



Web-Based Management Information System PT. Bach Multi Global By Using The Design Thinking Approach Method

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Abstract. The increasing use of information technology has encouraged every organization to be able to utilize technology in carrying out various activities electronically. The increasingly rapid development of information technology, especially in the field of information systems, is a challenge for companies to be able to compete with other companies. Managers in various organizations are also expected to be able to quickly analyze their performance easily and consistently by utilizing available information technology. This is related to the management decision-making process, which is very important. PT. Bach Multi Global (BMG) was founded in 2006, starting as a generator set distributor in Jakarta and growing nationally in Indonesia. PT. Bach Multi Global has used information technology, but the information technology used is limited to using websites as information media containing company profiles, project lists, contacts, and products offered. The need for technology, especially management information systems, is also felt by PT. Bach Multi Global simplifies the decision-making process and enables the company's planning, control, and operational functions to be carried out effectively. Design thinking is a system design approach that can meet user needs and solve user problems. At the same time, UI/UX is the most critical part of a computer program because it is a communication process between the user and the computer system that can occur through the user interface.

Keywords: Design Thinking, Management information System, Desain UI.

1 Introduction

The increasing use of information technology has led every organization to be able to utilize technology in carrying out various activities electronically. Managers in different organizations are also expected to be able to quickly analyze their performance quickly and consistently with the use of available information technology. This is also associated with its importance in the management decision-making process. We know that there is still a need for more organizations in both the public sector and private sector organizations that implement management information systems in decision-making. Management Information Systems are a network of data procedures developed in an (integrated) system with the aim of providing management information (both internal and external) as a basis for decision-making. [1] PT. Bach Multi Global (BMG) is a company that was founded in 2006, starting as a generator set distributor in Jakarta

and growing nationally in Indonesia with the Austin Power and Himoinasa brands. Over time, the company developed by adding a new business unit called PT. Bach Multi Infrastruktur (BMI), where BMI is an integrated telecommunications contractor. Our business is to provide telecommunications solutions from partners to customers in the installation, rental, and maintenance of Base Transceiver Station (BTS) towers in various regions of Indonesia. BMG and BMI work together to complement each other, from the installation of Power (Genset), BTS, SITAC, and CME to their Managed Services, making this company competent and experienced in their respective fields and making the company PT. The Bach Group is one of the local companies that have the vision "To become a leading company and the main choice of customers in its industry."

PT. Bach Multi Global currently uses information technology, but the information technology used is limited to using websites as information media containing company profiles, project lists, contacts, and products offered. The increasingly rapid development of information technology, especially in the field of information systems, is a challenge for companies to be able to compete with other companies. The need for technology, especially management information systems, is also felt by PT. Bach Multi Global simplifies the decision-making process and enables the company's planning, control, and operational functions to be carried out effectively.

In building an information system to meet the basic needs of users, a method is needed so that the problems experienced by users can be defined and resolved well. User interface (UI) is the way programs and users interact. User Interface can also take the form of a visual display of a product that bridges the system with the user. The UI appearance can include shapes, colors, icons, and writing that are designed to be as attractive as possible. In simple terms, the UI is the most critical part of a computer program because it is a communication process between the user and the computer system that can occur through the user interface.[2] Meanwhile, User Experience (UX) can be interpreted as the user's response or perception when using a product or service system, which includes several variables, such as Preferences, observations, feelings, beliefs, attitudes, and results of the use process before and after using the product.[3] Apart from that, building a system also requires an approach method. One approach method that can be used is design thinking. Design thinking is a system design approach that can meet user needs and solve user problems.[4] Apart from that, using the design thinking method creates a solution by offering better products and services [5]. Based on the literature review that has been mentioned, this research aims to create a UI/UX design model by innovating to create a management information system for PT. Bach Multi Global, where previously all decision-making processes were carried out manually, namely by only using Microsoft Excel in the decision-making process, was considered very ineffective, and the results could have been more accurate. Therefore, with this research and the design of a management information system using the Design Thinking Approach method, it will be easier for PT. Bach Multi Global, in the decision-making process, enables the company's planning, control, and operational functions to be carried out effectively and obtain more accurate results. Thus making PT. Bach Multi Global can compete in the decision-making process by implementing all digitalized procedures.

1.1 Information Systems

Information Systems An information system is a system that provides a number of information for management's needs in making decisions related to the implementation of company

operations.[6] Information systems are an inseparable part of a modern organization, even for several types of companies, in order to compete in the industry.[7] Apart from that, information systems can be utilized to provide information quickly, and from a management perspective, it is instrumental in making decisions.[8]

1.2 Management Information System

Management Information System Management information systems are also a tool to support operational activities, simplify management monitoring, and increase company or organization productivity.[9] In addition, a management information system is defined as an electronic device that functions to process data, can receive input and output, has high speed and accuracy, and can store instructions for solving problems.[10]

1.3 UI/UX Design

UI/UX Design UI/UX design is essential because good, user-friendly design can make users feel comfortable using the product. [11] UI/UX describes a set of concepts, guidelines, and workflows that can be used to think critically about the design and use of products in interactive ways, map-based or otherwise. [12] When developing a startup, UI/UX design is an essential step because it gives the first impression to potential users. [13]

1.4 Design Thinking

Design Thinking The design thinking method is a human-centered innovation approach formulated so that designers must integrate human, technological, and business needs.[11] In addition, design thinking can also be interpreted as an iterative process in which developers seek to understand users and their assumptions and redefine problems in an effort to identify alternative strategies and solutions.[14] The design thinking method is a UI/UX design method that has five stages in it [15].

METHODOLOGY

Design Thinking is a solution-based problem-solving method that only focuses on repeated user experiences. In the way used, there are five stages, namely Empathize, Define, Ideate, Prototype, and Test. The following are the stages of the Design Thinking method, which can be seen in Figure 1.

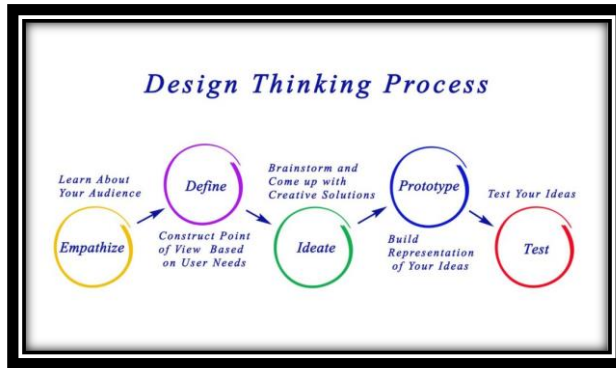


Figure 1. Methodology

1. *Empathize*

Empathize The empathize stage is the stage where the process of empathetic understanding of the problem you want to solve. The knowledge of the problem to be resolved is carried out through direct observation and interviews with resource persons, in this case, stakeholders/users who will use the management information system.

2. *Define*

Define The define stage is the stage where the process of getting user opinions and understanding user needs is done by creating a user persona, which will later become the essential basis for designing a product or application. In other words, at this stage, an analysis of the problems faced by the user is carried out, and the problem is defined using the Point of View (POV) method.

3. *Ideate*

Ideate The ideation stage is the stage where the process of drawing a solution from various ideas is then described through brainstorming. At this stage, ideas are formulated as solutions to deal with problems that have been analyzed and defined in the previous step. Determining solution ideas is carried out through a brainstorming process, which will then be implemented in the next stage, namely the prototype.

4. *Prototype*

Prototype Prototyping is the process of creating a display design that you want to build and then implementing the idea to produce a prototype or product that is ready to be tested. At this stage, UI/UX implementation is also carried out.

5. *Test*

Test The test is the final stage of this approach method; the test is a technique used to carry out evaluation activities in which there are several questions or a series of tasks that must be completed or answered by participants. This test was carried out using a system testing method, namely black box testing, and then evaluation was carried out by distributing questionnaires to users.

2 Result And Discussion

After the user adds the products, they want to buy, the buyer can press the shopping cart icon, which will take them to the page showing the total products to be purchased (see figure 9), then proceed to the checkout process for the buyer's order, as shown in figure 10.

Based on the results of applying the Design Thinking method in UI/UX Design in the PT Management Information System. Bach Multi Global (BMG), which has been built, obtained the following results:

2.1. Emphasize

Based on the results of interviews with supervisor, coordinator, and pic users, which are mapped into an empathy map which can be seen in Figure 2.

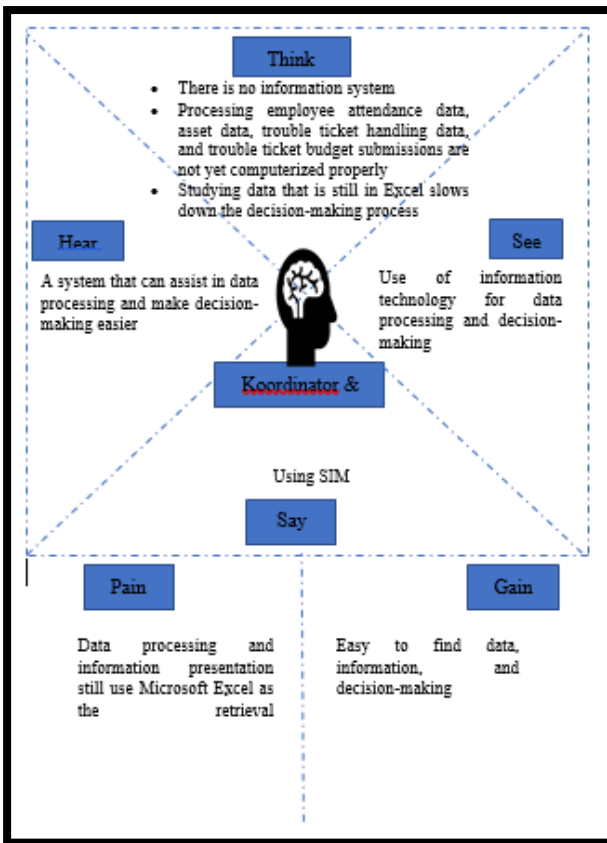


Figure 2. Emphasize Map

2.2. Define

Define The define stage defines the problem from the empathize stage. At this stage, the problem definition uses the Point of View (POV) method, which can be seen in Table 1.

Table 1. Point Of View (POV)

No	Problem	Need
1.	Processing employee attendance data, asset data, trouble ticket handling data, and trouble ticket budget submissions still needs to be appropriately computerized.	Systems that can make data processing easier,
2	Studying data that is still in Excel slows down the decision-making process.	A system that can present information quickly, precisely, and accurately
3	There is no management information system	A management information system that can facilitate data processing and presentation of data in decision-making

2.3. Ideate

This stage is a continuation stage of the define stage, where this stage is carried out to solve the problems that exist at the define stage. In looking for solutions to solve problems, brainstorming was carried out to get solution ideas, which can be seen in Table 2.

Table 2. Solution Ideas

No	Solution Ideas	Implementation
1	Designing a Management Information System using UI/UX	Implementing a Management Information System
2	Building a system that can simplify the processing of attendance data, asset data, trouble ticket handling data, and trouble ticket budget submission.	Adding data editing, data viewing, report, and search features

2.4. Prototype

The prototype stage is an implementation of the ideate stage. Prototype designs for Management Information Systems include the following:

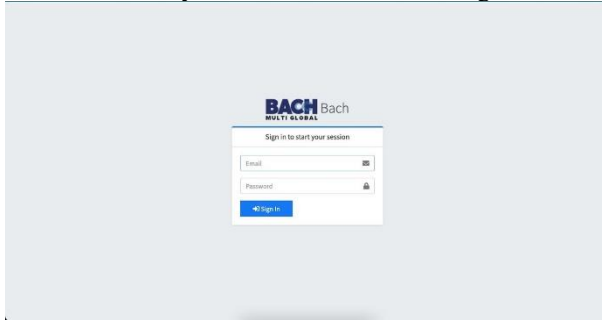


Figure 3. Prototype - System Login Page

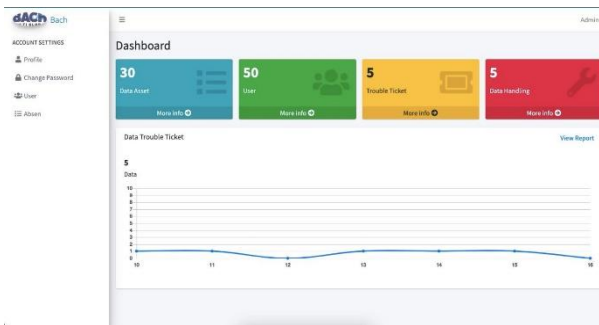


Figure 4. Prototype – Main Page/Dashboard

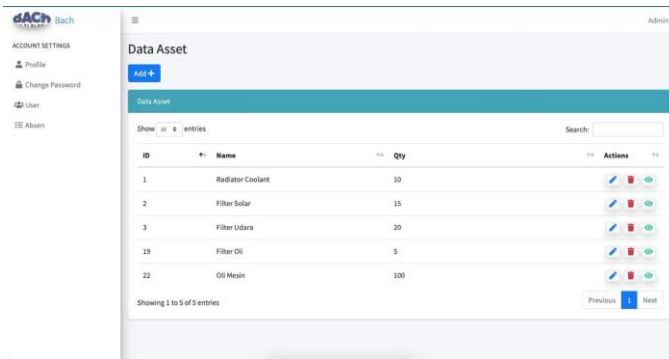


Figure 5. Prototype – Assets data processing

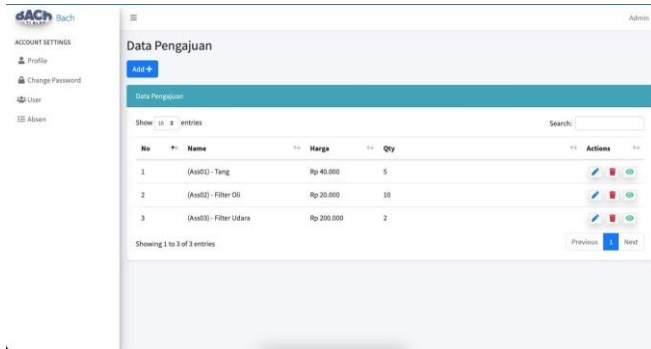


Figure 6. Prototype – Handling Trouble Ticket

2.5. Test

The final stage of design thinking is the testing stage. This test was carried out using a system testing method, namely black box testing. The following is a system testing table, which can be seen in Table 3.

Table 3. System Testing.

No	Task	Sub Task
1.	System Login	Enter User Name and Password. Press the Enter button
2.	Change Password	Select the Profile Page menu. Memasukkan kata sandi baru Enter a new password. Select the confirm button.
3.	Menu List	Selects a menu and displays the selected menu
4.	Perform a Search	Select the search menu. Enter keywords. Enter keywords.
5.	Add employee data	Select the employee menu. Fill out the form. Press the add button.
6.	Add assets data	Select the assets menu Fill out the form. Press the add button.
7.	Add trouble ticket handling data	Select the trouble ticket handling menu. Fill out the form. Press the add button
8.	Edit employee data	Select the employee menu. Edit data on the form. Press the add button.
9.	Edit assets data	Select the assets menu. Edit data on the form. Press the add button.
10.		Select the trouble ticket handling menu.

No	Task	Sub Task
	Edit trouble ticket handling data	Edit data on the form. Press the add button.
11.	Approve handling ticket submission data	Select the trouble ticket handling menu. approve the data on the form. Press the add button.
12.	System Logout	Select the exit button. Select the yes button

3 Conclusion

Based on the description of the research stages that have been described, it can be concluded:

1. The Design Thinking method can support UI/UX design in the PT Bach Multi Global Management Information System well.
2. The results of the Management Information System prototype testing that has been carried out show that the management information system is in accordance with requirements and the system has no errors.

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