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## Virtual Reference Services at a University Library

HASLINDA MOHAMED<sup>1</sup>, SAIDATUL AKMAR ISMAIL<sup>2</sup>, NOR  
RASHIMAHWATI TARMUCHI<sup>3</sup>, ABDULLAH MUSTAFA<sup>4</sup>

<sup>1, 2, 3, 4</sup> Universiti Teknologi MARA (UiTM), Shah Alam, Selangor, Malaysia

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## VIRTUAL REFERENCE SERVICES AT A UNIVERSITY LIBRARY

Haslinda Mohamed<sup>1\*</sup>, Saidatul Akmar Ismail<sup>2</sup>, Nor Rashimahwati Tarmuchi<sup>3</sup>, Abdullah Mustafa<sup>4</sup>

<sup>1, 2, 3, 4</sup> Universiti Teknologi MARA (UiTM), Shah Alam, Selangor, Malaysia

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**Abstract.** This is a case study to explore the practices of virtual reference services at one of the academic libraries at a university. The library supports the needs of about 4500 to 5000 users from various programs, from undergraduate to postgraduate levels. The library provides reference services via various channels, from face to face to electronic mediums. The study is conducted to understand more about the current practices of reference services, particularly through electronic mediums at the campus, to identify issues faced by the librarians in supporting those users' demands, and to provide several recommendations. Library users have various needs and librarians have to support those needs through the services that they provide on a daily basis. A quick response and feedback from librarians are expected. Some of the questions that the librarians receive everyday from their users could have been avoided if proper database systems are available to store them for future retrieval. However, having a system in place and enforcing people to use it can be challenging. The library needs to revisit their policy and processes related to reference services to support virtual reference services. It is good to have various ways of communicating with the users to give them flexibility; however, the library should have the capability to support them. Reference librarians should give equal attention to inquiries directly from e-mails as they would give to inquiries directly from users at the reference desk. The study has revealed that the services they provide through electronic mediums to users can be improved to reduce manual management of questions and answers between the librarians and users. Thus, the study has resulted in the development of a system prototype to support virtual reference services. In addition, librarians need to be well-trained and competent in using social media tools to take full advantage of the benefits offered by these technologies.

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### INTRODUCTION

University libraries or academic libraries are faced with challenges on several elements such as reference services, online information providers, and e-learning products. As a result, the creation and delivery of services to their users, mainly the academic staff, researchers and students, become more challenging. With the advancement of information and communication technology, the scope of librarians' responsibility progresses into becoming more complex. It also changes the way user search and use information whether for personal or educational purposes. The new generation maximizes the use of information technology to complete their task (Newby, 2003).

The function of libraries is three-fold. Libraries acquire information, organize that information in a way it can be retrieved, and disseminate the information the library has acquired. Reference services fulfill the last function. Referral services may vary from library to library, but most libraries have an information or reference desk where assistance from a librarian is available. Almost all libraries also provide reference services via the telephone and in many libraries you can e-mail your reference question, or ask a librarian, to a reference librarian who

will e-mail you back with the answers.

The purpose of this study is to understand more about the current practices of reference services, particularly through electronic mediums at the campus, to identify issues faced by the librarians in supporting those users' demands, and to provide several recommendations. The library under study in this paper is referred to as HM Library. HM Library serves in total about 5000 users consist of students, academic and non-academic staff. The library is not a stand-alone library. It operates under the supervision of the main library near the campus. The library is supported by two librarians and eight assistant staff. HM Library operation is divided into five main functions—customer services and collection, journal and online databases, IT services, information services, and administration. Its vision and mission are related to achieving excellence in providing services through physical and virtual means.

### Reference Librarian

The study of reference theory was necessary (Danner, 1983). Many researchers suggested that in view of the complex nature of

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\*Corresponding author: Haslinda Mohamed  
E-mail: [meetraaa@gmail.com](mailto:meetraaa@gmail.com)

librarianship, an understanding of a theory behind the reference work was important to enable librarians to practice their discipline (Vavrek, 1968; Hollers, 1975; Rettig, 1978; Wagers, 1978). Saxton (2000) began defining reference service from Green's work in 1876 which stated that it was appropriate for the library to promote "personal intercourse between librarian and readers". Although not all might agree Dana (as cited in Saxton, 2000) said that the view of helping users would be a central function of librarianship that people could be trained by librarians to arouse their "inquiring spirit". To achieve this, although Dana (1920) did not mention specifically about reference service, he instructed librarians to: (1) welcome users as they enter, (2) be sensitive to what they need, and (3) teach them the process of finding the information (Saxton, 2000). In addition, Learned (1924) stated that a librarian should go beyond the local resources to assist the users. Wyer (as cited in Saxton, 2000) influenced by Learned's work, believed that "it still is, and always will be, imperative to provide human beings as intermediaries between the reader and the right book".

Rothstein (1961) defined reference work as "the personal assistance given to individual readers" and reference service as "the responsibility and organization of a library to prepare for this work". In contrast, Rees (1966) disregarded Rothstein's definitions and identified reference service as "the actual provision of assistance" and reference work as "the library function performed by reference librarians in providing that service". Rees also added reference process to describe the complexity of librarianship that involves psychological, sociological, and environmental variables. Danner (1983) mentioned that although reference theorists agreed on the levels of service (Rothstein, 1961; Wyer, 1930) they argued about the role of reference librarians, whether or not they should provide users with direct answers or let them find on their own, also known as "information versus instruction debate" in the literatures by (Katz 1969; Nielsen, 1982). Danner (1983) also highlighted that another approach was to base the theory on the librarian's role as a "communicator". He found that Rettig (1978) expanded Vavrek's (1968) model to define reference service as, "Interpersonal communication process, the purpose of which is to provide a person who needs information with that information, either directly by culling the needed information from an appropriate source (or sources) or indirectly by (1) providing the person with the appropriate information source(s) or (2) teaching the person how to find the needed information in the appropriate information source(s)."

In this light, communication and all activities to support the communication were part of reference service (Danner, 1983). This definition diverted the attention from the debate about the role of reference librarians as discussed earlier.

VanScoy (2010) highlighted that model of reference service that has elements of mental constructs which impact reference librarians' views and actions could assist in managing the

expanding needs for reference services. She introduced a new approach by identifying personal theories of practice. As librarians gain more experience and reflect on the practice, they could develop sophisticated informal theories about reference service (VanScoy, 2010).

### Virtual Reference

In response to the growth of virtual reference services, the Reference and User Services Association of the American Library Association (2004) introduced the Guidelines for Implementing and Maintaining Virtual Reference Services (VR Guidelines). The VR Guidelines define virtual reference as:

*"Reference service initiated electronically, often in real-time, where patrons employ computers or other Internet technology to communicate with reference staff, without being physically present. Communication channels used frequently in virtual reference include chat, videoconferencing, Voice over IP, co-browsing, e-mail, and instant messaging."*

In practice, librarians might use the term virtual reference when they were actually referring to the use of either e-mail or chat. They might also use the term virtual reference to refer to the use of any number of technologies. Based on literatures, virtual reference could be used when the concept being studied relates to any types of virtual services (Hendricks & Buchanan, 2013; Muller, 2013; Nicol & Crook, 2013; Xu, Kang, Song & Clarke, 2015; Yang & Dalal, 2015).

Stevens (2013) discussed desk-centric reference and its costs. According to the author, data from her institutions showed an increase in the percentage of online reference transactions out of the total reference transactions. Stevens (2013) said that although the FAQ database did not represent direct user-librarian communication, it provided examples of effective reference work and hence, its usage should also be included when studying reference services.

Shaw and Spink (2009) identified varied models for virtual reference provision, such as hiring more staff to manage the virtual reference services to release some work load of reference librarians. This would allow virtual reference duty to stand separate from the traditional reference duty and be recognized fully. Shaw and Spink (2009) also identified a set of virtual reference services best practices from their analysis of literatures. According to them, developing an FAQ database is the most cost effective decision for libraries and the users can choose which mode to get information from the libraries, stating that "allowing patrons to use self-service can reduce staff numbers required for a chat or e-mail VR service, and reduce the number of repetitive or straightforward operational questions handled by staff."

Nicol and Crook (2013) identified two main factors that could give positive effects on virtual reference services. The two factors were the willingness of library users to use the service and the competencies of librarians to provide quality virtual reference service. They highlighted that the library users' preferences and

characteristics affect their use of the service in addition to the importance of support and training for librarians and staff, as well as their enthusiasms while working with virtual reference service. The study had brought the university (Washington State University) to a decision to completely support virtual reference service which resulted in LibAnswers implementation, more headcounts to support virtual reference service, and more training for them.

### Library Users

Several literatures discussed user centered approach in the library services provision (Baron & Harris, 1995; Wener, 1985; Mills & Morris, 1986). Academic library users represent diverse background and abilities. Technological competencies and research skills vary widely among students. By understanding more about their users, librarians can create more meaningful educational environments that meet an individual's current and future needs. Baron and Harris (1995) stated that library users play an important role to encourage better communication between the users and librarian staff. Baron and Harris (1995) suggested the need for users to be told in advance what their expected roles would be. Wener (1985) and Mills and Morris (1986) earlier had suggested user's involvement such that users need a proper "orientation" to their setting or role and they need prior training or briefing in operating the procedures and tasks required. Libraries are known for a creation of rules and procedures to control the activities of their users, but they lack on the consistency of a role definition (Mills & Morris, 1986).

### METHODOLOGY

Given that virtual reference service is not a new topic and several research on virtual reference service best practices are already available, much research of an exploratory and descriptive in nature are still needed as the context of study can vary. A research method that facilitates "a deep investigation of a real-life contemporary phenomenon in its natural context" is a case study (Neuman, 2011; Yin, 2012). The case study describes a single situation, and usually involves the collection of a large amount of qualitative information. Ideally, a case study research should use a multiple case study design that involves multi-sites to be studied and using multiple methods to analyze the collected data (Yin, 2012).

In this study, the researchers focused on exploring within a context—the HM Library reference services. Case studies can be very valuable in generating an understanding of the reality of a particular situation, and can provide a good basis for discussion. As much as possible, data are gathered, on the assumption that it might be useful as it could be difficult to go back for more information later. Since the information collected is often specific to a particular situation at a particular point in time, through the case study method, results cannot be generalized. Even though HM Library operates under the main library, their issues and

problems may not be the same. In spite of this limitation, the case study was chosen as the research method for this study, as its advantage in providing a useful description was seen as outweighing its limitations. Several literatures have shown that through the experience and problems encountered on a daily basis that librarians can understand what are lacking in their process that require improvements (VanScoy, 2010; Nicol & Crook, 2013; Shaw & Spink, 2009; Xu et al., 2015; Yang & Dalal, 2015). In this study, a series of informal contacts were conducted over a week period with the librarians of the library via face-to-face, emails and telephone conversations. Thus, the findings are further strengthened through the direct validation of those responsible for the process being studied. The purpose of the personal interview is to encourage the interviewee to relate experiences and attitudes relevant to the research problem. It is a very flexible technique in that the interviewer can probe some interesting details that emerge during the interview, and concentrate in detail on particular aspects—a reflexive approach (Trauth & O'Connor, 1991: 131-144).

### Reference Services

Similar to the scenarios identified in previous literatures, reference librarians at HM Library, in addition to handling users through the usual face-to-face medium, they are expected to answer inquiries from e-mails and chat as well. They are also responsible to handle other matters outside of information and reference service related activities. Due to the time limitations, according to one of the staff, enquiries through e-mails are sometimes overlooked or put on-hold. When this happens, the requests are not recorded in their reference desk system.

Services through social media medium—Twitter and Facebook, are available, but are inactive for HM Library. The chat service itself started in mid October 2014. So far, there was 0% usage for chat and social media. E-mail and telephone usage were also low, almost insignificant compared to face-to-face medium. Although HM Library provides other mediums for users to use the services, they are not utilized. Students prefer to use face-to-face medium.

The overall evaluation of a library should not only include the use of the physical facility and printed collection, but should also include online usage and electronic resources as highlighted by (Shi & Levy, 2005). At the time of the study, the library has just started evaluating the instant messaging and social media usage but through manual intervention.

The manual way of saving each request into their reference desk system can be overwhelming to the busy staff. Hence, some of the face-to-face as well as the telephone encounters are not recorded in the reference desk system. When an interaction between a user and a librarian happens, he or she may not be able to take the details and key-in into the system immediately. Sometimes, the details are jotted down during the meeting, but are keyed-in into the system later. In some cases when no details are gathered, the data could not be captured at all. In addition to the inability to

capture all encounters in the reference desk system, the time stamped for each encounter, when it is recorded, it will not reflect the actual time. As a result, an evaluation of reference services related to the time taken to respond to an enquiry becomes difficult. The senior librarian stated that a simple form is introduced to ensure all details are captured even if they are not keyed-in into the system, as a preventive measure to data loss. Students' habits in doing the assignments at the last minute also contributed to the issue. When too many students are waiting for assistance at one time, the librarians can get overwhelmed. Students tend to rely heavily on librarians to help them with their assignments. Some of the questions asked by students are repetitive. This is because in every semester, there will be students taking up the same course. Librarians sometimes have to deal with the same questions every semester and have no record of previous answers that they gave students in the past.

Despite the availability of different modes of information and reference services, users as well as librarians are not able to use them effectively. They prefer face-to-face medium. Due to the limitations in the process of handling the services, the limitation of the reference desk system and staff, and inadequate measurements on virtual reference service, HM Library may not be able to fully engage the reference services through various mediums.

**FINDINGS**

According to a tracer study (questionnaires were completed by students) conducted by the university in 2014, the level of satisfaction of library users towards the HM Library is as tabulated in Table 1. Data has shown that students are generally satisfied with the services provided by the HM Library.

**TABLE 1**  
**Level of Satisfaction Index (2014)**

	<b>Comfortable and Conducive to Learning</b>	<b>Sufficient Resources/Materials (Books, etc)</b>	<b>Sufficient Operating Hours</b>	<b>Library Staff Service</b>	<b>Online Resources</b>	<b>Online Library Services</b>	<b>Library (Facilities and Services Overall)</b>
Total	4.11	3.97	4.22	4.17	4.16	4.15	4.19

\*(Note: 1 = Very Dissatisfied, 5 = Very Satisfied)

Users of HM Library are mostly students from the undergraduate level (75%) and so, they represent the majority of users. They come to the library to use the facilities, especially when deadlines of assignments are approaching. In today's world, resource and information are in abundance with the Internet. Textbooks, journal articles and titles are accessible at the library as well as on the library systems through online materials and subscribed databases. Students, especially those in their first to second year of study, are inexperienced in finding the right information timely and evaluating the information for effective use. Sometimes, it is really surprising to see some students in their second year of study have not really acquired some basic library and research skills. According to the senior librarian, there are busy days and non-busy days at HM Library. During the busy period, students have to queue and wait for assistance from the library staff. She said that their problems are mostly related to finding sources or references, and using the library and research tools—End Note, Library Search Engine, OPAC, and so on.

The following tables show the usage of the reference desk at HM Library from 2011 to 2014. Data were obtained from a reference desk system and the system was upgraded in 2014. The system captures each student's request for assistance by having the reference librarian to manually key in the request during or after each encounter, and then, when the answers are already available, he or she will provide the most simplified answers into the

system. The questions are generally related to reference services, selecting the right reference source, types of reference sources, where and how to find reference sources, and reference sources available on the Internet.

Table 2 shows the reference desk usage—users requesting for assistance from the library staff. Since the upgrade, the reference desk systems have several new fields in its reporting feature as shown in Table 2—live chat, social media, and instant messaging. Only in the last quarter of 2014 that data for live chat, instant messaging and social media can be extracted. Table 2 shows that users prefer face to face medium than any other medium of reference services.

Table 3 shows the number of enquiries by subject. The system counts the number of enquiries for each subject—online database, the Internet, digital collection, OPAC, and others. From Table 3, it shows that questions that users ask vary each year, depending on their needs at the particular time. New users come in every semester with different skills and background.

Table 4 shows the number of enquiries by enquiry type. There is no significant difference in the number of enquiries by enquiry type each year, but there is a trend of an increase in the usage of the services. This could mean that students, while asking for research reference, might also be asking about search techniques.

Users may employ varying strategies for diversity of materials and resources in order to meet a range of needs in relation to issues, demand and interest. Three main types of reference

assistance are: (1) assistance in using the library, including location of materials, use of the catalog, use of computers to access information, and the use of basic reference sources, (2) assistance in identifying library materials needed to answer a question, (3) providing brief, factual answers to questions, such as

addresses, statistics, phone numbers, etc. that can be quickly located. The Figure 1 below is a snapshot of individual questions that they ask. The figure shows students use face-to-face medium to ask the librarian and the questions that they ask are about searching resources and evaluating them.

**TABLE 2**  
**Reference Desk Usage at HM Library**

	2011	2012	2013	2014 (Jan-Sep)	2014 (Oct-Dec)
Face to face	11.30%	12.82%	36.70%	20.02%	17.54%
LiveChat					0.00%
Telephone	0.05%	0.15%	0.25%	0.41%	0.25%
E-mail	0.00%	0.00%	0.20%	0.25%	0.05%
Social Media					0.00%
Instant Messenger					0.00%
Fax	0.00%	0.00%	0.00%	0.00%	0.00%
Others	0.00%	0.00%	0.00%	0.00%	0.00%
Total	11.35%	12.98%	37.15%	20.68%	17.84%

**TABLE 3**  
**Number of Enquiries by Subject at HM Library**

	2011	2012	2013	2014 (Jan-Sep)	2014 (Oct-Dec)
Online Database	1.93%	1.61%	6.91%	3.32%	1.12%
Internet	0.86%	0.11%	0.64%	0.75%	0.11%
Digital Collection	0.32%	0.11%	0.11%	0.75%	0.00%
OPAC	1.87%	3.00%	11.94%	5.52%	4.71%
Others	7.50%	10.1%	18.69%	11.84%	6.16%
Total	12.48%	14.9%	38.30%	22.17%	12.10%

**TABLE 4**  
**Number of Enquiries by Enquiry Type at HM Library**

	2011	2012	2013	2014 (Jan-Sep)	2014 (Oct-Dec)
Quick Reference	3.23%	2.90%	7.79%	1.75%	3.23%
Research Reference	3.96%	3.96%	5.21%	0.97%	4.29%
Search Technique	3.73%	3.04%	10.09%	6.41%	5.12%
Advice and Guidance	1.11%	4.52%	5.71%	3.92%	2.76%
Others	0.46%	2.44%	4.65%	6.59%	2.17%
Total	12.49%	16.8%	33.46%	19.63%	17.5%

These are the skills which could enable students to learn to solve problems, think critically and make informed decisions. Such skills are not only required to help students during their university studies, but also beyond their university life. The senior librarian stated that the library conducts information skills workshops

continuously to improve information seeking skills of students. Yet, not all have really utilized the opportunity to learn and relearn those skills. Students may also come to the librarians for guidance in doing their assignments.

Figure 2 shows a sample of questions they prepared before

meeting the librarian on duty. They would normally first write an official letter, signed by their lecturer, stating their requirements to the librarians—a list of questions that they have. Then, the

librarian will provide the relevant sources and reference information that they need, in addition to helping them in using the research tools.

**FIGURE 1**  
A Snapshot of Individual Questions Recorded by Librarian

Medium	Question	Answer	Date/Time	Duration
Face to face	Analisa kad katalog- susunan by subject, author dll	Done	01-Oct-2013 10:38:36	00:00:58
Face to face	Analisa kad katalog- susunan by subject, author dll	Done	01-Oct-2013 10:39:51	00:01:10
Face to face	Analisa kad katalog- susunan by subject, author dll	Done	01-Oct-2013 10:41:16	00:00:10
Face to face	Analisa kad katalog- susunan by subject, author dll	Done	01-Oct-2013 10:41:16	00:00:14
Face to face	Analisa kad katalog- susunan by subject, author dll	Done	01-Oct-2013 10:41:41	00:00:09
Face to face	Evaluate Jurnal Abstract	Evaluate of format, authority etc	01-Oct-2013 12:52:42	00:01:00
Face to face	Evaluate Jurnal Abstract	Evaluate of format, authority etc	01-Oct-2013 12:53:54	00:00:18
Face to face	Evaluate Jurnal Abstract	Evaluate of format, authority etc	01-Oct-2013 12:54:27	00:00:21
Face to face	buku metadata	Done	01-Oct-2013 13:15:17	00:00:14
Face to face	crai buku metadata	Done	01-Oct-2013 13:20:05	00:00:59

**FIGURE 2**  
A Sample List of Questions Students Ask

1. Roles and Functional Description of Department
  - Tanya tentang kewujudan setiap department
  - Fungsi setiap department
2. Data-data yang ada
  - Ex: buku, student and staff
3. List of Information System
  - Apa system yang digunakan
  - Kalau ada system selain , explain setiap Information System
    - Apa sub-sub module dalam ?
    - Adakah refence department di bawah ?
4. Function of each Information System
5. Types of Module
  - Jenis-jenis module yang wujud dalam system di
  - Explain setiap module

- DETAILS OF SELECTED MODULE (REFERENCE MODULE)**
1. Reference module background
  2. Functional description and activities of reference module
    - Ada tak flow dalam reference?
    - Penerangan tentang setiap proses/steps
  3. Reference module components
    - Input : apa data yang masuk?
    - Processing : apa proses-proses yang terlibat untuk me
    - Output : hasil yang diperoleh (generate report)
    - Feedback : Macam mana dapat feedback dari user?
  4. Hardware and Software Configuration
    - Hardware and Software yang digunakan
    - Ada ke vendor atau orang luar yang maintainkan syste sendiri?
  5. Reference Module Problem
    - Pernah wujud tak masalah-masalah dalam mengurus
- PERFORMANCE OF REFERENCE MODULE**

**Library Skills**

According to Carey (1998) in his article about library skills, in order for students to engage in problem solving tasks, they need a set of skills—using a variety of information, concepts, and rules to arrive at a correct answer, understanding general operating rules and procedures at the resource center, identifying the names and locations of resources, recognizing relevant sources for specific reference tasks, and using the IT facilities. Carey (1998) stated that several models share the same features and characteristics of problem solving. A representative information problem solving model that he had identified was the Eisenberg & Berkowitz’s (1988) Big Six Skills Approach—(1) Task definition, (2) Information Seeking Strategies, (3) Location and Access, (4) Use of Information, (5) Synthesis, and (6) Evaluation. In line with this study, HM Library offers information skills workshops that will incorporate—how information is organized, how to look for information, how to evaluate information, and how to document sources (referencing/citation). Students are

taught on how to use library resources, access the library’s OPAC, search electronic databases to obtain information from online journals, and search the Internet effectively. In addition, they are also exposed to learning how to document sources of information and use the information ethically to avoid accusations of plagiarism.

In addition, HM Library also conducts library orientation program. The program is a way to help new students/users to familiarize themselves with the layout, regulations, types of services, and facilities offered at the library. It is conducted at the beginning of every new semester. New students/users are briefed on the services and facilities, followed by a tour of the library. They will also be introduced to the types of materials in the library. Faculties are invited to use this service and recommend it to students and staffs.

Reference and information services through reference desk and electronic medium are handled by skilled and knowledgeable staff. During their interactions, students and staff will be exposed

to search strategies in information retrieval for printed and electronic sources, and evaluating information from these sources. Students and staff will also be shown how to access and search the electronic databases—online journals. A senior librarian at HM Library stated that the librarians will provide assistance to any types of information request, especially to assist students in doing their class assignments or projects.

### Challenges

The librarian at the reference desk states that sometimes he or she is reluctant to check e-mails or use chat to answer questions. Users come to them at the desk to get help and of course, priority is given to them. The same staff on duty at the desk is expected to also check e-mails. There is no record of how many e-mails actually come in, but the ones that got feedback, according to Table 2, are not many. There might be a relationship between the numbers of unresponded or unattended e-mails to the number of requests coming in through e-mails. It could be that because e-mails are unanswered, users are reluctant to use email as enquiry place. But, there is no data to support this. Moreover, the traditional face-to-face method is preferred because the library is very accessible to students and staff.

Another observation is that, there are two perspectives that could affect the reference services provided by the HM Library. From the students' perspective, they could get a faster and immediate response through face-to-face medium. Through e-mails, they have to wait for the response and check e-mails every now and then, and from the answers given, they might have to post following questions. By looking at the enquiry types, data as shown in Table 4, at the same time when the users asked research based questions, they might also have questions about their searching techniques. To seek for that kind of answers and help, face-to-face medium is more appropriate.

Another perspective is studying the processes involved in entertaining each user's request. The reference desk system is a centralized system used among librarians at several libraries in the university. The system has a KIV feature that would allow HM Library staff to forward unanswered questions to the main library staff for them to assist, if required. The system may be intended to actually record the content of a question and its answer in detail, capture the time as it happens, and produce usage report. But in practice, due to time limitation, the information that was keyed-in into the system had been simplified. The reference desk system is more for collecting data to get usage statistics than for collecting the actual content of the Q&A. Hence, from the librarians' perspective, the existing system that they use to manage reference services still requires them to do manual work to capture the requests coming in. Those records could not be as detail as they would like them to be due to time constraint. Their tacit knowledge, which means the answers that they provide to users, is not recorded.

### RECOMMENDATIONS

As the university is moving towards a blended learning approach, academic staff is updating their courses in phases to enable blended learning. When policy and procedures change, the systems that are needed to support the functions of that institution will also change (Gellman–Danley, 1997). According to Gellman–Danley (1997) "distributed learning is a force that requires a fundamental reexamination of policies and procedures that define the business of higher education". Reference services at the library need to be IT-enabled in order to support the university. This will require online support capabilities, which means that the current administrative systems and institutions should be designed to support them. Online support capabilities include having well-trained staff in using IT-based tools, developing a database system that could capture the incoming requests automatically, and revising process in handling the reference services.

When the appropriate support systems are in place, the library could then evaluate the usage of different modes of reference services. Kwon and Kwen (2010) stated systems' perceived ease of use as well as perceived usefulness have a direct influence on usage of an information system and perceived usefulness facilitates the effect of perceived ease of use on usage (Agarwal & Prasad, 1999; Davis, 1989; Jackson et al., 1997). According to Heinrichs, Lim, Lim and Spangenberg (2007) previous studies adopted the Technology Acceptance Model (TAM) for studying factors that determine IT usage. The theory also stated "behavior intention has a high correlation with actual use" (Kwon & Wen, 2010). Therefore, as library users, students should be well-informed with the library services and play their roles as active online library users.

A study by Chu and Du (2013) suggested that academic librarians should make informed decisions in applying social media tools. In the study, a web-based survey was sent to 140 university libraries from Asia, North America and Europe, and only 38 libraries responded. The study revealed 27 libraries used social networking tools and 6 did not plan to use them at all. Facebook and Twitter were the most commonly used in university libraries. The study also showed that most library staff agreed on the usefulness of social media, but hesitancy among library staff and limited participation of users were perceived to be the hindrances. According to Chu and Du (2013) Facebook had been used to provide reference assistance and library tours, and to promote services. While social media seemed to have benefited the libraries, their use had not been widespread. The study suggested that it could be partly due to "librarians' perceived limitations in their abilities to set up profiles and in time dedicated for maintenance" (Hendrix et al., 2009).

As previously mentioned, Shaw and Spink (2009) identified varied models for virtual reference provision, such as hiring more staff to manage virtual reference services to release some work load of reference librarians. However, before HM Library decides to employ dedicated staff to handle virtual reference service,



more studies need to be conducted to identify what can be done to reduce the librarians work load in handling their face-to-face users.

Difficulties in managing enquiries through other mediums such as e-mails, chats, and phone calls are due to their unstructured nature and the inability to record the question-and-answer session information real time. One of the ways that could help in reducing these difficulties has indicated the need for the development of a database almost similar to an FAQ database. As mentioned earlier, Shaw and Spink (2009) had stated that developing an FAQ database is the most cost effective decision for libraries and the users can choose which mode to get information from the libraries. This will allow users to use self-service and hence, no new staff is required for a virtual reference service.

In this light, this study introduces V-Ref or Virtual Reference, targeted to cater to the online and virtual community information reference needs. The system is suggested with the baseline of meeting the basic reference needs of online and distance users. Advantages of V-Ref can be seen through these two strong features—(i) central source of information made available for major reference enquiries, (ii) reference transaction made available to all user across physical boundaries and time limitation. Therefore, the system can provide flexibility in reference services and serve as a backbone system in supporting reference services through an online, virtual and blended learning environment. This is in-line with the direction of the university in response to the Ministry of Education Malaysia requirements in promoting blended learning and teaching approach and engaging students in the transformation process.

#### **Proposed system**

V-Ref is a system that can keep references information. It is derived from daily operational routine in dealing with reference transaction and enquiries. It is a reference tool designed to help librarians to keep references information that they have acquired upon receiving requests from students or staff. Future users can use this reference information directly via online access. Solving a reference transaction problem requires recording of a reference librarian tacit knowledge. The content of this reference database will grow over time and it will become an important resource for reference guide. This new system should be able to cater to the specific needs of its users based on the subjects they are studying at the campus. In other words, this database will record references information per topic requested by a particular student.

The significance of this system is that it can provide a quick guide virtually to references based on users' requests and the knowledge pool will grow over time. The reference librarian can continuously update the information as more and more resources available so long as they are required by the students. Students can refer to V-Ref first before asking for an assistance from a reference librarian. Hence, V-Ref is a tool to help both the librarian—avoiding repetitive work, as well as the users—having faster access to answers. One of the problems that the system can solve is—eliminating the repetitive and straightforward reference questions which have already been answered by reference librarians. This can significantly reduce the total number of

questions to be responded by librarians at the reference desk.

#### **Implementation**

A prototype has been developed to support students in particular, studying at the campus. The design idea has not been presented to the library management staff at the main library. The researchers intend to test the system prototype at HM Library and plan to distribute a simple questionnaire to students who have used the prototype after a certain period. The researchers need to understand their willingness to use the system and find out if students and librarians get the advantages it is supposed to bring. No cost involved for HM Library for this purpose. Some of the snapshots of the prototype are shown in the following Figure 3.

#### **CONCLUSION**

Data collected by HM Library indicate that the library interacts directly with their users via a face-to-face medium, a traditional method of providing reference services, because this is the medium that the students prefer. Users will choose the method that they are comfortable with to achieve their goal in a short period of time. They are more comfortable speaking to the librarians directly and furthermore, they may not know how to generate questions by typing out the problem through e-mail or chat. Sometimes, their questions are related to basic reference needs and so, they may require a hands-on tutorial which they can get via face-to-face. The difficulties faced by students to learn and solve problems are genuine, and so, there is nothing wrong with having this preference. However, there are rooms for improvement in the reference services provided by the HM Library.

There should be a system that could record questions posted by students and answers posted by librarians, real-time. The system should have the capability to be accessed by students to post a question, check the answer to their particular question, and browse previous questions and answers stored in the system. When students can get what they want from the library through online method, there is no need for them to meet up with the librarian unless really necessary. Questions related to research reference can be handled by the proposed system. The proposed system can help reduce the number of face-to-face encounters when students themselves can view the answers online. There is no need for the librarian to use the reference desk system for research reference-type questions. The existing reference desk system can continuously be used to capture data for other types of enquiries, such as search techniques and other requests.

Students should also know their roles as students in using the library. They should utilize the workshops organized by the HM Library to learn and relearn basic library skills. Preparations for each assignment should be done much earlier, instead of at the last minute, to ensure that the library staff has ample time to assist their users. Students should not have the expectations that librarians will provide them with direct answers. They will only guide students to the right and relevant resources.

As previously mentioned, some of the questions that the librarians receive everyday from their users could have been avoided if proper database systems are available to store them for future retrieval. Having a system in place is one thing, but enforcing

people to use it, is even more challenging. Enforcement of new processes or policies can be successful if they can actually solve previous problems. Therefore, HM Library needs to revisit their policy and processes related to reference services to support virtual reference services. It is good to have various ways of communicating with the users to give them flexibility; however, the library should have the capability to support them. Reference

librarians at HM Library should give equal attention to enquiries directly from e-mails as they would give to enquiries directly from users at the reference desk. If, for an example, HM Library has no means to support enquiries by e-mails, then, users need to be well-informed. Lastly, librarians need to be well-trained and competent in using social media tools to take full advantage of the benefits offered by these technologies.

**FIGURE 3**  
**Snapshots of the Prototype**

**Please do not leave any field empty**

Student ID	1234567890
Email Address	student@email.com
Programme Code	
Course Code	
Topic	Difference between Information Systems and Information Technology
Save Record	

**Saving Your Query**

Student ID	1234567890
Your Topic	Difference between Information Systems and Information Technology
Post Date and Time	2015-01-30 18:40:00

An email has been sent out to notify our librarian about your query. Thank you for using our system.

**Admin Screen - Giving Feedback**

Program Code	From Student ID	Post Date	Question
	1234567890	2015-01-30 18:40:00	Difference between Information Systems and Information Technology
Main Area	<input type="text"/>		
Sub Area	<input type="text"/>		
Main Topic Area	<input type="text"/>		
Answer	<input type="text"/>		
By	<input type="text"/>		
Save Answer			

**Admin Screen - Saving Feedback**

Successful update of answer. An email has been sent out to inform the user : student@email.com

<b>Main</b>	INFORMATION TECHNOLOGY
<b>Sub</b>	COMMUNICATION
<b>Topic</b>	Difference between Information Systems and Information Technology
<b>Response Date</b>	2015-01-30 18:56:23
<b>References</b>	McLeod, R., & Schell, G. (2001). Management Information Systems 8/e. Chapter-17 "Marketing Information System" published in.
<b>By</b>	Aisyah Adam

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— This article does not have any appendix. —