Quality Analysis of Library Information System Using Webqual toward User Satisfaction

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Abstract − Websites for educational institutions is a form of information services that can be accessed online. One of the information services in educational institutions is library information system. This research focused on Institut Teknologi Telkom Purwokerto as an object of library information system implementation (dlibrary). Corresponding with the library strategy to become "user-friendly", the library of Institut Teknologi Telkom Purwokerto has provided information that follows user requirements and understanding. The one of user satisfaction for accessing the "dlibrary" is the provided quality information system. This research uses Webqual Method. Webqual method is a method for measuring the quality of information from web. This research is done by taking the perspective of the users about the information quality of the website. The 95% confidence level is used in this research, and the result on the dimensions of information quality (usability quality, information quality, and service interaction quality) has significant influence against the user satisfaction. It indicates that the content of the "dlibrary" information are accurate, complete, understandable, relevant and present information in accordance with the needs of the user

Keywords – system information quality, webqual, information quality

I. INTRODUCTION

The library is a collection manager of papers, prints and/or professional record works with the system to meet the needs of education, research, information and recreation of the librarian. The library becomes an important container of educational place which has a very important role in increasing the insight and knowledge of learners. In the library information system, the aspects that affect the level of user satisfaction is the quality of information delivered in the system [1][2].

The Information system has been applied in many organizations such as Universities, governments, and private companies. Applying information system is a way to support and develop their work and business processes.

Some universities have applied information system for library. They are UPN Veteran Surabaya and Universitas Ponorogo. UPN Veteran Surabaya names their library information system with "SIAMIK" and Universitas Muhammadiyah Ponorogo conducts it as "Model updated DeLone and McLean Information System".

SIAMIK UPN Veteran Surabaya has examined their library information system. The result is usability and information quality get 60% for each toward user satisfaction, and interaction quality gets 40% against user satisfaction. It means that users at UPN Veteran Surabaya feel less satisfied with the interaction quality of the information system. In addition, Universitas Muhammadiyah Ponorogo has tested their information system and shows that linear correlation between information quality and user satisfaction [3].

Furthermore, some governments have applied information system to support their works and activities. One of them is SIMPEG. SIMPEG is information system for university employees in East Java Province. SIMPEG is applied for supporting

employee performance and managed to provide a reliable source of information [4].

Measuring the success of information systems needs to be done to determine the effectiveness of the system and a positive impact on the organization. By using the updated Model De Lone and McLean Information System, University Muhammadiyah Ponorogo conducted a test to determine the quality of SIM that has been applied. From these tests, indicate that the quality of information positively and significantly influences the user satisfaction[5].

Private sector or company who has implemented information system is Zamrud TV in Riau and PT KAI (Indonesia Railway Company). An Information system which is applied by Zamrud TV has weakness, especially for less content. So user satisfaction for the system is also very low. In addition, PT KAI has applied information system for the ticketing system. By doing some studies, PT KAI gets the result that any relationship between user satisfaction with system quality, information quality, and service quality [6].

The Library of Institut Teknologi Telkom Purwokerto has implemented library information system to actualize library automation. It corresponds with library strategy to make library become "user-friendly". User-friendly means the provided information that is published satisfies user requirements. In addition, the strategy is focused on implementing information communication technology (ICT) to come up with institution vision and mission.

The Library Information System implemented in 2015 is called "dlibrary". The services of dlibrary are a search of book collections, view collection of books being borrowed and can download the e-books. However, the research about the information quality which is submitted into the dilibrary has never done. So, by using three kinds of quality approach, we will examine Institut Teknologi Telkom Purwokerto library information system (dlibrary) and for the method, Webqual is chosen because it could gain good quality of information needs to a system which might process the information in a fast, precise, and accurate way.

II.   RESEARCH METHOD

A. *Website Quality (Webqual)*

Webqual is the development of SERVQUAL which is used in the measurement of service quality. Webqual is a method of measuring the quality of a website viewed from the user's point of view. This method was introduced by Stuart J. Barnes and Ricard T. Vidgin and has been progressing recently. The dimensions of this method have areas in usability quality, information quality, and interaction quality. Usability is related to the quality of the website design as the display is delivered to the user and easy to use as presented in Fig.1.

Information quality relates to the quality of the content of the website, such as the conformity of information submitted. Interaction quality is the quality of service interaction experienced by the user when learning the system, such as trust, empathy and communication with website owners [7][8].
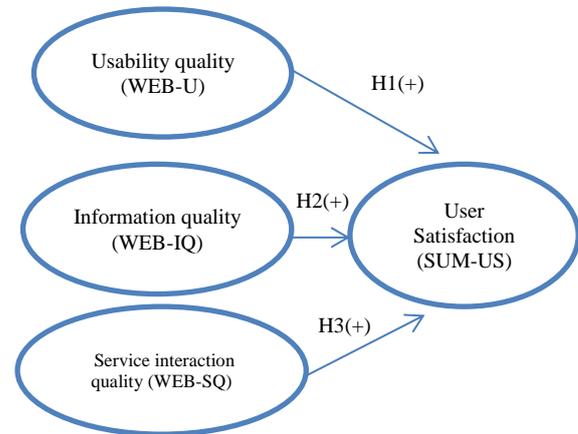

Fig.1. Webqual

The representative indicators of each dimension of this method are listed in Table 1.

Table 1. Dimension Questionnaire

Dimension	Webqual 4.0 Questionnaire
Usability	Finding the site convenient to learn and operate
	The interaction is clear and understandable
	Convenient to be navigated
	Convenient to be used
	Having attractive content
	Design is suitable for the site
	Conveying competence sense
	Creating positive experience
Information quality	Providing accurate information
	Providing believable information
	Providing relevant information
	Providing straightforward information
	Providing information in detail
	Presenting the information in good format
Service interaction	Having good reputation
	Feeling save to complete transaction
	Securing personal information
	Creating sense of personalization
	Conveying community sense
	Communicating with organization easily
	Feeling confident that services will be given as promised
Overall	Website overall view

B. Information Quality

According to O'Brien, Information Quality is divided into three; time, content and form. In addition, the correlation among them shall be connected each other to gain information accuracy, information precision, and information relevancy. A Good information system is influenced by user activities. User satisfaction and user convenience is a goal for successful information system. [9]. Furthermore, Indicators to measure information quality could be seen on Table 2.

Table 2. Indicator Description Of Quality

Indicator
Easy to use for user to learn website operation
The interaction between the website and user is clear and easy to be understood
Easy way to navigate within website
Easy to use
Attractive appearance
Design is appropriate
Website contains competency
Website created positive experience for user

C. Hypothesis

The research hypothesis is tested empirically based on collected data. Data is from library visitor at Institut Teknologi Telkom Purwokerto. Testing criteria and formula could be seen on Figure 2 and Formula 1. Data is collected using Simple Random Sampling technique. It means that the data give the same opportunity for each member of the population to be selected as a sample member [10]-[12]. The number of samples in this research is/ 50 library visitors which could be seen in Table 3.
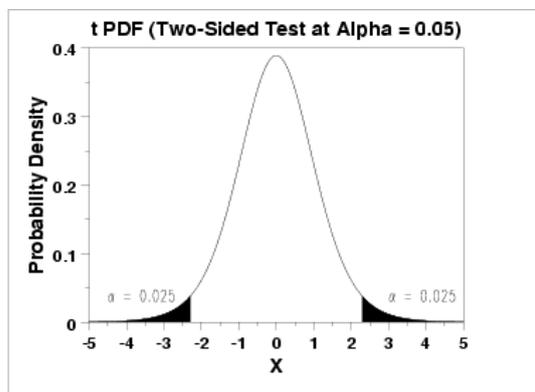

Fig.2. Testing Criteria

$$H_{hitung} = \frac{\bar{\bar{x}} - U_0}{\frac{\sigma}{\sqrt{n}}} \quad [13] \tag{1}$$

Where :
$\bar{x}$ = sample mean
$\bar{U}$ = average assumption / prediction

σ = standard deviation
n = number of samples

Table 3. Demographic of Respondents

Variables		Percentage
Gender	Male	50
	Female	50
Age (Years)	< 20	92
	20-30	6
	> 31	2
Occupation	Student	94
	Lecturer	2
	Employee	4

The Hypotheses of this research are,

1. H_0 U = U_1 (mean of usability quality is equal to mean of user satisfaction)
   Ha U $\neq$ U_1 (mean of usability quality is not equal to mean of user satisfaction)
2. H_0 U = U_2 (mean of information quality is equal to mean of user satisfaction)
   Ha U $\neq$ U_2 (mean of information quality is not equal to mean of user satisfaction)
3. H_0 U = U_3 (mean of interaction quality is equal to mean of user satisfaction)
   Ha U $\neq$ U_3 (mean of interaction quality is not equal to mean of user satisfaction)

D. Validity and Reliability Tests

The sample is analyzed using validity and reliability test. Validity test is a test to measure questionnaire validity result. On this questionnaire is used a Likert scale that contains four levels,

1 = Strongly Disagree (STS)
2 = Disagree (TS)
3 = Agree (S)
4 = Strongly Agree (SS)

In addition, reliability test is used to measure a consistency of answers or responses from the respondents that has been interviewed [14] [15].

III. RESULT

The result of this research is separated into three parts. First, validity and reliability data are tested. Then, Z-score is calculated. Validity and reliability result of the data are presented in the Table 3 and Table 4. The results of reliability and validity testing on Table 3 and Table 4 obtained Cronbach alpha value greater than 0.284. It means that the variable indicator on the questionnaire items meets the criteria of validity and reliability.

Table 3. Validity Test Result

No. Item	I calc.	I table	Criteria
A1	0.65	0.284	valid
A2	0.83	0.284	valid
A3	0.82	0.284	valid
A4	0.78	0.284	valid
A5	0.70	0.284	valid
A6	0.62	0.284	valid
B1	0.56	0.284	valid
B2	0.75	0.284	valid
B3	0.63	0.284	valid
B4	0.73	0.284	valid
B5	0.74	0.284	valid
B6	0.70	0.284	valid
B7	0.63	0.284	valid
B8	0.75	0.284	valid
C1	0.63	0.284	valid
C2	0.71	0.284	valid
C3	0.61	0.284	valid
C4	0.61	0.284	valid
C5	0.56	0.284	valid
C6	0.77	0.284	valid
C7	0.62	0.284	valid

Table 4. Reliability Test Result

No	Variabel	Cronbach alpha	Information
1	Usability quality	0.742	Reliable
2	Information quality	0.684	Reliable
3	Interaction quality	0.774	Reliable

After getting result valid and reliable sample, it is continued to calculate Z-score (normal cumulative distribution) based on a mentioned formula. Those calculations are shown below.

1. Usability Quality

$$H_0 = \frac{3 - 3,07}{\frac{0,58}{\sqrt{50}}} = 0,38$$

2. Information Quality

$$H_0 = \frac{2,865 - 3}{\frac{0,65}{\sqrt{50}}} = -1,47$$

3. Interaction Quality

$$H_0 = \frac{2,948 - 3}{\frac{0,63}{\sqrt{50}}} = -0,58$$

All of Z calculation results are on white area (Figure. 4). It means all of H_0's are accepted. So, mean of usability quality, mean of information quality, and mean of interaction quality are equal to mean user satisfaction.
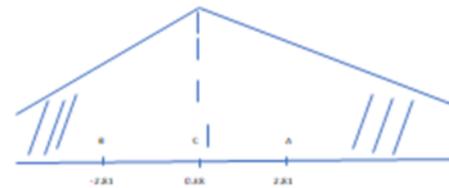

Figure 4. Area of Hypothesis Outcome

IV. DISCUSSION

This research uses 95% confidence level. All of hypotheses tests indicate that initial hypothesis (H_0) is accepted. It means that any correlation between usability quality, information quality and interaction quality with user satisfaction.

A. Usability Quality Variable

Effect of usability quality variables based on validity test results obtained Z_{calc} is at accepted H_0 area. It means that usability quality variables significantly affect the user satisfaction of "dlibrary". The results of this test is supported by the results of respondents in accordance with indicators of usability quality such as the functioning of web design. Furthermore, library information that is needed easily obtained which states agree means user easily obtains the required library information. So overall, those are stated that usability quality has a significant effect on user satisfaction

B. Information Quality Variable

Effect of information quality variables based on validity test results obtained Z_{calc} is at accepted H_0 area. It means that the variable information quality significant effect on user satisfaction from dlibrary. The results of this test is supported by the results of respondents in accordance with indicators of information quality such as relevance of displayed information. In addition, conveyed information understanding indicator means that the information is easy to be accessed. So as a whole of the indicators or criteria on the information quality have a significant effect on user satisfaction.

C. Interaction Quality Variable

Effect of interaction quality variables based on validity test results obtained Z_{calc} is at accepted H_0 area. It means that interaction quality variables

significantly affect the user satisfaction of "dlibrary". The result of this test is supported by the respondent's answers according to the interaction quality indicator on feeling helpful for seeking book. Some users satisfy when looking for the required book is good. Moreover, providing service according to what is presented indicators states that "the website provides services according to what is presented states agree (3.12 average values) that giving affect the user satisfaction.

From above test results, the three dimensions have an influence and significant to user satisfaction. In the dimension of information quality has a relationship with user satisfaction. It could be explained that high-quality information has characteristics, attributes or qualities that make information valuable. Information quality presented at library system (dlibrary) Institut Teknologi Telkom Purwokerto is accurate, complete, easy to understand, relevant and present information according to the needs of the user in terms of searching the collection of books, knowing the availability of books sought and users can download the e-book .

V. CONCLUSSION

Based on the results of research that has been done, to measure the quality of the library information system in Institut Teknologi Telkom Purwokerto (dlibrary) using webqual method, there are three dimensions used which are the usability quality, information quality and interaction quality.

These three dimensions have a relationship with users satisfaction. It means that the library information system (dlibrary) of Institut Teknologi Telkom Purwokerto is considered to have accurate information, complete, easy to understand, relevant and present information according to the needs of the user

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