

## Research Article

# Analysis of the Usefulness of the Public Works and Spatial Planning Office Website Using the Webuse Method and Heuristic Evaluation

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**Abstract:** In this modern era, the existence and usefulness of websites have become an undeniable necessity. The internet has set the stage for websites to become a vital tool in various aspects of life, not only as a means of disseminating information but also as a platform for improving efficiency and economic growth. However, various problems often occur to website users, the lack of notification or feedback after users act. And the lack of information updates. For example on the Website of the Public Works and Spatial Planning Office of West Lombok Regency web. This website still does not use two-way communication commonly called two-way communication, so some problems might arise such as a lack of ability to receive direct feedback from users, and website owners lose the opportunity to understand user needs. To overcome the above problems, the author conducted website usability research using the Heuristic Evaluation Method and the Webuse Method. To improve website usability regarding information services for users. And with the results of the PUPR Office website has shortcomings in providing information updates in the form of announcements and various other information. and the lack of an attractive appearance on the website menu. Therefore, researchers provide recommendations for improvement in providing information to users of the website of the Public Works and Spatial Planning Office of West Lombok Regency.

**Keywords:** website; heuristic evaluation; webuse; information system for public services; information system for spatial planning

## 1.Introduction

In this modern era, the existence and usefulness of websites has become an undeniable necessity. The Internet, as a land of information and interaction, sets the stage for websites to become a vital tool in various aspects of life[1]. By providing fast and global access, websites are not only a means of information dissemination, but also a platform for idea exchange, efficiency improvement, and economic growth.[2] Websites act as an unlimited source of information. Modern society can easily access data, the latest news, research, and various other information with just a few clicks.[3] This provides convenience and speed in gaining knowledge, allowing individuals to stay informed in real time.[4] Thus, it can be concluded that websites not only fulfill the needs of information, communication, and business but also become a driver of positive transformation in various aspects of life. The existence of websites is a milestone in building a digitally connected and competitive society in this modern era.[5] By conducting website usability research, it can help in building a positive image by providing an efficient and satisfying experience to users.[6] In addition, website owners can ensure that their website meets user needs, creates positive relationships, and contributes to their business goals. This is an important step in ensuring online sustainability and success. [7]

However, various problems often occur to website users, the lack of news or feedback after users take an action. For example on the website of the Public Works and Spatial Planning Office of West Lombok Regency (<https://dputr.lombokbaratkab.go.id/>). This website still does not use two-way communication commonly called two-way communication. If there is no two-way communication on a website, several problems may arise such as a lack of ability to receive direct feedback from users, website owners lose the opportunity to understand user needs.

Moreover, the lack of trust, users may feel that the site is not responsive or does not pay attention to their needs, which can be detrimental to the site's reputation. [8] To overcome the above problems, the authors conducted a website usability study using the Heuristic Evaluation method and the Webuse Method. According to (Abulfaraj & Steele) heuristic evaluation The evaluation method for assessing system usability is an inspection-based approach that relies on a specific set of usability guidelines.[9] According to (I K Dewi, Y T Mursityo, & R M Pu-tri) a web-based usability evaluation questionnaire known as the Web Usability Evaluation Tool (WEBUSE) divides the usability categories in the WEBUSE method based on usability evaluation criteria, which include When evaluating a website, important factors to consider include the quality of its content, the organization and readability of the information, the effectiveness of its navigation and links, the design of its user interface, the performance of the site, and its overall effectiveness.[10].

## 2. Theory

### 2.1 The Heuristics Evaluation Method, discussed by several researchers

This research was conducted by Sumakmur Goenawan, Syaiful Rahman, and Renny with the title "Analysis of User Interface on Lpgo Website Using Heuristics Evaluation Method". In 2022, In summary, the LPGO website has a fairly good user interface, because 9 out of 10 aspects have a severity rating of 1, which indicates that there are minor but insignificant problems, while 1 out of 10 aspects has a severity rating of 2, which indicates that there are several potential problems that can cause problems for users, especially in the help and documentation sections. This research was conducted by Aisya Rizki Hasnanursanti, Buce Trias Hanggara, and Andi Reza Perdanakusuma, with the title "Usability Analysis of the Official Website of the Surakarta City Government Using the Heuristic Evaluation Method". In 2022. The results of the evaluation of the official website of the Solo DPRD using the heuristic evaluation method involving 4 expert evaluators in the field of user interface who identified 21 problems. Of the 21 problems found, there are 4 cosmetic problems, 3 minor problems, 3 major problems, and 11 usability catastrophe problems [12].

This research was conducted by Amalia Oktafina, Febiyanti Arifatul Jannah, Muchammad Fahur Rizky, Muhammad Verrel Ferly, Yansen Dharma Tangtobi, Sri Rahayu Natasia, with the title "Evaluation of Website Usability Using the Case Study Heuristic Evaluation Method: (Xyz City Public Works Website)". In 2021, the findings of this study include 17 problems and 17 recommendations for improvement in the form of prototypes made in response to the identification of difficulties that exist in the object of this research, although two principles are free from problems. The most problematic issue lies in the principles of flexibility and efficiency of use. There were 3 issues with a severity rating of 4, 4 issues with a severity rating of 3, 7 issues with a severity rating of 2, and 1 issue with a severity rating of 0.[13].

This research was conducted by Rasmila, M.Agil Kusumadya, Faiz Hidayat, Dicky Chandra, with the title "Analysis of the Farmer Code Website Using SUS (System Usability Scale)", in 2022. The results of data collection using the observation method that we have Based on our experience with the Kode Petani website, we can conclude that this website feels fast in terms of performance and responds well and without problems when moving from one page to the next page [14].

This research was conducted by ndah Hidayanti, Sri Rahayu, with the title "High School Website Usability Analysis" in 2022. Based on checking the performance of the website through software, it can be seen that the performance obtained is 75 performance, this means that from another point of view, this is satisfactory mobile performance, the

results achieved are only 29 Performance, which means that the performance is not good. [15].

This research was conducted by Alfriyanto Na-has, Hustinawati, with the title "Performance Analysis of the Information System of the House of Representatives of the Republic of Indonesia Based on Community Perceptions Using the Heuristics Evaluation Method", in 2023. The DPR RI information system at [dpr.go.id](http://dpr.go.id) is considered by the public to have met user expectations according to their perceptions of all usability factors. The website is excellent because the title of each page is very clear The content and appearance of the website pages are well harmonized, ensuring a consistent and cohesive experience overall, The website offers the option to display content in the user's preferred language, organizes menus and information effectively for easy recall, presents confirmation messages when errors occur, and includes a contact menu for visitor communication with website administrators. However, based on the heuristic analysis, the system shows shortcomings, especially in the sub-aspects of the heuristic [16].

This research was conducted by Besty Ghina, Hafiz Ma'ruf, Jhordy Wong, Dewi Agushinta R., and Metty Mustikasari, with the title "User Experience Analysis of the Gunadarma University Library Website with the Heuristic Evaluation Method", in 2019. The findings of the Heuristic Evaluation study usually show an evaluation of the UG Library website interface design, user-friendliness, and user understanding. However, these results do not match the expected results of the heuristic evaluation method. This was due to the inefficiency and lack of user comprehension in navigating the website dashboard, thus highlighting the need for significant improvements, particularly on features that enhance user accessibility." [17]

This research was conducted by Rifda Faticha Alfa Aziza, and Yahya Taufiq Hidayat, with the title "Analysis Usability Design User Interface on the Tokopedia Website Using the Heuristics Evaluation Method", in 2019. After analyzing and discussing the results, we can draw the following conclusions and suggestions. The Tokopedia website was evaluated using the Nielsen heuristic evaluation method, and it was found that 10 aspects studied received a score of 1 (one) which indicates a significant shortcoming. However, these deficiencies do not cause problems or inconvenience to users accessing the website. The highest severity rating was given to flexibility and efficiency of use. In the future, it is recommended to compare the findings of this study with other methods to obtain a more comprehensive measurement [18].

This research was conducted by Yemima Monica Geasela, Pranchis Ranting, and Johannes Fernandes Andry, with the title "User Interface Analysis of E-Learning Based Website with Heuristic Evaluation Method" Journal of Informatics, in 2019. After carefully analyzing the research findings discussed earlier, it can be concluded that the user interface design of the NetAcad e-learning website is quite commendable. This is mainly because the website design aligns with almost all of the 10 principles outlined in the heuristic evaluation theory." [19].

This research was conducted by Iunike Kartika Dewi, Yusi Tyroni Mursityo, and Rekyan Regasari Mardi Putri, with the title "Usability Analysis of Mobile Applications for Booking First Taxi Services Using Webuse and Heuristic Evaluation Methods", in 2018. Based on the results of the study, applications for drivers have a lower test success rate than applications for taxi customers. In addition, there is a difference of 0.03 (zero point zero three) usability points between the evaluation results of the driver application and the user application, which indicates that the usability of the driver program is still lower than the usability of the user.

## 2.2 Summary of results discussed by several researchers

After deeply analyzing the research findings and paying attention to the recommendations provided, based on the information presented, the following conclusions can be drawn:

1. The usability level of the user and taxi driver applications determined based on the WEBUSE test results can be characterized as "GOOD". However, it is important to note that there is a "MEDIUM" level identified in 2 variables in the driver application, indicating room for improvement. In addition, both

applications showed usability issues, thus highlighting the need for improvement to achieve a higher level of usability.

2. The taxi user app was subjected to a heuristic evaluation, which revealed instances of violations of the six heuristic principles. The most frequent problems identified were flexibility and efficiency of use, while violations of five heuristic principles were found in the driver app, with the most common problems identified being error prevention, design aesthetics, and minimalism. Therefore, improvements are needed to address these violations[20].

### 3. Method

#### 3.1 Literature Study

It is a research stage carried out to deepen knowledge of where to conduct literature studies using scientific journals, books, and articles related to the research being carried out, namely website usability analysis.

#### 3.2 Data Collection

Researchers collected data in 3 steps, including Observation by making observations by obtaining the necessary data, it is very important to proceed directly to the specified research location.

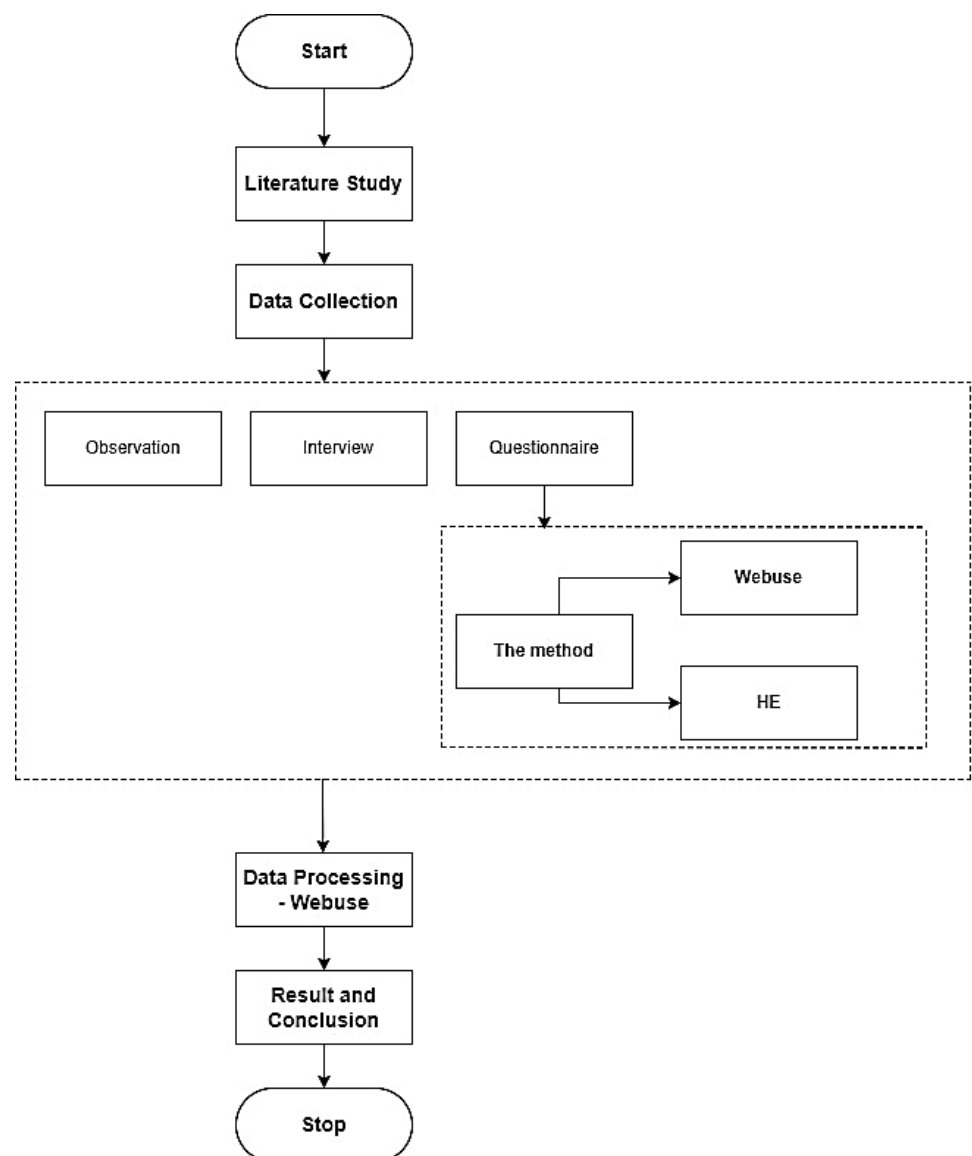


Figure 1. Research Flow

$$n = \frac{N}{1+N(e)^2} + \frac{400}{1+400(0.1)^2} \quad (1)$$

Interview: [1] Prepare questions following the research objectives. [2] Selecting sources that match the research criteria of the researcher. Moreover, the questionnaires are one way to get the data we need through written questions. Researchers combine two methods, the Heuristic Evaluation method and the Webuse method, and then researchers design questions that are clear and easy for respondents to understand. The population found at the PUPR Office is 400 potential respondents, to determine the minimum number of respondents using the Slovin formula.

$n$  = Represents the sample size,  $N$  = Indicates the population size,  $E$  = The remaining percentage of allowance for sampling accuracy that can be tolerated;  $e = 0.1$ , Then the researchers processed the data using the mathematical formula from the webuse method to get the results of the usability analysis of the PUPR service website. After the researcher collects and processes the data, the researcher writes down the results and conclusions obtained from the processing. Moreover, The data processing formula uses the WEBUSE method. Table 1. Merit for each question in the category In Table 1, the value for each merit is explained, namely, merit 1.00 is strongly agreed, merit 0.75 is Agree, merit 0.50 is undecided, merit 0.25 is disagree and 0.00 is strongly disagree.

**Table 1.** The Merit Formula

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1,00	0,75	0,50	0,25	0,00

**Table 2.** Point Usability

$0.8 \leq X \leq 1,0$	Perfect
$0.6 \leq X \leq 0,8$	Good
$0.4 \leq X \leq 0,6$	Medium
$0.2 \leq X \leq 0,4$	Bad
$0. \leq X \leq 0,2$	Very Bad

Usability Point & Corresponding Usability Level. Table 2 above explains the usability points and levels where point  $0, \leq x \leq 0.2$ , the usability level is "Very bad", while pointing  $0.22 \leq x \leq 0.4$  the usability level is "Bad", point  $0.4 \leq x \leq 0.6$  the usability level is "Medium", then point  $0.6 \leq x \leq 0.8$  the usability level is "Good", and point  $0.8 \leq x \leq 1.0$  the usability level is "Perfect" [21].

$$x = \frac{[\sum a]}{b} \quad (2)$$

Description:  $x$ : Usability points in each category,  $a$ : Assign a value to each question, and  $b$ : Number of questions for usability points.

#### 4 Result and Discussion

The author presents the results of data processing in this chapter and makes conclusions based on the findings of the research conducted. In addition, the researcher offers recommendations for additional studies and for those who create websites. A table of variables and the level of usability achieved is shown in Table 3.

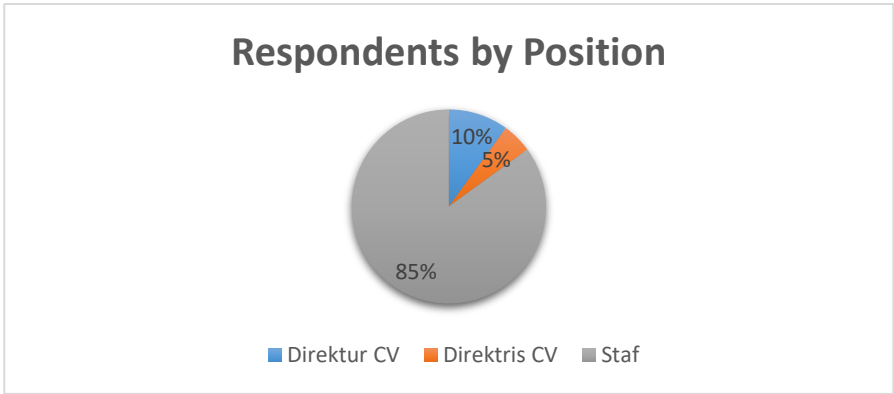


Figure 2. Respondents by Position

In Figure 2, we can see an overview of the characteristics of respondents based on position, where these respondents are employees and also vendors who work with the PUPR office. For PUPR Office Staff, there are 17 people with a presentation of 85% and for CV Directors, there are 2 people with a percentage of 10% and for CV Directors, there are 1 person with a percentage of 5% with a total of 20 respondents.

Table 3. Point Usability

Category	Category Code	Point Usability	Level Usability
Content organization readability	Cor1	0,26	Bad
	Cor2	0,30	Bad
	Cor3	0,40	Medium
	Cor4	0,43	Medium
Navigation Link	NI1	0,42	Medium
	NI2	0,37	Bad
	NI3	0,42	Medium
Desain user interface	Dui1	0,35	Bad
	Dui2	0,42	Medium
	Dui3	0,37	Bad
Performance and Effectivity	P&E1	0,43	Medium
	P&E2	0,36	Bad
	P&E3	0,45	Medium
	P&E4	0,31	Bad
	P&E5	0,33	Bad
	P&E6	0,35	Bad
Visibility of System	Vos1	0,35	Bad
	Vos2	0,36	Bad
	Vos3	0,35	Bad
	Vos4	0,36	Bad
Match between the system and the real world	Mbs&Trw1	0,21	Bad
	Mbs&Trw2	0,35	Bad

Category	Category Code	Point Usability	Level Usability
User control and freedom	Uc&F	0,42	Medium
Consistency and standards		0,41	Medium
Error Prevention		0,37	Bad
Recognition rather than recall		0,37	Bad
Flexibility and efficiency of use		0,33	Bad
Aesthetic and minimalist design		0,23	Bad
Help users recognize diagnose and recover from errors		0,38	Bad
Help and Documentation	H&D1	0,35	Bad
	H&D2	0,36	Bad

Based on Table 3, questions for each category code have points between  $0.2 \leq x \leq 0.4$  and  $0.4 \leq x \leq 0.6$  where the level for all questions in the category is getting the usability level "Poor" and "Medium" with the number of respondents reaching 20 respondents in various users distributed including PUPR Office employees and also users who work with the Public Works and Spatial Planning Office of West Lombok district, such as several CVs in West Lombok district and Mataram city.

**Table 4.** Point Usability

Category	Point Usability	Level Usability
Content organization readability	0,34	Bad
Navigation Link	0,40	Medium
Desain user interface	0,38	Bad
Performance and Effectivity	0,35	Bad
Visibility of System	0,35	Bad
Match between the system and the real world	0,28	Bad
User control and freedom	0,42	Medium
Consistency and standards	0,41	Medium
Error Prevention	0,37	Bad
Recognition rather than recall	0,37	Bad
Flexibility and efficiency of use	0,33	Bad
Aesthetic and minimalist design	0,23	Bad
Help users recognize diagnose and recover from errors	0,38	Bad
Help and Documentation	0,35	Bad

It can be seen from Table 4 that to get these categories, researchers combine two methods, the webuse method, and the heuristic evaluation method. As obtained from the webuse method, the Content, Organization, and Readability category gets a point of 0.34 with a usability level of "Poor". The Navigation and Links Category gets a point of 0.40 with a usability level of "Medium" and the User Interface Design Category with the Performance and Effectiveness Category gets a point that is not much different, namely 0.38 and 0.35 with a usability level of "Poor". Furthermore, the Heuristic Evaluation method has the Visibility of the System and Matches between the system and the real-world categories getting points 0.35 and 0.28 with a usability level of "Poor", User control and freedom and Consistency and standards categories get points 0.42 and 0.41 with the same usability level of "Medium", Then for the Error Prevention Category, Recognition rather than recall, Flexibility and efficiency of use, Aesthetic and minimalist, Help users recognize diagnose and recover from errors, and the Help and Documentation Category get points between  $0.2 \leq x \leq 0.4$  with a usability level of "Poor".

**Table 5.** Level usability website

Point Usability Website	Level Usability Website
0,35	Bad

In Table 5, it can be seen that the most points are  $0.2 \leq x \leq 0.4$  with an average of getting points  $<0.35$  to  $<0.40$  so it can be concluded that the website of the Public Works and Spatial Planning Office gets a usability level of "not good (Bad)".

## 5 Conclusions

In Table 3, it can be seen that the highest point is in the range of 0.35 with a usability level of "Poor" Then in the Navigation and Links category, User Control and Freedom and Consistency and standards get the highest points of 0.40 0.42 and 0.41 with a usability level of "Medium". Furthermore, the lowest points are obtained in the Content, Organization, and Readability, Match between the system and the real world, and Aesthetic and minimalist categories getting points 0.34 0.28, and 0.23. So it can be concluded that the PUPR Office website has shortcomings in providing information updates in the form of announcements and various other information. and the lack of an attractive appearance on the website menu. So, researchers provide recommendations for improvement in providing information to users of the website of the Public Works and Spatial Planning Office of West Lombok Regency.

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**Author contributions:** All authors are responsible for building Conceptualization, Methodology, analysis, investigation, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision of project administration, funding acquisition, and have read and agreed to the published version of the manuscript.

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