

Website Quality Measurement of Educational Government Agency in Indonesia using Modified WebQual 4.0

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ABSTRACT This study aims to evaluate the quality of the Region III Higher Education Service Institution (RHSI3) website using the modified WebQual 4.0. This evaluation needs to be carried out to find out things that need to be improved on the website so that it can satisfy its users. Based on the evaluation results, it can be seen that the overall average score of the RHSI3 website measurement is 568.50 with an interpretation of 69.33%, so it is included in the Good criteria. There are six indicators that get a score above the average while there are four indicators that get a score below the average. The indicator that gets the highest score is the indicator about the simplicity of learning to operate the RHSI3 website. This indicator gets a score of 808 with an interpretation of 98.58%, so it is included in the Excellent criteria. The indicator that gets the lowest score is whether the website provides a space for the community. The indicator only gets a score of 216 with an interpretation of 26.34%, so it is included in the Bad criteria. To improve the quality of the website, it is necessary to improve several indicators that get a low score interpretation value, i.e., providing detailed information, a space for the community, and making it easier to communicate with organizations. From an academic point of view, this study contributes to the modifications of WebQual 4.0 as well as gives examples of how to use it. From a practical point of view, the results of this study can be a reference for RHSI3 website managers regarding things that need to be considered and improved to make their website quality better.

KEYWORDS Website Quality; WebQual 4.0; Higher Education Service Institution; Formal Website.

I. INTRODUCTION

THE Region III Higher Education Service Institution (RHSI3) is a responsible government agency for formulating monitoring, controlling, and developing policies and practices of universities in the DKI Jakarta region in Indonesia. In carrying out its duties, RHSI3 has various functions, including the implementation of higher education quality mapping, promoting quality improving, enhancing management quality, preparing quality assurance in higher education, conducting an assessment, data and information management, and also higher education management in the DKI Jakarta region.

Based on statistical data, the number of universities under the guidance of RHSI3 was recorded as 297 universities, including 1,878 study programs, 23,838 permanent lecturers, and 640,471 students.

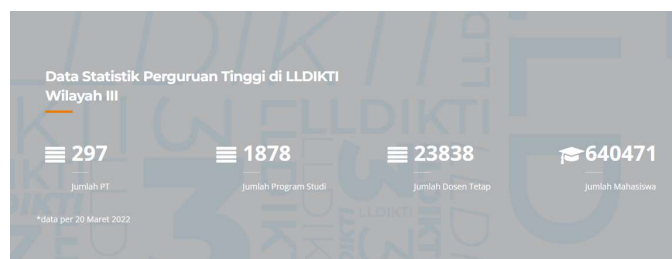


Figure 1. Universities Assisted by RHSI3
 Source: <https://lldikti3.kemdikbud.go.id>

The abovementioned data indicate that RHSI3 needs to think about effective and efficient information media to reach all academic stakeholders in its target universities. One of the methods used by RHSI3 is to use the website to disseminate information regarding its mission and functions. The website is accessible via the URL <https://lldikti3.kemdikbud.go.id>.

One of the functions of the website is disseminating information to the public [1]. Likewise, the RHSI3 website is used as the official RHSI3 information channel aimed at the public, especially at academic stakeholders. The information included on the website is about higher education administration services, lecturer administration information, information on training and seminars, information on scholarships, information on higher education government policies and regulations, and other related information. The existence of the website is considered very important and necessary for the academic community, such as students, lecturers, and education staff.

The RHSI3 website plays a central role as an official information funnel for citizens, specifically, academic stakeholders. Its quality needs to be examined to determine if the website services have met user expectations. Good website quality influences the intent of users to operate it [2]. WebQual method can be used to rate the website quality. The WebQual method focuses on 3 key aspects: level of availability, information level, and the quality of interactive services [2]. The objective of this study is to evaluate the quality of the RHSI3 website using the modified WebQual 4.0. This evaluation is very important to reveal things that need to be improved on the RHSI3 website so that it can satisfy its users.

This study contributes to the modifications of WebQual 4.0. Apart from that, this study also provides examples of how to use this modified instrument in the field. The results of this study can also be used by RHSI3 website managers to understand things that need to be considered and improved to make their website quality better.

II. THEORETICAL BASIS

The Republic of Indonesia Law. No.11 defines information technology as “a technology for collecting, preparing, storing, processing, reporting, analyzing, and/or distributing information”. According to Eko Indrajit in [3], information technology is “a technology related to processing data into information and the process of distributing data/information within the boundaries of space and time” [3]. Another definition of information technology is to utilize electronic tools, particularly computers, to capture, process, save, anatomize, and information distribution [1]. Based on that definition, it can be said that a website is a product of information technology, and also the website is a medium for the public to gain information through the internet.

Recently, the websites have been widely used to transform business into digital forms such as e-commerce [4-6], e-learning [7, 8], e-government [9, 10], e-banking [11-13], and others. The main reason various organizations use websites to provide information cannot be separated from the many advantages offered by the website. Some of the benefits derived from using the website are the following: easy access to information, easy distribution of information, and free platform (multi-platform). Thus, it is an appropriate and smart choice to use the website as a tool to convey information. Furthermore, it is essential for every website manager to measure their website in order to maintain the quality of their website [14].

A. WEBSITE USAGE FACTORS

The use of website-style information technology as an information medium by various institutions such as RHSI3 is caused by several factors. These factors are cross-platform, geographical or timeless access, websites as a point of contact for organizations, and increased Internet penetration [1].

- 1) *The website is cross-platform.* According to Salamah and Ganiardi in [1], cross-platform is the flexibility of software that can be run on multiple electronic devices. This means that software such as websites can be accessed through a variety of information technology devices such as Personal Computers (PCs), smartphones, and tablets. In addition, the website is also multi-platform. Websites can be properly accessed on different types of operating systems such as IOS, Windows, and Android. It also can support several web browsers such as Mozilla Firefox, Opera, Safari, and Google Chrome.
- 2) *There is unlimited access to the website in terms of space and time.* Websites are considered to be a very efficient and effective medium of information because they can be accessed anytime and anywhere. Website is known to be an information technology that can break through and erase regional boundaries [1].
- 3) *The website can act as a window for an organization.* Website is sometimes referred to as the organization's "window" because we can learn about the activities of the organization by browsing its official website.
- 4) *The spread of the Internet continues to increase.* So, when we talk about a website, we cannot separate the role of the Internet because we cannot access the website without it. As can be seen in a report of research in 2022, Indonesia's Internet penetration reached 57% in February 2022. Compared to the survey executed by the Indonesian Internet Service Providers Association (APJII) in June 2022, Indonesia's Internet penetration rate is about 210,026,769 out of a total of 272,682,600, which is equivalent to 77.02% of Indonesia's population. Internet access has increased. This phenomenon is also inseparable from the COVID-19 pandemic that has hit the entire world, including Indonesia, where many personal or business activities are taking place over the Internet.

B. PURPOSE OF USING WEBSITE

In general, the use of a website as an official information medium by various institutions such as RHSI3 has different purposes to be achieved. The goals are:

- 1) *Fulfillment of legal obligations (UU).* Republic of Indonesia Law No. 14 of 2008 or UU-KIP on Disclosure of Public Information requires public organizations to publish information on a regular basis, especially information on financial reporting, activities, performance, and other legal or regulatory information. The public organization in question is the organization funded by the government, RHSI3 for instance. The law implicitly states that the public has the right to access information and monitor the activities of public organizations. In other words, public organizations must implement information disclosure. The positive impact of making information publicly available on websites at various public institutions is to ensure accountability and transparency aimed at combating corruption.
- 2) *To achieve good governance.* Transparent, democratic, reliable, effective, efficient, safe, to meet the demands of society, are needed to realize good governance. MPR Decree No. VII / MPR / 2001 on Indonesia's Future Vision enshrines excellent governance. The vision is "Religious, humane, united, democratic, fair, prosperous, progressive, independent, good and clean Indonesian society in government". To achieve good governance, the government

has taken various steps, including Presidential Order No. 3 of 2003, requiring all government agencies to provide electronic public services. Electronic public services refer to the use of information technology products such as websites. Governments are expected to improve the quality of services provided to communities and businesses by using information technology. This includes improving the performance of effective and efficient bureaucracy and achieving good clean governance [15-17]. Information technologies such as websites make it easier for the community to monitor all activity, making management more relevant and cleaner. That oversight continues to properly enforce the principles of good governance: transparency and accountability [18].

Based on the explanation of the above two purposes, the use of the website as an information funnel by RHSI3 is very important as it is part of fulfilling the obligations of the law and a step towards achieving good governance.

C. RELATED STUDIES

WebQual is a further development of the quality of service measurement, or SERVQUAL method [19]. The WebQual method was developed in 1998, namely the WebQual 1.0 version. Until now, the latest version (WebQual 4.0) has had several changes regarding the dimensions and indicators. Webqual has been used to measure the quality of various types of websites, such as government websites [1, 20-23], educational websites [24, 25], news portal [26], and sales websites [27, 28].

There are several previous studies that related to this study, especially the use of WebQual 4.0 to assess Indonesian websites, i.e.:

- a. WebQual 4.0 was used in [20] to assess the improvement of disaster prevention information system (Sikabi) quality in Boyolali Regency. Based on the research results, researchers recommend improving the quality of the information displayed on the page of the Sikabi website [20].
- b. WebQual 4.0 was used in [25] to measure E-learning services. The study results show that E-learning in STMIK Dipanegara Makassar has good website quality, but there are still some parts that need to be improved [25].
- c. WebQual 4.0 was used in [1] to measure the quality of the LL-Dikti Region IV website. The results show that most of the indicators are included in excellent criteria. The top rate was the usability dimension, which got a score of 81.05% [1].
- d. WebQual 4.0 was used in [21] to measure the quality of the Ministry of Public Works website. This study indicates that website usability correlates with website usefulness. The website needs to update valid information more frequently to promote transparency. An online complaint platform needs to be added to the website to facilitate problem resolution [21].

Based on the results of several related studies, it is shown that the WebQual 4.0 can be used to measure the quality of various types of websites, including government-type websites such as the RHSI3 website.

III. RESEARCH METHODS

There are primary and secondary data used in this study. Primary data collection methods are applied through observation, interviews, and filling out the modified WebQual

4.0 questionnaire. The population consists of RHSI3-led academic stakeholders. The academic community in question are visitors to the RHSI3 website such as lecturers, education staff, and students. The secondary data are obtained through a literature study, i.e., tracing relevant references. Reference data are searched from books, journals, magazines, research report articles, and websites on the internet.

In this study, the method used is the WebQual 4.0 modification. WebQual 4.0 focuses on three measurement dimensions: Quality of Usability, Information Quality, and Quality of Interaction with Service [2]. The definition of the measurement dimensions is as follows [29, 30]:

- a. Quality of Usability is defined as the quality related to the description and navigation provided to the user.
- b. Information Quality is determined as the suitability of information to a user, such as accuracy, format, and relevance associated with the content of a website.
- c. Quality of Interaction with Service is defined as the quality of the experience perceived by the user when interacting with the service.

WebQual has evolved from WebQual 1.0 to the latest version WebQual 4.0. The latest version’s indicators are shown in Table 1.

Table 1. WebQual 4.0 indicators

Dimension	Code	Indicator
Quality of Usability	Q01	It's simple to learn how to use the website
	Q02	It serves clear and understandable user interaction on the website
	Q03	The website is easy to navigate
	Q04	It's simple to use the website
	Q05	The website has an interesting user interface
	Q06	The website design is in accordance with its type of website
	Q07	The website contains competency values
	Q08	The website gives a positive experience to the user
Information Quality	Q09	There is accurate information on the website
	Q10	There is reliable information on the website
	Q11	There is timely information on the website
	Q12	There is relevant information on the website
	Q13	There is an easy-to-understand information on the website
	Q14	There is detailed information on the website
	Q15	The information is presented in the correct format on the website
Quality of Interaction with Service	Q16	The website has a good reputation
	Q17	There is a secure to complete transactions on the website
	Q18	There is a secure of personal information on the website
	Q19	There is room to customize the website
	Q20	There is a space for the community on the website
	Q21	The facility to communicate with the organization is provided through the website
	Q22	It guarantees that the service received is as promised as it can on the website

Source: Adopted from [2]

To measure the quality of the website, RHSI3 will use the modification of the WebQual 4.0 method. Modifications are needed to adjust the dimensions and indicators relevant to the type of the website in this study. The modified indicators are shown in Table 2. The code numbers are rearranged.

Table 2. Modified WebQual 4.0 indicators

Dimension	Code	Indicator
Quality of Usability	Q01	It's simple to learn how to use the RHSI3 website
	Q02	The RHSI3 website is easy to navigate
	Q03	The RHSI3 website has an interesting user interface
	Q04	The RHSI3 website design is in accordance with its type of website
Information Quality	Q05	There is accurate information on the website RHSI3
	Q06	There is relevant information on the RHSI3 website
	Q07	There is detailed information on the RHSI3 website
	Q08	The information is presented in the correct format on the RHSI3 website
Quality of Interaction with Service	Q09	There is a space for the community on the RHSI3 website
	Q10	The facility to communicate with the organization is provided through the RHSI3 website

From the results of those modifications, it can be seen that there is no change in the dimensions and changes are only in indicators. Several indicators were omitted because they were represented in other statements such as the Q04 website which was easy to use (Table 1). This indicator has been represented in the Q01 indicator. The other indicators that were omitted because they were considered irrelevant were Q16, Q17, Q18, Q19, Q20, and Q22.

The modified WebQual 4.0 indicators are assessed using the Likert Scale. This scale was developed by Rensis Likert as a technique to measure a person's perception or opinion simply in a statement of agreement. The degree of the deal according to the Likert Scale is composed of 5 options, i.e.: totally agree, agree, undecided or neutral, disagree, and completely disagree [31]. The Likert scale is a scale used to measure respondents' perceptions of a statement based on a predetermined operational definition. In order to be calculated quantitatively, each option needs to be scored. The rating of each point on the Likert scale is 5 rating for SA to a score of 1 for SD. The Likert scale options used in this study and their scores are shown in Table 3.

Table 3. Options and scores

Scale	Option	Score
1	Totally Agree (SA)	5
2	Agree (AG)	4
3	Undecided / Neutral (NT)	3
4	Disagree (DS)	2
5	Completely Disagree (SD)	1

The items in the questionnaire are not in the form of questions. It is in the form of statements that are taken from indicators in Table 2. Each statement then corresponds to 5 answer choices based on a 5-scale Likert scale, ranging from Completely Disagree (1) to Totally Agree (5). Respondents were asked to choose one of the 5 available choices. In this case, it is intended that the respondent indicates his perception, whether he agrees with the statement, based on his direct observation of the RHSI3 website.

After collecting questionnaire results from respondents, then an interpretation will be carried out to find the percent index value (index %). The index value then will be used in the interval analysis. The criteria based on the intervals are shown in Table 4.

Table 4. Interpretation criteria based on interval

Interval	Criteria
1	Extremely Bad (EB)
2	Bad (BD)
3	Quite Good (QG)
4	Fine (F)
5	Excellent (XL)

In addition to the interpretation of criteria, the collected data will be analyzed using descriptive qualitative. It can be used to describe in more detail the drawbacks of the website in each dimension and measure. Therefore, it is expected that the results of this measurement can provide factors that reflect or contribute to managing the RHSI3 website better.

IV. RESULTS AND DISCUSSION

As a government agency, RHSI3's duties is to promote higher education in the DKI Jakarta region, Indonesia. There are 297 universities under the guidance of RHSI3. The RHSI3 official website is <https://lldikti3.kemdikbud.go.id>. The website is used to provide information to the public. The landing page of the website is shown in Figure 2.

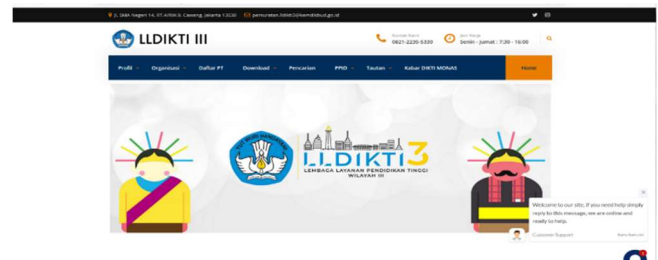


Figure 2. Landing page of RHSI3 website

The RHSI3 website has a role as an official website so it is necessary to test its quality to determine whether the website services have met user expectations. The modified WebQual 4.0 method is used in measuring the RHSI3 website in this study.

The respondent population in this study consists of the academic stakeholders from 237 universities in the DKI Jakarta region that are under the guidance of RHSI3, i.e.: lecturers, education staff, and students. The number of respondents who filled out questionnaires was 164 people. The distribution of the number of respondents is shown in Table 5:

Table 5. Number of respondents

Stakeholder type	Number
Lecturer	112
Education staff	23
Students	11
TOTAL	164

Source: Primary data

There were 142 respondents who stated the name of their university in the questionnaire. While those who did not write down the name of their university origins are 22 respondents. The respondents who wrote down the name of the university came from 34 universities. This represents around 47.8% of the number of universities assisted by RHSI3. Because RHSI3 focuses on higher education in the DKI Jakarta region, we did not ask about their geographical origin, because we assumed that they were all from DKI Jakarta.

Some variables must be defined first, including:

a. Interpretation of Scores (IS)

In order to get the interpretation results, firstly, the highest score (ScMax) and lowest score (ScMin) for the assessment indicator must be determined using the formula below:

$$\begin{aligned} \text{ScMax} &= \text{SA} \times \text{respondents} \\ \text{ScMin} &= \text{SD} \times \text{respondents} \end{aligned}$$

Based on Table 3, the score of SA is 5 and the score of SD is 1, so:

$$\begin{aligned} \text{ScMax} &= 5 \times 164 = 820 \\ \text{ScMin} &= 1 \times 164 = 164 \end{aligned}$$

Then, the formula for calculating IS:

$$\begin{aligned} \text{IS} &= \text{Total} / \text{ScMax} \\ &= \text{Total} / 820 \end{aligned}$$

The IS calculation formula will produce an index in the form of a percent (%).

b. Interval and Criteria

To get the interval value (in percent) use the formula:

$$\text{Int} = 100 / \text{number of scales (Likert)}$$

$$\text{Int} = 100 / 5 = 20$$

The criteria based on intervals can be seen in Table 6.

Table 6. Criteria based on interval

Interval	Criteria
0% – 20 %	Very Bad (VB)
20.01% – 40%	Bad (BD)
40.01% – 60%	Fair enough (FE)
60.01% – 80%	Good (GD)
80.01% – 100%	Excellent (XL)

The results of the indicator assessment along with the total score for each indicator are shown in Table 7. After getting the ScMax, ScMin, interval, and criteria, the next calculation is carried out. The Interpretation of Scores (IS) calculation will be carried out for each indicator. For example, with a total score of 808, the IS for the Q01 indicator is:

$$\begin{aligned} \text{IS} &= \text{Total} / \text{ScMax} \\ &= (808 / 820) \times 100 = 98.54\% \end{aligned}$$

The IS of the Q01 indicator (98.54%) then compared with the interval in Table 6. It can be concluded that the Q01 indicator for the RHSI3 website falls in the Excellent criteria. The overall measurement results are shown in Table 8.

Based on Table 7, it can be obtained that the mean point of the index Q01 to Q10 is 569. The following descriptive

explanations refer to the output of measurement that are shown in Table 7 and Table 8, and also the results of observations:

- a. The Q01 indicator is included in the Excellent criteria. Through observation, researchers also assessed these indicators. As a result, researchers got the same experience. The RHSI3 website is easy to learn how to use.
- b. The Q02 indicator is included in the Good criteria. Through observation, researchers also navigated the website. The result is that the researchers share the same opinion that the RHSI3 website is easy to navigate.
- c. The Q03 indicator is included in the Good criteria. Through observation, researchers make assessments of these indicators. As a result, researchers agree that the RHSI3 website has an attractive appearance.
- d. The Q04 indicator is included in the Good criteria. Through observation, researchers make assessments of these indicators. As a result, researchers agree that the RHSI3 website has been designed in accordance with its type of website.
- e. The Q05 indicator is included in the Excellent criteria. Through observation, researchers make assessments of these indicators. As a result, researchers agree that the RHSI3 website provides accurate and timely information.
- f. The Q06 indicator is included in the Excellent criteria. Through observation, researchers make assessments of these indicators. As a result, researchers agree that the RHSI3 website has provided relevant formations.
- g. The Q07 indicator is included in the Fair Enough criteria. Through observation, researchers make assessments of these indicators. As a result, researchers agree that the RHSI3 website provides detailed information, but not in its entirety.
- h. The Q08 indicator is included in the Good criteria. Through observation, researchers make assessments of these indicators. As a result, researchers agree that the RHSI3 website provides information in a correct format.
- i. The Q09 indicator is included in the Bad criteria. Through observation, researchers make assessments of these indicators. As a result, researchers agree that the RHSI3 website has not provided a community space.
- j. The Q10 indicator is included in the Fair Enough criteria. Through observation, researchers make assessments of these indicators. As a result, researchers agree that the RHSI3 website has provided the facility to communicate with the organization but not in all communication channels.

Table 7. The results of the indicator assessment along with the total score

Indicator	Respondents					Total Resp.	Score					Total Score
	SA	AG	NT	DS	SD		SA.5	AG.4	NT.3	DS.2	SD.1	
Q01	152	12	0	0	0	164	760	48	0	0	0	808
Q02	11	136	17	0	0	164	55	544	51	0	0	650
Q03	3	114	47	0	0	164	15	456	141	0	0	612
Q04	55	11	98	0	0	164	275	44	294	0	0	613
Q05	44	108	12	0	0	164	220	432	36	0	0	688
Q06	29	124	11	0	0	164	145	496	33	0	0	674
Q07	5	3	140	6	10	164	25	12	420	12	10	479
Q08	2	30	129	1	2	164	10	120	387	2	2	521
Q09	0	0	20	12	132	164	0	0	60	24	132	216
Q10	2	39	13	109	1	164	10	156	39	218	1	424

Source: Primary data

Table 8. Results of IS for each indicator along with the criteria

Indicator	Total Score	IS (%)	Criteria
<i>Usability</i>			
Q01	808	98,54	Excellent
Q02	650	79,27	Good
Q03	612	74,63	Good
Q04	613	74,76	Good
<i>Information Quality</i>			
Q05	688	83,90	Excellent
Q06	674	82,20	Excellent
Q07	479	58,41	Fair Enough
Q08	521	63,54	Good
<i>Service Interaction Quality</i>			
Q09	216	26,34	Bad
Q10	424	51,71	Fair Enough

Source: Primary data

VI. CONCLUSIONS

Based on the results of this study, it can be concluded that the dimension of assessment that received the highest score was the Quality of Usability dimension, and the lowest-scoring dimension was the Quality of Interaction with Service dimension. The index with the highest score is the Q01 index, which is an easy-to-learn how to operate the RHSI3 website. The score of the Q01 indicator is 808 and the IS of that indicator is 98.54%, which can be included in the Excellent criteria. The index with the lowest score is the Q09 index, i.e., the website provides space for the community. The indicator obtained a score of 216 with an IS of 26.34%. So the Q09 indicator is included in the Bad criteria. There are six indicators above the average: Q01, Q02, Q03, Q04, Q05, and Q06. There are four indicators that got scores below the average: Q07, Q08, Q09, and Q10. The average value of the measurement of the RHSI3 website was 568.50 with an average IS of 69.33% so that in overall it can be included in the Good criteria.

The contributions of this study are two folds. First, from an academic point of view, this study contributes to the modifications of WebQual 4.0 and also provides examples of how to use it. Second, from a practical point of view, the results of this study can be used by RHSI3 website managers as a reference regarding things that need to be considered and improved to make their website quality better.

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