Saudi Academic and Research Libraries in the world of Information Technology: an over view

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Keywords

Academic Libraries, Electronic journals, Information technology, Automation systems, Saudi Arabian Libraries.

Abstract

This study introduces Saudi Academic Libraries (SALs), their organization structures, automation systems, the application of CD-ROMs and their development in KAAUL, and the role of King Abdul-Aziz City for Science and Technology in information systems until the year 2000. Furthermore, this study ends with a brief review of previous works in the development of information technology in SALs. In this study, survey method was used as a research methodology and a telephone call interviews were took place to vice-deans on 13th September 2001 to get primary information about the different academic libraries all over KSA to know how much can SALs establish management databases which help to give reports to help library managers in their different managerial levels to take the right decisions in electronic journals collection management. The most important results showed that most SALs have the minimum required network and electronic service activities, and the available different information technologies, that can provide the necessary support to Interlibrary Loan (ILLN) and Document Delivery (DD), and automated their information systems between 1980 and 2002. Moreover, the study showed the role of KACST in science and technology and its national information systems in setting up the infrastructure of the information systems in the Kingdom and also have been reviewed taking into consideration the viewpoints and attitudes of those involved in the information field. Though SALs still facing problems that could be summarized in: the great lack in financial resources in the last couple of years caused the weakness in the acquisition collections from both quality and quantity aspects, the lack of library staff member numbers year after year, while the number of library users and the number of acquisitions and services are increasing at the same time, unsatisfied users` needs and the lack of training programs, and The limitation of cooperative and cooperation activities. SALs still need to apply a cooperative collection development for electronic journals such as consortia initiatives and journal aggregation services for publishers which provide an integrated access to a range of electronic journals.

Introduction

The establishment of the modern concept of libraries in the Kingdom of Saudi Arabia goes back to 1970, when an extensive five-year plan was launched, that made the economic, social, and educational situation begin to improve. The university libraries have developed in the last two decades, and improvements have been reflected in buildings, collections, staffing, facilities, services and technology especially between 1975 and 1983. The drop in oil prices had a great influence on budgets, which were cut drastically between 1984 and 1989 causing the cancellation of thousands of printed journal subscriptions. The budgets were cut even more dramatically after the Gulf War in 1991 and continue to be a problem as SALs have kept pace with technological advancement including OPAC, online and CD-ROM searching, LANs, and full-text databases on CD-ROM (1). As well as the insufficient independent budgets there was also the lack of professional librarians and the absence of a library association to create general Saudi library legislation and planning (2). These problems have increased during the last ten years as SALs have accepted more and more students each year.

The statistics for the Saudi Arabian Ministry of Higher Education for the year 2000 show that SALs registered 172339 undergraduate students, 1286 diploma students, 2390 master degree students, and 1109 PhD students as shown in table 1.

Scope and objectives:

This study is going to introduce:

1. SALs, their organization structures, automation systems, and their application of CD-ROMs until the year 2000.
2. The development in King Abdul-Aziz University Library.
3. The role of King Abdul-Aziz City for Science and Technology in information systems.
4. A brief review of previous works in the development of information technology in SALs.
5. Problems facing SALs.

Table 1:Students (boys and girls) registered in Higher Education in KSA year 2000

UNIVERSITY	Bachelor degree	Diploma	Master degree	PhD
KAAUL	40752	266	854	12
KFUPML	5671	-	398	24
KSUL	48609	268	2396	208
KFUL	11921	197	245	-
IMSIUL	25111	162	613	521
UQUL	24241	373	676	201
IUL	4513	20	208	143
KKUL	11521	-	-	-
Total	**172339**	**1286**	**2390**	**1109**

1. Saudi academic libraries

According to the directory of Saudi Libraries and Information Centers, 1999,there are now eight universities in different parts of the country with several branches besides the central one. These are:

1- Imam Mohamed Bin Saud Islamic University Lib. in Riyadh **(IMSIUL)** was established in 1951. It has 138,673 books, 1,179 periodicals, 20,950 manuscripts, 6,428 records of audiovisuals, 90 members of staff, and it is 45964 square meters in size.

2- King Saud University Lib. in Riyadh **(KSUL)** was established in 1957. It has 555,857 books, 263,904 periodicals, 20,008 manuscripts, 106,419 documents, 19,472 audiovisuals, 48,259 other materials, 136 members of staff, 4000 users per year, and it is 52000 square meters in size.

3- King Abdul-Aziz University Lib. **(KAAUL)** in Jeddah was established in 1967. It has 509,642 books, 2,628 periodicals, 3,116 manuscript, 16,306 documents, 2,662 audiovisuals, 52 staff members, 393640 users per year, and it is 15500 square meters in size.

4- Umm-Al-Qura University Lib. in Makkah (**UQUL)** was established in1971 in Makkah. It has 679 periodicals, 5,758 manuscripts, 7,500 documents, 17,096 audiovisuals,. 60 members of staff, 11000 users per year, and the size is 7200 square meters.

5- King Fahad University Lib. Of Petroleum and Minerals in Dhahran (**KFULPM)** was established in 1975 in Dhahran. It has 283,669 books, 1,776 periodicals, 526,853 audiovisuals,. 48 members of staff, and the size is 75320 square meters.

6- King Faisal University Lib. in Dammam (**KFUL)** was established in 1976. It has 8,559 books, 311 periodicals, and 600 documents. There are 17 members of staff , 5200 users per year, and the size is 2600 esq. Its branch in Ehsaa has 51768 books, 141 periodicals, 227 manuscripts, 16750 documents, and 3042 other materials. There are 16 staff members and it is 2600 square meters in size. (Directory of Saudi Libraries and Information Centers, 1999). The other two are King Khalid University Library in Abha (**KKUL**), and the Islamic University Library in Madina (**IUL**), which will be not included in the study. The first one was just established in the year 2000, and the other one did not start to have EJ or CD-ROM databases until the first of July 2001.

2. The organizational structures

A few articles discussed Saudi academic libraries, without giving an informative look into their systems and operations. In 1998 Siddiqi made a comprehensive survey of seven SALs to review their systems, operations, and services. The establishment of the Ministry of Higher Education (MHE) which supervised and financed the eight university libraries made the development of university library systems more progressive,. The MHE has applied five year development plans since 1970, and the fifth development plan which ended in 1995 paid special attention to a number of issues related to higher education, e.g. easier accessibility to information in institutions and cooperation within and between universities (3).

Al-Otaibi stated that the only source of government financial resources for SALs is part of the university budget. There is no independent yearly library budget to be spent on library activities. The library budget is allocated with other miscellaneous expenses such as teaching aids, faculty offices and classroom facilities, under the category “Office Supplies and Equipment”(4). Siddiqi stated that SALs are allocated yearly budgets, but libraries do not have freedom in the payment of invoices, which are usually paid by the central purchasing department of the university. The budget of SALs differs from one institution to another. These budget run at around several million US dollars. Most of these budgets are spent on periodicals rather than other resources due to the need to satisfy research and teaching information needs.

Siddiqi's study revealed that 43% of libraries do not have a written library policy manual, which sets out the goals and objectives as a tool to enhance the performance of library services and activities, and to guide library planning and development. 71% have a centralized structure, which makes clear the responsibility for all the activities of the system, such as controlling the acquisition and processing, and the distribution of the staff. The decentralized ones (KAAUL & KSUL) work independently but coordinate with each other. All libraries have a Dean as a member of the university board and qualified to make decisions. Siddiqi found that 43% of staff members are professional librarians. There are four universities offering Library and Information Science education. These are IMSIUL, KAAUL, KSUL, and UQUL. Of these only KAAUL offers master and Ph.D. degrees. Of course these departments have helped a lot to relieve the shortage of native library professionals in SALs.

It also found that 71% are using the Dewey Decimal classification scheme, and only KFULPML & KFUL are using the Library of Congress classification scheme. The survey indicated that SALs cooperate together and have agreements (3 formal and 2 informal) for interlibrary loan, and one only has a formal agreement for resource sharing (5). Siddiqi also did a PhD study in 1998 that looked into the extent of cooperative interaction among seven SALs (KSUL, IUL, KFUULPM, KAAUL, IMSIUL, KFUL and UQUL). All of them cooperate with each other, but although an interlibrary loan department is a must for ILL cooperation, only three of the SALs

have ILL departments and union catalogues in their libraries. All the seven SALs agreed that cooperative activities at the time of the study were inadequate (6).

3. Automation

Aref and Solayman made an empirical evaluative study of automation systems used in libraries and information systems in Saudi Arabia concentrating on the evaluation of DOBIS-LIBIS, MINISIS and Horizon and looking at their design and their application feasibility from a users point of view. Libraries in Saudi Arabia and other Arab countries not only suffered during the sixties from the inefficiency of Arabized automated systems but also from the difficulty in finding systems compatible with their various needs and the problems created by the physical facilities. That suffering was not the only problem that faced libraries and information centers of Saudi Arabia. The more Arabized systems available at that time were enduring a number of deficiencies regarding information material in addition to the lack of technical support from producers and vendors (7).

Studying the current inclinations of libraries and information centers toward utilizing automated systems, Al-Ajlan found that most libraries and information centers wishing to change their systems or to adopt a new system have no clear idea about the new system they wish to adopt. This could be attributed to the fact that most of the available systems were still being Arabized and developed or they were still being subjected to experimentation (8).

3.1 Automated systems in libraries and information centers:

Aref and Solayman stated that there are numerous and diversified automated systems available to different sizes of libraries and information centers worldwide. In Saudi Arabia there have been numerous foreign Arabized automated systems being utilized from the early 80s. Despite the success of some of them in dealing with the characteristics of Arabic language, they do not fully meet all the requirements of Arabic libraries and information centers. This situation led to a big burden being put on libraries and information centers in terms of developing and promoting those systems to conform to the requirements of libraries and information centers. Lack of cooperation and coordination between the libraries in the field of Arabization increased the suffering. They continued to work independently without holding meetings, workshops or seminars to discuss or review problems. This resulted in duplication of efforts and wasting of resources. The users of MINISIS profited from Arabization of the system by the documentation and information centers of the Secretariat-General of the Arab League, which arranged training sessions, workshops and held seminars for the users of the system in the Arab world.

KSUL in Riyadh was the first Saudi institution that attempted to Arabize the system in 1984, followed in late 1984 by KFULPM. The Institute of Public Administration started arabizing the system in 1986 but then stopped, deciding instead to design its own program. DOBIS/LIBIS was the Arabized system most used by libraries and information centers in Saudi Arabia. KFUPM, KSUL, KAAUL, UQUL, and the Institute of Public Administration used it. The latter two institutions abandoned utilizing the system shifting to other systems. It is worth-mentioning that there was a tendency among the libraries utilizing DOBIS/LIBIS towards utilizing another system.

Now MINISIS is the most-utilized system in libraries and information centers in Saudi Arabia. King Faisal Research Center, KAAUL, King Fahd National Library, and KFUL use it. Again, it is worth-mentioning that some libraries and information centers are thinking of abandoning the system and using alternative ones.

The Arab Advanced Systems, a Saudi corporation based in Riyadh, in cooperation with Ameritech Library Services designed a copy of the Arabic HORIZON System in 1994. The HORIZON System is the most recent Arabized computer system utilized by some libraries and information centers in Saudi Arabia such as IMSIUL, UQUL, and the Tabuk Community College. The HORIZON System scored a high percentage of the users' satisfaction for its design, whereas DOBIS/LIBIS occupied the forefront for its speed, while MINSIS is favored for its utilization easiness (9). The information in this table has been updated in this study. KKUL started to use HORIZON in 2002. Four SALs are using HORIZON two are still using DOBIS/LOBIS, and only one is using MINSIS.

Table 2: Automated systems in Saudi university libraries

Automated systems in Saudi university libraries			
Institution	Location	System	Date of install
KAAUL	Jeddah	DOBIS/LOBIS converted to HORIZON	1986
KFUPML	Dhahran	DOBIS/LOBIS	1980
KSUL	Riyadh	DOBIS/LOBIS	1983
KFUL	Dammam	MINISIS IN-HOUSE	1985 1992
IMSUL	Riyadh	IN-HOUSE converted to HORIZON	1980
UQUL	Makkah	DOBIS/LOBIS converted to HORIZON	1983
IUL*	Madena	IN-HOUSE	-
KKUL*	Abha	HORIZON	2002

3.2 The development of automated systems in academic libraries

The next step in developing library systems was in 1979 when KFULPM used an automated library system DOBIS/LIBIS as an on-line integrated, interactive system to support most library functions. KFUPML was the first library that completely automated its library functions. The other Saudi universities automated many of their library operations later on either with DOBIS/LOBIS system or other automated systems as is shown in table2. Four of the seven academic libraries have either acquired, or automated their library functions through the DOBIS system. They provide library users and staff complete access through computers. Siddiqui believed that if the network of these four academic libraries could be established, a union catalogue of participating libraries could be created to share the tremendous benefits of such a network. Its scope may be broadened in the future by including, for example, cooperative acquisition and interlibrary loan. Siddiqui states that KFULPM was the first academic library in Saudi Arabia to automate all its library operations and services, followed by KAAUL. There are two academic libraries that have developed their own in-house operations, these are IMSIUL and IUL. The first one has automated cataloguing and the other automated its cataloging and reference functions. KFUL is the only university that acquired the MINISIS system which automated all functions except periodical control. It also automated its circulation operation through an in-house system developed in 1992 (10). The details of automated activities of SALs are shown in table3. The information in this table has been updated in this study. It seems that all SALs have automated sub-systems such

as: OPAC and Arabic OPAC except for IUL and KKUL. KSUL, IMSIUL, IUL, and KKUL do not have automated acquisitions, KSUL, KFUL, and KKUL do not have automated periodicals control and KKUL does not have automated circulation and reference. All SALs have automated their cataloguing functions.

Table 3: Automated sub-systems in Saudi university libraries

Library	Automated sub-systems in Saudi university libraries						
	OPAC	Arabic OPAC	Acquisitions	Cataloguing	Periodicals control	Circulation	Reference
KAAUL	✔	✔	✔	✔	✔	✔	✔
KFUPML	✔	✔	✔	✔	✔	✔	✔
KSUL	✔	✔	-	✔	-	✔	✔
KFUL	✔	✔	✔	✔	-	✔	✔
IMSIUL	✔	✔	-	✔	✔	✔	✔
UQUL	✔	✔	✔	✔	✔	✔	✔
IUL	-	-	-	✔	✔	✔	✔
KKUL	-	-	-	✔	-	-	-

3.3 Telecommunications and networks

Siddiqi states that five of the SALs are connected to Gulfnet and accessing KACSTNET through Gulfnet to get information and messages, in addition to communicating with each other accurately and quickly. . IMSUL and IU are the two academic libraries, which are neither connected to Gulfnet, nor accessing Kacstnet and CD-NET networks. To activate electronic transmission and receive messages and information there are three different types of computer-based communication: electronic mail, electronic bulletin board and electronic conferencing. These types are available through Gulfnet. Five SALs, which are connected to Gulfnet, are able to use the three e-services (11). The availability of e-services in SALs is shown in table 4. The information in this table has been updated in this study. UQUL started with a connection to KACSTNET but KKUL did not. Most SALs now have CD-NET except for KFUL, IUL, and KKUL. All of them can communicate by e-mail. Most of them have electronic bulletin board and electronic conferencing except IMSIUL, IUL, and KKUL.

Table 4: Network and electronic service activities

Library	Network and electronic service activities					
	GULFNET	KACSTNET	CD-NET	E-MAIL	Electronic bulletin board	Electronic conferencing
KAAUL	✔	✔	✔	✔	✔	✔
KFUPML	✔	✔	✔	✔	✔	✔
KSUL	✔	✔	✔	✔	✔	✔
KFUL	✔	✔	-	✔	✔	✔
IMSIUL	-	✔	✔	✔	-	-
UQUL	✔	✔	✔	✔	✔	✔
IUL	-	-	-	✔	-	-
KKUL				✔		

3.4 The availability of different information technologies

Online and CD-ROM search services are the most essential information search tools needed for the successful completion of activities to do with national development. KAAUL, KFULPM, and KFUL are the three libraries, which make the online search service facilities available through databases such as DIALOG and ORBIT. The other SALs conduct these services through KACST which offers hundreds of international databases offered by major online vendors in Europe and USA, including DIALOG, ORBIT, STN, NEWSNET, NEXIS/LEXIS, and EASYNET.

SALs made better progress when end-user CD-ROM technology was added in the libraries especially to those, which were having financial problems. Six of the SALs have been developing CD-ROM databases from 1991 until 2000. Those are KAAUL, KFULPM, KFUL, IMSIUL, KSUL, and UQUL. All of the SALs have acquired faxes to ensure good information transmission. Also all of them have personal computers. These are mainframes, microcomputers, and microcomputers that increase their ability to meet the information needs of their users and members of staff (12). The availability of different information technologies are shown in table 5. The information in this table has been updated due to this study. All SALs have the availability of different information technologies except IUL which does not use online technology.

Table 5: Availability of different information technologies

Library	Availability of different information technologies			
	ONLINE	CD-ROM	FAX	PCs
KAAUL	✔	✔	✔	✔
KFUPML	✔	✔	✔	✔
KSUL	✔	✔	✔	✔
KFUL	✔	✔	✔	✔
IMSIUL	✔	✔	✔	✔
UQUL	✔	✔	✔	✔
IUL	-	✔	✔	✔
KKUL	✔	✔	✔	✔

4. The impact of CD-ROM applications in SAL:

In 1998 Bamofleh's study concluded that the Introduction of CD-ROMs in Saudi university libraries led to the cancellation of subscriptions to a large number of periodicals. KAAUL abolished its subscription to 99.8% of foreign published journals during 1994-95, KFULPM canceled 23.1% of its subscriptions in the same year and 9% the next year. KSUL invalidated 34.5% of its subscriptions to published foreign journals. Also, the introduction of CDs led to the cancellation of subscriptions to some printed Bibliographic tools to save money with which to subscribe to CD-ROMs. This resulted in a reduction in the traditional forms of information sources against the electronic forms. The effect from a subjective point of view, varied according to the difference in cancellation policy for each library. The study found that King Abdul-Aziz University Library was affected, while the other two libraries were not affected.

4.1 CD-ROMs collection management:

The utilization of CD-ROMs databases facilitated selection operation. However, the introduction of this technology added more procedures to provision

operations for equipment selection to operate databases. It also allowed comparison between publishers or vendors of CD databases. Silverplatter Information publishing helped Saudi university libraries publish 32.4% of their holdings or collections on CDs. CD-ROM databases were not used in cataloguing, except in KFULPM and no single library used this technology in classification.

The introduction of CD-ROMs saved space, and saved the costs of annual maintenance of which big amounts were allocated to binding books, and periodicals, etc. Searching requests via the direct line offered by DIALOG and ORBIT dropped in 1995-96 by 11.9% at KFULPM when compared to 1989-90. There was an increase in searching documents through DIALOG service in KAAUL in 1995-96 of 58% compared to the previous year as a result of the cancellation of subscriptions to printed journals. The effect of CD-ROMs on interlibrary loan services differed in KFULPM and KAAUL. These services increased by 47% in KFULPM in 1995-96 compared to 1989-90, while they continued increasing in KAAUL up to 1992-93 by 66% compared to the previous year, but they began decreasing till they reached 47% in 1995-96 due to the feasibility of attaining text of articles free of charge via direct line service made available by the library from 1995.The utilization of CD service added more burdens to libraries since this service called for user training and provision of current awareness services. The inadequacy of training programs in KFULPM and KAAUL and their unavailability in KSUL has been noticed.

The introduction of CDs resulted in additional services in libraries such as data downloading from CDs to floppy disks and typing or composing research findings. Request ratio from disk form was higher than it was from printed form. The request average in printed form was 84.5% compared to disk form in applied sciences whereas it did not exceed 35.7% in printed form compared to disk form in the field of social sciences. The cost of disk databases was less than its counterpart printed form. The utilization of CDs did not reduce expenditures of libraries. The amount saved by the cancellation of subscription to printed copies and binding was directed toward acquiring documents, equipment, establishing networks and other necessary expenses of the CD services (13).

Al-Mosnad stated that the ignorance of decision-makers in the organization of the value and importance of information made SALs unable to allocate adequate budget for information and its tools including CD-ROMs (14).

4.2 Training and users:

Bamofleh's study showed that the lack of training by university libraries for their staff members responsible for operating and maintaining CD service incited those staff members to pay for training from their own pockets. The majority of CD service users were the undergraduate students accounting for 55.1% of the total users. The students of the faculty of engineering totaled 47% from which 11.8% were students from the computer-engineering department. 68.8% of the users were between 20 and 30 years old. CD holdings of Saudi university libraries were in agreement with the users subject interests. Databases specialized in pure and applied sciences accounted for 42.25% and 68.2% of the use. 42.5% of the CD users used the service to prepare a research paper in a specific subject, 20.9% used it for a new research project, while 20% used to carry out a comprehensive research. This showed that users accessed this service to fulfill their needs. 52.6% of CD users preferred to use the service for retrieving bibliographical data; 46.1% of them to retrieve periodical articles; 38.9% to retrieve encyclopedic articles; 32.1% to retrieve digital data. Despite this the study found that 43.9% of users opposed the cancellation of

subscription to published forms of information. 67% of the users needed utilization of other forms of information sources beside the disk forms. The databases available for search via direct line were the most-favored forms.

Bamofleh's study concluded that the utilization of periodical articles increased after the introduction of CD service to libraries. The number of users of information sources increased by 33.6%. 36.4% of users defined by themselves the suitable databases without seeking help, while 63.6% of them sought assistance from the responsible staff member or his assistants. The users resorted to many ways to verify availability of databases in the specific library. The responsible staff members together with their colleagues were available to answer such queries. 71.3% of the users defined their research strategies, and 70.7% of them modified these strategies. It was clear that there was a direct relationship between the user's definition of his research strategy and the level of his knowledge of using CDs; 84.7% of the users utilized the subject as an element to carry out their search, and 54.5% of them used free term, 27.1% used document titles, while 11.9% used authors' names. 32.7% of the users utilized the Boolean logic in their search, whereas 25.9% used the removal or disconnection method. It appeared that there was a direct relationship between the user's know-how of using CDs and the adoption of these methods. 79.1% of the users conducted their research without any help from the responsible staff member. It appeared that there was a strong adverse relationship between the user's experience in utilizing the CD system and his refraining from looking for help from the responsible staff member. 71.3% of the users acquired their search findings in printed form while 16.2% of them got the findings on floppy disks.

4.3 Use study:

Bamofleh stated that MEDLINE databases were the most used at KAAUL where in it scored 35.5%, ERIC was the most used at KSUL scoring 23.8%. The Applied Science and Technology Index database scored 57.1% at KFULPM. Consistency in using CD databases in KFULPM exceeded their utilization in the other two universities. The utilization in KSUL was minimal and inconsiderable; perhaps because there was not a need to establish a CD network or maybe because the utilization volume did not warrant establishing one. Lack of advertising and promoting the service were among many other reasons that minimize embarking upon it.

Bamofleh's study found that 35.4% of the users faced the problem of utilization of complex means in research program; while 27.7% of the users were faced with the insufficiency of selection lists in the programs. 44.4% of the users found that their inability to adapt themselves to computers was the biggest reason for the difficulties that they faced. It became clear that there was a strong relationship between the user's confrontation with these complexities and his knowledge to use a computer and utilize CDs. 25.9% of the users retrieved 5 bibliographical registers, while on the other hand, 24.6% retrieved 20 or more bibliographical registers. There was no relationship between the number of the retrieved registers and the user's definition of the research strategy. 7.5% of the users did not retrieve any bibliographical registers associated with their research subject matter whereas 43.9% of the users retrieved bibliographical registers related to their research subjects. All the retrieved registers correlated with the researches of 42.1% of the users. The majority of users were satisfied with the CD service in all its various aspects such as presentation, printing, together with the degree of assistance offered by the responsible staff member. The guidebooks and training programs were the least important aspects in user's satisfaction. The users were generally satisfied with the CD service, 46.7% of them

were completely satisfied while 43.3% were satisfied to some extent. 32.1% of the users showed their readiness to pay fees in return for composing their research findings on CDs. The suitable fee from their viewpoint was less than one riyal per page whatsoever the form of the retrieved data. Most of the users' suggestions concentrated on their desire to make the libraries increase their subscriptions to CD databases whether for full text or bibliographical data. They also wished that libraries should arrange training programs to teach them to use the CD system, in addition to suggestions to expand the scope of the CD network (15).

4.5 CD-ROM publishers

Bamofleh's study shows that KFULPM deals with the largest number of publishers namely 12 publishers. KSUL deals with 7 publishers and KAAUL only subscribes to the databases of 8 publishers despite the fact that its collection of disks is the largest in any university library. This is because it is keen to acquire databases issued by the least number of publishers, as the variations in research software produced by different publishers cause difficulties for users. UMI uses special software called ProQuest, Silver Platter Information uses its own program which is called SPIRS, Knight Ridder uses Dialog Ondisc Manager, and Wilson uses Wilson Disc software. ISI uses ISI Proprietary while ACM uses CD-Answer software.

It is clear that Saudi university libraries are keen to subscribe to the products of as few publishers as possible and this is made possible by the fact that some of the famous disk databases are sold by more than one publisher. This allows libraries to select a suitable publisher. Despite this these libraries sometimes still face problems. For example, we find that KFULPM subscribes to seven disk databases issued by seven different publishers because these databases are important and they are not published by any other publisher the library deals with. KAAUL, KFULPM and KFUL are keen to deal with the lowest number of publishers. This means they will select products issued by one of the publishers they deal with and this in turn will facilitate search programming.

For example, KAAUL subscribes to an Applied Science and Technology Index issued by Silver Platter even though the product is also issued by Wilson. It also subscribes to Medline issued by the same publisher (Silver Platter) even though it is also issued by Knight Ridder and CD Plus Technologies. Silver Platter Information search software is one of the simplest research disk database softwares and because of this it is the most used software in Saudi university libraries accounting for 32% of the total foreign disk databases acquired by these libraries. 45 % .of the databases subscribed to by KAAUL are published by SPI and 38% of King Saud University Library databases are issued by the same publisher. The research simplicity of SPIRS is considered the most important factor that puts it top of the disk database list of publishers. It is worth mentioning that Silver Platter beat its competitor Compact Cambridge in the early nineties because of the simplicity of its research software. Due to the competition in this field, Compact Cambridge struck a deal with Silver Platter which stipulated that the latter could distribute the Compact Cambridge database and market it after supplying it with Silver Platter research software SPIRS. Silver Platter also supplies software to teach the use of databases. It is called database demo.

Perhaps the cancellation by KAAUL of its subscription to the database CINHAL and the World Marketing Statistics of the publishers EBSCO Publishing is considered the least important evidence to research programs when choosing publishers. When the library found that the publishers research program was not working well when connected to the network it cancelled its subscription to both

databases .

Despite the fact that simplicity of research software is considered one of the factors affecting the selection of publishers; the cost, updating intervals, and the coverage limits should also be taken into consideration as other factors affecting the selection of publishers when a specific database is issued by more than one publisher. Maybe one of these other factors forced KAAUL to subscribe to the ERIC database published by Knight Ridder instead of that published by Silver Platter, and might be the reason why KFULPM preferred to subscribe to Applied Science and Technology Index issued by Wilson instead of that issued by Silver Platter. The reason for that is because Wilson has no license agreement that imposes restrictions on utilizing databases or connecting them to a network. Furthermore Wilson research software facilitates selection by providing alternatives making the use of its programs easier than some users think. KSUL decided to subscribe to NTIS Database which is published by Knight Ridder despite the fact that it deals with Silver Platter and KFULPM subscribes to the copy issued by Silver Platter .

Bowker Saur holds second position among publishers that the Saudi universities deal with. This is because it publishes specialized data in the field of librarianship and information which help KAAUL, KFULPM and KFUL to perform technical operations. Bowker Saur publications include (Global Books In Print), (Ulrich Plus), and (LISA). UMI ranks third as it publishes most of the specialized and general textual databases that libraries subscribe to, such as BPO, General Periodicals Ondisc, Social Science Index/Full Text, in addition to some bibliographical databases such as Dissertation Abstracts (16).

4.6 CD-ROM development in KAAUL

In the Annual Report for KAAUL, Information Databases Network Section, CD-ROMs are considered one of the most advanced information sources. Since they emerged in 1987, libraries and information centers strived to obtain and utilize the enormous potential of CD- ROMs. KAAUL started automating its processes in 1408H when it connected the library with KACST via GULFNET enabling the university community to obtain necessary and up-to-date information. These services did not last long because the number of institutions attempting to connect with KACST increased causing delay in obtaining references.

To overcome this problem, the Deanship subscribed in 1987 to the medical database of the American National Library, MEDLINE, a large number of professors, postgraduate students, and some researchers from Jeddah hospitals benefited from this service. In view of the success of this service, the Deanship deemed appropriate the subscription to a large number of databases in several fields of specialization. In1995, the Deanship subscribed to 28 databases containing references and abstracts of articles published in international periodicals.

At the same time, the Deanship established a local CD-ROM network paving the way for researchers from outside the library to communicate with it via 22 telephone lines, while the academic staff, postgraduate students, and researchers inside the university accessed the network from their college libraries. To overcome the problem of obtaining the full texts of the articles published in scientific journals, the Deanship adopted the new technique of laser disks holding the full-text of articles published. It secured the following databases:

1- Economics and administration information databases ABI-Inform that consists of 1000 titles, abstracts, and citations that have 500 titles of full-text articles.

2- Electrical engineering and electronics databases IEEE-IEE consisting of 150 full-text titles.
3- Periodicals Abstract Research databases; have 600 titles abstracts and citations: 300 of them are in full-text.
4- Adonis medical databases with 800 full-text titles.
5- Computer options databases; Computer-Select with 100 full-text titles and 70 thousand-citation information.
6- Social sciences index databases which have 500 titles, 300 of them are in full-text.
7- Applied-Science-Technology databases; with 490 titles, 400 of them are in full-text.
8- Drug Information full-text databases that have 1400 full-text titles and 50 thousand citations references.
9- Humanities-Abstracts full-text databases; with 350 journals that have citation references and 95 full-text titles.
10- Education-Abstract full-text databases; with 400 journals 200 of them are in full-text.
11- Fire sciences databases; which have7500 full-text titles.

To enhance the quality of the network, the databases department subscribed to a number of information databases in addition to some publishers' private databases. In 1997 they subscribed to nearly 35 databases taking into consideration the extent of their coverage and specialization's comprehensiveness, concentration and emphasis. Furthermore, the section witnessed:

(1) Expansion of its location in order to accommodate any future increase in equipment and facilities that enable users and trainees to acquire the information they need. A study room was built to accommodate 40 trainees on using the computers and their multiple systems.

(2) Equipment and facilities that disseminate information were developed, the communication system was secured, operation programs were changed to harmonize with the possibility of entering the world of the INTERNET.

The section now has a laser disk server in addition to a highly qualified network server coordinating between inside and outside working stations. This development enabled the section to increase the years of information coverage on available laser discs.

As a continuation in the area of making available full texts of articles from DIALOG or NIGHT READER, the section is still contacting other information sources such as the British Library. The old working stations have been modernized to fit in with the new developments in the operation programs. The number of users of the available services is increasing and it was expected to reach 700 by the end of 1999.

Technical Support Services was given to users of the information network. The information databases network is one of the most popular and prolific departments in the Deanship of Library Affairs. As it is primarily concerned with the analysis, design, development and implementation of various application programs for a variety of works inside and outside the Deanship. A working group was formed to provide necessary technical assistance and training in using the network. This technical support is provided directly or via telephone and fax services (17).

4.7 Plans to develop information databases network:

To improve and maintain the current databases, the Deanship of KAAUL endeavored to promote facilities and application programs by acquiring the latest

version of laser disk operators that utilize the Windows system (WINDOW NT), the operating program (CDNET SOFT) and the network server which is conformed with these systems. The communication system was developed and provided with new information procuring and supplying facilities. The communication system shifted to the WINFRAME program instead of the PCANYWHERE program to facilitate accessing information databases.

Problems and impediments:

By reviewing the achievements and services of the library, it appeared that the Deanship faced some problems and obstacles during1998. These problems can be summarized in:

1- Financial appropriation: (a): the inadequacy of the financial appropriation during previous years was one of the biggest problems that faced the Deanship and its departments.

b. The amount of money required as part of the next five years plan was not approved.

2- Staff: (b) the Deanship needed to increase the number of employees so as to extend its services to the outside community instead of being confined only to the university campus. Again, the number of staff members in the girls' section now does not match either with the current expansion of services or with those that were being offered before (18).

It seems that the financial problem will continue in KAAUL, as the budget declined by 32.29% during 1999 to 2000 from 2,779,478 SR. to 1,882,218 SR. (19).

4.8 King Abdul Aziz City for Science and Technology

Saudi Arabia thought that scientific research and technological progress were essential to achieve the country's development goals. It wanted to give science and technology an important place in the second development plan (1975-1979). This was followed by a proposal to establish a council for science and technology whose mission was to facilitate the transfer of technology and find solutions for major problems facing the country in a way that meets the Kingdom's economic and social objectives. A royal decree was issued in 1976 to establish a national center for science and technology. Its mission was to boost the country's economic and social progress. The center`s name was changed to King Abdul Aziz City for Science and Technology in 1985. The city encouraged scientific research and coordinated activities of research centers and academic library institutions (20).

4.8.1 Information Directorate in KACST: Formation and Development

The National Center for Science and Technology at the beginning of its establishment commissioned the administration of Basic Principles for Science and Technology to shoulder the responsibility of developing a national information center. The administration started with a field survey to determine the available information on science and technology in the Kingdom. After four months the administration submitted a report titled "Development Center in the Kingdom." The report defined the goal of the center as supporting research and procuring information and reports from national and international organizations of similar interests ensuring availability of all published and unpublished literature to the users in the Kingdom.

In the year1979, an agreement was signed with a company specializing in information systems to establish the technical aspects of the system. In the same year, online was utilized to facilitate access to national and international information resources and services through contacting a number of international databases such as ORBIT, BRS and DIALOG. The name of the center was changed to the Directorate of

Information and Technical Services. A new computer was obtained and the contract with INFORMATICS was canceled. An information data base unit was established to study and review the works and accomplishments of INFORMATICS and to prepare a study regarding selecting and implementing a system facilitating input and retrieval of Bibliographical data.

In 1981, a committee was formed to evaluate the achievements of INFORMATICS and a number of specialists in documentation and information were appointed.1n 1982, a study was prepared by Pittsburgh University evaluating the activities of the information sector in KACST. Also a committee was set up to study the possibility of establishing a publishing section. A Saudi expert in scientific and technical terms carried out a study to establish a Saudi data bank of terminology which succeeded in verifying and designing the system and the necessary programs.1n 1987, the technical procedures to shift from IBM 4331 to the more advanced IBM 4361 system were completed.

Realizing the importance of communications in the field of scientific and technical exchange of information, the Gulf Network subscribed to a number of international data bases such as NETNORTH, DFN, EARN and BITNET. After studying the needs to keep pace with the latest technology, the computer division drew up a plan for a comprehensive study to update the existing system (21).

4.8.2 The roles of King Abdul-Aziz City for Science and Technology in information systems

The roles, contributions, and efforts of King Abdul-Aziz City for Science and Technology in setting up the infrastructure of the information systems in the Kingdom have been reviewed taking into consideration the viewpoints and attitudes of those involved in the information field.

The conclusions can be summarized as follows:

1- A qualified workforce specializing in information activities and having the technical, and administrative expertise necessary to design, develop & implement the national information system was to be put in place: 89.5% of those surveyed categorically agreed that KACST identified the qualified workforce entrusted with planning the national information system, while 10.5% disagreed.

2- Development of effective administrative frameworks to achieve flexibility of the system's performance: 84.2 % of the participants in the questionnaire agreed that KACST has succeeded in establishing the framework to achieve that goal.

3- Formulation of general objectives to achieve the establishment of a national information network: 97.4% agreed that KACST has achieved that goal.

4- Provision of a number of training programs on information for its staff and the users: 86.9% agreed that this goal was achieved.

5- Replacing foreign staff members with a national well-trained workforce: 86.9% agreed that KACST had done that.

6- Securing the necessary financial support for some of the national information projects: 81.6% agreed that this goal had been achieved.

7- Provision of information services compatible with the Kingdom's development plans and its scientific, social and cultural development: 100% of the participants in the questionnaire said that KACST has made the needed information available.

8- Supporting and promoting research and studies in the field of information: 86.8% agreed that the city has contributed well to supporting research and development activities.

9- Establishing a number of standards to design and promote information systems and services: 68.4% of the sample agreed that KACST succeeded in achieving this goal, while 7.9% disagree.
10- Establishing a developed scientific library to meet the information needs of KACST academic and research community and users from outside: 89.5% agreed that the library meets the needs of its users, but 7.9% of the sample considered the achievements insignificant.
11- Providing the necessary information services to all users in the Kingdom: 94.8% of the sample agreed that KACST provides the users in the Kingdom with what they need.
12- Utilizing modern information technology equipment, facilities and resources that facilitate the access of information: 89.5% of the sample agreed that KACST has utilized highly advanced modern information technology to ease access to required information.
13- Issuing current awareness services and a retrospective bibliography on national and international scientific literature: 79% of the participants in the questionnaire agreed that KACST issued current awareness service that met the needs of its users.
14- Providing translation of scientific terms: 97.4% of the sample agreed that KACST offered this service.
15- Procuring, identifying and providing copies of the documents based on the requests lodged: 100% of the samples agreed that this goal had been achieved.
16- Providing a photocopy service: 100% of the sample agreed that KACST provides photocopy services free of charge.
17- Designing and developing some of the local databases: 97.4% of the samples agreed that KACST has designed, and developed some local databases (22).

4.9 National Information Systems:

The systems designed by the Information Services Directorate can be classified as follows: -
1- Systems to fulfill national goals and offer national services. The directorate conducted studies on the national information databases while the Computer Directorate developed, maintained, installed and operated the following systems:
a: Arabic Bibliographic Database: Aiming at compiling and inputting scientific literature written in Arabic on Saudi Arabia. The database covered a wide variety of published and non-published literatures such as conference proceedings, periodical articles, theses and dissertations, annual reports etc. It acts as a resource base for Arabic language documents in the Kingdom.
b: Science and Technology Bibliographical Data Base (English): Its scope is limited to the publications of national interest. However, materials produced overseas on Saudi Arabia or by Saudis or of interest to Saudi Arabia are covered.
c: Current Research Data Base: It aims at compiling information about scientific research in progress in order to enable researchers to become acquainted with the current scientific activities taking place in their specialist fields.
d: Scientific Workforce Data Base: It aims at compiling personal information on available scientific specialist fields to help in carrying out statistical studies and in planning scientific policies in the Kingdom.
e: Technology Data Base: The Technology Data Base is a multilingual thesaurus of semantically and generically related terms. The main objective is to mitigate the language barrier in science and technology communications enabling researchers all over the Arab world to utilize this information.

e-1-:Preparation of the scientific and technical part of the general translation thesaurus with the help of the compiler;
e-2-: Setting up a medium to help Arab terminology specialists in drafting new terms;
e-3-: Supporting Arabization activities of scientific curriculums through connecting them with the Arabic Information Network.
7-1. King Abdul-Aziz City for Science and Technology Network was one of the first networks established to connect research centers, libraries and various institutions with its main computer center, and to utilize the available national information databases. KACST made CD-ROMs available to the users.
Further, it has access to enormous collections of national data base literature and the library databases. The main function of the online services department is to conduct a variety of searches according to the request being lodged and to supply it to the users concerned. Orders can be placed by post/fax or e-mail. KACST also developed a bilateral retrieval system called NRS to retrieve information from the databases.
7-2- GULFNET: It is considered to be the first computer network in the Arab world that connected the central computer systems available in the scientific research and academic centers. GULFNET was established in 1985 in cooperation with IBM. It is now linked with more than 12 bodies from Saudi Arabia, Kuwait and Bahrain. As a storing and delivering network, GULFNET looks like the American BITNET and the European EARN networks.
4- CD-ROM Network: It was established and provided with the latest technologies to enable researchers to access the CD-ROM databases, ensuring availability of the required information.
KACST subscribes to 450 international information databases in America and Europe. The importance of these data bases incited some experts to conduct a cost price study of the information services offered by these bases in the light of the availability of some bases on laser disks with readable memory that make information services available locally instead of international calls through satellites to conduct Bibliographical research (23).

5. Review of previous work

In Saudi Arabia, some Academic Libraries have been using electronic journals (EJs) since 1992, and others since 1995. The Internet started to be used in Saudi Academic and Research Libraries in 1999. The researcher believes that this development will make many changes to SALs collection management policies. In 1993 Saudi and Arab librarian professionals started to write about the application of information technology in their academic libraries and information centers.

In 2000, Shahin examined the impact of electronic publishing on social sciences periodicals in the Central Library of King Abdul Aziz university library for use and users studies in an analytical description study of the extent of usefulness from the periodicals of sociology in their printed and electronic forms. The study discusses the effect of shifting from the printed form to the electronic form, on the extent of benefiting from those periodicals. The study endeavors to find answers to some questions reviewed as follows: What are the rate of growth and updating in the index database and full texts of the periodicals of sociology? And how much is the cost of subscribing to them?

The database grows annually at the rate of 4 periodicals, but the buildup rate of the periodicals with no full texts in the database, exceeds the rate of buildup of the database as a whole. About 50.6% of the periodicals in the database have no full texts of their articles, apart from the periodicals which were no longer being indexed and

the ones which had halted photocopying the texts of their articles. This raised the rate of periodicals lacking full text of articles to 70.3%. The rate of periodical titles added monthly to the database during 1996-1999, and the ones having no full texts, stood at 71% of the total additions. The library spent SR68.773 to subscribe to the database in 1998-99, although subscribing to the index database alone cost only SR17.309. This means that full texts in the database cost SR51.464 per annum. There is no difference in format or in subject matter between an article in printed format and the same article in its electronic form available in the database (24).

In 1998 Bamofleh wrote a thesis evaluating the impact of CD-ROM technology on SAL, and found that having such technology led to most universities canceling their printed periodical subscriptions. She advised other researchers to use corroborative-networked CD-ROMs, and not to cancel their printed periodical subscriptions without covering them on Ejs (25). In 1998, Qumosani aimed to know the information seeking behavior for CD-ROM and networked databases in King Abdul Aziz University (26). 1n 1997, Alsrehee and Qumosani conducted a descriptive study about King Abdul-Aziz university libraries databases network. In 1997, Alsrehee examined the attitude of King Abdul Aziz university users towards networked databases (27).

In 1994 Al-Musnad made a study of the factors influencing the adoption of CD-ROM technology in Saudi Arabian libraries. The purpose of the study was to establish baseline data on the use of CD-ROM technology in SALs. It was found that 35% of the responding libraries were using CD-ROM technology and, 32% were planning to acquire this technology in the future whilst 33% were not using it. The study found that 94% of the respondents believed that CD-ROM use and evaluation should be included in the library school curriculum, and more than 85% believed that the availability of CD-ROMs in libraries has a positive effect on the image of librarians (28). In 1994, Mahmood & Abbas examined the impact of CD-ROM on periodicals collection in three Saudi academic libraries (29). In 1993, Mirza and Sidiqui made an analysis for using CD-Rom bibliographic database searching in King Fahad university library (30).

6. Problems facing SALs:

From the annual reports of KSUL 2002 and KAAUL 2001 can be summarized the problems that facing SALs as the following :

1. The great lack in financial resources in the last couple of years caused the weakness in the acquisition collections from both quality and quantity aspects. One important reason caused this situation is the lack of annual budget existence which is suitable, and should be awarded from all library managers. Thus makes it very hard for the library to direct their resources towards the best channels. The best solution for SALs is to re evaluate and review the estimation of library budget allocation that match the continues increase in users numbers from academic libraries and also match the Varity of different subjects for teaching and research needs. The amount of money required as part of the next five years plan was not approved (31, 32).
2. The lack of library staff member numbers year after year, while the number of library users and the number of acquisitions and services are increasing at the same time. One should mention, that there is a great need to increase the number of professional in academic library and concentrate to increase the specialized quality in library, information, and computers applications training

programme with the ability to handle English language and computing aspects (31, 32).

3. Users` needs: Bamofleh's study found that the guidebooks and training programs were the least important aspects in user's satisfaction. The users were generally satisfied with the CD service, 46.7% of them were completely satisfied while 43.3% were satisfied to some extent. 32.1% of the users showed their readiness to pay fees in return for composing their research findings on CDs. The suitable fee from their viewpoint was less than one riyal per page what so ever the form of the retrieved data. Most of the users' suggestions concentrated on their desire to make the libraries increase their subscriptions to CD databases whether for full text or bibliographical data. They also wished that libraries should arrange training programs to teach them to use the CD system, in addition to suggestions to expand the scope of the CD network (33). In 2001, Rajeh had studied the faculty members attitude towards bibliographic databases in KAAUL, the study shows that the most important difficulties facing them are: the difficulties of use with 38.7%, rareness of availability of the articles with 30.1%, the suitability of their subjects with 28.4%, no awareness of these databases with 26.7%, and the lack of training programme which help to use these databases with 24.1% (34).
4. The limitation of cooperative and cooperation activities: from the conclusion of Siddiqi PhD study about Saudi academic libraries, it appears that there is no organized resource sharing system among them, although opportunities are presented, ILL policy only followed in KFULPN, the study has determined that if a formal, obligatory, and regular ILLN is established among SALs, it will lead to cooperation and coordination (35). SALs still not applying any cooperative collection development for electronic journals such as consortia, {CALIM in Manchester, the M25 group in London, and SCRUL in Scotland}. Also there is no appearing for journal aggregation services for publishers in SALs which provide an integrated access to a range of electronic journals such as Blackwell electronic journal navigator, SwetsNet, and BIDS journals online, and European Business ASAP.

7. Conclusion

This study took a quick look at the development of SALs, it's the institutions which have eight university libraries in different areas in the Kingdom and focused on the development in information technology. The development of university library systems took place between 1975 and 1984. The establishment of the Ministry of Higher Education helped speed up this development as it supervised and financed SALs. Most SALs have centralized structures and only two of them are decentralized with the position of Dean as the head of the library Deanship. SALs` organization structures still lack written policy manuals, professional librarians, and a unified classification scheme. Most SALs automated their information systems between 1980 and 2002. Four SALs (KKAUL, KFULPM, KSUL, UQUL) used DOBIS/LIBIS, the first automated system, and two of them (KAAUL, UQUL) converted to HORIZON which is the most recent Arabized system that has been utilized lately by KKUL, the latest university library in the Kingdom. IMSIUL also converted its IN-HOUSE system to HORIZON. Most SALs have automated their sub-systems especially for OPACs, cataloguing, circulation, and references. Most SALs have the minimum required network and electronic service activities, and the available different information technologies, that can provide the necessary support to Interlibrary Loan

(ILLN) and Document Delivery (DD). The researcher has tried to show the importance of the results of Bamofleh's study which evaluated the impact factors of CD-ROM technology on SALs. It was very important also to have a look at the KAAUL experience in developing its information databases network. Moreover, the study showed the role of KACST in science and technology and its national information systems. Finally, SALs still facing problems that could be summarized in: the great lack in financial resources in the last couple of years caused the weakness in the acquisition collections from both quality and quantity aspects, the lack of library staff member numbers year after year, while the number of library users and the number of acquisitions and services are increasing at the same time, unsatisfied users` needs and the lack of training programs, and The limitation of cooperative and cooperation activities. SALs still need to apply a cooperative collection development for electronic journals such as consortia initiatives and journal aggregation services for publishers which provide an integrated access to a range of electronic journals.

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