Application of The WEBUSE Method in Analyzing National Industrial Information Systems

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A R T I C L E   I N F O

A B S T R A C T

At this time the development of information systems is very rapid in various sectors. One of them is in the economic sector. Many information systems have sprung up in the economic sector, for example, the information system used by government agencies, namely the National Industrial Information System. The National Industrial Information System is an information system used by government staff to supervise data owned by each industrial company. This Information System has many features are home, industrial policies, e-reporting, helpdesk, and others. The application of an information system in an organization is inseparable from the user's perception of the information system. The Website Usability Evaluation (WEBUSE) method is an analytical method that allows users to assess the usability of the implemented web system. This method uses a questionnaire to obtain the required information. Therefore, this study uses the WEBUSE method in analyzing the National Industrial Information System to determine the value of the usability level of the system used. After doing the calculations, the results of the usability analysis of National Industrial Information System with the WEBUSE method get a point of 0.89 which includes an "Excellent" usability level. This usability level shows that the National Industrial Information System is following the wishes of its users.

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1. INTRODUCTION

The current development of information systems has penetrated the economic world of an organization, company, or government agency. This information system is used to complement, support, and achieve the goals of each of the organization's activities [1]. Currently, many information systems have sprung up in the economic world, one of which is the information system used by government agencies, namely the National Industrial Information System. This information system is used to facilitate government staff in knowing and supervising data owned by every industrial company that has been registered.

At the Department of Industry and Trade of North Sumatra Province, the ILMEA Division in terms of daily work uses the National Industrial Information System. This Information System has many features to fulfill the duties and functions of the ILMEA Division. Some examples of the features available in this information system are home (displays a list of registered industrial companies), industrial policies, e-reporting, helpdesk, and others.

The application of an information system in an organization is inseparable from the perception of the use of the information system. Analysis of this perception assessment through an evaluation of opinions or statements from users. Based on this, here will be analyzed about the National Industrial Information System in the ILMEA Division of the Department of Industry and Trade of North Sumatra Province.

Relevant previous research on the analysis of the application of information systems has been carried out by A.Ndarbeni, et al., [2] with a case study of the Muhammadiyah Gombong STIKES Academic Information System using the UTAUT and TTF methods. Then, Fachruzi, et al., [3] analyzed the application of digital service pawnshop information systems using the Website Usability Evaluation (WEBUSE) method in providing convenience to customers at Unit Betun Pawnshops. Furthermore, there are

M. Sulistiyono and A. Nurwandari [4] use the User-centered and WEBUSE methods to analyze the ability of a Travel Service Information System to make it easier for tourists to obtain information about tours.

Subsequent research was conducted by Andiputra and Tanamal [5] using the WEBUSE method to analyze the usability of a website. N.Aini, et al., [6] also used the WEBUSE method in their research entitled "Evaluation of the Prabumulih City Government Website through the Website Usability Evaluation (Web use) Approach". In this research, the WEBUSE method was used to evaluate the capabilities of the Prabumulih City government website. On the Tribun Sumsel website, an analysis of implementation is also carried out using the WEBUSE method [7].

This research was made using the Website Usability Evaluation (WEBUSE) method. This method is an evaluation method that allows users to assess the usefulness of the web being evaluated [5]. The WEBUSE method is organized into four categories, namely, (1) Content, Organization, and Readability, (2) Navigations and Links, (3) User Interface Design, and (4) Performance and Effectiveness [8]. Research using the WEBUSE method can be used as input for website development because the results of the research provide usability-level information on the website [9].

2. RESEARCH METHOD

The research method is a method used to obtain the information needed in compiling research [10]. This study uses the WEBUSE method, that is to say a usability evaluation method using a questionnaire to obtain the required information. Wherein this method allows users to assess the usability of the website being evaluated, and divide usability categories in the WEBUSE method based on usability evaluation criteria, namely Content, Organization, and Readability, Navigation and Links, User Interface Design, Performance, and Effectiveness [11].
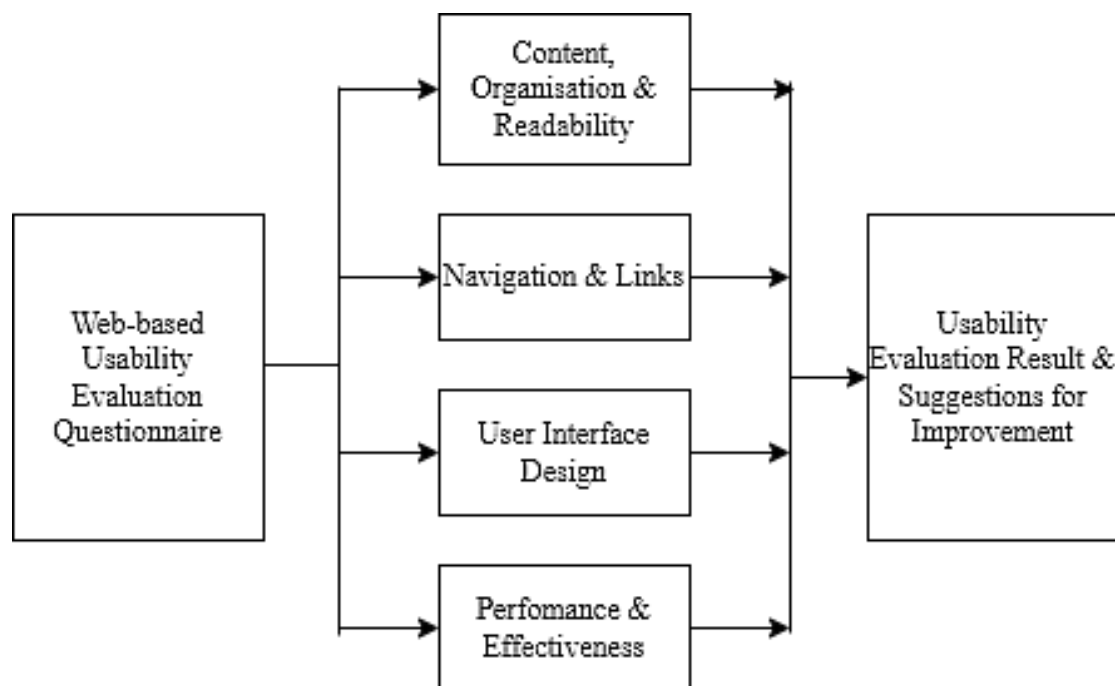

Figure 1. WEBUSE Method [8]

In the WEBUSE method there are several stages that must be carried out to find out the results of the system usability level analysis. The following are the stages in the WEBUSE method [12], namely:

    1) Determine the web system to be evaluated.
    2) Respondents filled out all the questions in the questionnaire following the system evaluation criteria, namely Content Organization and Readability, Navigation and Links, User Interface Design, Performance, and Effectiveness.
    3) Merit is used based on answers from users for each question, then accumulated for each usability category.
    4) Points for the usability category are the mean value of each category.
    5) The usability point of the website is the mean value of each category.
    6) Usability level is determined based on usability points.

In this study, data were obtained from an online questionnaire which was created using the Google Form with 24 questions and 5 options that were grouped into 4 usability categories. From this questionnaire, there is a merit value for each choice option which can be seen in table 1.

Table 1. Merit Value [13]

Option	Merit
Totally Disagree	0,00
Disagree	0,25
Neutral	0,50
Agree	0,75
Totally Agree	1,00

Hereafter, merit is accumulated based on 4 usability categories. The average score for each category is considered as usability points. Usability points for category x are defined as follows:

$$x = \frac{[\Sigma(Merit\ for\ each\ question\ on\ the\ category)]}{[Total\ of\ questions]} \quad (1)$$

Where:

x = Usability point

Σ = Total merit for each question

Usability assessment consists of several levels which can be seen from the calculation of usability points. Table 2 below shows the relationship between usability points and usability level.

Table 2. Usability Points and Level

Point, x	Usability Level
$0 \leq x \leq 0,2$	Bad
$0,2 \leq x \leq 0,4$	Poor
$0,4 \leq x \leq 0,6$	Moderate
$0,6 \leq x \leq 0,8$	Good
$0,8 \leq x \leq 1,0$	Excellent

3. RESULTS AND DISCUSSION

Table 3 below shows the grouping of 24 questions in 4 WEBUSE categories.

Table 3. Grouping questions in each category

Categories	Indicator	Question Description
Content, Organisation, & Readability	COR1	This system provides the information I need about industrial company data.
	COR2	I can easily find the information I want in this system.
	COR3	The available content is well structured.
	COR4	I can easily read the contents of this system.
	COR5	I feel comfortable and familiar with the language used.
	COR6	I don't need to scroll left and right when reading this system.
Navigations & Links	NL1	I can easily know where I am or what page I am on.
	NL2	The description of the icon display makes it easier for me to understand the function of the icon.
	NL3	I can easily explore this system by accessing links or going back to the previous page with the back button.
	NL4	The links in this system are well maintained and updated.
	NL5	When I explored the system it didn't open many new windows.
	NL6	Links and menus are placed by default throughout the system and I can easily recognize them.
User Interface Design	UID1	The user interface design of this system is attractive.
	UID2	The system's user interface design is up to date.
	UID3	I feel comfortable with the colors used in this system.

	UID4	This system has a consistent feel and looks on all pages.
	UID5	This system does not contain annoying features like text blinking.
	UID6	The design of this system is well-understood and easy for users to learn.
Perfomences & Effectiveness	PE1	I don't have to wait too long for a page to load.
	PE2	I can access this system most of the time.
	PE3	This system can be accessed with all browsers.
	PE4	This system responds to the actions I take according to my expectations.
	PE5	I feel right using this system without wasting time, effort, or money.
	PE6	The system always provides clear and usefull information when I don't know how to proceed with my actions.

Based on WEBUSE calculation results data from each category is shown in table 4.

Table 4. Points and Usability Level for each Category

Categories	Indicator	*Usability* Point	*Usability* Level
Content, Organisation, & Readability	COR1	0,80	Excellent
	COR2	0,75	Good
	COR3	0,75	Good
	COR4	0,75	Good
	COR5	0,95	Excellent
	COR6	0,85	Excellent
Navigations & Links	NL1	0,90	Excellent
	NL2	0,90	Excellent
	NL3	0,90	Excellent
	NL4	0,80	Excellent
	NL5	0,80	Excellent
	NL6	0,95	Excellent
User Interface Design	UID1	0,85	Excellent
	UID2	0,70	Good
	UID3	0,90	Excellent
	UID4	0,90	Excellent
	UID5	1,00	Excellent
	UID6	0,95	Excellent
Perfomences & Effectiveness	PE1	0,85	Excellent
	PE2	1,45	Excellent
	PE3	0,95	Excellent
	PE4	0,90	Excellent
	PE5	0,95	Excellent
	PE6	0,85	Excellent

Next, a usability analysis is carried out to determine the level of usability on the National Industrial Information System website. The results of the calculations are shown in table 5.

Table 5. Web System Usability Points and Levels

Variabel	*Usability* Point	*Usability* Level	*Usability Website* Point	*Usability Website* Level
Content, Organisations, & Readability	0,81	Excellent		
Navigations & Links	0,88	Excellent	0,89	Excellent
User Interface Design	0,88	Excellent		
Perfomance & Effectiveness	0,99	Excellent		

The results of the table calculations above refer to "(1)" as follows:

$$x = \frac{[\Sigma(Merit\ for\ each\ question\ on\ the\ category)]}{[Total\ of\ categories]}$$

$$x = \frac{0,81 + 0,88 + 0,88 + 0,99}{4}$$

$$x = \frac{3,56}{4} = 0,89$$

Based on these calculations, it shows that the usability level of the National Industrial Information System website gets a point of 0.89 which is included in the "excellent" level. These results indicate that the usability level of the National Industrial Information System website is following user requests.

4. CONCLUSION

Based on the analysis of the National Industrial Information System in the ILMEA Division of the Department of Industry and Trade of North Sumatra Province using the WEBUSE method, a point of 0.89 was obtained. So, this shows that the usability level of the National Industrial Information System website is at an "excellent" level. This means that the National Industrial Information System website is in accordance with the wishes of its users.

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