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ACADEMIC DIGITAL LIBRARY IN MALAYSIA : A CASE STUDY ON THE STATUS OF DIGITAL REFERENCE SERVICES

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Abstract:

This paper highlights the current status of digital library services provided by selected public academic libraries in Malaysia. The drift from traditional library to digital library architecture has set drastic changes in favour of adopting knowledge-gain mechanisms via the use of networked and digital environments. With diversity of functions, academic digital library is seen the most awaiting proxy in changing the information culture among academic users. This paper in general attempts to highlight the phenomena of using digital library system in public universities in Malaysia. The focal of the discussion is on digital reference services of academic digital library.

Keywords: Digital library, Academic digital library, Digital reference services

1. Introduction

Librarianship in the digital era combines the long-established discipline of library science and the more recent disciplines of computer science and information retrieval. Throughout history, various technological developments have been used to assist in a variety of functions in library and information units. Librarians in the higher education institutions must consider how the innovations can be applied to provide new and better library services.

Owing much to the rapid development in human-computer-interface (HCI) technology, digital library's growth is keeping in pace with this technology. With a drift from traditional to digital library, knowledge-gain process has changed. Developed under the environments of WWW, digital library has brought its users to a new information culture. Network information systems' roles in providing sort of demanded infrastructure for platforms and distribution of information cannot be belittled due to the fact that digital library is accessed over the web via the internet technology (Razilan et al., 2008). They also stressed that digital library is developed side-by-side with the development of information technology which made digital library technologies too evolve rapidly.

All of traditional library services are somehow being transformed to work in a WWW environment. And until now, digital library has played a significant role among its targeted users, especially academic users, in bridging them to reach to the knowledge of their interest within their fingertips.

This paper highlights the scenario of one of the digital library services in Malaysia that is the digital reference services, and its current practices in selected public academic libraries in Malaysia. It begins with discussion on digital library in section 2, by covering the aspect of academic digital library and common types of digital library services for academic library. Section 3 defines the environment of digital library, which includes its characteristics. It is followed by discussion on digital reference services and its case study is presented in section 4 and section 5 concludes this paper's discussion.

2. Digital Library

Digital libraries are emerging as an important area of research and education for information science, computer science and a number of other related disciplines (Sharma & Urs, 2008). The term digital libraries existed since early of 1990's, but no conclusive definition exists due to the fact that different people seem to adopt them for their context of usage (Gard, 2001). According to Razilan et al. (2009b), it has emerged as a result of advances in computing and information systems technologies, and has been introduced in universities and to public. With this significant advancement in network and computing technologies, digital library needs to penetrate in diverging its usage to fulfill its targeted users. Apart from owing its diverse function from those technologies, information system like digital library system needs to play its extraordinary role (as compared to traditional library) in providing transformation of paradigm in knowledge endeavor process among its targeted community.

Indeed, this kind of transformation can be observed have given impact on the way of information seeking process among users where this process is formed by how digital library provide its services to humanities especially to the community of scholars. We can witness the difference between today's and two decades back on how information culture among users has changed and keeps on changing. This might no cover the whole spectrum of digital library services however the drastic changes are due to keeping pace with the rapid changes in information systems and information technologies.

2.1 Academic Digital library

Academic digital library is digital library designed for serving its specific purposes to academic community using institutional digitized repositories. The specific purposes are mainly covering the specific academic resources and services in meeting academic users' needs. Academic resources that have been digitized have made a significant impact on how academic users do their research. Dependency on using online resources provided by institutions digital library is drastically increasing from time to time however the use of printed scholarly materials may still in existence.

Academic digital libraries are becoming crucial tools for information seekers like academic community as they live with information and they need to grow their knowledge (Razilan et al., 2009b). They emphasized in growing and enhancing knowledge, this community seeks current, fast, reliable and accurate information where digital libraries systems should meet these requirements. Further, the usefulness of digital library relates with the usability of the system – how the system is used and how it is usable to users. Wallace et al. (1996) listed six main characteristics of digital library for education:

i. The content is current.

ii. The content can be from primary resources.

iii. The content is comprehensive where the depth and breadth of many disciplines are provided.

iv. The resources are presented in various formats.

v. The content is readily accessible.

vi. The student can publish online.

vii. Reuse the teaching resources.

The above characteristics have made digital library superior to traditional library. Users are the closest entity to use and assess digital library, as noted by Razilan et al. (2009a), usability assessment is capable of revealing two main contexts. First, users' information needs and expectations towards the digital library and secondly how acceptable the system is in supporting and fitting into education environments.

2.2 Digital Library Services

Digital library services for academic community may not suffice to only on offering online contents. Different area of disciplines require different resources, formats or usage. Prior to the development of digital library, institutions should synergize various human resources to come up with an academic digital library. Various human resources may comprise of librarian, educator, programmer, author, technologist and so forth. Via synergizing these several of resources, digital library services can be developed.

As online basis provider of scholarly publications, digital library services may not bounded by providing only scholar publications. Digital library needs to penetrate further in providing services that meets to scholars' requirements. In this context of Malaysia University's digital library, the existing services are including:
1. Periodicals:

   Providing open access to e-journals or databases that are subscribed by institution. It should be current and sufficient for all study/research disciplines.
2. E-book and e-media:

   Liaison with third party in having e-books and continuously updating with latest published books. E-media includes e-music, e-movie and so forth.
3. Reference:

   Providing online help for library users in finding information, answering questions and so forth to fulfilling users' information needs. It can be in the form of email, web forms and instant messaging.
4. Information programs:

   Providing programs which related to information literacy among academic users in fulfilling its diverse functions to diverse disciplines of study/research.
5. Marketing (like promotion) of all the above:

   Hold promotions as a mean of marketing activities of any of its new and upcoming programs / events in order to receive feedback from academic community regarding on the services provided.

This paper however highlights the coverage of digital library services with respect to awareness on these services by academic community, and also on digital reference services; that based on Malaysia's universities environment.

3. Defining the Digital Library Environment

A digital library is a library that has been developed to fulfill the needs of information facilities in the digital age. The primary form of information in this age is in many cases digital. With digital technology, information in various formats – text, audio, video and electronic can be created, stored, organized, accessed and transmitted with relative ease, and in the forms that we could not have thought of earlier (Singh, 2004).

The digital age has brought many changes to libraries. Some of these changes have taken place even before the introduction of the Internet in the early 1990s. The reference departments of academic libraries have seen a rapid evolution from a print-centered world to a digital-intensive one. The 1980s and early 1990s saw much discussion in libraries on issues such as '*print versus electronic*', '*access versus ownership*', '*mediated versus unmediated online searching*', and professional concerns that gradually widened to include electronic licensing and consortia collection development (Penka, 2003). Healy (1995) summarized the questions of '*access versus ownership*' as:

> '*Do librarians rationalize services (e.g. special collections, outreach programmes) to ensure that needed material continues to be available on the shelves, or do they sacrifice some of the physical collection and provide access to others' collection via the new technologies?*' (p. 40).

The definition of a library as a collection of books changes in the digital era because ownership of digital information is an uncertain concept. Intellectual property issues such as copyright piracy, definitions of fair use, authorship, archiving and rights to retrospective collections are all being revised and reinterpreted with controversial results (Electronic Frontier Foundation, 2002). In the context of librarianship, there is a tendency to refer to the '*digital library*', '*electronic library*' and '*virtual library*' interchangeably. Arms (2001) defined a digital library as '*a managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network.*' The American Digital Library Federation has given a more comprehensive definition of digital libraries as:

> '*Organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by defined community or set of communities*' (Greenstein, 2002: 2)

Burke (2003), quoting from Wainwright (1996), believed a digital library possesses the same functions and goals of the traditional print-based library and that the difference lies in the digital part of the term (which) indicates merely that the material is stored and accessed digitally. Arms (2001) claimed that the digital libraries have three main functions: to help users interact with the library, to store collections of materials, and to provide services. Two typical services provided by digital libraries are search services and location services. Search services provide catalogs, indexes, and other services to help users find information. Location services are used to identify and locate information.

A digital library should support the storage, representation and dissemination of all kinds of digital objects, as well as serving users with all kinds of computers and software. The users' computer can access the collections by a communication network, where the Internet is the dominant network. Several researchers have discussed the specific characteristics of digital libraries (for example Oppenheim and Smithson, 1999; Lin, 2000; Arms, 2001; Deegan and Tanner, 2002; Chowdhury and Chowdhury, 2003). In general, a digital library has the following characteristics:

1. A large collection of publications in a digital format that are organized in some useful manner, such as subject directories or indexes of search engines.

2. Accessible, searchable, and duplicatible through the Internet or other media of electronic transmission with greatly reduced barriers in distance and time.

3. The size and contents of digital libraries undergo changes and modifications with various degrees of frequency while some Web pages are ephemeral; others often are relocated within a web site.

The main reason for developing digital libraries is a belief that they will provide better delivery of information than was possible in the past. Enthusiasts for digital libraries point out that computers and networks have already changed the ways in which people communicate with each other. In some disciplines, they argue, a professional or a scholar is better served by sitting at a personal computer connected to a communications network than by making a visit to a library (Arms, 2001). Adida et al. (2003) pointed out that the digital library brings the library to the user's desk, either at home or at work, as long as they have a personal computer and network connection. From a personal computer, the user is able to consult materials that are stored on computers around the world.

A digital library must focus on access and service, not buildings and volumes. Libraries will support users in their searching and acquiring of information and their organization will reflect services rather than physical location. Chowdhury and Chowdhury (2003: 10-11) listed a number of benefits of having digital libraries, as follows:

    a. A digital library brings information to the user

    b. Improved searching and manipulation of information

    c. Improved facilities for information sharing

    d. Timely access to information

    e. Improved used of information

    f. Improved collaboration

    g. Reduction of the digital divide

Digital libraries have created an information environment that is complex and fluid, connective and interactive, diverse and unpredictable, where the professional provision of information is no longer constrained by time and place. Academic libraries have embraced a variety of widespread adoption of online services during the last decades. Tenopir and Ennis (1998) survey of 68 academic libraries on the impact of digital reference on librarians and library users reported three main areas of changes:

1. Changes in attitudes

Expectations and attitudes toward the research process have changed for both librarians and users. Heightened expectations from students and, to a lesser degree, from faculty are noticed by many librarians. Partly because of the Internet and World Wide Web, students expect to be able to answer every question and do every research online. Good reference service enhances these expectations, while adding a reality as well. Access to good secondary sources with as much full text as possible is clearly important to help meet these expectations.

2. Changes in instruction

One major impact of electronic services is the growing need for user instruction. The trend in education towards distance learning and web-based learning is providing new challenges for information professionals as service providers. This has required the librarian to provide access to quality and valid information to support it by online instruction.

3. Changes in workload and workplace

Many librarians report an increase in their workloads as more and different resources are added with no increase in professional staff. As a result, in many universities paraprofessional staff and student assistants are providing more reference service, particularly basic assistance in using electronic sources. Librarians are moving more towards specialized research and instructional services.

With such transformation in information society of academic users, the existence of digital library may be seen as a drive to a significant path in knowledge-gain spectrum. In Malaysia, paradigm change in knowledge-gain at higher level of education may not be much different from the developed countries. Digital library environment is not an alien environment to many due to online library resources are ubiquitous which can imply that almost everybody is using it. This includes digital reference service that was first made on the basis of providing web search facility for catalogues, as well as FAQs to answer some common and standard questions.

4. Digital Reference Service

Reference services or the personal assistance provided to library users seeking information have been a main component of library activities for more than a century. The reference environment has undergone a significant transformation, as collections and information in general become increasingly accessible electronically (Wan, 2008). As new technologies are introduced, the web is changing and still changes, librarians in the higher education institutions must consider how the innovations can be applied to provide new and better reference services to meets academic users' expectations. Current technologies witness the use of digital reference services (DRS) such as via email, web forms, chatting and others.

The following sections present the discussion on the case study with respect to DRS in Malaysia.

4.1 The results of case study

In the case study, the four libraries from selected universities involved are Tun Abdul Razak Library (UiTM), University of Malaya Library (UM), Tun Seri Lanang Library (UKM) and Sultan Abdul Samad Library (UPM). The questionnaires consist of 163 sets but a total of 93 respondents (57%) have been returned. The respondents are among universities libraries. However, most of the data on current status of DRS were obtained from the structured interviews and content analysis of the academic libraries' web sites under study.

4.1.1 Library System's Used

In order to envisage the existing status of DRS, this case study investigated the following details: library systems being currently used, the respective vendors, year of implementation and first time using the automated system. Table 1 summarizes the findings.

Table 1: Library System's Used

Library	Current Library System's Used	Vendor	Year	First Used Automated System
Tun Abdul Razak Library, UiTM	ILMU	Paradigm	2000	1992
University of Malaya (UM) Library	i-LINK	SIRSI	2004	1990
Tun Seri Lanang Library, UKM	VIRTUA	VTLS	2000	1990
Sultan Abdul Samad Library, UPM	VIRTUA	VTLS	2000	1987

Referring to Table 1, the study found that Tun Abdul Razak Library, UiTM was using Integrated Library Management Utility (ILMU) supplied by Paradigm Systems Sdn. Bhd. since 2000 but has first used automated system since 1992. University of Malaya (UM) Library uses i-LINK library system supplied by SIRSI since 2004 and has first used automated system in 1990. Tun Seri Lanang Library, UKM and Sultan Abdul Samad Library, UPM both use VIRTUA library systems supplied by VTLS since 2000. Tun Seri Lanang Library, UKM first used automated system in 1990 whilst Sultan Abdul Samad Library, UPM in 1987.

4.1.2 Electronic Library Services

Electronic library services are the basic requirement for DRS. Findings from the content analysis showed that all the four public academic libraries in this study have their own websites as follows:

Table 2: Selected Malaysian Public Academic Libraries Websites

Public Universities	Websites/Library URLs
Universiti Teknologi Mara (UiTM)	http://www.uitm.edu.my/ptar
Universiti Malaya (UM)	http://www.umlib.um.edu.my
Universiti Kebangsaan Malaysia (UKM)	http://pkukmweb.ukm.my
Universiti Putra Malaysia (UPM)	http://www.lib.upm.edu.my

These four websites provide rich resources for their local holdings, connections to electronic resources and digital collections.

An analysis was made on selected element of the libraries' home pages, such as the presence of online catalogues, links to recommended or dedicated Web sites, interactive services, resources remotely available over the network, and links to other OPACs. Table 3 summarizes the services available online for the libraries in the study.

Table 3: Electronic Library Services in Selected Malaysian Public Academic Libraries

Library	Catalog on Web	Dedicated Web site	Interactive services	Resources remotely available	Links to other OPACs
Tun Abdul Razak Library, UiTM	Yes	Yes	Yes	Yes	Yes
University of Malaya (UM) Library	Yes	Yes	Yes	Yes	Yes
Tun Seri Lanang Library, UKM	Yes	Yes	Yes	Yes	Yes
Sultan Abdul Samad Library, UPM	Yes	Yes	Yes	Yes	Yes

All the four academic libraries have online public access catalogues (OPACs) to make users aware of their collections. An OPAC can be used by a member of the library's public to search the catalogue database in order to see if the library holds a particular work on a particular subject and be informed of the location of those works.

Academic libraries also have links to Internet resources, Web sites, electronic books and journals which are reserved for specific use. These recommended or dedicated Web sites are compiled by the librarians according to subject areas which reflect the online sources available and courses offered in the universities.

All the four academic libraries in this study offered interactive services to their users. The services include loan status check and fines accrued, online renewal, new acquisition, charged books reservation, purchase suggestion, and inter-library loan request. University of Malaya (UM) Library has an interactive library portal to e-resources and online services which is a user-driven and customizable information service.

In addition, the libraries had provided links to subscribed databases such as ACM Digital Library, AIDSearch, ProQuest, Ebscohost, Educational Resources Information Centre (ERIC), etc. Some of the services are restricted to the university community; they require the use of appropriate login names and passwords, for some databases. All the academic libraries in this study also provide links to other selected library OPACs within and outside the country. This will enable the users to access not only their own academic libraries' resources, but also resources from other libraries globally.

4.1.3 Types/Formats of Digital Reference Services Offered

The main element of any DRS is the answering of users' queries (Chowdhury and Margariti, 2004). The interface should allow users to place queries electronically usually through a Web form, often via a '*Contact Us*' or '*Ask Us*' link in the main menu. In all academic library services observed, there were link for submitting general enquiries and for contacting a librarian.

The types of DRS offered are given in Table 4.

Table 4: Types of DRS Offered

Library	E-Mail	Web Forms	Ask-A Librarian	FAQs	Others
Tun Abdul Razak Library, UiTM	Yes	Yes	Yes	Yes	Yes (VRF)
University of Malaya (UM) Library	Yes	Yes	No	No	No
Tun Seri Lanang Library, UKM	Yes	Yes	No	Yes	No
Sultan Abdul Samad Library, UPM	Yes	Yes	No	Yes	Yes (DLS)

Note: VRF = Virtual Reference Facilitator
DLS = Distance Learning Services

As shown in Table 4 that Tun Abdul Razak Library, UiTM provides e-mail reference, web forms, Ask-A Librarian, FAQs and Virtual Reference Facilitator (VRF). University of Malaya (UM) Library offers e-mail reference and web forms. Tun Seri Lanang Library, UKM provides e-mail reference, web forms and FAQs. Sultan Abdul Samad Library, UPM has e-mail reference, web forms, FAQs and Distance Learning Services.

All academic libraries in this study have created special reference e-mail accounts with an address that identifies the library, that is http://www.uitm.edu.my/ptar for Tun Abdul Razak Library, UiTM, query_perpustakaan@um.edu.my for University of Malaya (UM) Library, kpustaka@pkrisc.cc.ukm.my for Tun Seri Lanang Library, UKM and lib@lib.upm.edu.my for Sultan Abdul Samad Library, UPM.

Users can either click directly on the e-mail addresses on the library's web page which activates e-mail software, or send a message to the e-mail address using their own software. In all academic libraries' web sites in the study, the librarian's individual e-mail addresses were also provided for contacting any of the librarians through e-mail.
In Tun Abdul Razak Library, UiTM there is a special management software called Virtual Reference Facilitator (VRF) that track and store answers to queries to enable them to save materials for future reference. In other libraries under study, there were no management software to track or store answers to queries or to enable them to save material for questions' and answers' archives. The librarians only keep certain queries and answers in their personal computer files that are not shared.

4.1.4 Virtual Reference Facilitator (VRF) in Tun Abdul Razak Library, UiTM

Besides offering e-mail reference, web forms and Ask-A Librarian services, Tun Abdul Razak Library, UiTM has special software known as Virtual Reference Facilitator (VRF) through the main menu of the library's web page.

VRF serves as a platform for users to send reference queries or research title for researching. VRF can be used as a mediator or middle tool between the librarian and the user. User can ask for reference or research work to be done whereby the librarian does the researching. The VRF allows the user view the researches and lets the researchers to be maintained by the administrators. At the same time the librarian are able to view the details of the researches that they need to work on.

Specifically, VRF has the following functions: (a) able to send in research titles, (b) processing researches, (c) able to cancel the researches, (d) maintaining the attributes in VRF, (e) maintaining categories in VRF, (f) searching researches and experts in VRF and (g) able to view history of research.

Next table below shows the enquiries recorded through VRF from 2005 to 2007.

Table 5: VRF Transactions in PTAR 2005-2007

Year	Enquiries	Research Questions	Cancelled
2005	56	27 (48.2%)	29 (51.8%)
2006	128	91 (71.1%)	37 (28.9%)
2007	175	139 (79.4%)	36 (20.6%)

Source: Information Technology and Systems Division, Tun Abdul Razak Library, UiTM

From Table 5, the number of enquiries increased from 56 in 2005 to 175 in 2007. The librarian in Tun Abdul Razak Library, UiTM responded to the enquiries based on the types of questions received. Only research questions were approved and searched by the service administrator.

Analysis of the log of more than 350 questions asked through VRF revealed that during the first year of the implementation, most of the enquiries 29 (51.8%) were cancelled since the questions were simple and duplicated. However, the percentage of research questions that have been approved increased to 71.1% in 2006 and 79.4% in 2007. In terms of category of users for the year 2007, 143 (81.7%) are undergraduates, 25 (14.3%) postgraduates and 7 (4%) are academic staff. Even though the response time policy was not stated on the library's web page, but from the analysis, in general the service provides quite fast response time. The librarian's in-charge also has guided the requestors by providing the information sources needed in their research.

4.1.5 Distance Learning Services in Sultan Abdul Samad Library, UPM

Distance Learning Services provide library services for distance learning students of the university. Through this quick link, the user can access various library services, e-resources and link to distance learning web and others. The user can contact the librarian/library through Ask Us, feedback and suggest a purchase besides accessing online library catalogue as well as online databases

Summary

Digital library cannot be treated as a *teacher* but its whole spectrum of services that are built on the WWW can assist them in their education / research process. The characteristics of digital library have made it different from traditional library but with the similar objective – to support the process of learning and researching.

The existing DRS status in Malaysia academic digital library indicated that the higher institutions have implemented at least e-mail reference and web forms. Different from the other three universities, UiTM introduces a special software or service known as Virtual Reference Facilitator (VRF) and also provides *Ask-A Librarian* services to its users. On the other hand, UPM offers DRS through Distance Learning Services (DLS). Most of the institutions provide the FAQs services.

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The continuing changes of information culture inline with the continuing changes of the web technologies has made commercial services such as Google scholars came into existence. This is the closest rivals to DRS offered by academic digital library. Thus academic digital library should be designed with innovative facilities by synergizing resources through the web in engaging with academic users' needs and interests.

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