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IMPLEMENTATION OF WEBQUAL 4.0 FOR MEASURING WEBSITE QUALITY FOR USER SATISFACTION (A Case Study on University Polytechnic of Hauts-de-France)

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Abstract

Universities strategically utilize their websites as potent tools for branding and marketing initiatives, enabling them to highlight academic programs, showcase on-campus achievements, and disseminate crucial information, such as admission details, to potential students. This study focuses on evaluating the quality of the University Polytechnic of Hauts-de-France IUT Department website, emphasizing User Satisfaction. The assessment employs the WebQual 4.0 methodology, encompassing three pivotal dimensions: Usability Quality, Information Quality, and Service Interaction Quality. The research methodology employed in this study was hypothesis testing with the population and sample consisting of 31 students, using the census technique. The research findings underscore the substantial impact of both Information Quality and Usability dimensions on website users. Areas for improvement based on the study include enhancing Service Interaction Quality with more personalized features, ensuring Information Quality with updated and relevant content, and optimizing Usability Quality by improving website navigation and accessibility. The implementation of these improvements holds the potential to positively influence User Satisfaction, reinforcing the pivotal role that website quality plays in shaping the overall perception of a university. This study reinforces the importance of user-centric improvements to enhance the overall effectiveness of university websites in meeting the evolving expectations of users in the digital era.

Keywords: *WebQual, Website Quality, User Satisfaction, University Website*

1. INTRODUCTION

In the contemporary digital age, a website serves as a vital means of interaction between an organization and its users. Possessing a website enables organizations to draw in users from around the globe, providing them access to information and establishing a competitive advantage over counterparts. Websites serve as a representation of an organization's values, effectively communicate its vision and mission, and streamline various tasks essential to the organization's operations. And this is why universities also need their own website (Hidayah et al., 2019).

Hence, a university website should directly cater to the specific needs of users, ensuring that it aligns with their intentions and facilitates the completion of tasks effectively (Alshira'H, 2020). Therefore, conducting a website usability assessment has emerged as a crucial study for gathering data and insights into the ongoing effectiveness and usage of a university's website. Webo-metrics, as a quantitative approach, becomes

instrumental in evaluating the usability of an academic website by analyzing its structure, content, and the technologies employed in a publicly accessible manner.

Since the previous year, the IUT department of University Polytechnic of Hauts-de-France has adopted the use of the website to advertise and introduce the programs offered. But due to some changes in the academic program, from Bachelor's Degree in International Trade to International Business, Purchasing and Sales, there is a necessity to update the website with the latest information about the new program. Additionally, it requires the inclusion of more comprehensive details about student life, encompassing information about the dormitory and city life, particularly tailored to international students, who are the primary audience of this program. Another issue at hand is that the students responsible for last year's website redesign project did not complete it to the required standards. Hence, there is a need for design modifications to align with the latest web design trends.

Taking into account the department and all the challenges encountered by the IUT website, the website's quality has not yet reached the desired standards for providing effective service interactions. Consequently, there is a requirement for quality assessment on bachelorinternational.com, which serves as the link to the IUT department website, utilizing the WebQual 4.0 methodology. The prior research employing the WebQual 4.0 method was conducted by Rerung and Fauzan (2020). The purpose of this study is to measure and describe the Higher Education Services Institution Region IV website quality using the Webqual 4.0 method. The questionnaire filling, depth interviews, and observation are the methods used in this research.

The measurement results showed that the overall of the Higher Education Services Institution Region IV website quality was included in Good criteria. Another study, carried out by Maryani et al. (2019), focused on evaluating the Government Knowledge Management Portal using the WebQual 4.0 method. Their results indicated that website usability had the strongest association with user usefulness, aligning with the goal of enhancing the website to meet the ideal standards. This study utilized a quantitative approach and employed the WebQual 4.0 questionnaire as its instrument.

The reliability and validity of this questionnaire have been rigorously tested in previous studies, such as the research conducted by Nurhadi et al. (2019) on the implementation of WebQual 4.0 to measure the quality of the Baznas.Go.Id website for user satisfaction, Kincl & Štrach (2012), Sørum et al. (2012) which also stated about how the quality of a website influence the user satisfaction and Wikrama et al., (2017) who also conduct a study on the website information quality information quality of university website.

2. LITERATURE REVIEW

2.1. Website

A website is a medium consisting of several interconnected pages, serving as a platform for displaying information in various forms such as images, videos, text, audio, or a combination of these elements. Websites are multiplatform, meaning they can be accessed from any device connected to the internet. Despite this technology being in use for a considerable time, many companies still utilize websites to showcase their company profiles, sell products, or provide systems for customer use (Elgamar, 2020). Meanwhile

Sarwono (2015) stated, a website is a medium comprised of pages containing information that can be accessed through the internet and enjoyed globally (across the entire world). Essentially, a website is a series of codes containing sets of commands, which are then interpreted through a browser.

2.2. Quality

Based on Kotler and Keller (2014), quality refers to the totality of features and characteristics of a product or service that depend on its ability to satisfy stated or implied needs. The quality of products and services, customer satisfaction, and company profitability are closely interconnected. The higher the level of quality, the higher the level of customer satisfaction generated, which supports higher prices and lower costs. On the other hand, Quality according to the American Society for Quality (ASQ) cited in Heizer (2015) is the entirety of features and characteristics of a product or service that rely on its ability to satisfy promised and implied needs. Quality is the ability of a product or service to meet customer needs (Heizer & Render, 2015).

2.3. User Satisfaction

Kotler and Keller (2014) state that satisfaction is determined by the closeness between consumer expectations and perceived product performance. When performance falls short of expectations, consumers feel disappointed; when it meets expectations, consumers are satisfied; when it exceeds expectations, consumers are delighted.

According to Adianto (2016), *"Consumer Fulfillment response"* is an evaluative assessment of overall product usage or consumption. It encompasses the evaluation of how well product features or services, or the products/services themselves, meet the level of satisfaction in enjoyable usage or consumption, including levels of under fulfillment and over-fulfillment. And also according to Tjiptono (2014), the quality of a website significantly influences the level of satisfaction of its users. Similarly, according to Tarigan as cited in Raharjo (2011), the higher the quality of a website, the more users will access it.

3. RESEARCH METHODS

3.1. WebQual 4.0

This approach utilizes Quality Function Deployment (QFD), a systematic process that guides the identification and incorporation of customer aspirations throughout the stages of product or service development and implementation. Quality function deployment (QFD) is adopted as a framework for identifying web-site qualities demanded by users, which are gathered through a quality workshop. From the workshop an instrument for assessing web-site quality is developed (WebQual). The QFD process commences by capturing the “voice of the customer,” essentially identifying quality needs aligned with user preferences. Subsequently, this gathered quality information is fed back to the customers, forming the foundation for evaluating the quality of the product or service.

Users are actively involved in assessing each aspect of quality, facilitating a comprehensive understanding of the prioritized qualities in different situations. The

WebQual instrument has been developed since 1998 by Barnes and Vidgen, and up to the present time, it has reached version 4.0. WebQual 4.0 is constructed based on the analysis of previous versions, which identified three dimensions of e-commerce website quality: usability, information quality, and service interaction quality. Quality function deployment (QFD) is adopted as a framework for identifying web-site qualities demanded by users, which are gathered through a quality workshop. From the workshop an instrument for assessing web-site quality is developed (WebQual) (Barnes & Vidgen, 2000). Three areas in WebQual 4.0 are defined as follows: Usability quality refers to how well design elements like appearance, ease of use, navigation, and conveyed messages contribute to a positive user experience.

It includes characteristics such as easy learning and operation, clear understanding, efficient search, user-friendly exploration, visually appealing presentation, and the ability to offer new enjoyable experiences. Information quality involves the relevance, accuracy, format, and suitability of the content presented on the website for users' needs. This includes delivering accurate, reliable, up-to-date, topic-relevant, easily understood, comprehensive, and well-designed information.

Service Interaction Quality relates to users' experiences while exploring the website. It includes aspects such as ensuring secure transactions, maintaining a good reputation, facilitating communication, fostering personalized emotional connections, preserving user privacy, and providing assurance that promises will be fulfilled. The survey comprised three sections. The initial section comprised 25 questions, focusing on the respondents' perspectives regarding the Usability Quality, Information Quality, and Service Interaction Quality of the IUT Bachelor International program, aiming to evaluate its effect on User Satisfaction and will be calculated using Likert Scale.

3.2. Research and Population Sample

This study concentrates on a particular set of individuals, consisting of 31 students who displayed interest and raised inquiries in the Instagram message box. These individuals are either prospective students or possess a strong interest in pursuing their education at the Polytechnic University of Hauts-de-France, primarily through programs like the IISMA (Indonesian International Student Mobility Awards) scholarship or other scholarship programs, and have explored the IUT website. Due to the limited size of the population, all members were included as the sample, and a census sampling technique was employed.

3.3. Likert Scale

Indicators of WebQual 4.0 will be measured using the Likert Scale, which is employed to gauge individuals' or groups' perceptions regarding a specific question or statement, in accordance with the operational definition established by the researcher. To quantify the data, each gradation needs to be assigned a score. Scoring for each gradation on the Likert scale ranges from 5 for Strongly Agree (SA) to 1 for Strongly Disagree (SD). The scale gradations are as follows in Table 1:

Table 1. Likert Scale Gradations

Scale	Criteria	Score
1	Strongly Agree (SA)	5
2	Agree (A)	4
3	Neutral (N)	3
4	Disagree (D)	2
5	Strongly Disagree (SD)	1

Source: Rerung (2020)

Following the collection of respondent answers, the interpretation of Likert Scale results is conducted to find values in percentages (Index %). The resulting percentage index is then subjected to interval analysis to establish quality criteria. The criteria based on intervals based on Rerung (2020) can be observed in Table 2:

Table 2. Quality Criteria

Scale	Criteria
5	Very Good
4	Good
3	Fair Enough
2	Not Good
1	Bad

Source: Rerung (2020)

In addition, in the form of criteria, the data which has been collected will be analyzed using qualitative approach, descriptive and deep learning. It is intended to describe in more detail the shortcomings of the website on each dimension and measurement indicators. Thus, the expected results of this study can provide material for consideration or input to those who manage bachelorinternational.com website (Rerung et al., 2020).

During the later phases of the research procedure, the implementation of validity and reliability assessments played a crucial role in confirming the strength and credibility of the data and measurements employed (Sugiyono (2019); Arikunto (2010). These assessments were pivotal in validating the precision and coherence of the research results, guaranteeing that the deductions made from the gathered data were reliable and trustworthy.

4. RESULTS AND DISCUSSION

4.1. Research Results

4.1.1. Validity Test

Validity testing was carried out using computer assistance with the SPSS Statistics 25 program, focusing on 31 respondents in this study. The results of the validity testing for the statement indicators related to the Usability Quality, Information Quality, Service Interaction Quality and User Satisfaction for the bachelorinternational.com website are detailed in the following table 3:

Table 3. Validity Test Result

Question	R Values	R Table	Criteria
Usability Quality			
Q1	0.795	0.355	Valid
Q2	0.805	0.355	Valid
Q3	0.902	0.355	Valid
Q4	0.527	0.355	Valid
Q5	0.802	0.355	Valid
Q6	0.713	0.355	Valid
Q7	0.623	0.355	Valid
Q8	0.747	0.355	Valid
Information Quality			
Q9	0.853	0.355	Valid
Q10	0.505	0.355	Valid
Q11	0.717	0.355	Valid
Q12	0.859	0.355	Valid
Q13	0.747	0.355	Valid
Q14	0.808	0.355	Valid
Q15	0.665	0.355	Valid
Service Quality			
Q16	0.655	0.355	Valid
Q17	0.793	0.355	Valid

Q18	0.817	0.355	Valid
Q19	0.496	0.355	Valid
Q20	0.809	0.355	Valid
User Satisfaction			
Q21	0.810	0.355	Valid
Q22	0.799	0.355	Valid
Q23	0.898	0.355	Valid
Q24	0.921	0.355	Valid
Q25	0.921	0.355	Valid

Source: Processed Data (2023)

Based on the validity testing results presented in Table 2 for the statement indicators related to Usability Quality, Information Quality, Service Interaction Quality, and User Satisfaction, it is evident that all Pearson correlation coefficients (r values) exceed the threshold of 0.355 (r table value). This leads to the conclusion that the validity testing results affirm the validity of the indicators.

4.2. Reliability Test

Table 4. Reliability Test

No	Variable	Cronbach's Alpha	Criteria
1	Usability Quality	0.919	Reliable
2	Information Quality	0.882	Reliable
3	Service Interaction Quality	0.859	Reliable
4	User Satisfaction	0.770	Reliable

Source: Processed Data (2023)

Likewise, the outcomes of the reliability testing for all statement indicators within each variable can be deemed reliable since they exhibit Cronbach's alpha values exceeding 0.6. With both validity and reliability established for the variables, namely Usability Quality, Information Quality, Service Quality, and User Satisfaction.

4.3. WebQual 4.0 Assessing

The assessment of website quality involves three variables: Usability Quality (X1), Information Quality (X2), and Service Interaction Quality (X3). Meanwhile, User

Satisfaction is measured through the variable named User Satisfaction (Y). Interval data is derived from Likert scale computations.

The website bachelorinternational.com serves as the primary source of information, specifically targeting students interested in applying, particularly for the IISMA 2022 program. Therefore, a quality assessment of the website is conducted to determine the extent to which its services align with user expectations. For the measurement of the bachelorinternational.com website's quality, the WebQual 4.0 method will be employed. This method focuses on the dimensions of Usability Quality, Information Quality, Service Interaction Quality, and User Satisfaction. The research involves observations and the distribution of questionnaires to students interested in enrolling in IUT Bachelor International through the IISMA 2022 program. There are a total of 31 respondents. Specifically, there are 17 respondents from current education in Vocational School and 14 respondents from current education in Bachelor's Degree.

In order to conduct the WebQual 4.0 assessment, the basic steps involve calculating each indicators and whether they fit into a category that also need to be calculated. The step-by-step process to derive the interpretation results of each WebQual 4.0 indicator is as follows based on Rerung (2020):

a. Calculating the Interpretation Score (IS) for each indicator:

SMax: SA x Respondent
SMin: SD x Respondent

The total score for the “Strongly Agree (SA)” rating is 5, and the total score for the “Strongly Disagree (SD)” rating is 1. Therefore: SMax: 5 x 31 = 155, SMin: 1 x 31 = 31. Meanwhile, to calculate IS, the IS formula will yield an index in the form of a percentage (%), which is: Total / Smax = Index %.

b. Determine the intervals and criteria for each indicator in the form of percentages:

Interval: 100 / number of scales (Likert)
Interval: 100 / 5 = 20

Therefore, the criteria based on intervals range from 0% to 100%, determining from Very Good (VG) to Bad (B), as outlined in Table 6:

Table 6. Interval and Criteria

Interval	Criteria
0% - 20%	Bad
20.1% - 40%	Not Good
40.01% - 60%	Fair Enough
60.01% - 80%	Good

Interval	Criteria
80.01% - 100%	Very Good

Source: Processed Data (2023)

The list of the questionnaire aligns with the WebQual 4.0 dimensions and guidelines which has been customized based on the study be found in the provided Table 7:

Table 7. WebQual 4.0 Dimensions

Usability Quality	
Q1	Understanding how to use the website is not complicated
Q2	The information given in the website is clear and easy to understand
Q3	It is easy to access each pages of the website
Q4	I feel easy to use the website
Q5	The website has an attractive appearance
Q6	The website looks convincing and competent
Q7	The website conveys a trustworthy image of university
Q8	It is not difficult for user to visit the website
Information Quality	
Q9	The information on is in accordance with the existing reality
Q10	The information is backed by reputable sources or factually correct
Q11	The information on the website is up-tp-date to current situation
Q12	The information on the website is relevant accordance to the university program
Q13	The website makes me understand the information given easily
Q14	The design effectively arranges all the information
Q15	The overall information is arranged aesthetically pleasing
Service Interaction Quality	
Q16	The website has a good reputation
Q17	The website gives a sense of security to personal information

Q18	The website provide space for personalizations (creating account, preferences settings, targeted advertisement)
Q19	The website provides contact to connect with the university easily
Q20	The website assured that the program received as promised
User Satisfaction	
Q21	I like to look of the website
Q22	I like the service on the website
Q23	I did not wait long to access the website
Q24	The information provided by the website is very useful for me
Q25	The website can be accessed with gadget

Source: Rerung (2020)

Meanwhile the results of the calculation can be found in the Table 8 below:

Table 8. Respondent Data Calculation

Indic-ator	Respondent					Resp.	Score					Total
	SA	A	N	D	SD		SA.5	A.4	N.3	D.2	SD.1	
Q1	13	15	2	1	0	31	65	68	6	2	0	141
Q2	15	11	2	3	0	31	56	56	6	6	0	138
Q3	10	18	0	2	1	31	80	80	0	4	1	135
Q4	13	14	3	1	0	31	60	60	12	2	0	139
Q5	15	12	2	1	1	31	75	52	9	2	1	139
Q6	7	22	1	1	0	31	40	92	3	2	0	137
Q7	10	17	4	0	0	31	50	76	12	0	0	138
Q8	9	17	3	1	1	31	40	72	15	2	1	130
Q9	8	20	2	0	1	31	40	80	6	0	1	131
Q10	9	15	7	0	0	31	45	60	21	0	0	131
Q11	7	15	5	3	1	31	35	60	15	6	1	122
Q12	10	17	3	0	1	31	50	68	9	0	1	137
Q13	15	13	1	1	1	31	75	52	3	2	1	136
Q14	13	13	4	0	1	31	65	52	12	0	1	143

Indic-ator	Respondent					Resp.	Score					Total
	SA	A	N	D	SD		SA.5	A.4	N.3	D.2	SD.1	
Q15	15	14	0	2	0	31	75	56	0	4	0	135
Q16	9	9	12	1	0	31	45	36	36	2	0	122
Q17	11	13	6	1	0	31	55	52	18	2	0	126
Q18	8	8	12	3	0	31	40	32	36	6	0	119
Q19	12	17	2	0	0	31	60	68	6	0	0	138
Q20	10	13	7	0	1	31	50	52	21	0	1	128
Q21	9	9	12	1	0	31	45	3	36	2	0	119
Q22	11	13	6	1	0	31	55	52	18	2	0	127
Q23	8	8	12	3	0	31	40	32	36	6	0	114
Q24	12	17	2	0	0	31	60	68	6	0	0	134
Q25	10	13	7	0	1	31	50	52	21	0	1	124

Source: Processed Data (2023)

After evaluating the indicators and total scores provided by the respondents, the subsequent procedure involves Interpretation Score (IS). For instance, in the case of indicator Q1 with a total score of 141, the calculation follows the formula: IS = Total / Smax = 141 / 155 = 90.96%. Consequently, the interpretation for indicator Q1, addressing the simplicity of understanding how to use the website, results in a score of 90.96%, categorized as Very Good. The comprehensive outcomes are detailed in Table 9:

Table 9. WebQual 4.0 Data Calculation

Indicators	Total Score	IS%	Criteria
Usability Quality			
Understanding how to use the website is not complicated	141	90.96%	Very Good
The information given in the website is clear and easy to understand	138	89.03%	Very Good
It is easy to access each pages of the website	135	87.09%	Very Good
I feel easy to use the website	139	89.67%	Very Good
The website has an attractive appearance	139	89.67%	Very Good

The website looks convincing and competent	137	88.38%	Very Good
The website conveys a trustworthy image of university	138	89.03%	Very Good
It is not difficult for user to visit the website	130	83.87%	Very Good
Information Quality			
The information on is in accordance with the existing reality	131	84.51%	Very Good
The information is backed by reputable sources or factually correct	131	84.51%	Very Good
The information on the website is up-tp-date to current situation	122	78.70%	Good
The information on the website is relevant accordance to the university program	137	88.38%	Very Good
The website makes me understand the information given easily	136	87.74%	Very Good
The design effectively arranges all the information	143	92.25%	Very Good
The overall information is arranged aesthetically pleasing	135	87.09%	Very Good
Service Interaction Quality			
The website has a good reputation	122	78.70%	Good
The website gives a sense of security to personal information	126	81.29%	Very Good
The website provide space for personalizations (creating account, preferences settings, targeted advertisement)	119	76.77%	Good
The website provides contact to connect with the university easily	138	89.03%	Very Good
The website assured that the program received as promised	128	82.58%	Very Good
User Satisfaction			
I like to look of the website	119	76.77%	Good
I like the service on the website	127	81.93%	Very Good

I did not wait long to access the website	114	73.54%	Good
The information provided by the website is very useful for me	134	86.45%	Very Good
The website can be accessed with gadget	124	80%	Good

Source: Processed Data (2023)

Using the indicator scores, it is observed that the average total score from Q01 to Q25 is 131.32. For more detailed information on the total scores, refer to Tables 7 and 8, as presented below:

a. The indicator with the highest score *"The design effectively arranges all the information."* One of the Information Quality dimension. This indicator obtained a score of 143 with a score interpretation of 92.25%, categorizing it as *Very Good*. On the other hand, the indicator with the lowest score, *"I did not wait long to access the website,"* which contained in User Satisfaction dimension, received a score of 114 with a score interpretation of 73.54%, falling into the *Good* category.
b. The Usability Quality dimension exhibits the most dominant high score with the highest average score of 137.1, while the Service Interaction Quality dimension has the least dominant high score, indicated by the lowest average score of 126.6

In general, users of the bachelorinternational.com website express satisfaction after accessing the site, as indicated by an average score of 123.6 with the IS% score 79.,35% which can be categorized as good category.

4.4. Discussion

Usability involves enhancing a system, product, or service to enable users to accomplish their objectives with effectiveness, efficiency, and satisfaction (Windarto, 2016). It encompasses how users experience interacting with a website, including aspects such as ease of navigation and alignment of design with the website's purpose. Usability is also associated with design principles such as framing and structuring the website, which are the responsibilities of the website designer aimed at improving usability. (Roche et al., 2013). In this study, Usability Quality received the highest and filled with dominant high score, resulting in User Satisfaction, with all indicators rated as *Very Good*. Which also means that it has a positive influence to User Satisfaction. This finding is supported by both theoretical frameworks and the results of the study itself. Additionally, previous research by Kincl & Štrach (2012) and Sørum et al. (2012) has also highlighted that Usability Quality contributes to enhance User Satisfaction.

Meanwhile, Information Quality, one of the indicators in this study, received the highest score among all the indicators related to the website and was categorized as *"Very Good."* This aligns with findings from previous studies as well. This can be seen on the perspective of Wikrama et al. (2017) that highlighting the importance of increasing the Information Quality could lead to the increase of User Satisfaction. Therefore, we know that Information Quality, as stated by Park and Kim cited in Anggreini (2016),

Information Quality refers to the customer's perception of the quality of the product or service information provided by a website. Barnes (2000) further defines information quality as the quality of the content or information presented on the website, which includes its accuracy, format, relevance, and alignment with the user's goals. This is why it can be concluded that with the accuracy of the Information Quality, it more likely to influence the user of the website.

In broad terms, interactions, as outlined in Hasnawiyah (2016), occur when an individual's actions prompt responses from others. Barnes (2000) defines interaction quality as the experience customers have when exploring a website in more depth, marked by trust and empathy. This encompasses elements like transaction security, reliable information, prompt product delivery, and communication among visitors or with website administrators. Despite Service Interaction Quality receiving the lowest dominant high score among all dimensions in this study, it can still be classified as *Good*. This aligns with the explanation provided by Wirtz (2017), which suggests a positive correlation between interaction quality in service settings and the outcomes of services, directly or indirectly contributing to building satisfaction after gaining some trust. This theory corroborated by the perspective of Wikrama et al. (2017), who also asserted that enchancing Interaction Quality leads to increased User Satisfaction. This underscores the significance of the quality of website interaction in influencing overall user satisfaction.

5. CONCLUSION

In conclusion, the study highlights the critical importance of Usability Quality, Information Quality, and Service Interaction Quality in determining User Satisfaction with a website. Usability Quality plays a pivotal role in enabling users to achieve their objectives effectively, efficiently, and with satisfaction. Similarly, Information Quality emerged as a crucial factor influencing User Satisfaction, emphasizing the importance of accurate and relevant content. Additionally, Service Interaction Quality, despite receiving a lower score in this study, remains significant in fostering trust and empathy among users. Enhancing these qualities can lead to increased User Satisfaction, underscoring the importance of website interaction quality in overall user experience. Thus, prioritizing Usability, Information, and Service Interaction Quality is essential for website developers and designers to ensure positive user experiences and ultimately enhance User Satisfaction.

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