Analysis of website service quality with webqual 4.0 integration method

K Syahputri*†, I Rizkya, I Siregar, O C Syardhi
Department of Industrial Engineering, Faculty of Engineering, Universitas Sumatera Utara

*E-mail: syahputri.khalida@gmail.com

Abstract. Universitas Sumatera Utara is one of the state universities that uses a website as an information system to support education. The Academic Portal and Student Directory are websites released by the USU Information System Centre to facilitate academic services for students. However, as a service provider, the Academic Portal website and student directory do not escape complaints from students' complaints about the quality of service provided and make students feel that the quality of the website is not in accordance with what they expect and give dissatisfaction with the services provided. This research was conducted to analyze the quality of the Academic Portal website and the Student Directory based on the Webqual 4.0 dimension. Analysis of website quality by calculating webqual index to determine the level of quality of the website based on the WQI coefficient interval. If the Academic Portal Dimension usability and Information are in the coefficient interval of 0.60-0.70, it can be said that the quality level of the Academic Portal Website is the Usability and Information dimension is "Good". Whereas the interaction dimension is at an interval of 0.40-0.59, it can be said that the quality level of Portal A Website is academic.

1. Introduction

In the industrial era 4.0, the role of information technology is felt to be even greater because all organizational activities and business activities are carried out with information technology intermediaries. Utilization of information technology using the internet. The Internet has several advantages not only for individual users but also for organizations, for example in terms of convenience, access 24 hours a day, 7 days a week, global reach, efficiency, alternative space and relatively unlimited options, personalization, potential resources, and others [1]. The use of the internet network is by means of a website. Website is the set of web pages that are interconnected and the files are related. The web consists of pages or pages, and a collection of pages called the homepage. The homepage is in the top position, with related pages at the bottom. Usually each page under the homepage is called a child page, which contains hyperlinks to other pages on the web [2].

The website has an important role for organizations, one of which is a university because it can simplify online services for its users. Website quality is the overall excellence or effectiveness of a website in delivering messages aimed at viewers and viewers [3]. The quality of the website is in accordance with the expectations of the web stakeholders [4]. Website design is an important determinant in achieving the quality of service offered to consumers [5]. One type of website in higher education is an academic website. Academic website is a website-based academic information system, where its use is intended to provide information services in the form of data related to academics. The definition of an academic website is a system specifically designed to meet the needs of higher education institutions that want computerized educational services to improve performance, service quality, competitiveness and quality of human resources produced. Universitas Sumatera Utara is one of the State Universities that uses the website as an information system to support the implementation of education so that the Universitas Sumatera Utara can provide better and more effective information to all academicians. According to 4ICU, which is a website that ranks higher education websites in
Indonesia, provides an assessment and determines the website of Universitas Sumatera Utara at rank 14 in Indonesia.

The result of interviews with several students who use the website portal of academic and student directory as a sub domain website usu.ac.id there are some complaints which occurred constraints regarding error occurs Academic Portal website and lags in the response speed. All students at Universitas Sumatera Utara use the Academic Portal in academic activities, especially filling in KRS which is done by many users during the KRS filling period so that server downs often occur, this is because the more a web is accessed, the slower the time it takes due to the use of resources tall one. If this happens continuously, the web server will be overloaded with traffic and cause the web service to stop (server down), then the appearance of the website is less attractive, the color and font designs on the website are less safe to see, lack of features that are less attractive. It should be needed by students, the case of hacking the homepage of every student's portal, many features that cannot be accessed and are not used at all, lack of security when submitting personal data. Some of these cases tend to make students feel that the quality of the website is not in accordance with what they expect and give dissatisfaction with the services provided. On the other hand, satisfaction is one of the factors that influence the success of a system. The more quality the product or service provided, the higher the customer satisfaction. For this reason, it is necessary to analyze the quality of service so that the level of quality of the website can be determined.

Service quality analysis can be done by various methods, one of which is using Webqual. WebQual is a method used to measure website quality by end users. WebQual compiles of three-dimensional based research that is usability, information quality and quality of interaction. This research aims to know the quality of web conferencing so that students can improve the learning process and know the indicators that most affect the quality of e-Learning [6].

Many assessments of the level of service quality have been carried out in previous studies, such as the researcher Imoda (2019) who analyzed the comparison of Shopee and Lazada web services [7]. Research in tian also being done by Henny and A hs in (2012) which is me doing research on sala h the Government of Bank Local in Bekasi [8]. Based above research was conducted to analyze the website Portal Academy and Directory of Students according performance and user perception using WebQual 4.0.

2. Methodology

This type of research is survey research, namely survey research is applied to collect information and data about a large population using a relatively small sample. The population can follow and relate to agencies, institutions, people, organizations and social units, and so on, but the main source is people. Research survey research is defined as the collection of information from individual samples via their responses to the question [9]. The populations in this study were USU undergraduate students, totaling 27,321 students. The type of probability sampling used is cluster sampling, where each element in the population is given the same opportunity to be drawn into the sample. The calculated sample size in this study is as follows, assuming an error value of 5% (d = 0.05).

Slovin formula:

\[ n = \frac{N}{1+N \cdot d^2} \]

\[ n = 393.26 \approx 394 \text{ Students} \]

After obtaining the number of samples, questionnaires were distributed in the form of performance and expectation questionnaires on the academic portal website and Student Directory. The questionnaire used uses a Likert scale of 1-5. After the data is collected, validity and reliability tests are conducted on the respondent's answer to calculated WebQual index, WebQual index used to determine standards (benchmarks) on academic websites being viewed as a whole. To obtain WQI beforehand, it is necessary to know several values, namely the weight / importance value (Mean of Importance), maximum score (Max. Score), and weighted score (Wgt. Score) so that eventually you will get WQI from each website.
2.1. Mean of importance (MoI)
MoI is obtained based on the average value of interest / expectation given by respondents for each indicator.

2.2. Maximum score (Max. score)
Maximum score is obtained from the importance value multiplied by 5 (the largest scale in the assessment).

\[
\text{Maximum Score} = \text{MoI} \times n \tag{2}
\]

2.3. Weighted scored (Wgt. score)
The weighted score, obtained from the product of the Mean of Importance (MoI) and the average value obtained from the respondent's assessment of the perceived quality of the website at this time (perceived value).

\[
\text{Weighted Score} = \text{Mean} \sum (I \times P) \tag{3}
\]

2.4. Webqual index (WQI)
The WQI value is obtained from the division between the weighted score and the maximum score obtained from each indicator.

\[
\text{WQI} = \sum \frac{\text{weight score}}{\text{maximum score}} \tag{4}
\]

The webqual index interpretation table can be seen in the following table:

| No | WQI Coefficient Interval | Quality Level     |
|----|--------------------------|-------------------|
| 1  | 0.80-1.00                | Very good         |
| 2  | 0.60-0.70                | Well              |
| 3  | 0.40-0.59                | Enough            |
| 4  | 0.20-0.39                | Not Good          |
| 5  | 0.00-0.19                | Not Very Good     |

3. Result and Discussion

3.1. Validity test

One of the important steps that must be taken in a study is to test the validity of the data, so that it can be seen whether the data that has been obtained is data that can describe the actual situation or is in accordance with the actual situation, so that the data is worthy of further investigation and can be used to measure object under study [10].

In determining the significance or insignificance by comparing the value of \( r_{\text{count}} \) with the value of \( r_{\text{table}} \) degree of freedom = \( nk \). The validity test was carried out on each variable, namely Quality of Use (USA), Quality of Information (INF) and Quality of Interaction (INT). Where \( N = 400 \) and \( r_{\text{table}} \) with a significant level of 5% is 0.098. If \( r_{\text{count}} > r_{\text{table}} \), the data is declared VALID.

3.2. Reliability test

Test Reliability is regarding confidence one can have in the data obtained from the use of an instrument, namely the extent to which control style measure to random errors [11]. Analysis was performed on each of the variables of Quality of Use (USA), Quality of Information (INF) and Quality of Interaction (INT). Reliability test used is Alpha Cronbach's reliability test. If the basis of decision-making in the reliability test is if the value of Cronbach's Alpha > \( r_{\text{table}} \) then a questionnaire or questionnaire stated
reliable or consistent. If the value of Cronbach's Alpha < r table questionnaire survey questionnaires or otherwise did not Reliable or consistent.

3.3. Webqual index calculation (WQI)
Based on the results of calculations, it can be seen that Dimension of usability and Information are in the coefficient interval of 0.60-0.70, so it can be said that the quality level of the Academic Portal Website in Usability and Information dimensions is "Good". Meanwhile, the Interaction dimension is in the interval 0.40-0.59, it can be said that the quality level of the Academic Portal Website in the Interaction dimension is "Enough". Then on the website of Student Directory dimension of usability Information and interaction is in the interval 0.60 to 0.70 coefficient, it can be said that the level of quality Website Student Directory dimensional usability Information and Interaction "Good". The recapitulation of WQI Academic Portal Calculation can be seen in Table 2.

| Website          | Variable    | Max. Score | Wgt. Score | WQI  |
|------------------|-------------|------------|------------|------|
| Academic Portal  | Usability   | 156.820    | 107.425    | 0.685|
|                  | Information | 128.115    | 88.622     | 0.692|
|                  | Interaction | 125.100    | 65.542     | 0.524|
| Student Directory| Usability   | 146.285    | 105.382    | 0.720|
|                  | Information | 124.995    | 83.044     | 0.664|
|                  | Interaction | 129.595    | 80.393     | 0.620|

4. Conclusion
Based on the above research, it can be concluded that the usability and information dimensions on the academic portal are good, while the interaction dimension is sufficient and the quality needs to be improved. Meanwhile, on the dimension student directory website, usability, information and interaction are good.

Acknowledgement
Thank you to Universitas Sumatera Utara for their financial support so that this paper can be published Authors also thanks to the other parties who helped in this research.

References
[1] Shia B. C, Chen M, Ramdansyah A. D, and Wang S 2016 American Journal of Industrial and Business Management 6, pp 117–128.
[2] Kambey D J F 2020 Seminar Nasional Teknologi Komputer & Sains (SAINTEKS).
[3] Wang L, Law R. Guillet, B. D Hung K & Fong D K C 2015 International Journal of Hospitality Management 47, pp 108-115.
[4] Canziani B F and Welsh D H 2016 Journal of Hospitality and Tourism Technology 7(3), pp 266-280.
[5] Hasanov J and Khalid H 2015 Procedia Computer Science 72, pp. 382-389.
[6] Sujono and Santoso H B 2017 International Journal of Science and Technology (IJSTE) 6(1), pp.8-14.
[7] Imoda David 2019 International Research Journal of Advanced Engineering and Science 4, pp 385-388.
[8] Medyawati H 2012 International Congress on Interdisciplinary Business and Social Science.
[9] Check J & Schutt R K 2012 Survey research. In J. Check & R. K. Schutt (Eds.). Research methods in Education (California: Thousand Oaks, Sage Publications).

[10] Andry J 2019 Journal of Information Systems Engineering and Business Intelligence 5(1), pp. 23-31.

[11] Mohajan 2017 Annals of Spiru Haret University