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HOT FIT MODEL DIGITAL LIBRARY EVALUATION AT STATE UNIVERSITY OF SURABAYA

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Abstract

Digital Transformation is currently causing changes in almost all aspects of life, including academics, for example libraries that initially use conventional methods to become digital-based or often known as Digital Libraries. Efforts made by several universities in adapting to these changes are by developing digital libraries, including those carried out by the State University of Surabaya. This study aims to evaluate the implementation of a digital library at the State University of Surabaya using the HOT Fit Model Evaluation. This evaluation model defines the components in the information system as the main components to be evaluated, namely the human, organizational, and technological components and the relationship between each component. The results of the Bivariate Correlation Test in this study indicate that the components of Human, Organization and Technology are interconnected, as well as the relationship between these 3 components and the Net-Benefit component or the effectiveness of the Surabaya State University digital library which indicates that the relationship is very strong as well. In other words, in order for an information system development to run effectively, these 3 core components are needed, namely Human, Organization and Technology. Even so, not all of

the tested variables obtained maximum results, this also means that improvements still need to be made in the future.
Keywords: *digital library, education, HOT Fit Model*

1. INTRODUCTION

Technological developments in the 21st century have an impact on almost all aspects of human life, especially those directly related to information and communication such as libraries. Libraries have been one of the most important sources of information for humans, especially in the field of education. Almost every educational institution requires a library to be a means for humans to find information. However, along with the times, the physical form of the building of the current library is no longer needed, because there is technology that can replace it. The development of libraries that adapt this technology which is then known as digital libraries.

The concept of a digital library was first developed by Americans in the early 1990s (Shuqing, Fusen, Yong, & Xia, 2019). After experiencing gradual development over several years, digital libraries have finally become one of the important aspects of modern library development (Shuqing, Fusen, Yong, & Xia, 2019). Libraries adapt technology with the aim of sending information to their users and also to connect with their users more effectively and efficiently (Shulman, Yep, & Tomé, 2015). By using technology, digital libraries change library services from traditional ways to become more innovative by offering technological advances to meet user needs for information (Tripathi & Kumar, 2010). Traditional libraries are only able to provide information in printed or written form (Rozkolupa, Bogush, Laguta, Kravchenko, & Adamenko, 2019),, but with library technology they can provide information in digital form that can be accessed anywhere and anytime. That's why the development of digital libraries is very important to do.

The development of a digital library that is increasingly being carried out also requires evaluation to ensure whether the developed digital library is in accordance with the objectives and functions of the library itself. The purpose of evaluating digital libraries is to find out whether the practices carried out are in accordance with the stated goals and also to provide recommendations as consideration for improvement.

(Chowdhury & Chowdhury, 2003). Digital library evaluation covers every aspect of its development and operation (Tsakonas, Mitrelis, Papachristopoulos, & Papatheodorou, 2013). Digital libraries are usually evaluated explicitly by collecting attitude survey data for example (Priestner & Borg, 2016), or implicitly by generating usage reports from LF (Maram, Monica, & Ayman, 2020).

One of the evaluation models that can be used to evaluate an information system is the HOT Fit Model. This theory is made from two evaluation models for information systems, the models are the D&M IS Success Model (DeLone & McLean, 2004) and the IT Organization Fit Model (Morton, 1991). This evaluation model defines the components in the information system as the main components to be evaluated, namely the human, organizational, and technological components and the relationship between each component (Wiyati & Sarja, 2019). This study aims to evaluate the implementation of a digital library at the State University of Surabaya by using the HOT Fit Model Evaluation and the suitability of the relationship between the three variables.

2. METHOD

This study aims to evaluate the implementation of a digital library at the State University of Surabaya using the HOT Fit Model Evaluation. This evaluation model defines the components in the information system as the main components to be evaluated, namely the human, organizational, and technological components and the relationship between each component (Wiyati & Sarja, 2019).

The stages carried out in this research are as follows:

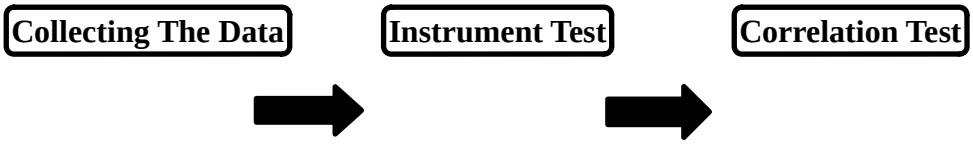

Fig. 1. *Research Stage*

2.1 Collecting The Data

The data in this study were obtained online by distributing questionnaires via google form to the research targets. The questionnaire distributed contained the components of the HOT Fit Model Evaluation which were then broken down into

several variables. The variables used in this study are contained in the following instrument lattice table:

Tabel. 1. *Kisi – kisi Instrumen Penelitian*

No.	Indicator	Sub-Indicator 1	Sub-Indicator 2
1.	Technology	System Quality (SQ)	The system is easy to learn and use for people who are using it for the first time
			Digital Library display is simple and not confusing
			There is a login menu for admins to make changes to data such as (adding and editing)
			The system can be easily accessed
		Information Quality (IQ)	The information generated is in accordance with the inputted data
			The information presented is quite complete
			Information can be easily understood
			The information presented is in accordance with reality
		Services Quality (SRQ)	Fast and responsive service from the developer
			Digital library has facilities that are visually attractive
			When the system has problems, the system provider will provide a solution
2.	Human	System Use (SU)	The use of digital libraries makes it easy for students to find references and information
			Provides convenience for admins in processing library data
			In carrying out the work depends on the digital library
		User Satisfaction (US)	There are still some things that need to be developed
			All existing features have been running well
			The resulting information is great
			Users are satisfied with the level of accuracy of the application used
			Easy to use
			Very helpful in completing assignments and preparing a Final Project report
			The digital library application is user friendly
			The resulting information is in the required format
3.	Organization	Organization's Structure (OS)	The application of digital libraries to improve the work performance of the library section
			The institution always supports the need for software and hardware in an effort to improve quality and quality
			The implementation of the digital library development has been planned in advance

			The institution strongly supports the implementation of digital library implementation
		Environmental Organization (EO)	Get support in the form of funds from the management
			All parts of the institution strongly support the implementation of the digital library
4.	Net-Benefit	Usability (N)	Improve work efficiency
			Assist in processing library data
			Help achieve goals effectively

2.2 Instrumen Test

a. Validity

Validity is a value that measures the level of truth of an instrument used in research. If the validity value generated by an instrument is high, then the instrument can be said to be valid for use in research, but on the contrary, if the validity value is low, then the instrument is less valid to use and improvements are needed (Arikunto & Suharsimi, 2006). Testing the validity of the instrument in this study used the Pearson product moment correlation formula which will be calculated using SPSS 25, with the following formula:

$$r_{xy} = N \sum X Y - ¿¿¿$$

Explanation:

rxy = The correlation coefficient of an item

N = Number of objects

X = Item Score

Y = Total score

(Arikunto & Suharsimi, 2006)

(Sugiyono, 2019) also explains another provision for assessing the validity of an instrument is to look at the correlation of the number of factor scores with the total score, provided that if the correlation between each factor is > 0.3 and a positive number, then the factor can be said to be able to represent the construct. and the instrument used has a high validity construct. And vice versa.

b. Reliability

Questionnaires can be said to be reliable or appropriate if the answers from respondents are consistent (Setiaji, 2004). (Arikunto & Suharsimi, 2006)

states, the reliability of the instrument is called valid if Rcount ≥ Rtable. The instrument reliability test in this study used the Cronbach Alpha formula which was calculated using SPSS 25, with the following formula:

$$r_{ii}=\left(\frac{n}{n-1}\right)\left(1-\frac{\sum \sigma_t^2}{\sigma_t^2}\right)$$

Keterangan:

rii = Instrument Reliability Coefficient (Alpha Cronbach)

n = The number of questions.

Σσ t2 = Number of item variants.

σt2 = Total variance.

The benchmark for high and low reliability coefficients in this study uses the interpretation proposed by (Sugiyono, 2019).

Tabel. 2. *Reliability Coefficient Benchmark*

Coefficient Correlation	Tingkat Hubungan
0,800 – 1,000	Very Strong
0,600 – 0,799	Strong
0,400 – 0,599	Average
0,200 – 0,399	Low
Less Than 0,200	Very Low

2.3 Correlation Test

Data analysis according to (Wiyono, 2007) is processing the numbers obtained from scores that are easy to read and conclude. Meanwhile, according to (Sugiyono, 2019), data analysis is "an activity after data from all respondents or other data sources are collected".

The data analysis technique used in this research is Bivariate Correlations Analysis. Bivariate Correlation Analysis is an analytical technique used to examine more deeply the relationship between variables, both linear and non-linear relationships. Although the basic correlation data analysis technique is only used to calculate the relationship between two linear variables, the bivariate correlation analysis technique is used to calculate both (linear or non-linear). In addition, Bivariate Correlation Analysis is an analytical technique used to measure the strength

between variables through the calculation of different coefficients. This study aims to determine the relationship of the variables that are arranged based on the components contained in the Hot Fit Model Evaluation, namely, Human, Organization, Technology, and Net-Benefit. Based on these objectives, the hypothesis of this study is as follows:

Table. 3. *Research Hypothesis*

Hypothesis	Relations Between Variables
H1	System Quality ——— System Use
H2	System Quality ——— User Satisfaction
H3	System Quality ——— Organization's Structure
H4	Information Quality ——— System Use
H5	Information Quality ——— User Satisfaction
H6	Information Quality ——— Organization's Structure
H7	Services Quality ——— System Use
H8	Services Quality ——— User Satisfaction
H9	Services Quality ——— Organization's Structure
H10	System Use ——— Net-Benefit
H11	User Satisfaction ——— Net-Benefit
H12	Organization's Structure ——— Net-Benefit
H13	Environment ——— Net-Benefit
H14	System Quality ——— Net-Benefit
H15	Information Quality ——— Net-Benefit
H16	Services Quality ——— Net-Benefit

The conceptual framework in this research can be seen in the following figure:

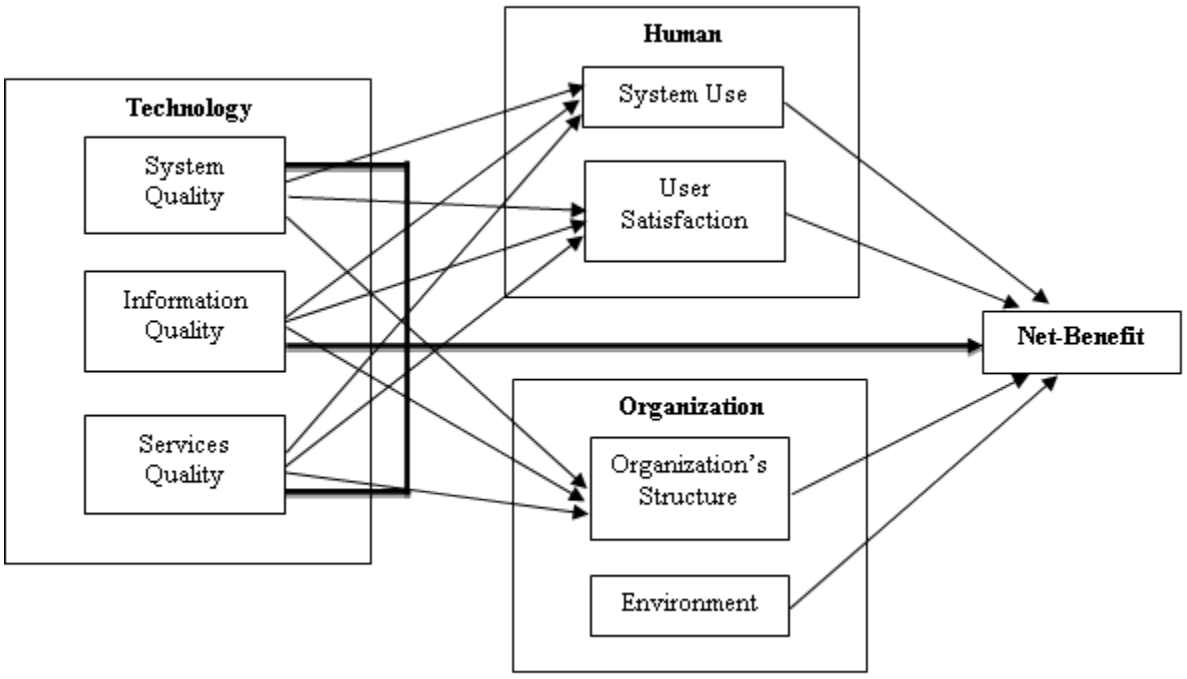

Fig. 2. *Conceptual Framework Research*

The value of the relationship between two variables, both linear and non-linear, can be seen from two aspects, namely the strength and direction of each variable which is indicated by the absolute value and the sign of the correlation coefficient. The value of the relationship seen from the aspect of strength can be known through the value of the correlation coefficient between -1 and +1. The closer the correlation coefficient value to +1, the stronger the relationship. On the other hand, the closer the correlation coefficient is to zero, the weaker the relationship will be. While the value of the relationship seen from the aspect of direction, if it shows a positive sign, it means that each variable shows a positive relationship, where when one variable increases, the others follow. And vice versa, if it shows a negative sign, then the relationship between variables can be interpreted as negative as well, where if one variable increases, the other decreases. In the calculation of the important correlation to calculate the P value, the P value which corresponds to the null hypothesis value means that the coefficient is also equal to zero, because the P value > 0.05 indicates that there is no significant correlation (Giuseppe, 2019).

3. RESULT

3.1 Instrument Test

a. Validity Test

The results of the validity of each variable in this study are as follows:

Table. 4. *Validity Test Result*

Component	Variable	Validity Test Result
Technology	System Quality (SQ)	0,789 > 0,3
	Information Quality (IQ)	0,793 > 0,3
	Services Quality (SRQ)	0,820 > 0,3
Human	System Use (SU)	0,622 > 0,3
	User Satisfaction (US)	0,861 > 0,3
Organization	Organization's Structure (OS)	0,827 > 0,3
	Environment Organization (EO)	0,605 > 0,3
Net-Benefit	Usability (N)	0,848 > 0,3

Based on the results of the validity test above, it can be seen that the correlation value between the item variables used in this study is in accordance with the provisions, namely > 0.3. So it can be concluded that the variables used in this study are valid.

b. Reliability Test

The results of the reliability of each variable in this study are as follows:

Table. 5. *Reliability Test Result*

Component	Variable	Reliability Test Result	Relation Level
Technology	System Quality (SQ)	0,782	Strong
	Information Quality (IQ)	0,760	Strong
	Services Quality (SRQ)	0,780	Strong
Human	System Use (SU)	0,567	Average
	User Satisfaction (US)	0,869	Very Strong
Organization	Organization's Structure (OS)	0,863	Very Strong
	Environment Organization (EO)	0,670	Strong
Net-Benefit	Usability (N)	0,691	Strong

Based on the results as described in the table above, it can be seen that the instrument of each variable in this study has a very good correlation, or can be said to be reliable to use, because each variable is at the Strong and Very Strong level, only one variable which one is at the Average level.

3.2 Correlation Test

The results of the Bivariate Correlation Test in this study can be seen in the following table:

Table. 6. *Bivariate Correlation Test Result*

The relationship between the variable	Correlation	P Value
System Quality ——— System Use	0,479	0,000
System Quality ——— User Satisfaction	0,735	0,000
System Quality ——— Organization's Structure	0,666	0,000
Information Quality ——— System Use	0,455	0,000
Information Quality ——— User Satisfaction	0,707	0,000
Information Quality ——— Organization's Structure	0,636	0,000
Services Quality ——— System Use	0,535	0,000
Services Quality ——— User Satisfaction	0,787	0,000
Services Quality ——— Organization's Structure	0,724	0,000
System Use ——— Net-Benefit	0,684	0,000
User Satisfaction ——— Net-Benefit	0,735	0,000
Organization's Structure ——— Net-Benefit	0,841	0,000
Environment ——— Net-Benefit	0,490	0,000
System Quality ——— Net-Benefit	0,676	0,000
Information Quality ——— Net-Benefit	0,732	0,000
Services Quality ——— Net-Benefit	0,689	0,000

Based on the results of the Bivariate Correlation Test above, it can be seen that the average correlation value between variables in this study is at the level of $0.4 \leq 0.5 \leq 0.6 \leq 0.7 \leq 0.8$, which is at Average to Very Strong level. It can also be interpreted that each variable is interconnected so that the system can function properly, especially in the Organization's Structure - Net-Benefit variable, which means that the development of a system requires the role of the organization as a good manager.

4. DISCUSSION

The era of digital transformation (DT) can also be interpreted as an era of change in organizational systems. The era of digital reform is an era where digital technology is applied in almost all fields, such as implementation models, models of cooperation carried out both in the internal and external environment, public services, and also information management systems (Deja, Rak, & Bell, 2021). This digital transformation

has resulted in changes in almost all aspects of life, including academics, for example, libraries that initially used conventional methods to become digital-based or often known as digital libraries (Sheikhshoaei, Naghshineh, Alidousti, Nakhoda, & Dehdarirad, 2021). The concept of Digital Transformation is to aim to change public services from conventional method to the new ones, which is using digital platforms and the internet, so there is two types of services – online and offline (Mergel, Edelmann, & Haug, 2019). Therefore, to realize these changes, all social publications other than business are carried out by utilizing digital technology, for example, such as public administration services that have changed to electronic systems (e-government, e-governance, digital government, and transformational government) (Mergel, Edelmann, & Haug, 2019) or education (including higher education) is still increasing ((Jackson, 2019); (Mergel, Edelmann, & Haug, 2019); (Sousa & Rocha, 2019)). These very fast changes have inspired several researchers to conduct research related to the readiness of the universities and the role of libraries in these changes (Grzegorz, 2019). Efforts made by several universities in adapting to these changes are by developing digital libraries, including those carried out by the State University of Surabaya. Some of the most important aspects in the effort to develop information systems are the human, organizational, and technological components and the relationship between each component. These changes and improvements need to be made not only to meet the needs of students, but also to ensure that the information provided by the library is continuously updated and the number of available resources continues to increase (Titan, et al., 2021). Based on this explanation, this research was conducted with the aim of evaluating the digital library of the State University of Surabaya referring to these 3 components, or also known as the Digital Library HOT Fit Model Evaluation.

The results of the Bivariate Correlation Test in this study indicate that the technology component of each variable is related to the human component and vice versa, although the quality of the system is not very related to the level of system use, as evidenced by the correlation value of only 0.479, which is at the average level. Similar to the technology component which relates to the human component, the technology component also relates to the organizational component at the level of a strong relationship, as well as preferably. While the results of the calculation of the Bivariate

Correlation Test also show that the 3 components are related to the Net-Benefit component, although the results of the organizational environment variable show that it is not very related to the effectiveness of the digital library, with a correlation value of only 0.490. This means that the organizational environment has not provided a maximum role to increase the effectiveness of the Surabaya State University's digital library, and it is necessary to make improvements to these components in the future. For more detailed results are presented in the Table. 6. Research conducted by Yuliusman also shows relevant results, that to develop an effective information system at the University of Jember, the most important thing is the technology, human, and organization components (Yuliusman, Setiawan, Indrawijaya, Jaya, & Fitri, 2020). In addition, the results of research conducted by Sallehudin also show that the components of technology, human, and organization are related to the effectiveness of implementing Enterprise Architecture in the public sector (Sallehudin, et al., 2019).

5. CONCLUTION

The results of the Bivariate Correlation Test in this study indicate that the components of Human, Organization, and Technology are interconnected, as well as the relationship between these 3 components and the Net-Benefit component or the effectiveness of the Surabaya State University digital library which indicates that the relationship is very strong as well. In other words, in order for an information system development to run effectively, these 3 core components are needed, namely Human, Organization, and Technology. The results of the hypothesis in this study can be concluded as follows:

- H1 : *system quality* has a significant relationship with *system use.*
- H2 : *system quality* has a significant relationship with *user satisfaction*
- H3 : *system quality* has a significant relationship with *organization's structure*
- H4 : *information quality* has a significant relationship with *system use.*
- H5 : *information quality* has a significant relationship with *user satisfaction*
- H6 : *information quality* has a significant relationship with *organization's structure*
- H7 : *services quality* has a significant relationship with *system use.*
- H8 : *services quality* has a significant relationship with *user satisfaction*
- H9 : *services quality* has a significant relationship with *organization's structure*

- H10 : *system use* has a significant relationship with *net-benefit*
- H11 : *user satisfaction* has a significant relationship with *net-benefit*
- H12 : *organization's structure* has a significant relationship with *net-benefit*
- H13 : *environment organization* has a significant relationship with *net-benefit*
- H14 : *system quality* has a significant relationship with *net-benefit*
- H15 : *information quality* has a significant relationship with *net-benefit*
- H16 : *services quality* has a significant relationship with *net-benefit*

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