

THE ASSESSMENT OF USABILITY OF SOCIAL MEDIA SITES: A HEURISTIC EVALUATION

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ABSTRACT

One of the success factors of a website is the quality/level of usability. In user-centered design, a high level of usability is required to create harmony when users interact with the product. The purpose of this research is to evaluate and develop the potential usability interface of a social media site using the heuristic evaluation method. The study's results found that there were 33 problems and 33 recommendations for user interface improvements. Other results show that the most significant usability problem lies in the 'User Control and Freedom' area, with the lowest severity rating, 3.20, compared to the overall average severity rating, which is 3.47. On the other hand, the 'Match Between System and the Real World' variable gets the highest severity rating with a value of 3.58. The findings in this study are applied to improve the usability and user experience of a website and as a reference for supporting effective interface designs in the future.

Keywords: *Heuristic evaluation, Severity rating, Usability, User experience, User interface*

1. INTRODUCTION

The development of digital technology in recent years has been very rapid and affects many activities today. The presence of technology undeniably provides many opportunities for business people and positive benefits for the general public. The main goal of technological development is to increase the effectiveness, efficiency, and productivity of the company or each individual. One thing that has become habitual in the application of technology is the use of the internet. The internet helps daily activities by making communicating (receiving and sending information) between people more accessible. Due to its flexibility and use for various purposes, all circles can reach the internet.

Internet usage and access have continued to increase in recent years. Based on the latest research from Hootsuite and We Are Social, internet users globally reached 4.95 billion out of a total population of 7.91 billion people in 2022. Meanwhile, the number of active social media users in the world reached 4.62 billion [1]. The high number of active social media users is an opportunity for business people, especially the social media platform itself. In an era where communication is done quickly and instantly, social media has a significant influence on it.

The online business model of developing a web-based social media platform system certainly has experienced a lot of good development, and some have yet to develop or even end up being closed. A website can fall into the category of successful if the level of usability of the website meets the criteria in a certain way. In the development of social media websites, one factor determining whether the website is worthy or unfit for users is the quality/level of usability (comfort and convenience) [2]. Therefore, social media sites & platforms need to evaluate and assess the usability of their digital products, which aims to improve aspects of user experience. From the perspective of user-centered design, studies to obtain a high level of usability are needed to create harmony when users interact with the product [3].

Based on data from Statista revealed that in the 2nd quarter of 2022, 58.99% of all internet traffic worldwide came from mobile devices [4]. Although many users access the website using mobile devices, there are still many users in several countries where the majority still access websites using desktops, such as the United States. Being the third most populous country in the world in 2022 [5], 50.22% of total web visits in the United States came from desktops, compared to 40.78% from mobile as of November 2022 [6]. Just as important as websites on desktop and mobile, social media

website business people also need to continue to evaluate and improve the usability of their websites, including Instagram.

As an illustration, Silva, T. A. S., Barbosa, G. A. R., Silva, I. S., & Coutinho, F. R. S. conducted a study in 2018 that aimed to understand how the interface and interaction of one of Instagram's features, Instagram Stories supports and limits socialization among its users [7]. With the evaluation of Human-Computer Interaction (HCI) experts, it was found that Instagram's ephemerality proposal violated several User Experience & sociability guidelines that caused potential problems when users interacted with the feature. The study results inform that the Instagram Stories feature can still be improved in terms of interface and interaction model to support the sociability of its members.

Based on research by Hootsuite and We Are Social in 2022 [8], the most used social media in the world is Facebook, with 2.91 billion active users, followed by YouTube (2.562 billion), WhatsApp (2 billion), and Instagram in fourth place with 1.478 billion active users. Nevertheless, in recent years, TikTok's new social media has experienced high-speed growth in popularity. TikTok also entered the top 10 most used social platforms with a figure of 1 billion active users. In addition, Semrush produces data on the most visited websites by traffic globally [9]. In January 2023, Instagram was in the 6th position of the most visited websites, totaling 5,602,372,440 visits. Google leads the first position with 102,240,533,524 visits, then the second position is followed by YouTube with 86,866,891,068 visits, and the third position is Facebook with 12,702,191,083 visits. While Twitter is in 4th place with a total of 8,902,150,430 visits, and Wikipedia is in 5th place with a total of 7,722,191,738 visits. To win the global market, every social platform must continue innovating and evaluating all aspects, including the website's usability.

From existing phenomena, such as some users who still use desktops to access the internet, social media platforms should also pay attention to the user experience on the entire website. Previous research found several problems with the Instagram Story feature in the Instagram application. The results of this research are also felt by users of the web version of Instagram because the user interface is similar to the Instagram Story feature. However, there are several different interfaces between applications and websites because they adapt to different devices and users. If a usability problem is

found in the Instagram application, what about the web version? The user is the end-user of Instagram. If users don't get a good experience on a website, there is a possibility that the user will leave the website. This is avoided by business people who have websites. This is reflected in the number of visitors to the Instagram website, which is under Twitter in January 2023, even though Instagram has more active users than its competitor, Twitter.

Based on the background of the existing problems, the formulation of the problem used as a reference for this study is how to measure the usability level of the Instagram website using a heuristic evaluation. In addition, the research also looks for any problems that exist in the user interface and impact the user experience of users on the web version of Instagram. The usability problems found will later be used as a reference to answer what improvements are recommended to improve the user experience.

The research scope is limited by focusing on Instagram users in Indonesia because Indonesia is the country with the fourth most active Instagram users in the world, with around 99,150,000 people. India, the United States, and Brazil are in the first place (230,250,000 users), second (159,750,000 users), and third (119,450,000 users) [10]. Conducting research in Indonesia not only makes it easier for researchers to get feedback, but these conditions are sufficient to describe active Instagram users as a whole. This research is also limited by measuring the usability of Instagram for the web version only due to the lack of previous research that specifically addresses the web version of Instagram.

Several methods can be used to evaluate a user interface and user experience, one of which is Heuristic Evaluation (HE). The purpose of the Heuristic evaluation is to help identify problems with the usability of a social media platform website [11]. It can be used to determine how well users use a social media site to achieve specific goals such as being easy to learn, efficient to use, not prone to errors, and user satisfaction [12]. The points mentioned earlier lead to user experience, the experience that users feel when using a social media website product. A good user experience brings many benefits, such as a positive brand image and encouraging customer loyalty, to winning a business competition.

This paper intends to explore and develop the potential usability interface of a social media website using Heuristic Evaluation based on the ten

principles of Jacob Nielsen [13]. Those ten principles will take center stage on a particular issue and help find their relation to the influence of the overall user experience. Using heuristics is an effective way to solve problems quickly and make accurate judgments [14]. Because the object of study is too broad, data collection is limited to Instagram social media.

2. LITERATURE REVIEW

2.1 Social Networking Website

A website is a collection of interrelated site pages located on a domain or subdomain on the internet. As one of the information media, a website is a component consisting of text, images, and animated sounds arranged so that it can be visited, read, and utilized by internet users worldwide. A website page is written in HTML (HyperText Markup Language) format and is a collection of hyperlinks that link from one address to another. Links to pages from the website provide access via a URL. URLs organize the pages into a hierarchy that explains the overall arrangement and workings of the information flow for users or readers [15].

Quoted from the book entitled "Komunikasi Anak Muda dan Perubahan Sosial" explains [16] that social media is an online-based media that is used as a supporting tool to establish intense relationships between individuals. Various groups in the form of social media such as Facebook, Twitter, Instagram, WhatsApp, YouTube, and others use the use of web-based technology. Not only can social media communicate in one direction, but social media is also now experiencing a two-way communication change through interactive dialogue. Users of this technology get many conveniences when interacting and sharing messages in the form of social networks, blogs, forums, online encyclopedias, to virtual worlds. The book argues that social media is an internet technology that can shape communication patterns and information dissemination from one party to many.

Referring to the above exposure, social media is a web-based online technology that can connect each individual without the limitations of time and space. Social networking websites provide information through text, images, and sound that are arranged so that users can communicate in two directions (interactively) [17]. To facilitate the use of social media, the usability and appearance of a website are one of the main factors that provide

user comfort when forming communication patterns. Therefore, the evaluation phase of the website is crucial to run to ensure that users can find and disseminate information as appropriate without any barriers to interaction between the user and the system [18].

2.2 Heuristic Evaluation

Usability has been known for quite a long time as the primary key determining the success of interaction with a system or product. System/product quality is a characteristic of usability. Usability also has a sub-characteristic consisting of 6 formulations described in table 1 [19].

Table 1: Usability Sub Characteristics Formulations

No	Sub Characteristics	Description
1.	Appropriate	Measure the ability of users to be able to recognize a system or product according to their needs.
2.	Learnability	Measure the ability of specified users to be able to learn to use a system or product and achieve their goals effectively and efficiently, and freedom from risk and user satisfaction.
3.	Operability	Measures the ability of users to be able to operate and control a system or product easily.
4.	User Error Protection	Measure the ability of a system or product to protect users from making errors on the system.
5.	User Interface Aesthetics	Measuring the ability of the user interface that can provide pleasing design and interaction satisfaction to the user.
6.	Accessibility	Measuring the ability of a system or product to be used by people from different walks of life and different characteristics.

One way to evaluate interface design is to conduct a Heuristic Evaluation (HE) [20]. HE is a usability inspection to effectively improve and improve a design using a simple set of interconnected heuristics [21]. The process of Heuristic Evaluation makes it fast and easy for evaluators to evaluate and thoroughly assess the system from each heuristic point that will indicate usability problems [22]. In addition, evaluators often use HE because it is a fast, inexpensive, and effective method of identifying a usability problem.

At first, Molich and Nielsen proposed nine usability heuristics [23], namely:

1. Simple and natural dialogue
2. Speak the user’s language
3. Minimize the user memory load
4. Be consistent
5. Provide Feedback
6. Provide clearly marked exits
7. Provide shortcuts
8. Good Error Message
9. Prevent Errors

Nine usability heuristics was a collaboration between Rolf Molich and Nielsen in 1990. However, after four years (1994), Nielsen conducted a factor analysis of 249 usability issues and refined the heuristic sequence [24]. In the end, the revised heuristic series increases to 10 points, whose content is more fully explained in the evaluation [25][26][27][28].

Table 2: 10 Nielsen’s Usability Heuristic

No	Heuristic	Definition
1.	Visibility of System Status	The interface on the system must always provide information (feedback) to the user about the condition of a process or what is happening through a good message and in an appropriate period of time. In digital design, the information or visual feedback provided can take the form of color changes or notifications of the progress status of the activity.
2.	Match Between System and the Real World	The system uses language, words, phrases, sentences, and concepts that are commonly used (familiar) and easy to understand by users. This is to make it easier for users to understand the perception and meaning of the design of a system without having to search for illustration definitions and/or words in search engines.
3.	User Control and Freedom	When accessing system functions, users can freely choose, perform work, and control certain conditions as needed and can exit a condition if a misstep occurs.
4.	Consistency and	The consistency of the interface on the system and in accordance

	Standards	with the standards applied in terms of writing fonts, sentences, and so on so that users do not feel confused by different situations and actions on the system. This is because there are many pages on the system, and each page is interrelated, so it must have structured and systematic navigation in its presentation.
5.	Error Prevention	Designing a feature to prevent and minimize errors that users on the system may make. Whether a new user or an expert, there is a regularity of the structure of the boundaries of the actions of the interactions carried out governed by the user.
6.	Recognition Rather Than Recall	The interface components on the system are easily recognized, so it helps users to remember every process that has been passed or done because the system has clearly and standardly informed it. With clear action instructions, users do not have to spend more effort memorizing information from one page to another.
7.	Flexibility and Efficiency of Use	The system provides ease and use of the interface flexibly and efficiently so that new users or experienced users feel comfortable accessing the system.
8.	Aesthetic and Minimalist Design	The system's interface has aesthetics/beauty so that it does not interfere with the user when interacting with the system. In addition, the information or information displayed is only relevant (proportional) to the intention of the menu selected by the user.
9.	Help users recognize, diagnose and recover from errors	The system helps users to recognize and diagnose errors by displaying error messages that occur clearly so that users can correct or exit the error.
10.	Help and Documentation	The system provides a feature that provides a complete help menu and documentation as a guide for the user to help them use the system.

2.3 Related Works

Usability experts use heuristic evaluation to test usability in developing user-centric websites [29]. This method is utilized to prioritize usability

problems and is used as a basis for generating solutions. Previous researchers have used a lot of Heuristic Evaluation for various cases, such as e-commerce websites, e-learning, educational games, and others, as follows:

Geasela, Y. M., Ranting, P., & Andry, J. F. (2018). [30] conducted research in Indonesia to find many problems arising from e-learning websites. The evaluation process starts with planning, collecting data, then analyzing the net Acad website user interface using 10 principles of Heuristic Evaluation. From each principle, a screenshot of the page is given, and an assessment analysis is carried out to determine whether the components on the page have met each principle of heuristic evaluation or not. The research results show that the Net Acad e-learning website has almost fulfilled all 10 principles of HE theory, and its user interface design is classified as quite good. The disadvantages of the website are the lack of available language types, the lack of detailed explanations of the mistakes made by users, &c. Suggestions for improving interface design are also given to make it easier for users to run the website.

Aliyanto, A., Wijaya, A., & Sitompul, A. (2022). [31] conducted research in Indonesia to find problems and provide suggestions for some usability of the Shopee e-commerce website as the object of research. The research method used is to create a test scenario to be given to 100 respondents, and after the data is collected and finished processing, data analysis is carried out. By calculating the questionnaire evaluation results, it can be concluded that Shopee e-commerce still has much to improve in its services from various variables. The recommendations given include speeding up the feedback waiting process, clarifying the use of words, improving navigation buttons to make them more accessible, replacing symbols that are more familiar to users, and providing information tooltips.

M, B. A., Saputra, M. C., & Pinandito, A. (2016). [32] conducted research in Indonesia to conduct usability in order to find out the problems that exist on the official website of Universitas Brawijaya. The research used the PSSUQ research instrument to test user preferences on the UB website so that a comparison of the results of the analysis between HE and the user preference test can be carried out. From the results of the questionnaire to 400 respondents, it was found that there were 52 usability problems found by the evaluator (expert judgment). The problems of each heuristic are classified based on the priority repair

rate of high (major), low (minor), and those that do not require improvement.

Balaff, S. (2022). [33] conducted a study to identify UI severity rating usability from the official website of the Ministry of Agrarian Affairs and Spatial Planning in Indonesia. The research used quantitative assessment (questionnaire assessment) with a severity rating-based measurement scale and the usability testing method using the Usability Scale System (SUS) because it produced a more comprehensive and sharp evaluation value. From the results and discussion of the evaluation, the usability scale system of the government website received a score of 77.25, which has an excellent predicate. However, there are still problems that cause less user-friendly websites.

Viera, E. A. O., Silveira, A. C., & Martins, R. X. (2018). [34] conducted a study in Brazil to identify problems and evaluate the heuristic implementation of the usability of educational games. The research methodology used is a systematic literature review (SLR) based on previous relevant research on the heuristic usability of educational games. The study results show a heuristic that meets the usability evaluation of educational games, namely the Game User Experience Satisfaction Scale (GUESS) instrument. GUESS is a tool that can be used to assess user satisfaction with the gaming experience.

Silva, T. A. S., Barbosa, G. A. R., Silva, I. S., & Coutinho, F. R. S. (2018). [7] conducted a study in Brazil that aimed to find usability problems and evaluate the interaction between users and ephemeral media platforms (Instagram stories). The research process is divided into three stages. The first stage is the user experience evaluation of the Instagram story feature using a Human-Computer Interaction (HCI) perspective. The second stage evaluates the user's perspective when interacting with the system/product. Furthermore, finally, the third stage is to discuss the impact of social interaction from users on the Instagram story feature. The research also includes providing recommendations to improve user experience and HCI for Instagram story products based on the evaluation that has been given.

Erenler, H. H. T. (2018). [35] conducted a study in Turkey using the questionnaire method with a total of 236 respondents. The purpose of the study was to inspect e-learning websites' usability in using knowledge management systems at universities in Turkey. Based on the study results,

users stated several usability problems in the e-learning web, namely lack of feedback, difficulty finding a component, confusion in understanding a text, lack of explanation of instructions, less minimalist design, to difficulty finding helpful information on the website.

3. METHODOLOGY

This study uses a descriptive-quantitative approach by collecting and managing data using numerical calculations using scores or values used to make objective decisions. This research methodology elaborates the stages to be carried out to design and provide an overview of the research flow being carried out. The following is an overview of the stages of the User Interface (UI) and User Experience (UX) design analysis research that will be built in the following figure.

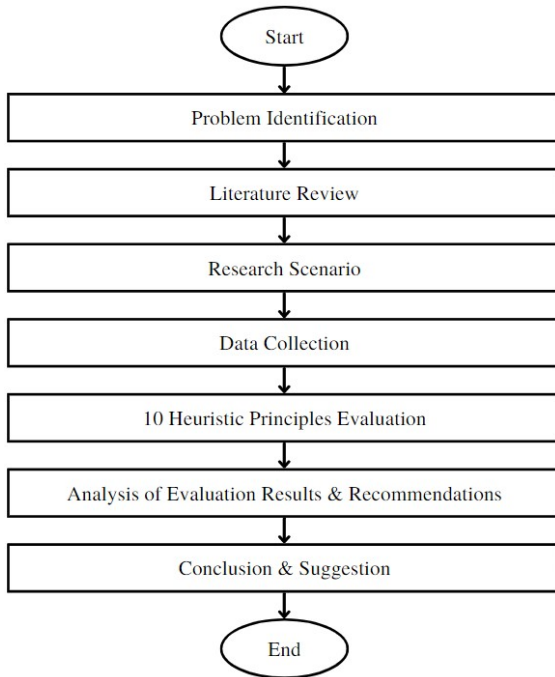


Figure 1: Research Stages Diagram

Based on Figure 1 above, it is known that this research starts from problem identification which is carried out through literature and observation studies to define problems that can be measured and tested as the first step of research. This stage is used to help determine and understand what problems will be studied, which will later be solutions to the research being conducted.

The stages of the literature study are carried out by reviewing the research before

carrying out the research. The purpose of conducting a literature study is to obtain a theoretical basis that will be used to support the successful process of evaluating the usability of social media websites using the heuristic evaluation method. Literature studies are from journals, books, and several official websites related to user experience, usability, and heuristic evaluation. The basic theory explains the relationship between the objects studied and the methods used.

The research scenario is the presentation stage of the design of a series of tasks to be carried out in the research process. The population used in this research is Instagram users in Indonesia (99,150,000 people). Based on reducing the number of samples using the slovin formula [36] with an error tolerance of 5%, the number of samples in this study is 400 active Instagram users. The data collection technique used in this research is a questionnaire. The questionnaire contains a list of questions asked to 400 respondents or data sources. The technique of analyzing the data obtained is by quantity analysis. In this study, severity ratings are used as a variable measurement.

UI and UX design analysis is taken from measurements based on Severity Ratings by Nielsen. Severity Ratings are values given by users or evaluators and can be measured based on the severity of each problem found [37]. In this study, Severity ratings determine the actions to be taken [38], where the higher the problem severity value found using heuristic principles, the greater the priority and the need to quickly solve UI/UX problems from a website [39].

Table 3: Severity Ratings

Context	Rating	Severity	Description
Strongly Agree	5	No Problem	No usability issues were found on the system, and it does not need to be fixed.
Agree	4	Cosmetic Problem	There are problems found, but they do not significantly impact the user and only need to be worked on if there is free time in the project.
Neutral	3	Minor Usability Problem	Minor problems that affect several user criteria when carrying out activities on the system. It should be fixed and given low priority.

Disagree	2	Major Usability Problem	There are problems that are very important to fix because they can interfere with users accessing the system. Due to users having difficulty with issues found at this level, it should be given high priority.	is repaired at an urgent or vital level to be repaired before the system or product is released.
Strongly Disagree	1	Usability Catastrophe	Fatal usability problems so that users cannot use the system or system functionality is not fulfilled. Priority	

Data collection was carried out by distributing questionnaires related to the 10 HE principles criteria. Research instruments from various previous studies are used to obtain better, more accurate, complete, and systematic research results in data collection. Table 4 is a list of questions that will be given to respondents to assist the research process [40][41][33][42].

Table 4: Questionnaire Question List

HE Variable	Instrument Code	Instrument
Visibility of System Status	V1.1	Each page interface in the web version of Instagram has a title that describes the meaning of the page.
	V1.2	The Instagram website displays clear system status information from a process. Example: There is a loading animation while waiting for data to be displayed.
	V1.3	After the user completes an action/series of actions, the web version of the Instagram system displays feedback explaining the next action. Example: Response from the system.
	V1.4	The web version of Instagram's system provides feedback quickly or in a reasonable time.
	V1.5	Every button on the web version of Instagram can be understood, and when used, it functions properly. Example: The next button can function to move forward to the next page.
Match Between System and the Real World	V2.1	The Instagram website provides several types of languages that are often used. Example: There are choices of English, Indonesian, Spanish, and other languages.
	V2.2	The Instagram website clarifies the use of icons or symbols that users commonly use. Example: The notifications page is represented as a bell icon.
	V2.3	Every menu on the web version of Instagram is written logically and can be understood by users.
	V2.4	The grammatical concepts used in the web version of Instagram are excellent and familiar.
	V2.5	The Instagram website uses clear, communicative images as visual cues.
	V2.6	Selection of colors that match general expectations on the web version of Instagram. Example: The use of pink describes the color of the heart icon.
User Control and Freedom	V3.1	Ease of navigating from one page to another on the web version of Instagram. Example: Switching from the Home page to the Settings page.
	V3.2	Ease of undoing errors using the system function on the web version of Instagram. Example: there is an undo or redo button after making a mistake deleting content.
Consistency and Standards	V4.1	The Instagram website has consistency in writing on each page.
	V4.2	The icons and interface design schemes on each page of the web

		version of Instagram are consistent. Example: Colors and icons.
	V4.3	All icons and images on the web version of Instagram are labeled/titled. Example: There is the word "Home" on the home icon.
Error Prevention	V5.1	The system on the web version of Instagram prevents users from making mistakes. Example: The user cannot continue to the next stage if there are still errors.
	V5.2	The Instagram website displays clear and unambiguous messages to avoid mistakes when carrying out a process. Example: The system informs the standard strength of the password entered, so that account registration is successful according to standards.
	V5.3	The words in the error message on the web version of Instagram already use excellent and polite grammar.
	V5.4	There is a help button on the web version of Instagram to prevent errors from happening. Example: Tooltip icon for getting help.
Recognition Rather Than Recall	V6.1	The interface components of the Instagram website are familiar. Example: Website interface that is familiar to others.
	V6.2	Easily remember information from one part of the system to another in the web version of Instagram.
Flexibility and Efficiency of Use	V7.1	The system on the web version of Instagram makes it easier and faster for users to carry out a task.
	V7.2	There is no need to do many steps to get a process on the web version of Instagram. Example: Do not go through a long process to open the settings page.
Aesthetic and Minimalist Design	V8.1	The information displayed on the web version of Instagram is relevant. Example: The home page only displays essential information.
	V8.2	The beauty of the interface in the web version of Instagram helps define the process.
Help users recognize, diagnose and recover from errors	V9.1	The Instagram website displays clear and easy-to-understand error messages when users make a mistake. Example: There is an error message when the requested data is still not filled in (empty) during registration.
	V9.2	The error message displayed on the web version of Instagram is accurate with the cause of the error.
	V9.3	The system in the web version of Instagram warns users when they make a serious mistake. Example: There is red writing or a warning sign.
	V9.4	The error message on the web version of Instagram displays instructions for what to do to resolve the error. Example: After making a mistake, there is a solution given.
Help and Documentation	V10.1	The Instagram website has fully documented help information. Example: There is a system usage guide.
	V10.2	Ease of finding help center information pages in the web version of Instagram.
	V10.3	The information provided in the help center on the web version of Instagram is clear and unambiguous.

4. RESULTS AND DISCUSSION

4.1 Validity Test Results

According to Suharsimi, A. (2006). [43], validity is a measuring tool that shows an instrument's level of precision and accuracy for measuring its variables. The results of testing the validity of the data obtained through distributing questionnaires can be seen in table 5. The validity

test of the research instrument was carried out using the Pearson Product-Moment Correlation Coefficient analysis technique. Based on the output stated in Table 5, all question items are valid because the Pearson Correlation Total Score on all question items > from r table is 0.128 with N = 400 and a significance level of 1%.

Table 5: Data Validity Test Results

HE Variable	Instrument Code	r table	Pearson Correlation Total Score	Category
Visibility of System Status	V1.1	0.128	0.446035	Valid
	V1.2	0.128	0.450171	Valid
	V1.3	0.128	0.506885	Valid
	V1.4	0.128	0.416628	Valid
	V1.5	0.128	0.436330	Valid
Match Between System and the Real World	V2.1	0.128	0.298546	Valid
	V2.2	0.128	0.340661	Valid
	V2.3	0.128	0.432719	Valid
	V2.4	0.128	0.420256	Valid
	V2.5	0.128	0.473201	Valid
	V2.6	0.128	0.322508	Valid
User Control and Freedom	V3.1	0.128	0.529641	Valid
	V3.2	0.128	0.413414	Valid
	V4.1	0.128	0.478874	Valid
Consistency and Standards	V4.2	0.128	0.458309	Valid
	V4.3	0.128	0.331553	Valid
	V5.1	0.128	0.491455	Valid
Error Prevention	V5.2	0.128	0.482130	Valid
	V5.3	0.128	0.422150	Valid
	V5.4	0.128	0.460785	Valid
	V6.1	0.128	0.453472	Valid
Recognition Rather Than Recall	V6.2	0.128	0.439839	Valid
	V7.1	0.128	0.445125	Valid
Flexibility and Efficiency of Use	V7.2	0.128	0.511015	Valid
	V8.1	0.128	0.488132	Valid
Aesthetic and Minimalist Design	V8.2	0.128	0.459926	Valid
	V9.1	0.128	0.470411	Valid
Help users recognize, diagnose and recover from errors	V9.2	0.128	0.425032	Valid
	V9.3	0.128	0.442039	Valid
	V9.4	0.128	0.455476	Valid
	V10.1	0.128	0.593636	Valid
Help and Documentation	V10.2	0.128	0.463661	Valid
	V10.3	0.128	0.579890	Valid

4.2 Reliability Test Results

The reliability test was carried out to determine the level of consistency of a questionnaire and to measure whether the measuring instrument used in the study was reliable and remained consistent when repeated measurements were made. According to Ghozali (2014) [44], the recommended composite reliability and Cronbach's alpha values are more than 0.7. Based on table 6, it is known that there are N of items (number of questionnaire questions) totaling 33 questionnaire items, with a Cronbach's alpha value of 0.876. Because Cronbach's alpha value is $0.876 > 0.7$, it can be concluded that the 33 questions in the questionnaire are reliable or consistent.

Table 6: Reliability Test Results

Reliability Statistics			
N of Items	Cronbach's Alpha	Cut Off	Category
33	0.876096553	0.7	Reliable

4.3 Interface Evaluation

The distribution of questionnaires to 400 respondents resulted in answers that varied according to the questions given within the scope of the 10 HE variables. The results of the severity evaluation are in table 7.

Table 7: Severity Evaluation Results

HE Variable	Instrument	Severity
Visibility of System Status	Each page interface in the web version of Instagram has a title that describes the meaning of the page.	3.74
	The Instagram website displays clear system status information from a process. Example: There is a loading animation while waiting for data to be displayed.	3.54
	After the user completes an action/series of actions, the web version of the Instagram system displays feedback explaining the next action. Example: Response from the system.	3.44
	The web version of Instagram's system provides feedback quickly or in a reasonable time.	3.28
	Every button on the web version of Instagram can be understood, and when used, it functions properly. Example: The next button can function to move forward to the next page.	3.52
Match Between System and the Real World	The Instagram website provides several types of languages that are often used. Example: There are choices of English, Indonesian, Spanish, and other languages.	3.67
	The Instagram website clarifies the use of icons or symbols that users commonly use. Example: The notifications page is represented as a bell icon.	3.62

	Every menu on the web version of Instagram is written logically and can be understood by users.	3.52
	The grammatical concepts used in the web version of Instagram are excellent and familiar.	3.57
	The Instagram website uses clear, communicative images as visual cues.	3.55
	Selection of colors that match general expectations on the web version of Instagram. Example: The use of pink describes the color of the heart icon.	3.53
User Control and Freedom	Ease of navigating from one page to another on the web version of Instagram. Example: Switching from the Home page to the Settings page.	3.30
	Ease of undoing errors using the system function on the web version of Instagram. Example: there is an undo or redo button after making a mistake deleting content.	3.09
Consistency and Standards	The Instagram website has consistency in writing on each page.	3.41
	The icons and interface design schemes on each page of the web version of Instagram are consistent. Example: Colors and icons.	3.45
	All icons and images on the web version of Instagram are labeled/titled. Example: There is the word "Home" on the home icon.	3.48
Error Prevention	The system on the web version of Instagram prevents users from making mistakes. Example: The user cannot continue to the next stage if there are still errors.	3.45
	The Instagram website displays clear and unambiguous messages to avoid mistakes when carrying out a process. Example: The system informs the standard strength of the password entered, so that account registration is successful according to standards.	3.46
	The words in the error message on the web version of Instagram already use excellent and polite grammar.	3.75
	There is a help button on the web version of Instagram to prevent errors from happening. Example: Tooltip icon for getting help.	3.46
Recognition Rather Than Recall	The interface components of the Instagram website are familiar. Example: Website interface that is familiar to others.	3.50
	Easily remember information from one part of the system to another in the web version of Instagram.	3.60
Flexibility and Efficiency of Use	The system on the web version of Instagram makes it easier and faster for users to carry out a task.	3.46
	There is no need to do many steps to get a process on the web version of Instagram. Example: Do not go through a long process to open the settings page.	3.46
Aesthetic and Minimalist Design	The information displayed on the web version of Instagram is relevant. Example: The home page only displays essential information.	3.43
	The beauty of the interface in the web version of Instagram helps define the process.	3.45
Help users recognize, diagnose and recover from errors	The Instagram website displays clear and easy-to-understand error messages when users make a mistake. Example: There is an error message when the requested data is still not filled in (empty) during registration.	3.59
	The error message displayed on the web version of Instagram is accurate with the cause of the error.	3.36
	The system in the web version of Instagram warns users when they make a serious mistake. Example: There is red writing or a warning sign.	3.63
	The error message on the web version of Instagram displays instructions for what to do to resolve the error. Example: After making a mistake, there is a solution given.	3.42
Help and Documentation	The Instagram website has fully documented help information. Example: There is a system usage guide.	3.35
	Ease of finding help center information pages in the web version of	3.50

Instagram.

The information provided in the help center on the web version of Instagram is clear and unambiguous. 3.59

The average value is a representative data set or the average whose value is closest to the actual measurement result. In the results of the interface evaluation, the mean results were obtained for each of the variables listed in table 8.

Table 8: Mean Variable Details

No	HE Variable	Mean
1	Visibility of System Status	3.50
2	Match Between System and the Real World	3.58
3	User Control and Freedom	3.20
4	Consistency and Standards	3.44
5	Error Prevention	3.53
6	Recognition Rather Than Recall	3.55
7	Flexibility and Efficiency of Use	3.46
8	Aesthetic and Minimalist Design	3.44
9	Help users recognize, diagnose and recover from errors	3.50
10	Help and Documentation	3.48
	Average	3.47

Based on table 8, the results obtained an average severity rating score of 3.47 or Minor Usability Problems, which are minor problems that affect several user criteria when carrying out activities on the system. It should be fixed and given low priority [45]. The severity rating value can be utilized to determine priority levels from high to low. The lower the severity rating, the higher the priority to work on.

4.4 Analysis of Evaluation Results

Looking at the results of the mean values in table 8 shows not very good results for users' views of the Instagram website using the heuristic evaluation instrument, with the lowest variable value of 3.20 and the highest variable value of 3.58. From these values, the researcher will conduct a problem analysis of the ten variables. Table 9 shows the results of the evaluation analysis of the variables.

Table 9: Analysis of Heuristic Evaluation Results

HE Variable	Evaluation Code	Problems
Visibility of System Status	E1.1	Users may find it difficult to understand the name and purpose of a menu or page due to a lack of explanation.
	E1.2	There is no motion in the loading skeleton when opening content, so there is no certainty whether the page is stuck or the data is still loading.
	E1.3	Lack of visual feedback showing user location or user progress when registering, creating new posts, and creating new "Saved" collections.
	E1.4	Users may not be happy because they have to wait for a long feedback process.
	E1.5	Buttons on carousel images are less interactive because they are not clickable.
Match Between System and the Real World	E2.1	If there is no language option according to the user's native language, the user may have difficulty understanding the use of language on the web version of Instagram.
	E2.2	There is a possibility that the user is still unfamiliar with the heart-shaped icon or symbol in the notification menu, so it is not easy to understand its function.
	E2.3	Some users may have difficulty understanding some menu names in the settings.
	E2.4	The Instagram Help Center uses Latin abbreviations (e.g.) in the English setting, while not all users are familiar with the word.
	E2.5	When accessing using a desktop, the landing page displays a mobile app image instead.
	E2.6	The active and non-active buttons have almost the same color, so it is

		hard to tell them apart.
User Control and Freedom	E3.1	Some users find it challenging to find a page.
	E3.2	Users cannot revert or undo actions after accidentally deleting a post.
Consistency and Standards	E4.1	The writing of each page may not be consistent.
	E4.2	The direct messages icon on the menu button and on the page is different.
	E4.3	Some of the icons in the header have not been labeled/titled, and it is possible that the user does not understand their function.
Error Prevention	E5.1	There is no dialogue confirmation message when the user accidentally presses the "Log Out" button.
	E5.2	There is a possibility that the error message is still unclear and ambiguous when the user makes an error in filling in the text field during account registration.
	E5.3	Instructions in error messages may seem too brisk and bossy for some users.
	E5.4	Some components do not have a help button to prevent errors from occurring.
Recognition Rather Than Recall	E6.1	Some users may find it challenging to understand the components of the Instagram website interface.
	E6.2	Some users may have difficulty remembering the web version of Instagram navigation.
Flexibility and Efficiency of Use	E7.1	There is a possibility that a delayed process prevents the user from completing a task.
	E7.2	Some users may feel they must go through too many steps to open a page/process.
Aesthetic and Minimalist Design	E8.1	Some users may feel that there is less relevant information on a page.
	E8.2	It is necessary to evaluate the beauty of the interface on the web version of Instagram.
Help users recognize, diagnose and recover from errors	E9.1	The error message may still be unclear and complicated for users to understand when they make an error.
	E9.2	The error message displayed by Instagram may be inaccurate with the cause of the error. Example: When entering the wrong username and the correct password at login, the system only gives an error message to recheck the password, even though the username can also be wrong.
	E9.3	There is no error message when logging in when entering a username <1 character and password <6 characters, so the user does not realize the mistake.
	E9.4	Some processes do not display error messages, so users cannot resolve errors.
Help and Documentation	E10.1	It is possible that the Instagram Help Center does not provide a solution to the question the user is looking for.
	E10.2	Some users may find it challenging to find the Instagram Help Center page.
	E10.3	Some users may feel that the information on the Instagram Help Center is unclear and ambiguous.

4.5 Interface Improvement Recommendations

From the evaluation results in table 9, recommendations for improvement interfaces are compiled, which are listed in table 10. Recommendations are provided for each specific problem in the heuristic evaluation results marked with an evaluation code.

Table 10: Interface Improvement Recommendations

Evaluation Code	Recommendation
E1.1	Add page titles on each main page.
E1.2	Add motion to skeleton loading to give the perception of decreased waiting time.
E1.3	Adding progress bars for each step or stage during registration, creating a new

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| <p>post, and creating a new Saved collection to give an idea of how far the activity is progressing.</p> <p>E1.4 Make improvements and re-optimization the database for faster data access.</p> <p>E1.5 Make buttons on carousel images clickable with the aim of not giving the wrong perception to the user.</p> <p>E2.1 Add language options according to the languages that Instagram users widely use.</p> <p>E2.2 Change the notification menu icon to a bell because it is easier to understand and commonly used, compared to the heart icon, which tends to function to give likes to a post.</p> <p>E2.3 Change some of the menu names in the settings to a language that is easier for most people to understand.</p> <p>E2.4 Change the word "e.g." to "For example" because the use of language is more common and easy to understand.</p> <p>E2.5 Change/add an image on the landing page with a desktop frame to better suit the user's device.</p> <p>E2.6 Change the color of inactive buttons on the login page to be grayer or lower the transparency level.</p> <p>E3.1 Create a vertical navigation menu with menu levels and their sub-menus.</p> <p>E3.2 Add an undo button after accidentally deleting a post to allow users to try and explore Instagram's features.</p> <p>E4.1 Change the writing of each page to be more consistent.</p> <p>E4.2 Change the icon on the direct messages menu button and on the page to be the same for consistency because they both have the same function.</p> <p>E4.3 Add a label/title for each button in the header.</p> <p>E5.1 Add a confirmation dialog after a user accidentally presses the "Log Out" button to confirm an action or an error.</p> <p>E5.2 Changing the use of language in error messages becomes clearer and more precise when the user registers an account.</p> <p>E5.3 Adding the word "Please" to the instructions section of the error message makes it feel friendly and polite.</p> <p>E5.4 Add tooltips to components where errors often occur so that users understand the function and use of these features.</p> <p>E6.1 Use design metaphors from interfaces</p> | <p>that are familiar or commonly used by users on other websites.</p> <p>E6.2 Add a shortcut to the header or vertical navigation menu.</p> <p>E7.1 Do image weight optimization or reduce image size so the website loads faster.</p> <p>E7.2 Create a vertical navigation menu with menu levels and their derivatives (sub-menus) to make navigation faster.</p> <p>E8.1 Evaluate the relevance of the content/components displayed on a page.</p> <p>E8.2 Improve the beauty of the interface for a better overall user experience.</p> <p>E9.1 Evaluate and clarify error message information, making it easy to understand.</p> <p>E9.2 Add information to double-check the username entered when an error occurs when logging in.</p> <p>E9.3 Add instructions and data validation information needed to log in correctly.</p> <p>E9.4 Add an error message every time the user makes a mistake to achieve the desired output.</p> <p>E10.1 Add a list of answers or solutions that are frequently asked by users so</p> <p>E10.2 Add the Help Center sub-menu to the vertical navigation menu.</p> <p>E10.3 Evaluate and clarify the information on the Instagram Help Center so users can capture the information conveyed more precisely.</p> |
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4.6 Discussion

After going through the data processing of the validity test, reliability test, severity evaluation, analysis of HE results, and interface improvement recommendations, the results of problem identification can be answered and concluded. The instruments used in the study were declared valid and reliable so that they can be used as a usability measurement for the web version of Instagram. From the measurement results using severity ratings, the Instagram user interface evaluation results get a value in the range of 3-4 or an overall average of 3.47. So it can be concluded that the web version of Instagram has minor usability problems that impact several user criteria when using the system. The variable that gets the lowest score is 'user control and freedom,' with a severity rating of 3.20. While the 'match between system and the real world' variable gets a severity rating of 3.58. The problems in the web version of Instagram must be fixed, and the severity ratings can be used as a

reference to determine the priority for improvement. The lower the value, the higher the priority is given because it harms the user.

Research instruments are used to evaluate variables that get low scores. There are several problems that cause 'user control and freedom' to be considered less good in its usability. The main problem is the lack of freedom to explore Instagram functions or features without fear of making mistakes. For example, if a user accidentally deletes content, that content will be deleted from their profile. Meanwhile, the user wants to be given the option to undo or redo the action because there is a possibility that the user may change their mind or have no intention of deleting the content. As a result, they cannot restore deleted content. Another problem with the same variable is that navigating from one page to another is challenging.

From the results of the HE evaluation, there are 33 usability problems on Instagram. The problems that have been described can be used as a reference for platform development and improving usability for the better. These problems are real problems experienced by users and have an impact on user experience when using the web version of Instagram. Therefore, recommendations for improvement interfaces are given that are suitable for each specific problem. The suggestions provided include navigation improvements, error messages that need to be detailed, improvements to the design, text, and more consistent buttons, as well as improvements to the aesthetics of the user interface. These recommendations help improve usability, increase severity ratings, and ultimately provide a pleasant user experience when using the platform.

The results of this study indicate that the web version of Instagram still requires some improvements in terms of usability. Previous research regarding the usability evaluation of the Instagram story feature in mobile apps [7] stated that Instagram ephemerality proposal violated several user experience & sociability guidelines that caused potential problems when users interacted with the feature. The two studies present issues from two different versions, the Instagram web version, and the mobile app version. Instagram can see this as an opportunity to simultaneously improve the interface not only in one software version but both. Even though the two versions are different, efforts to create a consistent design are necessary because they represent one another. That way, Instagram can improve usability because it's easy to use, and users feel familiar with the design

across all platforms, the web version and the mobile app version.

5. CONCLUSIONS

The web version of Instagram requires usability measurements to look for existing user interface problems and their impact on the overall user experience. The method used is Heuristic Evaluation because it effectively solves problems quickly and provides an accurate judgment. The evaluation results that have been carried out on the Instagram website using a heuristic evaluation produce a more comprehensive and sharp evaluation. Some conclusions that can be generated from this research are:

1. The average result of the heuristic evaluation based on severity ratings is 3.47, or Minor Usability Problem, which is a small problem that affects several user criteria when carrying out activities on the system. The variable 'User control and freedom' has the lowest score, which is 3.20.
2. The study found 33 problems and 33 recommendations for user interface improvement. Of the variables tested through instruments on the questionnaire, the web version of Instagram still has to improve a lot to improve usability so that it can achieve the maximum value/score for all variables.

Based on the research that has been done, this research has limitations. The main limitation is that the research sample was only conducted on users of the web version of Instagram, which is located in Indonesia. Thus, further research is needed to explain the usability of the web version of Instagram in other countries. In addition, the limitations of this study are that it only focuses on the web version of Instagram. Thus, further research or exploration is needed regarding the usability of the mobile app version of the social media platform.

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