Application of Computer Mediated Communication in the Delivery of Virtual Reference Services

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Abstract: *Internet technologies have facilitated libraries, communication with patrons. Reference services have become virtual and more effective. Today, most of library reference services have virtual reference applications. There is an increasing connection between Virtual Reference Service and patrons. Libraries have been accomplishing the transmission from traditional to digital medium and adapting to the new technologies. Traditional form of reference services has also moved to computer-mediated form, and libraries have started to communicate with patrons through many different communication tools and channels, synchronous and asynchronous. In today's libraries, computer-mediated communication (CMC) has an important role and Virtual Reference Services (VRS) fits in CMC. CMC connects library users to reference librarians over the Internet.*

This study reviews the virtual reference services in the context of CMC. The case of the research illustrates the virtual reference service in Turkish University Libraries through addressing current issues concerning the evaluation, sustainability, and, ultimately, the relevance of Virtual Reference Services for university libraries. Furthermore this research will investigate on future perspectives of librarians towards VRS.

Keywords: *Virtual reference services, computer mediated communication, university libraries, Turkey.*

Introduction

The reference service is one of the most significant parts of the library services since it is the connection point between users and librarians for all kind of libraries. Communication, face to face (F2F) or virtual, between library users and reference librarians is the key element for libraries to deliver the information to user. Computer networks and Internet technologies pave the way of accessing online library facilities and the transmission of information become easier than ever.

In today's libraries, CMC has an important role. As Chilton and McHaney (2009) mentioned, Computer-assisted communications have a great role in society as the cost of technology declines, the communications infrastructure grows, the cost of face-to-face meetings increases, and social pressure to communicate and network with others more efficiently increases. Authors defines CMC as a field that studies the use of computers and related technologies as a means of facilitating human communication and "mediate" implies reliance upon a third party or entity to enhance the information flow between two or more people (Chilton & McHaney, 2009).

In the last decade libraries have been accomplishing the transmission from traditional to digital medium and adapting to the new technologies. Traditional form of the reference services has also moved to computer-mediated form, and libraries have started communicate with patrons through many different communication tools and channels synchronous and asynchronous. Virtual reference services have become a reality and are an active part in the evolution of the library services on the Web. There is a number of definitions of VRS. One of the most common definitions was made by Reference and Users Services Association (RUSA). RUSA (2004) defines virtual reference as a: -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.

Background and Literature Review

With increasing availability of digital libraries and digital information resources reference services has altered the way of delivering information services. Many libraries are in transformation and accepting facilities/challenges of technology. Libraries and librarians are preparing themselves for the inevitable shift of communicating with users online. The world of the libraries is changing, and so is the reference librarian. As more and more patrons go to the Internet first to meet their information needs, libraries must be there to help them locate and obtain relevant information (Kresh, 2002, p.20). Nowadays students are digital natives: individuals who have grown up immersed in online media and who are well-adapted to CMC (Romiszowski and Mason, 2004) thus adaptation of CMC in library reference services should be taken into account.

Virtual Reference (VR) is a type of Computer Mediated Communication (CMC) that gives library users access to reference librarians over the Internet (Deangelis, 2010). Virtual reference and several of its equivalent terms, e.g., digital reference, electronic references are the new terms for modernity leading the reference services into the new information age.

Virtual reference services may provide better understanding in teaching activities for users to search on their own than traditional reference services: it shifts the control of the reference interaction away from the librarian (Gronemyer & Deitering, 2009).

At the same time the central question for virtual reference is "How can human expertise be incorporated effectively and efficiently into information systems to answer information seekers' questions?" (Lankes, 2004) and whether librarians have the skills and the attitude necessary to help patrons learn in the virtual environment (Gronemyer & Deitering, 2009).

Research Design

This study aims to evaluate VRS in university libraries where it is widely used by researchers and students. According to determined aim, this study reflects a research that conducted in university libraries in Ankara, İstanbul and İzmir, Turkey.

This study identifies the VRS provided by university libraries in Turkey. The research is a case study which particularly demonstrates the current applications of VRS and explores future perspectives of librarians towards VRS according to description method that is widely used in social science.

In this respect the research questions of the study that seek to determine the awareness application of VRS delivery and computer mediated communication in university libraries can be described as follows;

- What is the current situation of application of VRS in university Libraries?
- What is the efficiency level (including capabilities, perspectives and approaches) of VRS provided by university libraries?
- Which steps should be taken by librarians and library managers for the development of VRS in university libraries?
- What are the perspectives of reference librarians towards future of VRS for the next five years?

Data Collection

In parallel with research design and with the aim of gathering data from target group an online survey carried out with librarians who work in university libraries. In order to get depth knowledge for the research objectives the questionnaire is designed to gather both qualitative and quantitative data therefore it also included some open ended questions. The online questionnaire was disseminated to reference librarians via email. Email addresses of reference librarians were collected from web pages of university libraries in İstanbul, Ankara and İzmir. The survey generated 30 responses from 23 libraries however; two respondents provided their opinions about the topic and the situation of their libraries by replying email. According to these replies, two university libraries don't have VRS yet.

Sample of the research were gathered among several university libraries (state/private) from 3 biggest provinces (İstanbul, Ankara, İzmir) that are potentially providing virtual reference services to a large number of users in Turkey.

The research instrument consists of nineteen questions including 10 likert scale and 9 multiple choice and rank order questions. Additionally, quantitative data were gathered via three open-ended questions. The data

gathered via above mentioned instrument represents VRS and CMC approaches in 23 state and private universities and perspectives of reference librarians on VRS. University libraries that investigated in this research are displayed in Table 1.

Table 1. University libraries that are researched within the scope of the study

Universities
Ankara University
Atılım University
Başkent University
Bilkent University
Boğaziçi University
Doğuş University
Dokuz Eylül University
Hacettepe University
Haliç University
Koç University
Middle East Technical University
Piri Reis University
Sabancı University
Kadir Has University
TED University
TOBB University of Economics and Technology
İstanbul Ticaret University
Özyeğin University
Üsküdar University
İstanbul Bilgi University
İzmir University of Economics
Mimar Sinan Fine Arts University
İzmir Katip Çelebi University

There were 23 university libraries that participated in the research. 8 (58%) out of 14 university libraries from Ankara, 12 (31%) out of 39 university libraries from İstanbul and 3 (38%) out of 8 university libraries from İzmir were represented in this research. The contributions from İstanbul were not much, because most of the universities in İstanbul were founded in 2011 and 2012 and they may not have an active and efficient reference services yet.

Among the sample 6 of the universities are state universities, 17 of them are private universities. The descriptive statistics for test-beds discovered that, the two thirds (66.7%) of university libraries provide VRS while 33.3% of them do not implement VR services. According to results reference services are generally provided by 0-2 librarians in almost half of the university libraries (48%). 43% of the libraries have 3-5 librarians and 9% of them have 6-8 librarians in reference services.

Data Analysis

Qualitative findings obtained via the questionnaires within the scope of the research were analyzed using the program PASW (Predictive Analytics Software). Data that were gathered via questionnaires matched with forty six variables in PASW Software and cross-tables and descriptive statistics were used for analyses. Furthermore, quantitative findings were analyzed and reported by coded according to their topics and their similarities. In this section, some opinions of reference librarians that reflect current situation for VRS and CMC were reported.

Results

General Overview

In the beginning of the survey usage level of VRS (based on statistics) in libraries was identified by a Likert Scale question (1 to 5). According to results, in many university libraries (40.7%) the usage of VRS among users are in Medium (Fair) level. The usage of the VRS in 18.5% of libraries is in Good Level whilst in 22.2% of them the usage of the services is in Poor Level. In some (18.5%) libraries the usage is in Very Poor level.

Perspectives of Library Administration towards provision and development of VRS were investigated via another five scale Likert question. According to mean value (3.4), managerial perspectives for developing and

providing VRS range between Fair (21.4%) and Good (25%) levels as it is displayed in Table 2. Plus, more than half of the reference librarians (53.6%) stated that the managerial perspective for VRS is in Good and Very Good levels and more than one fifth (21.4%) of the reference librarians thought the managerial perspective on VRS is in mid-level. On the other hand some participants (25%) noted that the managerial perspectives for providing and developing VRS are in Poor and Very Poor levels.

Table 2. General overview on VRS perspectives in university libraries

	Very Poor	Poor	Fair	Good	Very Good	X	S
	%	%	%	%	%		
Usage Level of VRS	18.5	22.2	40.7	18.5	0	2.6	1.0
Managerial Perspective for VRS	17.9	7.1	21.4	25	28.6	3.4	1.4
Evaluation of technical facilities and capabilities	7.1	17.9	32.1	28.6	14.3	3.3	1.1
Effectiveness of Library in terms of VRS	14.9	22.2	33.3	25.9	3.7	2.8	1.1

The reference librarians were asked to evaluate the effectiveness of their own VRS. The results are demonstrated in Table 2. One third of the respondents (33.3%) considered the effectiveness of the VR services which provided by their libraries as fair. Some librarians (25.9%) stated that the VRS is in Good Level in terms of effectiveness while some of them (22.2%) in Poor Level.

Most of Librarians (32.1%) stated that technical resources for developing and presenting of VRS are fair. 28.6% of the participants considered the technical requirements are good as 14.3% of them considered it as Very Good. Some participants (17.9%) stated that the technical resources are in Poor level 7.1% of them found it as Very Poor.

Awareness

The awareness for VRS was revealed in different stakeholders. First, awareness of Library Administrations towards VRS was investigated from Librarians point of view. As it can be seen in the Table 3, the awareness of Library Administration towards VRS is considerably high (22.2%, Good / 22.2% Very Good).

Table 3. Awareness of Library Administration, Students and Reference Librarians

	Very Poor	Poor	Fair	Good	Very Good	X	S
	%	%	%	%	%		
Managers	14.8	14.8	25.9	22.2	22.2	3.2	1.3
Students	14.3	32.1	28.6	25.0	0	2.6	1.0
Faculty	14.3	28.6	32.1	25.0	0	2.7	1.0
Reference Librarians	10.7	0	14.3	35.7	39.3	3.9	1.2

Secondly, users' awareness was questioned. In the questionnaire users group were classified as students and faculty to have understanding on awareness of VRS. When asked "What is the level of awareness among students towards VRS" many respondents stated that awareness of VRS among students is not very high. 28.6% of respondents indicated that awareness among students are in Fair level, while 32.1% stated that level of awareness is Poor and even 14.3% stated that it is in Very Poor level. However; some respondents (25%) mentioned that awareness level among students is in Good Level. The survey results also demonstrated that awareness of the VRS is quite low among academics. As displayed in Table 3, majority of Reference Librarians (32.1%) stated that awareness among academics is in Poor Level.

Lastly, the question regarding awareness was directed to Reference Librarians to find out whether they are aware of VRS features in general and developments in VRS regardless of their current VRS applications. Most of the reference librarians (39.3%) believed that they are aware of developments in VRS facilities and features.

Reference Service Perceptions

Librarians were asked to rank (from 1 to 5) which Reference Services Methods and which VRS Channels are most preferred by their users via a matrix questions. The ratings related to perceptions are displayed in Table 4.

The results revealed that Face to Face referencing is not very common way for reference services in some university libraries (32.1%), while it is frequently in use for some libraries (35.7%). It was also sought which communication channels were preferred by users, as it is demonstrated in Table 4, Email service is most frequently preferred (1st, 14.3% - 2nd 21.4%- 3rd 32.1%) communication channel to submit enquiries electronically to reference services. According to the results users also preferred to use Social Networks

(Facebook, Twitter etc) (1st, 14.3%- 2nd 7.1%- 3rd 3.6%), Web Based Forms (2nd 10.7%- 3rd 17.9%) and Instant Messaging (Meboo etc.) (1st 7.1%- 2nd 3.6%- 3rd 10.7%). Apart From these virtual tools, users also prefer to get help from Reference services via Telephone (1st 3.6%- 2nd 21.4%- 3rd 21.4%), FAQ (1st 17.9%- 2nd 10.7%) and SMS (2nd- 7.1%).

Table 4. Rank order of reference services method

RS Method /Rank Order	Not ranked	1st	2nd	3rd	4th	5th
	%	%	%	%	%	%
Face to Face	3.6	32.1	10.7	7.1	10.7	35.7
E-mail	10.7	14.3	21.4	32.1	17.9	3.6
Telephone	10.7	3.6	21.4	21.4	32.1	10.7
FAQ	50	17.9	10.7	0	10.7	10.7
Social Networks	50	14.3	7.1	3.6	7.1	17.9
Web Based Forms	60.7	0	10.7	17.9	10.7	0
Instant Messaging (Meebo.. etc.)	60.7	7.1	3.6	10.7	10.7	7.1
Blogs	96.4	0	0	0	0	3.6
SMS	92.9	0	7.1	0	0	0
Video conference tools (Skype, Hangout. etc.)	100.0	0	0	0	0	0
Wikis	100.0	0	0	0	0	0

Table 5. Reference service usage

RS Usage /Rank Order	Not ranked	1st	2nd	3rd	4th	5th
	%	%	%	%	%	%
Databases and access to electronic resources	10.7	32.1	17.9	7.1	10.7	21.4
General (Library usage rights, working hours...)	25.0	25.0	25.0	14.3	3.6	7.1
Information needd for a research or a reference	21.4	3.6	17.9	28.6	21.4	7.1
Finding a known item	25.0	7.1	14.3	14.3	32.1	7.1
Resource usage and technical support	46.4	0	7.1	17.9	10.7	17.9
Reference services for citations	67.9	14.3	3.6	7.1	3.6	3.6
Daily information needs	57.1	7.1	3.6	3.6	10.7	17.9
Other (please specify)	100.0	0	0	0	0	0

Table 5 demonstrates the responses for the questions of "Which types of Reference Questions are usually submitted by user to reference services through using electronic media". As results show 'Databases and access to the electronic resources' (32.1%) took place in the top of the list. 'General and Ready Reference Questions' such as borrowing rules and working hours follow as second (1st, 25% - 2nd 25%) and 'Information need for a research or a reference' is in the third places. Table 6 shows the communication tools used for reference services.

Table 6. Communication tools used for reference services.

Communication Tools /Rank Order	Not ranked	1st	2nd	3rd
	%	%	%	%
E-mail	10.7	32.1	35.7	21.4
Social Networks (Facebook, Twitter, etc.)	39.3	17.9	25.0	17.9
Chat (Embedded software or via web pages)	46.4	21.4	14.3	17.9
Instant Messaging (Messenger, Skype, etc.)	57.1	14.3	10.7	17.9
SMS	85.7	3.6	3.6	7.1
Blogs	89.3	0	0	10.7
Wikis	96.4	0	3.6	0

According to respondents, Email is the most ideal way to provide Reference services (32.1% - 35.7%). Social Networks (1st 17.9% - 2nd 25%) and Chat (Embedded software or via web pages) are also considered as ideal ways of communication with users. Instant Messaging (Messenger, Skype, etc.) is also mentioned by librarians as an ideal communication channel.

The results revealed that Librarians usually reach to users via Library Web site (82.1%) to inform them about VRS facilities. User training/orientation (82.1%) is also one of the most frequently used way to update the users about the VR services. Library News Bulletin, Library Guides and Librarians on desk play role to publicize the VRS among users.

Skills, Competencies, Expectations and Improvements

In the end of the survey, future expectations, improvements and required skills and competencies for efficient VRS were asked to the participants as three separate open ended questions. Quantitative results obtained from these questions were classified and coded according to their similarities. In this context, some librarians shared their opinions regarding future expectations for VRS and their libraries as listed below:

> *….It is very difficult to evaluate next five years with this quickly changed world. However in my opinion most of the today's F2F reference services will be transmitted into virtual environments completely...*
>
> *...Virtual services will be the most important services within the scope of Library Services. Awareness-raising activities are very important not only for librarians but also for users…*
>
> *...administrative perspectives and approaches are extremely important for providing these services and creating best-practice environments for VRS...*
>
> *...it is difficult to talk about the next five years of VRS, especially today's rapidly changed world. I believe most of the F2F reference services will be provided by virtual environments. In this context requirements for keeping libraries up-to-date will create important challenges and opportunities...*
>
> *...VRS will be more widespread information services for libraries and physical reference services will be replaced by VRS...*

Skills and competencies of reference librarians to provide efficient VRS were also investigated via an open-ended question. According to librarians' opinions a reference librarian should have the following skills and competencies for efficient VRS: IT skills, Communication skills and public relations, Information literacy skills, Problem-solving skills, Decision making skills, Language skills, Critical thinking skills, Time management skills, keeping up with innovations.

In the end of the open-ended questions, existing structures of the VRS were examined and some recommendations were made by reference librarians for the improvement of VRS. These recommendations can be listed under the following headings; Marketing and promotion of VRS to increase awareness, Social media marketing, Policy developments and implementations, Trainings for reference librarians and users, Technological infrastructure improvements, Various communication and VRS tools, Mobile technologies, More user oriented services.

Conclusion and Recommendations

Today's VRS utilize various communication channels, yet the current primary modes of delivery for VRS are generally e-mail, telephone, and real-time chat communication. However as results displayed F2F referencing is still in highly used. In this study, it is found that VRS especially synchronous communication services are not entirely in use in all university libraries. Email service is most frequently used in many university libraries, and face to face reference services are in often used. Although many university libraries in developed countries offer synchronous communication to their users, the new media tools and new virtual communication channels are not very common for referencing in Turkish University Libraries.

Turkey has a great potential with its young population. Internet usage, especially social network usage is very common in the country (according to Internet World Statistics (2012) 30,963,100 Facebook users on Dec 31/11). Libraries should take into account that potential user groups are in the online platforms and create an opportunity for users to reach to reliable information in global information explosion.

Computer based education and CMC increasing in the Turkish community as it is in the world. Synchronous/asynchronous interactions and new communication methods have great impact on Education system. Libraries as an important part of educational life should design and update their services considering CMC developments.

Based on the usage statistics provided by librarians, current use of VRS among users are not in Good Level. Users should be encouraged to use VRS and to get benefit from services available in libraries. Libraries should reach the user groups as much as possible and inform them and market their services. Awareness of the user is not high level among users. It is important to make all user groups aware of the virtual reference service. On the other hand, libraries should create and develop marketing strategies to publicize the VRS.

Reference librarians should improve their skills and competences. Professional development and learning activities such seminars or workshop may be arranged to update the reference librarians about new developments in the field of VRS and information services. The findings pointed out that, almost all respondents believe that the future of the reference services will be much more technology donated and featured.

Further Research

This study was carried out at 23 university libraries in three biggest cities of Turkey. As a further study, similar studies can be conducted for the measurement of awareness in order to VRS implementation in university libraries. Extended version of this study can also be applied to all university libraries in Turkey and the results can be useful for reflecting VRS perceptions of reference librarians and making comparisons with those of other countries which utilize VRS implementation.

The users' expectations and perspectives are important for services when a library is developing a service, and it is definitely essential to look at the evaluation from a broader perspective. Therefore user‘s perspectives towards the virtual reference services would be studied.

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