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Measuring the Quality of the Health Information Websites Alodokter.com and Hellosehat.com Using Webqual 4.0

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Abstract**—** *The development of the internet provides innovations for an example of an information innovation, namely the information website health in Indonesia such as Alodokter.com and Hellosehat.com. The websites is necessary to analyze the quality of the website to find out whether it has achieved a good quality website or not in the category well. This study aims to analyze the quality of the Alodokter.com Hellosehat.com with WebQual 4.0 based on variable usability, information, and service interaction. This research uses quantitative methods and data sources obtained by distributing questionnaires to visitors Alodokter.com and Hellosehat.com websites. Data analysis techniques were tested using Mann-Whitney test.*

Keywords**—** *Website Quality, Webqual 4.0, MannWhitney, Service and Information quality.*

I. INTRODUCTION

Entering the current global era, the development of information technology and the internet provides convenience in various aspects of everyday life for the community. With the emergence of the internet amid society currently provides convenience in obtaining information quickly and efficient. In Indonesia, there are quite a lot of internet users, according to Internet Service Providers Association in its survey titled "Penetration and Indonesian Internet User Behavior Profiles 2018" of the total Indonesia's population is 264.16 million, there are 171.17 million inhabitants Indonesia uses the internet or around 64.8% of the total population of Indonesia [1], it can be said that it increased 10.12% from the proportion in 2017 with a total proportion of 54.68%, in other words, other developments in use internet in Indonesia will continue to grow every year. This research was conducted to determine quality of the website, the object used is a static website, namely a website health information Alodokter.com and Hellosehat.com. Information website health is commonly referred to as e-health, which is a field of informatics medical, public health and business, refers to health services and information conveyed via the internet and technology [2].

Internet development is a good innovation to provide many benefits, one of which is the community can get in-formation from various sites according to his needs. One of the characteristics of internet development is the number one of the services provided by the internet is the World Wide Web (WWW). WWW is a collection connectedness of multimedia documents stored on the Internet and accessed using a protocol (HTTP = hypertext transfer protocol) [3]. In a website users can access information such an images, videos, sound and animation quickly and effectively.

Determining the quality in a website is the reason for this research, because it is can be a reference for companies that become a platform for convey information related to health and services that can be assist users in using the website. The judgment score is by users who related on website.

II. LITERATURE REVEW

A. Internet

The Internet is a series of accessible computer network connections in general around the world, which sends data in the form of data packets based on internet protocol (IP) standards. The internet is a collection of networks of the world's computer networks consisting of millions small units, such as Education networks, business networks, government networks, and others, which jointly provide information services such as e-mail, online chat, file transfer and linked between one web page with other web sources [4].

B. World Wide Web (WWW)

World Wide Web (WWW) or commonly referred to as a website is a collection of linked multimedia documents stored on the Internet and accessed using a protocol (HTTP = hypertext transfer protocol) [3]. In a website users can access information such an images, videos, sound and animation quickly and effectively.

A website requires a web client software to open a website, the software must have browser or specific internet browsing software, such as for example: Google Chrome, Internet Explorer, Opera and others. Other than that, in a web page (web-page) it takes a page address or commonly called the Uniform Resource Locator (URL). The URL contains the name of the protocol for access files consisting of domain names, the domain will determine the location where the file can be accessed.

C. Website Quality

A good quality website is a website that is concerned with good content required in a website and will then pay attention to the appearance as well as the use of a website. According to previous studies.

Website quality is divided into five dimensions (Hyejeong & Niehm, 2009):

1. Information, which can be in the form of quality content

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and quality of inside information a website.
2. Security, namely the belief in privacy security and assurance to get security.
3. Ease, namely the dimensions that include ease of operation, ease of navigation on a website.
4. Comfort, namely the dimensions that include visual appeal, attractiveness emotional, creative and attractive design.
5. Service quality is a dimension that includes online completeness and customer service.

From the above explanation it can be concluded that a good website includes user satisfaction in accessing a web-site in other words an outline of the appearance, use and function of a website must be able understood by users and based on user satisfaction levels thorough.

In measuring the quality of a website there are several methods that are used, such:

1. Quality Function Deployment (QFD)
   QFD is a method for transforming requests from users become a design quality to deploy the function forming quality and disseminate methods to achieve design quality in systems, component parts, and specific elements in the process manufacture. QFD is designed to help planners get it focus on the characteristics of the product or service from an existing point of view segmentation of the market, company, or development needs technology. QFD is also very useful for transforming Voice Of Customer (VOC) in-to the engineering characteristics of a product or ser-vice by prioritizing the characteristics of each product or service in conjunction with setting development targets simultaneously for the product or ser-vice. The main technique of this QFD is to make graphs and matrices [5].
2. SERVQUAL (Service Quality)
   SERVQUAL (Service Quality) developed by Par-asuraman, Zeithaml, and Berry (1985, 1988, 1990, 1991, 1993, 1994) in their series of studies of six ser-vice sector: repair of household appliances, credit cards, insurance, long-distance telephone lines, retail banking and securities brokers. Model SERVQUAL is based on the assumption that consumers compare service performance on the relevant attributes with the standard ideal / perfect. If the service performance matches or exceeds the standard, then perceptions of the overall service quality will be positive as well otherwise. In other words, this model analyzes the gap between two main variables, namely the ex-pected service with perceived service [6].
3. WEBQUAL (Website Quality)
   Webqual is a measurement technique used for assess the quality of the website and based on the end user's perception. Webqual was developed by Stuart J Barnes and Richard T Vidgen with the initial concept of QFD.

Webqual has progressed from webqual 1.0 to 4.0. Here are some explanations about the development of webqual [7]:

1. Webqual 1.0
   The first version of the Webqual instrument (Webqual 1.0) was developed by Barnes and Vid-gen (2000) who assessed the quality of websites in domains UK business schools from a sound customer perspective.
2. Webqual 2.0
   To expand the application of Webqual in the con-text of the B2C website, Barners and Vidgen (2001a) developed a second version of Webqual (Webqual 2.0) for evaluating Internet bookstore websites. Webqual 2.0 includes a quality perspec-tive interaction based on the SERVQUAL pro-posed by Parasuraman, Zeithaml and Berry (1988).
3. Webqual 3.0
   The third version of Webqual (Webqual 3.0) is a combination of Webqual 1.0 and Webqual 2.0 and has been tested in the context of an online auction. Three dimension merged from Webqual 3.0: website quality, information quality, and the quality of service interactions (Barnes & Vidgen, 2001b).
4. Webqual 4.0
   The fourth version of Webqual (Webqual 4.0) re-places the website quality appeared on WebQual 3.0 for the purposes of Barnes and Vidgen (2002) considers usability to “reflect better on another two-dimensional level of abstraction of information — Webqual and interaction service,". The usability dimension was adapted from the literature in the field of interaction human computers and web usability (Barnes & Vidgen, 2002). WebQual 4.0 successfully validated in the con-text of UK Internet bookstores.

D. Webqual 4.0

In the preceding explanation, there are three categories under method webqual 4.0 measurement, in that category there are usability, information quality and service interaction quality. To summarize, it appears that there are five factors in the WebQual instrument. These factors can be grouped into three main components that confirm previous research [8]:

- Usability
  The qualities associated with "site design" and "usability"; for example display, ease of use and navigation, and the image submitted to the user.
- Information Quality
  Quality of site content: suitability of information for user purposes, for example accuracy, format and relevance.
- Service Interaction Quality
  The quality of service interactions experienced by their current users dig deeper into the site, which is embodied by "trust" and "empathy"; for example, transaction security issues and information, product delivery, personalization, and communication with the site owner.

In the three categories above, there are 23 questions, namely usability there are eight questions, in information quality there are seven items question, in service interaction quality there are seven questions and one the last question is related to the overall assessment of a website. These questions are developed regarding the quality of the website and

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proposed by Barnes & Vidgen (2003) [9]. Webqual 4.0 questions arranged as in table 1 below:

Table 1: Webqual 4.0 Question

Category	No	Webqual 4.0
Usability	1	I find the site easy to learn to operate
	2	My interaction with the site is clear and understandable
	3	I find the site easy to navigate
	4	I find the site easy to use
	5	The site has an attractive appearance
	6	The design is appropriate to the type of site
	7	The site conveys a sense of competency
	8	The site creates a positive experience for me
Information	9	Provides accurate information
	10	Provides believable information
	11	Provides timely information
	12	Provides relevant information
	13	Provides easy to understand information
	14	Provides information at the right level of detail
	15	Presents the information in an appropriate format
Service Interaction	16	Has a good reputation
	17	It feels save to complete transaction
	18	My personal information feels secure
	19	Creates a sense of personalization
	20	Convey a sense of community
	21	Makes it easy to communicate with the organization
	22	I feel confident that goods/services will be delivered as promised
Overall quality	23	My overall view of this website

In webqual 4.0 research, there is research modeling as in figure 1 below which shows the concept of the relationship between dimensions with customer satisfaction. This modeling is relevant to previous research in gazal et al. (2015) [10] and excimirey et al. (2013) [11] which also includes modeling research as in figure 1 below:

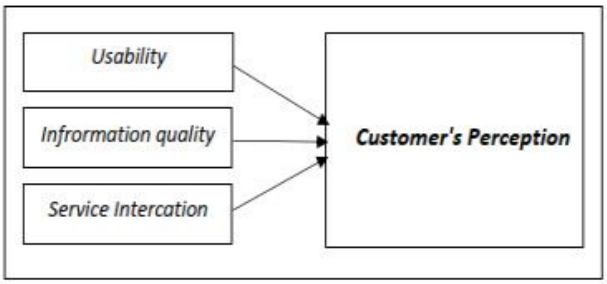

Figure 1: Webqual 4.0 Research Model

III. Research Methodology

This section presents the research methodology used in the study. Areas covered include the sample used, research variables and statistical tools for data analysis.

1. Validity Test & Reliability Test

   In testing the validity, the instruments that have been retrieved from the respondents will then test the validity statistically. Technique the statistic that can be used is correlation. To test the validity there is a formula for calculating the data, as follows:

   Note :

   r = Colleration

   x = Item score

   y = Total Score

   n = data

   To perform reliability analysis, Cronbach's method can be used Alpha. If the coefficient obtained is > 0.60, then the research instrument reliable. Reliability test can use the Cronbach Alpha technique, with the formula as follows :

   Note :

   r = reliability value

   $\sum \sigma b$ 2 = Number of item variations

   σ12 = Total variance

   k = Number of questions

2. Normality Test

   The purpose of the normality test is to find out what the distribution of data is follow or approach the normal distribution, namely the distribution of data with forms bell shaped [12]. The basis of decision making on the normality test, namely:

   A. If the number of significance (SIG) > 0.05 then the data can be said normally distributed.

   B. If the significance level (SIG) < 0.05 then the data can be said not normally distributed.

3. Mann-Whitney Test

   The Mann Whitney U Test is also known as the Wilcoxon Rank Sum Test. It is a non-parametric test option if the Independent T Test cannot done because the normality assumption is not fulfilled. But despite the form non-parametric from the independent t test, the Mann Whitney U Test did not test differences in the mean (mean) of the two groups as befits the Independent T Test, but to test for differences in the Median of the two groups [13]. To test the Mann Whitney manually, a formula such as the following:

   Note :

   U1 = U1 examiner

   U2 = U2 Examiner

   R1 = Number of rank samples 1

   R2 = Number of rank samples 2

   n1 = Number of sample members 1

   n2 = Number of sample members 2

   After getting the test statistical values U1 and U2. then take the value the smallest of the two values. The smallest value obtained later compared to the Mann Whitney table. However to count samples on a large scale, namely n1 and n2> 20, it will use a formula like the following:

   The basis for making decisions on the Mann-Whitney test is as follows:

   a. If the sig value> 0.05 then H0 is accepted

   b. If the sig value <0.05 then H0 is rejected

IV. Result

In this study, it is divided into two respondents, namely the first respondent is the user of the Alodokter.com website with a total of 308 respondents and the second respondent is a user of the Hellosehat.com website with a total of 333 respondents. In table 2 and 3 bellow there is a result of validity & reliable

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test.

Table 2: Result of Validity Test

Website	Status	Note
Alodokter.com	All Item Valid	Test on 23 item of question on webqual 4.0 method using SPSS software
Hellosehat.com	All Item Valid	

Table 3: Result of Reliable Test

Website	Status	Note
Alodokter.com	All Variable Valid	Test on 4 variable of question on webqual 4.0 method using SPSS software
Hellosehat.com	All Variable Valid	

The normality test is carried out to see whether the data distribution is normal or not. Normality testing is done to analyze parametric statistics. In this research is a normality testing technique using Kolmogorov smirnov.

The decision making process in the normality test is: if the value is sig. > 0.05 then the data is normally distributed, and if the value is sig. <0.05 then the data is not normally distributed. In the table 4 and 5 below shows that the results of the normality test on the Alodokter.com and Hellosehat.com websites are not normally distributed, it can be seen from the Asymp Sig value. (2-tailed) is 0.000 where the value is <0.05. Because the data is not normally distributed then the Mann-Whitney difference test will be carried out.

Table 4: Result of Normality Test Alodokter.com

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		308
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.43507943
Most Extreme Differences	Absolute	.094
	Positive	.065
	Negative	-.094
Test Statistic		.094
Asymp. Sig. (2-tailed)		.000[c]

Table 5: Result of Normality Test Hellosehat.com

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		333
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.47616672
Most Extreme Differences	Absolute	.091
	Positive	.057
	Negative	-.091
Test Statistic		.091
Asymp. Sig. (2-tailed)		.000[c]

Mann Whitney test, namely the assumption of normality must not be fulfilled or the data is not normally distributed. The Mann-Whitney test was also conducted to test the hypothesis in the study. From the research conducted there is a hypothesis as follows:

1. Ha0: There is no significant difference according to the variables usability on the Alodokter.com and Hellosehat.com websites
2. Ha1: There is a significant difference according to the usability variableon the Alodokter.com and Hellosehat.com websites
3. Hb0: There is no significant difference according to the variables information quality on the Alodokter.com and Hellosehat.com websites
4. Hb1: There is a significant difference according to the variables information quality on the Alodokter.com and Hellosehat.com websites
5. Hc0: There is no significant difference according to the variables service interaction on the Alodokter.com and Hellosehat.com websites
6. Hc1: There is a significant difference according to the service variable interaction on the Alodokter.com and Hellosehat.com websites

The basis for making decisions on the Mann-Whitney test is as follows:

a. If the sig value> 0.05 then H0 is accepted
b. If the sig value <0.05 then H0 is rejected

From the data that has been processed in table 6 below, the results of the test hypothesis on usability variables, information quality and service interaction shows the results that:

- Ha0 is rejected, where the p-value significance in the Usability dimension is 0,000 which means less than 0.05.
- Hb0 is rejected, which is the significance of the p-value on the dimension of Information Quality is 0.000 which means it is less than 0.05.
- Hc0 is rejected, which is the p-value significance in the Service Interaction dimension is 0.000 which means it is less than 0.05.

Table 6: Result of Mann-Whitney Test

Test Statistics[a]			
	Usability	Information quality	Service Interaction
Mann-Whitney U	42647.000	40589.500	40785.000
Wilcoxon W	90233.000	88175.500	88371.000
Z	-3.700	-4.592	-4.504
Asymp. Sig. (2-tailed)	.000	.000	.000
a. Grouping Variable: Responden			

From the table above, it can be concluded that the accepted hypotheses in this study are:

1. Ha: There is a significant difference according to the usability variable on the Alodokter.com and Hellosehat.com websites
2. Hb: There is a significant difference according to the information quality variable on the Alodokter.com and Hellosehat.com websites
3. Hc: There is a significant difference according to the service interaction variable on the Alodokter.com and Hellosehat.com websites

Through the table 7 below, it can be seen that the average ranking is on Group 1 namely Hellosehat.com has the highest average rating on information quality of 353.11 which can be concluded that the information quality has a good score based on the results of the assessment by the user followed by service interaction, then the last one is usability, while in

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group 2 it is Alodokter.com has the highest average rating on usability of 292.96 which means that users assess usability on the alodokter.com website good score followed by service interaction then ranked last is information quality.

Table 7: Ranks

Ranks				
	Responden	N	Mean Rank	Sum of Ranks
Usability	hellosehat.com	333	346.93	115528.00
	alodokter.com	308	292.96	90233.00
	Total	641		
Information quality	hellosehat.com	333	353.11	117585.50
	alodokter.com	308	286.28	88175.50
	Total	641		
Service Interaction	hellosehat.com	333	352.52	117390.00
	alodokter.com	308	286.92	88371.00
	Total	641		

In this study, it can be seen that all the items tested on the Webqual 4.0 method variable, namely usability, information quality and service interaction with users of the Alodokter.com and Hellosehat.om websites are valid and reliable and all tests in this study use SPSS.

From the results of research conducted using the Mann-Whitney test, it can be concluded that there are significant differences in the usability, information quality and service interaction variables on the Alodokter.com and Hellosehat.com websites. In addition, the average rating on the Alodokter.com website variable shows that the use of the website is better than the quality of information and the quality of information services, which means that the use of the website is attractive according to users and the usefulness of the website also has a good function. Also, the quality of information on the Alodokter.com website needs to be improved considering that the quality of information is ranked last in the average ranking. . The quality of the information that will be improved can be in the form of content contained on the website. On the Hellosehat.com website, users assess the quality of the information on the website as good, marked by having the highest average rating compared to the other two variables, while Hellosehat.com website users think that the usability of the website is not very good marked by getting the last ranking on average rating. The usability of the website can be improved by conducting regular testing in order to evaluate the usability of the website, as well as improving the appearance so that it can provide a positive experience from the user because usability is the main preference for the user.

Research using the Webqual 4.0 method shows that the higher the quality of a website, the higher user satisfaction is in using the website. The quality of a good website is characterized by good usability, quality of information and service interaction on a website so that it gives a positive impression to visitors and gives a trust effect to access the website regularly.

V. Conclusion

Based on the results of research conducted on website quality analysis using the Webqual 4.0 method, the following results were obtained:

1. Respondents obtained in data collection techniques by distributing questionnaires are divided into two groups, namely the first 308 respondents who use the Alodokter.com website and 333 respondents who use the Hellosehat.com website.
2. The results of data processing from the Mann-Whintey technique test show that there are significant differences in the usability, information quality, and service interaction variables on the health information websites Alodokter.com and Hellosehat.com.
3. Users think that on the Alodokter.com website the usability of the website is good and is followed by information quality and service interaction. Meanwhile, Hellosehat.com website users have good information quality on the website, followed by service interaction and usability.
4. Research using the Webqual 4.0 method shows that the higher the quality of a website, the higher user satisfaction is in using the website. The quality of a good website is characterized by good usability, quality of information and service interaction on a website.

VI. Future Work

The suggestions that can be given in this research are as follows:

1. Expanding research techniques or methods so that results are obtained better.
2. In further research, it is expected to add variables more variety related to the level of user satisfaction so that the future research results will be better.

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