Usability Testing Analysis of a Company Website in Indonesia

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***Abstract*— Usability testing is a method of evaluating the user experience of a product or service by testing it with real users. Usability testing is an essential step in the product development process, as it helps to ensure that the product is easy to use and meets the needs of its intended users. Websites are an important communication and interaction channel for many businesses, and it is important to ensure that they are easy to use and provide a good user experience. It provides various information technology facilities that can support companies in improving and optimizing their business processes. However, some website still has deficiencies in terms of website interactivity and a responsive display when the website changes to a User Interface display on several gadget devices. Therefore, the main objective of this testing process is to ensure that each scenario in the application has run as expected and meets the standard requirements written in three main aspects: System Aspect, User Aspect, and Interaction Aspect. This study uses the UAT (User Acceptance Testing) method to determine the responses of respondents (users) to the system that has been built. Based on the data from the questionnaire results, three aspects are assessed: the system aspect, which gets an average score of 3.243, and the user aspect, which is around 3.186. and interaction aspects with an average value of 3.22. In short, the research that has been carried out using usability testing analysis in our case study has generated positive ratings that can satisfy users when accessing the website, although some respondents still give pretty bad ratings.**

Keywords*— *Website, Usability Testing, UAT, Blackbox Testing)

I. INTRODUCTION

Information technology has a big enough contribution in helping activities or activities carried out by humans. Operational activities and company management can be facilitated by the presence of a touch of information technology to help various problems that occur in it [1]. The development of technological advances creates data integration which is the process of combining two or more data sets in order to facilitate analysis in order to support information management in a work environment. Information technology has a relationship with providing information, integrating sub-systems and systems, as well as supporting good management[1].

In the application development cycle or what is commonly referred to as the SDLC (software development life cycle), testing is one of the processes that should be carried out in every system development. This is to check, track and also assist the developer in the process of repairing the system so that it is in accordance with what is expected by consumers [2] For this reason, a tester or quality assurance team needs to carry out testing of an application before the application is handed over to consumers. The test is called user acceptance testing[3].

Our case study is a company engaged in IT Consultant services that provides various information technology facilities that can support a company in improving and optimizing its business processes. However, the websites owned by them still have deficiencies in terms of website interactivity and responsive appearance when the website is changed to display the User Interface on several gadget devices.

Therefore, the primary purpose of this testing process is to ensure that every scenario in the application has run as expected and meets the standard requirements written in the software requirements specification. The software requirement specification is the basis for testing because what the developer has done is described in the software requirement specification and the user acceptance test will test this.

This study uses the UAT (User Acceptance Testing) Method. The UAT method is a method for conducting direct testing by end-users. The user is usually a staff or company employee who directly interacts with the system and verifies whether the existing functions are running as needed so that UAT can produce documents that can be used as evidence that the products made are acceptable to users.

As a "quick and dirty" usability measurement. The survey consists of several questions; each has 4 points by using a Likert scale as the attitude and response of the user. The output of the UAT (User Acceptance Testing) method is in the form of documents on the results of testing scenarios and scores using a Likert scale that looks easy to understand, with a range from 1 to 4, with the higher the score, the better the usability.

II. LITERATURE REVIEW

A. Usability

Usability comes from the word usable which is interpreted as good use. Usability is an ideal example of an application in terms of hardware and software that illustrates

the level of comfort in using the product from the user's point of view. Usability comes from the word usable which means it can be used properly. This refers to how users can use something to achieve a goal, and their satisfaction in using it [4]. While based on the concept of usability [4] a product or service to be appropriately used, the product or service must have the following six elements:

a. Effectiveness
   Effectiveness can be measured based on the level of completion of the user when achieving the specified task objectives. The completion rate is the percentage of the number of tasks completed to the total tasks performed. According to a study conducted, the average task.
b. *Efficiency*
   Efficiency is a way that is done in the form of an effort to run things correctly and quickly and minimize error in terms of time, effort and cost. Inefficiency is usually the fastest time measure of a product to be able to complete the user's wishes accurately and thoroughly.
c. *Satisfaction*
   Satisfaction refers to the user's perceptions, feelings and opinions of a product. When a product can provide what users want, users tend to work well and feel satisfied with the product.
d. *Context of Use*
   ISO 9241-11 (1998) currently says nothing about how broad a range of users, tasks, and environments should be included in the context of use. The revised standard also clarifies that usability can be related to all potentially relevant use contexts (when considering overall usefulness), defined use contexts (particular users, purposes, and spheres of interest), and use contexts for a single individual (to individual usefulness when considering user experience). ISO 9241-11 (1998) currently provides detailed information on how to define the context of use.
e. *Usability Measures*
   ISO 9241-11 (1998) states that current usability measures focus on usability specifications and measurements and include detailed information on usability measures and usability specifications. This information has not been included in the new draft. It might be included in a new related standard on usability measurement.

According to ISO 9241, (1998)[5] usability can be interpreted as how far the user can use a product to achieve its goals with effectiveness, efficiency and user satisfaction in terms of use. Usability can be interpreted as an element that assesses and measures how effectively users interact with a system or website in terms of user acceptance so that later they can optimize user performance in accessing the system or website in question. According to[6].

B. *Usability Testing*

Usability testing Information obtained directly from the user about his experience in using the application or system and the problems that occur will be obtained from the usability testing process that includes the user. The tester observes how the user interacts with the features of a system or application and in the usability test a number of usability problems will be found with no known solution. According to [7] the user will provide direct information about how he uses the system and the problems encountered during the usability testing process. This usability test aims to test the feasibility of the potential to make major changes or improvements to the content, design, and layout of mobile applications. The results of usability testing itself will be used as a major factor in making decisions and it will be possible to be used as a stepping stone to lead to a better user experience.

Meanwhile, according to [8], usability testing is used to evaluate an application or website by testing it as a user. Most software tests create test scenarios for usability testing by positioning themselves as users who have already experienced the application or website. How can the flow of the application or website be said to be easy or not when used, and trying the user interface of the application or website can be said to be in accordance with the user experience or not.

Usability testing which uses the User Acceptance Criteria method has 5 stages, namely learning (learnability), efficiency (efficiency), easy to remember (memorability), safe to use or reduce error rates (errors) and has a level of satisfaction (satisfaction). Learnability measures how easy it is to perform simple tasks when you first encounter a design. Efficiency measures the speed at which certain tasks are performed after studying the design. Memorability looks at how quickly users regain proficiency with the design when they return after some time. Errors looks at how many errors a user made, how severe the errors were, and how easy they were to find a resolution. Satisfaction measures the level of satisfaction in using the design [9]. Based on the previous explanation, it can be said that usability testing (usability testing) is an important indicator in assessing the effectiveness of a website or application when users use it. Usability testing is also a factor that needs to be considered so that the goals of a website or application can achieve what is desired and not abandoned by its users.

C. *Website*

A website can be defined as a collection of pages that display information on textual data, still or video data, animated data, audio, video, and/or all combinations, static and dynamic, and in different formats. Websites are usually obtained from several related web pages. When a series of webpages are linked, each page is linked by a side network (hyperlink). While connecting media derived from text has another name, namely (hypertext)[10]. A website has four root components: browser, server, URL, and pages[11].

a. *Websites Functions*

Website Functions according to[12] In general, the website has the following functions:

1) Communication Function: Several facilities that provide communication functions, such as: chat, web base email and others
2) Information Function: Website information functions such as: News, Profile, Library, references and others.
3) Entertainment Function: The website has an entertainment function. For example websites that provide online games, online music and others.
4) Transaction Function: A web can be used as a means to make transactions and others.

b. Types of Websites

In general, websites are divided into several types. Explanation of the types of websites used in this study, namely[13]:

1) *Web search engines* is a *web* which can perform searches. Documents based on certain keywords. Example: *Google* and *All the web*.
2) *Web portals* is a web that contains a collection of links, search engines, and information. Example: Yahoo and AOL.
3) *Web company* is a web that describes a company, services, facilities, and everything about the company. Example: Andi Publisher and Indosat.
4) *Weblog,* often abbreviated as a blog, is an internet site that allows its owner to write down anything that becomes a user's opinion or view of something as well as a diary or diary. Internet users who create or have blogs are called bloggers.

D. Usability Testing Method

According to [14] defines, usability testing as follows, "Usability testing has traditionally meant testing for efficiency, ease of learning, and the ability to remember how to perform interactive tasks without difficulty or errors." In other words, usability tests measure efficiency, ease of learning, and the ability to remember how to interact without difficulty or error. Since the development of the internet, experts in the field of dependency testing have emphasized dependency testing with two main points, namely,[15]:

1) *Ease of Learning:* Measures usability by comparing the time it takes a user to learn an utterly unfamiliar computer system to do something with the time it takes to do the same thing in another way.
2) *Ease of use:* Measures the number of actions that need to be performed to complete a job. For example, comparing the number of mouse clicks on the two designs

E. User Acceptance Testing Method

According to [16]User Acceptance Testing (UAT) is a test carried out by end-users where the users are company staff/employees who directly interact with the system and verify whether the existing functions are running according to their needs/functions. After system testing, acceptance testing states that the software system meets the requirements. After system testing, acceptance testing states that the software system meets the requirements. Acceptance testing is performed by users who use black box testing techniques to test the system against its specifications. End users are responsible for ensuring all relevant functionality has been tested.

User acceptance testing (UAT) is the final phase of the software testing process. During UAT, software is tested to ensure that tasks conform to specifications. UAT is one of the final and most important software project procedures that must occur before the software is developed and released to the market. UAT is also known as beta, application, or end-user testing[17].

F. Population and Sample

Sugiyono in [18] explains that the population is a generalization area consisting of objects/subjects with specific qualities and characteristics determined by the researcher to be studied and then drawn conclusions. Meanwhile [19] states that the sample is part or representative of the population studied. It is called sample research if we intend to generalize the results of sample research.

G. Likert Scale

The Likert scale is a measurement scale developed by[20]. The Likert scale has four or more question items that are combined to form a score/value that represents individual characteristics, for example, knowledge, attitudes, and behavior. A composite score, usually the sum or average, of all question items can be used in the data analysis process.

The sum of all question items is valid because each question item is an indicator of the variable it represents. The Likert scale uses several question items to measure individual behavior by responding to 5 point choices on each question, strongly agree, agree, do not decide, disagree, and strongly disagree. The ease of use of the Likert scale causes this scale to be used more widely by researchers[21].

According to Kriyantono [22] the Likert scale is a scale used to measure attitudes, opinions, and perceptions of a person or group of people about events or social phenomena. The method of measurement is to confront a respondent with a statement and then asked to be asked for answers from the five answer choices, where the value of the answer has a different answer value[22].

Previous researchers used the Likert Scale a lot because it is easy to manufacture and easily managed. The only drawback of this scale is that it tends to take longer to complete than other detailed rating scales because the respondent has to read each statement carefully.

III. RESEARCH METHODOLOGY

A. User Acceptance test

The UAT method is to find out the responses of respondents (users) to the system that has been built, namely by using a Likert Scale Questionnaire which is generally used for research in the form of surveys and giving questions to respondents (users) where the answers to these questions consist of levels that can be selected[23] as shown in Table 1.

TABLE I. INTERPRETATION SCORE

Percentage Score (%)	Interpretation
0% - 24.99%	Strongly disagree
25% - 49.99%	Disagree
50% - 74.99%	Agree
75% - 100%	Strongly agree

B. Questionnaire Method

This method is carried out by providing several questions according to the rules. These questions will then be given to respondents according to the sample requirements previously

determined. The questionnaire results will be analyzed to obtain the information needed in the research.

C. Data Analysis Method

After the results of the questionnaire data were obtained and collected, the next step was to analyze the data. This study's data analysis was carried out using a Likert Scale measurement. The first thing to do is to calculate the average satisfaction of the respondent's answers to the list of questions that have been given using the formula:

$RK = JSK / JK$
RK = Satisfaction average
JSK = Questionnaire Score Total
JK = Number of Questionnaires

IV. RESULT

A. Respondent Demographic Analysis

The results of this demographic analysis are an explanation of the results of the questionnaire based on gender, faculty, class, and whether the respondent has a background in the IT (Information Technology) field or not.

Fig. 1. Respondent Genders

The picture above is respondent division based on the gender. It can be seen in Figure 1 that most of the respondent are female with a percentage of 65.3% or as many as 49 people. Meanwhile, the male gender obtained 34.7% or as many as 26 people.

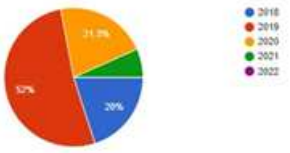

Fig. 2. Respondent Years'

The picture above shows that most of the respondents who filled out this questionnaire were from the 2019 class with a percentage of 52% or as many as 39 people. Meanwhile, there were only a few respondents, namely the class of 2021 with a percentage of 6.7% or just 5 people

Fig. 3. Are you in IT Background?

In Fig. 3 the researcher tries to find out whether all respondents are the majority with background knowledge of IT (Information Technology). These results show that 64% or 48 of the total sample population, totalling 75 respondents, did not have an IT background. At the same time, the remaining 36% or as many as 27 people, have IT background knowledge.

B. Recapitulation of Usability Testing Analysis Questionnaire Results

TABLE II. RECAPITULATION OF QUESTIONNAIRE RESULTS

Aspect	Question	STS	TS	S	SS
System	P1	1	5	42	27
	P2	2	8	43	22
	P3	3	3	44	25
	P4	1	4	37	33
Users	P5	1	13	42	19
	P6	0	5	39	31
	Q7	0	8	33	34
	Q8	8	20	26	21
	Q9	1	5	45	24
	P10	0	5	39	31
Interaction	P11	2	5	42	26
	Q12	1	9	38	27
AMOUNT		**20**	**90**	**470**	**320**

$$\mathbf{RK} = \frac{(20x1)+(90X2)+(470x3)+(320x4)}{75X12}$$

$$\mathbf{RK} = \frac{2890}{900}$$

$$\mathbf{RK} = 3.21$$

C. Aspects of testing using the UAT (User Acceptance Testing) method

After recapitulating the answers and calculating the average user obtained from the questionnaires that have been distributed, the researcher will conduct an analysis of each of these aspects to find out what things are lacking and can be improved from website case study.

a. System Aspects

TABLE III. THE RESULT OF THE SYSTEM ASPECT QUESTIONNAIRE

Aspect	Question	Strongly Disagree	Disagree	Agree	Strongly Agree
System	P1	1	5	42	27
	P2	2	8	43	22
	P3	3	3	44	25
	P4	1	4	37	33
AMOUNT		**7**	**20**	**166**	**107**

$$\mathbf{RK} = \frac{(7X1)+(20X2)+(166X3)+(107X4)}{75X4}$$

$$\mathbf{RK} = \frac{973}{300}$$

$$\mathbf{RK} = 3.243$$

b. Aspects of Users

TABLE IV. USERS ASPECTS QUESTIONNAIRE RESULTS

Aspect	Question	Strongly Disagree	Disagree	Agree	Strongly Agree
User	P5	1	13	42	19
	P6	0	5	39	31

Aspect	Question	Strongly Disagree	Disagree	Agree	Strongly Agree
	Q7	0	8	33	34
	Q8	8	20	26	21
	Q9	1	5	45	24
	P10	0	5	39	31
AMOUNT		**10**	**56**	**224**	**160**

$$\mathbf{RK}=\frac{(10X1)+(56X2)+(224X3)+(160X4)}{75X6}$$
$$\mathbf{RK}=\frac{1434}{450}$$
$$\mathbf{RK}= 3.186$$

c. Aspects of Interaction

TABLE V. THE RESULTS OF THE INTERACTION ASPECTS QUESTIONNAIRE

Aspect	Question	Strongly Disagree	Disagree	Agree	Strongly Agree
Interaction	P11	2	5	42	26
	Q12	1	9	38	27
AMOUNT		**3**	**14**	**80**	**53**

$$\mathbf{RK}=\frac{(3X1)+(14X2)+(80X3)+(53X4)}{75X2}$$
$$\mathbf{RK}=\frac{483}{150}$$
$$\mathbf{RK}= 3.22$$

D. Website Feasibility Level Analysis Results

b. Aspects of system

$$\mathbf{RK}=\frac{(7X1)+(20X2)+(166X3)+(107X4)}{75X4}$$
$$\mathbf{RK}=\frac{973}{300}$$
$$\mathbf{RK}= 3.243$$

c. Aspects of the User

$$\mathbf{RK}=\frac{(10X1)+(56X2)+(224X3)+(160X4)}{75X6}$$
$$\mathbf{RK}=\frac{1434}{450}$$
$$\mathbf{RK}= 3.186$$

d. Aspects of Interaction (Interaction)

$$\mathbf{RK}=\frac{(3X1)+(14X2)+(80X3)+(53X4)}{75X2}$$
$$\mathbf{RK}=\frac{483}{150}$$
$$\mathbf{RK}= 3.22$$

Based on the data from the questionnaire results, three aspects are assessed. The first aspect is the system aspect which gets an average value of 3.243, the second aspect is the user aspect which gets an average value of 3.186; and the third aspect is the interaction aspect which gets an average value of 3.22. from these three aspects, the feasibility level of the website of our case study with the following average scores.

$$\text{Average} =\frac{(3{,}243+3{,}186+3{,}22)}{3}$$
$$=3{,}216$$

So, it can be concluded that the value of 3.216 is feasible because this study's most significant category is 4. Therefore, the our case study is feasible to use and has fulfilled all three aspects: system, user and interaction.

V. CONCLUSION

Based on the research done to analyze usability testing on our case study using the UAT (User Acceptance Testing) method it can be concluded the study that uses the UAT (User Acceptance Testing) method where this research focuses on users directly as respondents in determining research results. In the UAT (User Acceptance Testing) method, three aspects are used as a reference in determining whether the website can be included in the appropriate category or not.

In the system aspect, a calculation of 3.243 is obtained, if it refers to the definition of Kaplan and Norton, it meets the appropriate criteria. The system aspect also shows the website of our case study is easy to understand; besides that, the website has an attractive appearance, and navigation directions and features follow the semester.

In the user aspect, the average calculation is 3.186. If this refers to the definition of Kaplan and Norton then it meets the eligibility criteria. On the user aspect, it shows that the website of our case study as a whole is comfortable to use for users both from menus that can be accessed quickly as well as information and content that can be easily understood

In the interaction aspect, the average calculation is 3.22. If this refers to the definition of Kaplan and Norton then it meets the eligibility criteria. In the interaction aspect, it shows that the website of our case study can provide interaction and relevant information for respondents as well as is a recommended place for other users because this website contains content for users who are looking for information related to information technology companies

Overall based on the description above, our case study is considered to have produced a positive assessment, which means it can satisfy users when accessing this website. However, there are still some respondents who give quite bad ratings. This lousy rating can be used as an excuse or basis for improving and enhancing the quality of our case study.

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