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Users' Expectation and Perception Gap Analysis of Telkom University Website with Modified WebQual 4.0 Method

Mochammad Faizal
M.A. in Management, Telkom University, Bandung, Indonesia
Corresponding Author: hai@mf-chan.com

Adhi Prasetio
Lecturer in School of Economic and Business, Telkom University, Bandung, Indonesia
adhipras@gmail.com

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Abstract

Telkom University as one of the universities in Indonesia that have used website media has never done in-depth research to find out whether the main website it manages still has a gap between expectations and perceptions from the perspective of its users. In previous studies, assessments of higher education websites were carried out using the slightly modified WebQual 4.0 instrument by omitting several indicators. However, it is not clear what the priority level of each indicator should be measured, based on the perception of their users. This study will measure the level of the gap between the users' expectations and perceptions of the Telkom University website, and what factors are prioritized to be improved. To collect the required data, researchers distributed questionnaires to 400 stakeholders of the Telkom University website. The collected data were analyzed using the Gap Analysis and Importance-Performance Analysis methods. It can be seen that there are nine indicators on Telkom University's website that need improvement. From the results of this study, it can be concluded that there is still a gap between the expectations and perceptions of users, with several factors that must be corrected to improve the quality of the Telkom University website sequentially from the highest priority. This study contributes by developing the modified WebQual 4.0 instrument to assess the quality of the university website which uses five variables such as Usability, Information Quality, Service Interaction Quality, User Interface Quality, and Availability, and also provides an overview of the indicators that must be improved, indicators that must be maintained, indicators with low priority, and which indicators must be reduced in priority on the Telkom University website, Telkom University, Indonesia.

Keywords: higher education website, modified webqual 4.0, user satisfaction.

Introduction

Indonesia has become one of the many countries that have begun implementing digitalization in their daily activities. This is stated in terms of business, communication, transactions, and so forth. In the digital scope, many types of media are commonly used, such as websites that are used to find information and communicate.

In addition to delivering information, companies can also use the website as official markers of the company. For example, the recruitment poster displayed on an official website of the company is an indication that the information is valid and can be justified. Along with the times, the ease of creating and accessing websites seems to make every company have a website. In a more specific scope like universities, websites are used with a higher intensity

because they provide many benefits both in terms of effectiveness and efficiency.

Supported by 132.7 million internet users in Indonesia (Moore, 2019), the development and use of websites in Indonesia have become a common thing for every business activist from various industrial sectors, including higher education institutions that use website media to support various activities happening in it. The various activities carried out as in conducting marketing activities, for student registration, as a portal for students' academic and non-academic information, and also other important matters. Of the many universities, Telkom University is a tertiary institution that has used website media to support the activities that occur in it.

Although Telkom University has the vision to become a "research and entrepreneurial university" in 2023, the university has never done in-depth research to find out whether the main website it manages still has a gap between the expectations and perceptions of its users. Even though if this has been done, Telkom University can create a university website design that adjusts to the expectations of its users, as one of the supporting tools in helping to achieve its vision.

Based on interviews that have been conducted with the Public Relations of Telkom University, the university has several stakeholders such as students, lecturers, university employees, parents, high school or equivalent students, and the general public through community service cooperation. This is almost in line with what Indrawati (2014) explained, that universities have several stakeholders such as students, parents, industry, lecturers, university employees, and the government.

The Public Relations of Telkom University wants a redesign of the Telkom University website, which is oriented towards the expectations of their stakeholders because a website becomes one of the means of communication from higher education to its stakeholders (ibid). This redesign is expected to come from the results of scientific research, so it will be in line with Telkom University's vision and also considering that the previous website design was only based on the principle of "observe, copy, and modify".

Sinuraya (2019) has stated that higher education needs to put attention to maintain website quality consistency so that the quality of higher education from the aspect of web assessment becomes better. In previous studies conducted by Hariyanto, Kristianto & Cia (2018), Napitupulu (2016), Sinuraya (2019), Wawolumaya, Sunarto & Wulandari, (2016), and Winarti & Munggaran (2014), the assessment of university websites was carried out using a slightly modified WebQual 4.0 instrument by removing some indicators that were not relevant to the type of website to be assessed. On the other hand, studies conducted by Gata & Hekhmatyar (2017), Hafiz (2017), and Khawaja & Bokhari (2010), show that assessments of university websites can be carried out using a modified WebQual 4.0 instrument that includes several new variables such as Availability and User Interface Quality. However, the indicators in these new variables are not well standardized, where there are still differences in one study with another.

WebQual 4.0

At present, it has been known instrument WebQual 4.0 intended to measure the quality of a website based on the user's perspective. In general, there are various studies to improve user satisfaction ratings on websites, which uses an instrument called WebQual version 4.0 that combines three scientific areas including Usability, Information Quality, and Service Interaction Quality (Faizal, 2019). To assess the Telkom University website using WebQual

4.0, several irrelevant indicators will be removed, such as the "it feels save to complete transactions", "creating a sense of personalization", and "conveys a sense of community". The elimination of these three indicators is because the Telkom University website is an official information portal website from tertiary institutions which does not facilitate buying and selling transactions. The measurement results of the Telkom University website using WebQual 4.0 can be seen in Table 1.

Table 1
WebQual 4.0 results on Telkom University website

Variable	Indicator	Agree	Disagree
Usability	Telkom University website is easy to learn	83.3%	16.7%
	Telkom University website is easy to understand	80%	20%
	It is easy to navigate on the Telkom University website	80%	20%
	Telkom University website is easy to use	76.7%	23.3%
	Telkom University website has an attractive appearance	63.3%	36.7%
	The design used is by Telkom University website types	83.3%	16.7%
	The website shows the competence of Telkom University	86.7%	13.3%
	Telkom University website has a positive impact on me	73.3%	26.7%
Information Quality	Telkom University website provides accurate information	90%	10%
	Telkom University website provides reliable information	96.7%	3.3%
	Telkom University website provides the latest information	70%	30%
	Telkom University website provides relevant information	90%	10%
	Telkom University website provides information that is easy to understand	73.3%	26.7%
	Telkom University website provides detailed information	56.7%	43.3%
	Telkom University website provides information in the right format	73.3%	26.7%
Service Interaction Quality	Telkom University website has a good reputation	70%	30%
	Telkom University website maintains the security of personal information	86.7%	13.3%
	The website makes it easy to contact Telkom University	66.7%	33.3%
	Telkom University website promises that services can be delivered properly	63.3%	36.7%

Source: Author's documentation

After distributing questionnaires to 30 random respondents to assess the quality of the

Telkom University website, the results show that the indicator "Telkom University website has an attractive appearance" has the lowest score in the usability variable. As many as 36.7% of respondents consider that the appearance of the Telkom University website still needs improvement. While from the information quality variable, the indicator "Telkom University website gives detailed information" still having a bad score according to 43.3% of respondents. On the service interaction quality variable, the indicator "Telkom University website promises that services can be delivered properly" scored badly by 36.7% of respondents. Overall, all aspects listed in the indicator can be fixed because none has been rated well by 100% of respondents.

Although the instrument is quite popular to use, some researchers such as Devi & Sharma (2016) have added User Interface Quality and Availability variables to the modification of WebQual 4.0. Improvements are still needed so that the instrument can be used to assess the quality of university websites, as well as other websites. By modifying the WebQual 4.0 instrument, researchers will be able to conduct an assessment to improve the quality of the Telkom University website, based on the expectations of its users. This can be a positive catalyst that can help achieve the vision of Telkom University to become a "research and entrepreneurial university" in 2023.

Therefore, researchers will conduct research aimed at formulating an instrument to assess and improve Telkom University and other universities' websites. From doing this research, the process of assessing a university website can be carried out systematically, so that reforming the university websites can be done effectively and efficiently.

Problems

From the phenomenon that is happening, it is not yet known how high the expectations and perceptions of Telkom University website users, and whether there is a gap between the expectations and perceptions of these users. So, the first step that must be done is to identify how high the expectations and perceptions of users of the Telkom University website to find whether there is a gap between the expectations and perceptions of these users. Then, the factors that are prioritized for improvement must be identified as a step in improving the quality of the Telkom University website.

Material and Methods

Operational Variables

Indrawati (2015, 124) explains that operational variables are a process of elaborating the variables into the smallest parts so that its size classification can be identified and facilitate data collection needed to solve research problems. The following are operational variables that will be used to develop research instruments, as described in Table 2.

Table 2

Operational variables

Variable	Code	Indicator
Usability; can be associated as quality concerning the usability of a website (Faizal, 2019)	UA1	Telkom University website is easy to learn (Devi & Sharma, 2016; Jayathunga et al., 2017)
	UA2	Telkom University website is easy to understand (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	UA3	It is easy to navigate on the Telkom University website (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	UA4	Telkom University website is easy to use (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	UA5	The website shows the competence of Telkom University (Hafiz, 2017; Rosania & Yasir, 2016)
	UA6	It is easy to search for information on the Telkom University website (Devi & Sharma, 2016; Jayathunga et al., 2017)
	UA7	Telkom University website provides new knowledge (Gata & Hekhmatyar, 2017; Hariyanto et al., 2018)
Information Quality; is a concept of quality in delivering information content to the public accurately, actually, and accordingly (Faizal, 2019)	IF1	Telkom University website provides accurate information (Devi & Sharma, 2016; Khawaja & Bokhari, 2010)
	IF2	Telkom University website provides reliable information (Gata & Hekhmatyar, 2017; Hafiz, 2017)
	IF3	Telkom University website provides the latest information (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	IF4	Telkom University website provides relevant information (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	IF5	Telkom University website provides information that is easy to understand (Gata & Hekhmatyar, 2017; Hafiz, 2017)
	IF6	Telkom University website provides detailed information (Gata & Hekhmatyar, 2017; Khawaja & Bokhari, 2010)
	IF7	Telkom University website presents information in the right format (Gata & Hekhmatyar, 2017; Khawaja & Bokhari, 2010)
	IF8	Telkom University website provides complete information (Gata & Hekhmatyar, 2017; Khawaja & Bokhari, 2010)
Service Interaction Quality; is the level of quality of an interactive service that is felt by users when they explore deeper on a website, which is manifested in the form of trust and empathy (Faizal, 2019)	SI1	Telkom University website has a good reputation (Gata & Hekhmatyar, 2017; Hafiz, 2017)
	SI2	Telkom University website maintains the security of personal information (Gata & Hekhmatyar, 2017; Napitupulu, 2016)
	SI3	The website makes it easy to contact Telkom University (Devi & Sharma, 2016; Khawaja & Bokhari, 2010)
	SI4	Telkom University website promises that services can be delivered properly (Napitupulu, 2016; Rosania & Yasir, 2016)
	SI5	It is easy to provide feedback on the Telkom University website (Gata & Hekhmatyar, 2017; Khawaja & Bokhari, 2010)
	SI6	Telkom University website can make an interest (Gata & Hekhmatyar, 2017; Khawaja & Bokhari, 2010)
User Interface Quality; is a system that can be seen, heard, and touched, which aims to facilitate the user in working with computers so that they become more productive, enjoyable, and as effective as possible (Faizal & Adriyanto, 2018)	UI1	Telkom University website has an attractive appearance (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	UI2	The design used is by Telkom University website types (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	UI3	Telkom University website displays multimedia content well (Devi & Sharma, 2016; Hafiz, 2017)
	UI4	Telkom University website shows the organization's identity well (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	UI5	Telkom University website uses the appropriate illustration (Gata & Hekhmatyar, 2017; Jayathunga et al., 2017)
	UI6	Telkom University website displays good legibility (Gata & Hekhmatyar, 2017; Jayathunga et al., 2017)
	UI7	Telkom University website uses the right color (Gata & Hekhmatyar, 2017; Jayathunga et al., 2017)

Variable	Code	Indicator
	UI8	Telkom University website displays a consistent design (Gata & Hekhmatyar, 2017; Jayathunga et al., 2017)
Availability; the level of website readiness that must be ready and available for users to access at any time (Devi & Sharma, 2016)	AV1	Telkom University website can be accessed at any time (Devi & Sharma, 2016; Jayathunga et al., 2017)
	AV2	Telkom University website has a fast response time (Devi & Sharma, 2016; Gata & Hekhmatyar, 2017)
	AV3	Telkom University website can be accessed through various browsers properly (Devi & Sharma, 2016; Hariyanto et al., 2018)
	AV4	All links displayed on the Telkom University website work well (Gata & Hekhmatyar, 2017; Khawaja & Bokhari, 2010)
	AV5	It is easy to find the Telkom University website on a search engine (Gata & Hekhmatyar, 2017; Khawaja & Bokhari, 2010)

Source: Author's documentation

For the instrument scale to be used in this study, researchers used a Likert scale, a scale based on the sum of respondents' attitudes in responding to the variable being measured (Sanusi, 2011, 59). Boone Jr. & Boone (2012) have explained that the Likert scale is a form of series of questions to provide a quantitative measure of character or personality traits, which uses interval data types and can be analyzed using parametric statistics.

Interval data itself is quantitative data that can be sorted, for example, is a student's grade data (Jubilee Enterprise, 2018, 18). In using the Likert scale, choices with five grading answers with a range of scores between 1 and 5 will be more proper and suitable for use (Kulas et al., 2008).

Population and Sample

The population is a collection of all objects to be studied and analyzed, whose characteristics will be predicted in a study. While the sample is a portion of the population that is considered to be representative of population characteristics, when the objects in the population are too many (Jubilee Enterprise, 2018, 1; Soewardikoen, 2013, 4).

The population in this study are all stakeholders from Telkom University who can access the website. Knowing this, the researchers will use the stratified random sampling method because of the heterogeneous population. Grouping will be conducted so that a homogeneous sample is obtained for each group (Sedarmayanti & Hidayat, 2011, 37). Researchers will divide the population into two groups, namely the internal members of Telkom University, and the external members of Telkom University. The internal members are people who are part of the Telkom University academic community. On the other hand, the external members are people who are not part of the Telkom University academic community.

Because the population size is not known with certainty, then to determine the number of samples, researchers will use the Bernoulli formula. As explained by Zikmund, Carr, & Griffin (2010, 436), the formula is illustrated in the following equation.

$$n = \frac{(Z\frac{\alpha}{2})^2 p.q}{e^2}$$

Explanation:

n= Sample size

α= Level of accuracy

Z= Standard normal distribution value

p= Probability of rejection
q= Probability of acceptance
e= Error rate

This study uses a level of accuracy (α) of 5% from a confidence level of 95% so that the Z value obtained in the standard normal distribution of 1.96. The error rate is set at 5%. Then, the probability of the questionnaire being rejected and accepted is 50% each. From the formula, a minimum sample size of 385 respondents was obtained, which was then rounded up to 400. From these results, the researcher would set the sample size of 200 people each for the internal and external members of Telkom University.

Data Analysis

Consumer satisfaction will be determined by consumer expectations compared to consumer perceptions after using a product. In Gap Analysis, the gap between consumers' perceptions and expectations will be calculated to get the level of service quality (Wijaya, 2018, 61). To conduct a Gap Analysis, the researcher will use the following formula (ibid, 62).

$$Q_i = P_i - E_i$$

Explanation:
Q_i = Indicator gap level
P_i = Perception indicator score
E_i = Expectation indicator score

The calculated results of each indicator will then be sorted from the largest to the smallest gap. The greater the gap, the indicator has a higher level of urgency of improvement compared to other indicators (ibid, 61–62).

Importance-Performance Analysis or commonly abbreviated as IPA, as has been explained by Wijaya (2018, 59) is a method to see the relative importance of various indicators in determining the basic indicators, which leads to the formulation of a foundation to improve quality services.

Over the years, IPA instruments have been developed and used as a tool for researching quality and customer satisfaction in the service industry and were initially used to develop company strategies. IPA classifies the indicators into a diagram, according to the users' expectations and the users' perceptions (ibid,. 66).

In conducting IPA, the researcher will determine the average perception and average expectation of each indicator from the results of the research questionnaire. Then, each indicator will be categorized according to its quadrant according to the criteria outlined in Table 3.

Table 3
Quadrant categorization of Importance-Performance Analysis diagram

Quadrant	Expectation	Perception
1	> average expectation	< average perception
2	> average expectation	> average perception
3	< average expectation	< average perception
4	< average expectation	> average perception

Source: Author's formulation from Wong, Hideki & George (2011)

The researchers will conduct a Gap Analysis for the indicators included in quadrant 1 on the Importance-Performance Analysis diagram. This is intended to focus only on indicators that need improvement. To visualize the diagram of the results of the Importance-Performance Analysis, researchers will use SPSS version 25.

Results and Discussion

Validity Test

Validity indicates the extent to which an instrument can measure what it wants to be measured. The higher the validity of an instrument, the more the instrument shows what should be measured. A research instrument is a tool used to measure what is the purpose of the research being carried out. Therefore, the instrument's validity must be measured (Indrawati, 2015, 146–147).

To test the validity of research instruments, the Pearson method is used, with the formula illustrated in the following equation (Taniredja & Mustafidah, 2011, 134).

$$r_{xy} = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{(N\sum x^2 - (\sum x)^2)(N\sum y^2 - (\sum y)^2)}}$$

Explanation:

r_{xy} = The correlation coefficient of all research variables
N = Sample size
Σ_{xy} = Total multiplication of all research variables
x = Total number of respondents
y = The total number of statements of each respondent

The value of r table for n = 30 with a significance of 5%, then obtained a figure of 0.361. To facilitate and reduce the occurrence of errors, researchers will use SPSS version 25. The criteria for interpreting the results of the validity test are as follows:

1. If the value of r_{xy} is greater than the value of r table, then the questionnaire items are declared valid and can be used
2. If the value of r_{xy} is smaller than the value of r table, then the questionnaire items are declared invalid and cannot be used

The researcher then conducted a validity test, and the results obtained as shown in the following *Table 4*.

Table 4
Result of validity test

Code	r Table	r_{xy} (Expectation)	Result (Expectation)	r_{xy} (Perception)	Result (Perception)
UA1	0.361	0.578	Valid	0.815	Valid
UA2	0.361	0.671	Valid	0.791	Valid
UA3	0.361	0.608	Valid	0.472	Valid
UA4	0.361	0.841	Valid	0.801	Valid
UA5	0.361	0.687	Valid	0.659	Valid
UA6	0.361	0.652	Valid	0.765	Valid
UA7	0.361	0.469	Valid	0.589	Valid
IF1	0.361	0.751	Valid	0.764	Valid
IF2	0.361	0.771	Valid	0.836	Valid
IF3	0.361	0.721	Valid	0.606	Valid
IF4	0.361	0.811	Valid	0.861	Valid
IF5	0.361	0.734	Valid	0.859	Valid
IF6	0.361	0.597	Valid	0.791	Valid
IF8	0.361	0.518	Valid	0.851	Valid
SI1	0.361	0.549	Valid	0.791	Valid
SI2	0.361	0.838	Valid	0.753	Valid
SI3	0.361	0.764	Valid	0.800	Valid
SI4	0.361	0.679	Valid	0.651	Valid
SI5	0.361	0.722	Valid	0.737	Valid
SI6	0.361	0.851	Valid	0.776	Valid
SI7	0.361	0.880	Valid	0.775	Valid
UI1	0.361	0.806	Valid	0.863	Valid
UI2	0.361	0.841	Valid	0.880	Valid
UI3	0.361	0.822	Valid	0.790	Valid
UI4	0.361	0.811	Valid	0.775	Valid
UI5	0.361	0.854	Valid	0.844	Valid
UI6	0.361	0.834	Valid	0.801	Valid
UI7	0.361	0.744	Valid	0.796	Valid
UI8	0.361	0.550	Valid	0.787	Valid
AV1	0.361	0.377	Valid	0.818	Valid
AV2	0.361	0.619	Valid	0.745	Valid
AV3	0.361	0.790	Valid	0.585	Valid
AV4	0.361	0.814	Valid	0.703	Valid
AV5	0.361	0.883	Valid	0.787	Valid

Source: Author's formulation from SPSS

Based on the results of the validity testing above, the results obtained that all questionnaire questions for both the dimensions of expectation and perception are valid, and can be continued to the next step.

Reliability Test

In addition to being valid, research instruments must also be reliable, or as described by

Indrawati (2015, 155) that reliable is when an instrument can produce relatively the same and consistent measurement results when used twice or more because of it concerning the level of trust, reliability, consistency, or stability of the results of a measurement. To facilitate and reduce the occurrence of errors, researchers will use SPSS version 25. In testing the reliability of research instruments, the reliability of the Cronbach Alpha method is used with the formula described in the following equation, and the instrument can be said to be reliable if a greater value of the calculation results is obtained from 0.6 (Kurniawan, 2014, 103).

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum s_i^2}{s_x^2}\right)$$

Explanation:

α = Instrument reliability
k = Number of questions
s_i^2 = Number of item variants
s_x^2 = Total variants

The researcher then conducted a reliability test, and the results obtained as seen in the following Table 5.

Table 5
Result of reliability test

	Cronbach's Alpha	N of Items	Result
Users' Expectation	0.968	34	Reliable
Users' Perception	0.977	34	Reliable

Source: Author's formulation from SPSS

Based on the results of the reliability test above, it was found that both the expectation and the perception dimensions were reliable, and the questionnaire was ready to be distributed to research respondents.

Respondent Characteristics

The respondents of this study as shown in Table 6, were all website users in the form of 400 university stakeholders in the form of Telkom University students, Telkom University lecturers and employees, high school students, and the general public.

Table 6
Respondent characteristics

Characteristics	Total	Percentage
Gender		
• Male	261 persons	65.25%
• Female	139 persons	34.75%
Age		
• 17 to 25 years old	286 persons	71.5%
• 26 to 35 years old	43 persons	10.75%
• 36 to 45 years old	47 persons	11.75%
• 46 to 55 years old	13 persons	3.25%
• 56 to 65 years old	11 persons	2.75%

Characteristics	Total	Percentage
User group		
• Telkom University students	165 persons	41.25%
• Telkom University lecturers and employees	35 persons	8.75%
• High school students	70 persons	17.5%
• General public	130 persons	32.5%
Gadget type		
• Desktop	55 persons	13.75%
• Mobile	154 persons	38.5%
• Both desktop and mobile	191 persons	47.75%

Source: Author's documentation

Data Analysis

In the next step, the researcher will determine the priority of each indicator using the Gap Analysis. First of all, the gap level of each variable will be calculated by reducing the perception score with the expected score of each indicator. The data will then be sorted by the highest gap level which is shown in negative numbers, sequentially to the indicator which has the lowest gap level. For several indicators that have the same gap value, the indicators are considered to have the same level of priority. The results of the order can be seen in Table 7.

Table 7
Indicator research sorted by priority

No.	Code	Gap	No.	Code	Gap
1	AV2	-762	16	SI6	-413
2	IF8	-711	17	AV3	-412
3	SI5	-702		AV4	
4	SI3	-608	18	IF4	-389
5	UI6	-575	19	UA3	-387
6	UI1	-533	20	UI4	-380
7	IF6	-518	21	AV1	-361
8	UA4	-503	22	UI5	-353
9	UA6	-499	23	SI2	-352
10	SI1	-488	24	UA1	-311
11	SI4	-485	25	UA2	-310
12	IF5	-481	26	UI8	-294
13	IF7	-468	27	IF2	-244
	UI2		28	IF1	-224
	UI7		29	UA5	-194
14	UI3	-441	30	UA7	-163
15	IF3	-438	31	AV5	-94

Source: Author's documentation

According to Kotler & Keller (2016, 200), the higher the gap rate, the higher the level of user dissatisfaction. It was also stated by Wijaya (2018, 61–62) that the greater the gap number, the urgency level of improvement of the indicator would be higher compared to other indicators.

From Table 7, it can be seen that all research variables show a negative gap score, which indicates that there are no variables with perceptions that reach or exceed expectations. Ideally, improvements need to be made for each variable examined on the Telkom University website.

Furthermore, researchers will categorize research indicators into the Importance-Performance Analysis quadrant, as shown in table 8.

Table 8
Quadrant categorization of each research indicator

Code	Expectation Score	Perception Score	Quadrant
AV2	1935	1173	1
IF8	1895	1184	1
SI5	1823	1121	3
SI3	1796	1188	3
UI6	1823	1248	3
UI1	1916	1383	1
IF6	1839	1321	3
UA4	1921	1418	1
UA6	1874	1375	1
SI1	1913	1425	1
SI4	1787	1302	3
IF5	1904	1423	1
IF7	1846	1378	3
UI2	1882	1414	1
UI7	1829	1361	3
UI3	1879	1438	1
IF3	1888	1450	2
SI6	1903	1490	2
AV3	1929	1517	2
AV4	1919	1507	2
IF4	1892	1503	2
UA3	1825	1438	3
UI4	1872	1492	2
AV1	1931	1570	2
UI5	1816	1463	4
SI2	1933	1581	2
UA1	1819	1508	4
UA2	1846	1536	4
UI8	1849	1555	4
IF2	1958	1714	2
IF1	1948	1724	2
UA5	1817	1623	4
UA7	1628	1465	4
AV5	1938	1844	2
Mean	**1869.79**	**1445.06**	

Source: Author's documentation

The researcher uses the SPSS version 25 to describe the position of all indicators studied in an Importance-Performance Analysis diagram. The visualization of the diagram has been illustrated as shown in Figure 1 below.

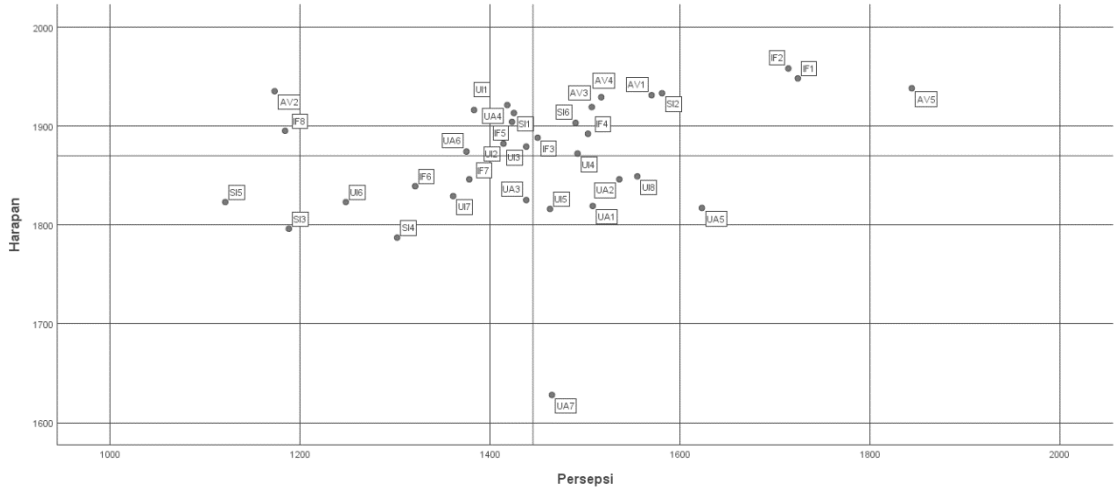

Figure 1: Importance-Performance Analysis diagram
Source: Author's formulation from SPSS

Through Gap Analysis and Importance-Performance Analysis, researchers will find out the factors that require improvement based on the level of relative importance, sequential to the level of urgency (Wijaya, 2018, 59, 61–62). In the first quadrant of the Importance-Performance Analysis diagram, visible research indicators that must be improved to improve the quality of the Telkom University website. Some of these indicators as outlined in Table 9, sequentially from the highest priority to the lower.

Table 9:
Telkom University website indicators that must be improved

No.	Code	Indicator
1	AV2	Telkom University website has a fast response time
2	IF8	Telkom University website provides complete information
3	UI1	Telkom University website has an attractive appearance
4	UA4	Telkom University website is easy to use
5	UA6	It is easy to search for information on the Telkom University website
6	SI1	Telkom University website has a good reputation
7	IF5	Telkom University website provides information that is easy to understand
8	UI2	The design used is by Telkom University website types
9	UI3	Telkom University website displays multimedia content well

Source: Author's documentation

In the second quadrant, contains indicators that must be maintained to preserve the quality of the Telkom University website. Some of these indicators as outlined in Table 10, sequentially from the highest priority to the lower.

Table 10
Telkom University website indicators that must be maintained

No.	Code	Indicator
1	IF3	Telkom University website provides the latest information
2	SI6	Telkom University website can make an interest
3	AV3	Telkom University website can be accessed through various browsers properly
4	AV4	All links displayed on the Telkom University website work well
5	IF4	Telkom University website provides relevant information
6	UI4	Telkom University website shows the organization's identity well
7	AV1	Telkom University website can be accessed at any time
8	SI2	Telkom University website maintains the security of personal information
9	IF2	Telkom University website provides reliable information
10	IF1	Telkom University website provides accurate information
11	AV5	It is easy to find the Telkom University website on a search engine

Source: Author's documentation

In the third quadrant, some indicators have low priority, where the indicators have low performance but are not considered important by respondents. Some of these indicators as outlined in Table 11, sequentially from the highest priority to the lower.

Table 11
Telkom University website indicators with low priority

No.	Code	Indicator
1	SI5	It is easy to provide feedback on the Telkom University website
2	SI3	The website makes it easy to contact Telkom University
3	UI6	Telkom University website displays good legibility
4	IF6	Telkom University website provides detailed information
5	SI4	Telkom University website promises that services can be delivered properly
6	IF7	Telkom University website presents information in the right format
7	UI7	Telkom University website uses the right color
8	UA3	It is easy to navigate on the Telkom University website

Source: Author's documentation

In the fourth quadrant, it contains indicators that must be reduced in priority, which indicators have high performance but are not considered important by the research respondents. Some of these indicators as outlined in Table 12, sequentially from the highest priority to the lower.

Table 12
Telkom University website indicators that must be reduced in priority

No.	Code	Indicator
1	UI5	Telkom University website uses the appropriate illustration
2	UA1	Telkom University website is easy to learn
3	UA2	Telkom University website is easy to understand
4	UI8	Telkom University website displays a consistent design
5	UA5	The website shows the competence of Telkom University
6	UA7	Telkom University website provides new knowledge

Source: Author's documentation

Discussion and Conclusions

Based on the study that has been done, it is known that the level of user expectation on the quality of the Telkom University website is 93.49% with a very important category. If sorted from the highest, the expected dimensions of the variables are Availability at 96.52%, Information Quality at 94.81%, Service Interaction Quality at 92.96%, User Interface Quality at 92.91%, and Usability at 90.93%. On the other hand, the level of user perception of the quality of the Telkom University website is 72.25% with a good category. If sorted from the highest, the perception dimension variables are Availability by 76.11%, Usability by 74.02%, Information Quality by 73.11%, User Interface Quality by 70.96%, and Service Interaction Quality by 67.56%.

It is noted that there is a gap between the expectations and perceptions of users of Telkom University website quality with a difference of 21.24%. If sorted by priority or from those with the biggest gaps, those variables are Service Interaction Quality, User Interface Quality, Information Quality, Availability, and Usability. As for several factors that must be corrected to improve the quality of Telkom University website, sequentially from the highest priority are the response speed of website pages, the completeness of available information, attractive website appearance, ease of use, ease of finding information, website reputation, availability of information that easy to understand, the suitability of the design to the type of website, and multimedia content display.

This study contributes by developing the more structured modified WebQual 4.0 instrument, based on the previous study by Rosania & Yasir (2016), Hariyanto et al. (2018), and Napitupulu (2016), who only use the Usability, Information Quality, and Service Interaction Quality variables, as well as the study by Devi & Sharma (2016), Jayathunga, Jayawardana, Wimaladharma & Herath (2017), Gata & Hekhmatyar (2017), Hafiz (2017), and Khawaja & Bokhari (2010), which presents the Availability and User Interface Quality variables in their modified WebQual 4.0 instrument. The modified WebQual 4.0 instrument in this study was specifically designed to assess university websites by includes and categorizes all indicators that are often used in all the previous studies. This modified instrument can be a reference in assessing university websites that measured based on the perceptions of their stakeholders.

Also, this study provides an overview of the indicators that must be improved, indicators that must be maintained, indicators with low priority, and which indicators must be reduced in priority on the Telkom University website. It can be seen that there are nine indicators on Telkom University's website that need improvement. However, it is unknown how to fix this,

which can be examined in subsequent studies.

The following are some suggestions for further development:

1. Telkom University website managers can pay attention to the indicators that must be maintained and whose priorities must be reduced in the aim of maintaining and developing the quality of Telkom University websites
2. Performing redesign by paying attention to aspects that require improvement in this study
3. Measuring and analyzing whether there is an increase in quality after a website redesign
4. Conduct user testing to find out specifically, what form of information is expected by the university website accessors

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