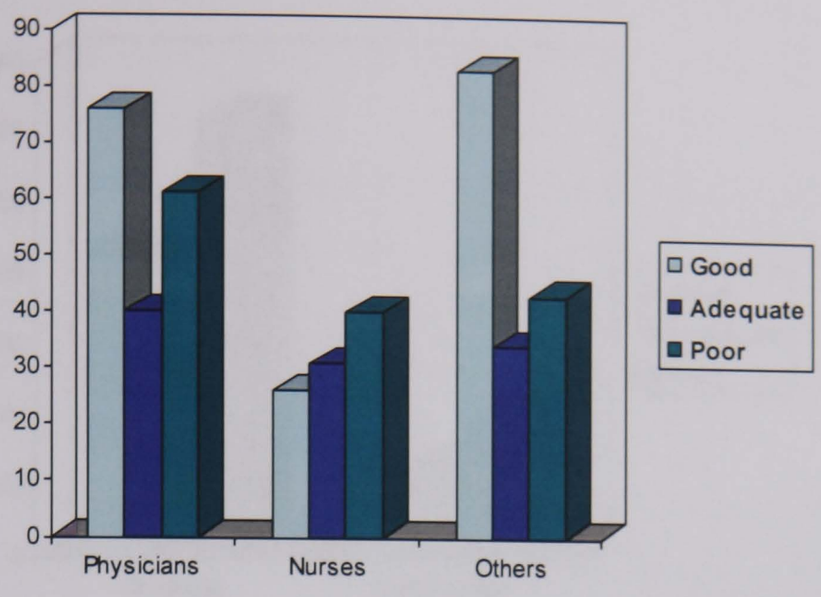


Figure 8.15: Photocopying by Job description

Respondents' qualifications were significantly associated with the quality of services of training programmes provided by health libraries in Riyadh. Categories in this section were reduced for the purposes of cross-tabulation: *bachelor degree* and *medical degree* were combined to form *graduate,* while *master's degree and PhD*, were combined to form *postgraduate*. The result was statistically significant (χ^2 = 6.28, $df = 2$, $N = 348$, $p < .04$), with the number of respondents holding a postgraduate qualification who rated the service to be 'good' or 'very good' less than that of hose who held a graduate qualification. The ratings of the quality of services provided by the health libraries in Riyadh for books, e-books, current journals, old journals, e-journals, CD-ROM, photocopying, staff helpfulness, and ILL were not significantly associated with respondents' qualification (Figure 8.16).

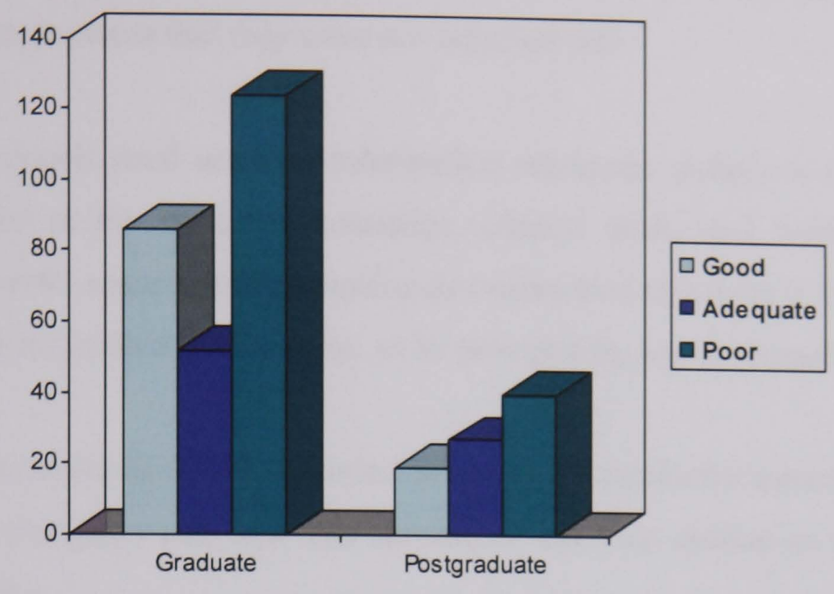


Figure 8.16: Training services by qualifications

Through observation, this can be interpreted as physicians appreciating and valuing e-books more than other users. However, health libraries are in the position of being unable to satisfy physicians' needs. On the other hand, significantly more nurses than other users were not satisfied with ILL and photocopying services; this can be related to the fact that these services are focused mainly on physicians and researchers.

8.4 Further discussion:

By and large, the various services mentioned and provided by the health sciences libraries did not reach a satisfactory level for users. Health libraries and information services have an influence upon users and healthcare practice. Health professionals in the current research indicated that their need for information services is mainly to update information and for clinical work. However, insufficient services might well affect the improvement of the healthcare system's overall condition. It is essential, therefore, for health sciences libraries to consider reviewing their position and the services provided.

Health professionals in Riyadh hospitals have enriched their evaluation of library and information services by giving extra comments, which explain why they thought the position of services provided were not adequate to satisfy their information needs and

indicate some changes they would like to see. Some of these comments are recorded according to some issues that they were not satisfied with.

Health professionals need accurate information resources, mainly to enable them to keep up-to-date in the field of knowledge, clinical work, and writing paper and research. However, some health professionals commented that there is a need for more resources whether printed or electronic, to be provided by health sciences libraries.

A health professional in RAFH recorded his need for particular materials, especially books in his speciality, and how this influenced his own evaluation of the support given to teaching:

> *"The current books in the field of cardiology, specifically ECH interpretation, stress testing and cardiac catheterisation seem very old. Not a good supply of books for teaching needs."*

Similarly, a professional in KFSH/RC requested a specific type of resource and presented the important need for such materials to be part of the health sciences library collection:

> *"I work in a Biostatistics Department in the Research Centre. It is extremely important for us to have access to the latest statistical journals. It would be nice if they were available in the library."*

A health professional in KAUH/CD noted the lack of updated materials, printed and electronic, particularly of illustrated materials and photographs:

> *"Procurement of new medical books, e-books, latest medical journals; I don't see new updated medical and dental photography books."*

A health professional in KKESH highlighted the important need for electronic resources and the realisation and recognition of the potential for expansion of library collections through online resources:

> *"Any library can be an extensive medical library by on-line electronic subscriptions to textbooks and e-journals."*

In IGH, a health professional noted that the same problems exist in most health sciences libraries in Riyadh; there is a lack of updated medical and health materials, and more open access to the Internet must be provided, as IGH library has only one PC connected to the Internet, which creates barriers to access to electronic resources:

> *"It must have the latest textbooks, reference books, latest journals and full access to the Internet."*

The above comments, as well as many others, indicate the lack of updated materials and resources available to health professionals in Riyadh. Indeed, the unavailability of updated resources has a negative influence on health practice, as noted in the literature review, Chapter 4. This may force health professionals to spend more time in searching for updated materials in other places and from alternative sources, while this time could otherwise have been utilised for the benefit of the health professionals themselves, their patients, and health organisations as a whole.

In relation to the issue of staff helpfulness, it was observed that health librarians interact courteously with health professionals. However, health professionals are looking to deal with qualified and professional health librarians. Indeed, health professionals are influenced by the poor condition of training provided to health librarians, since health professionals cannot depend solidly upon health information professionals (health librarians) in their use of electronic resources and services. Moreover, health professionals indicated that they want health librarians to be trained (see Chapter 7 Education and Training), and to be able to overcome any type of communication barriers between them and health librarians.

For example, a health professional in KFSH/RC related how a key member of the library staff has a poor command of English and how this represents a barrier to communication:

> *"The person providing the information cannot speak English very well. I've tried to make bookings twice - always end up more confused than before I started."*

A health professional in RAFH indicated a particular problem when he communicates with the health sciences library by telephone, and this might explain why the majority

of health professionals prefer to visit health sciences libraries in person (see Chapter 6):

> *"My experience has been that - some of the current librarians are unable to or are not willing to help with an enquiry over the telephone."*

A female health professional in KAUH/CD highlighted the need for knowledgeable librarian; however she wanted to deal with female health librarians as she might feel better with someone of the same gender:

> *"We need more computer units, more knowledgeable staff especially for female staff to assist the health personnel..."*

In addition, the condition of training programmes for health professionals provided by Riyadh hospitals is not much better than what has been offered to health librarians (see Chapter 7 Education and Training). This issue of training, in general, is an indication of hospitals' insufficient concern for their human resources. Accordingly, health professionals highlighted the need for users' training.

In particular, a health professional in KACM indicate the need to train users to enable them to search and find their own needed information. He noted:

> *"Medical libraries could introduce courses to educate users on how to look for a specific subject, article or piece of information using the simple library classification system (card catalogue, electronic databases and international system of classification). The library should provide electronic means of searching to obtain a special piece of information as well as supervising users doing so."*

As noted above, high-quality training programmes are needed for both health professionals and health librarians, for better practice and service provision. The unavailability of quality training programmes creates a condition of dissatisfaction among staff and users, indicating the need for better education and training (see Chapter 7).

Health professionals, generally, indicated the importance of increasing the number of PCs available in the health sciences libraries. This would help in accessing various electronic resources as well as to the Internet. A health professional in IGH commented on the need for more PCs, confirming the need, mentioned earlier, for health professionals in IGH to have full Internet access:

> *"Try to provide more computers so that everyone could use them at any time in seeking the information which will enrich their knowledge. I think the Internet is an easier way to always be updated on what is happening all over the world, particularly in the field of medicine."*

A health professional in KAUH/CD requested more PCs as the ideal medium for Internet access and searching:

> *"Please add or provide more computers with Internet access, that is, equipped with a fast fax modem for fast and easy Internet search."*

The lack of sufficient numbers of personal computers in the health sciences libraries has created some problems which cause dissatisfaction among health professionals. In addition, there is a statistical correlation with users' dissatisfaction with the present computing system (see Chapter 9, Section 3). However, a health professional in RAFH presented an idea to solve the existing problem which is caused by the small number of PCs available in the health sciences libraries:

> *"Make specific appointments for those interested in utilising electronic services for long periods of time (usually for research purposes), otherwise other users will get "annoyed" while waiting. This provision would also bypass the limited time allowed for users as a routine."*

The issue of accessing more information is important for health professionals. They want health sciences libraries to provide more access to electronic resources and to the

Internet in particular. Clearly, most requirements for materials, personal computers, Internet connections, etc. are related directly or indirectly to the issue of access to information resources. A health professional in RAFH indicated that health sciences libraries should consider the accessibility issue:

> *"Medical libraries should have better access to the Internet and all the medical e-journals."*

Further, health professionals look for the concept of information services outreach to be practised by the health sciences libraries, i.e. Current Awareness Service and Selective Dissemination of Information. This shows the need for information services to be provided utilising the new technology, such as e-mail, to update and provide awareness of new materials to health professionals. A health professional in IGH highlighted the need for access, noting the importance of information services:

> *"I think they should provide all doctors with a separate Internet connection with which they can access from anywhere they like and they should send information to doctors about new techniques and new drugs through the e-mail. They should also give the addresses of the best consultants here for consulting them about cases."*

However, an efficient, accessible and reasonably comprehensive information service is a vital factor to enhance the effectiveness and productivity of health professionals in various issues such as research, clinical work, and patient care. It is worth saying that the healthcare environment in Riyadh is suffering from a lack of two important characteristics:

1 effortless access and use of health information by health professionals
2 direct health information flow in and out of health sciences libraries.

These two characteristics will influence healthcare environment productivity, and the fact that those problems persist suggests a lack of awareness of the importance of information access and information services. This was confirmed by library staff members who said that hospital management are not directly concerned with such

information as planning future work changes, library and information policies, and initiating personal development and change. Matarazzo and Prusak (1990) documented the general lack of awareness of managers about the real contributions made by libraries and their information services, and argued the need to change this state of affairs.

A health professional in Yamamah noted:

> *"We health professionals are, in this hospital, in need of great openness to health information located in vast electronic sources outside. Unfortunately, we might search for information in another place, which is hard most of the time."*

Direct information flow through the healthcare environment characterises it as a flourishing health information society. Information flow through formal and informal networks across this society build strong communication channels and promote competition. However, health professionals still experience difficulty in obtaining health information. One health professional in the IGH noted:

> *"... Why, every time, do I need to spend a great deal of time finding information? Why can information not reach me directly via my desk top!"*

A health professional (physician) in the KFSH/RC strongly criticised the condition of information services and delivery and indicated that the problem was not related to information tools but indirectly to other factors:

> *"The same tools as in the USA exist here, yet we still lack information being delivered to us either to our desktops or PDAs. I wonder if this service contradicts information policies in the country."*

Cooperation and collaboration among health sciences libraries is essential to their success. However, official cooperation is lacking among health sciences libraries in Riyadh particularly and in Saudi Arabia as a whole (see Chapter 4, Literature Review, and Chapter 10, Information Provision). The concept of cooperation amongst health sciences libraries is needed for their development and its advantages to users. A health

professional in KKESH explained the importance and advantages of cooperation among health sciences libraries:

> *"Medical libraries in KSA have various interests depending on the hospital speciality or political powers that lead it, so the resources of one library may be richer than another, which can cover the shortage at the other libraries and vice versa. Also having links is highly cost effective, as there would not be duplications in purchasing materials; also it would be time saving and energy saving as it limits physical and space travel."*

In addition, there were other comments by health professionals which indicated their needs. Health sciences libraries should show more concern to investigate needs and requirements and how to fulfil these needs and to improve their services, in order to obtain health professionals' satisfaction and to participate in accomplishing hospitals' missions.

Generally, the information services provided by health sciences libraries are perceived as having significant impact on the practice of medicine (King, 1987; Marshall, 1992; Breton, 1994; Urquhart, 1995; Oduwole, 1999; Ali, 2000; O'Connor, 2002; Peterson and Harris, 2002; and Dalrymple, 2003). The health sciences library information services can have an impact on the way knowledge is put into practice (O'Connor, 2002). Urquhart (1995) reported respondents' view that information supplied by health sciences libraries can have a positive effect on future clinical decisions.

On the other hand, many comments highlight the need for professional health librarians to provide better services and support for users in their search. The research done by Maynard (2002) provides evidence that adequate training, especially in ICT, is very important and greatly needed by librarians in order for them to provide a satisfactory search support for users. Stolt (1996) points out that utilisation of electronic resources will require continuous training programmes for end-users. Polson (1988), in an early study, reported a 100-300% reduction in training times for subsequent task training as a result of employing consistency within and across applications. Hewitson (2002) concluded that users tend to stay with the one service they feel confident using. Unique application interfaces lead to a decrease in usability

and to difficulties remembering the unique methods used by different systems (Morris and Dyer, 1998). Garrod (2001) suggested that the electronic and virtual library interface should consider the end-user who may have to access resources from a variety of locations.

One way to solve and meet the needs of professional librarians is described by Garrod (1998). It is the ideal role of librarians in the digital era, which requires staff to strive to change and be proactive in terms of both their approach to work and their own professional development.

As regards respondents' perceptions of their ability to perform this role, a good number of staff interviewed (N=18 out of 22, 11 male and 7 female) indicated that they had the ability to provide help and services to any researcher in the field of medicine, which means that most had confidence in themselves. However, staff in the SCH and Yamamah, and a few in KFSH/RC and RAFH health libraries, indicated that they were not able to provide sufficient help to any researcher in the field of medicine. They attributed this to refer to their weak background in the field of 'health librarianship', and to a lack of knowledge or background in the field of medicine and healthcare terminology.

Through observation and investigation, the researcher found that the majority of health library staff perform paraprofessional tasks (e.g. issuing books, photocopying). It can be argued, therefore, that staff in health libraries are willing to help and to provide more services, but they need to improve their professional skills and to have more resources available that meet the information needs of users. Willingness without proper skills and tools cannot provide satisfactory services, as has been observed during this research.

8.5 Summary

It is clear that the health library should have a vision of users' education and awareness, since users are seeking information mainly to satisfy their need to keep up-to-date with new knowledge in their field of medicine. It is important that health libraries should draw up a strategic plan to participate in the hospital's 'clinical practice' and to provide accurate information services based on a firm identification

of the need in clinical work. The current change from print and other forms to electronic forms, in which information is made available, is bringing about changes in users' information needs. However, health professionals in government hospitals in Riyadh were still making greater use of printed materials and sources than electronic sources. In addition, female respondents reported using electronic sources less than males working in the healthcare environment.

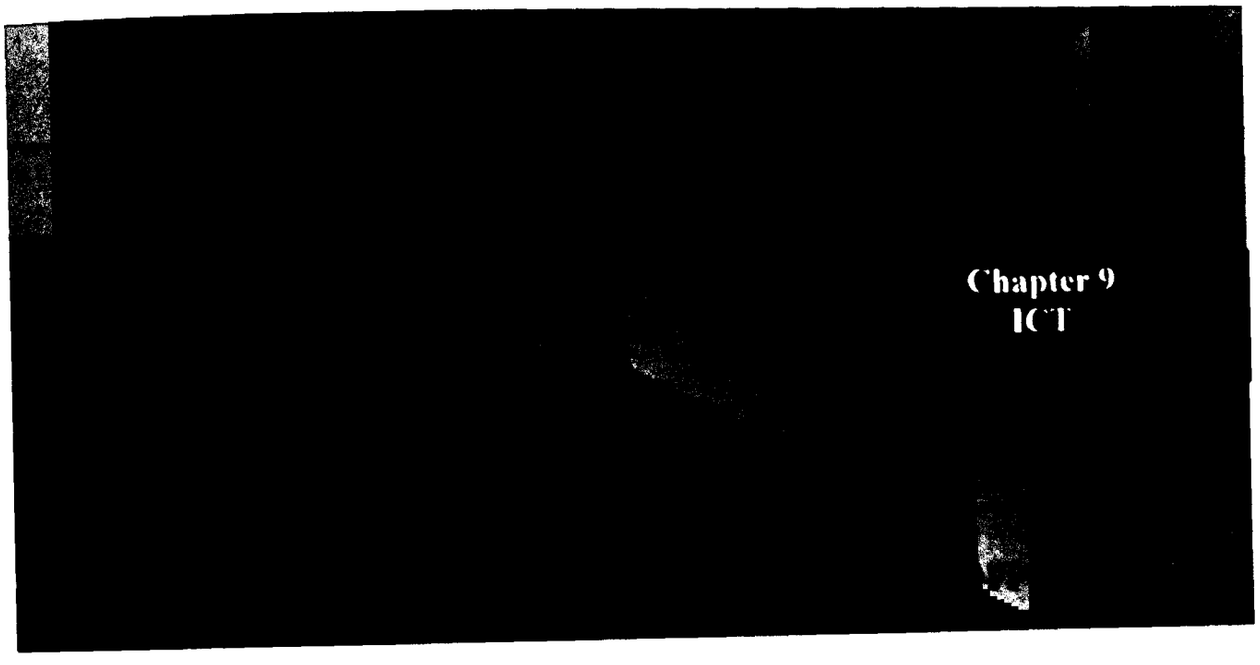
The health libraries and information services have an influence upon users and upon healthcare practice. Health professionals in the current research show the need for information. By and large, the various services provided by health sciences libraries were perceived by users as not reaching a satisfactory level. Furthermore, the insufficient services might be an obstacle to improvement in the healthcare system overall. It is essential for health sciences libraries to consider reviewing their position and the information services they provide. There is also a need for a general improvement in the capabilities of staff working within those libraries.

The quality and efficiency of information services depends on the resources and facilities available to health science library professionals. Therefore it is useful to consider the ICT development in the health science libraries in Riyadh in order to assess their adequacy, and identify where there may be need/scope for development. The next chapter, therefore, highlights the issue of ICT in those libraries, as it aims to evaluate ICT implemented within them through the insight of health professionals.

Chapter Nine

Information and Communication Technology

POSITION IN THE THESIS



This chapter has answers to the following research questions:

- **What is the level of satisfaction of health professionals with ICT implemented in hospitals and health sciences libraries?**
- **What is the level of use of information tools?**

Chapter Nine

9

Information and Communication Technology

The aim of this chapter is to highlight the topic of information and communication technology in the health sciences libraries in Riyadh hospitals. Furthermore, it aims to evaluate ICT implemented within these libraries as perceived by the health professionals, whom these libraries aim to serve.

The chapter will discuss users' perceptions of the ICT implemented in terms of the following: 1) Personal computers, 2) Hospital networks, 3) Present system of computing, 4) CD-ROM workstations, 5) OPAC, 6) Internet, 7) Electronic databases, 8) Electronic services, and 9) Information tools.

It is important to note that some topics have not been covered, such as the use of the Personal Digital Assistant (PDA), a new technology used for delivering information

to health professionals. This is due to the fact that these technological devices are not used by health libraries in Riyadh. It is worth stating that PDA technology has only recently been adopted by some health libraries in developed countries; therefore, it is possible that it will take some time to appear in less developed countries. However, recently, King Faisal specialist hospital and research centre announced the intention to introduce the use of PDA.

In general, ICT is observed to facilitate and provide access to vast amounts of information. It enables larger amounts of information to be circulated with higher speeds at lower costs. Technology plays an ever-increasing role in all organisations, and libraries are no exception (Lavagnino, 1998). New information technologies are making it possible for libraries to make the transition from a traditional library facility in one location to a corporate information centre providing information products and services at the point of need.

Hughes et al. (2002) note that ICT has become an important element of the working life of any healthcare service, and there has been a sharp increase in the amount of clinical information due to the use of advanced information technology. In some developed countries, health professionals and other information seekers no longer need to physically enter the library premises in order to take advantage of its services.

Meanwhile, in developing countries, time is needed for full implementation, evaluation and continuous development in order to reach a satisfactory level of information provision using ICT. However, ICT by itself will not shape the future of the developing countries. Change will be seen once these countries are encouraged to invest in ICT. It is therefore important for these developing countries to bear in mind the gradual implementation, considering cultural and environmental structures.

9.1 Personal Computers (PCs)

This section will explore the health professionals' views about the number of PCs provided in their health sciences libraries. Table 9-1 shows that only 10.2% of the total number of respondents was satisfied with the number of PCs provided libraries, compared with more than half of respondents (55.8%) who were not satisfied.

However, 31.8% of respondents were unable to determine if the number of PCs was satisfactory or not.

Table 9-1: Number of PCs

Number of PCs	Frequency	Percentage
Yes	50	10.2
No	275	55.8
I do not know	157	31.8
No answer	11	2.2
Total	**493**	**100.0**

Using a Chi-square test, it was found that there was a significant association between gender and respondents' satisfaction with the number of PCs available in health libraries ($\chi^2 = 15.45$, $df = 3$, $N = 488$, $p < .001$). Female health professionals were more satisfied than male.

To investigate whether job description is related with satisfaction with the number of PCs available, a chi-square statistic was also used. Categories in this section were reduced for the purposes of cross-tabulation: *IT/IS computer staff*, *administrators*, *pharmacies*, *paramedical personnel*, and *medical technician* were all grouped together to form *other*. The result indicates that there was no significant association between job description and satisfaction with the number of PCs in with health library ($\chi^2 = 1.99$, $df = 2$, $N = 325$, $p < .369$). This means that the proportion of physicians who were not satisfied with the number of PCs in health sciences libraries was not significantly different from the proportion of nurses who were not satisfied.

More light on the general dissatisfaction with the number of PCs available can be shed by considering the situation in individual hospitals. An individual hospital chief librarian in the Yamamah health library indicated her need for PCs since there was none available there. In IGH, only one respondents out of 26 expressed satisfaction with the number of PCs; the researcher observed that there was only one PC available at the time of conducting this study. In contrast, the numbers of PCs in KFSH/RC, RAFH, and KACM health libraries were greatest. As a result, users of these health

libraries were more inclined to express satisfaction with the number of PCs than in other libraries.

The shortage of PCs offered in the health libraries generally led users, to some extent, to use printed materials more frequently (see Chapter 8: Information services – Information sources). Respondents called for more PC terminals in the health libraries, which would avoid their having to wait in queues and being dependent on printed collections and materials. A previous study on Saudi libraries also found that the lack of PCs has an impact on computer usage (Basager, 2001). Moreover, AlShaya (2002) also confirms that an insufficient number of access points was an obstacle hindering the usefulness of other services such as the Internet.

9.2 Hospital Networks

Networks are very important for the improvement of health information provision in hospitals because they allow health professionals to locate information needed for the more confusing or difficult cases within their practice. Shani (2000) stressed the importance of health networks to allow health professionals to pursue lifetime learning, which should be the goal of everyone working in the healthcare environment.

This topic was included to explore if users had access to hospital networks from their home. Access to hospital networks could facilitates access to health libraries' resources and services, since these libraries are an integral part of the healthcare environment. On the other hand, the very existence of and access to such a network gives an indication of the development in hospitals with regard to ICT implementation.

The results in Table 9-2 show that the majority of respondents (90.5%) had no access to hospital networks from their home, while only 8.1% had access.

Table 9-2: Hospital network access

	Frequency	Percentage
Yes	40	8.1
No	446	90.5
No answer	7	1.4
Total	**493**	**100.0**

A chi-square test was performed to identify whether hospital network access was related to health professionals' gender. The value generated was =0.323, with an associated significance level of 0.6. In this case, the value is larger than the alpha value of .05; therefore it can be concluded that this result is not significant. This means that the proportion of male health professionals without access to the hospital network was not significantly different from the proportion of female health professionals without access.

Another chi-square test was used to investigate whether having hospital network access was related with respondents' job description. Categories in this section were reduced for the purposes of cross tabulation; *IT/IS computer staff*, *administrators*, *pharmacies*, *paramedical personnel*, and *medical technician*, were all grouped together to form *other*. The test resulted in a value of χ^2=6.099, with an associated significance level of 0.04. This means that the proportion of other hospital staff (neither physicians nor nurses) without access to the hospital network was significantly different from the proportion of physicians and nurses without access (Figure 9.1).

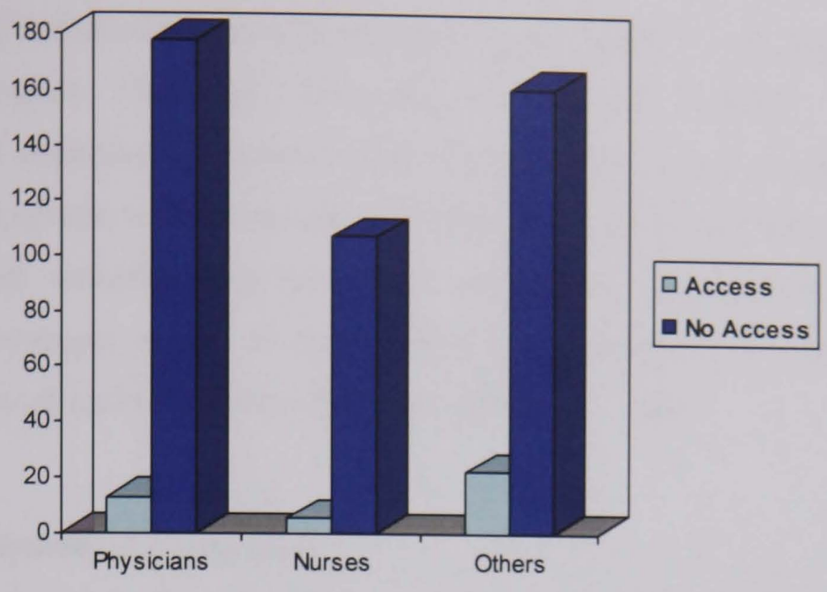


Figure 9.1: Access to hospital networks by Job description

The general lack of network access was confirmed by respondents' comments which indicated that this type of access was not easily available to them and, in some hospitals such as IGH, SCH and Yamamah, there was no such computer network. Respondents also expressed the view that the inaccessibility of the computer network undermined users' satisfaction with the present computing system in hospitals. This point will be discussed farther in section 9.3.

Even in hospitals known to be advanced in establishing new technologies, such as KFSH/RC, KACM, and RAFH, respondents indicated that they had no access to the hospital computer networks from their homes. Indeed, the percentage of total respondents who claimed that they had access to the computer network was very small. It was noticeable that most respondents who had access to the hospital network were in KACM and KFSH/RC. It is possible that respondents who had access to a hospital network were resident in the hospital compound area, which would be connected to its network.

Availability of network access could be a valuable facility for health professionals, judging by the experience of other countries; Franklin and Plum (2002) in their study demonstrate that remote usage of networked electronic services significantly exceeds in-library usage of those same resources. Al-Zahrani (2001) argued that the time has come not just to implement a computer network system, but also to plan and

implement a nationwide computer health information system for Saudi Arabia. He proposes a novel information network system, which should enable Saudi Arabian hospitals, particularly University Hospitals, to exchange medical and health information, and expertise for better health service provision. Al-Zahrani expected that his proposed system would form part of a Saudi National Health Network System (SNHNS). Indeed, recently, there have been various discussions in Saudi official meetings and newspaper reports about the need of implementing a National Health Information Network (Al-Ofi, 2002; Khudair and Bawden, 2004).

9.3 Present System of Computing

A system of computing is an essential sign of IT infrastructure built and managed in organisations. One of the early pioneers of the electronic library, Tilburg University in the Netherlands, suggested that the central elements of a successful electronic library are an infrastructure based on campus-wide accepted computer architecture, integration of services, and personally controlled information management (Geleijnse, 1994).

The topic under investigation explores the satisfaction of health professionals with the present system of computing in Riyadh hospitals. Almost half the total respondents (49.5%) gave a negative answer; this means that the majority were not satisfied with the present system (Table 9-3). However, a slightly lower percentage of respondents (45.6%) gave a positive answer, while only 4.9% of respondents gave no answer.

Table 9-3: Satisfaction with present system of computing

	Frequency	Percentage
Yes	225	45.6
No	244	49.5
No answer	24	4.9
Total	**493**	**100.0**

Some health professionals cited the lack of access to the hospital network from their home as a reason for dissatisfaction with the hospital systems of computing. Moreover, the result of a chi-square test revealed that there was a significant association between having access to the network from home and satisfaction with the

system of computing ($\chi^2 = 9.56$, $df = 4$, $N = 493$, $p < .048$). Respondents who have access to the network from home and are satisfied with the present system were more than those who also have access from home to the network but were not satisfied (Figure 9.2). However, the strength of this association was very small (Phi= 0.139), according to Cohen's (1988) classification.

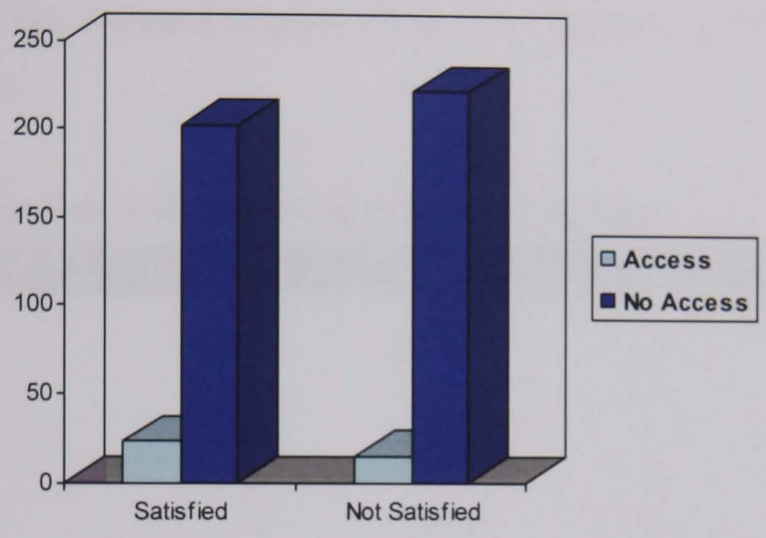


Figure 9.2: Network access by satisfaction with computing system

In general, respondents explained their dissatisfaction in terms of their needs. For example, physicians wanted the Intranet to be installed on all PC systems as a part of the hospital facility, and for the Internet to be available on individual PCs. Another physician highlighted a shortage of PCs and access points; a lack of online services was also noted. Similarly, a female physician linked her dissatisfaction with the present computing system to the fact that she could not access the library's electronic resources from her office.

It seems that the current hospital system and networks did not facilitate access to the health library database or other databases located in some hospitals and research departments. It was observed that there was no computing network in some hospitals, and amongst hospitals in Riyadh in particular. Al-Zahrani (2001) similarly discovered the lack of electronic connection in university hospitals in the Kingdom of Saudi Arabia, which had an adverse impact on hospital staff and health professionals' level of satisfaction with the computing systems.

Table 9-4 shows that respondents who were satisfied with the present computing system in KACM, KKESH, KFSH/RC, RAFH, and SFH outnumbered those who were not satisfied. However, in the case of IGH, KAUH/CD, SCH, and KKUH, dissatisfied respondents outnumbered those who were satisfied. Moreover, two staff members in the KKUH noted the need for updating the current system; they felt there might be a need to change the system, but even more, to change the management structure, which they indicated displays a lack of co-operation and understanding of new technologies.

Table 9-4: Satisfaction with computing system of hospitals

Name of Hospital	Yes	No	No answer	Total
IGH	0	26	0	**26**
KACM	38	14	2	**54**
KAUH/CD	6	45	0	**51**
KKESH	13	10	4	**27**
SCH	0	21	0	**21**
KFSH/RC	65	16	6	**87**
KKUH	9	55	0	**64**
RAFH	34	19	6	**59**
SFH	53	13	4	**70**
Total	**218**	**231**	**24**	**493**

One librarian in KKUH commented:

> *"The problem is beyond the present system. I believe there will not be any further development if the higher managers do not devote themselves and shift to the concept of future change. The difference between here and there is the conceptual thinking and adoption of technology merely to serve."*

The development of computing systems in the health sciences libraries is essential. However, most have been very slow in the process of development. On the other hand, a few of the libraries are proactive in maintaining and updating their computing system. For example, recently, in 2004, the health sciences library in KFSH/RC updated its computing system and implemented a Horizon system.

9.4 CD-ROM Workstations

Health sciences is one of the first fields to experience large-scale adoption of CD-ROMs, and these have been the most popular acquisition in health sciences libraries, with the advantages of access control and ease of use (Wood, 1993). In developing countries, users who cannot search online databases can easily and conveniently search the CD-ROM versions in-house (Mirza and Siddiqui, 1993; Aseel, 1996; Basager, 2001; Alshay, 2002).

Given the potential advantages of such facilities, it is of interest to examine users' perceptions on the number of CD-ROM workstations provided by the libraries in Riyadh. Table 9-5 shows that only 7.9% of respondents were satisfied with the number of CD-ROM workstations provided, while 28.6% were not satisfied. The majority of respondents (47.7%) did not know whether the number was sufficient or not, while 13.2% believed that there were no CD-ROM workstations provided in their health sciences libraries.

Table 9-5: CD-ROM workstations

No. of CD Workstations	Frequency	Percentage
Satisfied	39	7.9
Not satisfied	141	28.6
Not know if satisfied	235	47.7
No Workstations	65	13.2
No answer	13	2.6
Total	**493**	**100.0**

Even though only four out of eleven health libraries in Riyadh had CD ROM workstations, a large percentage (28.6%) of respondents were not satisfied with the number. It is noticeable, and surprising that around half the respondents did not know whether the number of workstations was sufficient or not, or even whether such a service existed. This suggests that health libraries have not effectively publicised their services and made their users aware of the existence of such facilities. This would be consistent with Basager's (2001) claim that, in Saudi Arabian libraries, publicising services is one of the most important factors in marketing the service. On the other hand, there is a possibility that those respondents were not users of CD-ROM

workstations, and this was why they could not assess whether or not this service was satisfactory.

Investigation revealed that little attention has been paid to this service, especially in recent times. In fact, the CD-ROM workstations service has largely been replaced by the Internet. The KFSH/RC health sciences library recently moved it workstations to the educational department, believing that availability of the Internet removed the need for them in the library. As far as the majority of other libraries are concerned, the lack of funding and staff shortage were regarded as major constraints on establishing and maintaining CD-ROM workstation services.

As observed, health professionals, and particularly physicians, are circulating some Medical CD-ROMs in various specialities. As a subscriber to the Saudi Physicians E-mail Group (SPEG), the researcher received a bibliographical list of CD-ROMs that cover over 600 medical and health titles (see Appendix G). It can be concluded that physicians are in need of CD-ROM workstations (databases) which enable them to access a number of different CD-ROM collections at one time. This need was increased because of the problem of access to electronic database in the health field (see Section 9.7)

The CD-ROM workstation can be useful for libraries that cannot afford the Internet, electronic databases or e-journals for their users. Generally, respondents were conscious of the limitations of CD-ROM collections and workstations, and the difficulties hindering use. Limited access to the service, as indicated by some respondents, was seen as a weakness because of technical and skill requirements.

Based on the above and on observations, it can clearly be said that:

1) There is a lack of awareness of the importance of the CD-ROM workstations (databases).
2) There is a need for the professional staff who work in the health libraries to appreciate such technology.
3) There is a lack of specified funds for this service.
4) Health libraries providing this service should work more effectively in publicising it.

9.5 OPAC

It is evident that there is growth in the use of Online Public Access Catalogues (OPAC) in libraries in general, in the USA and the UK, as they provide faster access to the library catalogues. Today, an OPAC can provide access to many library databases through the Internet, enabling the retrieval of useful information. Joint (2001) notes that a newly developed OPAC service offers a variety of interface options, including a range of listing devices and browsable filters that complement and enrich the search functionality of these powerful database systems.

It must be noted that not all health sciences libraries in Riyadh provide OPAC services (see Section 9.9, Information tools). Thus, the absence of OPAC in most of these health libraries directs users to find alternative services that can provide them with the information they require, even relying on card catalogues. Deemer (1982) however, indicated that KSU had already started to implement online library information systems. It is also worth noting that the health libraries in KKUH and KAHU/CD have a connection with the University Central Library of King Saud University's main and union catalogues. As a result, respondents in KKUH and KAHU/CD showed a higher use of the OPAC service.

However, one librarian in the KKUH health library indicated that the OPAC system (DOBIS/LIBIS) was very weak. He claimed that there were many deficiencies in the OPAC system, especially the Arabic version. This is consistent with findings of Basager (2001), who highlighted some weaknesses of this system also observed by the researcher:

1) There is no special file for series titles.
2) The system is slow.
3) The system is old, and cannot be accessed via the Internet.
4) There are difficulties with the interface. Access to the English version can be made using PCs, while the Arabic version has to be accessed through a special terminal.

9.6 Internet

The Internet is a great environment that provides easy access to a huge valume of information. The Internet service was provided to Saudi Arabia at a late stage, having been established officially in the country in December 1998. Basager (2001) suggests that one reason for the delay was the need to set rules in order to prevent access to offensive sites. This delay has affected the provision of this service to the health libraries to some extent. The Saudi government uniquely authorised KACST to provide the Internet service. As a consequence, no other institutions and bodies could use this service without accessing it through KACST.

It is worth noting however that a few hospitals in Saudi Arabia, such as KFSH/RC and RAFH in Riyadh, had access to the Internet service or any strong connectivity before the official establishment of the service in the Kingdom in 1998. Access for these specific hospitals came through special permission from the Royal Council. The fact that such permission was sought and granted is a favourable indicator of awareness of the need for adopting new technologies within these hospitals and medical units, in order to develop healthcare systems and services.

The investigation in relation to the Internet was intended to explore specifically the health professionals' use of the Internet, and covers the following:

1) Regularity of Internet use.
2) Place of Internet access.
3) Rating of information obtained with an Internet search.

As shown in the Table 9-6, the majority of respondents (63.9%) used the Internet on a regular basis, while 35.3% did not interact with the Internet regularly.

Table 9-6: Internet use

Internet use	Frequency	Percentage
Yes	315	63.9
No	174	35.3
No answer	4	0.8
Total	**493**	**100.0**

Accordingly in a cross-tabulation, 73.0% of male health professionals in Riyadh hospitals used the Internet, while a lower percentage (52.5%) of females used it on a regular basis (Figure 9.3). Respondents in KFSH/RC used the Internet more than respondents in individual hospitals. Generally, respondents in KFSH/RC, RAFH, KKUH and KACM used the Internet on a regular basis more frequently, while the majority of respondents in SCH, KAUH/CD, SFH and IGH indicated that they did not use it regularly.

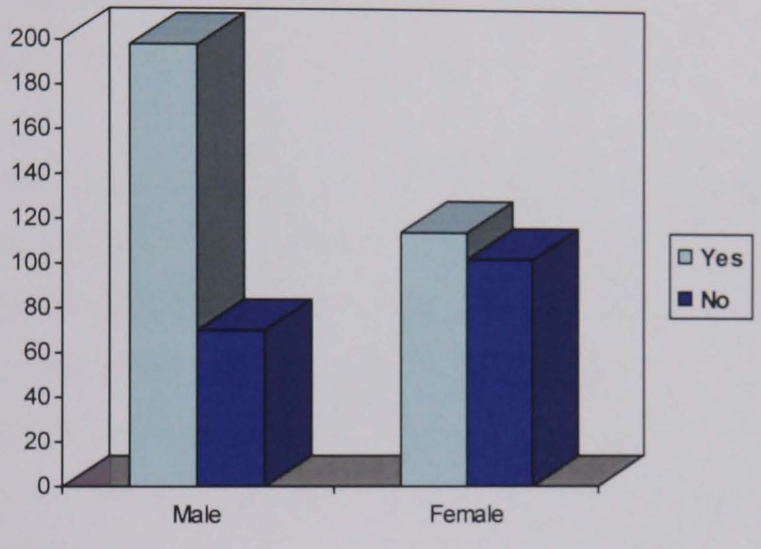


Figure 9.3: Internet use on regular basis by gender

However, respondents who used the Internet on a regular basis (N=315) used it to surf, and accessed it in places other than health sciences libraries. Table 9-7 shows that the majority of respondents (72.7%) accessed the Internet from other places, including home, work departments, or Internet Cafés, while only 25.4% of respondents accessed it from health sciences libraries.

Table 9-7: Where to access Internet

	Frequency	Percentage
In the library	80	25.4
Elsewhere	229	72.7
No answer	6	1.9
Total	**315**	**100.0**

In detail, the majority of respondents in KACM, KAUH/CD, KKESH, SCOT, KFSH/RC, RAFH and SFH indicated that they accessed the Internet from places other than the health library. This was mostly preferred, in view of accessibility in other places such as departments and offices. On the other hand, the majority of respondents in IGH and KKUH indicated that they used the Internet in the library more than elsewhere. IGH had no Internet network, but access was available in certain areas of the hospital, one of them being the health sciences library. The best place for students of the College of Medicine, KSU, to access the Internet was through their health library at the KKUH. In the case of SCOT and Yamamah, none of the respondents indicated they used the Internet in the health library since these two libraries did not have PCs and Internet connections for users.

SCOT health library had no access to the Internet, but the Internet service was established in all hospital offices, because those in authority believed access to the Internet should be obtained from an individual's desktop. In fact, the library was used for two main purposes: firstly, to host printed materials and to shelve printed issues of the Medical Journal published by SCOT; secondly, to conduct administrative meetings. Similarly, Yamamah library, as indicated by its health librarian, had no Internet access service.

In brief, the majority of respondents accessed the Internet in places other than the health libraries. The reason for this can be linked to:

1) Internet service was accessible in most hospital departments and offices.
2) Users' workloads in the hospital environment limited their access to and use of the Internet to be specifically from the health library.
3) The location of most of health libraries, and their opening hours, prevented users from using the library to access the Internet.

Table 9-8 shows that 56.0% of respondents believed they derived important information from their search on the Internet, whilst 32.0% of respondents believed that the information obtained was fairly important, and only 4.1% generated unimportant information.

Table 9-8: Internet information rating

	Frequency	Percentage
Important	276	56.0
Fairly important	158	32.0
Not important	20	4.1
No answer	39	7.9
Total	**493**	**100.0**

Statistically, based on the results in Table 9-8, the median rating of information generated from the Internet by users in the healthcare environment was 'important'. Therefore, the useful information generated reflects the importance and need of the Internet service to be provided in all health sciences libraries in Riyadh

As mentioned earlier, respondents in the KFSH/RC and RAFH hospitals used the Internet more regularly than those in other hospitals, and they rated the importance of the information they obtained higher than did other hospital respondents. This suggests that respondents in KFSH/RC and RAFH hospitals were more advanced in the use of the Internet than those in other hospitals. This advancement can be ascribed to the privilege of having the Internet service provided in these two hospitals earlier than in other hospitals.

9.7 Electronic Databases

This section is aimed to discover if there is a shortage of access to electronic databases, and to determine if there is any demand for a certain type of database that has not yet been provided by the health sciences libraries in Riyadh. Table 9-9 shows that the majority of respondents (66.7%) had experienced some problems in accessing specific electronic databases. In fact, only 19.5% of respondents indicated that they experienced no difficulties in accessing electronic databases.

Table 9-9: Database access

	Frequency	Percentage
Yes	329	66.7
No	96	19.5
No answer	68	13.8
Total	**493**	**100.0**

Respondents indicating that they had not experienced access difficulties mostly worked in KACM, KKUH, RAFH and KFSH/RC hospitals. They reported that their health libraries provided access to electronic databases that are needed and related to their profession. However, the majority of users in all hospitals had experienced some problems in accessing electronic databases from the health libraries.

To investigate whether problems in accessing these databases were related to gender, a chi-square test was used. The result ($\chi^2 = 4.55$, $df = 1$, $N = 221$, $p < .03$) indicated that the proportion of male health professionals who had problems in access was significantly different from the proportion of female health professionals who had problems (Figure 9.5).

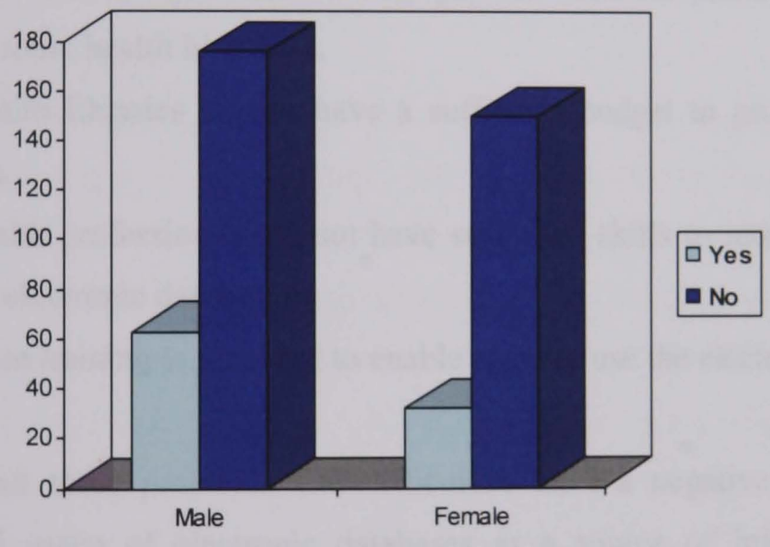


Figure 9.5 Problem in accessing electronic databases by gender

There was also a significant association between job description and facing problems in accessing electronic databases. Categories in this section were reduced for the purposes of cross-tabulation; *IT/IS computer staff*, *administrators*, *pharmacists*, *paramedical personnel*, and *medical technicians* were all grouped together to form *other*. The result ($\chi_2 = 7.49$, $df = 2$, $N = 425$, $p < .02$) indicated that physicians had more problems in accessing electronic databases than nurses and others.

Respondents indicated that they needed to have access to electronic and medical databases such as Medline, the Cochrane Collaboration, Harvard Medical School, OVID and BSDI software and database (BSDI specialises in Health and Wellness

facilities and programmes). Health sciences libraries should inform users about the available databases and what type of databases they need to subscribe to. It is also essential to make health professionals aware of how these databases could be used in order to obtain useful information, which should help to evaluate the use of databases accurately. Staff help is also important in this matter, to provide useful services directly to users and for users to gain a positive impression of the databases available to them.

Respondents complained about other problems regarding electronic database access. Some of these problems were:

1) Health libraries do not provide sufficient databases to users, and some libraries do not provide access to any electronic databases.
2) Electronic database providers do not provide accurate technical support, as noted by some health librarians.
3) Some health libraries do not have a sufficient budget to provide electronic databases.
4) Some health professionals do not have sufficient skills to interact and search using the electronic databases.
5) Insufficient training is provided to enable users to use the electronic databases.

It is clear that all these problems and difficulties have a negative impact on the accessibility and usage of electronic databases as a source of information when compared to other electronic services available in the health libraries.

Recently, businesses and organisations in Saudi Arabia realised the importance of accessing health and medical databases for health professionals, and started to provide such a service with an annual subscription payable by individual users. However, in 2004 the Prince Sultan Charity Organisation started supporting an advanced business in this field in order to provide access to medical and health databases for Saudi health professional at a very low cost.

9.8 Electronic Services

This section will investigate respondents' preference in using the electronic services provided by the health sciences libraries. Table 9-10 shows that 47.6% of respondents preferred to access electronic services by themselves, while only 14.4% preferred to access them through the health library staff. A high percentage (33.3%) of respondents did not mind whether they accessed the electronic services through the health library staff or by themselves.

Table 9.10: E-services access

Access by	Frequency	Percentage
Library staff	71	14.4
Myself	235	47.6
Both	164	33.3
No answer	23	4.7
Total	**493**	**100.0**

The highest percentages of respondents who preferred to access the electronic services by themselves were in KKUH, KFSH/RC and IGH. Of the comparatively small percentage of respondents who preferred to access electronic services with the help of the health library staff, most were in two hospitals, KKESH and SCH. Health professionals expected library staff to give them independence when dealing with electronic information services. Moreover, respondents also expected libraries to provide electronic service courses in order to promote their skills and to give them confidence in their ability to use the electronic services more effectively, without having to seek assistance from library staff.

As for the value of the electronic information services to respondents, Table 9-11, shows that 48.9% of respondents believed that the electronic information services provided by the health libraries was important to enable them to acquire the information they needed and a further 36.1% rated these services as fairly important. Only 6.7% of respondents noted that these electronic services were unimportant in relation to the fulfilment of their information needs.

Table 9-11: E-services evaluation

	Frequency	Percentage
Important	241	48.9
Fairly important	178	36.1
Not important	33	6.7
No answer	41	8.3
Total	**493**	**100.0**

The median evaluation of e-services was important. However, in relation to individual libraries, the majority of respondents in KAUH/CD, KKESH and SFH indicated they were fairly important. Respondents who claimed they were not important were mostly in KKUH, SCH and SFH. Remarkably, none of the respondents in KACM, KAUH/CD and KKESH indicated that the e-services provided were not important

A chi-square test was used to find association between accessing of electronic services by *library staff* or *myself* and the rating of electronic information services (χ^2 = 4.200, with an associated significance level of 0.04). In this case, the value is smaller than the alpha value of .05; therefore it can be concluded that this result is significant. This means that the number of users who preferred the help of library staff and rated the electronic services as important was significantly different from the proportion who preferred to use the electronic services by themselves and rated the services as important.

A cross-tabulation shows that physicians gave higher ratings of importance to electronic services provided by the health libraries than others, which indicates thier high appreciation of the electronic services (Figure 9.6). AlShaya (2002) similarly found that physicians admired electronic sources and services for their positive features and benefits, such as improving access to information.

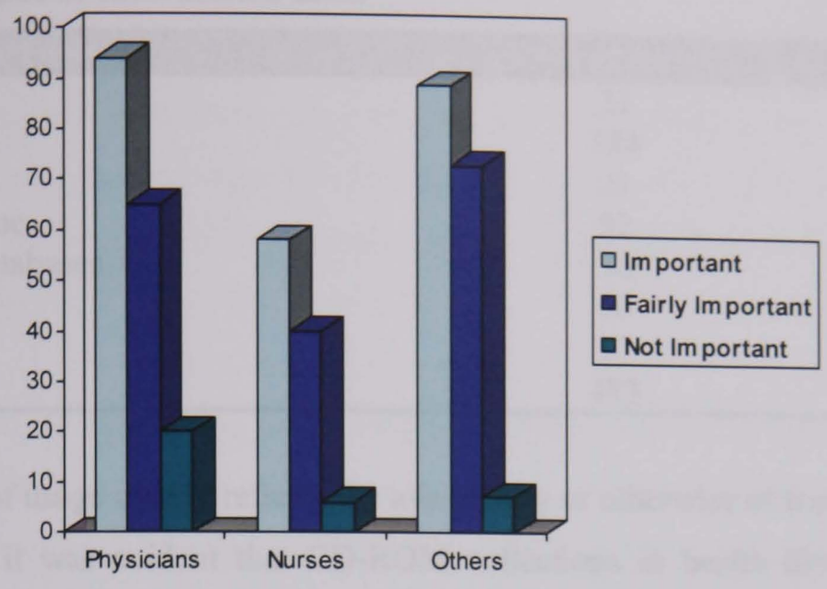


Figure 9.6: Rating of electronic services by Job description

In considering the electronic information services, hospital administrators, information professionals, and librarians should all be able to design and provide electronic information services that improve and enhance health professionals' access to medical and health information, and thus help to develop the quality of healthcare services.

9.9 Information Tools

This section aims to compare the respondents' use of information tools as a means of information searching. The majority of respondents (69.8%), as shown in Table 9-12, preferred to use and access the Internet for their information search. This was followed by the card catalogue which only 10.5% of respondents preferred to use for their search. A very small percentage (6.1%) of respondents preferred to use electronic databases, while there were only 4.3% each who preferred to use CD-ROM and OPAC for information searching.

Table 9-12: Use of Information tools

Information Tools	Frequency	Percentage
OPAC	21	4.3
Internet	344	69.8
CD-ROM	21	4.3
Card catalogue	52	10.5
Electronic databases	30	6.1
Other	10	2.0
No answer	15	3.0
Total	**493**	**100.0**

The pattern of usage clearly reflects the availability or otherwise of facilities. Through observation, it was evident that CD-ROM collections in health libraries were not sufficient and were not updated frequently enough. Most of the health libraries do not have an OPAC service for their users. As for electronic databases, some of the health library staff complained about electronic database providers in Saudi Arabia, saying that databases do not work properly and much of the time are out of service. This contributed to the problems and difficulties encountered by library users in accessing electronic databases (see Section 9.7, Electronic databases). Moreover, the availability of the Internet service, and the difficulties and obstacles occurring with other services such as the CD-ROM, OPAC and electronic databases, were major reasons why respondents preferred to use the Internet, and not other information tools and sources. The advantages of the Internet and its changing paradigm of all facilities and services make a difference to people's lives.

To investigate whether the preference of the use of the Internet as an information tool was related to job description, a chi-square statistic was used. Categories in this section were reduced for the purpose of cross-tabulation: *IT/IS computer staff*, *administrators*, *pharmacies*, *paramedical personnel*, and *medical technician* were all grouped together to form *other*. The result indicates that the variables are significantly associated ($\chi^2 = 7.307$, $df = 2$, $N = 478$, $p < .026$). The number of physicians who preferred the Internet as an information tool was significantly different from the number of nurses and others who preferred it.

Fors and Moreno (2002) reported that the use of ICT in the development process of most countries is on the rise, and that it has been used extensively from its inception

in the field of health and medicine. Technology plays an increasing role in most health sciences libraries in Riyadh. ICT has become an important element of the working life of health professionals, and there has been a sharp increase of the use of IT. This indicates the importance and recognition of the role of ICT in healthcare. It has been observed that ICT facilitates access to health information, but serious problems of implementation and access remain.

With regard to the situation in Saudi Arabia, Khudair and Bawden (2004) confirm that the features of the Internet have proven its superiority over all other types of information resources and communication tools. The researcher believes that the clear preference for using the Internet as a tool for searching for information is related to the following:

1) It is easy to use and interact with the Internet.
2) It is easy to access preferred websites, electronic journals and databases.
3) The Internet is available in most places: libraries, office desktop, and homes.
4) It combines three features, as a source of information, a search tool, and a way of fast communication with the outside world.

9.10 Summary

Information and Communication Technology (ICT) is universally accepted and implemented as being beneficial for individuals and organisations. It has been realised that ICT is a facilitator of both access and use of various resources. It is a trend and focal point for hospitals and health organisations concerned with their own development. Health professionals, generally, appreciate the implementation of ICT in the health sciences libraries, as it increases their access to various sources of information.

ICT is playing an important role in the health sciences libraries and has shaped a paradigm shift of functions and activities. However, it was observed in health sciences libraries in Riyadh that shortages of PCs forced users, to some extent, to use alternative means such as printed materials. The majority of respondents indicated that they had no access to hospital computer networks from their homes. The availability of the Internet service and the difficulties and obstacles occurring with

CD-ROM workstations, OPAC, and electronic databases can be considered as factors in respondents' preference for and greater use of the Internet rather than other information tools.

The high level of dissatisfaction with current ICT facilities, and the adverse impact the shortage of facilities has on information provision, raise questions regarding the future of the information services in health science libraries in Riyadh. The next chapter therefore investigates respondents' perception of the outlook for these services, the potential for development, and the problems that can be anticipated.

Chapter Ten

Information Provision

POSITION IN THE THESIS

Chapter 1 Introduction	Chapter 2 Background	Chapter 3 Research Design
Chapter 4 Literature Review	Chapter 5 Users and Staff	Chapter 6 Health S. Libraries
Chapter 7 Education and Training	Chapter 8 Information Services	Chapter 9 ICT
Chapter 10 Information Provision	Chapter 11 Change & Development	Chapter 12 SHIN Prototype
Chapter 13 Conclusions	Bibliography	Appendices

This chapter has answers to the following research questions:

- **What is the health professionals' provision of information and communication technology, and services?**
- **What is the health librarians' provision of health sciences libraries and services?**
- **What factors affects the development and implementation of ICT?**

Chapter Ten

10

Information Provision

The concept of the library access culture, as mentioned by Reid and Foster (2000), was devised as a research instrument to give researchers a point of comparison. They proposed two cultures: an access or network-friendly culture, and a holdings or network-averse culture. In the traditional library, it is possible to use important indications by relying, for example, on purchase recommendations, and reading lists. In the digital environment, indications are far less noticeable and reliable, although outsourcing may be achievable by co-operative activities like national networks or global resource-sharing. The success of an electronic library and computing systems depends on reliable access to user-required resources, combined with connectivity, content and competencies (MacDougall, 1998).

In developed countries such as the UK and USA, the brand of the information society is to have access to electronic resources. The use of new technologies has facilitated this access and use. Despite the differences within and between various environments in these two countries, a clearly shared aim is to enable users to gain access to and use the information they need. Libraries and service providers have adopted this ideology of service and information provision. Moreover, it is important to determine who is to be served, what is there to be offered, and what are users' and providers' expectations and provisions.

In Saudi Arabia, there has been little research concerned with health professionals' information and service provision. Al-Zahrani (2001) highlighted this issue in his study, and expressed the need of health professionals to have access to health information. Further, he suggested information-sharing between health professionals and hospitals. However, this vision would not be possible in the absence of a health information network.

This chapter aims to explore the provision of health professionals as a whole (physicians, nurses and others) towards the future of information and communication technology, and information services in health libraries and hospital environments in Saudi Arabia. It also highlights the health information professionals' provision and expectations related to the future of their health sciences libraries.

This chapter is divided into subsections as follows:

1) Health professionals' provision
2) Health information professionals' provision
3) Summary

10.1 Health Professionals' Provision

10.1.1 Information Network

Information networks facilitate the workflow and communication amongst various organisations and identities. For this reason, it is important in this section to view the health professionals' expectation regarding the information network among health

sciences libraries, and the realisation of those expectations if they are to help in accessing a greater amount of health information.

Table 10-1 illustrates that the majority (81.9% - N=404) of respondents believed that having an information network among health libraries would increase their ability to access the information as they need. This result is supported by the realised benefits of the information network worldwide; it shows that respondents working in Riyadh hospitals are aware of such technology and its effects. 9.5% (N=47) of respondents did not know whether the information network would help them to access more required information or not. Although this is a low percentage, it suggests that health professionals are concerned about the successful implementation of such a network. A health professional in RAFH noted his concern related to the implementation of a health sciences network. He expressed his anxiety and fear of network establishment and implementation failure, such as had occurred with many programmes and processes he had observed. However, various health professionals in different hospitals recorded their anticipation of such network which would enable them to have access to extensive health information resources with one press on their keyboards.

Table 10-1: Information Network among HSLs

	Frequency	Percentage
Yes	404	81.9
No	20	4.1
I do not know	47	9.5
No answer	22	4.5
Total	**493**	**100.0**

Further statistical test revealed that there is a significant association between respondents' way of accessing electronic services and their need for an information network among HSLs in Riyadh (Figure 10-1). The result ($\chi^2 = 7.04$, $df = 1$, $N = 277$, $p < .00$) indicates that respondents who preferred to access electronic services by themselves were more likely to believe that there is a need for an information network than those who preferred access through health library staff. This result confirms that health professionals needed a health sciences library network, as the majority preferred to access electronic services by themselves.

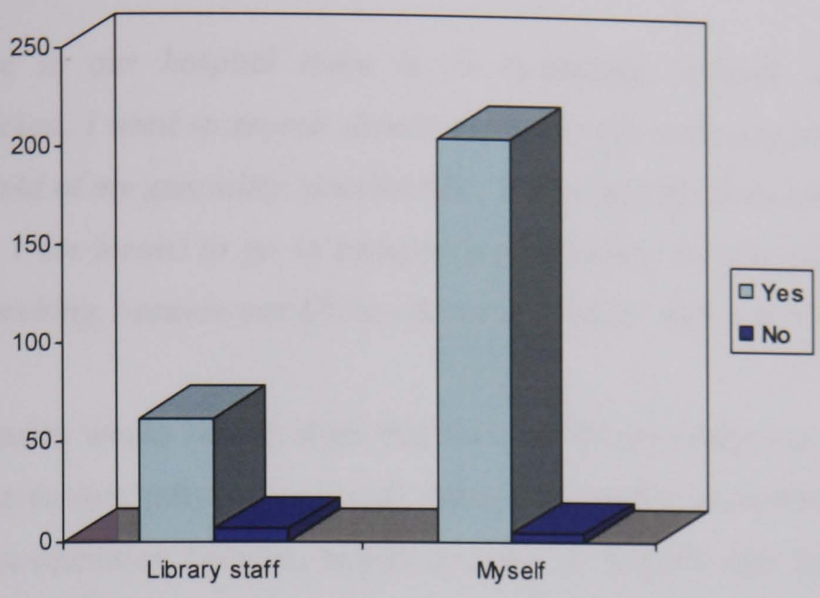


Figure 10.1: Health sciences libraries network by ways of accessing e-services

As seen in Figure 10.1, it appears that those who preferred to access e-services by themselves had more appreciation for better facilities such as networking in health sciences libraries. This appreciation was generated from their experience and realisation of the importance of having more access to services and resources. Indeed, as confirmed in the literature review of this study, wider access to health information services and resources will influence positively health professionals' practice and knowledge, and hence, the development of the healthcare profession in the country.

In detail, respondents in SCOT, IGH, KFSH/RC and KAUH/CD were most inclined to look for such networks to be established among Saudi health libraries, and none of the respondents in IGH, KAUH/CD, and SCOT indicated that there is no need for an information network. This reflects and confirms the need for information networks amongst health sciences libraries in Riyadh (see Section 10.2.6 Information network).

The need is increased in hospitals where there are no computing networks and no connection to other information networks. Many respondents asked for the immediate establishment of an information network, and to be connected to other networks and information centres.

A respondent from SCH commented:

> *"Here in our hospital there is no computing network. As a physician, I need to search almost every day for new research in the field of my speciality 'paediatrics'. Unfortunately, from time to time, I am forced to go to another health library for the sake of researching, because our library does not provide such a service."*

The health libraries would benefit from this network by providing more convenient, accurate and up-to-date information to all users. Information networks could create and improve co-operation between health libraries in Riyadh (see Section 10.2.1, Official co-operation), in the whole of Saudi Arabia and with other health libraries elsewhere. Information networks could facilitate the sharing of information between Saudi hospitals and healthcare centres. They could also help professionals in the field of medicine to access the information they need more easily and faster.

One respondent noted:

> *"This is a very important issue. We really need this type of network in the Kingdom. I am sure it will contribute in the development of our health libraries and it will help healthcare professionals in Riyadh and the Kingdom to explore, access and share more scientific research."*

10.1.2 Information Sharing

No organisation or entity in this world could accumulate all human knowledge and products, even in just one field of knowledge. However, with new technologies increasing every day, the world community realises the importance of both sharing information and of information resources; the idea of sharing information solves many problems. In order to discover the preference of health professionals about which information they would like Saudi hospitals to share, twelve different areas of information were listed as shown in Figure 10.2.

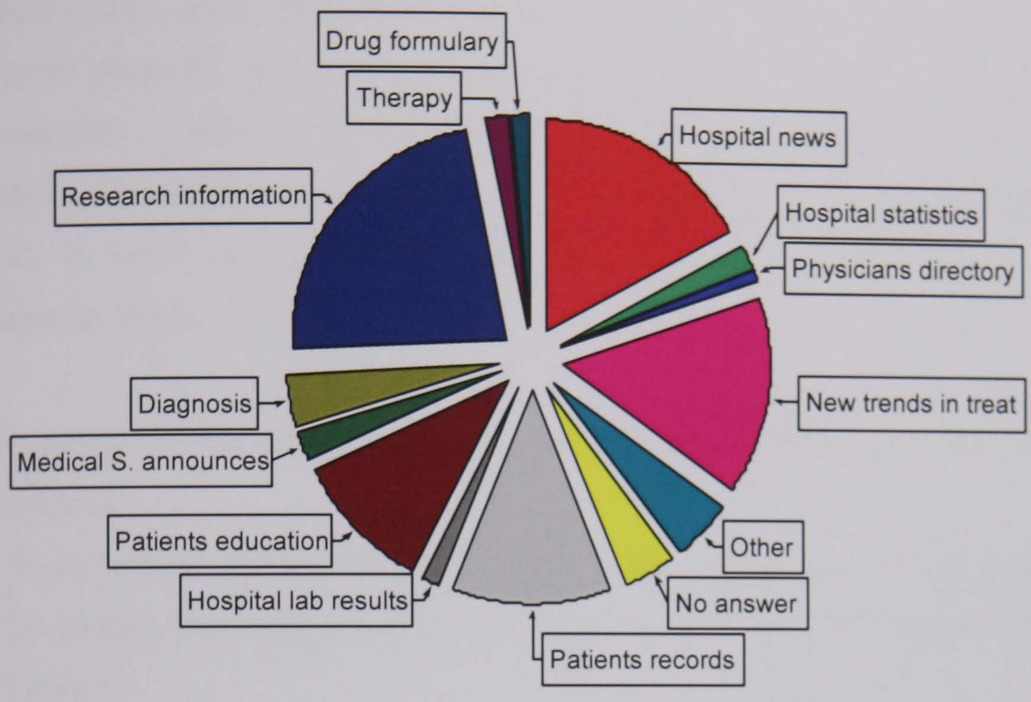


Figure 10.2: Preference for information sharing

Analysis of the Figure 10.2 shows that health professionals in the Riyadh hospital community greatly appreciated the sharing of information among Saudi Arabian hospitals. More precisely, respondents emphasised research information, hospital news, new trends in treating specific diseases, patient records and patient education. The highest percentage recorded was for 'research information' with 22.7%, and 'hospital news' reached 17.0%. In addition, 15.4% of total respondents indicated that 'new trends in treating specific diseases' should be shared, while a very low percentage (0.8%) of respondents were concerned to have a shared physicians' directory.

The majority of respondents in SCOT, KFSH/RC, KKUH, RAFH, KACM, IGH and KKESH indicated that the importance of sharing research information in the field of medicine is a priority, while the majority in KAUH/CD, SCH and SFH expressed the need for more information on new trends in treating specific diseases to be shared.

The majority of respondents in the Yamamah hospital indicated that hospital news needs to be shared amongst Saudi government hospitals.

Al-Zahrani (2001), in his study, found that people working in the health and medical environment generally focused on topical information, i.e. information needed in current research. In addition, he noted a need for other information such as new drug information and announcements for medical seminars. This explains the preference, and need, of health professionals for information that they would like the Saudi government hospitals to share.

It can be concluded that health professionals could benefit from information sharing for two reasons:

1) To keep them updated with knowledge; this is supported by their preference for seeking knowledge mainly to keep up-to-date (Chapter 6: Health Sciences Library).
2) To develop a strong communication with others based on knowledge and information sharing which will benefit the healthcare environment.

There is a need to share more information in an accurate and adequate way. Many of the comments received from respondents indicated the need for all information related to healthcare to be shared, which should benefit healthcare improvement and, in turn, the patients. Sharing of information, however, is a huge task that cannot be accomplished without a well designed information policy and formal co-operation. Health libraries and librarians would need to go beyond the normal traditional mode. Wakeley and Foster (1993) emphasised the hospital librarians' ability to serve as role models as hospitals move towards co-operative and collaborative ventures, since they have a rich tradition. This then leads the discussion to a related and important aspect of the health library role, that of Electronic Information Services.

10.1.3 Electronic Information Services

Information technologies provide many ways to develop and facilitate traditional work in a simpler way, by consuming less time and effort. It is important that health professionals are anticipating further expansion in electronic services to be provided by health sciences libraries.

Table 10-2 demonstrates that 84.5% of respondents answered positively that they were looking for more electronic information services, while only 11.2% answered negatively towards any expansion of electronic services.

Table 10-2: Electronic services expansion

	Frequency	Percentage
Yes	417	84.5
No	55	11.2
No answer	21	4.3
Total	**493**	**100.0**

The majority of total respondents wanted to see an expansion in the electronic information services provided in their health libraries. This suggests their appreciation for electronic information services, and might indicate their high expectation of better information services. In addition, none of the respondents in IGH, KAUH/CD, SCOT and Yamamah hospitals responded negatively towards the need for electronic information services in the health libraries. In fact, all the respondents in both IGH and SCOT were looking for expansion and improvements to their health library electronic information services.

To enrich the picture further, those who chose 'Yes' when answering on the expectation of expansion to receive more electronic services from the health library were also asked what type of electronic services they would prefer (Figure 10.3). The majority of respondents (47.5%) said they would prefer health information networks, which confirms their anticipation and understanding of the health sciences library network, as seen earlier, while 27.0% expressed a preference to receive online-reference services, and 7.7% said they would prefer expansion in document delivery service. Only 2% of respondents expressed a preference for other electronic services.

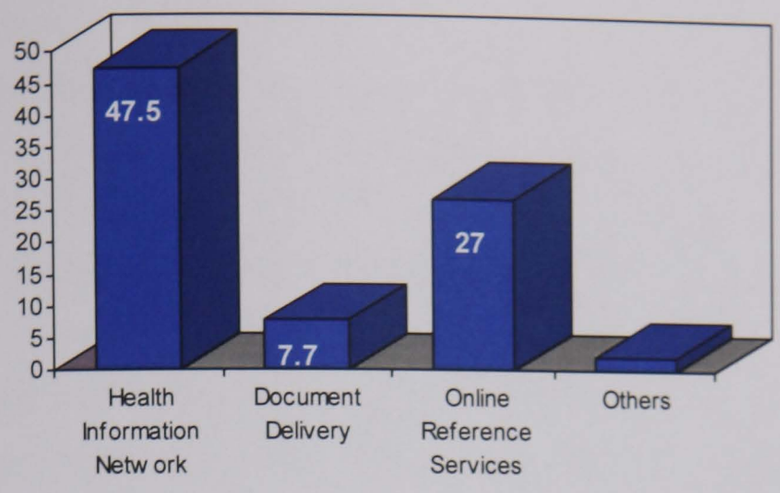


Figure 10.3: Type of Electronic services

The majority of respondents confirmed the need for health information networks, given the existing lack of such networks among Saudi hospitals and health sciences libraries. The previous discussion in section 10.1.1 'Information network' and section 10.1.2 'Information sharing', is applicable in this case (see also section 10.2.6, Information network, health information professional provision).

A remarkable percentage of total respondents indicated the need for expansion in online-reference services, as they provide instant answers to their enquiries. In fact, the researcher observed that no reference service existed in any health library in Riyadh. This was possibly related to the lack of professional health librarians with the specialist expertise to provide such service. Respondents also stressed the need for online-reference services which might supplement the lack of reference services in each library.

A physician in KACM commented:

> *"This service is needed, since sometimes I need help in emergency cases. Hopefully, this service will soon be available around the clock."*

A low percentage of respondents preferred an increase of Document Delivery Service. This service is very important, and is a major part of the library profession. Observation and literature from King AbdulAziz City of Science and Technology (KACST) gave a possible explanation, as it appeared that many health professionals in Riyadh and in the Kingdom of Saudi Arabia as a whole utilise the service provided by KACST in delivering needed documents. This finding supports previous research into this area such as Arif et al. (1998). The document delivery services depend centrally on KACST's information service department, and are also supported by library staff co-operation and personal and informal efforts. There is a need for more planning and co-operation for this service and others among health sciences libraries (see Section 10.2.1 'Official co-operation').

10.1.4 Introducing ICT

It is human nature to question and resist new phenomena and new information, and communication technologies are no exception. It can be envisaged, therefore, that obstacles to implementation could be encountered. Respondents were asked to indicate problems that they observed in introducing new technologies. The responses options were: 1) Lack of IT staff, 2) Lack of co-ordination, 3) Lack of funding, 4) Lack of training, 5) Poor management, and 6) Lack of IT policy.

The highest percentage (22.9% = 113) of respondents saw 'lack of training' as an obstacle to introducing ICT in Saudi government hospitals, while 20.3% (= 100) suggested that the problem of 'lack of co-ordination' might be encountered in the process of introducing ICT. Figure 10.4 shows that there is a similarity in percentage between 'poor management' 16.4% (= 81) and 'lack of IT staff' 16.2% (= 80). Less concern was expressed regarding lack of funding, which was cited by only 6.7% (= 33) and IT policy 3.7% (= 18), as potential obstacles to introducing ICT to government hospitals in Riyadh and in the country at large.

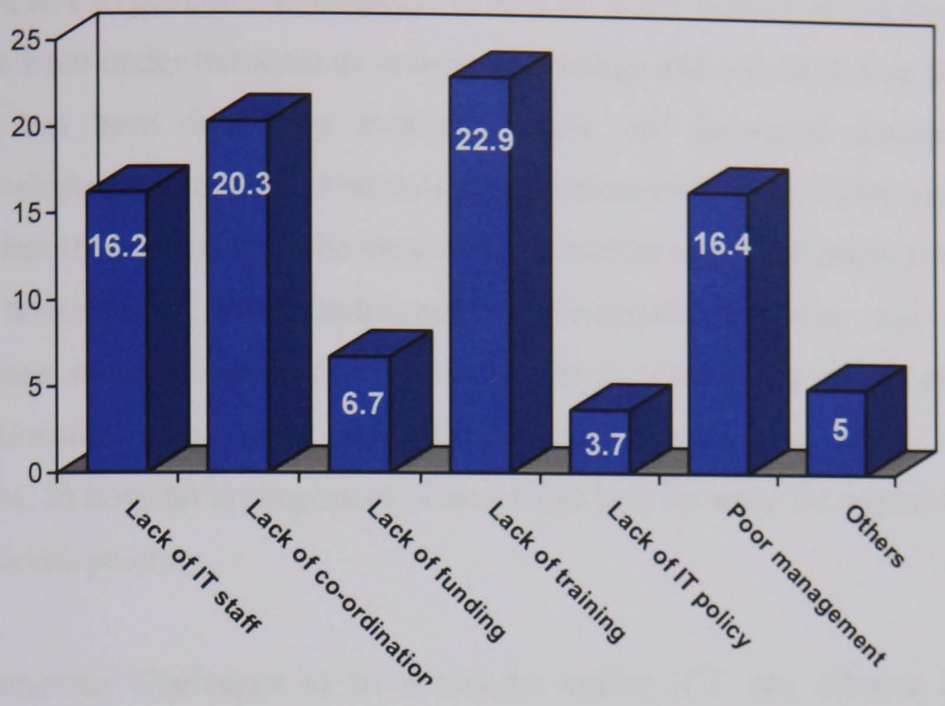


Figure 10.4: ICT Problems and Obstacles

In fact, the introduction of ICT in any developing country might encounter some difficulties, such as has been experienced in the process of development in developed countries. The similarity is observed since human nature and attitudes are involved. This study produced results which corroborate the findings of Al-Zahrani's study in 2001, which found that health professionals view 'lack of training' as the major factor in introducing ICT into hospitals, followed by 'lack of co-ordination', 'poor management', 'lack of IT staff', 'lack of funding', and 'lack of IT policy'.

In regard to individual hospitals, respondents in KACM, SCH, KFSH/RC and KKUH viewed 'lack of training' as the strongest obstacle facing the introduction of ICT and its implementation in the Riyadh government hospitals. This can be understood when considering the dissatisfaction of both health professionals and health librarians with regard to training programmes in Riyadh hospitals and health libraries (Chapter 7: Education and Training). 'Lack of co-ordination' was a major factor, in the eyes of the majority of respondents in IGH, KKESH, SCOT, RAFH and SFH. The majority of respondents in KAUH/CD and Yamamah highlighted 'lack of IT staff' as a major obstacle in introducing ICT in government hospitals.

Respondents also indicated 'poor management' as one of the obstacles facing the introduction of ICT to government hospitals in Riyadh. It has been observed that these hospitals have been under tremendous pressure to change and reform during the past decade. This has been driven by escalating costs, and increased demands for healthcare development. However, hospitals face problems which are either unique or more severe than those of others. The most difficult barrier to the full implementation of ICT in hospitals is their traditionally bureaucratic, complex and highly departmentalised structure within their leadership style. Potential conflicts exist: 1) hospital relationship with health professionals and the need to avoid various dissatisfactions, 2) hospital management philosophies and the need for organisational changes and development.

There are numerous challenges to be overcome before ICT can achieve its full potential and successful implementation in the healthcare environment in Saudi Arabia. However, the researcher considers that qualified management will play a major role in overcoming problems and obstacles which might cause failure in ICT implementation (see Chapter 11: Organisational change and development). The country's authorities and professionals should work in establishing a clear strategy of implementation based on field projects and research considering the human factor. This highlights the need for a health information policy in the country, as currently this is lacking. The anticipated problems also raise, again, the issues of training and co-ordination. The introduction of ICT faces similar problems to those affecting the overall condition of hospitals and health libraries. Therefore, decision makers and planners should take a holistic view of the situation, as an integrated part of their plans for the development of the country.

One of the challenges to be faced is designing a system network (see Chapter 12: SHIN proposed prototype) that meets users' needs, while reflecting a continuously changing organisational environment. Another challenge is to develop ICT that supports various organisational demands. The ICT development process should avoid any possible confusion, poor quality, inefficiency, and unnecessary costs. Therefore, from the perspective of ICT development, Andersson et al. (2002) noted that the main tasks appear to be to coordinate the different visions and, in particular, clarify them, as well as to establish the impact that these visions would have on the forthcoming

ICT application. It is recommended that hospital management and authorities should understand thoroughly what it is they are committing to, and what barriers they will encounter during the process of development (Short and Rahim, 1995).

10.1.5 NHL – VHSL – AHIP

The National Health Library (NHL), Virtual Health Sciences Library (VHSL), and the Association of Health Information Professionals (AHIP) are to play an essential role in the development of human knowledge which is related to health and medicine. Part of future planning and visioning is to identify health professionals' points of view in recognising and supporting new professional entities that are to be established, with the realisation that the overall aim of these entities is to serve the entire healthcare system.

Significant support was expressed for the establishment of a National Health Library with 95.4% of respondents in favour of Virtual Health Library (94.4%), and for an Association of Health Information Professionals (96.8%). These results represent health professionals' view towards the importance of the NHL–VHSL– AHIP to help in improving the health libraries and services, which in turn will help in the fulfilment of their information needs.

Table 10-3: Establishment of NHL-VHSL-AHIP

	Yes	No	No answer	Total
National Health Library	470 (95.4%)	11 (2.2%)	12 (2.4%)	**493 (100.0%)**
Virtual Health Sciences Library	465 (94.4%)	17 (3.4%)	11 (2.2%)	**493 (100.0%)**
Association of H. I. P.	477 (96.8%)	2 (0.4%)	14 (2.8%)	**493 (100.0%)**

The high level of support for the establishment of an NHL (Table 10-3) can be seen as an indication that respondents recognise the need and expertise of a place that is focused on both the materials and knowledge of health and medicine, since health materials are a distinct category, with a need for special treatment. The National Health Library can perform the expected role of organising, governance, and dissemination of information and knowledge.

Additionally, the majority of respondents supported the idea of establishing an Association of Health Information Professionals (AHIP). Health librarians' and information professionals' support will become a bridge to facilitate its foundation. AHIP would not only benefit them, but would also help, directly and indirectly, to ensure that health professionals receive proper and timely services.

The percentage of supporters for the AHIP was slightly larger than that for the VHSL and NHL, which might indicate recognition of the expected role of the AHIP, since there is a need for development and change of current conditions and practices in the health sciences libraries and for the development of health librarians. Moreover, developing and reforming information policies is important.

Physicians in different hospitals expressed their support of this research and indicated that they were looking for further development and improvement in current conditions. For example, a physician in the KACM commented that there is a long journey ahead for the process of improvement. He further said:

> *"In this part of the world, things will not improve if there is no professional leadership that assures the practice of change."*

This statement is very important and was encouraging to the researcher, strengthening his determination to participate in further development related to his profession. Indeed, there is a need for professionals generally to work to improve current practice and achieve beneficial change for both the sake of their profession and the good of their library users.

A respondent in KFSH/RC expressed the view:

> *"As far as I know, this type of association helps to shape and setup related policies. Truly, I want this association to be established, for me, just to give an understanding of rights as a library user."*

The majority of respondents supported, and wanted to see in the near future, the establishment of a VHSL for health professionals working in Saudi Arabia (Table 10-3). The primary aim of electronic and virtual libraries and services is to support an institution's teaching, learning, administrative tasks and other activities, which might change significantly with an increasing number of users. This type of library will provide users with timely and quality services. It will increase the access and use of electronic resources, for users who are geographically dispensed.

A respondent in SFH suggested:

> *"Why not create a site on the Internet telling us if a specific article is available in that hospital (i.e. SFH as an example)?."*

A respondent physician in Yamamah Hospital noted:

> *"A rich on-line facility for doctors and medical personnel is vital. It will ease the access to and follow-up of medical research and other information."*

A respondent in RAFH commented:

> *"I agree with the project you suggest of a 'Virtual Health Library' since it will support me in the fast access of a massive amount of health information."*

This study produced results which corroborate the findings of a great deal of previous work in the field, mentioned in the literature review, of the development of a virtual health library to provide online access to a variety of full-text clinical information and journal articles to enhance information access among its users. One of the principal benefits of the virtual or digital library is the ability to deliver information services to the user's desktop (Madge, 2000; Pugh, 2000), empowering the individual to gather, access, and assess information (Rashbass, 2000). There is an increasing shift from the ownership of materials to worldwide access, and in this context, the electronic library will be an information society that forms a significant part of the institution's

information service provision and is likely to have a much wider responsibility than that of the traditional library. Therefore, the emphasis is very strong on access to specialised information rather than to archives or holdings.

10.2 Library Staff Provision

Staff members, through interviews, highlighted various topics related to their work, which have a bearing on the anticipated direction of information services and prospects for development. The following topics are discussed as they are most frequently raised and were the ones of relevance to the research:

1) Official co-operation
2) Electronic sources
3) Information services development
4) Information services plan
5) Formulated policies
6) Information network
7) NHL – VHSL – AHIP

10.2.1 Official Co-operation

Most library staff members from health libraries who were interviewed explained that they had not observed official co-operation with other health libraries, or in fact any other type of library in Saudi Arabia. Table 10-4 illustrates the distribution of staff opinion relating to this subject.

Table 10-4: Official co-operation

	Frequency	Percentage
Official co-operation	4	18.2
No official co-operation exists	16	72.8
No mention	2	9.0
Total	**22**	**100.0**

Two staff members in KKUH health library indicated that there was no official co-operation with other health libraries, but they used their own connections to exchange services and establish informal co-operation. Small health libraries, such as IGH, SCH and Yamamah, which are operated mostly by a single health librarian, had no official co-operation with other health libraries. Yamamah's chief librarian highlighted this

issue, and expressed her willingness to start co-operating with other health libraries. She asked the researcher to help in this matter, since the administrative officers seemed unaware of the importance of her position or the role of her library.

Arif et al. (1998), in a study on health libraries in Saudi Arabia, mentioned that a good portion of cooperative activities have been pursued informally and, thus, remain dependent on the notion, motivation, and goodwill of individual libraries and librarians. Any existing co-operation among health libraries in Riyadh has been established mainly through personal contacts. Bailey et al. (2000) highlighted a similar situation in their study of the Marie Curie Centre, Newcastle upon Tyne, where they found that informal links already existed between the Centre, the local university and National Health Services libraries, and suggested that these links should be formalised through Health Libraries North (a regional association of librarians connected with health).

In the present study, it was observed that co-operation among health libraries in Riyadh is largely focused on: 1) document delivery, 2) inter-library-loans, and 3) library staff training. In practice, health libraries in Riyadh were involved in centralised lending which could be seen through the ILL activities depending on services provided by the KACST, which was founded as the country's premier centre for promoting research in science and technology. Arif et al. (1998) noted that the Saudi health sciences community, including health libraries, has been among KACST's best clientele, and among the biggest beneficiaries of KACST's search and document delivery service. In addition, the field of medicine is the most searched subject.

In the past, some Saudi health libraries attempted to promote co-operation among all health libraries in Saudi Arabia. In 1992, King Saud University, College of Medicine (Abha Branch), called for a meeting where the central theme was to be co-operation and co-ordination among health libraries in the Kingdom of Saudi Arabia (Arif et al. 1998). Within a more limited scope, as Brown and Blucker (1987) report, the Ministry of Defence and Aviation in Saudi Arabia permitted its hospital libraries to implement a 'holder of records' system. A conference took place in the United Arab Emirates University in 1995 on "strengthening resource sharing in libraries and information

centres in the Arabian Gulf Region", and came to a conclusion on the importance of co-operation, although concern in this case was mainly focused on ILL (Arif et al., 1998).

The mentioned means of co-operation, initially ILL services, were usually implemented and supported out of necessity as a way of supplementing the resources of the health libraries when they became unable to satisfy the information needs of their readers. No library is able to achieve self-sufficiency in periodical holdings. For this reason mainly, health libraries in Saudi Arabia are trying to promote some form of ILL service and document delivery, depending mostly on KACST, or upon their own staff members' relationships and informal co-operation.

Another area of cooperation was in the provision of training. Some health librarians received some training related to the field of librarianship (see Chapter 7: Education and Training) in other health sciences libraries which were considered to be more advanced. Health librarians considered this type of training as being limited, but acknowledged that it helped them to exchange some experiences and make friendships. For this reason, staff facilitated co-operation informally when the policies of such hospitals and health libraries did not support official co-operation.

In fact, successful co-operation requires firm collaborative links with local, national and international libraries, as well as information centres. This could maximise the access to electronic sources and services, in order to realise their full potential. Such co-operation would both improve the healthcare system and facilitate the establishment of an electronic information health network.

10.2.2 Formulated Policy

A high number of staff members (Table 10-5) believed that there are formulated policies for health libraries which organise the work flow, define services and the process of evaluation, and deal with problems. However, a considerable number of the health libraries' staff indicated the opposite. In fact, they further explained that the work process generally depended on their own efforts, experiences and reflections.

Table 10-5: Formulated policies

	Frequency	Percentage
Formulated policy	13	59.1
No formulated policy	6	27.3
No mention	3	13.6
Total	**22**	**100.0**

Health sciences libraries' staff in IGH, SCH and Yamamah, and two staff at the KKUH health library, indicated that there is no formulated policy for their health libraries. These health libraries, which lack any formulated policy, suffer from unawareness of authorities of their importance. Some librarians suggested that such unawareness may be the result of hospital management being overwhelmed by other hospital matters. The researcher observed that some health librarians had aspirations and wishes to improve the library structure and system through their participation in the design of library and information policy. However, they noted that this was difficult for them, due to their lack of influence and limited authority. The chief librarian of SFH demanded that greater authority be given to him and chief health librarians in general, and recommended that hospital management should move away from centralised decision-making. He was hoping to participate in hospital administration meetings to argue the need for improvement, as a matter of importance, in order to provide a better service to health professionals.

In addition, some library staff who noted the existence of formulated policy complained of restrictiveness in the limited scope and restriction of existing policies, such as a limited borrowing policy, inconvenient opening hours for users, and an unhelpful definition of eligible users. The researcher observed and found in reviewed library documents that library policies are indeed limited, as claimed by health librarians. For example, the plan of the Central Medical Library in Riyadh by Ashoor (1999), due to come into force at the end of 2004 and the start of 2005, is not a comprehensive information policy, but focuses on routine work processes.

In general, the information policy in Saudi Arabia only started to be formulated when a large committee was set up for this purpose. The researcher attended the first conference organised by the committee on Saudi Information Policy in 2002. The meeting gives grounds for optimism, as it demonstrated the awareness of this

important issue on the part of the organisers and participants. However, it was disappointing that most of the participants were not professionals, and some were not qualified to participate in such a critical event.

10.2.3 Electronic Sources

The majority of health sciences libraries' staff (Table 10-6) expressed the need to increase the electronic resources in their health libraries.

Table 10-6: Electronic resources needs

	Frequency	Percentage
More e-sources	21	95.5
No mention	1	4.5
Total	**22**	**100.0**

Such an improvement, as explained by one staff member, would facilitate easy access to information. The chief librarian in the KACM said:

> *"The increase of electronic sources is important, since it facilitates remote access to information, so users do not have to just come to the library to search and read printed materials"*

A chief librarian at SFH expressed the need for his library's users to have more electronic information sources, which have the advantage of ease of access to the information needed. Moreover, the chief librarian of KFSH/RC regarded as a necessity an increase in electronic sources, because the knowledge of medicine is massively increasing, and the electronic information sources would greatly help in accessing a major part of this knowledge and would supplement the limited printed collections within health libraries. This would enhance the quality of information services provided, and improve users' satisfaction.

10.2.4 Information Services Development

The majority of the health libraries' staff (Table 10-7) expressed the need for further development in the information services provided; they admitted being dissatisfied with the services presented.

Table 10-7: Information services development

	Frequency	Percentage
Information Service development	20	90.9
No mention	2	9.1
Total	**22**	**100.0**

Although information services are essential to libraries and one of their important roles, the majority of chief librarians in the current study indicated that their information services were limited. They indicated that they did not provide current awareness services or selective dissemination of information (see Chapter 6: Health sciences libraries. Table 6-1), and were looking for more development of these. Some librarians attributed this shortage to the lack of health information professionals (professional health librarians) in health sciences libraries. Such a shortage was observed while conducting this research (see Chapter 5: Staff and Users, and Chapter 7: Education and Training).

A health librarian in KFSH/RC noted:

> *"... These services do not exist and are not provided by our library. How can these types of services be provided while there is no health librarian specialised in delivering these services?"*

The researcher recommends development of the human resources, as this is the key to development of information services provided by health sciences libraries. This development requires ICT skills, as well as an adequate knowledge of medical terminology, to be possessed by health librarians' (see Chapter 5: Users and Staff). Librarians' lack of medical terminology and the English language in general is an obstacle to provision of any service which requires such knowledge. Klein and Ross (1997) argue that the health sciences librarians' knowledge of medical terminology should be combined with experience in the use of sophisticated technologies. Moreover, during an informal discussion which took place during the 4th Eastern Mediterranean Region Conference on Health Sciences Libraries (21-23 November 2004), the coordinator of the conference and the researchers agreed that there was a need to introduce the learning of medical terminology as part of health librarianship education.

10.2.5 Information Services Plan

Half of the health libraries' staff interviewed (11 out of 22) (Table 10-8) complained that they could not foresee any future plan related to the improvement of the information service. Five indicated that although a future plan for the development of the information services provided by the health libraries existed, they were not satisfied with it, since they did not participate in the planning. They also felt that they are working to implement something that had been forced on them, rather than being consulted as professionals.

Table 10-8: Information Service Plans

	Frequency	Percentage
Information service plan	5	22.7
No plan	11	50.0
No mention	6	27.3
Total	**22**	**100.0**

Most interviewed staff regarded information services as important and were looking for improvement and development. Staff members interviewed in IGH, KAUH/CD, KKESH, KKUH, SCH and SFH reported that their institutions had no such plan for the future of information services. In contrast, all staff members (3) in the KACM health library indicated that they had a future plan for the information service and its implementation. The chief librarians in KFSH/RC and KKESH also noted that they had a plan to improve the information services. They asserted the importance of such plans, but they indicated the need for wider planning and co-operation among health sciences libraries.

The chief librarian of Yamamah health library (the sole-Health-librarian) indicated that she had drawn up a plan for the future of information services of her health library, yet she could not implement any plan to improve the library's present unsatisfactory condition. She clearly explained the need for restructuring the library and argued that she should be given authority to implement her plan. The researcher believes that such planning cannot be adequately implemented without sufficient professional staff and a reformed management approach. Another chief librarian expressed the need of his library for professional staff members and extended training in order to proceed with any stage of development and planning.

It can be concluded that most of the health sciences libraries do not have planning for the development of their information services. This is considered critical, since they are failing to provide important information services such as Current Awareness Service (CAS) and Selective Dissemination of Information (SDI). This weak spot in the library and information services, as well as other poor conditions noticed in the health sciences libraries in Riyadh, call for immediate change and development.

10.2.6 Information Network

The majority of health library staff interviewed who highlighted this issue (Table 10-9) presented the need for an information network among health sciences libraries. They expressed the view that it would help to improve and develop more co-operation and services, which would release some of the pressure currently overwhelming them and their libraries (see section 10.1.1, Information network-health professionals' provision).

Table 10-9: Information network

	Frequency	Percentage
Need of Information network	14	63.6
No mention	8	36.4
Total	**22**	**100.0**

Some health library staff interviewed stressed the importance and need for information networks to be established among Saudi hospitals and health sciences libraries, to facilitate their work and improve their services.

The chief librarian in IGH noted:

> *"Our work needs us, as librarians, to communicate and co-operate. I feel isolated, since there is no such network established. I dream of a possible means to communicate with professionals in Saudi and around the world."*

One female librarian in RAFH expressed the view:

> *"The fast adoption of technologies is the issue. Saudi hospitals are so slow in this matter. This delay has an impact upon us and our libraries since we are attached to hospitals; also it weakens our resources and services."*

This reflects a need for initiatives to start energising the current condition. For real improvement, co-operative work from two sides is needed: 1) the authorities, and 2) health information professionals. Managers of computer departments in Saudi university hospitals believe that it would be possible, through ICT, to connect all university hospitals electronically in order to exchange medical information (Al-Zahrani 2001). This anticipation of implementation of such a network is not enough. However, it requires good planning and quality management of ICT infrastructure and projects.

10.2.7 NHL-VHSL -AHIP

Most of the health libraries' staff interviewed were aware of the importance of an Association of Health Information Professionals (AHIP), National Health Library (NHL), and Virtual Health Sciences Library (VHSL). Staff strongly expressed their need for the establishment of and participation in such a formulated and official identity, thereby giving an indication of the need for these bodies, as they could play a major role in the profession of health librarianship in Saudi Arabia (Table 10-10). Some staff indicated the importance of these bodies, AHIP in particular, in providing an official reference for their profession from which their voice should be heard.

Table 10-10: NHL-AHIP-VHSL

	AHIP	NHL	VHSL
Comments for need	19	12	16
No mention	3	10	6
Total	**22**	**22**	**22**

10.2.7.1 NHL

Some health libraries' staff expressed their hope for the establishment of a National Health Library in the Kingdom. Those were mainly chief librarians and those with more experience in the field of librarianship. They expressed the importance of the NHL role as a co-ordinator and in the co-operative workplace that they as librarians rely on. Others highlighted that this type of library is significant when formulating policies related to the profession, and in carrying out the task of implementing these policies.

A health librarian who had over seven years' experience working in the health library commented:

> *"National health library in the Kingdom... This library, as we expect, would play a major role in shaping the future of the profession. It possibly will be an information centre for all healthcare professionals in the Kingdom... I am waiting for this day!"*

10.2.7.2 VHSL

Some staff members mentioned the increasing importance of the Virtual Health Library for health professionals in Saudi Arabia. One health librarian indicated that he had observed an increasing number of enquiries about new websites concerning the field of medicine.

A chief librarian commented:

> *"Many healthcare professionals ask me to facilitate access to the library collection or metadata through the Net. Really, I have this planned, but it does need a lot of effort and professional teamwork. Also do not forget the need of a wise authority... under this one, put many lines!!"*

A health librarian in KFSH/RC expressed the view:

> *"Believe me, we want to offer our services and possible resources through the hospital website, but always there are many difficulties encountered. The problem here is that hospital management are not aware of our important role as a provider of services."*

A health librarian in RAFH explained:

> *"The virtual library is very important... it makes access to information easier for remote users as the demand is on the increase."*

These comments reflect the awareness of healthcare professionals of electronic resources, and the increased realisation of the need for remote access, which was predicted a few years ago by Bawden and Rowlands (1999). They mentioned that the widely held view regarding services and the use of digital libraries is that they will offer customised interfaces. They also predicted that there would be users who will depend on libraries for computational facilities and skills, particularly in the developing world. The researcher observed the increased use of electronic resources and the Internet in particular. The positive attitudes of health professionals towards the use of the Internet and electronic resources are an important factor, suggesting the feasibility and acceptability of the development proposal put forward by the researcher later in this thesis (Chapter 12).

10.2.7.3 AHIP

Some health library staff pointed out that they were members, and some merely followed up the events of the Saudi Library and Information Association (SLIA). They also indicated that they felt detached from that association, since it is mostly devoted to academic, public and school libraries. The SLIA has no remarkable influence on the health information profession, since none of the staff members in the health sciences libraries are employed through this association. One chief librarian

indicated that there is no professional association which can represent health library staff. However, some library staff members did not know about the SLIA at all. There is a need for a professional association to represent health librarians adequately, as happens through similar associations in various other countries, especially in the UK and USA.

A librarian in KKUH commented:

> *"Our future professional association must be healthcare-oriented."*

One health librarian in KFSH/RC said:

> *"I used to be a member of a professional association while I was in the USA, but now I am looking for something that is missing from my professional career. We have to unite and establish an association which represents us as healthcare librarians."*

10.3 Summary

Health professionals are expecting faster access to health information and to be able to share such information with other professional bodies and individuals, but this is clearly not possible in the absence of a health information network. Health libraries would benefit from such a network by providing more convenient, accurate, and up-to-date information to all users. On the other hand, health librarians are not satisfied with the current condition of their libraries and services. They expect development related to various issues concerning health sciences libraries in Riyadh i.e. co-operation, policy, access to electronic sources, development of information services and information networks. Information networks could create and improve co-operation among health libraries in Saudi Arabia and with other health libraries elsewhere.

Regrettably, the current computing systems in most hospitals do not facilitate access to the health library database and other databases located in some hospitals and research departments. Furthermore, there is a need for information services'

development and the need to draw up a clear plan. In addition, there are some problems facing the implementation of ICT, some of which are the lack of training programmes, lack of co-ordination, and poor management. Health sciences libraries need to develop a type of co-operation, which lasts longer, for continuous development attached to formulated policies upon which librarians and users can rely.

There is strong support for the establishment of a National Health Library, Virtual Health Library, and the Association of Health Information Professionals in the country, by both health professionals and health library staff. However, development and advancement will not reach their full potential if current hospital managements do not help in improving conditions. The current study suggests that resolution of these problems and obstacles should be given high priority by the Saudi authorities.

Change initiatives, however necessary and well intentioned, often face difficulties, especially when changes to management structure or organisational culture are involved. In view of the evidence presented throughout this thesis of a need for change, it seems desirable, before presenting specific proposals, to have some understanding of the change process and how it can best be managed. In the next chapter, therefore, issues surrounding organisational change and development will be discussed from a theoretical standpoint, after which a vision for development in Riyadh's health science libraries will be offered.

Chapter Eleven

Organisational Change and Development

POSITION IN THE THESIS

Chapter 1 Introduction	Chapter 2 Background	Chapter 3 Research Design
Chapter 4 Literature Review	Chapter 5 Users and Staff	Chapter 6 Health S. Libraries
Chapter 7 Education and Training	Chapter 8 Information Services	Chapter 9 ICT
Chapter 10 Information Provision	Chapter 11 Change & Development	Chapter 12 SHIN Prototype
Chapter 13 Conclusions	Bibliography	Appendices

11

Organisational Change and Development

Most attempts to introduce new technology into organisations meet their demise before they are fully implemented or very soon after (Davenport, 1995; Griffith et al., 1999; Dekker and McQuaid, 2002). In addition, planning and implementation costs are devoted to technical aspects, although faulty technology is not the primary reason for failure. Often, the human side of change management and technology adoption is to be blamed (Klein et al., 2001). As technology becomes a more pervasive and essential part of organisational operations, more researchers seek solutions to current technology implementation challenges, such as training, work attitudes, and system design and planning. While useful knowledge about systems adoption is abundant, it is dispersed across multiple disciplines (McAfee, 2003).

In this chapter, the researcher is proposing an organisational visionary model for the development of health sciences libraries in Riyadh. This model could be utilised by other health sciences libraries in the country of Saudi Arabia, and such extension is to be expected. The proposed model would help health sciences libraries to give more focus to their own vision, and would aid long-term planning to overcome possible problems and future challenges. In addition, this model is linked to change and development of the current health sciences libraries practice in Riyadh in order to facilitate the utilisation and implementation of new technologies (i.e. the proposed Saudi Health Information Network, see Chapter 12).

This chapter includes the following:

1) Organisational change and development: brief literature review
2) Method: the strategy applied to develop the proposed visionary model
3) A proposed visionary model: a description of the proposed visionary model.
4) Summary

11.1 Brief literature review

Organisations are extraordinarily complex entities, and the understanding of them and their management is still in a state of considerable instability and confusion (Lorenzi et al., 1997). Precisely, people and organisational issues have not received the high level of attention they deserve (Braude, 1997; Lorenzi et al., 1997). This is applied particularly to the management and exploitation of information (Lewis, 1995). However, the academic research areas and core information contribute to a better understanding of people, and organisational issues such as the importance of and processes for creating future direction, managing a complex change process, effective strategies for involving individuals and groups in the informatics effort, and effectively managing the altered organisation (Lorenzi et al., 1997). A number of important researchers have guided the understandings of organisational and individual attitudes, and behaviour related to organisational change and development (Ash, 1997; Braude, 1997; Giuse et al., 1997; Lorenzi et al., 1997; Weick and Quinn, 1999; Abels et al., 2002).

Van de Ven and Poole (1995) have defined the core concepts of change processes as follows: process is the progression of events in an organisational entity's existence over time; change, one type of event, is an empirical observation of difference in form, quality, or state over time in an organisational entity; the entity may be an individual's job, a work group, an organisational strategy, a programme, a product, or the overall organisation. Weick and Quinn (1999) characterise 'change' as an ongoing mixture of reactive and proactive modifications, guided by purposes at hand, rather than an intermittent interruption of periods of convergence. Goodhue et al. (2002) consider change in an organisation is a multifaceted phenomenon. Tsoukas and Chia (2002) set out to offer an account of organisational change on their own terms to treat change as the normal condition of organisational life.

Simply, change is the process of changing the present condition of an organisation into another condition for the purpose of organisational development. There is a tremendous dynamism in the understanding and restructuring of organisations (Kanter, 1989; Ricks et al., 1990). Henry and Mayle (2002) highlighted that some aspects of managing innovation are permanent; also, new technology, the global marketplace and deregulation are forcing new organisational change. Hampden-Turner and Trompenaars (1993) added that national culture can have an important impact on the style of management and the nature of organizations. However, each management approach, such as Management by Objectives, Continuous Quality Improvement, Strategic Planning, Business Process Re-engineering, Restructuring, Downsizing, and Right-sizing, has its own advocators and detractors (Shapiro et al., 1993).

In addition, research into people and organisational issues surrounding the implementation of information systems is equally scattered throughout the literature of different disciplines, and the amount of research is still relatively small (Ash, 1997; Braude, 1997). The brief history of health informatics is littered with disappointed stories of systems that were not completed (Braude, 1997). Lorenzi et al. (1997) confirm that in the first stages of the information revolution in health care, technical hardware and software issues understandably received more attention than people and organisational issues.

Some early information system implementations faced major obstacles. In 1990, at Calgary's Foothills Hospital (Canada), a conflict began between the users of the new information system called OSCAR and the people responsible for delivering the system. The health professionals perceived that management was attempting to impose its will over them; the system was prohibiting them from performing their functions, and restricting and redefining the work roles and patterns. Consequently, the health professionals refused to work with OSCAR (Williams, 1992).

In another implementation of an information system in 1992, the Computer Aided Dispatch system for the UK London Ambulance Service, the system failed. This was primarily because the information system supported the values and norms of senior management, and not those of the ambulance crews and the command and control staff (Dean, 1993).

Undoubtedly, implementation in each of the two cases mentioned above, and possibly others, was made with the best intentions and in response to the perceived changes needed to increase the functionality of the information system in the health care environment. Surely, implementers did not want to fail and lose their good reputation. Lorenzi et al. (1997) interpreted these cases as appearing to show that the implementers did not consider the people and organisational issues associated with these implementations. However, relatively, informatics implementations are becoming increasingly dependent upon how well the people and organisational issues are managed.

Furthermore, Adams and Blandford (2002) noted the importance of the World Wide Web accessible digital libraries on the wards, and how it can address the demands of Evidence Based Medicine (EBM). However, a study within a large London hospital revealed that the use and acceptability of digital libraries resources on the ward has been lower than expected. Adams and Blandford explained this case as being due to a poor understanding of the context of use and the lack of appreciation of the social and organisational impacts of ward-accessible digital libraries for health professionals.

On the other hand, Fuller (1997) describes the successful implementation of regional health information systems by the Integrated Advanced Information Management

System (IAIMS) institution in the USA. This success was attributed to the components of an IAIMS planning process which includes organising individuals and institutional units for change and environmental analysis. Furthermore, Fuller describes how technology is more than ever the easy part of development. It is the way planning processes deal with people that will result in the success or failure of regional integrated health information systems.

Huber et al. (1993) emphasise that the actual triggers of change come from at least five sources which are associated with internal and external changes: the environment, performance, characteristics of top managers, structure, and strategy. Orlikowski (1996) noted that sufficient modifications may be enacted over time so that fundamental changes are achieved. In addition, culture is important in continuous change because it holds the multiple changes together, gives legitimacy to nonconforming actions that improve adaptation and adaptability (Kotter and Heskett, 1992), and embeds the know-how of adaptation into norms and values (O'Reilly and Chatman, 1996).

However, organisations will fail if they attempt radical alteration to their work processes without adopting solutions that can be implemented fully and properly. On this issue, LaMarsh (1995) in her book *Changing the way we change* explains that large organisations have a remarkable capacity to resist change of all kinds, when the nature of change being sought is so much more radical and uncomfortable than anything required by a shift in strategy, process or structure. On the other hand, while continuous improvement and small changes within an organisation are important, the real management challenge is making radical shifts in structure, systems and processes which generate large improvements against the clock and other odds.

Ives and Olson (1984) found that involvement plays a role in better defining user requirements, providing clearer understanding on how to use the system in the organisation, avoiding inappropriate features, and enhancing the user's knowledge of the system. Winograd and Flores (1986) suggest that when the adoption and utilisation of IT is seen as an enabler and empowerer of individuals and groups, people support the system and its development. If group members perceive that they

own both the problem and the solution, they will generally cooperate with the developers to make the system work.

The role of people and organisational issues was heightened when it appeared that people issues were more responsible for implementation failure than the technical abilities of the system (Abdel-Hamid and Madnick, 1990; Lederer and Nath, 1991; Benjamin and Levinson, 1993; Prager and Overholt, 1994). Baltzer (1991) and Bailey (1993) confirm that, in the process of change, people can easily be overwhelmed by change, especially within large organisations, where they may perceive that they have little or no voice in, or control over, the changes they believe are descending upon them.

All prescriptive programmes imply that a system and its people must be open to change. Lorenzi et al. (1997) commented that being open to change cannot happen in a closed and highly structured bureaucratic system. In traditional systems, stability has been viewed as the norm, with change being a temporary deviation from that norm. However, organisational cultures must accept that change is the norm, and stability is the deviation. Further, this openness to change must be at the emotional level, not just at the intellectual level.

With the focus of how to facilitate the successful implementation, adoption, use, and positive outcomes of information and communication technology in organisations, DeLone and McLean (1992) highlighted that without successful and positive impacts of IT at the user level, it is difficult to realise positive outcomes at the organisational level. Ash (1997) noted that organisational change theory would suggest that readiness for change can assist the process. Planned change is purposeful and proactive, seeking to help the organisation change in a timely way and adapt to changes in its environment.

In conclusion, problems with organisational change and development often arise because people and organisational issues were not given a high level of attention (Braude, 1997; Lorenzi et al., 1997). Lorenzi and Riley (1995) provide a number of identifiable reasons behind the low interest in the subject:

- Visibility: Hardware is physically visible, whereas organisational and people issues do not have this characteristic.
- Measurability: There is a higher degree of measurability with hardware and software than with organisational variables.
- Predictability: Organisational variables are considerably more difficult to predict and they vary based on the complex reactions of individuals and groups.
- Accountability: Operational managers often have little experience managing organisational or change issues and thus have difficulty being accountable.
- Respectability: Organisational issues appear fuzzy to technical and scientific staff, and the staff who deal with these issues do not achieve the level of respectability as that of other more traditional academics.
- Timeliness: The time required to plan effectively for organisational change is often viewed as time wasted and a delay in accomplishing the real work. This time factor accounts for significant resistance to organisational planning.

Consistent with reports in the literature, the researcher's observation highlights the importance of people and organisational issues, which were kept firmly in mind in his formulation of a model for change and development for health science libraries in Riyadh. The remainder of this chapter is devoted to an explanation of the researcher's strategy in formulating his vision for development, and an account of the model itself.

11.2 Method

There were three steps followed (Figure: 11.1) in order to suggest change and development for health sciences libraries in Riyadh:

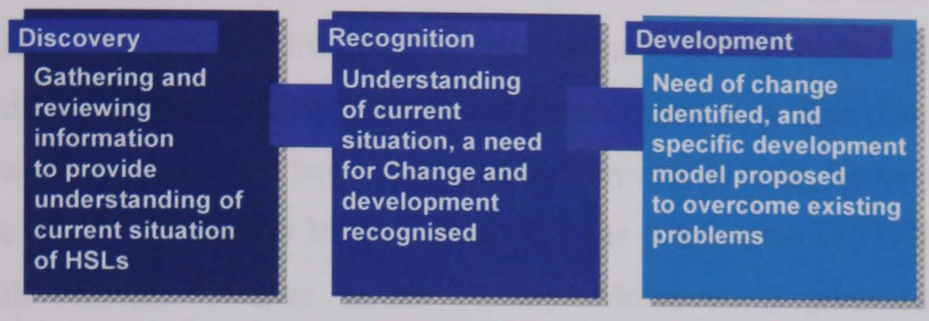


Figure 11.1: Steps for change and development

1) Discovery

This step includes; reviewing the data collected for this research and its results and findings. Observation focused on certain points; the setting of the physical environment within the health libraries, human and social environment and the implementation of services and facilities which explain the existence of those services and facilities. Outcomes show that the role of health information professionals (health librarians) in the libraries is as potential providers of services, which does not require advanced ICT skills. ICT and services were not adequately implemented and provided to users in all health sciences libraries. Interviews as well as observation show that librarians do not participate in the decision making related to their libraries and they are controlled by strict management regulation.

In addition, other related information, documents and literature were reviewed. Specifically, two unpublished documents were reviewed:

A) A report on medical libraries in the Ministry of Health by Elaywah (1985). The report explored the condition of health sciences libraries supervised by the MOH. It also discovered in the structure of health sciences libraries an inability to accomplish their duty to deliver accurate health information to health professionals and decision makers. Eleywah suggested the need for a well presented strategic plan

to develop the current situation, and to establish a health information network in the Kingdom of Saudi Arabia. In addition, he suggested the establishment of a central medical library supervised by the MOH.

B) The Central Medical Library plan and structure by Ashoor (1999) who supervised a team for its production and presentation for the Ministry of Health. This plan is proposed to be implemented in a time scale of 2000-2005. Its main concerns are: Collection development, Information services and management, Automation project, Building, furniture, and equipment, and Employment plan. This plan was long overdue, considering that it had been suggested by Eleywah in 1985. However, it fails to specify the role of the Central Medical Library in the cooperation and collaboration among health sciences libraries in the country. Moreover, it gives insufficient attention to the human resources planning and managing automation.

2) Recognition

This step is generated by the analysis and discovery of related literature, documents, and findings of this research which are reported in previous chapters. Some main problems and obstacles are recognised and summarised as follows:

A. Lack of health information professionals
B. Weakness of libraries and information services
C. Digital gap amongst health sciences libraries
D. Information systems implemented are not fully utilised
E. Users' dissatisfaction with current ICT and services in the health sciences libraries
F. Difficulties in accessing electronic information resources and weakness in the printed resources collections
G. Low cooperation among Riyadh hospitals and among health sciences libraries
H. Lack of studies conducted by hospitals to investigate health professionals' information needs
I. Centralised and structured bureaucracy in the management of health sciences libraries
J. Lack of health library staff participation in decision making
K. Slow pace of development.

3) Development

The discovery and recognition of the main problems give rise to a need to propose changes and development to overcome existing problems in the health sciences libraries, and to facilitate the implementation of new technologies, in particular the proposed health information network. Such development must take account of internal forces of change (i.e. users' dissatisfaction, needs of staff and users, centralised decision making) and external forces (i.e. competition and cooperation, international participation, and participating in the success of parent organisational mission).

It is important to practise development to deal with the extraordinary changes that are occurring in the health sciences library environment. Library change is essential, and libraries must react effectively and appropriately within new change paradigms and advances in ICT. Put simply, a successful library should be designed to encourage innovation and change. In reality, libraries are being forced to respond by competing in the information society. In addition, an Organisational Development Model (ODM) holds the key within an organisation to improve, innovate, and change for future success. However, Priestner (1995) noted that successful implementation is reliant on many interdependent factors: site characteristics, organisational structure, library mission, administration and, most importantly, individual employees. Furthermore, the objectives of each change in each case are different.

11.3 Proposed Visionary Model

The outcome of the steps followed suggested that development should be undertaken. However, it was concluded that it would be premature to assume that restructuring would be the only way to achieve positive change for health sciences libraries in Riyadh. The organisation change and development study process was envisioned as a way of solving key issues affecting them at the present time and in the future, and revealed a great number of beliefs about weaknesses of the health sciences libraries, as well as the movement and desired direction towards organisational change.

The direction is towards proposing an organisational visionary model (Figure 11.2). This model does not employ a specific structure and management style; rather, it

gives much emphasis to a future vision which can be adopted and developed in a gradual, incremental manner. This model is designed to match the capability of an organisation to the tasks and challenges ahead. The visionary development model aims to: (1) make continuous change and development in the culture of health sciences libraries, (2) increase health information professionals' involvement in supporting clinical practice, (3) increase the efficiency and quality of information access in the health environment; and (4) change the health sciences libraries information access paradigm to information services and outreach.

Figure 11.2 shows the seven major elements of the proposed model. The model suggests that the health sciences libraries environment should be surrounded and characterised with needed certain qualities (i.e. collaboration, communication, and innovation).

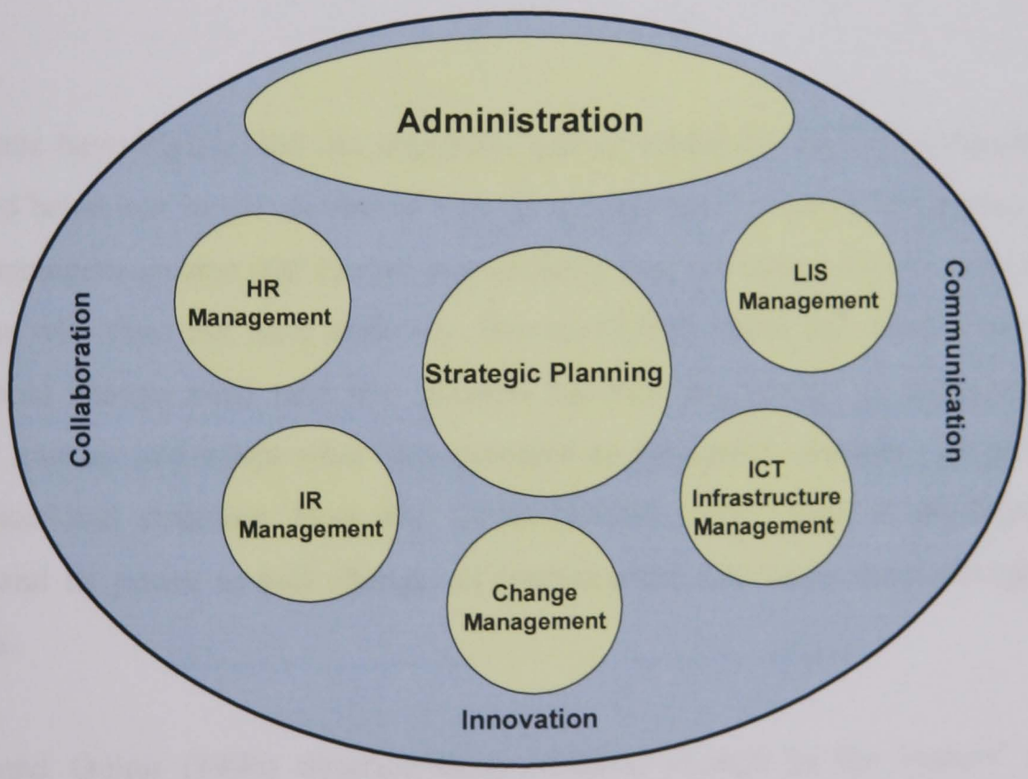


Figure 11.2: Organisational Visionary Model for Health Sciences Libraries

11.3.1 Administration

A leading position is an important factor for the successful change and development of an organisation. Generally, libraries are in need of qualified managers and supervisors who are committed to lead successful practice.

Library administration is defined by Reitz (2004):

> *The control and supervision of a library or library system, including planning, budgeting, policy making, personnel management, public relations, and program assessment, with responsibility for results. Also refers collectively to the persons responsible for managing a library, usually a board of trustees or dean, library director, and his or her immediate staff.*

Many writers have highlighted the important role of leadership and its management attitude and behaviour in the success of managing a process. Quinn (1996) argues that most top managers assume that change is something that someone with authority does to someone who does not have authority. Sevons (1996) stated that every theory of organisational change must take into account the fact that leaders of organisations watch one another and adopt what they perceive as successful strategies for growth and organisational structure. Boss and Golembiewski (1995) look at the logic of attraction and its power to pull change, as leaders must first make deep changes in themselves.

Spreitzer and Quinn (1996) describe deep personal change as the leaders' new behaviours which attract new behaviours from followers. When leaders model personal change, organisational change is more likely to take place. Cohen and Tichys (1997) confirm that organisational change is often more effective because it is led by more influential leaders. However, the management of organisations, who have made a true commitment to implementation for development, are often guilty of seeking

solutions that can work delightfully without the painful costs of cultural change in the organisation (Shapiro, 1995).

However, a project lacking leadership may not have the backing of top management. Such a situation can have a bearing on the amount of resources devoted to the implementation (Klein et al., 2001). Beaumaster (2002) suggests that implementation requires project leadership from the highest levels of management, in addition to dedication and support for changes to be enacted. Likewise, leadership needs to be able to enact an organisational culture that values IT as a necessary and integral part of operational and organisational success.

The visionary model suggests that the health sciences library administration is entirely within the library environment and is to be independent to some extent, as are other administrative and health departments in hospitals. In addition, libraries need to be supervised and managed by qualified health librarians. This will improve the quality of decision making and help to dissolve the communication barriers with others. The library administration should be affiliated to a professional health organisation (i.e. the Association of Health Information Professional), and library and information sciences educational programmes, to help in regulating and establishing accurate staffing class specifications, job descriptions, and promotions and rewards. This will ensure library staff empowerment and thereby enable them to assert themselves. They will then receive the recognition and respect they both deserve and need, in order to survive and thrive under their frequently extraordinarily difficult working conditions. As a result, library staff in general will be freed from excessive bureaucratic constraint.

In addition, qualified independent administrators can participate in developing a strategic vision for their library initially, and in the national health information policy. Hospital management should consider this issue for the benefit of the entire health practice, and development of hospitals and health information society in general. Indeed, this consideration and a greater authority for library administration will help health sciences libraries to participate effectively in healthcare organisation missions.

Importantly, with the understanding of the quality role of library administration, the library management will be able to overcome some observed problems, such as:

1. Bureaucratic library administration. Chief librarians are not able to make any decision without the direct supervision and approval of the head of the educational department to which they are related. In the case of smaller hospitals, they are under the direct control of a hospital manager. Chief librarians are the essential factor in the running of daily library activities and achievement, whether their outstanding efforts are ever recorded properly or not.

2. Administrative incompetence and centralisation are observed and have caused relationship barriers and communication obstacles between library staff and library administrators (i.e. heads of educational departments, hospital managers), and among health sciences libraries in Riyadh.

In brief, the important role of management and administration is in providing leadership and direction for change. It also focuses on information flow and transfer, and managing the continuous nature of change in the organisation. These roles, as well as others, require some identified administrative criteria. Miller et al. (1994) identify several characteristics as conducive to successful change, such as distributed power, open and decentralised communication systems, participative decision making, and acceptance of conflict.

11.3.2 Change Management

Change should be treated as the norm condition of the organisation (Tsoukas and Chia, 2002). It has the characteristic of being a mixture of reactive and proactive modification directed towards specific purposes (Weick and Quinn, 1999). Change management is not the end in itself, but rather it should be practised as a means to an end (Pettigrew et al., 1992). Looking at the contents of texts on organisational change, King and Anderson (2002) see the predominant focus is on the management of formally planned changes, especially changes to the ways in which the organisation relates to its environment and different parts of the organisation relate to each other.

Senior (2002) stressed the importance of the nature of the environment for organisational management of change and decision making. Similarly, a necessary first step for the library is to determine what change approach is most likely to succeed, given its size, environment, and conditions operating in the library. Whatever approach is taken, it must be compatible with internal values and conditions, but it must also be true to the requirements of quality improvement (Kovel-Jarboe, 1996).

Health sciences libraries are neglected in Saudi Arabia as places for study of strategies and processes of change management. The focus has been on organisational structure. The lack of research is clear by evidence in relation to the concepts of performance, the ability to manage longer-term change, the impact of political economy, and the role and nature of leadership. The change management unit in this model is considered to have the responsibility for such concepts.

However, change desired for health sciences libraries in Riyadh can be viewed from two perspectives:

1) Executives, and

2) Recipients.

In some cases, at the onset of a new change, executives might want the change be processed in immediate action, with less consideration of other issues related to human and environmental factors. In fact, as Pettigrew et al. (1992) expressed, the strong top-down commitment to change challenges the cultural continuity. However, in other cases, recipients of change (library staff) are looking for radical changes in the management structure of the organisation, with limited consideration of the possible vacancy of higher management positions. These attitudes in general are just a way of expressing the need for improvement wanted in the current conditions. However, the result is potentially dangerous, due to the mix of different priorities, different knowledge sets, and different driving forces. Indeed, if the change is not managed appropriately, these different values and driving forces will be at odds, resulting in unwanted outcomes for the organisation, such as:

1. Resistance to the change by staff, users and current managers.
2. Valued personnel leave the organisation.
3. Critical projects and services are delayed or paused.
4. Users feel the impact indirectly through distressed staff.
5. Lack of management and leadership in an organisation

Therefore, the hospital managers, library staff members and users, firstly should learn about the necessity for change management, and realise its influence on the ongoing strategic change process. They need to appreciate the two dimensions of change management:

1. Organisational change management
2. Individual change management

Organisational change management provides the knowledge and skills to implement a methodology and tools for managing change throughout an organisation (LaMarsh, 1995). Individual change management, in this instance, is the management of change from the perspective of library staff, as they are the ones who ultimately must implement the change.

Although some health librarians in Riyadh are requesting some change and development in the current conditions, the hospital top management does not give sufficient time to discuss such requests and needs for improvement, whether they concern individual or organisational change. Change management requires the effective management of an organisation so that executive leaders, managers, and front line employees work in accord to implement successfully the needed process, technology or organisational changes.

In practice, top managers of hospitals and health sciences libraries in Riyadh should establish a vision of change management to be the norm of the organisational environment and culture. They should study and identify motivators of and barriers to required changes. This would generate a conceptual framework which will prepare them to explore a broader range of potential sources of change. In turn, this would enable them to create a great movement towards needed development.

However, change should be employed through a concurrent, gradual approach, in order to avoid barriers and conflicts (i.e. people resistance). Both individual and organisational change should play a major role in the advancement of the health environment, and to generate environmental change. The focus is around the tools and techniques to help a library staff transition through the change process. The primary concerns are the education required to help individuals understand their role and the decisions they make in the change process. In this respect, the need is to provide tools that librarians can use to navigate their way through the change.

11.3.3 Human Resources Management

Many human resources departments and professionals in libraries are playing increasingly strategic roles within library organisations by redesigning jobs and work, developing performance management systems, managing change, and designing and restructuring organisations. Increasingly, this reflects organisational development activities (Hawthorne, 2004). Mendelow and Liebowitz (1989) defined that Organisational Development (OD) activities can be integrated into the Human Resources Management (HRM) activities that support the organisation's strategic plan and goals. In addition, HR practitioners started using their knowledge of workforce trends, coupled with knowledge of the business of the organisation, to work closely with senior management to develop long-term plans that link HR goals to organisational goals (Meisinger, 2003). Hawthorne (2004) commented that integrating OD concepts into HRM activities can provide libraries with enhanced workforce performance and increased capacity to manage change effectively throughout the organisation.

Health sciences libraries in Riyadh are less focused on HRM. The employment system is not linked to a health librarianship organisation, or to LIS educational programmes. This is caused by the improper use of fuzzy and vague staffing class specifications (i.e. job descriptions, promotions and rewards). The lack of HR development programmes and of regulations and policies generates a lack of qualified health librarians (health information professionals) working in these libraries. It was reported in 1989 by the Council on Library Resources in the USA that many problems facing librarians and library education arise from the failure to describe the profession

and its important role in terms that are compelling, expansive and accurate (Council on Library Resources, 1989).

In fact, the rapid development in health sciences librarianship worldwide, and the increased demand for service quality are factors, amongst others, requiring a redesign of HR functions. Developing individual skills in all levels of staff to work efficiently and effectively in team structures has a critical value. In addition, developing individual skills on a continuing basis is suggested, and the psychological and social needs of staff members should not be neglected in this process. This should be highlighted with a clear vision for the direct benefit of health sciences libraries and the entire organisation and hospitals, as it is the main factor in the individual change management process. Health sciences libraries should also enhance the ability of recruiting highly skilled staff who are capable of ongoing innovation and able to effectively deal with constant change. This will increase performance capabilities in order to enhance the organisational ability to survive in a world of constant change.

In brief, health sciences librarians need a new educational model that is directed towards professional development and improved job performance, and also meets international professional standards and expectations, and health sciences libraries' needs. This should provide them with required knowledge and skills to enable them to participate effectively and efficiently in the structuring of the health information society.

The vision of the health sciences libraries plan in future education and training should focus on the need to support innovation in their librarians' professional research, continuing education, and recruitment strategies. On the other hand, health librarians should be prepared to meet the requirements of new and expanded roles. Roper and Manfeld (1993) predicted that health sciences librarianship may not exist as a profession in the next century unless health information professionals begin to accept responsibility for their own destinies by seeking lifelong education and professional development opportunities from a variety of sources.

11.3.4 Information Resources Management (IRM)

Information is one of the most important assets of any type of organisation. The main role of IRM is to create and maintain a satisfactory information resource environment for users. Kesner (1994) stated that IRM strategic planning is a necessary division, and it is necessarily shaped by the goals and objectives of the parent organisation. Keeling and Lambert (2000) confirm that health sciences librarians need to look at new methods of managing and exploiting information resources in ways that contribute to the strategic aims of the organisation.

Alian (1991 and 1999) stated that the main objective of a health sciences library is to collect and organise health information resources. In turn, the library retrieves required information, and disseminates it to end-users in a suitable timeframe. However, several writers describe the health sciences librarians' role as having moved from simply acting as locators and resource providers to being quality filterers, critical appraisers, navigator digital information disseminators, and even managers of change (Braude and Wood, 1993; Booth, 2000; Harris, 2000; Wittwer, 2001; Dalrymple, 2003; Beverley, 2003).

Further, Weise (1993) specifies that the role of the library is now more active rather than passive; its success can no longer be measured by the size of its holdings, but rather by the quality of access and information services it provides to its users. Importantly, Kesner (1994) mentioned that librarians are best prepared to listen to users and to establish an accurate understanding of their information resources needs. However, since many users have limited IT skills, and have difficulties in finding time and gaining confidence (Garrod, 2001; Adams and Blandford, 2002), libraries should make opportunities to provide effective, efficient and independent use of libraries and information resources (Khalid, 2000).

In the health sciences libraries in Riyadh, the situation is one of confusion. This is caused by the unsystematic approach to developing and maintaining the information resources. In addition, most of these libraries are not ruled or regulated by clear collection development guidelines. For example, none of the health sciences libraries has adopted an appraisal system. It has also been observed that some libraries include collections not related to the health sciences, while there is a great shortage of health

sciences materials and related collections and a real need to develop these. Electronic information resources have been identified as of major value to health sciences libraries, but very few provide this type of resource.

The organisation of information resources is not much better. Two reasons are observed: 1) the lack of space forces the library to locate some materials in inappropriate places, and 2) there is a lack of professional librarians who are able to classify accurately the materials. The majority do not participate in the collection development. Also, most librarians are not participating in electronic information resources development because they are not allowed to contact or deal with electronic resource providers, even in case of system interruption; they are only authorised to report the problem to top management.

The visionary model puts emphasis on IRM in order for a health sciences library to act effectively and sufficiently in the development of the organisational knowledge. This requires developing a strategic policy for the management and development of information resources, and will play a role in overcoming a great deal of existing problems, providing a dynamic role for health librarians in achieving the great mission of their parent organisation. Constant evaluation and assessment is required to adapt suitable methods of information resources management that will contribute to the strategic aims of healthcare organisations and hospitals.

11.3.5 Library and Information Service Management

The health sciences library can achieve most of its objectives by offering appropriate library and information services to its users at a suitable time and place (Alian, 1999). Nagle (1996) and Alian (1999) indicate that library and information services provide useful and equal access to clinical information to many health professionals regardless of location. Watson (1998) and Peterson and Harris (2002) noted that these services contribute to institutional development, and support the goals and interests of institutions in medical and health fields. Oduwole (1999) confirms that libraries and information services provide information that has a strong impact on physicians' clinical work and patient care.

In addition, several writers found that physicians perceived the importance of library and information services in the healthcare environment, in terms of a significant impact on their practice of medicine (King, 1987; Marshall, 1992; Breton, 1994; Urquhart, 1995; Oduwole, 1999; Ali, 2000; Peterson and Harris, 2002; O'Connor, 2002; Dalrymple, 2003). O'Connor (2002) specifically noted that the health sciences library information services can have an impact on the way knowledge is put into practice.

Unfortunately, information services in the health sciences libraries in Riyadh are limited to traditional and basic services. It is observed that health sciences libraries do not provide information services using information and communication technology (i.e. current awareness services, selective dissemination of information). Although health professionals appreciate the role of health sciences libraries, it has also been observed that failure to deliver information services electronically and remotely has resulted in the need of health professionals to depend upon themselves to reach and use health libraries and other information resources.

Critically, most of the health sciences libraries in Riyadh lack policies which regulate and define the library and information service to be provided. The libraries are short of sufficient qualified health librarians who are able to provide such services. However, the suggested visionary model emphasises the importance of library and information services. It suggests the employment of health information professionals to practise effectively and efficiently in the delivery of information services. Information services must be based on the understanding of users' needs and the available resources. The model stresses the high usability of information resources through using new methods of delivering information resources utilising the ICT. This will play a major beneficial role in influencing the healthcare practice.

In addition, libraries should visualise and redefine their fundamental roles and services in the organisation. This requires further measurement of the impact of services provided and how to reach maximum satisfaction of the health professionals with such services. The measurement and evaluation process will help Library and Information Services Management team to identify and overcome any possible shortages and create willingness to embrace change for better and faster service.

Florance and Matheson (1993) and Alqudsi-Ghabra (1999) confirm that libraries should examine management perceptions of libraries and services in order to develop competitive strategies.

11.3.6 ICT Infrastructure Management

Tchnology can be employed to achieve a wide variety of benefits (Eason, 1992). Ward (2002) added that Information and Communication Technologies are powerful drivers for change, creating awareness in the community at large about information of potential value and its volume. In essence, the prime function of ICT is the provision and dissemination of information and knowledge (Edejer, 2000; Fors and Moreno, 2002). Workers of any status are enabled able to disseminate information electronically without having to go through hierarchical channels (Larsen and McInerney, 2002; Katsirikou, 2003). Jimba (1999) reported the enormous advantage of information technology in easing the delivery of information around the world. He forecasts that ICT will shape the dynamics of the future of third world countries. This will happen once these countries have been encouraged to invest in information technology.

The quality of the Information and Communications Technology (ICT) systems are crucial in collecting, analysing, and disseminating information throughout any organisation. Therefore, organisations need to invest appropriate efforts in the design, planning and management of ICT, in order to obtain the best value (ICT Infrastructure Management, 2002). Skyrme (2002) stated that ICT is dramatically changing the business landscape. Although organisation cultures and strategies shape the use of new technologies in organisations, more often the influence is stronger the other way round. ICT significantly affects strategic options and creates opportunities and issues that managers need to address in many aspects of their organisations.

ICT Infrastructure Management identifies system requirements through the tendering process, testing, installation, deployment and ongoing support and maintenance of the ICT components and services (Planning to Implement Service Management, 2002). The benefits of ICT relate to the reliable and consistent matching of ICT services to user needs (i.e. service quality), which in turn contribute to the overall success of the

organisation through higher productivity (ICT Infrastructure Management, 2002). These benefits are achieved through:

- increased service availability and quality to users
- better match of capacity to users' requirements
- less adverse impact of changes on the quality of ICT
- more efficient handling of problems
- lower costs of ICT service provision
- reduced risk of failure, minimising the effect of such failure

According to McNish (2002), technology changes can be achieved when organisational leadership accepts responsibility for establishing and articulating objective criteria, outlining the need for the new system and the selected solution. On the other hand, successful ICT operations require a whole range of skills such as; managerial skills which are essential to the operation of networks, information systems and databases. Hamelink (1998) stresses that the need for planning and funding of extensive educational programmes, also needs to go further, and to be realised through national efforts to attain digital benefits as a part of a global environment.

In the health sciences libraries in Riyadh, it has been observed that there is a digital gap; some have implemented new technologies while others are lacking in basic technology devices. Generally, health librarians are not participating in choosing the technology to be implemented and in most cases their feedback is not considered. In addition, the ICT used is not utilised to its maximum capacity, i.e. to facilitate services and to obtain users' satisfaction. Critically, the understanding of implementation with its all related prospects (i.e. people issues, technical issues) is not recognised. The recent project of the establishment of the central health library, which is still in the planning stage, describes the need for automation after establishment. This plan shows a lack of understanding of the potential of information communication technology. In addition, it indicates that the planners have a different mind set and do not have a full understanding of ICT implementation. Simply, the automation process's introduced to existing traditional organisation, but it is not enough to establish a traditional structure and then start calling for automation processes. Indeed, health sciences libraries in the country are in need of successful

planners who can utilise and deploy ICT in their plans and management of potential projects.

ICT Infrastructure Management is suggested, in the proposed model, to be within the library concern and participation. Qualified health information professionals (health librarians) have an essential role in choosing certain technology. Their participation in the implementation phases is recognised for the maximum outcome of a system by providing better library and information services. In addition, successful ICT managers should communicate with other key people within and outside their organisation in order to be able to anticipate change. They will need to plan for anticipated change so that when it happens it can be handled with minimum stress.

However, there are many issues related to managing the growth of the ICT infrastructure. Health sciences libraries in Riyadh should be aware of the need to participate in this growth and deal with its various issues. This participation is expected to involve:

- Developing a plan for the software and hardware to be used
- Investigation of expected upgrades of equipment and increased demand on resources as the technology progresses
- Balancing ICT infrastructure maintenance and development to guarantee the services utilised by ICT infrastructure management
- Employment of professionals and development required for a range of tasks,
- Participation in the ICT implementation management

In brief, as Salmela (1996) noted there may be no "one best way" to implement information technology, but rather, importance should be given to contingency issues, such as the implementation horizon, and environmental turbulence. Furthermore, as Beaumaster (2002) reminds us, that good information technology implementation starts with strategic planning that considers inter-departmental coordination needs, and the organisation's mission.

11.3.7 Strategic Planning

The way people in organisations think, make decisions about systems, and react to technology as an intervention can be a source of people-related barriers which lead to

implementation failure (Sokol, 1994). McAfee (2003) explained this issue clearly by saying that there is a lack of progress over time on implementation milestones and decisions, even after all parties have agreed that the effort is a good idea. Inactivity is a characteristic of complex implementations that involve many new processes or multiple constituents. Such complexity can create uncertainty and apprehension that can cause organisations to proceed slowly toward implementation. McAfee recommends, therefore, that organisations must be able to diagnose and remedy any types of failure or implementation barriers (i.e. resistance, participation, and misspecification).

Strategic planning is a management tool (Alliance, 2002). Further, it is important that organisations focus on the broad change management practices, skills and tools that will help the organisation understand, and support the needed successful change and implementation. This will depend on individuals sharing positive attitudes about technology; the organisation is then thought to have more confidence for innovation. Beaumaster (2002) highlighted that a greater state of "organisational readiness", in terms of providing necessary resources, and support structures, is needed to properly prepare the organisation for the change, and to maintain the technology intervention.

It has been observed and recognised that health sciences libraries in Riyadh do not employ a clear strategic plan; a plan which is encoded to participate in the direction of the parent organisation and health information environment. A lack of standardisation and defined health information policies is also observed. In fact, a national information policy for Saudi Arabia is now being developed to overcome many information and legal problems. In the meantime, however, library managements and staff members working in health libraries are focusing on the achievement of daily activities and duties without an understanding of their mission, but focusing simply on the work that has to be done. In addition, most librarians are starting to lose important characteristics such as innovation, communication, and collaboration among themselves and with others; this also influences the shape of health sciences libraries environments. Further, health sciences libraries in Riyadh are not sharing official communication or collaboration with each other, but relying mainly on unofficial and personal channels. Such barriers contribute to undermine innovation and creativity in the health sciences libraries environment.

In the visionary model, the strategic plan has been centred in the model to give emphasis on the importance of collective participation in expected future change and development. The focus here is to ensure that all main elements and units of a health sciences library are working towards accomplishing the parent organisation's planned mission and to participate in shaping that organisation's direction. It promotes interaction, collaboration, and innovation among these disparate units who have the same overall goal of health excellence and successful practice. In addition, it would also provide a rich ground for the growth of health research programmes. The strategic plan is a creative process influenced by environmental characteristics; communication, collaboration and innovation. It assesses the present practice and plans for the future development.

11.4 Summary

Looking towards the future, health sciences libraries in Riyadh, with the adoption of the organisational visionary model, are expected to move from a traditional organisational structure and modalities towards a continuous spectrum of change. In order to facilitate incorporating technology in the work process, many professional development opportunities should be available. Therefore, predictions should be made to enable the implications of change to be positively managed rather than merely survived; health librarians' participation can effectively manage that change in their own organisations. The environment is characterised by flexibility, collaboration, and interaction across units, with staff and users actively working together to foster an informative and successful environment.

However, the change and development process in health sciences libraries in Riyadh needs to be simplified and presented in such a way that participants in that change will accept and support the process. The technological infrastructure should make possible the support of a wide variety of options for offering various library and information services either within hospital buildings or online. Health sciences libraries development in Riyadh should continue to move to online and electronic resources to enhance remote access, meeting the need for resource access in any place and at any time

11.5 Conclusion

The model incorporates a collaborative approach in order to bridge the gap between change decisions and progress in real time. The priority is to participate in changing and improving the current condition of health sciences libraries in Riyadh. This includes management style, advanced technology, improved communication channels, innovation trend, organisational and people development, and teamwork setting. The proposed model attempts to bring together and balance the internal focus of the library staff with an external focus on library users and its mission. It reaffirms the library's traditional mission while proposing changes in how that mission can best be achieved utilising the new technologies and openness to change. The proposed change is to serve hospitals to achieve the libraries' mission of being supportive, responsive to the eminence of healthcare distinguished by its commitment to openness, innovation, and excellence in applying well planned strategies and change practice.

Overall, the fundamental values of the above proposed model are summarised as follows:

1. Create a social foundation for change within the organisation, which guides participants through the change, considering collaboration, communication, and innovation
2. Use strong communication to link change processes to the existing and reformed organisational change and development
3. Create and increase a ready-for-change attitude, and strengthen responses through "change management"
4. "Administration and Strategic plan" to facilitate firm, positive decision making, and ensure successful plans with its implementation, and collaboration within all divisions and units
5. "Library and Information Service Management" to allow traditional services and new innovative ones to coexist within the organisation utilising new technologies,
6. Greater concern for "Human Resources Management" through training and educational programmes. Listen to information specialists (librarians) and staff inside the organisation and make allowances for their experience to encourage their participation in organisational change and development

7. Through "Information Resource Management" acquire and manage resources for better utilisation, to meet users' expectations and win their satisfaction
8. Build and maintain the "ICT Infrastructure Management" to ensure the utilisation of new technology in performing the organisational operation and process.

The organisational visionary model is proposed for health sciences libraries in order to solve key issues affecting the health sciences libraries in Riyadh. As well, this is to facilitate the utilisation and implementation of new technologies, for example, the proposed health information network for Saudi Arabia as shown in the next chapter.

Chapter Twelve

SHIN Prototype

POSITION IN THE THESIS

Chapter 1 Introduction	Chapter 2 Background	Chapter 3 Research Design
Chapter 4 Literature Review	Chapter 5 Users and Staff	Chapter 6 Health S. Libraries
Chapter 7 Education and Training	Chapter 8 Information Services	Chapter 9 ICT
Chapter 10 Information Provision	Chapter 11 Change & Development	**Chapter 12 SHIN Prototype**
Chapter 13 Conclusions	Bibliography	Appendices

12

Saudi Health Information Network: A Proposed Prototype

12.1 Introduction

The current findings directed the researcher to propose the development of the interface requirement for the design of a prototype Saudi health information network. This research identified the importance of ICT for the health sciences libraries, and for health professionals and health information professionals. It is evident that its use would enhance the quality of services.

This chapter provides an overview and a discussion of different stages of the design, content, and its advantages. As well, it presents the future outlook, and the quality of the prototype.

This SHIN prototype was the topic of a research paper submitted and presented in the 4th Regional Conference on *EMR Health Sciences Virtual Library: Role in e-learning and building the information Society*, held in the Easter Mediterranean Regional Office in Cairo, Egypt during the period 23-25 November 2004.

12.2 Rationale

Information networks enable participants to share research databases (Marshall and Haley, 2000; Bell, 2002), and provide the ability to allow groups and individuals in organisations to share documents and to work concurrently over a network (Nettle, 1998). Harrington and Li (2002) include among the advantages time saved going to conferences, more control over the learning process, and the potential for networking and profession-wide reach. In addition, the universal adoption of the Internet has created the opportunity for firms and other organisations to establish a collaborative network of partners with whom they may exchange strategic knowledge in order to achieve mutually beneficial objectives (Katsirikou, 2003).

Kolo (2000) notes that the information society has been developed with the existence of new technologies, and became widely known with the invention of computer systems and networks. The terms "service society" and "information society" (Snoj and Petermanec, 2001) reflect the importance of knowledge, based on the power of information, where libraries were once major players. Now, libraries are in competition with vendors, publishers, the mass media, online services and the Internet. The new technologies and competition are leading the entire LIS profession to adopt new development and changes.

In practice, today, the Internet has become the largest and most important network, and has evolved into a global information society. The Internet has also become a key platform for rapidly expanding communication and information dissemination. Part of the global information society is the health information society (HIS). HIS will flourish with the strong involvement and co-operation of its main pillars (Figure 12.1); health professionals (producers and users of knowledge), health information professionals (organisers and managers of information and knowledge), and health sciences libraries (places for storing information and knowledge, whether (physically or virtually). The health information professionals are playing an important role in

organising and managing knowledge, and retrieving and facilitating the use of electronic and non-electronic information resources. This might require developing and providing services around the clock to become visible and desirable, with the development of the Internet.

Human resource development programmes should go some way towards ensuring that health information professionals are able to exhibit a flexible and enthusiastic approach to the challenges encountered. On the other hand, Wittwer (2001) believes that librarians should adopt a proactive approach to manage their own Continuing Professional Development (CPD). Jackson (1991) recommends that health sciences librarians (health information professionals) should provide services to users in an informal and relaxed atmosphere to improve the users' information handling skills.

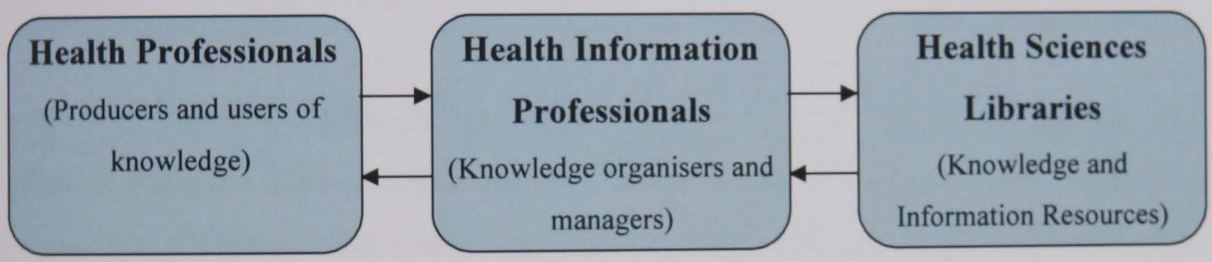


Figure 12.1: Pillars of Health Information Society

The health sciences library (physical or virtual) provides information and equal access to clinical information to many health professionals, regardless of location (Peterson and Harris, 2002). The health care literature emphasises the significant function of the health sciences library as an influential information centre (Darling, 1974; Roderer, 1993; Palmer, 1996; Myers, 1998; Palmer, 1999; Bishawi, 2001), and its services can have an impact on the way knowledge is put in to practice (O'Connor, 2002). Urquhart and Hepworth (1995) report how the information supplied by health sciences libraries can affect future clinical decisions. Many studies demonstrate conclusively that the use of appropriate information sources from libraries significantly influences health professionals in their practice of medicine, and results in better patient outcomes and fewer medical errors (Marshall, 1992; Ali, 2000; Peterson and Harris, 2002).

Musoke (2000) explains that information use usually leads to changes in the user's state of knowledge, behaviour, values or beliefs. Libraries provide information that has a strong impact on physicians' clinical work and patient care (Oduwole, 1999). The information service provided by health sciences libraries is perceived by physicians as having a significant impact on their practice of medicine (Dalrymple, 2003; Peterson and Harris, 2002; O'Connor, 2002; Ali, 2000; Oduwole, 1999; Urquhart and Hepworth, 1995; Breton, 1994; Marshall, 1992; King, 1987). Gorman and Helfland (1995) conclude that unanswered questions represent an important missed opportunity to educate physicians and improve medical practices. Bryson (1997) makes an important point that, bearing in mind strategic influences on library and information services over the next decades, an analysis is required of the factors that would create the need for change or the impact upon people and organisations during this period. However, the need still exists to demonstrate that health sciences libraries do add value, and that their services have a real impact on people's lives.

In the Arab region, health sciences libraries are in a better situation than many other types of libraries. This is due to the fact that medical education requires libraries to support the education and research process (Al-Shorbaji and Nour, 2001). The same authors also confirm that the ICT infrastructure has improved in these countries and changed dramatically in the last few years. Additionally, Eastern Mediterranean Region (EMR) countries are now connected to the Internet, and the number of trained computer and communication specialists has substantially increased. ICT is used for providing intellectual access to knowledge, and can be achieved by using the Internet and other electronic publishing media to identify resources and facilitate access.

12.2.1 Trends of Change

There are some trends of change recognised as having an influence on the global information society and the health information society in particular. These trends are fundamental, and have an influence upon individuals and organisations. Khudair and Bawden (2004) noted some of these trends as follows:

- **Global society:** Worldwide co-operation and co-ordination among large hospitals which develop a global practice.

- **Healthcare profession:** Hospitals are escalating in providing large and accurate health services. Health professionals are starting to be involved in the preparation and management of health issues and solving problems using ICT tools.
- **Health Information Profession:** Future health information professionals (health librarians) possibly will not be able to resell information that is freely available on the Internet. Successful health information professionals are managing multidiscipline projects and developing new work. Their influence will depend upon their wisdom, services, and strategic and tactical skills.
- **Education and Training:** The trend, in any profession, is focused on the quality of education and the learning process. Subsequently, training through continuing progress is essential (Continuing Professional Development).
- **Communication and Information sharing:** Many businesses and services use new technologies to speed up their way of communication. The Internet has developed new communication channels instead of the more traditional and limited ones. The trend, especially among health professionals, is to share health information and experiences. This exchange of information becomes essential between large and small hospitals in both the east and west.
- **Internet priority:** The features of the Internet have proven its priority and advancement over all other types of information resources and communication tools. Health professionals are enthusiastic to use the Internet for easy and accurate searches and fast communication.
- **Information Divide (Digital Divide):** The trend is to provide people with the technological means to access information (Foster, 2000), in order to narrow the information divide (Kargbo, 2002). This is observed more clearly in eastern countries. Some hospitals may be equipped with very advanced technologies and the ability to access health information worldwide, while others in the same city are not. The trend amongst health organisations and institutions worldwide is to solve and reduce this difficulty. The Internet shows its influence in reducing this worldwide problem.

12.2.2 Saudi Health Information Network

In view of the importance of ICT in the healthcare system, it is very desirable that a network is developed to provide health information sources and services that will satisfy the information needs of health professionals in Saudi Arabia. Furthermore, most health websites promoted in Saudi Arabia for health professionals and health information professionals are promotional websites that present the services offered by the hospital and libraries in the form of an 'online brochure' and advertisement. Specifically, there is a need to provide electronic information that will assist the professionals in carrying out their work tasks by providing easy access to relevant information. Such a health information network could also help to identify and locate health information resources and services through the Internet.

The problem facing the health system in Riyadh is that the 'body' (the health professional) and 'soul' (the health information professional) are not joined as one to form a single entity. As a result of this separation, health professionals spend a great deal of time in information searching, while the health information professional's role is underestimated. To overcome this problem, the researcher has developed the design of a prototype of a Saudi Health Information Network (SHIN) interface. The SHIN prototype attempts to join together the two elements of life, i.e. the body and the soul.

The proposed service is to offer regularly updated health and scientific articles and publications, and on-line health guidance relating to patients' particular problems. This network would help health professionals and health information professionals perform effective functions within one setting, which will enhance their information seeking and satisfy their information needs. The proposed network will promote various channels of communication and co-operation in the healthcare environment. Importantly, it will help the healthcare environment to move towards the establishment of a flourishing health information society through popularising the use of electronic resources and highlighting the benefits and advantages of the electronic learning programmes. There will be links to all appropriate health sites which would be authorised, authenticated and regulated. For example, users might find directories of governmental hospitals, governmental pharmacies, health sciences libraries, and guidance on organising and using personal health libraries. In addition, a web-based health information network prototype could be a key enabler and catalyst for such

change in the health profession, because the Internet has the capability to meet changes of this kind. However, the implementation and evaluation of this proposed health information network remain for further research.

12.2.3 Advantages of SHIN

There are some advantages for a health information network to be established for the benefits of its users in the country of Saudi Arabia, some of which are as follows:

1) The network will provide remote access to massive electronic resources with the concept of any time, anywhere health information.
2) The network will promote real participation in the health environment through many approaches, part of which is the medical decision support.
3) With improvement in ICT usage, the network will improve health information services and electronic document delivery.
4) The network will facilitate the communication channels and develop health information sharing among Saudi hospitals in general and health professionals in particular.
5) Parallel implementation will improve the work progress of health sciences libraries and health librarians in updating services and publicising their information services.
6) The network will consider specific health information needs which can be addressed separately, such as to help in finding the health professional needed for a particular medical case problem.
7) Recent technologies and software programs are used to increase health informatics training and to deliver electronic learning (e-learning) projects to both health professionals and health information professionals.
8) The network will promote and participate in e-health tools, link users to electronic information resources, and provide health alerts.

12.3 Prototype Design

The design of the Saudi Health Information Network (SHIN) prototype went through five steps:

- Vision and objectives

- Identify intended audience
- Information gathering
- Structuring the design
- Prototyping:
    - Mock-up prototype
    - Interface building

12.3.1 Prototype Vision and Objectives

The vision and objectives of the Saudi Health Information Network prototype were set up to be the milestone of the design process. It took some time to understand the needs based on the findings of the current research and other researches related to health information in Saudi Arabia, such as AlShaya (2002), Al-Zahrani (2001), Aseel (1996) and AbuOuf (1995).

12.3.1.1 Vision

The prototype vision was designed and noted for clear plans and provisions for today and into the future where the aim was to:

- Provide potential users with information through the provision of their information needs.
- Facilitate various information services and their components to improve users' satisfaction through remote and fast access to electronic resources.
- Promote various channels of communication and co-operation in the healthcare environment.
- Help the healthcare environment to move towards the establishment of a flourishing health information society by popularising the continuous use of electronic learning and electronic sources.

12.3.1.2 Objectives

The prototype design effort was focused on achieving the following objectives:

- To deliver relevant health information services to health professionals in Saudi Arabia.
- To keep health professionals updated with new information.
- To apply information technology to the information needs of health professionals in Saudi Arabia.

- To enhance the communication channels between health professionals in Saudi Arabia and other health professionals internationally.
- To enhance e-learning among health professionals and health librarians for the professional health information society as a whole.
- To unite health information professionals (health librarians) and to develop their way of communication.
- To help health information professionals (health librarians) to develop themselves throughout their career and profession.
- To provide a variety of links to relevant and authentic health information sources and services.
- To deliver relevant health information services to the general public in Saudi Arabia.
- To reduce and narrow the information divide existing in Saudi Arabia; and
- To be cost-effective.

12.3.2 Intended Audience

One of the essential steps of the SHIN prototype is to define its audience, i.e. who are they, and what are their needs? This helps to focus more on the targeted audience, as well as considering the priority of services of this network, based on the level of users. It is planned that the prototype will have a wide audience. However, the prototype has both primary and secondary audiences. The primary intended audience consists of health professionals, and health information professionals (health librarians), while the secondary intended audience is other users from the general public.

12.3.3 Information Gathering

At the start of the design process, information was gathered by various methods to increase the knowledge and understanding of the researcher in relation to some important points, such as familiarity with design, and the implementing of such systems. The information gathered includes the following:

- Research findings that indicate the requirements of health professionals in such a network.

- Literature related to the design of information networks, their implementation and evaluation.
- Analysis of other similar networks, considering elements such as scope, structure, resources and services provided, as well as the organisation of information and design layout.
- Basic resources of health information on the Web.
- Review of well known, professional health information and health library websites adopted and provided for the UK, USA, Canada, Australia, and others.

12.3.4 Structuring Design

People develop expectations about how to find different types of information and how to accomplish particular tasks. In order to reach a successful prototype, the work moved toward organising the information in a way that makes sense to both users and designers. In addition, care has been taken in structuring the prototype to assure the smooth flow of navigation. It took a considerable time to recruit some participants to help organise the information content of the prototype in a way that seemed most logical to them. The card sorting method (IBM, 2004) was used to formulate organised information contents:

- Cards were created of topics covered by the prototype,
- Participants sorted cards into logical groups, and
- Groups created by participants were analysed and the optimal organisation structure for the prototype was then determined.

This process was accompanied by the analysis of participants and how they accomplished the tasks that the prototype will facilitate. Analysis was carried out to organise the steps within the tasks according to the participants' preferences.

12.3.5 Prototyping

Designers always prefer to use prototyping before releasing the product, because it saves cost and effort. The advantage of using a prototype is that the process of modifying a prototype is much cheaper than modifying the final product. Designers usually create low and/or high fidelity prototypes. A low-fidelity prototype is quick

and easy to build, as it is created on paper (Rudd et al., 1996). In contrast, a high-fidelity prototype is similar to the final product (Walker et al., 2002). The SHIN prototype was built using software tools, and users can interact with the interface as though it is the real product. Walker et al. (2002) point out that designers can choose the most practical prototyping medium for them, because user-testing feedback is equally good with either. Virzi et al. (1996) conducted two experiments, and compared the usability problems that occurred when using low and high-fidelity prototypes; they found that there is no difference between the two types.

12.3.5.1 Mock-up prototype

After intensive information gathering and design structuring, a mock-up prototype was developed in order to produce presentable ideas. This mock-up was developed based on a number of thumbnail sketches which had been produced to allow a quick exploration of the idea and its major design components. Brinck et al. (2001) confirm that a mock-up allows the designer to explore page layout and arrangement. This mock-up was passed to some colleagues in the UK, Saudi Arabia, and Egypt. A session was held in which the project's vision, objectives and intended audience were discussed. The purpose of this was to gain the suggestions and recommendations of colleagues, and to identify potential difficulties as early as possible in the design process.

12.3.5.2 Interface building

The proposed interface had to be pleasing to the eye and had to minimise the effort that users need to accomplish their work. Peterson (2001) notes that the main emphasis is on setting up services to suit an online environment, and designing user-friendly pages to ensure acceptance of the new services. Therefore, the presentation of the interface was considered the most important element in the design. The prototype is designed in a way that allows users to consider who the audience of this network is, and why this website should be used. The future plan of this prototype is to use new tools for searching processes needed to allow health professionals to query the world's health and medical literature from the comfort of their own place of Internet access. In addition, it has been considered that, in the future, the Saudi Health Information Network (SHIN) will offer access to electronic resources by providing fast, affordable, high quality, simple and reliable information, with the feature of

customisation. Assurance has been given, by the researcher, that the prototype design and features fulfil the vision and objectives of the SHIN.

In real life, as noted by Martin (1998), health professionals and health librarians should work together to link clinical information systems to consumer health databases, and design easy-to-use interfaces or single entry points to these resources in order to make the best information available that directly benefits consumers and their caregivers.

12.4 Prototype Outlines

The prototype has certain contents and features (Figure 12.2) that have been developed to satisfy the information needs of the intended audience. The main content of the prototype is as follows:

- Health Services
- Health Library
- Health Professionals
- Health Librarians
- Health Links
- GeoMap
- Contact Us

The first page is the index page (Figure 12.2) which contains most links and services. It is made visible to facilitate access and navigation. Specifically, it invites users to subscribe to the e-mailing list and the electronic newsletter. SHIN members can log in directly to access and customise special services.

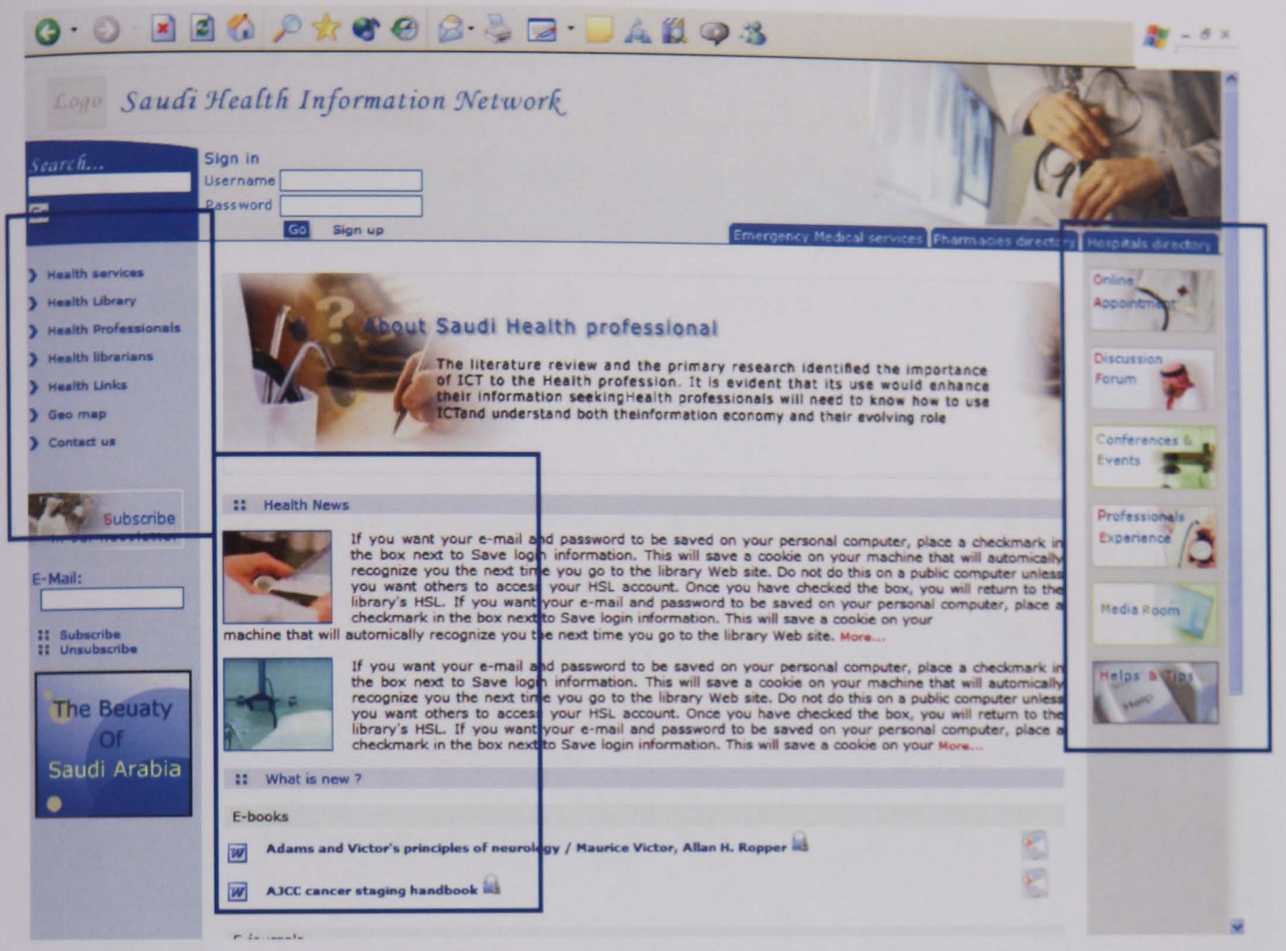


Figure 12.2: Index Page

12.4.1 Health Services

Health services endeavour to serve the health needs of all individuals, in a manner sensitive to the patient's language and cultural needs. They provide high quality health care with a focus on education, prevention, and early intervention. This part of the prototype (Figure 12.3) contains the following:

- Medical Services,
- Saudi Health Services, and
- International Health Services

Health Services in Saudi Arabia, as designed in the prototype, should co-operate with health services in other countries in the various health and medical aspects concerning individuals and communities. The Health Service programme is planned to offer patients and their families well-co-ordinated and individualised care, as well as fast and easy access to the excellent programmes and practitioners, both nationally and internationally.

A multidisciplinary treatment plan is designed for each patient, based on his or her unique needs, to be carried out by a team of dedicated specialists. Further, it is planned to link patients with particular hospitals and those physicians who are best suited to treat them. Health Services provides a variety of convenient services to accommodate patients and their families, and enable them to receive treatment in a timely manner.

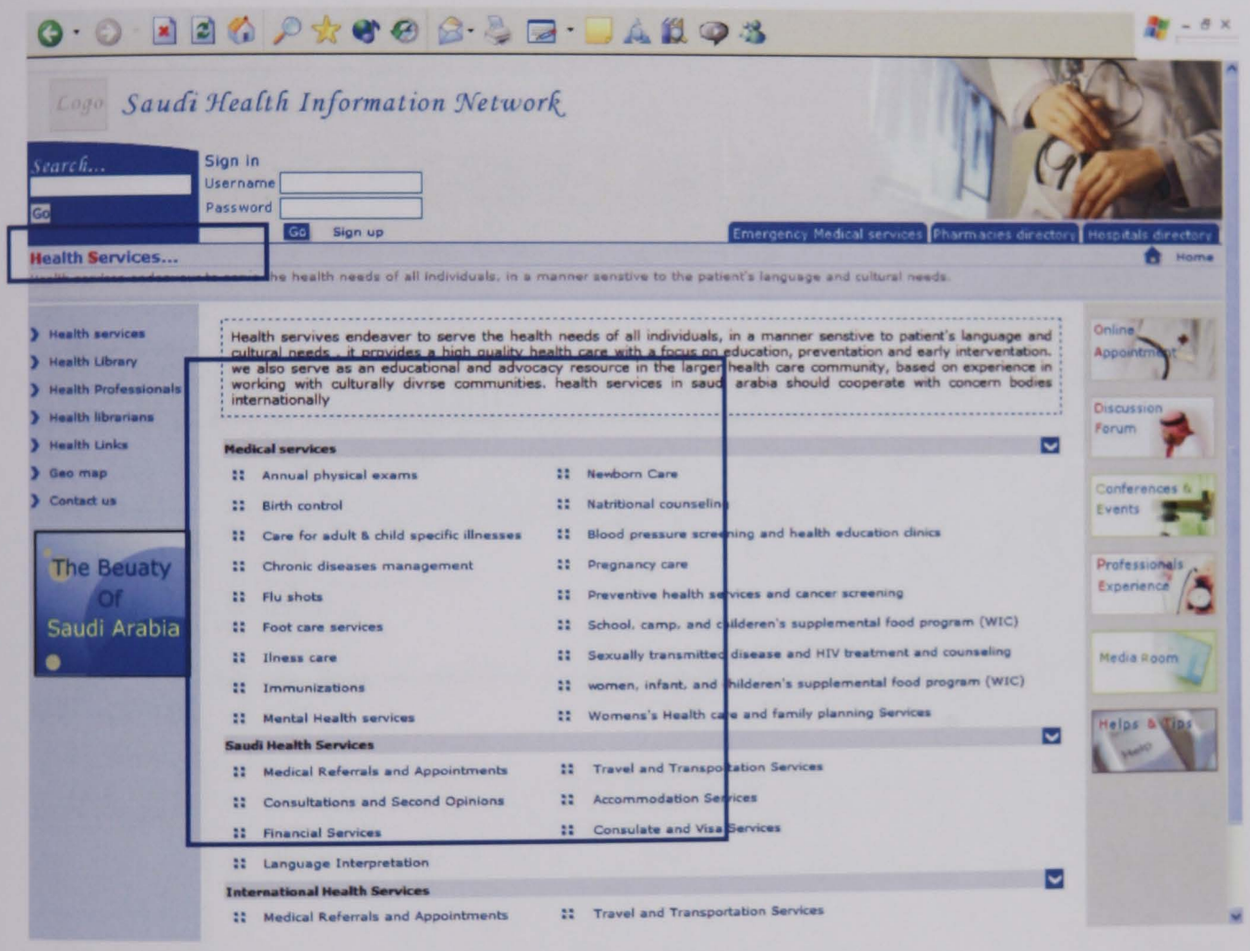


Figure 12.3: Health Services Page

12.4.2 Health Professionals

This part of the prototype is designed to create a scientific, informative, and co-operative environment with fast communication amongst health professionals. It mainly contains:

- Profiles
- E-learning
- Online Resources
- Research programmes

- Conferences and events
- My Cabinet

In Saudi Arabia, there are various directories related to specific hospitals and associations, which categorise and classify their health professionals. However, these directories are not sufficiently comprehensive to cover all health professionals in the country. It is clear that there is a need for such a directory to enhance communication channels among health professionals. Therefore, the prototype includes such a directory (Figure 12.4), arranged alphabetically according to the field of practice.

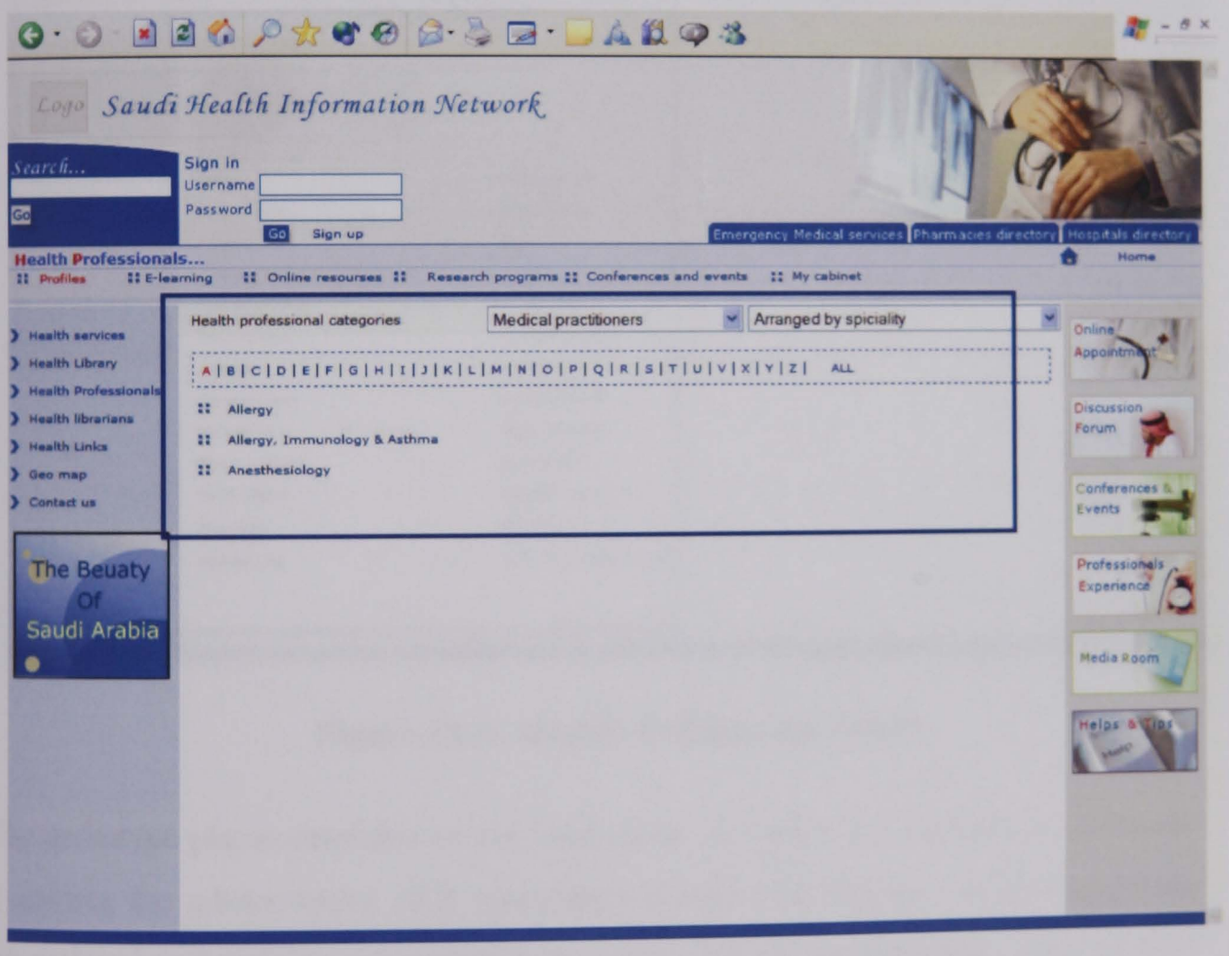


Figure 12.4: Health Professionals Profile Directory

In general, the search feature can categorise and retrieve data by any field of entry provided. For example:

- By the category of Health and Medical disciplines
- By name, age, or sex
- By region or city
- By specific hospital or organisation

The prototype gives the feature that each health professional has his/her own page **profile** (Figure 12.5) and he/she is responsible for updating his/her own information. It also allows advance searching, for example the search can be conducted to retrieve male dentists in Riyadh city.

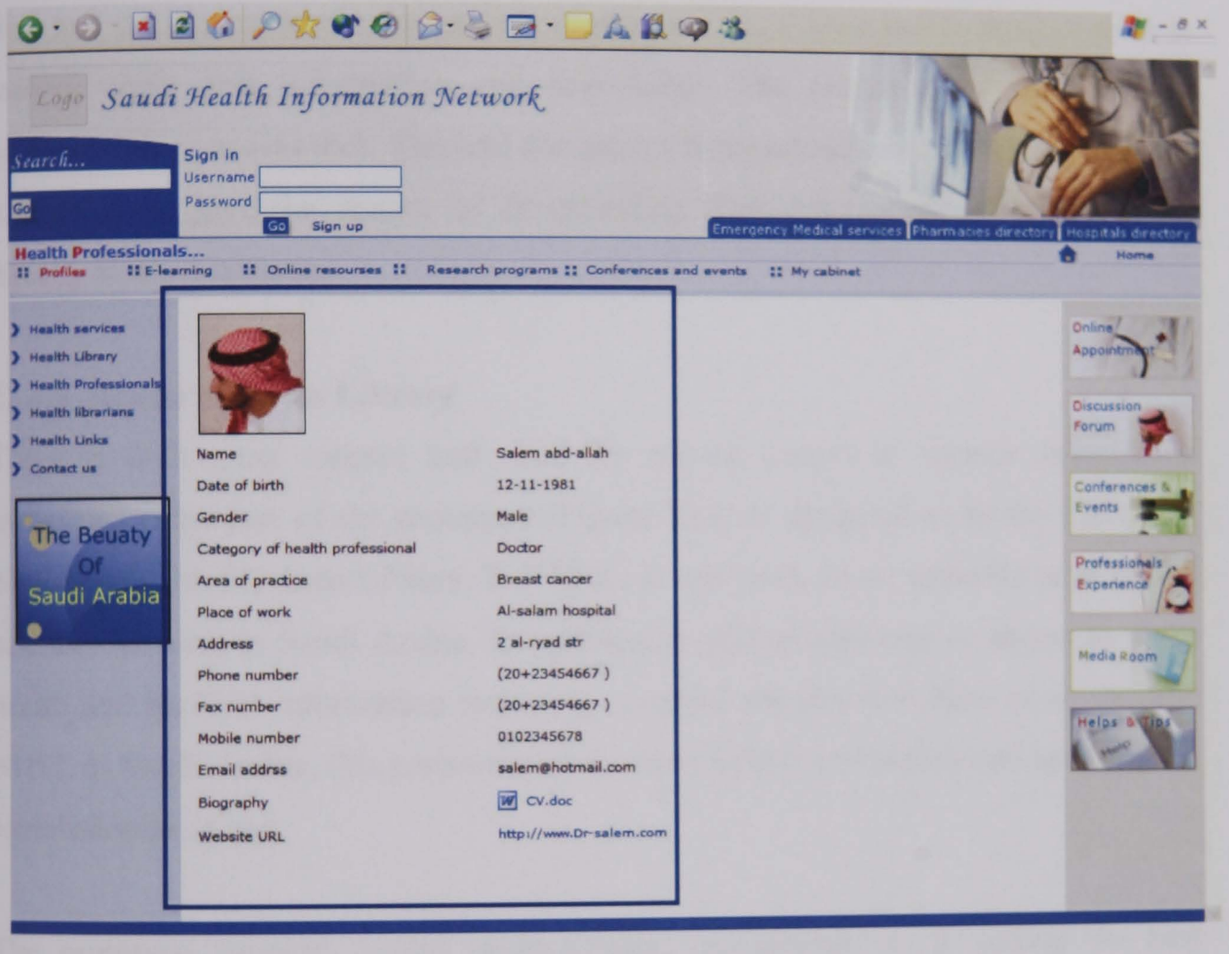


Figure 12.5: Health Professional Profile

The prototype places emphasis on the importance of continuing learning programmes. It utilises the advancement of **E-learning** software and programs to deliver proper educational and training programmes related to health professionals, either in their speciality or in any other areas where they might need such search skills.

The prototype provides general **Online Resources** for health professionals which cover daily needs, and can be used as a quick references for more general queries. Health professionals need to participate in scientific research related to their own speciality. For this purpose, the prototype offers **Research Programmes** to increase co-operation in research, and to increase the awareness of health professionals of

recent research in the field of medicine. No less important, a part of health professionals' activities is participation in health and medical conferences. The prototype is designed to provide health professionals with details of the **Conferences and Events** held worldwide related to of medicine.

Individually, each health professional has the option to store and retrieve his/her own files and documents in the feature **My Cabinet**. This allows health professionals to manage their own information and knowledge. The feature also allows health professionals to access their files and documents from any access point. The prototype is planned to give the feature of downloading files and documents from the net directly to **My Cabinet**.

12.4.3 Health Sciences Library

There is both great support and need for remote access to various information resources. This part of the prototype (Figure 12.6) is designed to be the Electronic National Health Sciences Library, **E-NHSL**. It will work as an umbrella of all health sciences libraries in Saudi Arabia. In addition, it will provide remote access to wider health and medical information resources. Despite the fact that there is no existing NHSL in Saudi Arabia, this proposed service may help in promoting and speeding the establishment of one.

The prototype supports health professionals' commitment to providing the best possible care for their patients. From this page, health professionals can access a range of online tools to help them meet today's healthcare challenges. The aim of E-NHSL in this prototype is to serve health professionals and health information professionals (health librarians) in providing timely, accurate information. The Health Library, as a part of the prototype, consists of the following:

- Profiles
- Library Catalogues
- Electronic resources
- Education and Training
- Information services
- Customisation

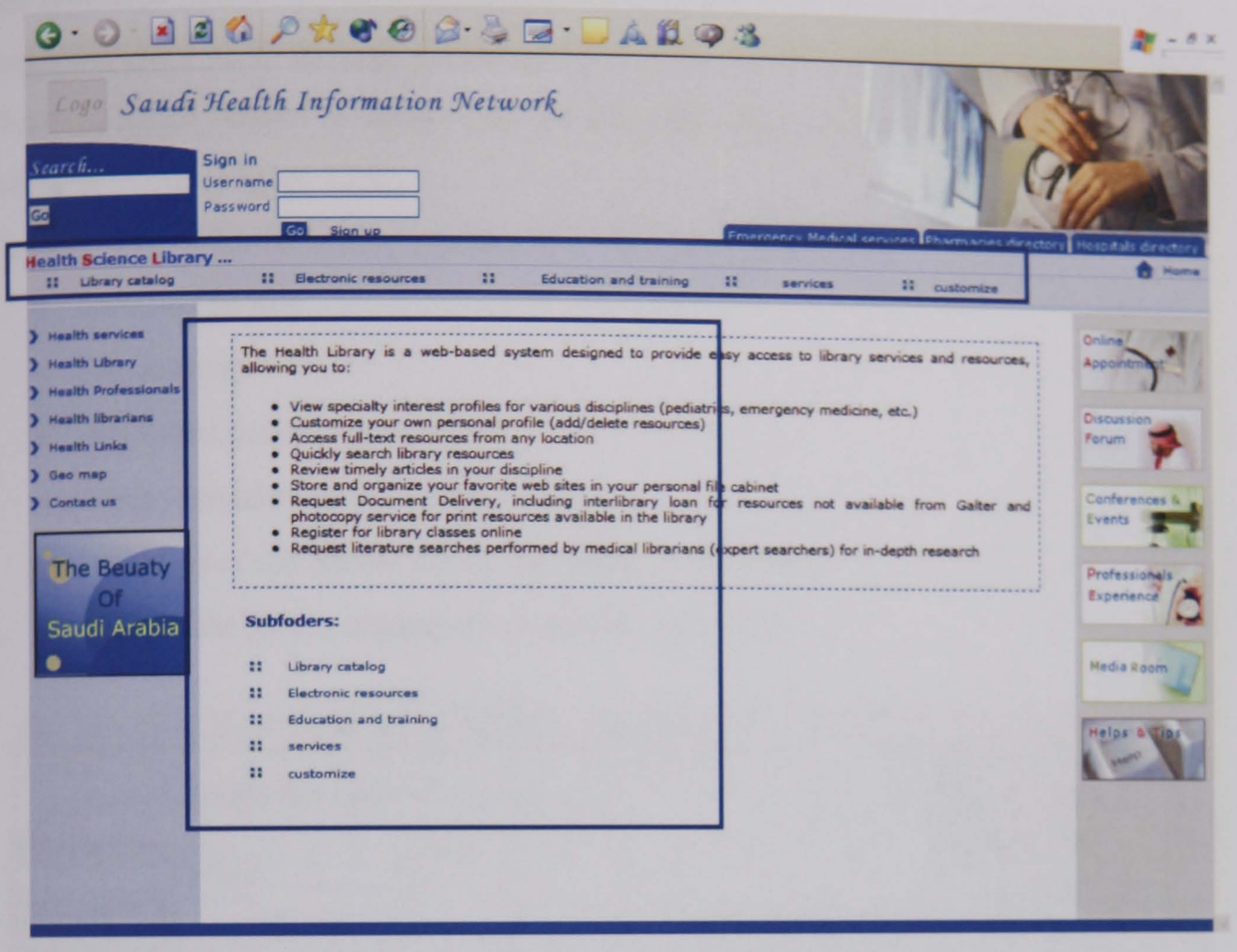


Figure 12.6: Health Sciences Library

The E-NHSL is designed not only to offer comprehensive content, but also to have sophisticated tools to guide users quickly and easily to the materials they need at any time. Therefore, this library provides a number of features, including the following:

- Health reference materials.
- Indexes for each item to give the user an idea about the subject.
- Books divided into various health and medical disciplines.
- A search engine that enables the user to search by title, subject, or by author name.
- Ability to download various materials.
- E-newsletters that send information about new health information materials directly to subscribers' e-mail accounts.
- Printed document delivery to be reached at any destination in Saudi Arabia (for example: request sent through health library 'A' that needs to be delivered to health library 'B').

The prototype offers the users the option to search for a particular health library in the country (Figure 12.7) through simple and advanced searches, and allows every health library in Saudi Arabia to create their profile, and add a link to their website if it is available online (Figure 12.8).

The directory of health library profiles has the following features:

- Detailed profile
- Digital map
- Affiliated parent organisation
- Main speciality of the health library
- Location of the library inside the parent organisation
- Link to the parent organisation website and profile

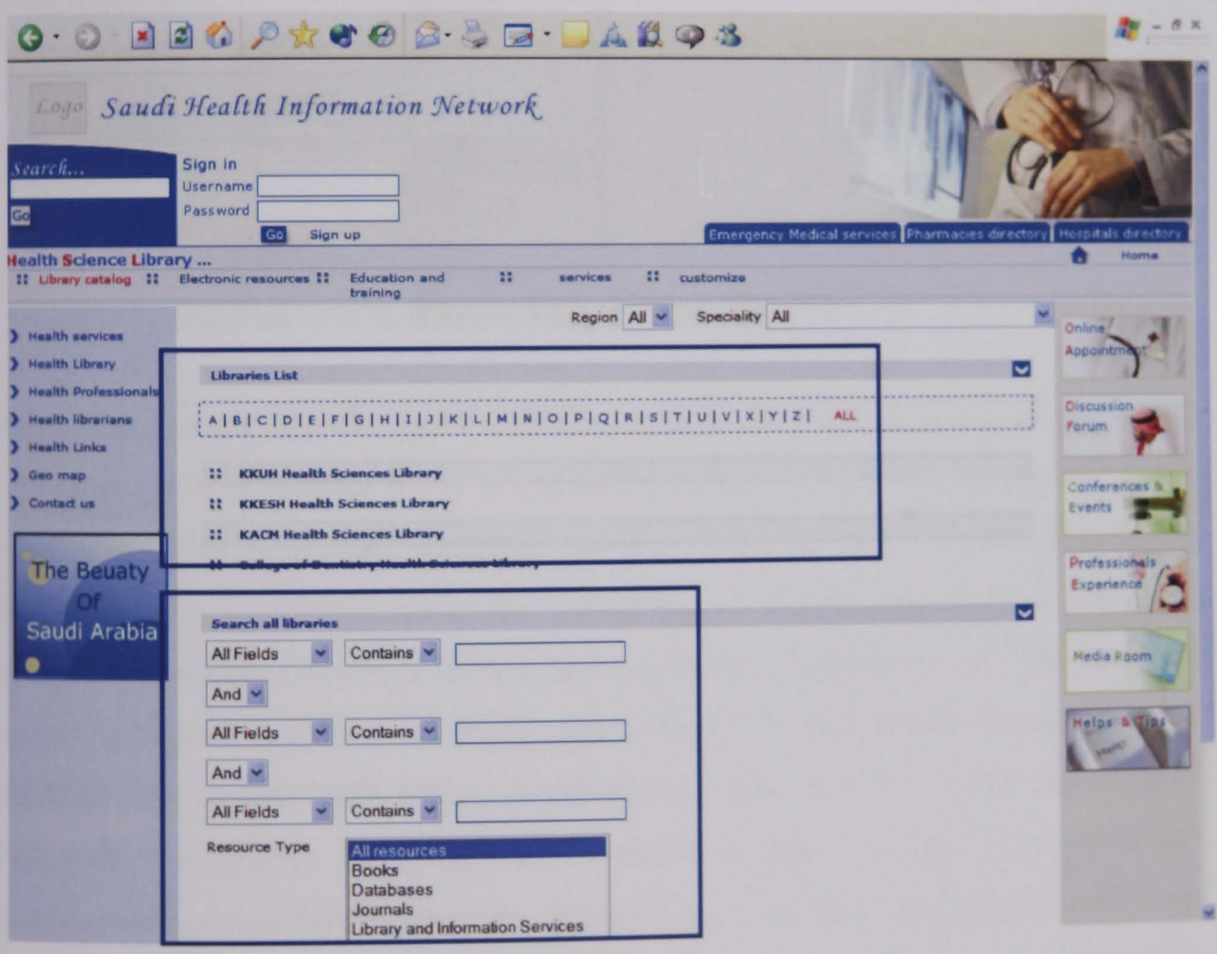


Figure 12.7: Library Search

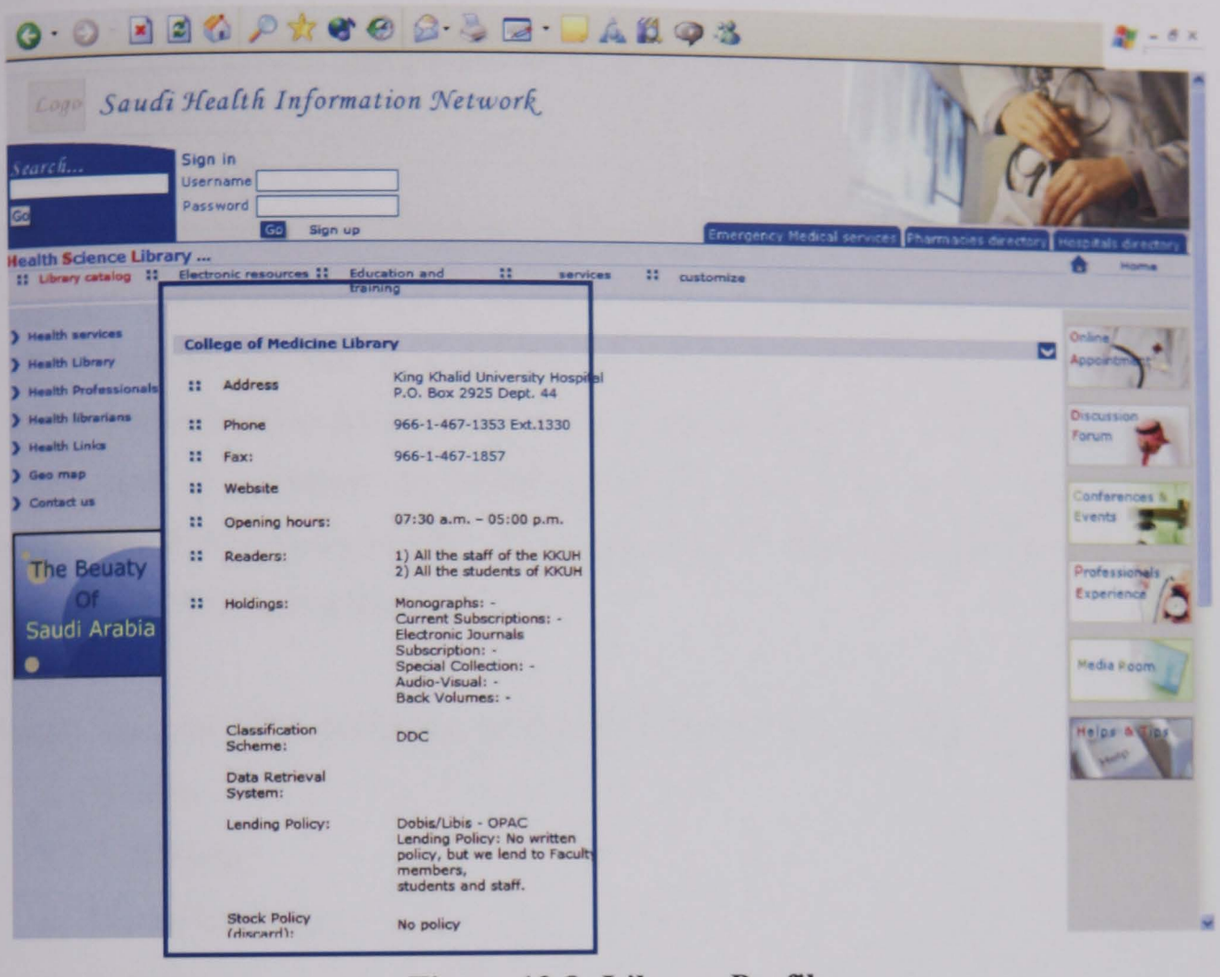


Figure 12.8: Library Profile

Library catalogues provide users with a complete search in the Saudi health library catalogues, but this needs more co-operation among libraries to participate in the network in order to provide successful services. The prototype has been designed to provide access to various electronic resources, i.e. health and medical databases, electronic journals, electronic books, and electronic references. This will facilitate access to required information in any place where Internet access is available. It is essential that Health Information Professionals take part in dealing with health information producers and suppliers. In addition, they are able to organise and manage various information services. The prototype facilitates **Information Services** to ensure that fast and accurate information is delivered through proper and suitable channels.

The prototype considers the importance of **Education and Training**. This service provides a complete schedule and time plan for educational programmes, seminars,

and training courses either to be held at a specific site or to be delivered through an e-learning programme provided by the Saudi Health Information Network.

12.4.4 Health Librarians

This part of the prototype is designed to help health information professionals (health librarians) to communicate and co-operate both to develop themselves and to be able to provide better services. It is also designed to overcome difficulties and obstacles that are encountered by health librarians in Saudi Arabia. It is expected that this will be the start of initiating the establishment of an Association of Saudi Health Information Professionals which will become one of leading organisations within the profession of health librarianship.

Mainly, this part of the prototype, as shown in figure (12.9), includes:

- Profiles
- E-learning
- Online Resources
- Institutions
- Associations and Organisations
- Research Programmes
- Conferences and Events
- My Cabinet

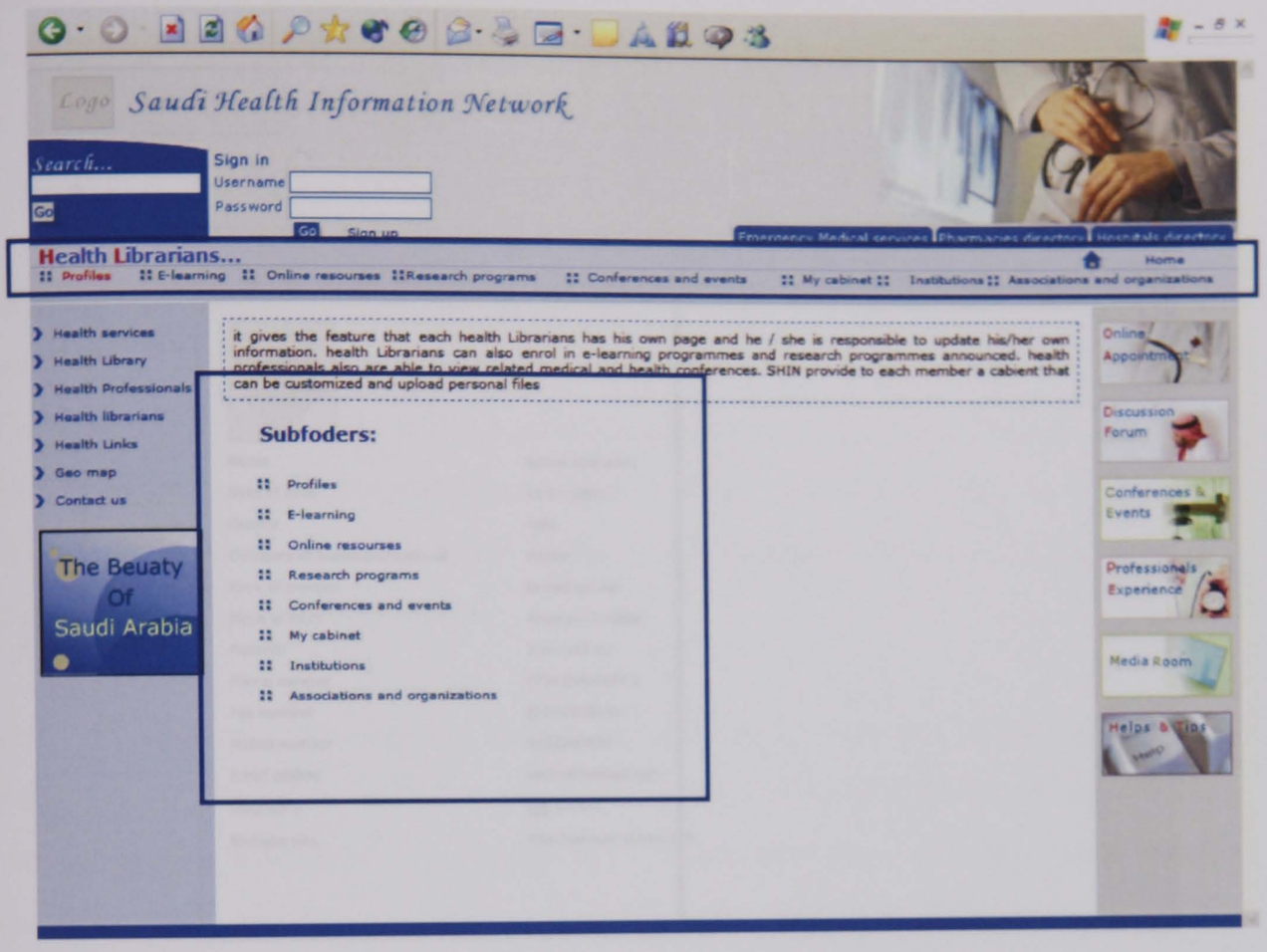


Figure 12.9: Health Librarians (Health Information Professionals)

It was clear that there is a real need for a directory to enhance communication channels amongst health librarians, since all types of communication were influenced by personal contacts and individual efforts. Therefore, the prototype includes such a directory and profiles (Figure 12.10). It gives the feature that each health librarian has his/her own page **profile** as before and he/she is responsible for updating his/her own information.

In general, the search feature can categorise and retrieve data by any field of entry provided. For example:

- By the category of speciality
- By name, age, or sex
- By region or city
- By a specific hospital or organisation

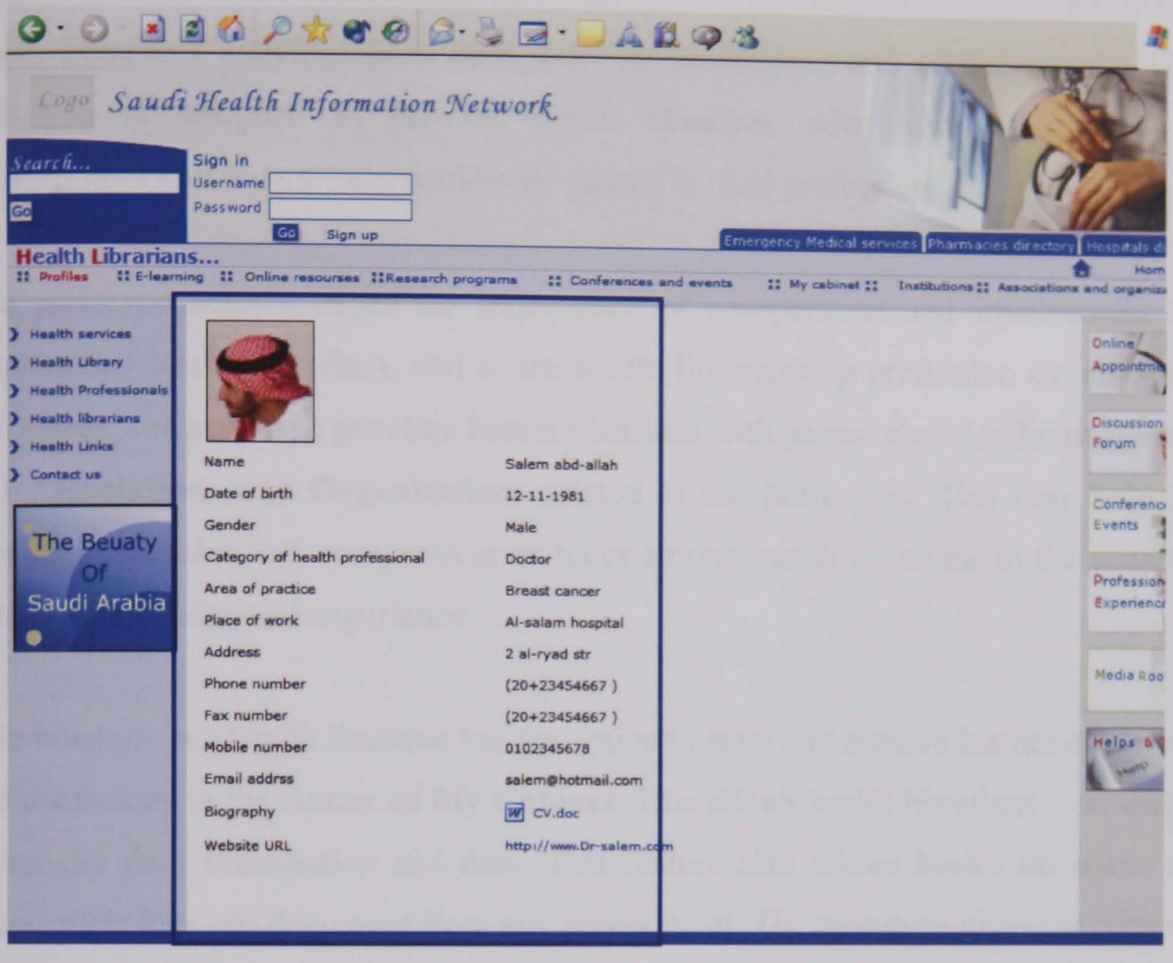


Figure 12.10: Health Information Professionals Profile

In addition, the user can directly choose and click onto one of the categories provided to have access to a list of related names. It also allows an advanced search, for example a user can search for Male Indexers in health libraries in Riyadh.

The prototype puts an emphasis on the importance of continuing learning programmes. It utilises the advancement of **E-learning** software and programs to deliver proper educational and training programmes related to health librarian, either in their speciality or in any programmes they might be in need of, to support their backgrounds and profession.

The prototype provides general **Online Resources** for health librarians which cover daily needs and are to be regarded as a quick reference for more general queries. Health librarians need to participate in scientific research related to their own speciality, such as technical services. For this purpose, the prototype offers **Research programmes** to increase co-operation in research, and to increase the awareness of

health librarians of the recent research in the field of health librarianship. Part of the health librarians' activities is to participate in conferences and related events. The prototype is designed to provide health librarians with information on the **Conferences and events** held worldwide related to their profession.

The prototype acknowledges the importance of co-operation and involvement in empowering health librarians, and to the health librarianship profession overall. For this reason, the prototype provides health librarians with pages related to **Institutions**, and **Associations and Organisations** related to the profession. This may help in creating responsive and co-operative attitudes among health librarians in the country to share knowledge and experience.

Individually, each health librarian has the option to store and retrieve his/her own files and documents in the feature of **My Cabinet**. This allows health librarians to manage personally their information and data. This feature also allows health librarians to access their files and document from any access point. The prototype gives the feature of downloading files and documents from the net directly to **My Cabinet**.

12.4.5 Health Links

This part of the prototype provides health professionals with links to a variety of healthcare and medical websites with Arabic and non-Arabic languages. It is divided into a number of categories (Figure 12.11) such as language, speciality, and countries. It should be considered that these links are working properly, and most importantly they should be examined and authenticated. They might be regarded as quick references to a selection of topics and specialities. The prototype also serves health information professionals and general users. Any user can suggest to the SHIN that a particular link to a website or free electronic journals should be added to this part **Health Link**.

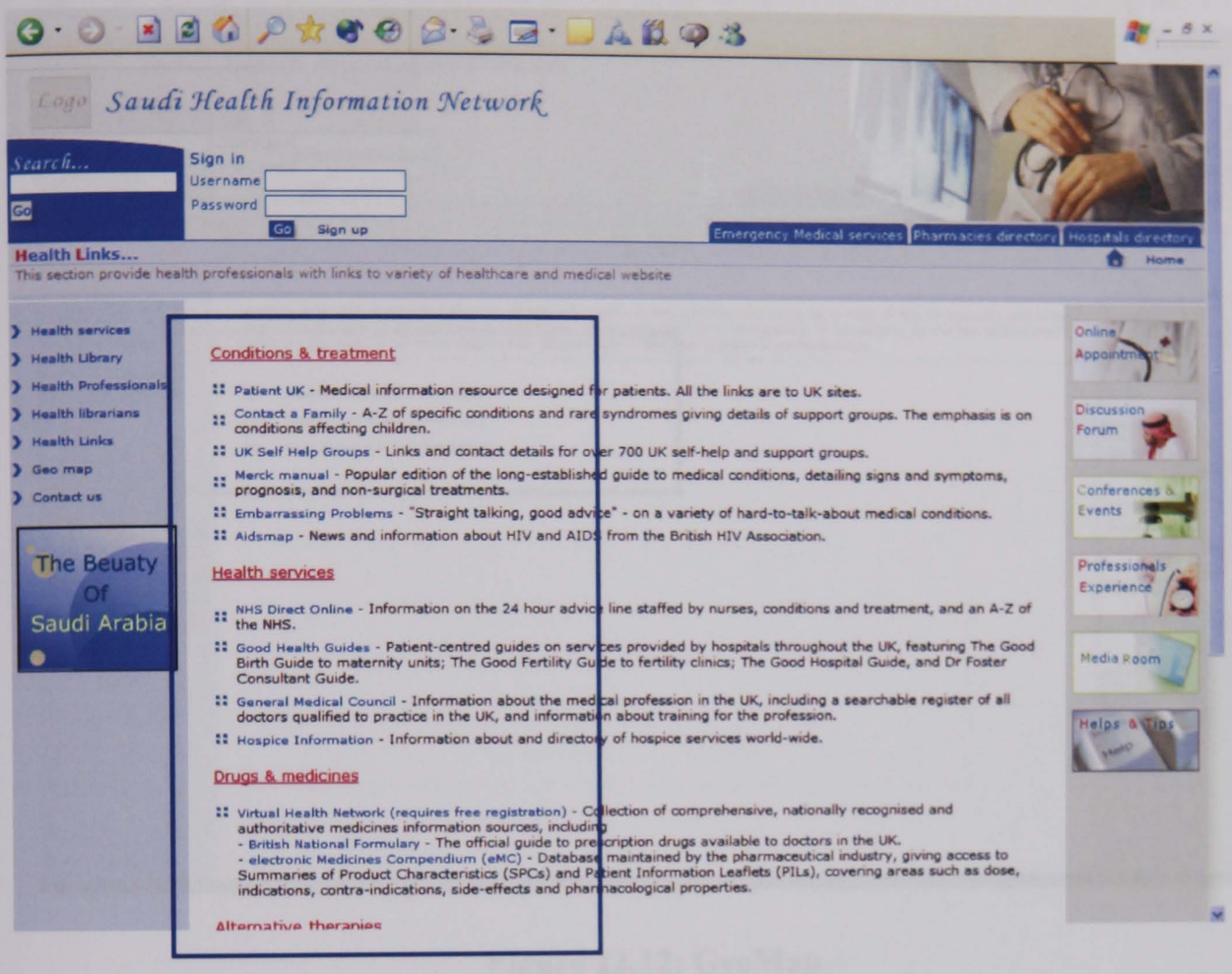


Figure 12.11: Health Links

12.4.6 GeoMap

The aim of the GeoMap (Figure 12.12) is to offer directions and locations of all organisations and concerns such as hospitals, pharmacies, emergency medical services, and health libraries. It provides an advanced search feature, for example searching for a hospital with a speciality eye diseases in the middle region of Saudi Arabia. As a result of the search, each profile appears accompanied with directions and a geographical digital map. The written direction and digital map for a particular site can be printed in a friendly format. The GeoMap service is best to be offered with the co-operation of the Ministry of Transportation which has detailed maps of the country. This service would be better and simpler to use if the Ministry offered maps over the Internet.

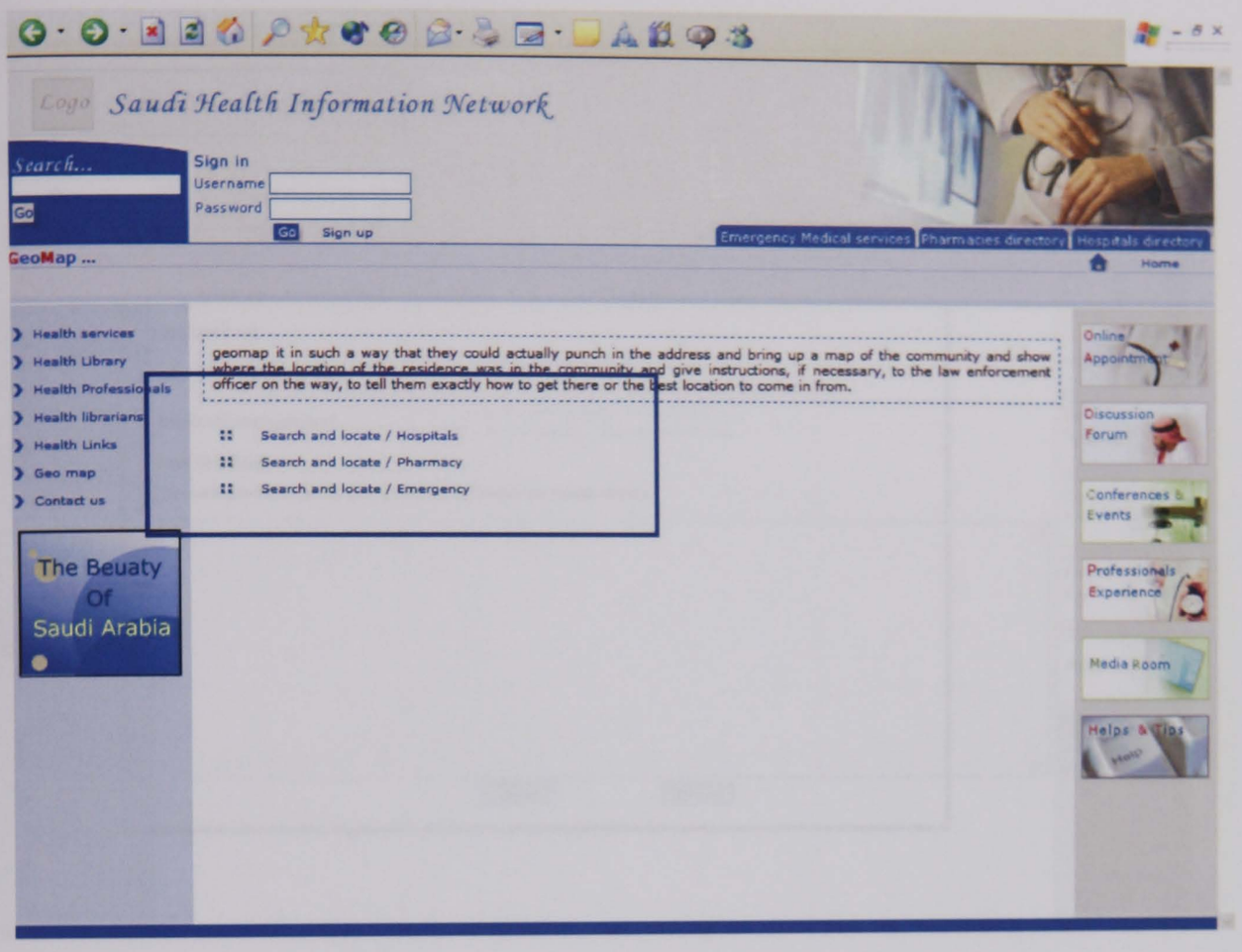


Figure 12.12: GeoMap

12.4.7 Contact Us

This section permits an official communication when needed (Figure 12.13). Users can contact the team operating the SHIN for various concerns. The link **Contact Us** provides a fast communication with team members according to their authority; for example, webmaster, technical services, etc. However, it also offers a quick response to any inquiry offering automated response services.

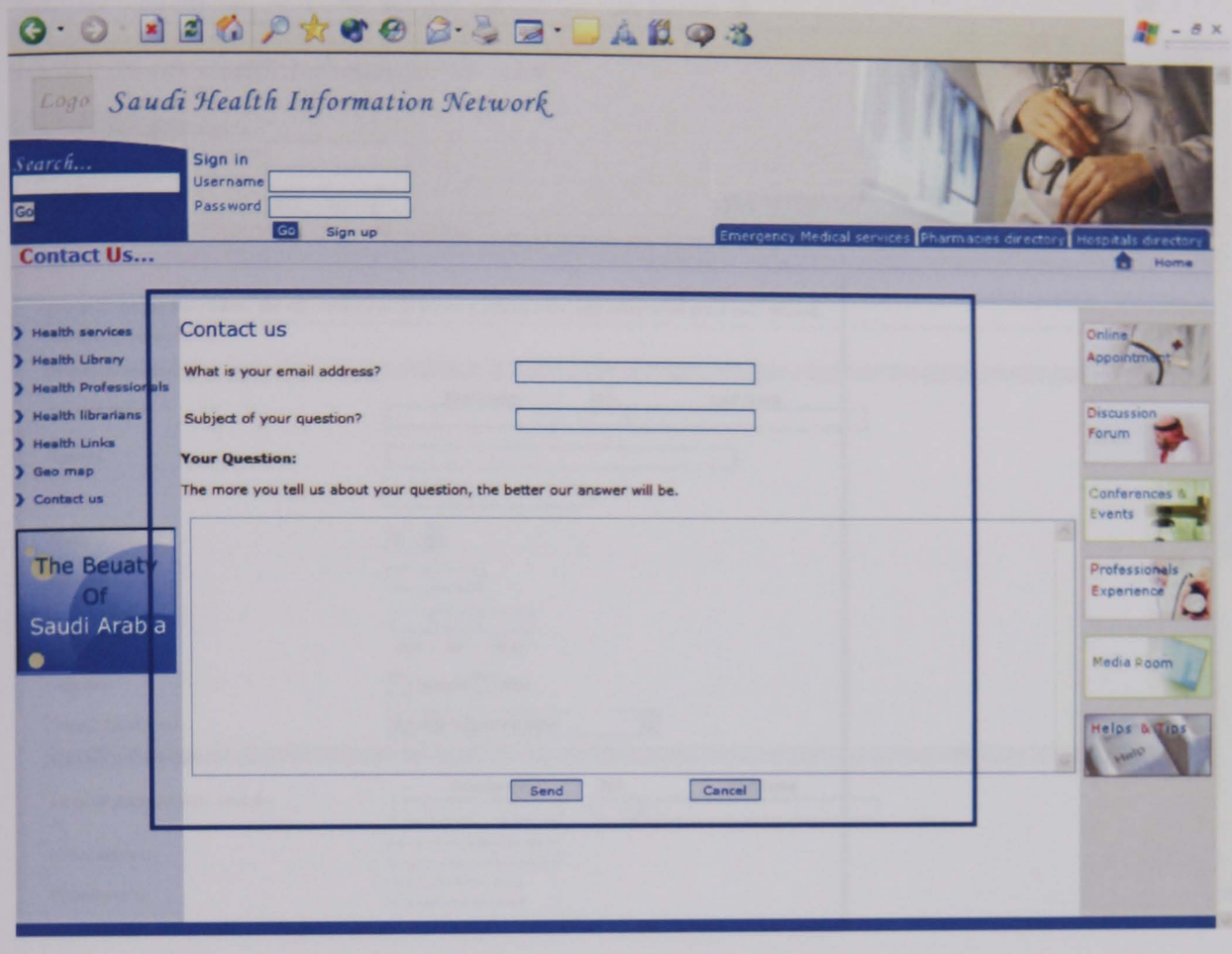


Figure 12.13: Contact Us Form

12.5 Additional Features

The prototype contains some features to help in providing better services and make better use of the site. For some, it would enhance the knowledge and experience of the site's users. Some of these features are as follows.

12.5.1 Online Appointment

This service is aimed to speed up the appointment schedule for treatment. It is designed for all types of audience of the prototype. The electronic application form (Figure 12.14) contains four main categories:

- Patient Information
- Contact Information
- Appointment Information
- Additional Information to expedite the request

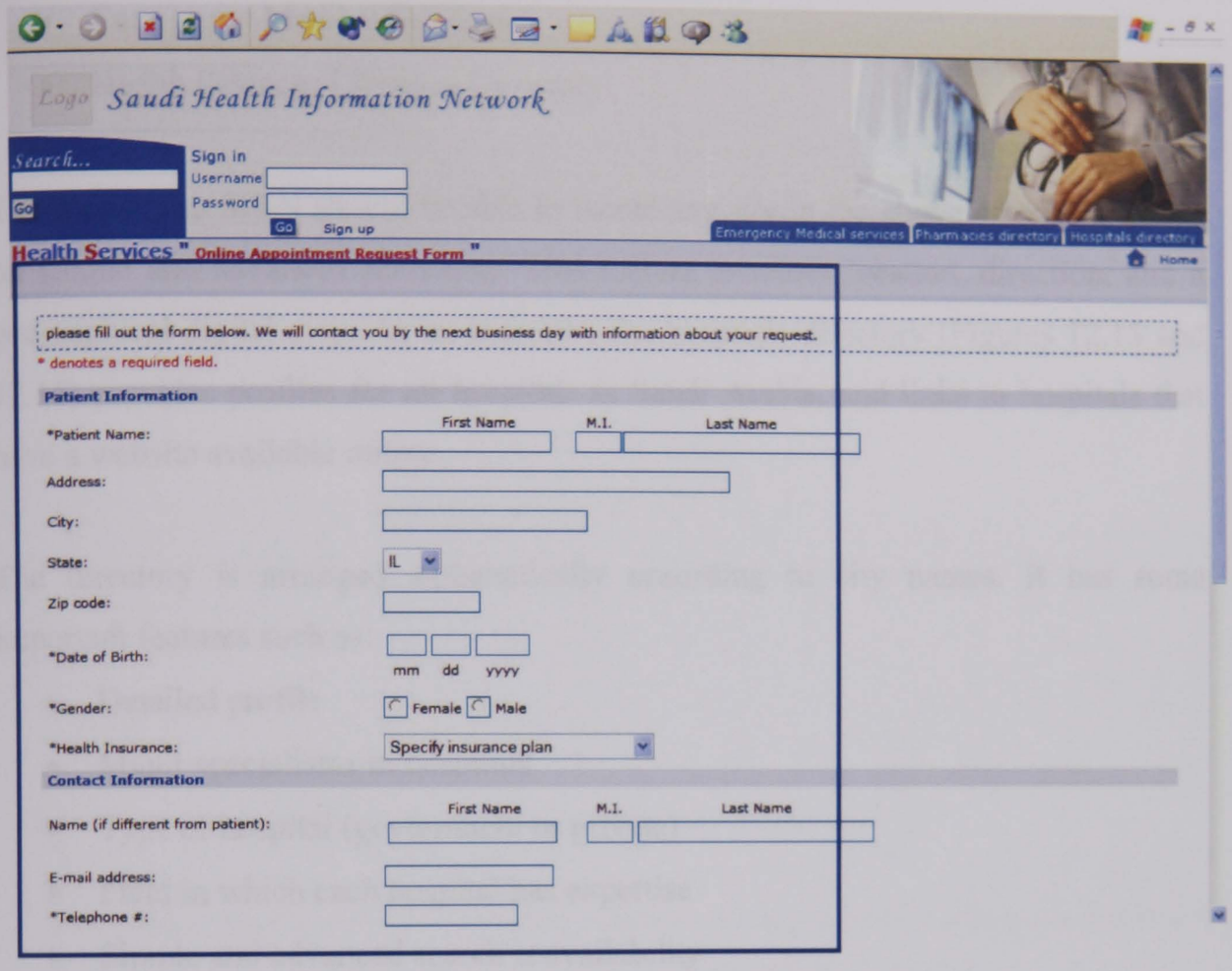


Figure 12.14: Online Appointment Application

The on-line appointment has the feature to let a patient select his/her preferred physician in a specific department or specialism. It gives the patient, based on his/her convenience, the opportunity to choose the date and time of an appointment, and the patient may add some comments or explain some points that may help to expedite the appointment request. Importantly, the patient is able to write some background and brief history of his/her illness in the case of being seen for the first time. The patient, as well, has the ability to write comments regarding any development in an existing case.

12.5.2 Directories

The prototype is designed to enrich the awareness of and services for its audience. Part of that is to establish flexible and easily updated directories for important sites. This contains:

- Hospital Directory
- Pharmacy Directory

- Emergency Medical Services
- Health Sciences Libraries Directory

The user of the SHIN should be able to locate any site in the above categories based on simple and advanced searching. This feature provides location, direction, and a geographical digital map. As an example, the hospitals directory (Figures 12.15 and 12.16) provides profiles for all hospitals in Saudi Arabia, and links to hospitals that have a website available online.

The directory is arranged alphabetically according to city names. It has some important features such as:

- Detailed profile
- Major specialisms in hospitals
- Type of hospital (government or private)
- Field in which each hospital has expertise
- Simple and advanced search is availability
- Direction and Map location

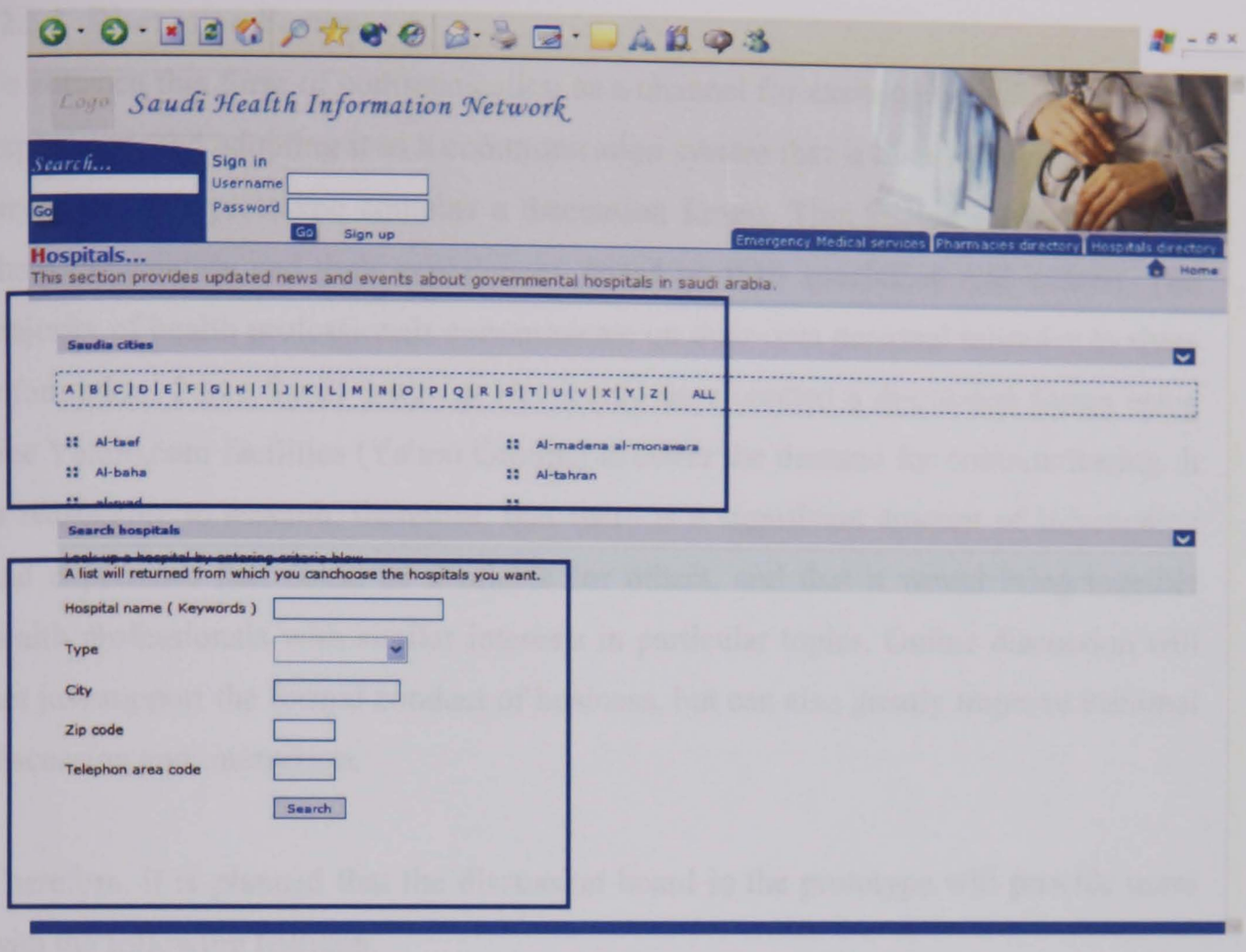


Figure 12.15: Hospital Directory and search

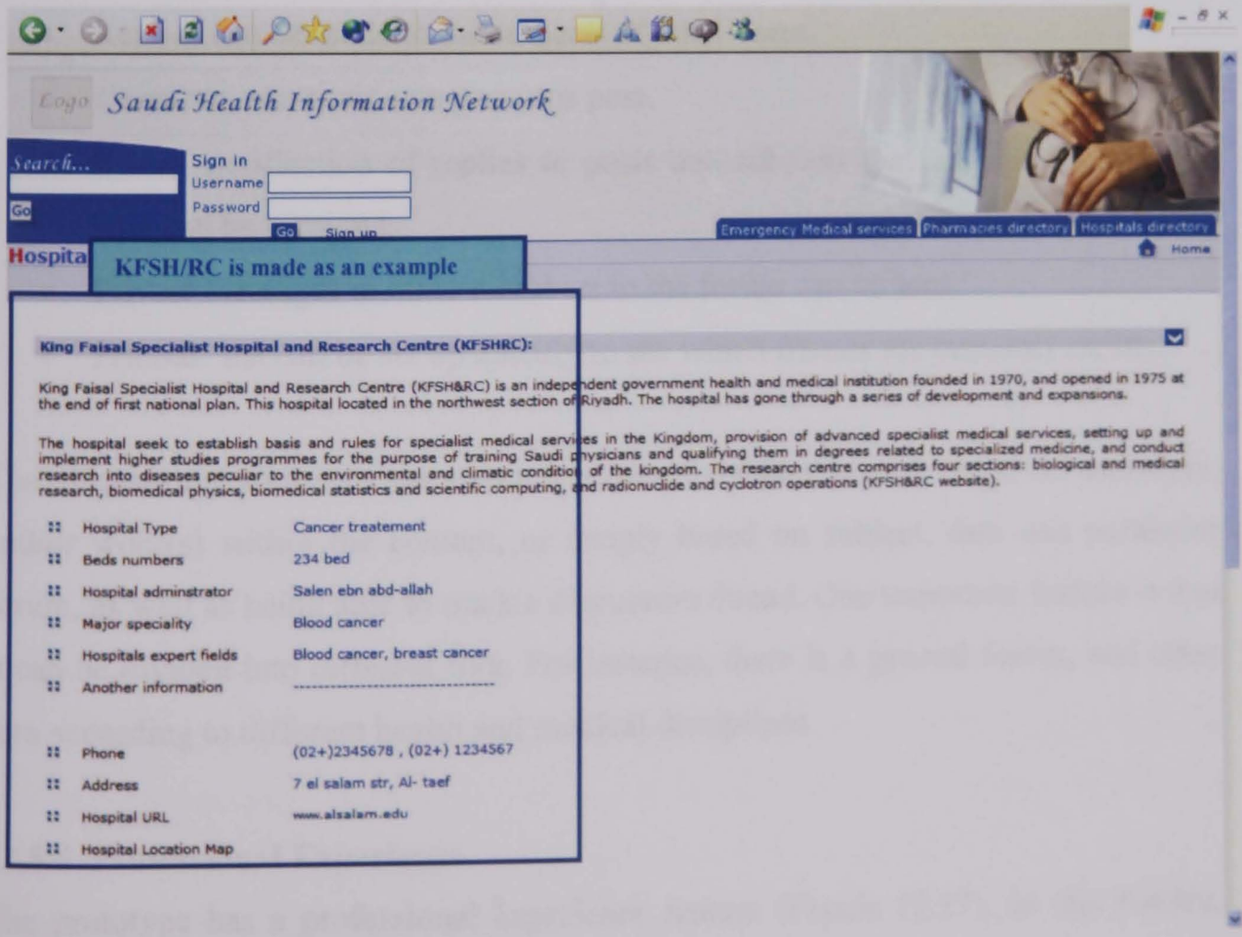


Figure 12.16: Hospital profile

12.5.3 Discussion Forum

To enhance this form of communication as a channel for exchanging information and experience, and adopting it as a communication system that is open at any time and in any place, this prototype contains a discussion forum. This feature enables users to share information and their experiences, based on their specialism and interest. The majority of health professionals communicate on their own personal initiative to share information. Some Saudi health professionals have created a discussion forum using free Yahoo.com facilities (Yahoo Groups) to cover the demand for communicating. It is reasonable to assume, therefore, that there is a significant amount of information and experience that could be available for others, and that it would bring together health professionals with similar interests in particular topics. Online discussion will not just support the formal conduct of business, but can also greatly improve informal discussion and interaction.

Therefore, it is planned that the discussion board in the prototype will provide users with the following features:

- New subjects can be posted.
- Replies can be made to the subjects of other users.
- Users can edit their own previous post.
- E-mail notification of replies to posts and subjects that are specified by the user can be received.
- Private messages to other members in the forum can be sent.
- Friends' list can be set up quickly to see which friends are currently online.

The discussion forum also has a search feature for topics posted, based on username, and/or word(s) within the content, or simply based on subject, date and particular forum, as well as being able to track a discussion thread. One important feature is that it can be divided into different fora. For instance, there is a general forum, and other fora according to different health and medical disciplines.

12.5.4 Professional Experience

The prototype has a professional experience feature (Figure 12.17). In this feature, health professionals are encouraged to publish their own health experiences, such as

recent cases in which they have been involved, essays, or any experience they have which they would like to share with others. The provision of such a feature will enhance the communication and information exchange between health professionals.

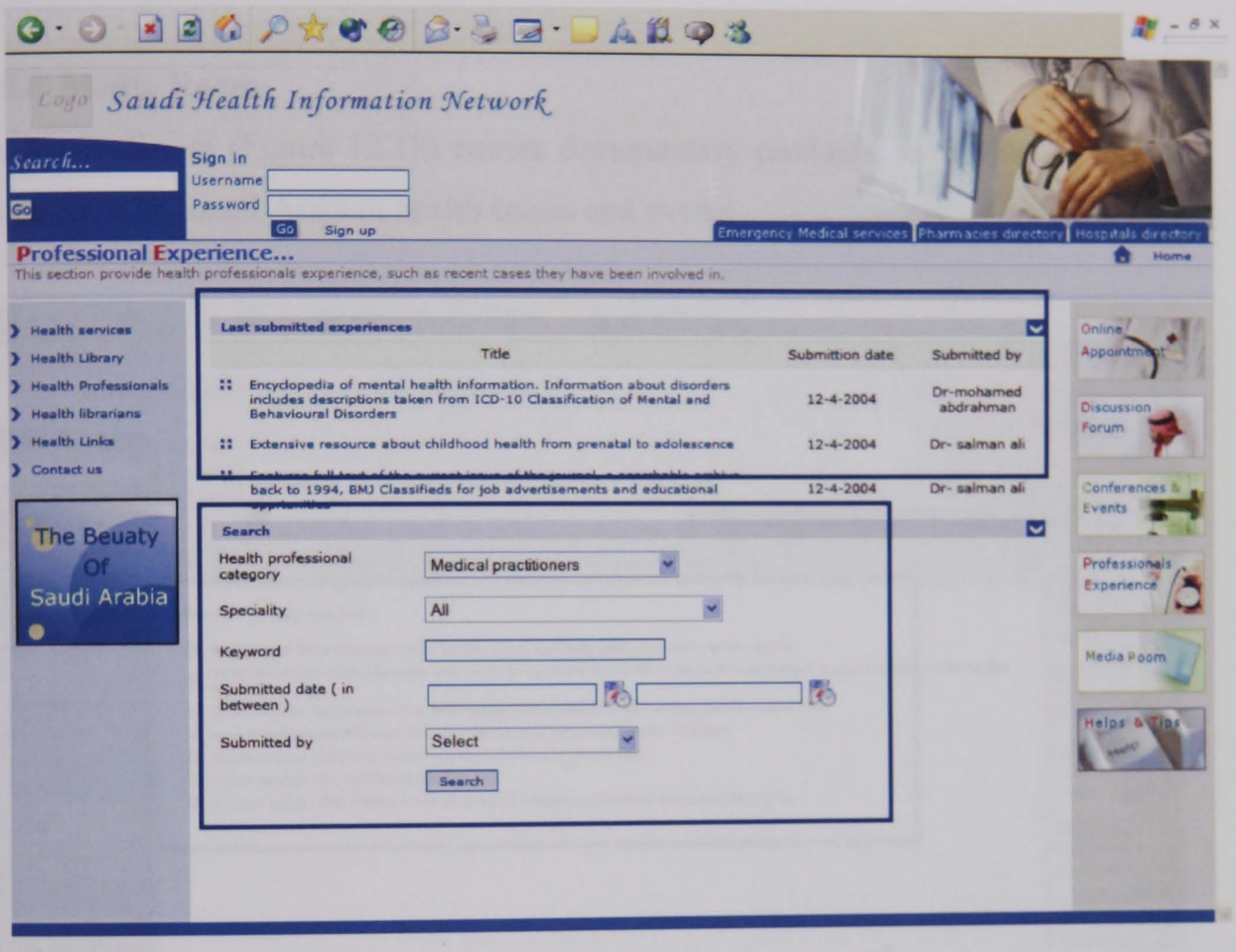


Figure 12.17: Professional experience feature

This feature has been developed as a database. The health professional is able to submit his/her contribution through a specific form. Also, the user can browse through the archives. There is an advanced search of professional experiences by keyword, speciality, health professional category, name, and date submitted.

12.5.5 New to Site (What's new?)

It is evident that health professionals have a need for electronic current awareness services that provide them with the latest developments in health and medical subjects. The prototype provides them with this feature directly in the main page **index page** of the prototype (Figure 12.2). They can subscribe free to this service, and the system will automatically send customised updated information via their e-mail

account, as text messages to their mobile or PDA, or directly to their Cabinet storage. Through this feature, health professionals are able to follow the latest development in their profession and speciality. The SHIN team members would be responsible for the updating and subscription policy.

12.5.6 Media Room

The Media Room (Figure 12.18) covers documentary products, as well as historical information on Saudi Arabian health issues and events.

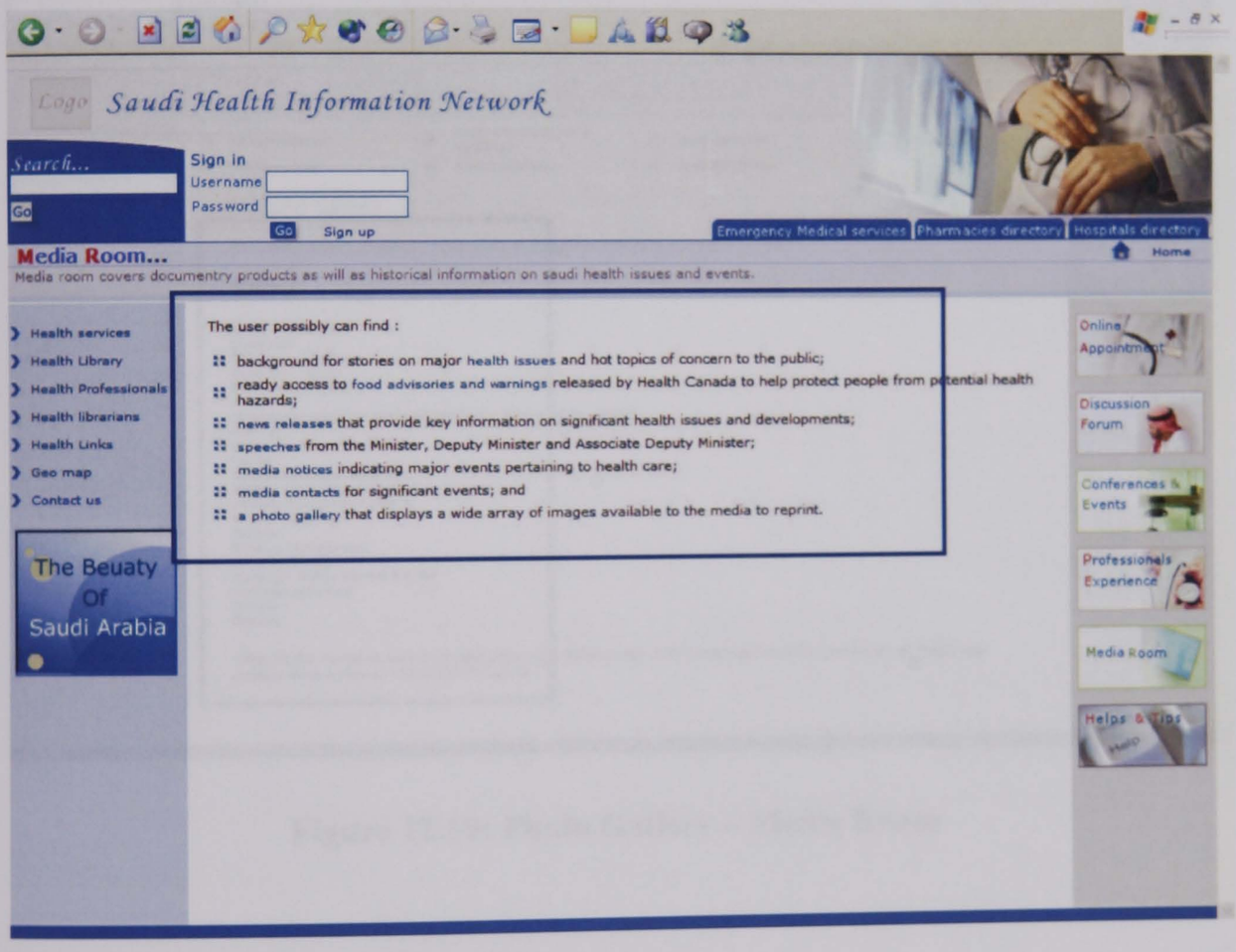


Figure 12.18: Media Room

The user can find in the Media Room various collections, some of which are:

- Background for stories on major health issues and hot topics of concern to the public.
- Ready access to food advisories and warnings released in order to help to protect people from potential health hazards.

- News releases that provide key information on significant health issues and developments.
- Media notices indicating major events pertaining to health care.
- Media contacts for significant events, and
- A photo gallery (Figure 12.19) that displays a wide array of images available to the media to reprint.

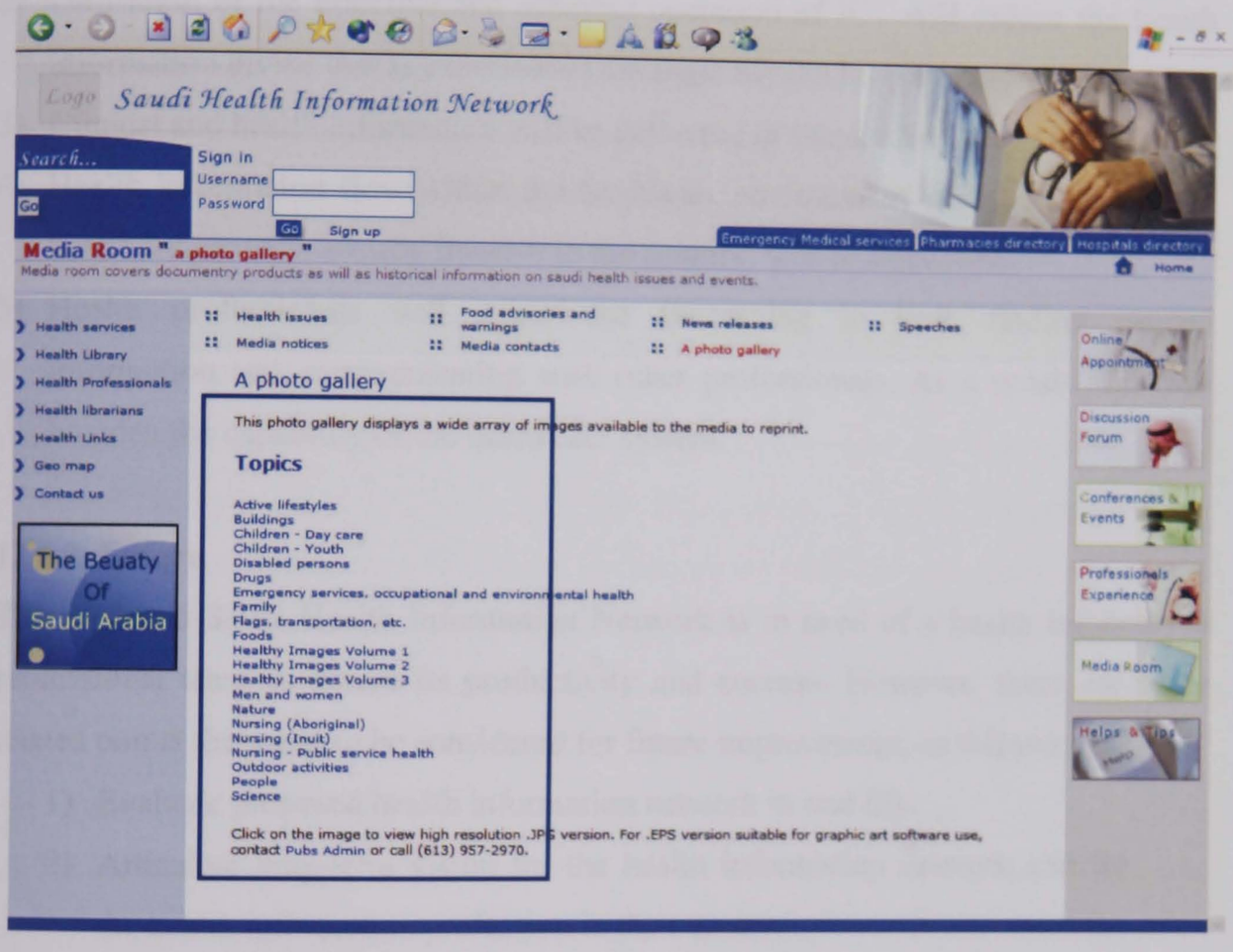


Figure 12.19: Photo Gallery – Media Room

12.5.7 Helps and Tips

The prototype is designed to provide helpful steps for using the SHIN **helps and tips** (Figure 12.2), and to indicate precisely the problems through browsing with a plain simple language, then suggest constructive solutions. It also gives direct help through contacting the technical support. Overall, the 'helps and tips' feature provides users with steps and explanations on how to use and browse SHIN. This feature is useful in providing easy instruction whenever appropriate, such as **FAQs** which tell the user where to go or what to do.

12.6 Expectation and Future

12.6.1 Expected Outcomes

Through the proposed design and analysis of health information network projects worldwide, the researcher expects the following:

1) Satisfaction and positive attitudes of health professionals and health information professionals towards the services
2) Utilisation of the effective and efficient operation of ICT will reduce the health information divide that is experienced amongst Riyadh hospitals.
3) Clinical and health information will be delivered in standardised form to users.
4) Health information flow within the healthcare environment which will make the health information society flourish in the country, will be improved.
5) Health professionals will experience timesaving in both finding needed information and communicating with other professionals. As a result, this will broaden the capability of the healthcare system.

12.6.2 Future

The proposed Saudi Health Information Network is in need of a health information professional team to assure its productivity and success. However, there are some related points that need to be considered for future improvement, as follows:

1) Evaluate proposed health information network in real life.
2) Articulate long-term vision for the health information network and for the health information profession in the country.
3) Initiate and raise national awareness among policy-makers, healthcare leaders, and other drivers of change, regarding health information feasibility, value, and strategy.
4) Improve methods for maximising effectiveness of communicated health information.

12.7 Prototype Quality

12.7.1 Visibility of Services

It has been planned and designed to keep users informed about what is going on through appropriate and timely services. As a feature of the design, the relevant objects in a focus area are either visible in the main window or there should be a

service to make them visible. The services selecting an object are often implemented as a mouse operation or as the result of searching.

12.7.2 Logic and Reality

The prototype considers the user's language rather than system-oriented terminology. It also follows real-world principles and makes information appear in a natural and logical order. The prototype identity will be clarified with information such as 'About Saudi Health Professionals', or 'About the Saudi Health Information Network', as well as links to provide site visitors with an overview of the aims, objectives and services of SHIN. The prototype is designed to present achievable tasks and functions.

12.7.3 Consistency and Relevance

A consistent terminology is employed in the prototype, so users do not have to wonder whether different words, situations, or actions mean the same thing. The prototype has been designed not to contain information that is irrelevant or rarely needed by users, since any irrelevant pieces of information diminish the system visibility and usability.

12.7.4 Friendly Interface

The prototype is designed to make objects, actions, and options visible. The instructions of the design are visible and easily retrievable whenever appropriate, and users do not have to retain information from one part of the site to another. In addition, the system used and layout are organised to suit both inexperienced and expert users. The prototype is provided with features that make it flexible to use, and offers easy navigation for users. For example, any selection of any link will change the current one rather than open a new window.

12.7.5 Management Control

The performance of the prototype in real experience will be monitored on a continuous basis. This will be explained clearly through the Information Policy of the Network. All network content will comply with copyright policy.

12.7.6 Market Needs

It is important for the Saudi Health Information Network to consider new technologies and other techniques that might be invented in the future. With the consideration of market needs, it is important to control the information exchange protocol to overcome many problems facing the dissemination of health information. It is also essential to manage and co-ordinate users' evaluation and feedback of the design.

12.7.7 Content Management System

The Saudi Health Information Network needs to use a Content Management System (CMS) in order to manage and develop the content. Designed systems can operate small websites as well as networks. This system can be managed by various members, and it can also be designed to allocate tasks and monitor work process within the network.

12.7.8 Semantic Web

The next step in the evolution of SHIN is to use different technologies for practice development. It will make available vast quantities of information resources, along with various kinds of descriptive information. Also, it will reduce manual discovery and usage of Web resources with the notion of being able to semantically link various resources. This gives the opportunity to move from the current simple hyperlink to a more expressive, semantically rich web resource. The adoption of new semantic-based applications will open new perspectives for the Health Information Society in Saudi, Arabia and it will increase knowledge about the meaning, usage, accessibility, and quality of information.

12.8 Summary

Prototyping is used to help in excelling with goals and strategies planned earlier for a project. It has many benefits. It allows participants to see, touch and handle the model, so they are all on the same page and can visualise the same end product. It increases communication and knowledge sharing, since there is an actual model instead of simply personal visualisation prior to individual imagination.

The aim of the SHIN prototype is to provide relevant and up-to-date information, and links to other information sources and services in order to improve communication channels at both the national and international level. Every attempt has been made to produce a user interface which is both attractive and easy to use. Basically, prototyping is a tool utilised to ensure quality product development, and allows the product to be visualised before it goes into production. It is a very cost-effective way of developing products and processes.

This network will ensure that health professionals will save time in searching various websites and databases. On the other hand, health information professionals will work effectively at the side of the health profession, demonstrating their influential role in clinical decision-making. This network helps health professionals and health information professionals to perform effective functions within one setting, which will enhance their information seeking and satisfy their information needs. The SHIN prototype attempts to join together the two elements of life, the body and the soul, represented by health professionals and health information professionals, for the benefit of humanity. The proposed network will promote various channels of communication and co-operation in the healthcare environment. Importantly, it will help the healthcare environment to move towards the establishment of a flourishing health information society by popularising the use of electronic resources, and describing the benefits and advantages of the electronic learning programs.

This prototype does not reach the level of real implementation and evaluation, for the reasons of time limit and further financial burden. However, the importance of implementation and evaluation of service is realised. Future development will be assessed after the network has been launched and tested by users. It is hoped that the Saudi Health Information Network will be popular enough to include further advancements.

Chapter Thirteen

Conclusions and Recommendations

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Chapter Thirteen

13

Conclusions and Recommendations

Information and communication technology (ICT) is universally accepted and implemented as beneficial for individuals, organisations, and national economies. It is a trend and focal point for many kinds of organisations concerned with their own development. It has been realised that ICT is a facilitator, not just an end in itself. Fors and Moreno (2002) confirmed that the use of ICT in the development process for most countries is on the rise, and that it has been used extensively from its inception in the field of health and medicine.

In the light of these developments, this thesis has attempted to describe and evaluate the current state and future prospects of health sciences libraries in the Saudi capital, Riyadh, in terms of three main dimensions:

- The health sciences libraries themselves, including the range and level of services offered (Objectives 1 and 2);
- The health professionals who are the potential users of the library – their needs, difficulties in using the services, and perceptions towards information provision and the use of ICT (Objectives 3, 4, 5, and 6);
- Objective 7 is related to the health library profession in general, with emphasis on health information professionals (health librarians).

The thesis further aimed to provide practical solutions to any difficulties identified in relation to the above dimensions, in order to enhance the role of health sciences libraries as an effective contributor to the delivery of health services in Riyadh and, by extension, the country generally (Objectives 8 and 9). In addition, the current chapter fulfils the last objective (Objective 10).

There has been very substantial progress towards fulfilling the research objectives, which were identified earlier. The most appropriate strategy to achieve the objectives of this research was found to be the mixed methods approach (see Chapter 3, which gives more information about this approach and its implementation).

As a result of these efforts, the research objectives were partially fulfilled, and the main issues engaged in relation to each are highlighted in this chapter. Before turning to these more detailed and specific conclusions, however, a number of broad issues can be summarised, beginning with the role of ICT.

Indeed, technology plays an increasing role in most of the Riyadh government hospitals and their health sciences libraries. ICT has become an important element in the working life of health professionals in the country, and there has been a sharp increase in information technology use. This indicates the importance and realisation of the role of ICT in the healthcare environment. It is observed that ICT facilitates the accessibility of health information. However, serious problems of implementation and access remain. Some of these problems which face ICT implementation are a lack of training and educational programmes, lack of co-ordination and co-operation, and impoverished organisational structure and management process.

In addition, health sciences libraries need to develop a type of practical model which lasts longer, for continuous development that librarians and users can rely upon. Accordingly, the proposed visionary model incorporates a collaborative approach in order to bridge the gap between change decisions and progress in real time. The priority is to participate in changing and improving the current condition of health sciences libraries in Riyadh. This includes management style, advanced technology, improved communication channels, innovation trend, organisational and people development, and teamwork setting. The proposed model attempts to bring together and balance the internal focus of the library staff with an external focus on library users and the library's mission. It reaffirms the library's traditional mission while proposing changes in how that mission can best be achieved utilising the new technologies and openness to change. The proposed change is to serve hospitals to achieve the libraries' mission of being supportive, responsive to the eminence of healthcare distinguished by its commitment to openness, innovation, and excellence in applying well planned strategies and change practice.

Most of the above issues can be enriched and utilised by establishing leading organisations and projects such as a National Health Sciences Library, Virtual Health Library, and the Association of Health Information Profession in the country. Overall, these will participate effectively with other organisations and entities in the kingdom, as well, to construct and develop a Saudi Health Information Network. The proposed Network is an ideal place to commence, since it would help to avoid current problems and obstacles facing access to and use of health information. Furthermore, it brings together the three focal elements relating to access to and use of health information. These three elements are the main concern of this research:

1) Health Sciences Libraries in Saudi Arabia
2) Health Professionals in Saudi Arabia
3) Health Information Professionals in Saudi Arabia

The Saudi Health Information Network proposes to increase the access, use and exchange of health information, knowledge and experiences for the benefit of the healthcare system in the country. In fact, there is a great awareness in the Kingdom of Saudi Arabia of the use of ICT, particularly the use of information networks; therefore

the effective use of a Saudi Health Information Network is anticipated. The efficient and effective use of ICT in the kingdom will change healthcare and information provision for the better and will also advance progress.

However, too many implementations fail due to short-sightedness which often does not extend beyond the installation of the new technology. Importantly, implementation researchers and practitioners need to adopt a more balanced socio-technical approach. They should share the responsibility to encourage and assist communicated system successes and failures. Similarly, further researches are needed to develop methods of anticipating implementation barriers and determining the best solution for problem prevention and correction related to health sciences libraries in Riyadh and in the Kingdom as a whole.

This chapter provides detailed conclusions in relation to each of the three main elements or dimensions of the research, and in so doing, addresses the research objectives set out in Chapter One. Section 13.1 addresses those objectives (1 and 2) related to the health sciences libraries; section 13.2 considers Objectives 3, 4, 5, and 6 concerning health professionals; section 13.3 refers to Objective 7, concerning the health library profession and professionals. The eighth objective, that of providing practical solutions, was addressed in Chapter 11, which contained proposals for change and development, and Chapter 12, in which a prototype for a Saudi Health Information Network was proposed. In addition, further practical recommendations related to the individual elements of the research are contained, after the conclusions, in the relevant section of this chapter.

13.1 Health Sciences Libraries

The first two objectives of this research as set out in Chapter One concerned health sciences libraries. They were:

1) To explore the state of health sciences libraries in Riyadh.
2) To compare the range and level of services in these libraries.

These issues were discussed in depth in Chapters 6, 8 and 9 of the thesis. The main issues emerging in relation to these objectives were the following.

In Saudi Arabia, great demands are made upon existing health sciences libraries. The fact that hospitals and health professionals are widely scattered and the great developments in medicine during recent years have made it difficult for individuals to keep themselves up to date. Health libraries have evolved without being specifically planned to fit in with existing facilities. They have developed individually without proper planning and co-operation with neighbouring libraries. As a result, the digital gap is noticeable amongst health sciences libraries in Riyadh. In the fact, there is a range of differences related to position, place, condition and services. Some of these libraries are highly equipped while others rarely use ICT in their work processes and information services.

In any health sciences library environment there is usually a type of pressure to prove the value of staff and services and even to justify their existence. There is a need to provide a 'managed environment' within traditional or electronic resources for users with different cultural backgrounds. At the present time, health libraries in Riyadh are being improved when compared to past decades. With current trends in the computer and Internet, most health libraries have been equipped with electronic resources for meeting information needs. However, this innovation, while welcome, still does not entirely satisfy health professionals' information needs.

This research shows that the health sciences libraries are of great value to users in the field of medicine, and have an influence both upon them and the healthcare practice. It can be seen that health professionals gave priority to the health libraries when seeking a piece of information to fulfil their information needs. In addition, health libraries are visited and consulted for various purposes and functions. The functions of borrowing, reading and literature search are measured as being the main reasons for visits to health sciences libraries. This places a serious demand upon health libraries to consider avoiding difficulties which might prevent users from visiting the library. One of the main difficulties is the opening hours, since most of main functions: reading, borrowing and literature search, can only be accomplished while the library is open.

This research confirms other research findings (AbuOuf, 1995) that most health libraries under investigation lack satisfactory information resources, whether they be

books, periodicals, audiovisuals, or electronic resources. Unfortunately, health sciences libraries lack strategic plans and are not involved and do participate in planning processes of information policies in the country. Most health libraries do not have clear strategic plans and do not draw wide visioning policies for their development, services, co-operation and co-ordination, staffing or future challenges.

As part of the co-operation, health sciences libraries in Riyadh are familiar with the concept of centralised lending for providing an inter-library loan service. In addition to their direct involvement in co-operative inter-lending, health libraries in Riyadh are interested in promoting resource sharing in other method of communication and co-operation. The shortage of resources needed to satisfy the users' information and research requirement, has led librarians to reduce and avoid problems where possible. As a result, increased co-operation in the area of the inter-library-loan service can be seen in the growing number of health libraries committing themselves to various resource sharing. However, much of this is conducted through informal communication rather than being organised and planned.

By and large, the various services provided by the health sciences libraries do not reach a level that is satisfactory to users. Furthermore, insufficient services might affect the improvement of the healthcare systems' overall status. In fact, information networks could create and improve co-operation amongst health libraries in Saudi Arabia and with other health libraries elsewhere. Regrettably, the current computing system in most hospitals does not facilitate access to the health library database and other databases located in some hospitals, research departments and centres. The future for Saudi Arabian health sciences libraries lies in their being linked more closely to each other. Co-ordination and co-operation are absolute imperatives. The lack of leadership organisations such as a National Health Library and the Association of Health Information Profession in the country make a proper co-operation and general improvement in the health librarianship far less likely to be accomplished.

13.1.1 Recommendations Related to HSL

To develop and improve the health sciences libraries setting, the following are recommended for consideration:

1) Adopt more objective views of the prospective outlines and forms of the environment setting now and for the future.
2) Examine the management perceptions of libraries, and develop competitive strategies, and a successful and appropriate organisational structure.
3) Increase the accessibility of libraries for users, in particular the opening hours, facilitate around the clock opening hours and promote remote access to libraries' electronic resources.
4) Relocate the health libraries to be in more suitable location for most of their users, and expand the space of such libraries to cover more needed functions (e.g. reading, searching, and photocopying).
5) Engage in a health information network to provide effective electronic information services to users whether on or off hospital sites.
6) Encourage users to use and take advantage of available services through improving service marketing and publicising, thus raising the libraries' profile, demonstrating their value to the knowledge and information of society.
7) Develop coordination and co-operation amongst each other. Policies for co-operation should be improved, especially since co-operation will be more efficient than before with the development of electronic services and ICT in general which has made the accessibility of resources easy through the Internet.
8) Develop staff and users by providing appropriate training in order to develop their ICT skills.
9) Consider reviewing the library's position, information services provided, and the general improvement of staff and staff employment conditions.
10) Draw up a strategic plan to participate in the hospital's "clinical practice" and to provide accurate information services based on a firm identification of need in clinical work.
11) Investigate the factors which might prevent health professionals from consulting the libraries, then reduce and avoid these factors.

13.2 Health Professionals

This section presents the main conclusions related to Objectives 3, 4, 5, and 6 of the research (see Chapter 1) concerning the needs, difficulties and perspectives of health

professionals. These issues were discussed in depth in Chapters 6, 8, 9 and 10 of the thesis. The main issues emerging in relation to these objectives were the following.

The predominance is clear of male over female physicians and of female over male nurses in the healthcare environment in Riyadh hospitals. It can be concluded that the health professionals carry out various job descriptions; however, most of them were male physicians and female nurses aged between 25 and 39. The male physicians were the largest group responding to the questionnaire, followed by female nurses. The majority of health professionals held professional degrees; the highest percentage held a Bachelor degree and the smallest held a PhD. Remarkably, the majority of nurses held Bachelor degrees.

Health library users generally are already occupied with full-time work for which they need the support of the library, be it for clinical, research or administrative problems. Information sources in health and medical fields are important for health professionals to keep them up-to-date with the new practices of medicine and for knowledge enhancement. At the same time, it is very difficult to generalise and state that all users of health sciences libraries need all services. Nevertheless, librarians can be most helpful in encouraging users to use the library effectively. However, they will be of greater help if they are aware of how important the time factor is for users in general and potential users in particular.

In general, health professionals might not receive enough courses related to Information and Communication Technology during their formal education and schooling, but the need has been observed. However, the advent of electronic information sources has further enhanced the speed, rapid access, and usability of information and knowledge. Yet, there are still some access problem remaining related to ICT skills. These can be avoided through further formal and informal educational and training courses. This is a lifelong process for health professionals to enhance knowledge, professional competence, and to learn to live along with technology changes and challenges.

The current change from print and other forms to electronic forms, in which information is made available, is bringing about changes in users' information needs.

However, respondents working in the healthcare environment showed a greater use of printed materials and sources than electronic sources. This was in part attributable to a shortage in PC numbers offered in the health libraries, generally which forced users, to some extent, to use printed materials more frequently. As well, access to electronic sources is influenced by technical and skill requirements which were not met by all health professionals. Health professionals believe that some personal, institutional, and national challenges must be highlighted in order to take full advantage of electronic resources' access and use.

Health professionals' aspiration to use more electronic resources is matched by increasing availability and accessibility of full text materials and a greater development of information networks in Saudi Arabia. In fact, health professionals believe their demands for more electronic resources for the health information network will improve the dissemination and accessibility of health information in the country. Availability and accessibility have an influence on the use of information in general, and electronic information sources in particular, since, as it mentioned by Nicholas (2000), people will usually use what is easiest and closest to hand.

The majority of health professionals indicated that they had no access to the hospital computer network from their homes. The researcher believes that the accessibility of the computer network will increase the use of electronic resources available in health sciences libraries and hospital research departments. Other studies have found that accessing and searching electronic sources from homes, offices, and laboratories when available, were more attractive and convenient than in libraries (AlShaya, 2002; Starkweather and Wallin, 1999; Zhang, 1999). It is worth noting that the availability of the Internet service and the difficulties and obstacles occurring with the CD-ROM workstations, OPAC, and electronic databases, should be considered as a main factor for respondents to prefer and increase their use of the Internet, compared with other information tools and resources.

It has been found that health professionals are expecting faster access to health information to be shared with other professional bodies and individuals, and to receive convenient, accurate, and up-to-date information. This would undoubtedly be impossible in the absence of a health information network. Despite all the problems,

health professionals appreciate the implementation of ICT in health sciences libraries and look forward to further advances.

13.2.1 Recommendations Related to Health Professionals

1) The electronic information services delivered to health professionals should be developed and improved to enable them to make more efficient use of their time.
2) During formal education, health professionals should be provided with opportunities to acquire basic information handling skills.
3) Health professionals should be provided with continuing educational programmes which cover their information competencies and keep up with technological advances to maintain their information management skills.
4) Advice and training programmes should be conducted using various methodologies, for example: one-to-one, within group, online consultation, live training courses either on site or e-learning.
5) Policy makers for the healthcare system in the country should develop and implement policies and strategies to make certain that all health professionals have appropriate access to all forms of health and medical information.
6) Health professionals should be more proactive and assertive in demanding improvement in and development of the current situation of few available resources and inadequate access to needed information.
7) Health professionals should give more consideration to improving their ICT skills in order for them to use various types of resources and not be limited to traditional printed materials.

13.3 Health librarians

The seventh objective of the research was to explore the condition of the health library professionals and the profession as a whole. Related issues were discussed in depth in Chapters 5, 6, 7, and 10 of the thesis; the following paragraphs summarise the main issues.

It has been observed that there are no differences between males and females working in the health libraries in the matter of attendance and responding, which was confirmed by another research conducted in Jeddah by AbuOuf (1995). However,

some female staff members were eager to learn, willing to provide more services to users, and hoped to improve and make some changes for the sake of the library, which was not observed as much with male members.

The majority of staff members working in the health libraries were satisfied and enjoyed working in the libraries. The staff members aspirated to continue to work in the health library, although there are some difficulties and dissatisfactions. In addition, some of these problems were related to their job contracts. This situation was related mostly to salary, official positioning (job description) and training facilities. Adequate training, especially on ICT, was considered very important and highly required by librarians in order for them to provide a satisfactory search support.

Many health professionals were of the opinion that health library staff members are not well trained and argued that the library should have major concerns for staff education and training. In fact, the majority of staff members working in the health sciences libraries in Riyadh were not qualified, since they held less than a university degree. The shortage in professional staffing is a considerably negative factor with an impact on the health library services and further on users' training progress. Staff members working in the health sciences libraries did not hold qualifications in the field of health librarianship; rather, they had obtained their basic professional standing through work experience.

The interviews and observations confirm the findings of previous researchers covered in the literature review, which show the poor staffing is as a result of inadequate educational programmes available related to library and information science. The finding of this research shows that the staffing status is inadequate in terms of nationality, job description, qualifications, and professionalism. Health library staff members need to be familiar with advances in electronic information services and technologies.

The LIS educational programmes in Saudi Arabia have little influence and impact upon the real life process in the health sciences libraries. A poor situation was observed, and many staff members complained, requesting an immediate

improvement and development of the current situation. The current research confirms what has been noted by many writers, that the LIS educational programmes in Saudi Arabia contribute little towards improving and directing the condition of Saudi librarians and information specialists. In addition, there is a lack of Continuing Professional Development programmes, although staff members are eager to join such programme. If the issue of staff education and training is not considered by the Saudi Authority then conditions would not improve any further.

Most previous researches, if not all, have come to the conclusion that the academic programmes in the GCC are in need of development in order to participate in the development of the profession as it faces new technology challenges. Libscomb et al., (1999) demanded more specialised curricula and retraining opportunities to improve the education of the health science librarianship, in order to contribute to preparation when facing challenges encountered in the profession of health science librarianship and health librarians.

13.3.1 Recommendations Related to Health Librarians

1) Health librarians need to improve their technical and technological skills to deliver effective information services.
2) Health librarians need to develop their professional attitudes and practice paradigm from being reactive to being proactive for the sake of themselves and their profession.
3) LIS educational programmes should develop their curriculum to match the demands and challenges of the health information profession.
4) Staff members should be developed through a continuous training facility (Continuous Professional Development).
5) Hospital management should work together with health information professionals/health librarians to create and develop an information society in the healthcare environment.
6) Health librarians should participate in national and international conferences and meetings to discuss various issues related to their profession.
7) Health librarians should come together and establish their own association (The Association of Health Information Professionals) to represent themselves and let their voice be heard.

8) Training programme evaluation should be considered in order for hospitals and health sciences libraries to develop their training services.
9) A professional qualification in Library and Information Science must be considered as a condition of employment for specialised positions in health libraries.

13.4 Further Research

During the present research some issues have arisen which call for further studies and investigation. The following is not for limiting the scope of such research, but rather to highlight the importance of these issues:

1) Health professionals' attitude toward the use of electronic services collectively and separately, such as physicians, nurses, paramedical staff etc.
2) Factors that obstruct the use of electronic information resources and services in the light of individual experience and development of the health environment.
3) Co-operation amongst health sciences libraries and possible factors which obstruct co-operation and co-ordination.
4) Evaluation of the library and information educational programmes and their output to the practical life of work, in the field of health librarianship in particular.
5) Management and structure of health sciences libraries.
6) Hospital management attitudes towards the development of health sciences libraries and electronic health information services.
7) Health sciences libraries standardisation and policies.
8) Health information services and their provision in rural areas.
9) Investigation of the present health sciences libraries and information legislation, and regulations, to evaluate their efficiency and impact on the development of healthcare practices.
10) Developing health library education and training programmes based on an analysis of the existing human resources in health sciences libraries.
11) Comprehensive study to formulate a national information policy including the health information profession in the country of Saudi Arabia.

12) Role of health sciences libraries in supporting the overall healthcare environment and their role in clinical decision making.
13) Need for ICT in the country, and possible resources and requirements which would bring this technology into efficient and effective operation.
14) Participation of health sciences libraries and health information centres in the international provision and exchange of health information.
15) Participation of the country in developing the global health sciences library.
16) Role of national health sciences libraries in the country.
17) Development of a Saudi Health Information Network.

13.5 Conclusion

This research has recorded the health professionals' views towards information services, ICT implemented, health sciences libraries in Riyadh, and expected future development. It also recorded health librarians' opinions towards their work environment, training needs and expectation for development. In addition, this research highlighted the deficiencies in the health sciences libraries in Riyadh. It draws attention to the contribution of efficient health sciences libraries and information services to healthcare development.

The findings of this research showed the need for development of health sciences libraries in Riyadh. An organisational visionary model was formulated to ensure good health sciences libraries practice for the smooth flow of health information. The proposed health information network would initiate new services utilising the advantages of information and communication technology.

Although the current research has investigated and discussed various issues, some objectives were not met in full as expected and planned for. There were some difficulties and limitations which need to be considered and dealt with in advance of further research. Time, budget and bureaucracy were the main difficulties that limited the plan for this research (see Chapter 1). In addition, there were some issues concerning the three elements and dimensions of this research which need further explanation. The researcher believes that with enough time dedicated to this research, he would have been able to use the sequential strategy of the Mixed Methods

Approach in order to solve this problem and provide further understanding of the research findings.

Despite its limitations, this research fills a gap in the literature of information science in Saudi Arabia. It also raises some issues and themes which might be studied by other research. Recommendations and further research were suggested to enable the government of Saudi Arabia and its various agencies to support improvements in the existing health sciences libraries and information provision.

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POSITION IN THE THESIS

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Chapter 4 Literature Review	Chapter 5 Users and Staff	Chapter 6 Health S. Libraries
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Appendix A

Health Sciences Libraries Profile

KKUH

The Library: College of Medicine Library

Address: King Khalid University Hospital
P.O. Box 2925 Dept. 44
Website: www.ksu.edu.sa
Telephone: 966-1-467-1353 Ext.1330 **Fax:** 966-1-467-1857
E-mail:
Opening hours: 07:30 a.m. – 05:00 p.m.

Readers: 1) All the staff of the KKUH
2) All the students of KKUH

Holdings:

Monographs:	-
Current Subscriptions:	-
Electronic Journals Subscription:	150
Special Collection:	-
Audio-Visual:	Yes
Back Volumes:	-

Classification Scheme: DDC
Data Retrieval System: Dobis/Libis - OPAC
Lending Policy: No written policy, but we lend to Faculty members, and students.
Stock Policy (discard): No policy

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	No
Databases online:	Yes. Infotrac and Khazindar

Inter-Library loan Policy:
Co-operation with others: No policy, but we find, locate and supply photocopies of articles and book chapters
Methods of receiving and sending: No postal system used, but we may use Facsimile.

Staff:
Professionals: 2 Non-professionals: 2

Information services:

Number of PCs:	14
E-mail group/listserv:	N/A
Current awareness:	N/A
Information dissemination:	N/A
Reference services:	Limited
Photocopying:	Yes

KKESH

The Library: KKESH Medical Library

Address: KKESH Medical Library
P.O. Box 7191, Riyadh, 11462, KSA
Website: N/A
Telephone: 482-1234 Ext. 3778 **Fax:** 482-1234 Ext. 1222
482-1908
E-mail: medlibrary@awalnet.net.sa
Opening hours: Sat-Tues. 08:00 a.m. – 06:00 p.m.
Weds. 08:00 a.m. – 05:00 p.m.

Readers: -

Holdings:

Monographs:	4000
Current Subscriptions:	325
Electronic Journals Subscription:	25
Special Collection:	Arabic Language Culture
Audio-Visual:	Slides
Back Volumes:	-

Classification Scheme: NLM
Data Retrieval System: Manual at present
Lending Policy: Yes
Stock Policy (discard): -

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	N/A
Databases online:	Yes

Inter-Library loan Policy:

Co-operation with others: Reciprocate with all libraries, BL in UK

Methods of receiving and sending: -

Staff:

Professionals: 1 Non-professionals: 2

Information services:

Number of PCs:	4
E-mail group/listserv:	-
Current awareness:	As requested/Yes
Information dissemination:	Yes
Reference services:	Yes
Photocopying:	Yes

KACM

The Library: King Fahad Hospital Medical Library

Address: King Fahad Hospital
P.O. Box 22490, Riyadh 11426
Website: -
Telephone: 252-0088 Ext. 2077, 2078, 2097 **Fax:** 252-0149
E-mail: medlib1@ngha.med.sa
Opening hours: Sat-Tues. 08:00 a.m. – 06:00 p.m.
Wed. 08:00 a.m. – 05:00 p.m.
Thurs. 10:00 a.m. – 02:00 p.m.
Readers: Faculty, Staff and Visitors

Holdings:

Monographs:	4821
Current Subscriptions:	431
Electronic Journals Subscription:	50
Special Collection:	Teaching aids
Audio-Visual:	889
Back Volumes:	375

Classification Scheme: NLM
Data Retrieval System: Ultraplus
Lending Policy: Books and A/Vs
Stock Policy (discard): Ten year-old books discarded

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	MEDLINE; CINAHL, HEALTHSTAR, CCINFO, MSDS, CHEM SOURCE, OSH CANDAT, OSH INTERDATA
Databases online:	-

Inter-Library loan Policy:

Co-operation with others: Yes/ Accepts requests by various methods

Methods of receiving and sending: Re by Mail, fax, telephone and e-mail.
Send by mail and fax.

Staff:

Professionals: 3 Non-professionals: 0

Information services:

Number of PCs:	-
E-mail group/listserv:	medlib1@ngha.med.sa
Current awareness:	N/A
Information dissemination:	Pamphlets
Reference services:	Yes with Literature search
Photocopying:	Yes

College of Dentistry

The Library: King Saud Dental Library – Malaz Campus

Address: KSU College of Dentistry
P.O. Box 5967, 11432 Riyadh
Website: www.ksu.edu.sa
Telephone: 478-4524 Ext. 340 **Fax:** 478-4524 Ext. 340
E-mail: -
Opening hours: Sat.-Wed. 07:00 a.m. – 04:45 p.m.
Thurs. 07:30 a.m. – 11:45 a.m.

Readers: Students, faculty, staff and visitors

Holdings:

Monographs:	Books
Current Subscriptions:	10 Journals
Electronic Journals Subscription:	-
Special Collection:	-
Audio-Visual:	In the Auditorium
Back Volumes:	30-40 Journals

Classification Scheme: Subject/One-man Library
Data Retrieval System: DOBIS
Lending Policy: Yes
Stock Policy (discard): Conditional

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	No
Databases online:	Some premed, project

Inter-Library loan Policy:

Co-operation with others: Yes

Methods of receiving and sending: By fax, phone and postage

Staff:

Professionals: N/A Non-professionals: 1

Information services:

Number of PCs:	6
E-mail group/listserv:	
Current awareness:	N/A
Information dissemination:	N/A
Reference services:	If requested
Photocopying:	Yes

IGH

The Library: Medical Library (Iman General Hospital)

Address: Iman General Hospital
P.O. Box 21481, Riyadh, 11475, KSA
Website: N/A
Telephone: 447-1900 Ext. 1066 **Fax:** 447-1917
E-mail: rashanjabeen@rediffimail.com
Opening hours: 07:30 a.m. – 04:30 p.m.

Readers: Medical staff, paramedics and students (College of Health Sciences)

Holdings:

Monographs:	Yes
Current Subscriptions:	Yes
Electronic Journals Subscription:	Yes
Special Collection:	-
Audio-Visual:	Yes
Back Volumes:	Yes

Classification Scheme: DDL
Data Retrieval System: Manual
Lending Policy: Yes
Stock Policy (discard): For reference we are keeping the old journals as well as old editions textbooks

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	N/A
Databases online:	N/A

Inter-Library loan Policy:

Co-operation with others:	N/A
Methods of receiving and sending:	N/A

Staff:
Professionals: 1 Non-professionals: 0

Information services:

Number of PCs:	1
E-mail group/listserv:	N/A
Current awareness:	N/A
Information dissemination:	N/A
Reference services:	Yes
Photocopying:	Located in Medical Director's Office

RAFH

The Library: Medical Library Riyadh Armed Forces Hospital

Address: Riyadh Armed Forces Hospital
P.O. Box 7897, Riyadh, 11159,
Website: -
Telephone: 477-7714 Ext. 5672 **Fax:** 966-1-4762121
E-mail: ahtashamuddin@hotmail.com
Opening hours: Mon.-Wed. 07:30 a.m. – 07:30 p.m.
Thurs. 07:30 a.m. – 11:30 p.m.

Readers: approx 300 per day

Holdings:

Monographs:	15000 Books
Current Subscriptions:	750 Journals
Electronic Journals Subscription:	-
Special Collection:	Nil
Audio-Visual:	Yes
Back Volumes:	Since 1960 onwards for some

Classification Scheme: NLM Scheme
Data Retrieval System: Inmagic for books' acquisition, cataloguing, OPAC, circulation
Lending Policy: -
Stock Policy (discard): Old editions are discarded when the new editions are purchased. All books more than 10 years old

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	Medline
Databases online:	Nil

Inter-Library loan Policy: Yes
Co-operation with others: Yes

Methods of receiving and sending: Faxing and personal

Staff:
Professionals: 4 Non-professionals: 4

Information services:

Number of PCs:	15
E-mail group/listserv:	Nil
Current awareness:	Nil
Information dissemination:	No
Reference services:	Yes
Photocopying:	Available

KFSH&RC

The Library: HSL of KFSH&RC

Address: P.O. Box: 3354 Riyadh 11211

Website: www.kfsh.edu.sa
Telephone: (01) 464 7272 (#31821) **Fax:** (01) 442 4185
E-mail: subaihi@kfshrc.edu.sa
Opening hours: 8:00am – 8:00pm, Tuesday close 5:00pm,
Thursday 10:00am-2:00pm
Readers: All hospital staff members

Holdings:

Monographs:	(0) Arabic, over 24,000 English
Current Subscriptions:	+500
Electronic Journals Subscription:	open
Special Collection:	N/A
Audio-Visual:	+2000
Back Volumes:	N/A

Classification Scheme: LG
Data Retrieval System: GLAS
Lending Policy: Yes/All Hospital staff
Stock Policy (discard): N/A

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	-
Databases online:	CancerLit, HealthStars, MedLine, CINAHL, and others

Inter-Library loan Policy:

Co-operation with others: personal co-operation with some other libraries.

Methods of receiving and sending: Post, Fax, e-mail

Staff:

Professionals: 2 Non-professionals: 7

Information services:

Number of PCs:	8
E-mail group/listserv:	N/A
Current awareness:	N/A
Information dissemination:	N/A
Reference services:	Available
Photocopying:	Available

SCH

The Library: Sulaimanyah Children Hospital library

Address: Sulaymanyah, Riyadh, SA

Website: N/A
Telephone: (01) 465 6666 **Fax:** (0) 465 7160
E-mail: -
Opening hours: 6 hours (8:00 am – 2:00 pm)

Readers: Hospital staff

Holdings:

Monographs: (100) Arabic – (375) English
Current Subscriptions: 23
Electronic Journals Subscription: -
Special Collection: N/A
Audio-Visual: -
Back Volumes: NO

Classification Scheme: Subject
Data Retrieval System: Manual card catalogue
Lending Policy: 3 days lending period
Stock Policy (discard): NO

Searching Facilities:

Internet: available
Databases on CD-ROM: N/A
Databases online: N/A

Inter-Library loan Policy:

Co-operation with others: No co-operation with others

Methods of receiving and sending: -

Staff:

Professionals: - Non-professionals: 2

Information services:

Number of PCs: 1
E-mail group/listserv: N/A
Current awareness: N/A
Information dissemination: N/A
Reference services: N/A
Photocopying: available

KAUH

The Library: King AbdulAziz University Hospital library

Address: P.O. Box: 245 Riyadh 11411

Website: www.ksu.edu.sa
Telephone: (01) 478 6100 (#1436) **Fax:** (01) 477 5524
E-mail: -
Opening hours: 7:30 am – 4:30 pm

Readers: University faculty, all hospital staff

Holdings:

Monographs:	(1038) Arabic – (3939) English
Current Subscriptions:	66
Electronic Journals Subscription:	Yes
Special Collection:	-
Audio-Visual:	Yes
Back Volumes:	N/A

Classification Scheme:	Dobis/Labis
Data Retrieval System:	As the KSU Central Library
Lending Policy:	As the KSU Central Library
Stock Policy (discard):	As the KSU Central Library

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	Yes
Databases online:	Yes

Inter-Library loan Policy: No Policy exist
Co-operation with others: only Information exchange

Methods of receiving and sending: Direct reference services/Fax-Telephone

Staff:
Professionals: 1 Non-professionals: 0

Information services:

Number of PCs:	5
E-mail group/listserv:	-
Current awareness:	available
Information dissemination:	based on request
Reference services:	available
Photocopying:	available

SFH

The Library:

Address: Riyadh, Sitteen Street

Website:
Telephone: (01) 477 4480 (#2195) **Fax:** (#2196)
E-mail: hassan_hakami@yahoo.com
Opening hours: 8:00 am – 5:00 pm

Readers: All hospital staff and researchers

Holdings:

Monographs:	5000
Current Subscriptions:	441
Electronic Journals Subscription:	150
Special Collection:	N/A
Audio-Visual:	N/A
Back Volumes:	Yes

Classification Scheme: LG
Data Retrieval System: Manual
Lending Policy: 2 weeks lending and to be extended for another 1 week only
Stock Policy (discard): No written policy

Searching Facilities:

Internet:	Yes
Databases on CD-ROM:	N/A
Databases online:	N/A

Inter-Library loan Policy:

Co-operation with others: Yes

Methods of receiving and sending: through KACST forms

Staff:

Professionals: 2 Non-professionals: 2

Information services:

Number of PCs:	2
E-mail group/listserv:	N/A
Current awareness:	N/A
Information dissemination:	N/A
Reference services:	Available
Photocopying:	Available

Yamamah

The Library:

Address: Manar district, Riyadh, Saudi Arabia

Website:
Telephone: (01)491 4444 (#1102) **Fax:** (01) 208 3059
E-mail: -
Opening hours: 7:30 am – 3:30 pm / Thursday close 12:30

Readers: All hospital staff

Holdings:
Monographs: (5) Arabic / (507) English
Current Subscriptions: 25 / total issues 1500
Electronic Journals Subscription: -
Special Collection: -
Audio-Visual: -
Back Volumes: Yes there is many

Classification Scheme: subject
Data Retrieval System: -
Lending Policy: 5 days lending, subject to renewal
Stock Policy (discard): N/A

Searching Facilities:
Internet: There is no PC in the Library
Databases on CD-ROM: -
Databases online: -

Inter-Library loan Policy: Not exist and no policy
Co-operation with others:

Methods of receiving and sending:

Staff:
Professionals: 1 Non-professionals: 0

Information services:
Number of PCs: N/A
E-mail group/listserv: -
Current awareness: -
Information dissemination: -
Reference services: -
Photocopying: Only one copy machine and reserved for Doctors

SCOT

(Filled by authorized staff in the Centre but not a librarian)

The Library:

Address: P.O. Box: 27049 Riyadh 11417

Website: www.scot.org.sa
Telephone: (01) 445 1100 **Fax:** (01) 445 3934
E-mail: -
Opening hours: 7:30 am – 3:00 pm

Readers: Staff - visitors

Holdings:

Monographs: Yes/ No statistic information available
Current Subscriptions: The Centre periodical (SCOT)
Electronic Journals Subscription: N/A
Special Collection: N/A
Audio-Visual: Yes
Back Volumes: N/A

Classification Scheme: Subject
Data Retrieval System: Manual
Lending Policy: No/ Reading only
Stock Policy (discard): No

Searching Facilities:

Internet: N/A – In the future plan
Databases on CD-ROM: N/A
Databases online: N/A

Inter-Library loan Policy:

Co-operation with others: N/A

Methods of receiving and sending:

Staff:

Professionals: Non-professionals: 1 (very soon)

Information services:

Number of PCs: -
E-mail group/listserv: -
Current awareness: -
Information dissemination: -
Reference services: -
Photocopying: -

Appendix B

Questionnaire

Health Professionals' questionnaire cover letter

Dear Health professional,

This survey is being carried out on behalf of the Department of Information Science at City University. The research investigates health sciences libraries: Information Services and Information and Communication Technology (ICT).

All information provided will remain confidential.

If you have any enquiries or comments relating to the survey please contact by email: A.Khudair@city.ac.uk

Sincerely,

Ahmad Khudair
Research Student
Information Science
City University
London

Many thanks for your time and co-operation.

Dear recipient, please be confident that all responses will be treated in the strictest confidence.
Please remember to **choose only one answer,** which is to be considered **the most important answer to you!**

Health Sciences Library

1- Where do you go first when seeking a specific piece of information?

☐ 1- health library ☐ 4- private on-line search ☐ 7- Other (please state).....
☐ 2- specialist meeting ☐ 5- department collection
☐ 3- own collection ☐ 6- colleagues

2- You visit the health library for:

☐ 1- borrowing materials ☐ 3- reading material ☐ 5- Other (please state) .....
☐ 2- photocopying material ☐ 4- literature search

3- How do you communicate to get use of the health library services?

☐ 1- go myself ☐ 3- e-mail ☐ 6- Other (please state).....
☐ 2- telephone ☐ 4- third party

4- How often do you use the health library?

☐ 1- daily ☐ 4- at least once every 3 months
☐ 2- at least once every week ☐ 5- rarely/never
☐ 3- at least once a month ☐ 6- Other (please state) ... .

5- Do you face any difficulties which limit you from visiting the health library on a regular basis?

☐ 1- Yes ☐ 2- No

6- If the answer is "Yes", it is because:

☐ 1- I do not understand the system in the health library 4- opening hours
☐ 2- I do not know how to get the information myself 5- There are not enough resources
☐ 3- the location of the health library ☐ 6- Other (please state).....

Information services and ICT

7- Why do you need information?

☐ 1- clinical work ☐ 5- writing a paper
☐ 2- keep up-to-date ☐ 6- have no need for any information
☐ 3- teaching ☐ 7- Other (please state).....
☐ 4- examinations

8- What type of sources do you prefer to spend most of your time searching?

☐ 1- printed materials ☐ 2- electronic materials 3- Other (please state).....

9- Which tool do you prefer to use for searching the information you need?

☐ 1- OPAC 3- CD-ROM 5- Electronic Databases
☐ 2- Internet 4- Card Catalogue 6- Others (please state).....

10- Do you think the number of PC terminals in the library is enough?

☐ 1- Yes ☐ 2- No 2- I do not know

11- Do you think the number of CD-ROM workstations in the library is enough?

☐ 1- Yes 3- I do not know
☐ 2- No 4- No CD-ROM workstations exist

12- Do you use the Internet on a regular basis?
1- Yes 2- No

If the answer is "NO" please go down to Q. 16

13- Where do you use the Internet on a regular basis?
1- In the library 2- Elsewhere

14- If the answer is "Elsewhere", please state where: .....

15- How do you rate the information you get from the Internet generally?
1- important ☐ 2- fairly important 3- not important

16- Do you have access to the hospital's network from your home?
1- Yes 2- No 3- Other (please state).....

17- Do you have any problem in accessing health library's electronic databases?
1- Yes 2- No 3- Other (please state).....

18- If the answer is "Yes", which electronic databases(s) you would like to have access to?
(Please state).....

19- Please rate the quality of the services provided by the health library:

Services	Very good	Good	Adequate	In-adequate	Poor
Book collections					
E-book collections					
Current journals					
Bound journals (old issues)					
E-journals					
CD-ROM collections					
Inter-library-loan					
Photocopying					
Training					
Staff helpfulness					

20- I prefer to access the electronic services via:
1- library staff 2- by myself 3- both

21- How do you rate the electronic services in the library for acquiring the information you need?
1- important 2- fairly important 3- not important

22- Do you believe that the present system of computing on campus is satisfactorily organised for your information needs?
1- Yes 2- No

23- If the answer is "No", please give reason(s) for the system being not satisfactory: .....
.....
.....

Education and Training

24- How did you learn to use electronic sources and services?

1- assisted by a member of library staff
2- through trial and error (self-taught)
3- private training course
4- friends/colleagues
5- Other (please state).....

25- Have you received any computer training?

1-Yes 2-No

If the answer is "NO", please go down to Q. 27

26- How long is the computer training?

1- Days 2- week(s) 3- month(s) 4- year(s)

27- Did the computer training you received satisfy your needs?

1- Yes 2- No

28- If the answer is "No", Why did the training not satisfy you? (please state):

.....

.....

29- If you face a computer problem during your search in the library, from where or whom would you like to seek advice?

1- Hospital computer staff
2- colleagues
3- health library staff
4- computer manual
5- Other (please state).....

Information provision

30- Do you believe that information networking among health libraries would help users to access more information?

1- Yes
2- No
3- I do not know
4- Other (please state).....

31- Do you want further expansion to provide more electronic services in the health library?

1-Yes 2-No 3- Other (please state).....

32- If the answer is "Yes", which of these electronic services do you prefer?

1- online-reference services
2- document delivery services
3- health information networks
4- Others (please state).....

33- What type of information should be shared among Saudi Government hospitals?

1- Hospital news
2- Patients' records
3- Hospital lab results
4- Patients' education
5- Medical Society announcement
6- Diagnosis
7- Research Information
8- Therapy
9- Drug formulary
10- Hospital statistics
11- Physicians' directory
12- New trends in treating specific diseases
13- Other (please state).....
.....

34- What is the most important problem or obstacle that may be encountered in introducing information and communication technology in Saudi Government hospitals?

1- Lack of IT staff
2- Lack of coordination
3- Lack of funding
4- Lack of training
5- Poor management
6- Lack of IT policy
7- Other (please state) .....
.....
.....

35- Do you think that Saudi Arabia is in need of a National Health Library (NHL)?

1-Yes 2-No 3- Other (please state).....

36- Do you wish to see in the near future a Virtual Health Library (VHL) for professionals in Saudi Arabia?

1- Yes 2- No

37- If the answer is "No", please give a reason: .....

38- Do you wish for a Medical Library Association to be established in the Saudi Arabia?

1- Yes ☐ 2- No

39- If the answer is "No", please give a reason: .....

Personal information:

40- Gender:

1- Male ☐ 2-Female

41- What is your age group?

1- Under 20 years
2- 20 -24 years
3- 25 -29 years
4- 30 -34 years
5- 35 -39 years
6- 40 -44 years
7- 45 -49 years
8- 50 or over

42- What is your job description?

1- Physician
2- Nurse
3- IT/IS computer staff
4- Administrator
5- Pharmacies
6- Paramedical personnel
7- Medical Technician
8- Other, (please state): .....

43- What is your highest academic qualification?

1- Bachelor Degree
2- Medical Degree
3- Master's Degree
4- PhD
5- Other, (please state): .....

44- Write your comments, suggestions, and ideas that a health library could do to encourage you to use it more and utilise its information service. Please be as detailed as you want. ***(Alternatively you can email the information direct to the researcher using the email provided, using Arabic or English language).***

.....
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.....
.....
.....
.....
.....
.....
.....

Thank you for sparing some of your valuable time filling in this questionnaire!

Ahmad Khudair
Khudair@yahoo.com

Appendix C

Library Staff Fact Sheet

Health Sciences Library
Staff Fact Sheet

Dear health librarian be confident that your answers will ONLY be used for the purpose of this research. *Thank you for your co-operation.*

1-Name (optional):

2-Gender:

☐ 1- Male ☐ 2- Female

3-Nationality:

☐ 1- Saudi ☐ 2- Non-Saudi (Please state): .....

4- Job description:

☐ 1- Chief librarian
☐ 2- Clerk
☐ 3- Data enterer
☐ 4- Library assistant
☐ 5- Health librarian
☐ 5- Other (please state):.....

5-Qualifications:

☐ 1- Below a University degree
☐ 2- University degree
☐ 3- Post degree diploma/special certificate
☐ 4- Master's degree
☐ 5- Ph.D.

6-Specialist qualifications:

☐ 1- Library and Information Science 2- Other (Please state): .....

Further and general comments

(This section is to put your further and general comments concern.)

.....
.....
.....
.....
.....
.....
.....
.....
.....

Appendix D

Correspondence

TEXT BOUND CLOSE TO THE SPINE IN THE ORIGINAL THESIS

City University
London

School of
Informatics

Professor David Nicholas
Head of Department

Department of
Information Science

23rd August 2001

To Whom It May Concern

Re: Mr Ahmad Khudair

The above named student is working under my direct supervision and he informed me that he intends to spend three months in Saudi Arabia commencing at the middle of December 2001. This time will be spent working to gather primary data from the following sites:

1- Riyadh Central Hospital
2- Hospital for infectious Diseases
3- Hospital for Chest Diseases
4- King Khalid University Hospital
5- King AbdulAziz University Hospital
6- Armed Forces Hospital
7- King Fahad National Guard Hospital
8- King Faisal Specialist Hospital and Research Centre
9- King Khalid Specialist Eye Hospital
10- Security Forces Hospital

He will be distributing and collecting questionnaires designed to collect necessary data from which fieldwork observations can be formulated. He will also take the opportunity to interview selected candidates to triangulate the research methods used.

I hope that this meets with your approval.

Yours sincerely

pp

Dr David Bawden
Department of Information Science

GDOM OF SAUDI ARABIA
FAISAL SPECIALIST HOSPITAL
AND RESEARCH CENTRE

المملكة العربية السعودية
مستشفى الملك فيصل التخصصي
ومركز الأبحاث

Limited Distribution
Training & Development Services

TO : **All Chairmans**

Date:4/04/ 1423
15/06/2002

FROM: **Fahad Al Saud**
Deputy Executive Director
Administration &Financial Affairs
&Acting Director , Training &Development Services

REF:

SUBJECT: **Questionnaire for Ahmad A. Khudair**

We Received the attached self explanatory letter from the literature College at King Saud University , concerning student , Ahmad A. Khudair who is studying at City University London for the Ph. degree under subject(Information Services in the Medical Libraries). As part of the above named student study requirements he needs to gather information related to his research by distributing the attached questionnaire ..

However Once the questionnaire is completed please return same to T&D . MBC 14 for forwarding to the concerned party.

Thank you.

Approved :

Abdullah Al Blaihed
Acting Executive Director
Administrative & Financial Affairs

ص. ب. ٣٣٥٤ ، الرياض ١١٢١١ تلكس : ٤٠١٠٥٠ تخصصي سع (٩٦٦-١) ٤٤١-٤٨٣٩ فاكس : (٩٦٦-١) ٤٦٤-٧٢٧٢ تلفون: برقيا : التخصصي
3354, Riyadh 11211 Telex : 401050 RYSPEC SJ Fax : (966-1) 441-4839 Telephone : (966-1) 464-7272 Cable Specialist
14 Rev.06-15) I.C.202040

بسم الله الرحمن الرحيم

Embassy of Saudi Arabia
Cultural Bureau
London/UK

المملكة العربية السعودية
وزارة التعليم العالي
مكتب الملحق الثقافي في بريطانيا

الأكاديمية

رقم الملف : R 389

إفـــــــــــــادة

يفيد المكتب الثقافي السعودي في بريطانيا بأن السيد/ أحمد بن عبدالله بن خضير مبتعث من جامعة الملك سعود للدراسة في بريطانيا لتحضير درجة الدكتوراه في علوم المكتبات بجامعة سيتي بلندن وهو يقوم الآن برحلة علمية إلى المملكة لجمع المادة الخاصة بأطروحته، فنرجو التكرم بتقديم المساعدة الممكنة له.

وقد صدرت هذه الإفادة بناءاً على طلبه لتقديمها إلى من يهمه الأمر.

والله ولي التوفيق ،،،

الملحق الثقافي في بريطانيا

عبدالله بن محمد الناصر

م ت / ح ى

DATE: ١٤٢٠/٩/٢١ ENC.

Embassy of Saudi Arabia
Cultural Bureau
London/UK

المملكة العربية السعودية
وزارة التعليم العالي
مكتب الملحق الثقافي في بريطانيا

الأكاديمية

رقم الملف : R 389

الأخ الكريم المبتعث / أحمد بن عبدالله الخضير المحترم

السلام عليكم ورحمة الله وبركاته، وبعد،

نود افادتك بورود رسالة مدير عام شئون هيئة التدريس والموظفين بجامعة الملك سعود الهاتفية رقم ٢٢١٦٠٣٩٦٠٢ وتاريخ ١٤٢٢/٨/٢٧هـ المتضمنة موافقة الجامعة على قيامك برحلة علمية الى المملكة لمدة ٣ أشهر اعتباراً ١٤٢٢/١٠/٧هـ الموافق ٢٠٠١/١٢/٢٢م.

عليه نأمل تزويدنا بصورة كاملة من جوازات سفرك والعائلة لإكمال اجراءات استخراج تذاكر السفر، كما نأمل تزويدنا بتقرير كامل من الجهة التي أشرفت على العمل الميداني، موضحا فيه بداية ونهاية الرحلة العلمية وكذلك أصول جوازات السفر بعد التصوير منها .

للاحاطة.

مع تمنياتنا لك بالتوفيق ،،،

الملحق الثقافي في بريطانيا

عبدالله بن محمد الناصر

م ت / ح ي

مملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
كلية الآداب

الرقم: ١٠/٥٥/٢٧
التاريخ: ٤/٤/١٤٣٣هـ
المرفقات: بدون.

الموضوع: ..

سعادة الدكتور مدير إدارة التدريب والتطوير
بمستشفى الملك فيصل التخصصي **المحترم**

السلام عليكم ورحمة الله وبركاته .. وبعد :

أفيد سعادتكم أن مبتعث القسم أحمد بن عبد الله بن خضير يقوم برحلة علمية لجمع المعلومات الخاصة بأطروحته بعنوان: "الخدمات المعلوماتية في المكتبات الطبية"، وقد اختار عددا من مستشفيات المملكة من ضمنها مستشفى الملك فيصل التخصصي.

آمل التكرم بتقديم المساعدة له بما يخدم بحثه، شاكرا لكم حسن تعاونكم.

مع خالص تحياتي وتقديري،،،

جامعة الملك سعود
كلية الآداب
قسم علوم المكتبات والمعلومات

قسم علوم المكتبات والمعلومات

د. مبارك بن سعد بن سليمان

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
كلية الآداب

الرقم :
التاريخ : / /
المرفقات :

الموضوع :

المحترم

سعادة مدير مستشفى الإيمان العام

السلام عليكم ورحمة الله وبركاته وبعد..

السيد / أحمد عبدالله الخضير ، أحد مبتعثي القسم في تخصص علم المعلومات و اطروحته لدرجة الدكتوراه بعنوان : الخدمات المعلوماتية في المكتبات الطبية ، وتهدف الرسالة إلى تقييم خدمات المعلومات المقدمة من قبل المكتبات الطبية في المستشفيات السعودية .

ومبتعث القسم يقوم الآن برحلته العلمية داخل المملكة وهو في أمس الحاجة إلى مساعدتكم في تعميم توزيع الإستبانة المرفقة على أطباء المستشفى والباحثين .

ونرجو أن يكون ذلك في أسرع وقت ممكن لحاجة الباحث للرجوع إلى مقر بعثته .

شاكرين لكم ما تبذلونه خدمة للعلم .

وتقبلوا خالص تحياتي وتقديري ،،،

رئيس قسم علوم المكتبات والمعلومات

٤/١٣

د. مبارك بن سعد بن سليمان

جامعة الملك سعود
كلية الآداب
قسم علوم المكتبات والمعلومات

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الملك سعود
كلية الآداب

بسم الله الرحمن الرحيم

الرقم :
التاريخ : / /
المرفقات :

الموضوع :

المحترم

سعادة مدير مستشفى الأطفال - السليمانية

السلام عليكم ورحمة الله وبركاته وبعد..

السيد / أحمد عبدالله الخضير ، أحد مبتعثي القسم في تخصص علم المعلومات و اطروحته لدرجة الدكتوراه بعنوان : الخدمات المعلوماتية في المكتبات الطبية ، وتهدف الرسالة إلى تقييم خدمات المعلومات المقدمة من قبل المكتبات الطبية في المستشفيات السعودية .

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ونرجو أن يكون ذلك في أسرع وقت ممكن لحاجة الباحث للرجوع إلى مقر بعثته .

شاكرين لكم ما تبذلونه خدمة للعلم .

وتقبلوا خالص تحياتي وتقديري ،،،

رئيس قسم علوم المكتبات والمعلومات

د. مبارك بن سعد بن سليمان

جامعة الملك سعود
كلية الآداب
قسم علوم المكتبات والمعلومات

بسم الله الرحمن الرحيم

مملكة عربية سعودية
وزارة التعليم العالي
جامعة الملك سعود
كلية الآداب

الرقم :
التاريخ : / /
المرفقات :

الموضوع :

المحترم

سعادة مدير مستشفى اليمامة

السلام عليكم ورحمة الله وبركاته وبعد..

السيد / أحمد عبدالله الخضير ، أحد مبتعثي القسم في تخصص علم المعلومات و اطروحته لدرجة الدكتوراه بعنوان : الخدمات المعلوماتية في المكتبات الطبية ، وتهدف الرسالة إلى تقييم خدمات المعلومات المقدمة من قبل المكتبات الطبية في المستشفيات السعودية .

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ونرجو أن يكون ذلك في أسرع وقت ممكن لحاجة الباحث للرجوع إلى مقر بعثته .

شاكرين لكم ما تبذلونه خدمة للعلم .

وتقبلوا خالص تحياتي وتقديري ،،،

رئيس قسم علوم المكتبات والمعلومات

١٤٢٢/٤/١٣

د. مبارك بن سعد بن سليمان

جامعة الملك سعود
كلية الآداب
قسم علوم المكتبات والمعلومات

Appendix E

Conference Attendance

WORLD HEALTH ORGANIZATION
Regional Office for the Eastern Mediterranean
ORGANISATION MONDIALE DE LA SANTE
Bureau régional de la Méditerranée orientale

بسم الله الرحمن الرحيم

منظمة الصحة العالمية
المكتب الإقليمي لشرق المتوسط

HIT.12/6 - (4VHSL)
H2/64/2 – (ISP)

6 December 2004

Dear Mr Khudair,

Reference is made to the 4th Regional Conference on EMR Health Sciences Virtual Library: Role in e-Learning and Building the Information Society held in the Eastern Mediterranean Regional Office, in Cairo, Egypt during the period **23-25 November 2004.**

We would like to thank you for your participation in the above-mentioned Conference and your presentation titled "Saudi health information network: a Proposed Prototype".

Your participation has contributed to the success of this event. I look forward to more collaboration with you in the future, trusting that this will build a basis for more and better networking and information sharing in our Region.

With kind regards.

Yours sincerely,

Dr Najeeb Al-Shorbaji
Health Information Management
& Telecommunications

Mr Ahmad A. Khudair
Health Information Services
School of Informatics
City University
London
UNITED KINGDOM

P.O. Box 7608, NASR CITY (11371) CAIRO - EGYPT
ص.ب 7608 مدينة نصر القاهرة مصر (11371) جمهورية مصر العربية
Electronic mail: postmaster@emro.who.int البريد الإلكتروني
FAX (202) 670 24 92/94 فاكس

CERTIFICATE OF ATTENDANCE

This is to certify that

MR AHMAD A. KHUDAIR

Attended the

FOURTH REGIONAL CONFERENCE ON EMR HEALTH SCIENCES VIRTUAL LIBRARY
23-25 NOVEMBER 2004

held at World Health Organization Regional Office for the Eastern Mediterranean

Ministry of Health and Population

Egyptian Universities Network (EUN)

Academy of Scientific Research (ENSTINET)

World Health Organization Regional Office for the Eastern Mediterranean

Saudi Bio
2002-Jeddah

KING FAISAL SPECIALIST HOSPITAL & RESEARCH CENTRE
Jeddah - Kingdom of Saudi Arabia

ATTENDANCE CERTIFICATE

This Certificate is awarded to

MR. AHMED BEN KHUDAIR

Has attended

SAUDI BIO 2002-JEDDAH

From : 6 APRIL 2002 To: 8 APRIL 2002

Dr. Hammad Al-Omar
Director Conference

Dr. Sultan Bahabari
Chairman & Chief Executive Officer

Dr. Essam Al-Sabban
Co-Chairman & Director Research Center

Appendix F

Reproduction Permission

Subj: **RE: Many thanks**
Date: 25/05/2005 15:43:50 GMT Daylight Time
From: Raynna_Bowlby@brown.edu
To: AKHUDAIR@aol.com

Mr. Khudair,
Please feel free to include this Brown University Library organizational model in your research. We request that it be appropriately credited. Please note also that this is a theoretical model which enabled us to envision our functional work in alignment with our strategic vision and plans. It is not our actual organizational structure.

Hopefully, this .pdf file will address your need for a better copy of the graphic as it is the only version I have of this graphic.
http://www.brown.edu/Facilities/University_Library/MODEL/LTMG/orgchart.pdf

Best wishes,
Raynna Bowlby
Office of the University Librarian
Brown University Library

-----Original Message-----
From: AKHUDAIR@aol.com [mailto:AKHUDAIR@aol.com]
Sent: Tuesday, May 24, 2005 5:08 PM
To: Bowlby, Raynna
Subject: Many thanks

Dear Raynna,

Thank you for your reply.

The model I mentioned is
http://www.brown.edu/Facilities/University_Library/MODEL/LTMG/orgchart.htm

I am a PhD candidate in the City University, School of Informatics, Department of Information Science. The title of my thesis will be: Health Sciences Libraries' Information Services and ICTs

Thanks,

A. Khudair
A.khudair@city.ac.uk

Appendix G

Sample of Medical CD-ROM List

CD-ROM Software For Medical Professionals (Sep.2003)

Email :- medical_tec@hotmail.com

	Anaesthesia
83	Silver Platter Anaesthesiology
156	Management Of The Difficult Airway
160	Regional Anaesthesia
168	Regional Anaesthisia For Obstetrics
185	Adult Airway Management
186	The Electronic Anaesthiology Library
373	Pain Management
493	Anaesthesia Textbook (Miller - 2001)
511	Anesthesia (Video) (Miller - 2001)
566	Anaesthesia And Resuscitation
639	Interactive Regional Anaesthesia
657	Adult Airway Management Principles & Techniques
732	Interactive Anaesthesia Library On CD ROM (2001)
746	Anesthesiology , Anesthesia & Analgesia Full Content Journals (2000)
	Anatomy
6	Human Body
7	Adam Anatomy
12	Body Works
14	3D Skeleton
49	Imaging Atlas Of Human Anatomy
51	4 In 1 Human Anatomy
70	Digital Anatomist : Interactive Brain Atlas
103	Skeleton Interactive
163	Visual Man Lite (Transv. Sections Of The Whole Body)
171	Microscopic Anatomy
195	Human Anatomy
197	Digital Anatomist
207	Interactive Clinical Anatomy
208	The World's Best Anatomical
209	Interactive Skeleton
210	Interactive Atlas Of Human Anatomy
220	The Ultimate Human Body
267	Full Anatomy And System Anatomy(Adam The Inside Story)
294	Applied Laparoscopic Anatomy
295	Functional Anatomy Of The Heart
312	Atlas Of Human Anatomy (Sobatta)
394	Interactive Training Course In Anatomy & Physiology
401	ECG Anatomy & Electrophysiology
414	Total Body
424	Clinical Anatomy
465	Atlas Of Sectional US / CT / MRI Anatomy
466	Cross Sectional Anatomy
469	The Anatomy Lesson

499	Gray's Anatomy
500	Color Atlas Of Anatomy " McMinn"
561	Video Atlas Of Human Anatomy – The Upper Extremity (2 Cd)
562	Video Atlas Of Human Anatomy – The Lower Extremity (2 Cd)
563	Video Atlas Of Human Anatomy – The Trunk (3 Cd)
564	Video Atlas Of Human Anatomy – The Head & Neck Part I (3 Cd)
565	Video Atlas Of Human Anatomy – The Head & Neck Part II (3 Cd)
604	Wolf Real Head &Neck Anatomy
607	Thorax Anatomy
624	Color Atlas Of Human Morphology
662	Extremities Anatomy Video (3 Cds)
679	Atlas Of Clinical Anatomy (Frank H.Netter)
681	Interactive Hand Anatomy
696	Neuro Anatomy (2 Cds)
715	Adam Interactive Anatomy
717	Color Atlas Of Anatomy (2002)
735	Spotting Of Upper Limb
800	Anatomy Of The Lower Limb
803	Spotting Of Head And Neck (Cadavar)
804	Anatomy Of Abdominal
805	Anatomy Of Pelvis
831	Skeletal And Topographic Anatomy (2 Cds)
833	Anatomy For Physians (Dr John Pegington)
	Immunology
64	Immunology
478	Immunology Methods Manual
502	Interactive Core Tutorial In Immunology
645	Immunology Tutor And Question Bank
	Infectious Disease
18	Infectious Disease Text Book
108	Fighting Infectious Diseases
114	CCC Infectious Diseases
313	Mosby Infectious Diseases
448	Visual Diagnosis Of Pediatric Infectious Diseases
583	Infectious Diseases (2002)
606	Infectious Diseases (Volumes Of Cases With Images,Questions And Model Answers)
778	The Pediatric Infectious Disease
	Neurology
70	Interactive Brain Atlas
71	Mastering MRI - Central Nervous System
89	MRI – Spinal Cord
90	Spinal CT
101	Neurology Textbook
127	Asthma & Neurology
173	Clinical Neurology
177	Neuro Ophthalmology
180	Epilepsy
204	ACR Neuroradiology (Radiology)
205	LEO Neuro-Ophthalmology Interactive
232	American Journal Of Neuroradiology

272	RSNA Special Course In Neuroradiology
288	Interactive Physiology Of Nervous System
303	Neuro Database 1999
351	Youman's Neurosurgery 4th Edition
353	Acute Ischemic Stroke – New Concept Of Care
378	Syllabi On CD ROM American Academy Of Neurology OCT. 2001
408	Cerebral And Spinal Tomography
412	Principles Of Neurology
468	Applied MR Neuro – Angiography
497	Imaging Of Cerebral Tumors
506	Subarachnoid Hemorrhage
532	Ocular Pathology
585	Neurology Textbook (2002)
604	Wolf Real Head &Neck Anatomy
636	The Practice Of Neurosurgery
638	Neurological Surgery
654	Neuro Angiography
656	Carpal Tunnel Syndrome
696	Neuro Anatomy (2 Cds)
727	Waveguide (Interperating EEG's,Recognizing Sizures,Artifacts,Rhythms,..)
755	Neurologic Localization (Stephen Golberg 2003)
	Nursing
350	Saunders Comprehensive Review For Nclex-Rn
439	Mosby Comprehensive Review Of Nursing
659	Wound Management And Interactive Dressing
671	Maternal Newborn Nursing (2001)
672	Textbook Of Medical-Surgical Nursing (2001)
	Obstetrics & Gynaecology
54	Human Reproduction (4 Cds)
62	American Journal Of Obstetrics & Gynaecology (4 Cds)
113	CCC Gynecology
141	Rsna Breast Imaging
161	Royal College Of Obst. & Gyn (2 Cds)
168	Regional Anaesthisia For Obstetrics
175	Your Pregnancy & Your New Born
189	The Female Infertility Ultrasound Scan
216	Adam Obstetric & Gynecology
263	Obstetric Ultrasound
275	Guide To Women's Health
348	ACR Genitourinary
352	Comprehensive Review Of Colposcopy
358	Diagnostic Ultrasound Of Fetal Anomalies Text Book
361	Colposcopic Patterns And Their Interpretations
404	Obstetrics And Gynecology Library
421	Fundamentals Of Breast Imaging
464	Obstetric Ultrasound Principles And Technique
496	Interactive Colposcopy
507	IVF
525	The Interactive Girlfriend's Guide To Pregnancy
530	Colposcopy
539	Ectopic Pregnancy

581	Gynecology Textbook (Dr. M.Sved And Dr.A.Zaltz)
586	Obstetrics Textbook (Dr. P.Bernstein)
626	Laparoscopic Surgery Of Gyenecology
632	Yamada Gastroenterology (Textbook And Atlas)
653	Gynecologic Cytopathology
701	Color Atlas Of Gynecology & Obstetric
704	Ideal Steps Of Caesarian Section
733	Gynaecology & Obstetric Museum (Jars , Instruments , Xray)
734	Color Power Doppler Ultrasound
779	Endoscopic Surgery For Gynecologists (Sutton & Diamond , Andrew Kent)
790	Diagnostic Ultrasound Of Fetal Anomalies (Case Studies And Anomalies Recognation)
791	Diagnostic Ultrasound Of Fetal Anomalies (Principles & Techniques)
796	Forceps Delivery Video
798	Atlas Of Tumor Pathology (Tumor Of The Cervix , Vagina And Vulva)
802	Breast Feeding & Mal Nutrition
815	Ultrasound Case Studies In Obstetrics,Gynecology And General Imaging
817	Video Atlas Of Breast Imaging
841	Mammoplasty And Reconstruction Of Aereola (2 Cds)
	Oncology
77	Etiology Of Cancer
118	Haematology / Oncology
140	Radiation Oncology
142	Oncomedia Vol. 1. Medical Oncology
221	ACR Learning File – Nuclear Medicine
283	Principles And Practice Of Oncology
315	Nuclear Medicine : Bone Scintigraphy
421	Fundamentals Of Breast Imaging
438	Uronet (A Global Resource For Prostate Cancer)
440	Laparoscopy For The Cancer Patient
483	Cancer Principles And Practice Of Oncology - 2001 . (De Vita)
512	Principles & Practice Of Radiation Oncology (Perez)
535	Atlas Of Tumor Pathology - Tumors Of The Bone Marrow
619	MKSAP Oncology And MKSAP Hematology
641	Atlas Of Tumor Pathology -Tumors Of The Eye,Ocular Adenxa&CNS
762	Breast Surgery (Examination,Mass Biopsy,Conservative Breast Surgery,Radical Mastectomy)
770	ACR Detection Of Colorectal Polyps & Cancer
798	Atlas Of Tumor Pathology (Tumor Of The Cervix , Vagina And Vulva)
802	Breast Feeding & Mal Nutrition
817	Video Atlas Of Breast Imaging
837	Clinical Management Of Metastatic Breast Cancer
872	Transhiatal Esopphagectomy For Cancer Of The Distal Esophagus
	Ophthalmology
55	Atlas Of Retinal Disease
56	Aids And The Eye
57	Electronic Ophthalmology Library On CD ROM
58	American Academy Of Ophthalmology
78	Funds Fundamentals
122	Primary Care Opthalmology
174	Cornea Copia(An Interactive Tool For The Cornea And Contact Lenses)
177	Neuro Ophthalmology
181	Diabetes And The Eye

182	CD-ROM Ophthalmology (Myron Ynoff)
183	Pathology Of The Eye
205	LEO Neuro-Ophthalmology Interactive
211	Phaco Today – The Latest In Phacoemulsifaction And Small Incision Cataract Surgery
212	Photo Cd Imaging (From Advanced Polymer Technology)
257	Ophthalmology Interactive (ASCRS)
261	Advanced Concepts In Cataract Surgery
297	American Academy Of Ophthalmology (Clinical Case Studies)
425	Atlas Of Ophthalmology
472	The Failing Glaucoma Filter
473	Glaucoma Surgery
474	Stereoscopic Atlas Of Macular Diseases
475	Vitreo-Retinal Course
484	Duane's Ophthalmology -2002 Edition
526	Retina Review Library
527	Atlas Of Clinical Ophthalmology
528	Atlas Ophthalmology (Kanski)
529	Color Atlas Of Ophthalmic Plastic Surgery
532	Ocular Pathology
536	The Basic Of Ultrasonography
602	Kanski Clinical Ophthalmology (Full Edition)
641	Atlas Of Tumor Pathology-Tumors Of The Eye,Ocular Adenxa&CNS
685	Cornea Color Atlas And Cornea Text
692	LEO Clinical Update Course In Uveitis
712	Catract And Refractive Highlights
714	LEO Clinical Update Course On Pediatric Ophthalmology And Strabismus
728	Clinical Update Course On Neuro –Ophthalmology
731	The Contact Lens Series (Introduction,Prefitting Examination,Patient & Lens Type Selection)
741	American Academy Of Ophthalmology Of Trabeculectomy (2 Cds)
742	Textbook Of Ophthalmology & Review Questions And Answer Book (Kenneth)
750	LASIK Complication
754	Video Operations In Ophthalmology (2 Cds)
772	Basic Ophthalmology (Thomas A. Farrel)
773	Ophthalmology Interactive – Advanced Concepts In Cataract Surgery
776	Indocyanine Green Angiography Technique And Interpreation
777	American Academy Of Ophthalmology - Evolution In Lasik
797	Ophthalmology Vedio And Slides
816	Atlas Of Ophthalmology (Eyelids , Lacrimal , Conjunctiva , Cornea , Sclera , Lens)
	Orthopedic
47	Orthopedic (Mosby Library Of Orthopedic)
79	Journals Of Bones & Joints Surgery
86	Mastering MRI Musculoskeltal Atlas Of Clinical Rhematology
92	Adam Trauma
93	Adam Standard
94	Adam Orthopediacs
105	Resnick Diagnosis (Bone & Disorder)
111	Adam Interactive Physiology Of Muscular System
116	Orthopedics / Sports Medicine
131	MRI Of The Shoulder
132	MRI Of The Knee

143	Orthopedics Knowledge & Orthopedic Self Assessment Exam (OSAE)
144	American Journal Of Bone And Joint Surgery
145	Resnick (Diagnosis Of Bone & Joint Disorders)
146	A . A . O . S Exams (American Academy Of Orthopedics Exams)
147	Skeletal Trouma
154	Adam Orthopedics Of The Lower Limb
184	Orthopedic Grand Round
187	Journal Of Bone And Joint Surgery (British Volume)
194	Interactive Physiology Muscular System
236	CD Atlas Of Orthopedics
255	Hip And Knee (2cds)
266	The Traumatic Hand Injuries
276	The Comprehensive Classification Of Fractures
280	Interactive Physiology Of Muscular System
286	Ortopaedic Data Base (American Acadmy Of Orthpedic Surgery)
287	Adult Reconstruction Surgery + Pediatric Orthopedic + Sport Medicine
314	Orthopedics General Rounds In Spine
329	Orthopaedics Grand Rounds Pediatrics
339	Traumatic Hand Injuries
356	Essentials Of Musculoskeltal Care (2 Cds)
410	Comprehensive Classification The Of Fractures With Radiographic & Proposed Treatment
447	A .O Principles Of Fracture Management (2cds)
449	MRI Arthhroscopy And Surgical Anatomy Of The Joints
450	Interactive Knee
461	MRI In Orthopedics And Sports
471	Orthopedic Basic Science Biology And Biomechanics Of The Musculoskeletal System
513	MRI Of Musculoskeletal System " Bradly "
514	Mastering MRI Of Musculoskeletal System " Crues "
519	Diagnosis Of Bone & Joint Disorder Textbook
520	Skeletal Trauma & Skeletal Trauma In Children
538	Chapman's Orthopedic Surgery
542	Fractures (Rockwood)
544	Journal Of The American Academy Of Orthopadic Surgeons 1993 – 2001
587	Orhopedics Textbook (Dr. C.Hutchison)
594	Wheeless' Textbook Of Orthopaedics
635	Orthopadic Arthroscopy
660	Musculoskeletal Pathology
661	Textbook Of Operative Arthroscopy
678	Journal Of Arthroscopic And Related Surgery
681	Interactive Hand Anatomy
682	Fractures In Adult And Childern
683	Interactive Hand Surgery
744	Campbells Operative Orthopedics 2003 (2 Cds)
757	Advanced Technologies In Knee & Shoulder Surgery (Acl Bone Tendon Bone) 2 Cds
839	Anterior Plate Fixation Of The Sacroiliac Joint (2 Cds)
840	AO And ASIF External Fixator , UFN And UTN And UHN , USS System (3 Cds)
856	Physical Examination Of The Musculoskeletal System (Conochi,MD.,FRCSC) 2 Cds
858	Spinal Disc Decompression
	Urology & Nephrology
124	Nephrology
138	Biblomed Urology Series (Disk 1)

139	Biblomed Urology Series (Disk 2)
170	Interactive Physiology Urinary System
251	British Journal Of Urology –1999
259	Understanding Prostate Disorders
260	Kidney
282	Urology (2 Cds)
305	Atlas Of Clinical Urology
348	ACR Genitourinary
423	Uroplasty
433	Erectile Dysfunction
438	Uronet (A Global Resource For Prostate Cancer)
491	Oxford Textbook Of Clinical Nephrology
545	Diabetic Nephropathy
546	Atlas Of Renal Transplantation
547	The Kidney - 6th Edition (Brenner & Rector)
548	European Society Of Urology Courses 2002
549	Masters In Urologic Surgery (2 Cds)
550	Journal Of Endourology (Innovations & Techniques)
551	Pathology For Urologists (Jo Ellen Cottey Krueger)
552	Abdominal Imaging Genitourinary (Radiology Interactive)
553	Genitourinary Imaging (2 Cds)
554	Genitourinary Ultrasound (2 Cds)
555	American Urological Association Annual Meeting 2002
556	British Journal Of Urology 1996-2001 (2 Cds)
558	American Urological Association Update Series 2001
559	American Urological Association Self-Assessment Study Program 2001
584	Nephrology Textbook (Dr. Burgman 2001)
593	Urology Textbook (Dr. Jewett 2002)
630	Genitourinary
761	Incontinence Text Book 2nd Edition 2002(The Diagnosis And Treatment Of Erectile Dysfunction)
768	Adult And Pediatric Urology (Gillenwater , Grayhack)
782	Extracorporeal Shock Wave Lithotripsy
783	Education On Erectile Dysfunction
784	Case Studies In Urology (2001)
785	A Man's Guide To Sexual Health
812	Understanding Of Benign Prostate
862	Construction Of Continent Ileal Reservoir (Kock POUCH) For Urinary Diversion
863	Female Stress Incontinence Urology
864	Suprapublic Vesicourethral Suspension For Stress Incontinence & The Transpublic Repair Of Membranous Urethral Strictures
865	Resection Of The Vena Cava For Renal Cell Carcinoma
866	Surgery Of Renal Calculi (William H, Boyce , M. D.)
867	Transuretheral Prostatectomy – An Anatomic Approach & Management Of Post-Traumatic Prostatomembranous Urethral Sticture
868	The Technique Of Radical Cystectomy (Donald Skinner , MD.)
869	Radical Retropubic Prostatectomy And Prostatectomy And Cystoprostatectomy – Surgical Technique For Preservation Of Sexual Function
870	Radical Cycsto-Prostatectomy With Preservation Of Sexual Function
881	Campbell's Urology 2002