Journal of Information and Knowledge Management (JIKM) Volume 11 Number 1 (2021)

Factors Influencing Users' Satisfaction and Continuance Usage Intention to Digital Library (Dl) in Management Science University (MSU)

Qudri Ali Abu Bakar, Mad Khir Johari Abdullah Sani,
Norshila Shaifuddin, Noor Zaidi Sahid

Faculty of Information Management,
Universiti Teknologi MARA (UiTM),
Selangor, Malaysia

Email: aliqudri@yahoo.com

Received Date: 22 December 2020
Publish Date: 1 April 2021

Abstract. Transition of technology had evolved certain traditional services into digitalized service in library. As of today, the situation have taken into place of library which are normally operates with traditional services such as borrowing and returning books were physically visited by the patron. Hence, the quality of service pertain from the Digital Library would be address from the user˝s perspective how does this services performed in effective or efficient way towards their patron. In this study, the objective were about to measure the factors affecting user satisfaction on Digital Library use in MSU from perspective of ISSM and TTF model as well to identify factors that may influence user satisfaction and DL continuance usage intention in MSU. The approach of this study conducted is quantitative method which uses the questionnaire as to collecting data in one library for this study. As a result, the factors that influence Digital Library MSU is quality of system, information and technology suitability for patron that utilized the system.
Keywords: digital library, library, ISSM, TTF

1 Introduction

In recent years, many academic institutions have implemented the latest approach in preserving and disseminating of information for their student. A Digital Library which vastly use by most academic institutions in order to cater their student with current references and ease of utilization in academic library. This Digital Library is very crucial for their patron especially students, lecturers, researchers and public users as they sought information within the existence of online information. The usage of Digital Library can productively impact the users that use this library services as the intention for implementing this Digital Library tend to ease users in completing either

their assignments or tasks with convenient facilities in the academic library. Based on ISSM (2003) meant for assessing the Information System towards users satisfaction. As for the TTF model developed by Goodhue and Thompson (1995), which usage of IT is likely to contribute positive impacts upon user performance which task of users have matched with the IT.

The student perception upon DL services also pivot role in measuring how effectiveness the services have satisfied the information demands from users. From examined of Bagudu and Sadiq (2013), student perception upon DL services in International Islamic University, Malaysia was found high level of awareness upon DL services. The student shows positive attitudes and perception towards the DL services. However, studies did not highlight factors of that influenced positive attitude towards DL services.

Continuance usage of digital library is important as where users keep continuance to use service due to its relevancy, usability, and stability. In due to that, providing relevant and high quality of information as well digital libraries can affect upon continuance use from users towards this service. From Lagzian et al., (2013), by providing users high-quality of DL has increasingly become a key concern in institutions, but research on quality factors that affect users‟ continuance intention of the digital library has rarely been conducted. This study was aimed to determine users satisfactory upon the Digital Library use provided by the Management Science University (MSU and to investigate the factors of effectiveness on Digital Library use.

2 Literature Review

Concept of Digital Library

Based on study from Vijayakumar and Jeevan (2001) they defined Digital libraries as organizations have vast collections as it including qualified staff which enables them to select, distribute, and preserve of digital collection. This ensures digital collection are accessible and readily available in purpose of use by communities. The concept of DL are categorized into two concept which is researchers and librarian domain. The differentiation from these domains are librarians focus on service as they see DL as institution whereas in domain of researcher focused on its content and served towards special communities. Basically, most common characteristics of DL be assessed on its collection, Library Information System (LIS), technology used for cater users demand. As for collection, all the print journals or books will be electronically available stored in the database subscribed by the library as well as other print materials are available in online.

Another aspect of DL characteristic is that the library have implemented the LIS for storing the metadata of materials, users and suppliers for long-term which is not traditional library implement this LIS into their library. Finally, that the technology used in the library will be one of characteristics due to cater users demand. For example, renewing borrowed library materials online directly into the system. From Sun and Yuan (2012) "*...a digital library is a computer–based system for acquiring, storing, organizing, searching and distributing digital materials for end user*

access…". The basic characteristics as explained by Sun and Yuan that digital library consists of computer-based system shows that DL is a library without boundary which users can directly use this service without physically visit the library.

Evolution of DL

The evolution of DL starts from approximately 20 years ago, with variety of differentiation of information system which known as "digital libraries" (Candela et al., 2011). It starts when advances of computer have introduced in the world. Due to advancement of computer science, which it had allowed digital form of documents to capture human knowledge and culture. As a result, libraries also involved into digitalisation of information due to the transition of information from physical to electronic. The first realization that DL articles can be associated as specialized area of services from publisher side is Association for Computing Machinery (ACM) which attract more scholars to subscribed both printed and electronic form of journals (Candela et al., 2011). Most traditional library were having printed type material rather than electronic type of material. The emergence of DL had transformed various aspects of the library such as collection, and services. A digital library managed collection for information along associated services as information were stored in the digital format and accessible by using a network (Arms, 2000). The emphasis for organizational setting have change such collection to digital collection works and aspects related to functioning in larger context of the service Saracevic, Tefko. (2000). From Licklider (1960), that integration of human brains and computer can be grouped and supported via network which will incorporate the function for present day of libraries.

Factors Influencing DL usage

Table 1. Summary of empirical research on factors influencing DL usage

Researcher	Description	Findings (Factors Influencing)
Omotayo & Haliru (2020)	Study using survey questionnaire, with 402 samples provided. As samples were examined to investigate task-tehcnology fit (TTF) of DL in selected three Nigerian Universities	Students that use DL, must be good fit with their tasks. Hence, results from the study have supported the proposition. The findings also stated that TTF model is useful in predicting usage of the technology which is DL.
Vongjaturapat (2018)	Usage of task-technology fit (TTF) model as to explore on effectiveness in smartphones for interaction in between online library systems. The study explain adoption of TTF model into study	The TTF model shows that model had supported for this study in overall which had significant positive impact of TTF for the smartphones in DL setting

	as reason to assess the technology library with the smartphone devices.	
Samadi & Masrek (2013)	To investigate the use of the digital library and its corresponding determinants and impacts in University of Tehran as selected population for this study.	Findings show that DL usage was impacting both user satisfaction and personal accomplishment. The factor of three IS which is information quality, service quality and system quality indicators is critical in determining usage behaviour of DL use
Etinger, D., Sehanovic, J. & Ribic, A. (2014)	This paper examined on success factors with Information System Success model by adopting e-library information system among Information Science students held in Croatia at the Faculty of Economics and Tourism.	The result shown from finding that information success indicators of quality were affecting towards user satisfaction, intentions to use and net benefits examined on students of Information Science. This shows that significant of ISSM as influencer towards e-library information system.
Halonen, R., Thomander, H. & Laukkanen E (2010)	This paper describe on success of knowledge sharing in IS as part of the knowledge base of a private educational institute. The adoption of information success model tend examined for this study	The findings shown that DeLone and McLean model is accessible for k-transfer whenever students and teachers were able to store as well transfer such knowledge. The important part is that information system success model as influencer indicator for assessing system technology.
Hong et. al. (2002)	This study was intended to point out factors that determine user adoption of digital libraries assessing with model of TAM in assessing DL with qualitative method.	Utilization TAM as framework, it have significant relationship with the intention to use a digital library. Thus, the study concluded that TAM model is acceptable in testing DL acceptance.
Hu, CP & Hu, Y. (2014)	The study was about to conduct a survey the factors influencing user perception of university DLs in China and the interactions among these factors.	The finding shows that Information providing services, information retrieval services, and individual services are direct influencing factors.

The findings had contributed in to the evaluation of DL services in academic libraries from a fresh perspective.

Information quality

The factors of information quality is where the information is in complete, relevant, easy to comprehend which will influence user to share or gather content and return usage for regular basis. From study of Masrek et al., (2010), information quality plays as strong indicator which had influence users satisfaction in terms of academic library portal. Accordance from previous study of IS, information quality were perceived positively impacts towards users satisfaction which have resulted an intention to continuance usage of DL. An updated information which also considered an important values when assessing how well the system can provide better service for users as they required to utilize current articles or information for their daily works.

System quality

System accessibility is where the system quality be measured which is users can access the system with an ease. The system can be remotely access also considered a value of accessibility where users can access those e-collections via internet without physically visits the library. From study of Thong et al. (2002), the accessibility upon DL is essential need for users' usage, which makes the DL show convenient access and easy to online services.

Service quality

The service quality comes when visibility of online instructions, help tools for searching e-articles, and ability to communicate with DL were important upon DL users when engage with the system because these technical supports services may reduce users effort and time to utilize the system effectively (Park et al., 2009). Another service quality is also measured when librarian or library staff were actively facilitate users with the DL services.

Task-Technology Fit

The Task-Technology Fit was developed as tool to deter whether IS meet users demands and demonstrated to have positive impact upon effectiveness of IS such as group support systems (Gebauer & Ginsburg, 2006). The studies from (D'Ambra et al., 2013; Goodhue & Thompson, 1995) found that TTF had impact towards technology usage were significant. Study from Vongjaturapat (2018), shows that

overall TTF model in reflecting significant positive impact of task and technology for smartphones in a DL setting.

3 Theoretical Framework

Based on Lederman (2015) he defined the theoretical framework a theory for this quantitative research which is attempt to verify and test the validity of existing theory used in Digital Library use . In context of IS research, they were more developed models and theories from various aspect of IS study. The models and theories developed have guided researcher to conduct IS study effectively.

The theoretical framework for this study conceptualized based on DeLone & McLean (2003), Samadi & Masrek (2013), Omotayo & Haliru (2020) and Goodhue & Thompson (1995). The mentioned models basically developed based on ISSM and TTF model. In addition, for ISSM and TFF are actually discussed and explained about which are impact on individual performance as well as user satisfaction upon certain issues. By understand fully about the DL use on user satisfaction in academic library at MSU. Used models as such ISSM and TTF have allocated as predictor of user satisfaction. Previous studies that utilize the ISSM and TTF models have impacted positively on user satisfaction as well as continuance usage. Therefore, development of theoretical framework as visualized in Fig. 1 used as design for this study.

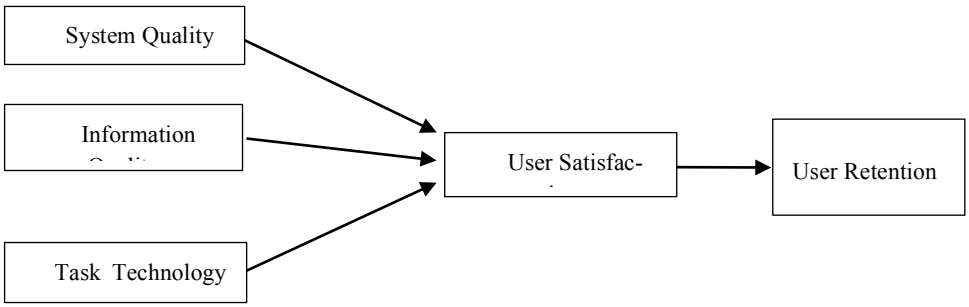

Fig. 1 Factors Influencing users' satisfaction and retention to digital libraries in Academic Libraries

Hypothesis 1

System in DL is more likely to focus on retrieval and deliverable of information which relates to user perception when using the DL. The system quality in DL is essential as indicator of Information System use. Based on Trice & Teacy (1998), they assert that system quality had influenced the precision output, response time, systems stability, systems security and form of information.

In addition, the availability of DL is 24/7 or anytime can be accessed due to existence of network and communication which have no opening hours like traditional library. The effectiveness of system quality relies on basic good

information provider characteristics which are relevance, accuracy, completeness and current for users to use. In this study, system quality have significant predictor on User Satisfaction.

H1: SQ has a positive influence on US in DL service
H1a: User Satisfaction has a mediating effect on the relationship between SQ and DLE

Hypothesis 2

Based on DeLone & McLean (2003) the information quality affects seriously users satisfaction. In context of Digital Library, quality of information defined as richness quality of information in the system which play crucial roles for users that use DL. In this study, the user satisfaction can be evaluate based on how efficient the DL offer great quality of information for users. The information quality derived on DL system of what information held in the system offer as it measures on how updated, relevance, and completeness of information for users that uses the DL. From study of Park et al. (2009) had validated that when users perceived DL provide them an instant access as well easy access into system, users can locate information effectively via DL thus this made them fell DL is useful to be utilized. Accordance from DeLone and McLean (2004), indicated that system quality (SQ) can be measured based on following aspects: availability adaptability, response time, usability, and reliability. Therefore, empirical study of (Urbach and Mu¨ller, 2012; Wu and Wang, 2006) found that system quality (SQ) as strong predictor for user satisfaction (US).

H2. SQ has a positive influence on US in DL service
H2a: User Satisfaction has a mediating effect on the relationship between IQ and DLE

Hypothesis 3

The TTF, a model that "the correspondence between task requirements, individual abilities and the functionality of technology". In this study, the TTF assists in users satisfaction in Digital Library use. Based on Omotayo & Haliru (2020), they stated that features of TTF could be in terms of availability of sources, user-friendly interface, navigation clarification, response time and so forth. The Task-Technology Fit model is significant in adjusting to specifications which imposed from individual needs and capability of technology (Vongjaturapat, 2018). Furthermore, the TTF model from Goodhue and Thompson (1995) represent the relevancy of system and facilities. The task-technology fit (TTF) is also having significant positive impact upon academic performance. Accordance from study of McGill et al. (2011), found that better fit of Learning Management System upon skills of instructors, the more the system will be used, and the more positive its impact on instructor performances. This shows that TTF meant to match with appropriateness of student tasks accessing digital library in their university of college. The current information development was depending on daily routine activities of the student and library users in the university. To correlate, the assigned tasks from any department or lecturers to students were consisting of task-technology features. The adoption of TTF is also to measure the technology dependencies with the allocated tasks.
H3: TTF has a positive influence on US in DL service

H3a: User Satisfaction has a mediating effect on the relationship between Task technology fit and User Retention

Hypothesis 4

Digital Library helps users in improving or enhancing their performance in finding, utilizing and organize of information based on their needs. The DL is rich in resources which will assist users in completing their assignment as well as answering their demands. Interactivity of DL have impacted the user satisfactory due to ease of use with the DL interfaces. The services offer from DL play pivot role in increasing the user satisfactory. The DL use have significant towards user satisfaction. From study Xu et al. (2010), users will felt satisfied with the DL service as users efficiently found what they need which helped them in their research and study. Users will satisfy their need if the DL were capable to provide information and services which met their expectation as this will made their continuance usage increase. Thus, from Joo and Choi (2015) their study found that resource quality, usefulness, confirmation and satisfaction had affected on student continuance usage upon online resources in the academic library. The user satisfaction would be important to be evaluated as they were predictors towards satisfaction of user when using the DL service. In study of Xu and Du (2018), user satisfaction was the most important determinant on user loyalty to digital libraries. The findings from previous study supported that user satisfaction is important predictor of DL loyalty (Chang, 2013; Bae & Cha, 2015)
H4: US has a positive influence on DL continuance usage

By defining what is Continuance Usage, in prospect of library is factors/reasons from users that continuously use the digital library as resource for their study. It shows a cumulative numbers either in higher or lower rates of users that participates in continuing utilize the DL. It is understood the perception of returnees users that have engaged with DL services.

4 Methodology

This paper utilized method of distribution of survey on findings of factors influencing users' satisfaction and continuance usage intention to digital library (DL) in Management Science University (MSU) as the surveyed have been conducted for 175 respondent in responding the questionnaire given to Centre of Fundamental Studies. The aim in distributing the questionnaire is to identify factors that may influence user satisfaction and DL continuance usage intention in MSU with the combination of theory of the information system, the acceptance model and the affinity theory. The purposive sampling was applied in selecting 175 respondents from a sample size of 240 at the Centre of Fundamental Studies which is an undergraduate student in Management Science University. It is about exploring on factors influencing users' satisfaction and their continuance in using the Digital Library. The data retrieve is meant to assess on which satisfactory of Digital Library have encourage users' in continuing utilize the digital service provided by the academic institution.

5 Respondent of Demographic

The respondent selected are experienced in utilizing the Digital Library services as they indirectly utilized the library resources in performing their assignments or tasks given from their lecturer. The respondents are both male and female of undergraduate students which enrolled in subject MPU1123U3202009003 (Islamic Studies) and MPU2023U120009024 (TITAS). The study was conducted at the beginning fall of 2020. The e-form of questionnaire was sent to the Lecturer supervised in the subject of Islamic Studies and TITAS as the targeted sampling in this study. The respondent demographic information are presented as three tables. Table 2 is represented on the summary of gender participation in this study. Most respondent were female which recorded 98 (56%) whereas the male participation are about 77 (44%) which is lower than female.

Table 2. Summary of Respondents of Gender participation

Gender	Frequency	Percent (%)
Female	98	56
Male	77	43
Total	175	100.0

The following Table 3 is represented on Age as demographic information of respondent in this study. In summarization of Table 3, the average respondent age which participated in this study is 18 to 24 as recorded 142 of 175 (81.1%). The least respondent responds for this study is age of 45-54 which accounted 1 of 175 (0.6%).

Table 3. Summary of Respondents Age participation

Age	Frequency	Percent (%)
18-24	142	81.1
25-34	27	15.4
35-44	5	2.9
45-54	1	.6

Total	175	100.0

As for Table 4, it is the summarization Education level of respondent that participated in this study. The highest participation of this survey is recorded on Diploma level which is 96 of 175 (54.9%), where for the Matrikulasi/Asasi and Sijil Pelajaran Malaysia recorded 29 of 175 (16.6%) and 26 of 175 (14.9%) respectively. The least participation of this study on Education Level of Others as recorded from Table 4, 1 of 175 (0.6%).

Table 4. Summary of Education level

Education Level	Frequency	Percent (%)
Diploma	96	54.9
Matrikulasi/Asasi	29	16.6
Others	1	0.6
Sijil Pelajaran Malaysia	26	14.9
Sijil Tinggi Persekolahan Malaysia (STPM)	23	13.1
Total	175	100.0

6 Descriptive Analysis

System Quality

System quality is where the capability of the system to deliver their services upon time when requested by users or measures following from the aspects: usability, availability, reliability, adaptability and response time (e.g. download time). Among the five items, the highest score for mean is recorded is SYSQ3 which is 4.274 and the lowest mean score is SYSQ5, recorded 4.206. Majority of the students are likely to agree that Digital Library is clear view on its functionality which also encourage them to continue to use the Digital Library as preference of sources.

Table 5. Descriptive of System Quality

			N = 175		
Items	**Mean**	**Std. Dev.**	**Var.**	**Min**	**Max**
System Quality					
1. SYSQ2: The navigation of DL is well- structure	4.194	.746	.560	2	5
2. SYSQ3: DL in MSU have clear view on its functionality	4.274	.720	.522	2	5
3. SYSQ4: DL is accessible for us at any place	4.257	.731	.537	2	5
4. SYSQ5: The interface of DL in MSU is easy to understand	4.206	.735	.544	2	5
Average	**4.232**	**0.733**	**0.540**	**2**	**5**
Average System Quality Dimension	**4.232**	**0.733**	**0.540**	**2**	**5**

1 =Strongly Disagree, 2 = Disagree; 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Information Quality

In Digital Library, information quality can be evaluate whether the information held is met with the requirement of the student which comprise of relevancy, accuracy, it is provided to support their information needs of users. From the Table 6, it shows that descriptive of information quality. The five item was measured in term information quality in assessing how far the richness of information held in Digital Library MSU. As recorded from Table 6, majority of students have replied on INQ5, the information that I found held in DL is quite relevant for me with total mean score of 4.514 as it is the highest mean score compared other items. This shows that Digital Library MSU have relevant content that met with the need of faculties in that university.

Table 6. Descriptive of Information Quality

			N = 175		
Items	**Mean**	**Std. Dev.**	**Var.**	**Min**	**Max**
Information Quality					
1. INQ1: DLMSU provides an updated information to us	4.297	.809	.658	2	5
2. INQ2: The accuracy of DL in providing information is precise	4.366	.780	.613	2	5
3. INQ3: The quality of information in DLM SU are met with my demands	4.143	.833	.698	2	5
4. INQ4: Online resources/content in the DL is complete as well as organized for me to use	4.434	.789	.626	2	5

5. INQ5: The information that I found held in DL is quite relevant for me	4.514	.732	.539	3	5
Average	**4.350**	**0.788**	**0.626**	**2**	**5**
Average Information Quality Dimension	**4.350**	**0.788**	**0.626**	**2**	**5**

1 =Strongly Disagree, 2 = Disagree; 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Task-Technology Fit

As for the task-technology-fit, it defines as correspondence between task requirements, individual abilities, and the functionality of the technology. It means that a technology is required when the task give are suited with the current technology. In Digital Library, the interface layout of Digital Library are also affected the usage of DL. For example, the basis of understanding when utilize DL is where user found the interactive of interface from the DL.

Table 7. Descriptive of Task-Technology Fit

		N = 175			
Items	**Mean**	**Std. Dev.**	**Var.**	**Min**	**Max**
Task-Technology Fit					
TTF1: DL MSU have provided user-friendly of user-interface as it eases for me to use in completing my assignment/task	3.754	.957	.922	1	5
2. TTF2: DL in MSU are suitable for my assignment/tasks	3.949	.902	.819	2	5
3. TTF3: By using DL, it fits well with my preference way of work	3.983	.858	.741	2	5
4. TTF4: Regularly updated information/content from DL MSU makes me want to utilize it	3.943	.867	.755	2	5
5. TTF5: Features of availability 24/7 makes me want to use DL MSU	3.674	.902	.819	2	5
Average	**3.860**	**0.897**	**0.811**	**2**	**5**
Average Task-Technology Fit Dimension	**3.860**	**0.897**	**0.811**	**2**	**5**

1 =Strongly Disagree, 2 = Disagree; 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Based from Table 7, the highest mean score recorded at 3.983 from the TTF3, and the least mean have recorded at 3.674 which is TTF5. Students utilized the Digital Library are based on their preference of work which mean their needs of locating and searching information via technology support have made their choice in choosing Digital Library as part of gathering information to answering their question of tasks given from the lecturer. The second highest mean score recorded at 3.949 which represent of TTF2. Across the student in MSU at Centre of Fundamental Studies, they felt that Digital Library are mostly suitable for them in carry-out assignment they received.

User Satisfaction

In definition, user satisfaction is where the assessment or evaluation of users that receive the end-product or services either it is positive review or negative review upon the product or services they received. In perspective of digital library, it is satisfaction level of a user has with a system relative to what the user expected upon first use of the system. This shows how good or bad experiences they get after their use the system for the first or subsequent times.

Table 8. Descriptive of User Satisfaction

			N = 175		
Items	**Mean**	**Std. Dev.**	**Var.**	**Min**	**Max**
User Satisfaction					
US1: I'm very delight when using DL MSU	4.000	.835	.701	2	5
2. US2: I'm truly satisfied towards information held in DL in MSU	4.209	.838	.706	2	5
3. US3: I'm happy about the functionality provided by the DL to me	3.977	.881	.781	2	5
4. US4: I'm satisfy with DL content wholly	4.074	.786	.621	1	5
Average	**4.065**	**0.835**	**0.702**	**1.75**	**5**
Average User Satisfaction Dimension	**4.965**	**0.835**	**0.702**	**1.75**	**5**

1 =Strongly Disagree, 2 = Disagree; 3 = Neutral, 4 = Agree, 5 = Strongly Agree

As depicted from the Table 8, the highest score of mean is 4.209 which is US2, I'm truly satisfy satisfied towards information held in DL in MSU. The students were satisfied upon the information of Digital Library as they used in supporting their task/assignment given from their lecturer. Somehow, the least mean score of 3.977 at US3 where I'm happy about the functionality provided by the DL to me. From the least score recorded on Table 8, maybe the functionality of Digital Library MSU quite

confusing and user-friendly for certain students. As mentioned earlier, the significance or relatively the US4 higher due to the student is having relevant information as well completeness of information held in Digital Library MSU.

User Retention

Table 9. Descriptive of User Retention

			N = 175		
Items	**Mean**	**Std. Dev.**	**Var.**	**Min**	**Max**
User Retention					
UR1: I will keep using DL services as regularly as I do now	3.97	.861	.741	1	5
2. UR2: My intention is to continue using DL rather than use any alternative means	3.91	.832	.693	1	5
3. UR3: DL is my first choice for getting information.	3.90	.865	.748	1	5
Average	**3.926**	**0.852**	**0.727**	**1**	**5**
Average User Retention Dimension	**3.926**	**0.852**	**0.727**	**1**	**5**

1 =Strongly Disagree, 2 = Disagree; 3 = Neutral, 4 = Agree, 5 = Strongly Agree

The user retention is tend to continuously sustain existing user known as customer retention where an organization keep their contact with existing user to continue use their service/product. It is also refers to the ability of any given business to keep existing customer. In library perspective, patron retention also important, where library take in charge to sustain their relationship with patron that utilize their services/products. However, the declination of patron retention in library is also factors from the internal. Based on the table above, it clearly shows the highest mean score of 3.97 which is UR1, where student agree that they will keep using DL services regularly. However the least core of mean is recorded on 3.90 which is UR3. The students from MSU were responded least on UR3 due to accessibility into other sources from the internet and other free access. This shows that maybe the sources held in the Digital Library have restriction on certain access of information. For example, the subscription of relevant articles did not subscribed by the library. This will contributed encourage students to find other sources that are not held in the Digital Library.

Hypothesis of study

As for this study, researcher had conducted the structural model which analyse the relationship with different variables. In this research, the direct relationship of system quality (SYSQ), information quality (INQ), task-technology fit and user retention (UR) and mediation relationship through user satisfaction (US). All relationship were analysed based upon their path coefficients which is SYSQ-US, SYSQ-UR, INQ-US, INQ-UR, TTF-UR, TTF-US and US-UR. The analysis was done by examine each path coefficients between constructs. As for path coefficients, the values were ranged in between of -1 and +1 as results of strongly negative and strongly positive relationship between constructs variables. For testing the significance of path coefficients, a two-tailed test was run that computed for p-values and t-values at significance level of 5%. Based from the provided table, results shown that t-values were above 1.00 and p-values were below than 0.001, which indicates that significant relationship in between SYSQ-US (0.369), SYSQ-UR (0.141), INQ-US (0.162), INQ-UR (0.062), TTF-UR (0.148), TTF-US (0.389) and US-UR (0.382). This shows that H1, H1a, H2, H2a, H3, H3a, H4 were supported. Based on Fig. 2, it shows the direct effects and indirect effects of the independent variables towards dependent variable from the SmartPLS3. The result of each variable will be discussed further at this section.

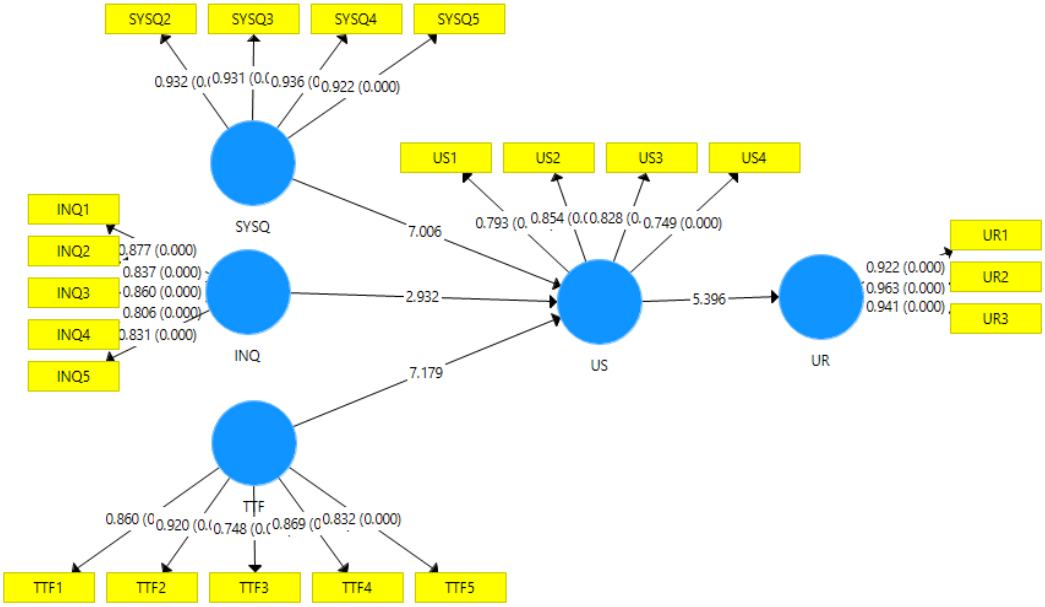

Fig. 2. Path Coefficient of Dimension

Table 10. Path Coefficient

	B	mean	s.d.	t-value	p-value
SYSQ - UR	0.141	0.139	0.031	4.548	0.000
SYSQ - US	0.369	0.366	0.053	7.006	0.000
INQ - UR	0.062	0.065	0.024	2.563	0.011
INQ - US	0.162	0.170	0.055	2.932	0.004
TTF - UR	0.148	0.150	0.038	3.888	0.000
TTF - US	0.389	0.391	0.054	7.179	0.000
US - UR	0.382	0.382	0.071	5.396	0.000

Moreover, the propose research model includes such potential mediation effects of US on relationship between of SYSQ, INQ, TTF and UR. The mediation effect was examined based on guidelines by Hair et al. (2017) and previous study which conducted with the SmartPLS3 (Wamba et al., 2017). Based on Wamba et al. (2017), method in analysing the mediation effect is based on path coefficients and standard errors of direct path relationships in between of independent and mediating variable and mediating and dependent variable. Hence, the US mediates relationship between SYSQ, INQ, TTF and UR which determined from the results of SmartPLS3 analysis. The total effect and indirect effect of SYSQ on US constitutes total effect of SYSQ on UR.

Table 11. Total effect and indirect of SYSQ on US and UR

	B	Mean	s.d.	t-value	p-value
Total effect					
SYSQ - US	0.369	0.366	0.053	7.006	0.000
Indirect effect					
SYSQ - UR	0.141	0.139	0.031	4.548	0.000

Based on the constructed H2 and H2a, the results upon the Table 12 shows that total effects of INQ on US as linkage of mediating role is significant recorded as (H2: $\boldsymbol{\beta}$ = 0.162, t = 2.932, p = 0.004). Without inclusion of mediation variable (US), the indirect effects have impacted towards INQ upon the UR also having a significant relationship (H2a: $\boldsymbol{\beta}$ = 0.062, t = 2.563, p = 0.011). This shows that relationship between independent variable (INQ) and dependent variable (UR) were mediated with US.

Table 12. Total effect and indirect of INQ on US and UR

	B	Mean	s.d.	t-value	p-value
Total effect INQ - US	0.389	0.391	0.055	2.932	0.004
Indirect effect INQ - UR	0.062	0.065	0.024	2.563	0.011

The Table 13 shows the results from constructed H3 which point out the total effect and indirect effect of the independent variable (TTF), dependent variable (UR) as well mediated variable which considered as dependent variable (US). The Table 13 shows that total effects of TTF towards US as linkage of mediating role is resulted as significant relationship (H3: **β** = 0.389, t = 7.179, p = 0.000). The excluded mediation variable (US), have resulted a significant relationship in between TTF towards the UR as indirect effect (H3a: **β** = 0.148, t = 3.888, p = 0.000). As a result, this relationship of TTF and UR considered significant relationship accompanied by mediation variable (US)

Table 13. Total effect and indirect of TTF on US and UR

	B	Mean	s.d.	t-value	p-value
Total effect TTF - US	0.162	0.170	0.038	7.179	0.000
Indirect effect TTF - UR	0.148	0.150	0.038	3.888	0.000

As depicted from Table 14, the total effect of (US) on the dependent variable (UR) have recorded a significant relationship (H4: **β** = 0.382, t = 5.396, p = 0.000). From Table 14, it is evidenced that relationship of US on UR are significant which supported the constructed hypothesis.

Table 14. Total effect of US and UR

	B	Mean	s.d.	t-value	p-value
Total effect US - UR	0.382	0.382	0.071	5.396	0.000

7 Contribution

Theoretical Contribution

Based on findings from this study were majorly support the theory of Information System Success Model and Task-Technology Fit as influencer that measuring the user satisfaction and continuance usage of Digital Library MSU. Most of previous study that measures the effectiveness of Digital Library is adopted the theory of ISSM and TTF which is considered as empirical studies. The students (users) are unable met their information desires as DL have limited access which might impacted on their quality of research due to the restriction access of digital library resources (Arif and Kanwal, 2009). Based on Somaratna and Peiris (2011), evaluation of library depends on its quality as it relates with their collection size, what library collection has, rather than what library does.

To correlate with the mentioned theory of ISSM and TTF, it is relevant to measure the quality of information that held in the DL MSU as well task fit with the technology or system. Accordance to Wei Xia (2003), author highlighted from his finding that unfamiliarity of digital services have brought into low frequency of use and dissatisfaction. This study had met other previous research findings in same field of research which utilize the ISSM and TTF in measuring the Digital Library. Most theories involved in evaluating Digital Library is ISSM, TTF, and TAM which can be reviewed from literature review in this study. From the drawing related theory are complete explanation of relationship in between user satisfaction and user retention of Digital Library MSU. A contribution with this study was to provide support for those theories. This are attained by linking the theoretical of these theories for assessing academic library that deployed Digital Library. These theories consists of; Information System Success Model (ISSM), and Task-Technology Fit (TTF). Both theories were applicable with this study as conducted by the researcher.

Methodological Contribution

This study have majorly focused on Digital Library use which been measured in terms of System Quality, Information Quality and Task-Technology Fit with the User Satisfaction and User Retention of the user. Previous studies that addressed upon the issue of Digital Library were often use the quantitative approach. Most of them have utilize the same theoretical framework which validated these dimensions as it suit with the context of Digital Library adoption in various countries. By using one method quantitative approach, this study had adopted the survey method as it led towards development for a research instrument which is questionnaire. The questionnaire was derived from various sources which assisting the development of instrument. The development of questionnaire was driven from the past literature within domain of Digital Library and Library Management context. The questionnaire developed is 25 close-ended questions by employing the Likert Scale in measuring

Digital Library use in MSU, had to undergo validity and reliability testing as such factor analysis and reliability analysis. As the developed questionnaire, it measures pretty well as adoption research method for DL have provided knowledge contribution.

8 Conclusion

This study had found that the predictors of Information Quality, System Quality and Task-technology Fit were having significant relationship for User Retention in Digital Library MSU. As discussed earlier, relevancy and updated information have satisfied user satisfaction in DL MSU which encourage student to continuously utilize the DL service. The subscription of e-books, online databases and other online services which quite relevant to the course or subject offered in MSU have positively impacted quality of information held in the Digital Library. In addition, DL MSU have provided amass of information and coping the trend of technological aspect which is availability of 24/7. In correlate to that, the system also provide better accessibility into their sources meaning that students in MSU can access at any time to access MSU Library Digital collections. With that intention, DL MSU have attained high user satisfactory level which researcher found from the data analysis based on choices of student that respond into survey conducted in this study. User nowadays were likely to remote access everything without physically visit and utilizing the services provided in the library. However, the presence of Digital Library have ease the accessibility of their user in finding, collecting, or downloading relevant articles or e-books as provided by the library.

References

Arms,W. Y. (2000). *Digital libraries*. Cambridge, MA: MIT Press.

Bae, K. J., & Cha, S. J. (2015). Analysis of the factors affecting the quality of service in public libraries in Korea. Journal of Librarianship and Information Science, 47(3), 173e186.

Bagudu, A. A. and Sadiq, H. (2013). Students perception of digital library services: a case study of international Islamic university, Malaysia, Retrieved April 18, 2014 from http://digitalcommons.unl.edu/libphilpra c/894/

Candela, L., Castelli, D. & Pagano, P. (2011). History, Evolution and Impact of Digital Libraries. 10.4018/978-1-60960-031-0.ch001.

Chang, C. C. (2013). Exploring the determinants of e-learning systems continuance intention in academic libraries. Library Management, 34(1/2), 40e55.

D'Ambra, J., Wilson, C., & Akter, S. (2013). Application of the task-technology fit model to structure and evaluate the adoption of e-books by academics. Journal of the American Society for Information Science and Technology, 64(1), 48–64.

Darko Etinger & Jusuf Sehanovic & Antonio Ribic, (2014). "Measuring The Success Of E-Library Implementation: Students Perceptions And Use," Interdisciplinary Management Research, Josip Juraj Strossmayer University of Osijek, Faculty of Economics, Croatia, vol. 10, pages 957-969.

Gebauer, J., & Ginsburg, M. (2006). Exploring the black box of task-technology fit: The case

of mobile information systems. Fifth workshop on e-business (WeB 2006) (pp. 1–14). .
Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. MIS Quarterly, 19(2), 213–236.
Hair, J.F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). (Second Edi.). Los Angeles: Thousand Oaks.
Halonen, Raija & Thomander, Heli & Laukkanen, Elisa. (2010). DeLone & McLean IS Success Model in Evaluating Knowledge Transfer in a Virtual Learning Environment. IJISSC. 1. 36-48. 10.4018/jissc.2010040103.
Lagzian, F., Abrizah, A. and Wee, M.C. (2013), "An identification of a model for digital library critical success factors", The Electronic Library, Vol. 31 No. 1, pp. 5-23.
Licklider J C R (1960)," Man-Computer Symbiosis", IRE Trans. Human Factors in Electronics, HPE, Vol. 1 pp.4-11.
Park, N., Roman, R., Lee, S. and Chung, J.E. (2009), "User acceptance of a digital library system in developing countries: an application of the technology acceptance model", International Journal of Information Management, Vol. 29 No. 3, pp. 196-209.
Samadi, Ismail & Masrek, Mohamad. (2013). Evaluating Digital Library Effectiveness: A Survey at University of Tehran. Proceedings - 2013 International Conference on Advanced Computer Science Applications and Technologies, ACSAT 2013. 80-84. 10.1109/ACSAT.2013.23.
Saracevic, Tefko. (2000). Digital Library Evaluation: Toward Evolution of Concepts. Library Trends. 49.
Somaratna, SD, Peiris, CN (2011) Service quality in University of Colombo libraries: An assessment. Annals of Library and Information Studies 58 (June): 1–18.
Sun, Jie & Yuan, Bao-Zhong. (2012). Development and Characteristic of Digital Library as a Library Branch. IERI Procedia. 2. 12-17. 10.1016/j.ieri.2012.06.044.
Thong, J.Y.L., Hong, W. and Tam, K.-Y. (2002), "Understanding user acceptance of digital libraries: what are the roles of interface characteristics, organizational context, and individual differences?", International Journal of Human-Computer Studies, Vol. 57 No. 3, pp. 215-242
Urbach, N. and Mu¨ller, B. (2012), "The Updated DeLone and McLean model of information systems success", in Dwivedi, Y.K., Wade, M.R. and Schneberger, S.L. (Eds), Information Systems Theory: Explaining and Predicting Our Digital Society, Springer, New York, NY, pp. 1-18
Vijayakumar, Jk & Jeevan, V.. (2001). Digital library development : major issues of externally published contents.
Vongjaturapat, S. (2018). Application of the task-technology fit model to structure and evaluation of the adoption of smartphones for online library systems. Science and Technology Asia, 23(1), 39–56.
Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J., Dubey, R., & Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. Journal of Business Research, 70, 356–365. https://doi.org/10.1016/j.jbusres.2016.08.009
Wei Xia (2003) Digital Library Services: Perceptions and Expectations of User Communities and Librarians in a New Zealand Academic Library, Australian Academic & Research
Libraries, 34:1, 56-70, DOI: 10.1080/00048623.2003.10755218
Wu, J. and Wang, Y. (2006), "Measuring KMS success: a respecification of the DeLone and
McLean's model", Information and Management, Vol. 43 No. 6, pp. 728-739.
Xu, Fang & Du, Jia. (2018). Factors Influencing Users' Satisfaction and Loyalty to Digital Libraries in Chinese Universities. Computers in Human Behavior. 83. 10.1016/j.chb.2018.01.029.