

USING SISPUKOM FOR AN INTEGRATED LIBRARY AND INFORMATION SYSTEM : THE EXPERIENCE OF ITM, JO LIBRARY, MALAYSIA

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Abstract: Recent technological advances have affected the management of library systems in Malaysia. Currently, the number of libraries and information centres that are gearing towards library automation and application of new technologies are increasing. The ITM, JO joins the race by using the only available local software package known as SISPUKOM. The library, though considered as a medium-sized, is moving fast towards this direction and to date has opened the CD-ROM services to its patrons. The application of IT is not static but dynamic, and evolving along the technological changes and environmental needs. Two main factors are emphasized, namely the use of local software package; and the process of decision, planning and implementation of the system, and the problem associated with the project. While libraries affiliated with universities or other academic institutions are likely to be reasonable in the size of their collection, building, staffing, and budgeting, the great majority of libraries and information centres in Malaysia in particular and elsewhere in Asia in general are still medium in terms of their size. How this library tackled the planning and implementation programmes may have similar implication on other libraries of the same size anticipating to automate. Decision on using a local package was considered seriously and such experience is worth noting too. Highlighted also in this paper is the impact of the new application of IT on several areas of library and information services. Subsequently, the process of computerization affect a great deal on the restructuring of staff duties, physical structure and training for both staff and patrons.

1. INTRODUCTION

During the 1980s a reassessment was noted as resources became more limited while demand for information services has grown. This state of affairs has encouraged the leadership in the library profession in Malaysia to review its

fundamental purpose and the mission of libraries, involving decision-making as they reach their communities besides considering economic demands for cost effectiveness and accountability. As said by Miriam Drake, the place of the library in society would depend on how rapidly it integrates technology into its operations and how rapidly engineers and designers of information systems recognized the library as an important link in the system. Drake further, stressed that the potential of technology to provide information when and where needed, coupled with the need to produce the labor intensity of library operation were prime motivators in innovation (Drake, 1979). Related to technological application in libraries, its impact is regarded as an important element in a general pattern of technological change. As Herman Kahn and Anthony Wiener have stressed, change as a force in society has become increasingly relevant because technological developments are numerous, rapid and pervasive (Kahn & Wiener, 1967).

This paper is presented with confidence that the Institute Teknologi Mara, Jalan Othman library (ITM, JO) experience in dealing with an integrated library computerized system could be of interest to other libraries. There is the availability of a much wider range of choices in the application of the library automation software. But the ITM, JO library has committed upon the local system than those available in the competitive marketplace. In this report, some of the innovative aspects of the applications, system development methodologies are described.

2. STATE OF THE ART

As can be seen in Table 1 a total number of 36 libraries have embarked on library automation. Twenty one libraries have applied the CD-ROM technology. It is worth mentioning however, that the speed towards this trend is rapid, which subsequently brings along various impact to the library systems and services. This is in line with the objective of the government to increase the level of IT application in Malaysia. According to *Computimes*, "The computer industry in Malaysia is expected to value at M1.94 billion dollars in 1992 as compared to 1.49 billion dollars in 1991, that is an increase of 30 percent. This means that per capita, the government will spend more than 110 dollars for computer hardware and services this year. This figure shows that the rate of computer usage in Malaysia is among the highest amongst the developing nations." (*Computimes*, 1992) This data supports the notion that more libraries would move along the same trend viz library automation.

This evidence reveals the seriousness on the part of the decision makers to implement new technology in the running of government organizations and related agencies. The provision of information to users could now be further enhanced by the advent of information technology. Information storage and retrieval are beginning to be mechanized in most Malaysian libraries and information centres. From the above data, it is noted that 39 per cent of libraries

have used SISPUKOM and this may as well be seen as a bright path forward. So far any bid by the government tender has not failed to include SISPUKOM.

In 1989, the National Library of Malaysia conducted a survey involving 600 libraries. Although only 450 libraries responded, the data showed that since 1982, there was an overall increase of 63 per cent for public libraries, 47 percent for academic libraries, and 58 per cent for special libraries. Another 159 libraries were identified but no response were given. Nevertheless, this data showed

that there is a considerable number of libraries in Malaysia and there is indeed a potential need for library automation. Hence, there is a need for library automated software. Out of the total number of about 759 libraries, the majority , that is, more than 500 hundred libraries are of medium-sized.

To this effect the report is regarded as crucial for the following reasons:

Table 1. The Distribution of Libraries and Information Centers Using Automation and IT

Libraries and Information Centres	Number	Applications
<i>Academic Libraries</i>	14	
International Islamic Univ. Lib. National Univ. Malaysia Lib. Northern Univ. of Malaysia Lib. Science Univ. of Malaysia Lib. Tun Abdul Razak Library, Johor Tun Abdul Razak Library, P. J. Tun Abdul Razak Library, Perlis Tun Abdul Razak Library, PPP Tun Abdul Razak Library, Sarawak Tun Abdul Razak Library, Tereng. Tun Abdul Razak Library, Shah Alam Univ. of Agriculture Malaysia Lib. Univ. of Malaya Library Univ. of Technology Malaysia Lib.		DOBIS/LIBIS DOBIS/LIBIS SISPUKOM DOBIS/LIBIS SISPUKOM SISPUKOM SISPUKOM SISPUKOM SISPUKOM SISPUKOM SISPUKOM VTLS ATLAS DYNIX
<i>Special Library</i>	18	
Central Bank of Malaysia Library ESSO Malaysia Library Infokraf Malaysia Library Institute of Medical Research Library Kuala Lumpur Memorial Library Malaysia Agr. Res. & Devt. Inst. Lib. Ministry of Defence Library Ministry of Internat. Trade and Ind. Lib. National Productivity Centre Library New Straits Times Library PERNAS Library Public Bank Library Public Works Department Library Sarawak Shell Library Shell Malaysia Specialist Teacher Training College Lib. State Economic Devt. Corp. Library Tenaga Nasional Library		TECHLIB PLUS TECHLIB PLUS SISPUKOM COLUMBIA LIB. SYS. DYNIX MULTILIS SISPUKOM MICRO-VTLS MICRO-VTLS BRS -BIBC. RET. SER. SISPUKOM COLUMBIA LIB. SYS. COLUMBIA LIB. SYS. TECHLIB PLUS SISPUKOM COLUMBIA LIB. SYS. DYNIX SISPUKOM
<i>National Library</i>	1	VTLS
<i>Public Library</i>	3	
Sabah State Library Selangor Public Library Pasir Gudang Public Library		URICA DYNIX SISPUKOM
TOTAL	36	

❖ Library automation in Malaysia is rapidly regarded as necessary to cope with information Table explosion and it is anticipated that it would not be a long time before libraries and information centres

venture into library automation.

◆ Since the great majority of libraries are of medium-sized, the experience of the ITM, JO library would have some bearings on them. Realizing the success of this application, it would open a substantial market for SISPUKOM.

◆ As a channel of communication to the international library and information world of the development of such software in this region as a gesture of contribution to the information profession.

3. TOWARDS AUTOMATION

Presently, there is a clear trend towards integrated systems in which all sub-systems share a common database as compared with the automation of a single sub-system, commonly used before. The application of IT in libraries in Malaysia underwent three distinct stages:

◆ In the 1970s, while the developed countries have begun to develop and apply library computerization, the information professionals were in the process of getting ◆to know◆ with the new trend. The traditional methods of library operations remains dominant while chances of libraries moving towards new technologies were not very encouraging.

◆ Towards the 1980s however, more information professionals who were western educated began to favour the new system, especially after they have seen and used the integrated system there. Ideas were brought back for innovative changes, but the attitudes of library managers as well as the attitudes of the parent organization proved to be an obstacle for this move. The situation is surprisingly similar in the universities, although budgetary constraints was not the main issue there.

◆ The 1990s has been the innovative stage. It is seemingly clear that library automation is now regarded as crucial and inevitable as it is the state-of-the art. What lies ahead is the increasing number of libraries both big and small that will enter the new era. The only likely problem has been the choice of the ◆right◆ software package. In other words it is the choice between the well established turnkey systems and the only available local system.

Advanced Information Technology is required because:

◆ There is a need for quick access to the increasing number of information for efficient use.

❖ The library needs to ensure access and implement resource sharing on the total information resources distributed in the ITM library system spread all over the country through the wide area networking (WAN).

❖ It enables the ITM, JO library to join a networking bibliographic utility with other libraries, in future.

4. SISPUKOM

What is needed from an ideal system is the ability to store and retrieve information on all library aspects of library and information work. The School of Library and Information Science itself plays an active role in preparing the prospective librarians to understand, appreciate and handle this technology. In fact the R & D undertaken by a group of faculty members have jointly developed a software with Business Computers (H) Sdn Bhd (BCH) in 1985 and successfully produced and marketed a software package for computerized library systems, known as SISPUKOM (System Perpustakaan Berkomputer). Courses and workshops are given from time to time to introduce and train information professionals on the application of this package and the response has been encouraging both from the public as well as the private sectors. One of the positive aspects of this system, being a local one, is that more facilities and features could be added or tailored. For example, this system now is able to interface with CD-ROM technology and also has the capability to generate bar-codes. At the same time, SISPUKOM is implemented on an operating-system platform that will permit interconnection with other systems in a networking environment. These are the basic capabilities available in SISPUKOM.

The Northern University of Malaysia (UUM) is one of the earliest to attempt on the local system. Since all the other university libraries use the turnkey systems that are imported from outside, it is not only a breakthrough but also a test on the viability of the system. The confidence given by this university opens the path for other libraries to follow suit. To date SISPUKOM has gained further recognition from various achievements as seen in Table 2.

Table 2. Achievements of SISPUKOM

YEAR	ACHIEVEMENTS
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1990 Runner-up for Asia Computer Weekly award for Best Software at Information Technology Exhibition in Malaysia.

8th May 1992 Certification of probability by ACUCOBOL Inc. (USA).

17th June 1992 Nominated for Innovation Award by Chief Secretary to the Malaysian Government,

It is also appropriate to mention the successful implementation of this system in the Datuk Jaafar Hassan Library, another of the ITM branch library. In fact, this is the first library within the ITM library system to use the package. The system hardware which cost M\$250, 000 was installed in May 1991 and was launched in December 1991. The hardware consists of Digital Equipment 5100 mini-computer equipped with 16 megabytes of main memory and 1.5 gigabytes of storage capacity. It is supported by 15 terminals to access over 33, 000 records that have been converted into the system. The ITM Perlis installation utilizes the Ultrix operating system, Digital's version of Unix. This system allows full integration of all the modules, namely acquisition, cataloging, authority control, serials, accounting, circulations, information retrieval services, and OPAC. What has changed drastically from the manual system is the OPAC and the online circulation transaction which have indeed encouraged the use of the system by the students. Between the December 1991 and May 1992, it was reported that 88, 707 OPAC searches have been conducted by the users. A new approach in statistical report is available. This automatic generation of statistical reports allows easier management of information. With the success story of this library, it is clear that the confidence level of the main library as well as all the other branch libraries has been raised. Apparently, a working committee has been established in the main library as well as all the other branch libraries. What is envisaged is that, once the ITM, JO library system are fully automated, all the branches and the main campus would be linked to each other.

5. FACTORS AFFECTING THE CHOICE OF SISPUKOM

Before deciding on the use of this system the library underwent the process of decision, planning and implementation of computerization. This system was

selected on the basis that it is a locally produced software and could obviously be customized to meet the user requirement. This software is an example of an integrated design which ensures integration of acquisition, authority control, cataloguing, circulation control, serials, indexing and other functions. A number of factors that contribute to this decision are as follows:

- ◆ A local product.
- ◆ Cheaper.
- ◆ Employs advanced technology.
- ◆ Customization to meet the library specifications are readily available.
- ◆ Maintenance and service support for the complete interface capability.
- ◆ User friendly for both staff and users.
- ◆ Capabilities to perform retrospective conversion.
- ◆ Capabilities to maintain Authority Files for Natural Language and Controlled Vocabulary.
- ◆ Ability to store information for practical use.
- ◆ Downloading capabilities.
- ◆ Prospect for a networking system.

Our decision on the locally developed system has been an achievement and is going to remain viable. From the experiences of libraries, both local and overseas using the turnkey systems suggests that available commercial systems are not necessarily effective nor as immediately operational as usually publicized. Besides, although initial costs that were announced may seem lower but the final costing after all the completion of implementation may turn out to be much higher. Another obvious asset is the open-ended nature of this system. Further development are in progress to meet the requirements of the library as future needs arise. The obvious advantages is the ability to have a very close control over the software developments and customization. While there is a great scope for achieving staff savings, there is also a better scope for adding the management information. Besides, enhancements can be developed locally and maintenance of the system can be made faster, because the developers are the local experts in the computer and library industry.

One of the characteristics of this package, like any other in-house system, is that it relies totally on the SISPUKOM Working Group for the enhancements and modification without the necessity of inviting external consultants or developers.

Table 3. Events Leading to the Automation of the ITM, JO Library

DATE	EVENTS
2nd May 1991 <i>Implementation of SISPUKOM</i>	<i>Formation of a committee on the in ITM Perlis and at Jalan Othman Library.</i>
27th May 1991 <i>SISPUKOM</i>	<i>First Meeting on the Implementation of</i>
1 June 1991	<i>Data Transcription activity began</i>
27th June 1991	<i>Request for Hardware Procurement</i>
6th August 1991 <i>Manpower Planning Unit)</i>	<i>Approval from MAMPU (Malaysian And</i>
21th August 1991	<i>Local Purchase Order was sent to the vendor.</i>
14th December 1991 <i>began Renovation.</i>	<i>Site Preparation for Central Processing Room</i>
21st Jan. 1992	<i>Delivery of the hardware</i>
21st Jan 1992	<i>Installation of the Operating System</i>
22nd Jan. 1992	<i>Testing and Commissioning of SISPUKOM</i>

When the computer configuration was specified, attention was given to allow expansion of hardware capability (storage capacity, number of terminals, ergonomics, etc), in anticipation of seven to eight years expansion. Usually, after the eight year, the hardware useful life will have come to the end and

considerations have to be made on the greater powered machines. SISPUKOM is executed on the hardware as reflected in Table 4.

Table 4. System Configuration at the ITM, JO Library

SOFTWARE	HARDWARE
SISPUKOM	DEC System
Line APrinter	NEC PC as Workstations with
	NEC P3200 PINWRITER
	HP LASERJET II P
	BAR CODE READERS
	Uninterrusptible Power Supply
	Modem CD-Rom

6. THE APPLICATION TODAY

It is indeed fortunate that the SISPUKOM, being the product of our own R and D of ITM is comparable to any turnkey system from abroad. The SISPUKOM, like any other system, has in its application system the followings modules:

- ◆ Acquisitions
- ◆ Cataloging
- ◆ Circulation
- ◆ Serials

- ◆ Information Retrieval System
- ◆ OPAC
- ◆ Accounting
- ◆ Statistics
- ◆ Authority Control
- ◆ Control File Maintenance

At this point of time effort is being made to work on the records management module with the help of another faculty member who is specialized in this area. Special programmes are also available for validation of data integrity; interface programmes; file recovery; back-up process; retrospective data conversion process; bar-code generation; spine labels, and the creation of parameters to designate policies, rules and procedures of the library operations.

6.1. Role of Students and Lecturer

The cooperation from the library school faculty and students has allowed this project to move at its smooth momentum. The library, being at the same location with the School of Library and Information Science, where the faculty members involved with Sispukom are located, is blessed with the advantage of having the students and lecturers to help. The library science students could get financial benefit as well as practical experience in library automation. The lecturers of the school helped in any way possible, in the data conversion activity such as verifying the data or subject headings. Such opportunities may rarely occur in other libraries.

6.2. Acquisition

This module allows the procurement of all information materials through a choice of ordering routes viz. purchase, gift and exchange. Input of request for new orders are reviewed and the verified records are channelled through a number of ordering routes. Purchased order letters in English or Bahasa Malaysia are automatically generated through the letter generator. Checking routines for Claims and Cancellations are provided in the forum of online listing. Items that are incorrectly supplied are tracked down in ◆Error in Supply◆ whilst the correctly supplied items are acknowledged by the system.

6.3. Cataloging

Data conversion on 21, 000 titles was performed by a cataloger assisted by 32 final year under-graduate students of the School of Library and Information Science. We worked on direct input from our shelf list to the sheets. It took 6 months to complete the task of data verification on input sheets and the print out was performed simultaneously by four professional librarians. It was a tedious exercise for a start especially when we were confronted with issue relating to MARC tags, indicators, subfield codes and terminators. However, through the interface facility with Bibliofile, and the facilities for the production of spine labels, barcode labels and catalogue print-outs the technical process is made much easier.

6.4. Online Public Access Catalogue (OPAC)

A user can access information on two levels: Catalogue Search and User Inquiry. The Catalogue Search is a precise-oriented search strategy. The Index Search has a variety of fields, namely author, title, subject, series, call number and ISBN/ISSN.

The Keyword Search allows a user to search , using Boolean operators on a single field and mixed field. Proximity or adjacency search can be carried out and truncation is permissible. The User Enquiry allows users to be informed on the status of their transactions with respect to items, like loan, reservation, overdues, and fines. This provides an easy reminder to users by browsing at any point of time.

6.5. Authority Control

The controlled vocabulary of authors, subjects etc., are authoritatively maintained with the cut and paste, merging and global techniques.

6.6. Circulation

The process of charging and discharging of materials can be performed by using bar-codes scanner light pen. Renewals, reservations and recalls are operated online. Daily checks on overdue materials can generate letters of overdue notifications. Inventory checks scrutinize the holding records, with notification letters can be sent to users in order to obtain the feedback on the status of items. Inter-library loans are transacted to facilitate in-coming and outgoing requests.

6.7. Information Retrieval Service

The first assignment performed was the indexing of past years examination papers from a number of courses, namely library science, secretarial science, public administration, business, banking, languages and Islamic studies. We worked from the 1987 issues onwards. Currently we are also preparing for the indexing of

conference and seminar/ workshops papers and some selected journal articles which are available in our collection.

6.8. Serials

Four hundred titles of serials from the cardex information have been transferred to the Serials Master. New subscriptions or Renewals are facilitated online and letters through proforma route or purchase order route are generated in the Malaysian language and English language. Online Check-In procedure is provided with a linkage to Contents Page Service. Claim lists can be printed when-ever needed with accompanying letters for issues that have not been received. Binding operations provide easy monitoring for outgoing requests and in-coming bound volumes that are transacted. Users are allowed to review the holding details through Online Searching.

6.9. Statistics

Statistical outputs for all modules can be produced to provide the management information on the performance of its operation in the library or information centre.

7. IMPACT OF THE APPLICATION OF THE NEW SYSTEM

Management Issues

While the literature reveals the situation in libraries of the developed nations where the CD-ROM systems integrates with the automation system the situation is different in Malaysia. In fact, like other libraries in Malaysia, the ITM, JO library automation project began long after the CD-ROM applications were used. Therefore, the application of the CD-ROM system was not determined to work with the planned hardware configurations for the individual library automation projects. What is obvious is that the Sispukom gives allowance for this development and this could be truly cost-effective.

Cost

The initial investment is high but it can hold more data at a lower cost per unit, as compared to other mass storage technology. Moreover, the voluminous capacity of data and the quick retrieval capability ensures that many libraries will justify the added expense in the application of this technology. Financial sources should include budget for the annual subscription as well as the maintenance costs for equipment.

Fee for Service

While charges for the OPAC searching is not in question, charges for the CD-ROM reference databases may be regarded as an extra reference source and should not be charged because this system eliminates telecommunications charges. It may, however be considered after the service has been well marketed to the patrons. A question that many librarians are faced with is the wisdom accompanied with the charging because it may affect the educational and intellectual process.

Impact on Librarians and Information Officers

Librarians have to be trained on the use of hardware, the operating systems, software and search retrieval techniques. They also need to extend instructional programs for patrons. Subsequent training programmes for junior staff should be conducted before attempting on the users. This effort has indeed placed an extraordinary labor-intensive burden on the ITM, JO library personnel. It is not unusual for librarians to be excited in informing and teaching patrons of the potentials of the new technologies. However, Malaysian librarians should be aware of the limitation of this system in terms of document delivery. Users may become frustrated when they realize that the reference items they have selected may not be in the library after all. Counseling the patrons is considered very crucial if the libraries are sensitive to users' feeling lest they may be turned off with the system. Inter-library loan (ILL) services are highlighted. An increase in the demand of inter-library loan service may then affect the staffing and work load of the ILL department. The librarians and other reference staff dealing with the system would have to keep abreast with the changes in database content and related software. Other than a well-written documentation, regular staff training is regarded as essential.

1) Job design

It was not unusual that some staff found difficulty in adapting the new system. Routine jobs have been reduced. The job design is changed and the skill needed requires retraining of staff.

2) Library procedures

The computerized system requires modification of library procedures to ensure maximum efficiency.

Impact on the Users Education

One of the main responsibilities of the library officers in ITM, JO library, like their counterparts in ITM, Perlis has been to promote and encourage the use of the new library services. With the introduction of library automation system, another area

of user education has been integrated. There is undoubtedly increased need for user training. Most of the patrons, especially the novice users are not familiar with the computer as well as the literature of a particular area of study. It has been found that users have to be outreached in order to convince them the potentials of the system and once this is accomplished, there is a need to teach the formulation of simple to complex Boolean search strategies according to user's needs. On the CD-ROM instruction, it has been undertaken in a number of ways, from workshop, Computer-Aided Instruction or group user education. However, as said by Kim Amato and Margaret Jackson, "no amount of planned instruction, however effective, entirely replaces one-on-one assistance from the library staff."

Document Delivery.

The question of document delivery is not addressed here because the OPAC indicates the availability status of items in the library. Librarians, in educating users on CD-ROM would carefully inform of the inter-library loan (ILL) service in the library if they could not find the text of the information in the library. Otherwise, they may be turned off from the system. Often, articles found from the CD-ROM may not be available in the library or other libraries in the country. Resource sharing is thus inevitable, not only at national level but also at the international level. Although some titles are available in disk form, the number is still small and most libraries could not afford to subscribe the electronically published documents.

8. MARKETING AND TRAINING

The publicity program propagating the availability of the library automating system and CD-ROM system is being done because most users are not aware of the existence of these systems. Concerted efforts are not made in marketing the use of the service, especially in identifying the subject for search strategies or to formulate the Boolean search. With regards to the service, the librarian reported that emphasis would be given on the one-on-one assistance at the terminals.

A series of training sessions are being conducted from the time the package was introduced until the present time when the library is in the active process of application. The training sessions are conducted systematically by the members of the SISPUKOM committee. The Working Group, from ITM and the Business Computers provides training to equip the staff with the know-how knowledge on the different aspects of the modules and computerization in general. Table 5 listed the training programmes that have been undertaken. The training programme provided by the Sispukom committee consists of a combination of both formal sessions to learn specific skills, and less informal sessions which usually involve hands-on experience with the terminals. Staff adaptation to the use of terminals is

at their own pace and the trainers respond accordingly to the information needs of the users. This open attitude of the trainers pays in encouraging certain staff with a startling lack of mechanical aptitude.

Staff are also taught to be familiarized with the documentation. However, it is recognized that during the implementation stage more staff time was needed as compared to the period after the implementation. Staff are also encouraged to give an immediate feedback should problems arise when using the software so that appropriate changes could be done.

Table 5. Training Programme for Library Staff by Date

No	Training Programme	Date
1. 91	Pre-Installation Training	<i>07 June 91 - 11 June</i>
2. 91	Module Training	<i>20 June 91 - 02 July</i>
3.	Data Preparation Training on the use of MARC, MALMARC	<i>21 Jan. 92 - 31 Jan. 92</i>
4.	Unix to Unix Copy (UUCO) activity training	<i>22 Feb. 92 -</i>
5. 92	Post installation training	<i>21 April 92 - 31 April</i>
6.	Bar code generation training programme	<i>24 August 92</i>
7. 92	Technical Training on Data Conversion and BIBLIOFILE Interface	<i>07 Sept. 92 - 08 Sept.</i>

At the same time, preparations are underway for the training of other staff members, including the supporting staff. Training and retraining will be organized from time to time to enable the staff to be well versed with the operation skills.

The management in charge of the training are actively involved in organizing user instruction and information skill. Graphic skill is also being sought in preparation of flyers and brochures. An out-reach programme to students is also being planned.

User education is another area of prime importance. Any introduction of new technology should focus on the ultimate clientele, that is, the user. Users' acceptance, according to Alex A. Koochang, is one factor that plays an important role in more positive attitudes toward the use of library computer systems. He believed that if technological change were to succeed, users needed to be convinced of its usefulness and effectiveness. It is hoped that the ITM, JO experience would take one step further and seek to show librarians the usefulness of information technology as an effective means of storing, retrieving, and accessing information.

We have three categories of users:

1. Academic staff and non-academic staff
2. Full-time students
3. Matured part-time or night class students

The above categories of users call for a different mode of teaching skill and at a different time-schedule. In view of the fact that no specific time-frame can be arranged with the part-time students, announcement is made in the bulletin board of the willingness of the library staff to assist based on appointments or they may approach the reference desk for assistance.

9. ADVANTAGES OF USING THE LOCALLY DEVELOPED SYSTEM

Some positive advantages operating the locally developed system environment has been obvious. With the librarians and the staff responsible for the system, working closely, it has facilitated a unique enhancement of skills on both parties in as far as understanding each other's requirements and the upgrading of the systems itself.

Problems Associated with the Project

◆ Cabling

◆ Renovation - this includes physically breaking certain wall of the library and transfer of work area to another building.

- ◆ Changes in the nature of job
- ◆ Impact on job manual and on library procedures.

Evaluation of System Performance

Evaluation was made even before the system was installed. Evaluation was also made by comparing certain performance criteria that are regarded as ideal system as illustrated in Appendix 2. On the real-life use, evaluation is also made so that:

- ◆ 'bugs' in the system can be discovered at an early stage so that correction can be made
- ◆ to identify which functions that could done be better or faster
- ◆ new modules are identified

10. FUTURE

There are positive avenues towards networking. The 1989 National Policy for Library and Information Services approved by the Malaysia Government in June 1989 supports full exploitations on new technologies. In one of the recommendations it stipulates that, "in order to provide for the effective exploitation and use of library materials, library and information services shall provide as appropriate ... access to computerized databases at the national and international level." Support from government like this is crucial for the realization of networking system in the near future as described below:

1.) Towards Networking:

One of the most significant developments has been access to the telecommunications networks and a greater appreciation in linking libraries together. Findings from research indicate that all the libraries involved in library automation look forward for the eventual formation of a bibliographic utility along the line of OCLC or SILAS (Singapore Information Library Automation Network). With the increasing number of libraries engaging in library automation, this dream is not impossible in the near future. To this effect, Sispukom, like any other software packages accommodates this function.

2.) Wide Area Networking (WAN) Within ITM Library Systems:

Sispukom, being a bi-product of ITM naturally uses this system for all its library systems. However, the branch libraries are situated all over Malaysia and are

separated by hundreds of kilometers as seen in Appendix 2. It is found useful at this point to get access to all the information in the library systems to enable resource sharing while at the same time ensure cost savings. The ability to link under SispuKOM's WAN facilities may also assist in the standardization of cataloging job because this job is decentralized.

11. RECOMMENDATIONS

The ITM, JO library which was found in the 1960s was not planned for the library automation. Therefore, various issues, such as the physical structure has to be addressed. The best has got to be achieved from the available resources. The following recommendations can then be considered:

- ◆ An important aspect of the management of the new system would be the publicity and the marketing aspect. Managers should be able to make patrons aware of the existence of the system and know how to use it.
- ◆ Related instructions should be well planned and should include the instruction provided by the reference desk (the one-on-one instruction and/or by appointments)
- ◆ Managers should create new skills that needs new jobs and training.
- ◆ Systematic training would be necessary so that staff could be instilled with the real confidence regarding the new expectation in the technology.
- ◆ The ergonomics issues, such as workstation design and layouts, lighting, temperature and humidity, that follow the new system should be considered. The environment around the work stations should be conducive and comfortable for users.
- ◆ Librarians and information officers should have a good communication with the staff members, especially in the light of installing new technology.
- ◆ There is a need for an awareness that most CD-ROM databases need to be updated constantly.
- ◆ Assistance to patrons on document delivery procedures would be necessary.
- ◆ User survey on the effectiveness of computerized library service.

14. CONCLUSION

Good planning has always been accompanied by a time-consuming, often costly undertaking. However, careful and meaningful evaluation has indeed bore fruition for the library's investment. One thing for sure Sispukom has proven to give a high degree usage of organizational resources possible, while utilizing advanced state-of-the-art techniques.

A well-coordinated library system tied together by computers and other technologies would enable a library to control costs and expand its ability to deliver information in a timely and efficient manner. The positive attitudes and actions of library staff can be regarded to play an important role in the successful implementation of change in the application of information technology in the ITM, JO library. Management could take great responsibility in creating an environment, open to change and innovative strategies. Library managers, moreover, are in an unusual position to initiate and introduce change and innovation. Drake disclosed that if they want to assume a strong leadership role, they should be aware of new ideas from outside the library and able to stimulate thinking within the library. Sispukom has the commitment towards innovation and excellence.

The changing context of library technology provides new opportunities for librarians to apply familiar skills. Library automation is a relatively new phenomenon in Malaysian libraries and the academic and special libraries are seemingly ahead in the application. In order to capitalize on these new opportunities, librarians will need to 1) be trained to take a broader view of traditional skills-reference and cataloging and 2) understand new technologies. With the large number of products that have come into the market, like the CD-ROM-based information system, it could offer exciting opportunities for both librarians and users of information. It also presents challenges in the process of changes to the new integrated system as well as the managerial issue that are of concern, such as the cost, training and user instruction, space, collection development, and maintenance of the hard-ware and software. Therefore, although the potentials of the library automating system and new technologies may be exciting, they carry along a number of policy matters which require decisions by library managers and the organizations.

REFERENCES

Barlow, Pat. (1984). "Impact of IOLS on Multi-Jurisdictional Libraries in Consortia," in *Conference on Integrated Online Library Systems*, September 26-27, 1983: Proceedings, rev. ed. Canfield, OH: Genaway & Associates, Inc.

Boss, Richard W. (1984). *The Library Manager's Guide to Automation*. 2nd edition. White Plains, New York: Knowledge Industry Publications, Inc.

Computimes, New Straits Times, 26th May 1992.

Drake, Miriam A. (1979). "Management Innovation in Academic Libraries," *College and Research Libraries*, 40: 505.

Epstein, Susan Baerg, "Maintenance of Automated Library Systems," *Library Journal* 108(22) 15: 2312-2313.

Genaway, David C. (1984). *Integrated Online Library Systems: Principles, Planning, and Implementation*. White Plains, NY: Knowledge Industry Publications.

ILASA Research Group of Shenzhen. (1992). "Development and Application of Integrated Library Automation System," in *Library in the 90's International Symposium on the Latest Development in Technologies in Library Service*, September 7-11, 1992.

Indahsah Haji Sidek. (June 1992). "Overview of the Software Industry in Malaysia," in *IT's Challenge to Information Services*, 22-24.

Kahn, Herman & Anthony J. Wiener. (1967). *The Year 2000: A Framework for Speculation on the Next Thirty-Three Years*. New York: Macmillan. pp. 3-4.

Katni Kamsono Kibat and Indahsah Haji Sidek, "From Idea to Reality: Discovering Opportunities for Computerization in Malaysian Libraries and Information Centers," in *ibid*.

Leggate, Peter and Dyer, Hilary. (1986). "The Microcomputer in the Library: VI. Implementation and Future Development," *The Electronic Library*, 4(6): 332-241.

Mardhiah Mohd. Zain. (1988). "Information Technology Applications to Support Palm Oil Research," in *IAALD Regional Conference*, Serdang, 21-24 November, 1988.

National Information Policy on Library and Information Services. Kuala Lumpur, National Library of Malaysia, 1989. (unpublished)

NewMan, William, "AMICUS: The Next Generation of National Library of Canada Systems."

Oli Mohamed Abdul Hamid. (1988). "Use of Available Technologies in Library Automation Programmes in Developing Countries: A Case Study of University Utara Malaysia Library," in *International Federation for Information and Documentation Commission for Asia and Oceania Congress*, 10th, Beijing China.

Rashidah Begum Fazal Mohamad. (1990). "Computer of Library Operations in Malaysia: An Overview," *Sekitar Perpustakaan*, 15: 16-27.

Reynolds, Dennis. (1985). *Library Automation: Issues and Applications*. New York: Bowker.

Shahar Banum Jaafar. (December 1990). "Computerised Library System: The National Library of Malaysia's Experience." in *Seminar Pustakawan*, MARA Institute of Technology, Port Dickson, 18th - 20th December, 1990.

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