



Evaluation of Information Systems in Public Libraries Using The Delone & Mclean Model

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ABSTRACT	ARTICLE INFO
<p>While many researchers have investigated the adoption and use of information systems in academic libraries, one section has not been thoroughly researched, particularly in public libraries that have adopted the use of information systems. Now public libraries have started to use or subscribe to any existing information system in line with the needs of the local community. The purpose of this paper is to identify and obtain information regarding the suitability or achievement of information system services used in public libraries using the Delone and Mclean information system success model. The method of data collection is to use an online survey questionnaire to obtain primary sources from the general public around. The findings of the investigation showed that the system quality, information quality, service quality, usage, user satisfaction and net benefits showed significantly good and satisfactory results and this further indicated that the information system service in public libraries was achieved. The results can help librarians to improve the information systems used so that their information system services can be improved to the maximum stage.</p> <p>© 2021 Edulib</p>	<p>Article History: <i>Submitted/Received 02 Sep 2021</i> <i>First Revised 02 Nov 2021</i> <i>Accepted 30 Nov 2021</i> <i>First Available online 30 Nov 2023</i> <i>Publication Date 30 Nov 2023</i></p> <hr/> <p>Keyword: <i>Delone and Mclean Model,</i> <i>Information system (IS),</i> <i>Public Library.</i></p>

1. INTRODUCTION

Today's technology has influenced all areas of the general public's life, affecting safety, the economy, education, and so on. Information and Communication Technology (ICT) will continuously develop and become more sophisticated with its discoveries. The sophistication of this technology can be seen from its size, model or shape, speed, and ability. The technology that has been developed has led to the change in world information. Now information is essential to become a highly knowledgeable human being. A facility is provided to obtain information, especially information on literature, so it is easily accessible to the public, namely the library. The development of information technology at this time is very rapid, so it has changed the dimensions of the library into a digital library or electronic resource center. Internet and computer technology is not foreign technology for today's society. With this technology, we can carry out our work more efficiently and get up-to date and accurate information. The emergence of Information and Communication Technology and a knowledge-based economy in the 21st century has made information systems a reality.

A system is a set of interactive elements that operate as a group to fulfill a purpose. A system consists of people, equipment, tools, and processes that all work together to achieve a common goal. Computer-based information systems are currently available. Computers have functioned as tools for information systems. They can store, process, and disseminate data and information successfully. An information system is an integrated set of components that collect, store, and process data to deliver information, knowledge, and digital products. The information system that has been realized must be checked for success to achieve the goal it is discovered. This research is based on several previous research concepts as follows:

Table 1. Previous Research

No	Title	Result
1	Investigating Digital Library Success using the DeLone and McLean Information System Success 2.0: The Analysis of Common Factor based Structural Equation Modeling (Afthanorhan, 2020)	Empirical findings show that 8 out of 10 proposed hypotheses are supported. Two unsupported theories are about the relationship between Information Systems, System Quality, and User Satisfaction. In addition, the Intention to Use a mediator influences the quality factor and User Satisfaction. In addition, empirical findings also highlight that Intention to Use is fully utilized when Information Systems and System Quality are implemented.
2	Mediating effects of user experience usability: An empirical study on mobile library application in China (Ke & Su, 2018)	The findings show that the usefulness of user experience is positively correlated with information, system, and service quality. In addition, the effectiveness of user experience significantly influences the relationship between information system success factors and net benefits.
3	DeLone and McLean models of information system success: critical meta-review and re- search directions (Pour, 2022)	This paper is the first attempt to conduct a meta-analysis of the literature and integrate the results of an e-learning success study based on the D&M model while considering the moderating role of user type. This provides a clear picture of the casual relationship in the D&M model in learning success.

Public libraries are responsible for providing comprehensive information and implementing fast and relevant services to users' information needs, ensuring that users' information needs are met when they access the library. District or city public libraries provide services to local and urban communities as a source of lifelong learning for all ages, races, religions, socioeconomic statuses, and gender. Public libraries serve as the frontline in disseminating information to the public, increasing public interest in reading and laying the foundation for education. The method of delivering information is now growing in line with technological developments. Directly to obtain information in public libraries, it is only necessary to access it digitally, such as using the Online Public Access Catalog (OPAC) and online resources, considering these technologies' success in meeting users' wishes. Therefore, the researcher uses the Delone and Mclean Model to analyze the success of the information system

Delone and McLean's (1992) information system success model establishes a model that attempts to measure the impact of information systems, taking into account six constructs. Historically, the Delone and McLean model of information systems has often been criticized for being developed with a lack of variables in the model, which is not recommended as a successful model. After ten years of research and modification based on many contributors, a new model of Delone and McLean (2003), proposed and this new model has been reformed. DeLone and McLean reviewed the model, considering several studies that used part or all of their model. They say that the model has met the main goal set: to achieve the success of information systems through multidimensional and interdependent construction. Reforming a new model to include Service Quality constructs to measure user behavior finally emerged as Individual Impact and Organizational Impact as Net Benefits. Since then, this model has been widely used to test information systems in digital libraries, knowledge management systems, management information systems, and online learning systems (e-learning). They modified the model by considering the following constructs: information quality, system quality, service quality, system use or intention to use, user satisfaction, and net benefits. The model can be seen in the image below.

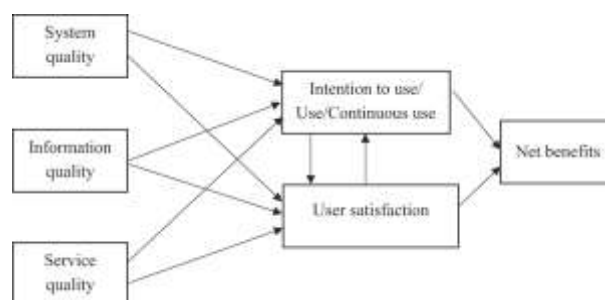


Figure 1. Delone and Mclean Model (Pour et al, 2022).

Based on what has been described above, it can be identified several problems will be discussed in this paper, namely; (i) What is the condition of the information system in the Pahang public library? (ii) Are users satisfied when using the information system provided? (i) Does this information system succeed in carrying out its duties?

The article review aims to identify and obtain information regarding the suitability or achievement of the information system services used in the Pahang public library. In particular, the purpose of this article review is to: (i) Obtain data and information about the condition of the information system. (ii) Obtain data and information about user satisfaction

when using information systems. (iii) Obtaining data and information regarding the success of the information system used.

2. METHODS

Concerning this research methodology, the researcher adopted a descriptive quantitative research design. The quantitative research design refers to the master plan of how the researcher intends to collect measurable data and measure and analyze this data. Respondents or participants involved in this study are the general public close to the study center, namely in Kuantan, Pahang, Malaysia. In this regard, this study developed and used an online survey questionnaire to collect data. The questionnaire provided contains a list of structured questions addressed to respondents to obtain written information about information quality, system quality, service quality, usage intensity, user satisfaction, and net benefits. In designing the questionnaire, the researcher surveyed the existing literature on the research variables and finally adapted the items. Instead of modifying the Delone and Mclean model, several research variables can be taken next, such as:

Table 2. External factor evaluation (EFE) matrix analysis.

Variable	Indicator
1. Information Quality	Completeness Precision Reliability Currency Format of Output
2. System Quality	System Flexibility Time to Respond Convenience of Access Language
3. Service Quality	Assurance System Responsiveness System Empathy
4. Use	Daily Used Time Frequency Of Use
5. User Satisfaction	Information Satisfaction/ Repeat Purchase Overall Satisfaction /Repeat Visit

The type of data in this study is primary data which is research data obtained directly from the source. This study's data sources were questionnaires from respondents who had used information systems in the study's public library. The sample for this study consisted of the general public around the research library and was taken using the "Volunteering Sampling Design" sampling technique. According to [Murairwa \(2015\)](#) this sample can be a sample of participants who voluntarily participate as part of a sample group. Participants in a voluntary model usually choose to respond to a survey because they have strong opinions about the survey subject. Volunteers can be owned in person, over the internet, through public postings, and various other methods.

3. RESULTS AND DISCUSSION

Demographic information, including gender and age, is presented in Table I. In this study, more women (88%) participated than men (12%). The median age was 23 years, with most respondents aged between 21 and 25 (84%).

Table 3. Demographic Information

	%
Gender	
Female	88
Male	12
Age	
20-22	84
23-25	8
More than 25	8

Table 4. Survey filling by respondents for information quality indicators

No	Question	Scale			
		SA	A	DA	SDA
1.	I got complete data according to the request	16%	80%	4%	-
2.	I got the correct and precise information as expected	20%	80%	-	-
3.	I may rely on the data obtained to meet the information needs of the workplace	16%	80%	4%	-
4.	I get the latest data and information / up to date?	16%	72%	8%	4%
5.	The output/search results I'm getting are presented in a useful format? (e.g. charts, tables, graphs)	20%	76%	4%	-

Based on the data above, as many as four respondents (16%) stated strongly agreed with the question, where respondents obtained complete data by request, and 20 respondents (80%) agreed. However, some disagree, namely one respondent (4%). For the second question, respondents received correct and accurate information. As many as five respondents (20%) stated firmly agreed, and 20 respondents (80%) agreed. For the next question, four respondents (16%) said they firmly agreed, 20 respondents (80%) agreed, and one respondent (4%) disagreed with this question. For the question of respondents getting the latest data and information, as many as four respondents (16%) stated strongly agree, 18 respondents (72%) agreed, two respondents (8%) disagreed, and one respondent (4%) strongly disagreed. For the last question, as many as five respondents (20%) stated strongly agreed with the question, where respondents obtained the output in a helpful format, and 19 respondents (76%) agreed. However, some did not agree, namely one respondent (4%).

Table 5. Survey filling by respondents for information quality indicators

No	Question	Scale			
		SA	A	DA	SDA
1.	I find it easy to make the information system do what I want	20%	80%	-	-
2.	I am satisfied with the response time of the system (eg the time it takes to get an answer to a question).	12%	76%	12%	-
3.	I feel comfortable and easy to access the system	32%	64%	-	4%
4.	The language used in the system is easy for me to understand	36%	64%	-	-

Based on the data above, as many as five respondents (20%) strongly agree with the question. Respondents found it easy to make information systems do what the respondents wanted, and 20 respondents (80%) agreed. For the second question, three respondents (12%) strongly agreed with this question, and 19 respondents (76%) agreed. However, some did not agree, namely, three respondents (12%). Furthermore, as many as eight respondents (32%) strongly agreed with the question, where respondents felt comfortable and easy to access the system, and 16 (64%) agreed. However, some strongly disagreed with this question, namely, one respondent agreed to the question, where respondents (4%). For the last question, as many as nine (36%) stated strongly agree, and 16 (64%) quickly understood the system language.

Table 6. Filling out surveys by respondents for service quality indicators

No	Question	Scale			
		SA	A	DA	SDA
1.	I feel safe in accessing or sending data through the system	28%	72%	-	-
2.	The input data provided may be useful for my work stress	32%	68%	-	-
3.	The system gives the result according to what I want	24%	76%	-	-

Based on the data in the table above, as many as seven respondents (28%) stated that they strongly agreed to the question that respondents felt safe in accessing or sending data through the system, and 18 respondents (72%) agreed. Eighteen respondents (32%) strongly agreed with the question where the input data provided can be helpful for respondents' work assignments, and 17 respondents (68%) agreed. Furthermore, in the question where the system provides results by what respondents want, as many as six (24%) stated strongly agree, and 19 (76%) agreed.

Table 7. Filling out surveys by respondents for indicators of Usage

No	Question	Scale			
		SA	A	DA	SDA
1.	I use the information system frequently in a day	28%	52%	16%	4%
2.	I at least use the information system 1 hour a day	20%	56%	20%	4%

Based on the data above, as many as seven respondents (28%) stated "strongly agree" on the question where respondents used information systems frequently in a day, and 13 respondents (52%) said, "agree." However, some answered "disagree" with four respondents (16%) and "strongly disagree" with one respondent (4%). For the second question, respondents use the information system at least 1 hour a day. As many as five respondents (20%) stated "strongly agree" on this question, and 14 respondents (56%) said, "agree." However, some answered "disagree" with five respondents (20%) and "strongly disagree" with one respondent (4%).

Table 8. Filling out surveys by respondents for user satisfaction indicators

No	Question	Scale			
		SA	A	DA	SDA
1.	I am satisfied with the data and information I got from this system.	32%	64%	4%	-
2.	I am satisfied with the existing information system	28%	68%	4%	-

Based on the data above, as many as eight respondents (32%) stated “strongly agree” on the question, where respondents were satisfied with the data and information that the respondent found from this system, and 16 respondents (64%) stated “agree.” However, some answered “disagree,” namely one respondent (4%). For the second question, the respondents were satisfied with the existing information system, a total of respondents (28%) stated “strongly agree” on this question, and 17 respondents (68%) stated, “agree.” However, some answered “disagree,” namely one respondent (4%).

Table 9. Filling out surveys by respondents for user satisfaction indicators

No	Question	Scale			
		SA	A	DA	SDA
1.	I can complete any task quickly	16%	84%	-	-
2.	My work performance increased after using the available in-formation system	24%	76%	-	-
3.	I am more effective in working by using the system	16%	80%	4%	-
4.	I can do any of my work more easily	24%	98%	4%	-
5.	I can solve any problem in work activities	20%	76%	4%	-

Based on the data above, as many as four respondents (16%) stated "strongly agree" on the question where respondents can complete any task quickly, and 21 respondents (84%) stated, "agree." Further- more, six respondents (24%) stated "strongly agree" on the second question, and the remaining 19 respondents (76%) stated, "agree." Followed by four respondents (16%) stating "strongly agree" on the question where respondents become more effective in working using the information system provided in this library, and 20 respondents (80%) stated "agree." One respondent (4%) stated, "disagree." The third question is whether respondents can do work more easily using this information system. There are six respondents (24%) stated "strongly agree," and 17 respondents (98%) stated "agree." Two respondents (8 %) answered: "disagree." The last question, as many as 5 respondents (20%) stated "strongly agree", 19 respondents (76%) stated "agree" and 1 respondent (4%) "disagree". Information quality focuses on the information generated by the information system. The criteria used by researchers to assess the quality of information include Completeness, Precision, Reliability, continuously updated data (Currency), and Format (Format of Output). From the results obtained in the monitoring and data analysis sections, we can see that the number of respondents who "strongly agree" and "agree" to the questions made based on the select- ed criteria is higher than the number of respondents who "disagree" and "strongly agree." do not agree." Based on this, the researcher can see that the information provided by the information system of the Pahang Public Library Agency is in good condition, quality, and satisfactory. This indicates that the information provided successfully meets the needs of the general population in the vicinity.

The criteria used by researchers to assess the quality of the system are System Flexibility, Response Time (Time to Response), Convenience of Access, and Language. The system's quality is focused on the performance and ability of the system to provide the information needed by the user. From the results on the part of the monitoring results and data analysis, we can see that the number of respondents who "strongly agree" and "agree" to the questions made based on the selected criteria is higher than the number of respondents who "disagree" and "strongly agree." do not agree." Based on this, the researcher can see that the

information system used in the study library is of good quality and can provide the information needed in excellent and satisfactory condition.

Service quality is the service obtained by the user. The selected criteria are assurance, system empathy, and system responsiveness. From the monitoring and data analysis section results, it can be seen that all of the respondents "strongly agree" and "agree" to the questions based on the selected criteria. Based on this, researchers can see that the information systems of the Pahang Public Library Agency can provide excellent and satisfying services.

Usage refers to how often users use the information system provided. For this, the selected criteria are daily used time and frequency. From the results obtained in the monitoring and data analysis sections, we can see that the number of respondents who "strongly agree" and "agree" to the questions made based on the selected criteria is higher than the number of respondents who "disagree" and "strongly disagree." This shows that users' frequency of use of information systems is at a sound stage.

User satisfaction is the user's response after using the information system. The criteria chosen for the researcher are information satisfaction and overall satisfaction. The results in the monitoring and data analysis section can be seen that the number of respondents who "strongly agree" and "agree" to the questions made based on the selected criteria is higher than the number of respondents who "disagree" and "strongly disagree." These results indicate that users are satisfied with this information system.

The criteria chosen by the researcher were the speed of accomplishing the task, job performance, effectiveness, ease of work, and usefulness in work. The results in the monitoring and data analysis section can be seen that the number of respondents who "strongly agree" and "agree" to the questions made based on the selected criteria is higher than the number of respondents who "disagree" and "strongly disagree." This shows the net benefit of providing a positive influence of information on user performance.

4. CONCLUSION

Based on the results and discussion, the study library information system has a good effect on the intensity of system use and user satisfaction. Libraries will benefit from user satisfaction, where they can improve their information systems according to user needs. This information system helps speed up the completion of any task and enhances work performance and effectiveness. The researcher can also conclude that the information system in the study library is in excellent condition. This can be seen through data analysis which has proven that users are satisfied when using the system. This shows the achievement and success of its information system services.

There are many limitations in this research. This research is focused on only one library, causing the data collection to be limited. The study extended to evaluate information system services among various library users in many public, unique, and university library users. In addition, there are limitations in standards due to the lack of Malaysian Public Library Standards available for the general public to see and understand the content of the standards, which also complicates the evaluation process of this information system. Not only that but there is no standard for the information system made by the authorities to be used as a reference in carrying out this research. In this regard, future research should consider a wider variety of factors.

Based on this study, there's a suggestion for future research that the researcher should increase the number of respondents so that the researcher can see the condition of the

information system used in the library more widely. In addition, they are considering the time limit for distributing the questionnaire to study library information system users. Researchers are also advised to simplify the respondents' questions to understand better what they want to ask. Furthermore, the researcher must prepare questionnaires in various forms, namely physical and digital forms, so that respondents who experience any constraints can answer the questionnaire provided by the researcher. Next, the library or the government should approve and publish Malaysian Public Library Standards that are specific for the general public and researchers so that at least the general public and researchers can know a little about the standard. With this standard, users can compare the library the measure whether the library has met the minimum requirements and is called a suitable library for the general public. Furthermore, the researcher cannot compare this evaluation with the information system standard because no standard mentions in detail about the information system. Therefore, the authorities should establish criteria for information systems to coordinate all library information systems.

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