

PROFITABILITY DASH BOARD DESIGN TO PROVIDE FINANCIAL PERFORMANCE ANALYSIS WITH USER CENTERED DESIGN METHOD

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ABSTRACT

The financial performance report is a very important thing for the company. For this reason, the company must be able to measure and evaluate the financial performance in order to achieve the results that have been set. One of the financial performance reports that must always be informed is the company's profit and loss report. The report contains all information regarding the income and expenses. The importance of this information must be communicated to stakeholders, so that it can assist in making strategies and making decisions for better results. Based on interviews conducted with several branch heads at the company, they wanted a more simple and informative report, such as a dashboard display. This dashboard is expected to help them in getting information and analysis that is easy to understand. To accommodate these needs, research was conducted on the design of the profitability dashboard to improve company performance. In this study, we develop a dashboard related to all information about profit and loss for each branch at company. The information provided in a dashboard designed such as data on Net Interest Income, Non Interest Income, Loan Recovery Income, OPEX, Shadow Income, Provision Expenses and other information that will be packaged in an interactive dashboard with user centered design method using the Microsoft Power BI application.

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1. INTRODUCTION

Currently, companies are often faced with rapidly changing business environments. In this regard, the company needs to carry out continuous monitoring and measurement of organizational performance to ensure the achievement of the goals that have been set. The performance monitoring process requires precise and accurate data and information, so that the decision-making process can be carried out properly.

Within the company, stakeholders must know how the performance of the business they are currently running. Whether its performance has provided maximum benefits or not. In addition to the results obtained, it is also very important to know what factors affect the company's profit and loss. This can be used as a comprehensive evaluation material so that

what is already good is maintained, while what is not good can be found out about the problem and solutions for future improvements.

At the company also monitors the profitability. The branch heads are always reminded by management in monitoring the performance of their respective branches. One of the performances that must be monitored is related to branch profit and loss. To find out this information, branch heads are routinely every month in receiving branch profit and loss reports. The format of the report provided is in the form of MS Excel which consists of long rows and columns. Based on interviews conducted with several branch heads, there were many complaints about the report format which according to them was less informative in terms of appearance and the information provided is incomplete such as no information on trend data for previous months in the same year and data for the same month in the previous year. This causes difficulties in understanding and analyzing reports quickly and accurately to make better business strategies.

To accommodate what is needed by the branch head, a profitability dashboard design is made that can be used to help display or model an analysis result in the form of an interactive graphic report that is easily understood by the user. The profitability dashboard that will be created can combine existing data into a visual display that is easy to understand and digest so that it can provide convenience to branch heads in knowing the current condition of their branches and in making decisions based on the results of the analysis provided.

Based on this background, research was conducted, where the purpose of the research was to describe how the profitability dashboard is designed as a tool to improve financial performance at the company. This research is expected to provide benefits to branch heads, especially in understanding and using this profitability dashboard to improve business performance.

The dashboard that we develop uses Microsoft Power BI in managing data. This is motivated by several advantages such as interactive graphic display, having many graphic visualization tools, managing relationship features to detect relationships between tables automatically, and being able to do forecasting. Microsoft Power BI features an editor queries that are able to analyze up to millions of data from various sources. Therefore, it is hoped that the development of dashboard-based business intelligence can help stakeholders to know the condition of their company's business processes, as well as a reference in making decisions in carrying out the company's business strategy.

2. LITERATUR REVIEW

2.1 Performance Measurement

Performance measurement is a process of assessing the progress of work towards goals and objectives in managing human resources to produce goods and services, including information on efficiency and effectiveness of actions in achieving organizational goals [1]. Some of the fundamental and most basic aspects of performance measurement are:

- a. Setting organizational goals, objectives and strategies, by defining in general what the organization wants in accordance with its goals, vision and mission.

- b. Formulating performance indicators and performance measures, which refer to indirect performance appraisals, while performance indicators refer to direct performance measurements in the form of critical success factors and key performance indicators.
- c. Measuring the level of achievement of organizational goals and objectives, analyzing the results of performance measurements that can be implemented by comparing the level of achievement of organizational goals and objectives.
- d. Evaluating performance by assessing the progress of the organization and making quality decisions, providing an overview or results to the organization of how big the level of success is and evaluating what steps the organization will take next.

Performance-based management requires a tool called performance measurement, which is a tool to assess the success or failure of an organization, program, or activity [2]. In other words, performance measurement is a key element of performance-based management. Performance measurement must at least include three important variables that must be considered, namely behavior (process), output (direct product of an activity/program), and outcome (value added or impact of activity/program) which are interrelated, interdependent on one another.

Performance measurement is a management tool used to improve the quality of decision making and accountability [3]. Performance measurement is used to assess the success/failure of implementing activities/programs/policies in accordance with the goals and objectives that have been set in order to realize the mission and vision of the organization. Performance measurement is a method or tool used to record and assess the achievement of implementing activities based on goals, objectives, and strategies, so that organizational progress can be known and improve the quality of decision making and accountability [4].

2.2 Business Intelligence

Business Intelligence (BI) is defined as all applications that support the analysis and reporting of enterprise data to improve decision making that leads to better corporate control. Decision makers need to be provided with reliable information, filtered from all the raw data the company has obtained in the past. Its main goal is to turn this raw data into valuable and actionable information [5].

Business Intelligence (BI) systems are an integral part of the IT service platform in many companies [6]. BI systems provide reporting and analytical capabilities for enterprises by integrating data collected from various internal and external sources, and providing BI system users with data visualization tools to improve organizational decision making. BI is also defined as a system that combines data collection, data storage, and knowledge management with analysis to evaluate complex enterprise and competitive information for presentation to planners and decision makers, with the aim of improving the timeliness and quality of input for the decision process. Business Intelligence (BI) is a set of mathematical models and analytical methodologies that exploit available data to produce information and knowledge that is useful in complex decision-making processes [7].

Some of the benefits obtained when companies implement Business Intelligent [8]:

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1. Increase the value of organizational data and information
By using BI, all data and information can be integrated so as to produce a conclusion from the business situation that is more accessible so that it can help stakeholders in making better decisions.
2. Facilitate the measurement of organizational performance
In measuring the performance of an organization using Key Performance Indicators (KPI). Business Intelligent can easily show the achievement of KPIs in a company quickly and precisely. This will make it easier for the parties involved in decision making to prepare anticipatory steps if there are indicators that have not reached the target.
3. Improve cost efficiency
Business Intelligent can improve cost efficiency because it can help speed up someone in doing work so that it saves time and makes it easier to use. The time needed to search for data and get the information needed is getting shorter.

2.3 Power BI

In developing the performance dashboard, Power BI (Microsoft Power BI, 2015b) is used as a platform. Power BI was developed by Microsoft in September 2013 for Office 365. Power BI was first publicly released on July 24, 2015 [9]. Power BI is a cloud-based data analysis from multiple data sources that can be used for data analysis and reporting. Power BI is a Microsoft application that is able to visualize data more easily and interactively [10]. This application is able to display data in real time in the form of a dashboard that is able to view detailed data more fully. Power BI can visualize data from Excel, SQL server, web, CSV. Some of the components of Power BI include [10]:

4. Visualization
Visual is a representation of data, it can be in the form of graphics, color-coded maps, and other visual forms.
5. Datasets
Datasets are collections or sets of data used by Power BI to create data visualizations. Datasets can be in the form of excel tables, online databases.
6. Report
This is a page that displays a visualization of the datasets. Reports can be in the form of charts or graphs.
7. Dashboards
It is an integrated view and displays a set of reports from a set of datasets. The dashboard provides data information, analysis, and provides an overview in the form of dashboard visualization.

2.4 Dashboard

Dashboard is a visual display of important information, which is needed to achieve one or more goals by combining and organizing information in one view, so that information can be monitored at a glance [11]. Dashboards can be defined as a visual information presentation mechanism in a performance management system that presents critical information about the performance of operational processes at a glance [12]. Through the use of data visualization, dashboards simplify complex data to display data that is easier for

users to read to measure current business performance [13] [14]. Important features of the dashboard include the interface and the ability to pull real-time data from multiple sources.

Things that must be considered in creating a dashboard are [11] Dashboard is a visual display consisting of text and graphics. Information can be conveyed more effectively by emphasizing graphic form. Dashboard only displays information needed to achieve organizational goals. Information for each field must be sufficient and displayed in one screen, so that the user can reach all the information in one view. The dashboard display should be concise, clear, and intuitive. Use visualizations according to the type of information displayed.

The benefits of dashboards on organizational activities are as follows [15]:

1. Improve the work decision-making process with the ability to identify and correct negative tendencies, the ability to make better decisions based on information obtained through business intelligence, the ability to measure the level of organizational efficiency, the ability to perform better analysis through performance measurement presentations, and the ability to align strategy with organizational goals
2. Improve employee efficiency by increasing productivity, save time because employees do not need to compose a lot of reports, reduce the need to create and manage large amounts of static reports, easy to understand so it doesn't require complicated training
3. Motivate employees by preparing detailed reports on the latest conditions, users have more time to analyze and less time to collect and format data, dashboards provide a medium for sharing strategies, tactics and operational data that empower employees to understand company goals and make the right decision

3. METHOD

3.1 Literature Study and Problem Identification

Literature study was conducted to understand the material, basic knowledge and concepts of the dashboard design method used and to find out the problems faced. Surveys and literature studies are used to determine the topic by analyzing the background of the problems related to the profitability dashboard design and observing directly the problems that exist in company. At this stage, the limitations of the problem, objectives, and benefits of determining the topic of this thesis are also determined. To support the background of the problem and the formulation of the problem related to the thesis topic, a literature review was carried out from previous research studies related to the dashboard design model using the User Centered Design method.

3.2 Identification of Components for Dashboard Development

The dashboard development components consist of:

1. Financial analysis dashboard
Financial analysis is a component that will be displayed on the dashboard. Based on the identification of needs conducted through surveys and interviews, it was found that there is no visualization that describes the financial condition related to profit and loss in company. In addition, a literature study was conducted to find out what financial analysis needs to be known by branch heads. Based on this, it is found that financial analysis can be done through data sources which include:
2. Profitability

To find out the condition of the business, the following financial analysis can be carried out which includes: net interest income, non interest income, operational income, provision expenses, profit before tax. The source of data for conducting financial analysis is the monthly report issued by the finance teams of company, which is still in the form of raw data.

3. User

Branch leaders must be able to understand the visualization displayed on the dashboard.

4. Database

In the design of financial dashboards, there are data sources that must be processed for financial analysis purposes. The technology in Power BI is able to collect interconnected data for processing and display in an interactive dashboard. The stages of data management consist of identifying data sources by means of mapping, extracting, transforming and making data models.

5. Visual Design

Dashboard is a tool that relies on human visual ability in understanding the information presented, so the design factor becomes an important part. The use of dashboards must be able to see meaningful relationships between data through effective and clear visual designs.

3.3 Software Architecture

To describe in general the designed financial dashboard, it can be seen from the software architecture. The architecture of this financial dashboard is divided into several layers, namely the presentation layer, business layer and database layer. Each layer has its own function. The presentation layer contains features related to the dashboard interface that are directly related to the user. Graphics showing financial analysis are on this layer. In Power BI there is a Dashboard feature to display the dashboard interface. The second layer is the business layer, the business layer contains all processes related to the calculation of financial-related data to be processed to produce financial analysis. The third layer is the database layer, the database layer contains the datamart. The datamart is modeled using the features in Power BI.

3.4 Dashboard Design Using the User Centered Design Method

User Centered Design (UCD) is a method used in designing designs that focus on user needs [16]. In relation to information systems, UCD is part of the System Development Life Cycle (SDLC), so that the design of applications developed through UCD will be optimized and focus on the needs of end-users so that it is hoped that applications that will follow user needs and users do not need to change behavior to use application. In general, there are 4 stages in the UCD process, namely:

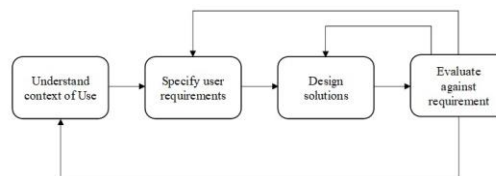


Figure 1. User Centered Design Process

The selection of the dashboard design method is based on the focus to be achieved, namely the branch heads understand the dashboard display functionally to make it easier to analyze data and make decisions to carry out future strategies. Based on this method, there are stages of needs identification, analysis, design, prototype development, testing, and implementation. To be adapted to the implementation of the profitability dashboard design, the model is detailed as shown in figure 2 below:

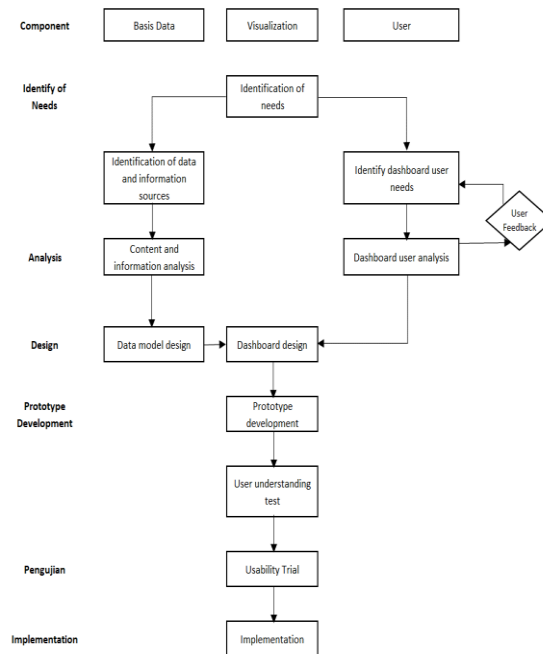


Figure 2. User Centered Design Model

4. RESULT AND DISCUSSION

4.1 Identification Needs

At the stage of identifying the needs of branch heads, identification of needs includes identification of data and information sources, financial analysis and identification of dashboard user needs. The identification carried out is:

1. Identification of data and information sources

At the identification stage of data and information sources, observations were made on the data and information used for the calculation of profitability. This data and information is used as material for reporting profit and loss for each branch in the company. The data source comes from the company's data warehouse which is still in the form of raw data.

2. Identify financial analysis

Financial analysis is a component that will be displayed on the dashboard. Based on the identification of needs, it was found that the company has no visualization in the

form of a dashboard that describes the condition of branch profitability. In addition, a literature study was conducted to find out what financial analysis needs to be known by the branch head. Based on this, it is found that financial analysis can be carried out through monthly report data sources which include:

Table 1: Identify Information Needs for Profitability Analysis

Stakeholder	Financial Analysis	Benefit
Branch Manager	Net Interest Income	To find out the income received from interest
	Non Interest Income	To find out the income received other than interest
	Shadow Income	To find out the income received from wealth management products
	Operational Expenses	To find out the costs incurred for operations
	Provision Expenses	To find out the reserves made to anticipate non-performing loans
	Profitability	To find out the total profit of the branch

3. Identify dashboard user characteristics

The head of the branch must be able to understand the visualization displayed on the dashboard. To be able to design a dashboard that makes it easier for users to understand the data displayed, a persona is created that contains information about name, age, frequently asked questions, behavior, work environment and obstacles experienced.

4.2 Design

In designing the profitability dashboard, the data used comes from the company's data warehouse, where the data will be updated every month and need to be processed again for profitability analysis. There are several stages that are carried out starting from the withdrawal of raw data from the system, the mapping process according to the organization in the company, the process of integrating it into power BI so that the Dashboard is generated. The technology contained in Power BI is able to display attractive and easy-to-understand visualizations. The following is an overview of the system design that will be made in profitability dashboard.

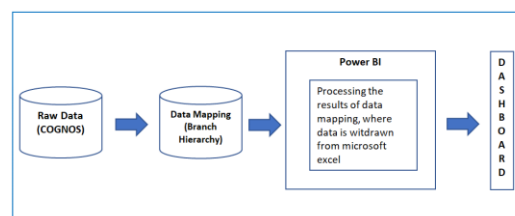


Figure 3. System Design

4.3 Usability Trial

The next stage is to test the prototype using usability testing to ensure that all functions work well and to look for errors that may arise when the system is used. Testing is also to get feedback from users to improve the capabilities and development of the dashboard. Usability is the degree of ability of a software to help users complete a task. There are 5 measures of the level of usability of a system [17] learning, efficiency, memory, error, level of satisfaction.

4.4 Implementation

After the evaluation/testing process shows the expected results, the last stage is the implementation of the prototype into its operational environment, by carrying out the installation process to the parts that have been identified in the early stages of needs. Followed by socialization of the use of the dashboard and user training. Periodic maintenance and repairs need to be done so that the dashboard can adapt to changes in the business and organization.



Figure 4. Profitability Dashboard

5. CONCLUSIONS

The result of this research is the submission of a dashboard development model in a user-centered design framework. By using the user centered design method allows developers to immediately find out level of user acceptance of the prototype made and allow for improvement further flexibly based on feedback given by the user. This prototyping will continue accompanied by assistance to users. The model will help in presenting a profitability dashboard that is tailored to the needs, in the domain of specific access rights, the use of appropriate database technology, and visual design and user-friendly interfaces. Suggestions for further research, the model that has been developed in this study needs to be evaluated and validated to get the optimal model to then be applied in making prototypes and implementing dashboards.

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