

Investigating Students' Use of Digital Reference Service in Oman's Academic Libraries

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Abstract

This study aims to understand the user behavior of digital reference services (DRS) among students in the Sultanate of Oman academic libraries and assess its factors. Using a questionnaire designed for the study, adopting quantitative research that employed a cross-sectional online survey, data were collected from 459 respondents in Sultanate of Oman university libraries. The results revealed that intention is a moderate determinant of DRS use. Performance expectancy, facilitating conditions, and social influence have significantly influenced intention; meanwhile, effort expectancy has no significant impact. Therefore, this study provides a valuable basis for Omani higher learning institutions to promote library digital reference culture among students and contributes to the dearth of empirical DRS studies in the Arab world.

Keywords

digital reference service; unified theory of acceptance and use of technology (UTAUT); reference and user services association (RUSA); user behavior; Sultanate of Oman

1. Introduction

The reference desks in academic libraries have historically been where skilled librarians serve as intermediaries to connect users to library collections and services (Bandyopadhyay & Boyd-Byrnes, 2016). According to Younus (2014), in addition to supporting users in the reference desk, the reference librarian assists users with the reference services in cyberspace by using online technologies. Recently, academic libraries have become more commonly visible on the Internet, and many are launching websites and finding ways to extend their services by engaging with users and reacting through the Internet to their inquiries. This service is called Digital Reference Service (Uutoni, 2014).

The digital reference service (DRS) has shown its significance during the Covid-19 pandemic during the suspension of studies in all educational institutions in the Sultanate of Oman, as academic libraries continue to provide remote services to the user community with the required and appropriate information. DRS is a network of mediators and experts who work to meet the needs of internet users (Dawood, 2015). Remote access to reference services by library users, as mentioned by Bakar (2009), is a significant challenge. Libraries must develop strategies to meet the demand for remote access among their current users. A variety of options for reference services are now available in the digital age, and libraries must begin deciding which communication modes to employ. The greater the use of technology in reference services, the easier it is to obtain statistical information that assists libraries in making the best decisions about the services they can provide (Gurganus, 2015). This study will shed light on the DRS in the Sultanate of Oman as one of the essential services in academic libraries and provide recommendations to help improve and expand the service. This study is also meant to inspire researchers to conduct additional DRS research in the Omani literature.

Nowadays, DRS has become one of the core services offered to users in higher education academic libraries. Consequently, fulfilling the needs of remote users in the academic library has become highly complex with the increase of information sources accessible on the web and changes in library users' behavior (Tyler & Hastings, 2011). According to Almahroqi (2014), academic libraries in the Arab world have begun to provide the reference service modestly, and

limited patterns such as email, web form, and Ask the Librarian service have been the primary channels in providing the service with a low-quality level.

Alhinai (2014) asserted that the DRS in some Omani medical libraries is still in its early stages, where only e-mail and telephone are used to respond to reference queries. In addition to the lack of understanding by many users about the value of the available DRS, it negatively affected its use. He found that most students in the main library at Sultan Qaboos University in Oman do not know about the library's DRS and thus lowered the statistics annually. Additionally, Alhaji and Almahroqi (2013) found that the level of adherence to the RUSA DRS Guideline in academic libraries at Qaboos University was low. Many Oman academic libraries provide reference services to users, but the reality of this service is yet to be investigated and evaluated.

As per Alkharousi et al. (2018), academic libraries face significant challenges since many library users are Internet users. Therefore, libraries need to integrate the use of Internet tools to suit the behavior of users. In the context of Oman, however, most academic libraries are unaware of the significance of the Web 2.0 environment. This is also clearly expressed in the Omani Academic Library (OAL) portals, inactive links to Facebook. In the context of Omani literature, the UTAUT model was not adopted in related research of DRS. The previous studies focused mainly on mobile commerce (Aljabri, 2018) used the UTAUT2 model in predicting consumer acceptance of trade. Al-Aziziyah, (2017) used the UTAUT model to determine factors that affect mobile applications through Oman government agencies.

Hence, this study is intended to bridge the gap of knowledge by defining the use pattern of DRS in the Sultanate of Oman's academic libraries. This study will investigate the acceptance of DRS among students in the academic libraries of the Sultanate of Oman by using the UTAUT model.

2. Literature Review

Academic libraries have begun to use digital technologies to offer services and acquire resources. Such efforts have improved service quality and boosted resource access for students, instructors, researchers, and other users (Bandyopadhyay & Boyd-Byrnes, 2016). Furthermore, using technology allows libraries to provide services in familiar and comfortable ways to new generations of customers (Deng & Zhang, 2015). As a result, the physical reference desk's

reference service has been extended to the digital reference desk. Users can now submit queries at any time and receive responses from any location (Younus, 2014). DRS is defined by the ALA's Reference and User Services Association (RUSA) as an electronically initiated, commonly in real-time, reference service in which users communicate with reference personnel via computers or other internet technologies without being physically present. Chat, video conferencing, email, and instant messaging are popular communication methods used in virtual referencing (King, 2009).

Reference services have been considered one of the significant library tasks connected to the library and the users. Many scholars attempted at the beginning to conduct profound studies on reference services to have a better understanding of it (Hussien & Mokhtar, 2018). James Wyer made the earliest definition in 1929. He defined reference services as direct, helpful, and knowledgeable personal assistance in searching library collections. Then the definition was expanded by many researchers according to their understanding of reference services.

2.1 Use of Digital Reference Service in Arabian Gulf

The user's knowledge has expanded, his needs developed, and he becomes more demanding towards developing digital content to enhance the availability and accessibility and the multiplicity of electronic means of communication used with DRS provision. Kuwait was the first Arab country to subscribe to the electronic database dialogue in 1978. Yarmouk University in Jordan was the first university to adopt automation in managing its office operations in the early 1980s.

Bamfleh (2009), in his prior study on DRS in the Gulf academic libraries, evaluated the DRS in a range of GCC academic libraries to check adherence to the guidelines and the level of service quality (RUSA) by analyzing the reference service sites on the Internet. The study also used the experimental approach by directing queries to the reference service in those libraries. The study revealed limited commitment of the libraries of the Gulf universities field of study to apply the guidelines of the Association (RUSA), and libraries that have committed to using these guidelines were not the best when evaluating the service.

In the context of Saudi Arabia, Altamimi (2017) found that through his previous work in a university library and his review of the literature relating to a DRS in university libraries in Saudi Arabia has shown that few studies have addressed the subject of the studies of users and their

satisfaction with the DRS in the library of King Abdul Aziz University (KAU). Therefore, the study aimed to define the reality of the reference service provided by the Library of KAU from the users' point of view. The researcher used the descriptive approach to determine users' satisfaction with a library's DRS using a questionnaire survey. The study found a high degree of joy in the DRS provided, which confirms the library's success in reaching its users by opening communication channels with them and providing services to them by employing the latest information and communication technology. Also, access to the service through the library's website is easy as the service appears prominently on the home page. In addition, the DRS has contributed to the marketing of KAU library services to wider audiences by using information and communication technologies, which fades with geographical and temporal barriers. Thus, the DRS provided by KAU Library is predominantly advisory services with low reference service rates that focus on providing information and answering reference questions when looking for specific facts.

In Iraq, a study by Dawood (2015) discussed university libraries in Iraq that started in the last ten years to invest in Information Technology and the Internet to provide modern information services to the users, especially the search service in the library catalogues and the current awareness service, while the DRS was not available despite its importance and role in the service of users and to the library. Many libraries have sought to provide these services in the university libraries. His study aims to define the DRS and the methods to offer it, which also aims at identifying Iraq's university libraries that provide the DRS and its status. The websites of libraries have been reviewed for data collection. Moreover, a questionnaire was sent to those libraries. The study shows the following results: three university libraries in Iraq provide the DRS. Two of the libraries are governmental, and the third is private, whereby both the University of Baghdad and Kufa's central library use web form as a specific means of delivering the DRS. Most of the employees offering DRS in these libraries are not experts in the profession of library and information. The researcher suggests that the two government libraries should provide more than one service delivery method. In addition, the university chancellors may provide sufficient financial assistance to the central libraries.

In Sudan, a study by Mohammed (2014) defined the nature of the DRS and its requirements in libraries in its theoretical analysis. In addition, the university has learned about the statistics,

measurements, and quality standards used for its evaluation. The practical framework of the study highlights the reality of the DRS throughout the academic libraries that are selected as the sample of the study community. This will be assessed against indicators and standards of the quality of information services in libraries, especially the electronic reference services. To fulfil his study requirements, the researcher has been using the historical approach in identifying the foundation of the electronic reference service in libraries, as well as the descriptive method in both forms of analysis and survey, to determine the reality of the application of indicators and standards of the electronic reference service in study libraries. In addition, a statistical approach is used to analyze the data collected by the questionnaire for it to be expressed in numbers. The questionnaire relied on a powerful tool for data collection with consideration given to the interview and direct observation. The research has provided a variety of findings, the most important of which is that the libraries rely more on e-mail as an intermediary to give the reference service (60%). A variety of sources is relied upon when answering the reference questions in the libraries where more reliance on electronic databases by (30.4%). Considering the results, the study recommended several recommendations, most notably that the libraries should develop a clear, written, and public policy related to the DRS.

In Lebanon, Jaber (2015) showed that with the spread of ICT in Lebanese libraries, since the 1990s, enhanced access to electronic resources has become a reality. The Internet has provided an ideal means of communication for the provision of DRS. The study aimed at defining and assessing the validity of DRS in academic libraries in Lebanon concentrated on the guidelines of the DRS of the International Federation of Library Associations and Institutions IFLA. In this study, the researcher adopted the descriptive analytical approach by using direct observation of the websites of the electronic libraries to evaluate the service interfaces and questionnaires for library managers to obtain statistical metadata about service management. The researcher also adopted the experimental approach, using implicit experience to evaluate DRS practices. The population consisted of forty-three libraries belonging to higher education institutions in Lebanon. Eight of them met the search criteria, the most important of which is that the library should provide any form of DRS and that the service should be advertised on its website. The researcher obtained a set of findings; the most important is that 91% of academic libraries offer a DRS. The reference

service is available in two asynchronous formats (e-form 75% and e-mail 63%). The percentage of librarians working in the DRS is 30%, and English was the dominant language in answering reference questions. The service did not meet the IFLA standards neither in terms of designing online service interfaces (49%) nor how the service was practiced (21%). The efficiency of the online DRS interfaces was 54%, and the service was not adequate by experience. The study concluded that Lebanon's DRS is in its early stages, and practical experience has shown that they are still in the ranks of developing countries.

2.2 Use of Digital Reference Service in Oman

Oman is a developing country that occupies most of the South-Eastern part of the Arab Peninsula and borders the United Arab Emirates to the north, Saudi Arabia to the west, and Yemen to the south-west (Hijji & Cox, 2012). The Sultanate of Oman is undergoing a significant change in its higher education system. The universities have a deep commitment to teaching and research excellence. Universities have demonstrated commitment to creating and disseminating expertise in all fields in which they work through research, academic publishing, education, and community service (Baporikar & Shah, 2012).

Academic libraries are critical essential components in the higher education system that support the curriculum and research goals and provide the university or college community (Samea, 2015). Many benefits have been developed, such as the reference service. DRS in academic libraries merit a high degree of marketing such that their clients are aware of the existence of such services. At the level of the Sultanate of Oman, three studies have appeared on DRS.

The first one refers to Almahroqi (2014). He discussed how the reference service in the Sultanate of Oman's academic libraries began in the main library at Sultan Qaboos University in 2004 by e-mail. Then the instant messaging service was made available by a program called MEBO in 2011, but they were suspended in 2012 for lack of staff. The webform for inquiries and Twitter was recently launched in 2013. Almahroqi (2014) study aimed at defining the reality of the DRS used by Sultan Qaboos University postgraduate students, which was provided by the main library at the university, and identifying the challenges facing references librarians in providing

this service. The study utilized the content analysis method for gathering data from the Sultan Qaboos University library website and used the questionnaire to collect data from 313 Masters and Doctoral students.

Moreover, semi-structured interviews were conducted with reference librarians to clarify specific aspects of the topic. Almahroqi (2014) 's most important finding was low awareness of DRS among students, lack of understanding of the service's existence, shortage of trained staff, lack of efficient marketing, and lack of instructions for using the service. E-mail was identified as the most crucial method requiring assistance, followed by Instant Messaging and Facebook.

The second study by Alhinai (2014) highlighted the medical information institutions in the Sultanate of Oman as institutions that keep pace with modern technological developments. Thus, the study sheds light on the reference service in the Omani medical information institutions and the extent of the commitment of librarians activating them. The study aims to identify the quality of the reference service in both digital and traditional forms in the medical libraries in Oman, based on the opinion of the information specialist. The study utilized a quantitative descriptive approach through the Sultanate of Oman's medical libraries and evaluated the reference service by adopting a questionnaire.

The study's results were collected from the Sohar Hospital Library, and the Royal Hospital as the online reference service is still in its early stages (only e-mail and telephone are used to answer reference queries). The significant progress in other medical libraries in providing DRS is by taking advantage of modern means such as social networks, text messages, application forms sources, and the link Ask the Librarian in the Medical Library of Sultan Qaboos University Military Hospital Library and Oman Medical Library College in Sohar.

The third study was conducted by Alhaji and Almahroqi (2013); this paper discussed the measurement for the DRS at the websites of the American Library Association (ALA)'s Sultan Qaboos University and UAE University libraries to assess the extent of their adherence to the criteria set by The Reference and User Association (RUSA). His study aims to identify a commitment of online reference service sites to university libraries Sultan Qaboos and the United Arab Emirates University with guidelines drawn up by the Services Association References and beneficiaries of RUSA for beneficiaries and quality of service with identifying the advantages and

disadvantages of the service and thus to determine the requirements for its development based on the mentioned criteria, and pursuit and suggest other standards. The study adopted content analysis methodology by tracking the service routes and tools under study at the libraries site.

The study's results are the DRS at Sultan Qaboos University libraries followed by RUSA guidelines by 13% and university libraries in the UAE University was 33%, which indicates that DRS standards are low. The similarities and differences in providing a DRS at the Sultan Qaboos University Library sites and the United Arab Emirates University libraries have shown that some standards were adhered to by both parties, and others were applied on one side and another. In addition, there seems to be a consensus in the application or a lack of criteria. Concerning the identity of the users of the service, the libraries that were studied agreed not to request it, as well as in the instructions for use and in determining the level of service as it was not included in any of the library's sites as there was a weakness in the marketing of the service in all libraries. One positive element was that the libraries under study had a positive result in responding quickly to inquiries.

The links were available in Arabic and English as they were parallel in UAE, while Sultan Qaboos University libraries provide better links in English.

After the summary of literature reviews exploring DRS, including the methodology and significant findings of each study, it can be observed that DRS is the most studied in providing reference services in libraries. Kuwait was the first Arab country to participate in the electronic database at the level of the Gulf countries. For other Arab countries, Jordan was the first university to adopt automation in managing its office operations. In addition, there is a limited commitment of the libraries of the Gulf universities to apply the guidelines of RUSA and libraries that have committed to using these guidelines were not at their best when evaluating the service. Many libraries have sought to provide DRS in Iraq, but most of the staff providing DRS in these libraries are not specialists in the library and information profession. The DRS in Lebanon is still in its early stages, and practical experience has shown that it remains in the ranks of developing countries.

South Africa's academic libraries struggle with technological connections, weak infrastructure, growth in the collection and other issues. One of the main challenges facing librarians was the lack of knowledge to explain how to access different library services adequately.

Early adopters of virtual reference technology in the United States have been libraries. Many are open to the concept of chat reference or to using chat within the academic environment for specific research purposes.

At the Sultanate of Oman level, three studies on the topic of the DRS have been published, the online reference service is still in its early stages, and there is low awareness of DRS among students.

The importance of investigating DRS use among students in Omani higher learning institutions is evident. Using different theoretical frameworks to measure user acceptance towards the service will assist in identifying the latest needs.

3. Research Questions

1. What is the use pattern of DRS in academic libraries in the Sultanate of Oman?
2. What are the factors that influence students' use behavior based on the unified theory of acceptance and use of technology?
 - a) Does intention have effect on the students' actual use behavior?
 - b) Does performance expectancy have effect on the students' intention to use DRS?
 - c) Does effort expectancy have effect on the students' intention to use DRS?
 - d) Does social influence have effect on students' intention to use DRS?
 - e) Does facilitating condition have effect on the students' intention to use DRS?

4. Theoretical Framework

4.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

Individual acceptance and use of information technology is the most common researched in the field of information systems (Venkatesh et al., 2012). Since the current study is trying to investigate students' acceptance towards DRS in libraries, the theoretical framework to be utilized is the Unified Theory of Acceptance and Use of Technology (UTAUT) adapted by Venkatesh et al., (2003). The selection of the UTAUT model for this study is justified by its global and integrative approach, which integrates a broad range of explaining variables from the major

theoretical models developed to explain the acceptance and use of technology (Attuquayefio & Addo, 2014).

The UTAUT model combines eight major models on user technology acceptance, namely the Theory of Reasoned Action (TRA), the Model of Personal Computer Utilization (MPCU), the Theory of Planned Behavior (TPB), the Motivational Model (MM), the Social Cognitive Theory (SCT), the Innovation Diffusion Theory (IDT), the Technology Acceptance Model (TAM), and a model Combined TAM and TPB (C-TAM-TPB).

UTAUT sums up the basic constructs from all eight models to four independent variables predicting the two dependent variables 'Technology Usage Intention' and 'Technology Usage Behavior' (Brünink, 2016). This model contains models that have been tested and validated in previous studies for the adoption and use of the latest information technology (Megadewandanu, 2016). In addition, a study by Jaya et al., (2017) stated that the UTAUT model has been developed to explain users' behavior regarding information technology. UTAUT contains four essential determinants of user acceptance and usage behavior: effort expectancy, performance expectancy, social influence, and facilitating conditions (Awuah, 2012). The variables of gender, age, experience, and voluntariness are used to illustrate the impact of performance expectancy, effort expectancy, social influence, and facilitating conditions on behavioral intention and use behavior.

UTAUT model is beneficial in analyzing issues related to the identification of skills and competencies to understand predictors of the actual use of technology in various fields such as communication, banking, education, health, and others (Abu et al., 2015).

UTAUT has been applied, integrated, and expanded by researchers to study the acceptance and usage of individual technology over a wide variety of fields involving different types of users, different types of organizations, different types of technologies, different tasks, different time frames, and locations (Venkatesh et al., 2016). Venkatesh et al. (2003) asserted that UTAUT is a comprehensive and efficient when compared to other technology acceptance theories available to date.

4.2 Theoretical and Empirical Background

Individual acceptance and use of information technology is one of the most common fields of information systems research, according to Venkatesh, V., Thong, J.Y., and Xu, X. (2012). The UTAUT model was chosen for this study because of its comprehensive and integrative approach, which comprises a wide variety of explaining variables from the major theoretical models to explain technology adoption and use (Attuquayefio & Addo, 2014). This model includes models for adopting and using the latest information technology that has been tested and proven in prior studies (Megadewandanu, 2016). The UTAUT model was used to investigate the acceptance and use of DRS among students in the Sultanate of Oman's academic libraries. The main factors of the UTAUT model are examined in the present study (performance expectancy, effort expectancy, social influence, facilitating conditions). Consequently, it is essential to apply such a model to the study of DRS use in the Omani context to gain a better understanding of how these services are used by their users.

Performance Expectancy (PE)

Performance expectancy refers to a person's belief that using the system will help them improve their job performance (Venkatesh et al., 2003). Extrinsic motivation (MM), perceived usefulness (TAM), perceived control (TPB), relative advantages (DOI), outcome expectations from social cognition theory (SCT), and job-fit from personal computer utilization (CPU) are some of the theories that have been used in previous models to predict performance (Al-Aziziyah, 2017). Previous studies have found that Performance Expectancy (PE) is a significant factor determinant of an individual's intention (Venkatesh et al., (2012); Tarhini et al., (2016); Al-Aziziyah, (2017); Awwad and Almajali, (2015).

Effort Expectancy (EE)

This refers to the degree of ease with which a system was used (Venkatesh et al., 2003). Similar constructs in other models, such as complexity (MPCU) and perceived ease of use (TAM), were used to develop this construct (Al-Aziziyah, 2017). According to Tarhini et al., (2016); Zuiderwijk et al., (2015); Aljabri, (2018) Effort Expectancy (EE) is a significant factor determinant of an individual's intention

Social Influence (SI)

This represents how many people believe the new system should be implemented (Venkatesh et al., 2003). Social influence is similar to that of social factors in (MPCU) and subjective norms (TRA, TPB) in earlier models (Aljabri, 2018). Past studies like (Tarhini et al., 2016; Ademola, 2019) support that Social Influence (SI) is a significant factor determinant of an individual's intention.

Facilitating Conditions (FC)

It refers to a person's belief that the system must have the organizational and technological capacity to make it easier to use (Venkatesh et al., 2003). Perceived behavioral control, facilitating conditions, and compatibility with the previous model comprise this factor (Aljabri, 2018). Previous research, such as Al-Aziziyah (2017); Venkatesh et al., (2003); Tarhini et al., (2016) have found that Facilitating Conditions (FC) is a significant factor determinant of the individual's intention.

4.3 Research Model and Hypotheses

The purpose of this study is to identify factors influencing DRS use behavior among students in Sultanate of Oman academic libraries adopting the UTAUT model. Based on the theoretical framework and the past researches employing the UTAUT as indicated in the literature review, the current study is examining the influence of intention on use behavior as its main determinant, as well as the influence of performance expectancy, effort expectancy, social influence, and facilitating condition on intention as its predictors. Based on the theoretical and empirical background on the factors influencing DRS use behavior, the following research model (Figure 1) and hypotheses are proposed:

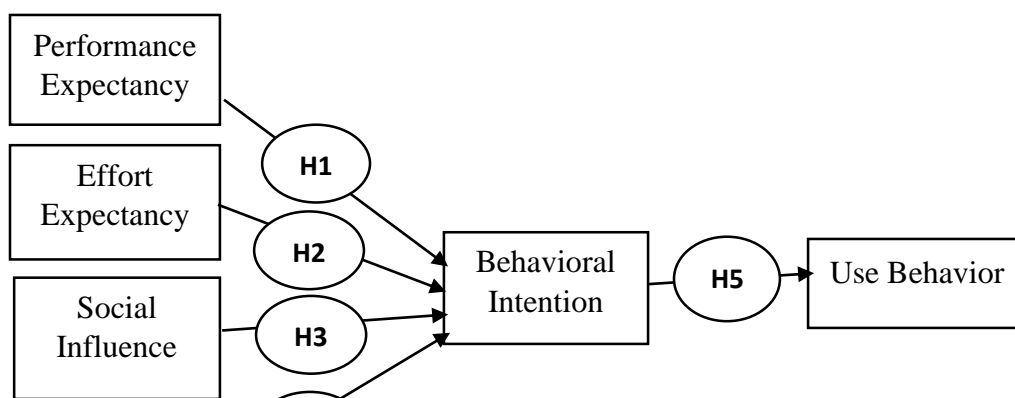


Figure 1 The Proposed Hypothetical Model

H1: Performance Expectancy impacts the behavioral intent to use DRS positively.

H2: Effort Expectancy positively impacts behavioral intention to use DRS.

H3: Social Influence positively impacts on behavioral intention to use DRS.

H4: Facilitation Condition positively impacts on user behavior to use DRS.

H5: Behavioural intention positively impacts students' use behavior.

5. Methodology

5.1 Research Design

A cross-sectional web-based survey was used as a method to collect data from the students in different public and private universities in the Sultanate of Oman. The instrument employed for

this purpose was a self-administered questionnaire. There are many benefits to conducting a web-based survey. Online surveys are more efficient and quicker to distribute and gather than paper surveys. The online tools allow participants to respond whenever and wherever they want. Furthermore, because the researcher was not present while the questions were being answered, the quantitative data was devoid of bias. Participants in online surveys have more time to think about the questions before responding, which could improve the accuracy of the information provided (Almuhanna, 2018).

5.2 Sample and Sampling Technique

Students from academic libraries in the Sultanate of Oman that offer DRS will be the study's target population. The total number of students enrolled in universities is 16,981 (Higher Education Admission Center, 2019). After determining the sampling frame, the sample size is 376. To achieve the highest response rate, the researcher distributed 600 emails containing the survey questionnaire.

5.3 Survey Instrument

The data was gathered using a questionnaire. According to Sejjane (2017), the main objective of a questionnaire is to obtain facts and perspectives on a phenomenon from people who are knowledgeable about the subject. Since the participant's native language is Arabic, the survey was designed in both Arabic and English. When a researcher decides to employ a survey in a study, they must examine the survey's design, the most acceptable technique of sample distribution, and the survey's topics (Almuhanna, 2018). The questionnaire in this study was based on studies by Venkatesh et al., (2003), which used the UTAUT model to investigate technology acceptance; it was also based on other studies on digital technology acceptance, such as (Khan et al., 2017), (Zalah, 2018; Arif et al., 2018; Kurt & Tingöy, 2017 & Chang, 2013). The survey was divided into five sections. Nine academic experts from various universities reviewed the survey items to confirm their validity and appropriateness for the study area. The survey was created using Google forms by the researcher.

5.4 Data Collection

In this study, the survey was conducted online by sending an email with a questionnaire link to the participants. The email, which was written in both English and Arabic, introduced the study to the participants inviting them to participate in the survey by answering the research questionnaire. The questionnaire was provided in the email through a URL link that led the participants to a Google Form to answer and submit it online. Once the participants submitted their answers, the data were recorded directly into a spreadsheet later transferred into data analysis software to carry out the required analysis. In order to ensure attaining the required sample size, a submission date was arranged to ensure that all the students would comply with it. Finally, reminder emails were sent to the students to answer the questionnaire.

5.5 Data Analysis

Using SPSS 27, the sample descriptive characteristics were assessed based on demographic information, including gender, age, nationality, level of education, type of university, faculty, year of study, university (Zalah, 2018). This study employed the partial least square structural equation modelling (PLS-SEM) method. The PLS-SEM was utilized because the proposed model includes a variety of indicators. The measurement models describe the relationship between the indicator variables and the constructs to which they are linked (Hair et al., 2014). Using partial least square path modelling PLS-SEM (Smart PLS 3.0), both the measurement model and the research model, as well as the research hypotheses, were tested. When the data set for the research is based on common factors, researchers should use the PLS-SEM. Acceptance of technology is a common factor in behavioral research. Zainab (2017)

6. Data Analysis and Results

6.1 Demographic data

As depicted in Table 1, there were 459 respondents, with 36.6 % (168 respondents) being male and 63.4 % (291 respondents) being female. The survey revealed that the majority of the participants

were between the ages of 20 and 30, by 91.3 percent, followed by those between the ages of 31 and 40 (6.1 %), 41 to 50 (2.4 %), and those beyond 50 (.2%). According to the respondents' educational levels, most have bachelor's degrees (72.3 %), followed by a Diploma of 20.5 percent. The rest (6.3 %) are master's degrees, while doctorate degrees are (.9 %). The participants' study year reveals that the second year has the highest percentage (29.2 %), followed by the third year (24.4 %).

Table 1 The respondent's demographic profile

Category	Item	Frequency (N=459)	Percent
Gender	Male	168	36.6%
	Female	291	63.4%
Age	20-30	419	91.3%
	31-40	28	6.1%
	41-50	11	2.4%
	More than 50	1	.2%
Qualifications	Diploma	94	20.5%
	Bachelor	332	72.3%
	Masters	29	6.3%
	Doctorate	4	.9%
year of study	First-year	95	20.7%
	Second-year	134	29.2%
	Third year	112	24.4%
	Fourth year	49	10.7%
	Fifth year	69	15.0%

Q.1 What is the usage pattern of DRS in academic libraries in the Sultanate of Oman?

According to the survey results, most participants use social media, followed by email and web forms as seen in Table 2.

Table 2. The usage pattern of DRS in academic libraries in the Sultanate of Oman

Frequency of use	Chat	135	29.4%
The DRS modes	E-mail	203	44.2%
	Instant messaging	73	15.9%
	Web forms	166	36.2%
	Frequently Asked Questions (FAQs)	109	23.7%
	Ask librarian	95	20.7%
	Social Media	226	49.2%

6.2 Assessment of Measurement Model

This section provides an answer to the research question: What are the factors that influence students' use behavior based on the unified theory of acceptance and use of technology? The internal reliability, convergent validity, and discriminant validity of the reflective measurement model are investigated (Chao, 2019).

6.2.1 Internal Reliability

Cronbach's alpha is a popular criterion for internal consistency that assesses reliability based on the inter-correlation of the indicator variables observed. Cronbach's alpha and Composite Reliability (CR) must be greater than 0.70. (Hair et al., 2017). As depicted in Table 3, Cronbach alpha values range from 0.828 to 0.847, while Composite Reliability values range from 0.879 to

0.906. Both values are greater than 0.7, which is the recommended threshold. In general, higher values indicate higher levels of reliability.

Table 3 Cronbach's Alpha and Composite Reliability

Construct	Cronbach's Alpha	Composite Reliability (CR)
Behavioral Intention	0.840	0.904
Effort Expectancy	0.847	0.906
Facilitating Condition	0.828	0.879
Performance Expectancy	0.842	0.888
Social Influence	0.831	0.898
Use behavior	0.847	0.882

6.2.2 Convergent Validity

Convergent validity is the degree to which the construct converges to explain the variance of its items. The average extracted variance (AVE) for all items in each construct is used to test the converging validity of the construct. An acceptable AVE is 0.50 or higher, indicating that the construct explains at least 50% of the variance in its items (Hair et al., 2019). Table 4 illustrate the construct's Average Variance Extracted (AVE) ranged from 0.484 to 0.764. The extracted average variance (AVE) is greater than 0.5, but we can accept 0.4. According to Fornell and Larcker, if the AVE is less than 0.5 but the composite reliability is greater than 0.6, the construction's converging validity is still adequate (Huang et al., 2013).

Table 4 Average Variance Extracted (AVE)

Construct	Average Variance Extracted (AVE)
Behavioral Intention	0.758
Effort Expectancy	0.764
Facilitating Condition	0.594
Performance Expectancy	0.614
Social Influence	0.745
Use behavior	0.484

6.2.3 Discriminant Validity

The discriminant validity is the extent to which a construct is empirically different from other constructs in the structural model (Hair et al., 2019). Fornell-Larcker and Cross loading are used to assess discriminant validity. Table 5 shows that for Fornell-Larcker, the AVE from each construct is greater than the highest squared correlation with any other construct. According to Table 6, the loading of the indicator on the associated construct is greater than all of its cross-loading correlations with other constructs. As a result, the discriminant validity result is satisfied.

Table 5. Fornell-Larcker Criterion

Construct	BI	EE	FC	PE	SI
BI	0.871				
EE	0.260	0.874			

FC	0.462	0.330	0.771		
PE	0.465	0.396	0.483	0.783	
SI	0.170	0.023	0.165	0.187	0.863
UB	0.784	0.351	0.913	0.552	0.193 0.696

Table 6. Cross Loading

Indicator	BI	EE	FC	PE	SI
BI1	0.894	0.236	0.408	0.409	0.146
BI2	0.888	0.202	0.411	0.456	0.201
BI3	0.828	0.245	0.391	0.344	0.090
EE1	0.253	0.885	0.294	0.412	0.017
EE2	0.172	0.835	0.277	0.268	0.019
EE3	0.242	0.901	0.297	0.336	0.025
FC1	0.345	0.158	0.744	0.418	0.172
FC2	0.359	0.263	0.729	0.373	0.101
FC3	0.352	0.269	0.820	0.396	0.143
FC4	0.354	0.251	0.771	0.339	0.108
FC5	0.372	0.327	0.785	0.339	0.114
PE1	0.335	0.279	0.304	0.771	0.110
PE2	0.362	0.280	0.387	0.795	0.140
PE3	0.370	0.275	0.388	0.820	0.148

PE4	0.365	0.339	0.426	0.755	0.141
PE5	0.387	0.370	0.382	0.773	0.189
SI1	0.158	0.040	0.146	0.182	0.871
SI2	0.119	-0.025	0.073	0.086	0.851
SI3	0.158	0.034	0.191	0.199	0.868

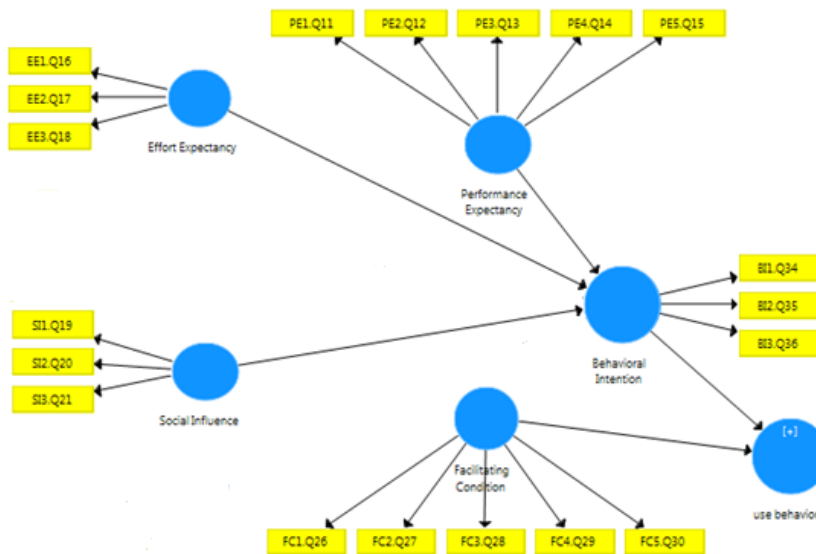


Figure 2 Research measurement model

6.3 Assessment of Structural Model

In the PLS-SEM, the structural model, also known as the inner model, depicts the relationship between the latent variable (Hair et al., 2017). The assessment of structural model Criteria is Coefficient of determination (R²), Path coefficients (B), Effect Size f², and Predictive Relevance Q².

6.3.1 Collinearity Assessment

To ensure that the regression results are not biased, collinearity must be investigated before assessing the structural relationship. Each predictor construct's variance inflation factor (VIF) tolerance value should be greater than 0.20. (Less than 5) Hair et al. (2017) According to table 7, the VIF value is greater than 0.20. (Less than 5).

Table 7. Collinearity statistics (VIF)

	BI	EE	FC	PE	SI	UB
BI						1.272
EE	1.270					
FC						1.272
PE	1.580					
SI	1.041					
UB						

6.3.2 Path coefficients (B)

The path coefficient explains the strength of the relationship between the latent variables, allowing the hypotheses to be assessed. Checking the algebraic sign, magnitude, and significance of the relationship path coefficient is part of estimating it (Nor, 2019). The coefficients' significance and relevance are the first issues to be investigated. The bootstrapping routine, as well as the analysis of t values, p values, or bootstrapping confidence intervals, are required for significance testing (Hair et al., 2017). Table 8 shows that the Path coefficients range from 0.023 to 0.700, indicating a small to medium relationship between the hypothesis constructs. The T Statistics values range from 0.550 to 20.565, indicating a significant level. All Path coefficient values are greater than 0.02 which is a good result.

Table 8. Path coefficients and T Statistics

	Path coefficients	T Statistics	Path Magnitude
Behavioral Intention -> use behavior	0.460	20.565	large
Effort Expectancy -> Behavioral Intention	0.023	0.550	Medium
Facilitating Condition -> use behavior	0.700	29.449	large
Performance Expectancy -> Behavioral Intention	0.258	4.662	Medium
Social Influence -> Behavioral Intention	0.089	1.989	Small

6.3.3 Coefficient of Determination (R2)

The coefficient of determination (R2), which depicts the amount of explained variance of each endogenous latent variable, is the primary criterion for structural model evaluation (Hair et al., 2012). The R2 values must be large enough for the model to have a minimum level of explanatory power (Nor, 2019). According to (Ademola, 2019), the R2 value from 0.01 to 0.09 is small, from 0.09 to 0.25 is moderate, and from 0.25 to 1 is large. As a result, the R2 in table 9 is large.

Table 9. The (R2) value

Construct	R2	Power
Behavioral Intention	0.297	large
use behavior	1.000	large

6.3.4 Effect Size f^2

f^2 Effect size is a measurement used to analyse how the removal of a specific predictor construct affects the R^2 value of the endogenous construct. Values greater than 0.02, 0.15, and 0.35, as a rule of thumb, represent small, medium, and large f^2 effect sizes, respectively (Hair et al., 2019). Table 10 reveals the effect size values, which range from 0.001 to 50.95.

Table 10. The results of Effect Size f^2

	f^2	Effect Size Value
EE- BI	0.001	No Effect
FC-UB	50.95	Large
PE- BI	0.060	Medium
SI- BI	0.011	No Effect
BI-UB	22.321	Large

6.3.5 Predictive Relevance Q^2 .

Another test that is used in PLS models is the Stone-Geisser predictive relevance test. This test can be used as an additional model fit evaluation in the PLS analysis. " Q^2 is a measure of how well the model and its parameter estimates reconstructed the observed values." Models with a Q^2 value greater than zero are known to be predictively relevant. Models with higher Q^2 positive values are considered to have greater predictive relevance (Vinzi et al., 2010). Table 11 shows that

the Cross-validated Redundancy Q2 for the dependent variable is greater than zero, which enhances the model's predictive relevance.

Table 11. Predictive Relevance

Construct	Cross-validated Redundancy Q2
Behavioral Intention	0.220
Use behavior	0.480

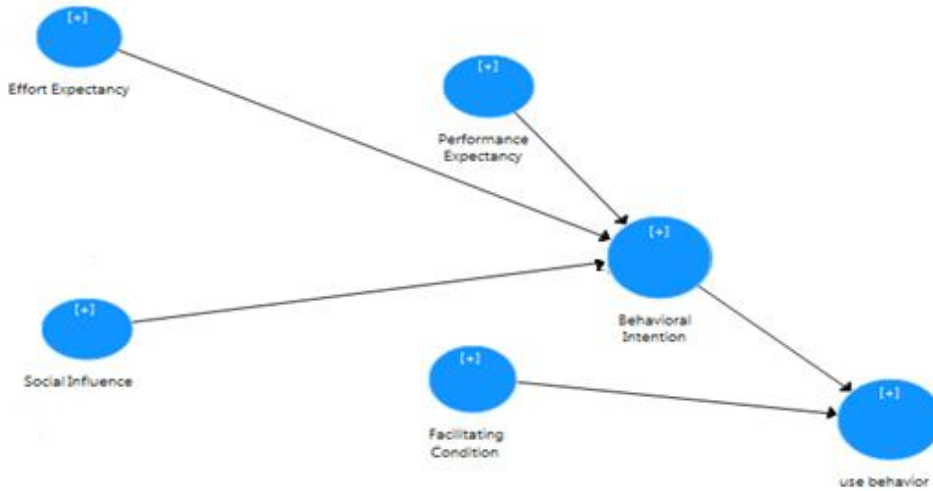


Figure 3 The research structure model

6.4 Hypotheses Testing

The result of the second question was found by using the (PLS-SEM) Partial least square structural equation modelling (estimate the model and test the research hypotheses). Table 12 illustrates that the Path coefficients range from 0.023 to 0.700, indicating a small to medium link between the hypothesis constructs. According to Hair et al. (2017), path coefficients close to +1 reflect strong positive connections (and vice versa for negative values) that are often statistically significant. The T Statistics values vary from 0.550 to 20.565, indicating a substantial level. All Path coefficient values are more than 0.02, which is a good result.

Table 12. Hypotheses Assessment

Hypotheses	Path Coefficient β	T Statistics	P Values	Result
H1 Performance Expectancy -> Behavioral Intention	0.258	4.662	0.000	Supported
H2 Effort Expectancy -> Behavioral Intention	0.023	0.550	0.582	Not Supported
H4 Social Influence -> Behavioral Intention	0.089	1.989	0.047	Supported
H6 Facilitating Condition -> Use Behavior	0.700	29.449	0.000	Supported
H7 Behavioral Intention -> Use Behavior	0.460	20.565	0.000	Supported

Note: * Significance at t value ≥ 1.96 with $p \leq 0.05$, **Significance at t value ≥ 2.59 with $p \leq 0.01$.

7. Discussion and Findings

ROI: Determine the use of DRS in the Sultanate of Oman's Academic libraries.

According to the survey results, most participants get responses to their inquiries via social media, followed by email and Web forms. The findings are consistent with prior research by Almahroqi (2014) and Alhinai (2014), which demonstrated that the most significant channels for addressing reference requests were e-mail, phone, social networks, text messages, and the Ask Librarian link. The interviews revealed that the participants had used DRS before, usually through Ask Librarian on the website or by contacting them by WhatsApp link or email. They started utilizing DRS in their first year of college. Participants answered that they are trained on how to use the DRS and that they must know how to search for library materials. Libraries advertise the service and marketing of digital references via the library's website and introductory lectures held at the start of the academic year. The participants agreed that the location of the service is visible on the library's website. In addition, interviewees stated that the time required to respond to student questions is not specified on the library's website.

RO2: Identify the factors that influence students' use behavior based on the unified theory of acceptance and use of technology (UTAUT) model

In this study, the independent variables were performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC) to influence behavior intention (BI) and use behavior (UB) to better understand DRS adoption and use in Omani academic libraries.

H1, it has been hypothesized that performance expectancy (PE) has a positive impact on behavioral intention (BI) to utilize DRS.

The findings are consistent with prior study by Venkatesh et al., (2012); Tarhini et al., (2016); Al-Aziziyah, (2017); and Awwad &Almajali, (2015). According to the survey results, most participants found that using DRS helped them to obtain information more quickly. Participants also indicated that DRS is significant in improving their academic performance and that using DRS makes obtaining information for academic tasks easier. Most participants said that the DRS is useful for information searching and improving the quality of their assignments. Meanwhile, the findings of the qualitative study demonstrate that the DRS are effective for searching and learning. They believe that employing DRS allows them to obtain information more quickly. Furthermore,

it offers quick and interactive online services. PE was found to be a significant predictor of behavior intention (BI) to use DRS.

H2 The study's findings demonstrated that effort expectancy (EE) has no effect on behavioral intention to use DRS.

In this study, effort expectancy was found to be a non-significant predictor of users' intention to use DRS. Even though this result contradicts earlier study (Venkatesh et al., 2003; Al-Aziziyah, 2017), it is consistent with Tarhini et al., (2016); Zuiderwijk et al., (2015); and Aljabri (2018). According to the quantitative findings, most participants obtained the information they required from the DRS immediately. As per qualitative findings, a high percentage of respondents have negative or neutral attitudes toward DRS, as shown by participants' statements that the devices in their library needed to be upgraded. As a result, the qualitative results show that DRS required less effort to use, easily offered the information users required, and is simple to obtain via the library website. As the Internet and technologies grow more user-friendly, users are getting less concerned about the problems of utilizing them. They believe there is no need for DRS training or programs because they already use technology. According to Aljabri (2018), ease of use becomes less essential when a mobile device is frequently used and familiar to users. As a result, DRS, like this study, can be accessible by any device, such as personal computers, tablets, laptops, or smartphones, but students must understand how to utilize the DRS as well as search for library collections.

H3 Social influence (SI) impacts on behavioral intention (BI) to use DRS positively.

This finding is consistent with previous studies (Tarhini et al., 2016; Ademola, 2019), however it contradicts Al-Aziziyah (2017). The results revealed that most participants thought their lecturers were helpful in using the DRS. Furthermore, the participants believed that their friends had a strong influence on them to use DRS. Moreover, many participants were confused about whether librarians had any influence over their use of DRS. According to the findings of the interviews, librarians and friends exerted Social Influence (SI) on Behavioral Intention (BI) to encourage participants to utilize DRS.

H4 Facilitation Condition impacts on use behavior to use DRS positively.

The result is similar to Al-Aziziyah (2017); Venkatesh et al., 2003; Tarhini et al., (2016). According to the survey results, most participants believe that the library staff is accessible to help them if they have a problem with DRS. Furthermore, most participants stated that they are skilled in the usage of DRS. The participants agree that adopting DRS is a good fit for the way they regularly work. According to the participants, the university provides technical support for the usage of DRS as well as DRS-related training programs and workshops. As per the findings of the interviews, all participants agreed that their universities provide facilities that assist the use of DRS, such as a WhatsApp link, Internet access, computer devices, and library staff who can be reached through email or the Ask the Librarian link.

H5 Behavioural intention impacts on use behaviour positively.

While the fact that the current results contradict prior research (Ademola, 2019), it is consistent with Zalah (2018) and Venkatesh et al. (2003), which indicated that behavioral intention BI has a positive influence on technology usage. According to the poll results, most participants intend to utilize DRS in the future and will attend any training programs that become available. The overall findings show a positive behavioral intention (BI) to utilize the DRS. According to the interview responses, all participants are interested in using the DRS in the future. Half of the interviewees have previously participated in related training programs on how to use the library's services.

8. Conclusion

This study aims to examine the use of DRS in academic libraries in the Sultanate of Oman; determine the relation between UTAUT variables and student acceptance of DRS. Regarding the pattern of DRS use in academic libraries in the Sultanate of Oman. Participants receive responses to their inquiries through social media, followed by email and Web Forms, in addition to the Ask Librarian link on the website or by contacting them through the WhatsApp link. The findings

revealed that there are significant correlations between performance expectancy (PE), social influence (SI), facilitating conditions, and behavioral intent to use DRS. The study's findings provide information and strategies that will be useful to other institutions, as well as improve understanding about DRS to encourage academic libraries to adopt DRS and impact users' motivation to use such services. As a result, this study shows crucial findings since it represents users' views and perspectives, and it will be helpful to library administrators and policymakers in Oman's academic libraries. This study significantly contributes to the literature on use factors on behavioral intention in accepting DRS. Investigating behavioral intention based on students' perspectives may assist decision-makers in developing effective strategies to use DRS. This research and its findings will enable academic libraries to evaluate the benefits and drawbacks of the DRS and improve it so that it can provide better services to its users. According to this study Sultanate of Oman's academic libraries have a high level of adherence to the RUSA guidelines for DRS. This research should encourage academic libraries to create unified standards for facilitating collaboration, serving, and satisfying the biggest possible range of users. As this study represents users' views and opinions, it can provide important findings that will be valuable to library administrators and policymakers in Oman's academic libraries and other developing countries throughout the world.

References

- Ademola, A. (2019). Factors influencing the adoption and use of ICT among academician in higher education institutions. Retrieved March 14, 2021, from <https://studentrepo.iium.edu.my/handle/123456789/9456>
- Al-Aziziyah, L. N. (2017). The factors influencing users' perception of using mobile applications in Oman: Using UTAUT model (Doctoral dissertation). Sultan Qaboos University. Retrieved January 5, 2019, from <http://squ.idm.oclc.org/login?url=http://search.mandumah.com>

- Alhaji, KH. & Almahroqi, S. (2013). Digital Reference Service at Sultan Qaboos University Libraries and UAEU Libraries: An Exploratory Study. The 19th Annual Conference of the Specialized Libraries Association, Arabian Gulf Branch, Abu Dhabi. <http://dx.doi.org/10.13140/2.1.4325.7286>
- Alhinai, A.B. (2014). Analysis of Quality of Reference Service in Medical Libraries in Oman: An Evaluation Study. P. Arab Union for Libraries and Information.1731-1746. Retrieved Jun 3, 2020, from <http://search.mandumah.com/Record/652077>
- Aljabri, H. (2018). Investigating the Factors Affecting M-Commerce Adoption Among Consumers in Oman: An Extension of Utaut2 with Trust and Perceived Convenience. (Doctoral dissertation, Sultan Qaboos University, 2018) (pp. 1-113). Muscat, Oman: Mandumah. Retrieved October 18, 2020, from <http://search.mandumah.com.squ.idm.oclc.org/Record/960231>
- Alkharousi, R., Jabur, N. H., Al Harrasi, N., & Bouazza, A. (2018). The status of the use of the Web 2.0 applications among Omani academic libraries (OALs). International Journal of Arts and Commerce, 7(3), 65-78. <https://ijac.org.uk/vol-7-no-3-april-2018/>
- Almahroqi, S. (2014). Awareness of postgraduate students at Sultan Qaboos University for Digital Reference Service and using it. (Doctoral dissertation, Sultan Qaboos University, 2014). Muscat, Sultanate of Oman.
- Almuhanha, M. (2018). Participants' Perceptions of MOOCs in Saudi Arabia (Doctoral dissertation, University of Sheffield).
- Altamimi, F. (2017). Customer Satisfaction with Digital Reference Service Level in King Abdulaziz University Library: A Case Study Available at: <https://platform.almanhal.com/Files/2/113560>
- Archer, E. (2017). *Introduction to Atlas.ti: Basic operations, tips, and tricks of coding*. Research Rescue.
- Arif, M., Ameen, K., & Rafiq, M. (2018). Factors affecting student use of Web-based services. The Electronic Library, 36(3), 518-534. doi:10.1108/el-06-2016-0129
- Attuquayefio, S., & Addo, H. (2014). Review of studies with UTAUT as conceptual framework. European Scientific Journal, ESJ, 10(8). Retrieved from <https://eujournal.org/index.php/esj/article/view/3020/2846>
- Awwad, M. S., & Almajali, S. M. (2015). Electronic library services acceptance and use. The Electronic Library, 33(6), 1100-1120. doi:10.1108/el-03-2014-0057

- Azmi, N. A. M., Noorhidawati, A., & Aspura, M. K. Y. I. (2017). *Librarians' behavioral performance on chat reference service in academic libraries: Perceived importance vs actual practices*. Malaysian Journal of Library & Information Science. <https://dx.doi.org/10.22452/mjlis.vol22no3.2>.
- Bakar, A. B. A. (2009). Virtual reference service in the Muslim world: Opportunities and challenges. *Library Philosophy and Practice*, 1.
- Bamfleh, F. (2009) Digital Reference Service in Gulf University Libraries: An Evaluation Study. *Arab Studies in Libraries and Information Science*, 14 (1) 90-133
- Bandyopadhyay, A., & Boyd-Byrnes, M. K. (2016). Is the need for mediated reference service in academic libraries fading away in the digital environment? *Reference Services Review*, 44(4), 596-626. doi:10.1108/rsr-02-2016-0012
- Baporikar, N. & Shah, I.A. (2012). Quality of higher education in 21st century-a case of Oman. *Journal of educational and instructional studies in the world*. May 2012, Volume: 2 Issue: 2 Article: 02 ISSN: 2146-7463 Retrieved from <http://www.wjeis.org/FileUpload/ds217232/File/02.baporikar.pdf>
- Chang, C. C. (2013). Library mobile applications in university libraries. *Library Hi Tech*, 31(3), 478-492.
- Chao, C. M. (2019). Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. *Frontiers in psychology*, 10, 1652.
- Dawood, S.J. (2015). Digital Reference Service in University Libraries in Iraq: An Exploratory Study. *Jordan Library and Information Society*. Vol.50 (3) pp11-84.
- Deng, S., & Zhang, Y. (2015). User perceptions of social questions and answer websites for library reference services. *The Electronic Library*, 33(3), 386-399. doi:10.1108/el-12-2013-0213
- Dollah, A. K. W., & Singh, D. (2012). Digital reference services in academic libraries. University of Malaya Press. Retrieved from Google Scholar.
- Emmelhainz, C., Pappas, E., & Seale, M. (2017, October 24). *Behavioral expectations for the mommy librarian: The successful reference transaction as emotional labor*. eScholarship, University of California. <https://escholarship.org/uc/item/2mq851m0>.
- Gurganus, A. S. (2015). Virtual reference in a community college library: Patron use of instant messaging and login chat services (Order No. 3680367). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (1652925234). (pp.1-161)

- Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The use of partial least squares structural equation modeling in strategic management research: a review of past practices and recommendations for future applications. *Long range planning*, 45(5-6), 320-340. Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-based nursing*, 18(3), 66-67.
- Hair Jr, J. F., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, 26(2), 106-121. doi:10.1108/ebr-10-2013-0128
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (*PLS-SEM*). Sage publications. Retrieved from Google Scholar.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of pls-sem. *European Business Review*, 31(1), 2-24. doi:10.1108/ebr-11-2018-0203
- Higher education admission center (2019). Student Guide to Enroll in Higher Education Institutions for the Academic Year 2019/2020 Retrieved June 1, 2019, from <http://www.heac.gov.om/>
- Hijji, K. Z., & Cox, A. M. (2012). Performance measurement methods at academic libraries in Oman. *Performance Measurement and Metrics*, 13(3), 183-196. doi:10.1108/14678041211284722
- Huang, C. C., Wang, Y. M., Wu, T. W., & Wang, P. A. (2013). An empirical analysis of the antecedents and performance consequences of using the moodle platform. *International Journal of Information and Education Technology*, 3(2), 217.
- Hussien, F. R. M., & Mokhtar, W. N. H. W. (2018). The Effectiveness of Reference Services and Users' Satisfaction in the Academic Library. *International Journal of Academic Research in Progressive Education and Development*, 7(3), 327-337.
- Jaber, J. A. (2015). Digital Reference Service in academic libraries in Lebanon: an evaluation study. (Master Thesis). Beirut Arabic University. Retrieved Feb 24, 2019, from <https://zenodo.org/record/997942>

- Khan, A., Masrek, M. N., Mahmood, K., & Qutab, S. (2017). Factors influencing the adoption of digital reference services among the university librarians in Pakistan. *The Electronic Library*, 35(6), 1225-1246. doi:10.1108/el-05-2016-0112
- King, M. M. (2009). Is what you see what you get? Exploring the role of virtual reference icons on academic library websites. Retrieved June 5, 2019, from <https://doi.org/10.7939/R3MB0W>
- Kurt, Ö E., & Tingöy, Ö. (2017). The acceptance and use of a virtual learning environment in higher education: An empirical study in Turkey, and the UK. *International Journal of Educational Technology in Higher Education*, 14(1). doi:10.1186/s41239-017-0064-z
- Megadewandanu, S. (2016). Exploring mobile wallet adoption in Indonesia using UTAUT2: An approach from consumer perspective. In 2016 2nd International Conference on Science and Technology-Computer (ICST) (pp. 11-16). IEEE. Retrieved from Google Scholar.
- Mohammed, A. (2014). Digital Reference Service in University Libraries in Khartoum State: Evaluation Study. *Arab Federation for Libraries and Information*. (25), 1637-1656.
- Nor, N. (2019). Factors influencing researchers' behavioral intention in using digitized Malay manuscripts at National library of Malaysia. Retrieved February 25, 2021, from <http://studentrepo.iium.edu.my/handle/123456789/9467>
- Samea, L. (2015). Academic library consortia in Arab countries: An investigating study of origins, development, and services. *International Journal of Library and Information Science*, 7(7), 130-147. Retrieved from Google Scholar.
- Sejane, L. (2017). Access to and use of electronic information resources in the academic libraries of the Lesotho Library Consortium (Doctoral dissertation)
- Shachaf, P. (2008). Virtual reference services: Implementation of professional and ethical standards. Wiley online (pp.20-24).
- Tarhini, A., El-Masri, M., Ali, M., & Serrano, A. (2016). Extending the UTAUT model to understand the customers' acceptance and use of internet banking in Lebanon: A structural equation modeling approach. *Information Technology & People*, 29(4), 830-849.
- Trott, B., & Schwartz, H. R. (2014). The application of RUSA standards to the Virtual REFERENCE INTERVIEW. *Reference & User Services Quarterly*, 54(1), 8-11. <https://doi.org/10.5860/rusq.54n1.8>

- Tyler, K., & Hastings, N. B. (2011). Factors influencing virtual patron satisfaction with online library resources and services. *Journal of Educators Online*, 8(2), n2.
- Uutoni, W. E. (2014). Evaluation of digital reference services in academic libraries in Namibia (Doctoral dissertation, Master's thesis in library and information science. Swedish school of library and information science). p1-69 <http://bada.hb.se/handle/2320/13843>
- Venkatesh, V., Thong, J.Y., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36, 157-178.
- Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27, 425-478.
- Vinzi, V. E., Trinchera, L., & Amato, S. (2010). PLS path modeling: from foundations to recent developments and open issues for model assessment and improvement. In *Handbook of partial least squares* (pp. 47-82). Springer, Berlin, Heidelberg.
- Younus, M. (2014) Digital reference services in university libraries of Pakistan. PhD Thesis., Loughborough University.
- Zainab Ajab, M. (2017). Librarians' acceptance of open source Library Information System using the Osis-Utaut Model (Doctoral dissertation, University of Malaya). Retrieved from Google Scholar
- Zalah, I. (2018). Factors that Influence Saudi Secondary Teachers' Acceptance and Use of E-learning Technologies (Doctoral dissertation, University of Brighton).
- Zuiderwijk, A., Janssen, M., & Dwivedi, Y. K. (2015). Acceptance and use predictors of open data technologies: Drawing upon the unified theory of acceptance and use of technology. *Government Information Quarterly*, 32(4), 429–440. <https://doi.org/10.1016/j.giq.2015.09.005>