Development of Intelligence Dashboard at BMT AL-Munawwarah

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***Abstract*—In last 2 years, BMT Al-Munawwarah decreased performance; targets companies that have determined can not be achieved. BMT Al-Munawwarah executives must determine what the best decision would be taken and also determines strategies for the company that will improve the performance of the company. To improve performance, executives are reading a company report, but the report is still separate and not integrated, which makes executives difficult analyzing the data and determining the right decision. Therefore, BMT Al-Munawwarah needs an Intelligence Dashboard that can help executives in dealing with such problems. In this research, systems development method used is the object-oriented system development utilizing Unified Modeling Language (UML) notations, and prototype development models. Thus, it is using Linear Trend Forecasting; the Least Squares method. The programming language used is the Hypertext Preprocessor (PHP), as the XAMPP web server and My Structure Query Language (MySQL) as the database. The results of this study are an Intelligence Dashboard that can display data in graphs and pictures so excecutives can assist in controlling the development of the company, and policy decisions and company strategic planning.**

***Keywords* — Intelligence Dashboards, Executive, Object Oriented Methods, Prototype, Least Square, BMT Al-Munawwarah.**

I. PRELIMINARY

1.1 Background

One of using information technology is to help the top-level managers or executives to obtain information that will be used as a base or foundation executive decision making. Baitul Maal Wat Tamwil (BMT) Al-Munawwarah is one Islamic microfinance institutions in Indonesia. BMT Al-Munawwarah had decreased their performance in last 2 years and executive tasks BMT Al-Munawwarah is to restore or improve the company performance. To improve the performance of the company which had dropped, executive BMT Al-Munawwarah will determine the decisions to be taken by using a company report, but the report is still a separate and not integrated, which makes executives difficulties in analyzing the data and determining the right decision.

Based on the above, the study titled "Implementation of Intelligence Dashboards at BMT Al-Munawwarah Center" is interesting and worth to be developed.

1.2. Formulation of the Problem

Based on the problems described in the background, the formulation of the research problem is:

1. How to design and build Intelligence Dashboard that can help executives to monitor and manage the information needs of in the form of tables, graphs and pictures?
2. How an Inteligence Dashboard can be a reference for the company to determine the company's decisions and plan strategies?

1.3. Limitations of Research

To focus more on the writing, the thesis research is limited with emphasis on:

a. This system only can be used in BMT Al Munawwarah for both headquarters and branch offices.
b. Data entered into the system is a data dummy with period of 2 years, by October 2010 until October 2012.
c. Manufacture of UML (Unified Modeling Language) is not reached the stage of Statechart Diagrams, Colaboration Diagram, Component Diagram and Deployment Diagram.
d. On financial data, the system does not include calculation rocess accounting.
e. Not discuss about security and network systems on intelligence dashboard are made.
f. Forecasting does not cover products made mudaraba, Musharaka, savings, and other deposits. Forecasting is only for murabaha product.
g. This system is not enggaging implementation stage.

1.4. Purpose Research

The purpose of this research is to produce an intelligence dashboard in BMT Al-Munawwarah.

II. THEORY

2.1. Basic Concepts Design Build

Design is a set of procedures to translate the results of the analysis of a system to the programming language to describe in detail how the components of the system are implemented. Understanding the development or activity

creates up system is a new system and replace or repair the existing system in whole or in part (Pressman, 2002).

2.2. Business Inteligence

Here is a definition of Business Intelligence System according to the experts is:

According Lonnqvist and Pirttimaki (2006) defines that:

"*Business Intelligence System is an organized and systematic process by which organizations acquire, analyze, and disseminate information from both internal and external information sources significant for their business activities and for decision-making*".

Common functions of BI technologies are reporting, OLAP (online analytical processing), data mining, business performance management, benchmarking, text mining and predictive analytics.

2.3. Dashboard

Dashboard is a tool that provides a visual display interface that presents important information needed to achieve a certain goal, at a glance in a single screen (screen). There are several types of the dashboard, according to Rasmussen, in his book "Business Dashboard", mentions:

- Strategical Dashboard which serves as a support line with the organization's strategic goals.
- Tactical Dashboard serves as a support measure progress in key projects or initiatives.
- Operational Dashboard that supports the monitoring of the activity of specific business processes.

2.4. Business Intelligence Dashboard

Dashboard is a category of business intelligence applications in real time to monitor various informations needed by an organization or a company. It has facillities with a variety of graphical formats such as gadgets, typically gauges, charts, indicators, and color-coded maps that enable them to make faster and effective smart decisions.

2.5. CSF Analysist

CSF is a method of analysis by considering some critical things within the company to define the factors that influence the success and the success of the company or organization and can be determined if the objective organization has been identified. CSF analysis gives an overview of the company on critical aspects of what in every activity and business processes that affect the performance of the company in achieving its vision and mission as well as its continued success.

2.6. SWOT analysis

According to Jogiyanto (2005) SWOT analysist (Strengths, Weaknesses, Opportunities, and Threats) is also called KEKEPAN is used to assess the internal strengths and weaknesses of the resources of the company and external opportunities and challenges faced.

2.6. KPI (Key Performance Indicator)

Key Performance Indicator (KPI) is indicators that can be measured (measurable). This means that for each Key Performance Indicator (KPI), both quantitative and qualitative measures already provided information about the type of data that will be extracted, data sources, and how to get the data. In addition to the criteria of "measurable", the Key Performance Indicator (KPI) should also have a number of other criteria. In some literature mentioned criteria Key Performance Indicators (KPIs) which among others include: Specific, Achievable, Realistic, and Timely, which when combined with Measurable criteria can be summarized in the acronym SMART.

III. METHODS OF RESEARCH

3.1.1. Data Collection Method

Data collection methods which used in this study are:

3.1.2. Observation Method

Observational data collection is done with a direct view of business processes and activities running on BMT Al-Munawwarah.

3.1.2 Interview Method

This interview was conducted discussion with several sources that the Director, Chief Operating Officer, Head of Marketing and Head of Branch. Interviews were conducted by asking questions about all the necessary requirements in the manufacture of the system.

3.1.3 Literature Study

Literature study is done by backtracing the theories that related to intelligence dashboard. These theories come from books, journals and research. The books are used, among others, Building Intelligence dashboard and Other Decisions Support Application, Prototype Development Methods, Design Methods and Analysis of Systems and others. As for the type of research, there are 8 similar researches that used to be used as a reference and comparison in the study.

3.2. Systems Development Method

Systems development methodology used in this research is a Prototyping method (Watson, et al. 1997) with 8 phases: Proposal, Determine Information Requirements, Select Intelligence Dashboards Software, Preparing Prototype, Preparing Data, Design Screens, Initial Rollout Version, and The Intelligence Dashboard Receives Ongoing Support.

4.1. Proposal

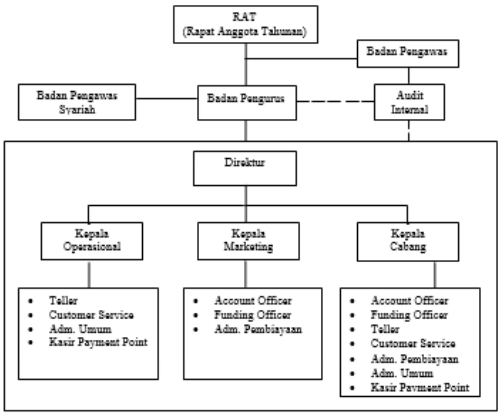
At this phase the researcher made a proposal to the supervisor and to the executive of BMT Al-Munawwarah for subsequent approval by both parties and making an Intelligence Dashboard can be run on the next phase.

IV. DETERMINE INFORMATION REQUIREMENTS

4.2.1 Identify

Based on observations and interviews, researchers found the existing problems in BMT Al-Munawwarah which needs information reported to the executive (director) performed by each part of the company separately. This makes the executives have problems in performing their duties, because the current system is the executive must reunite incoming reports from each division. It can make the executive not quick enough in taking action and decision, also in strategic planning company that will be applied.

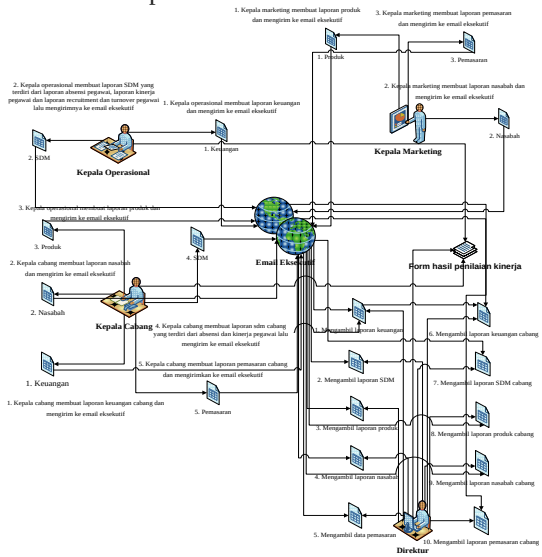
4.2.2 Understand



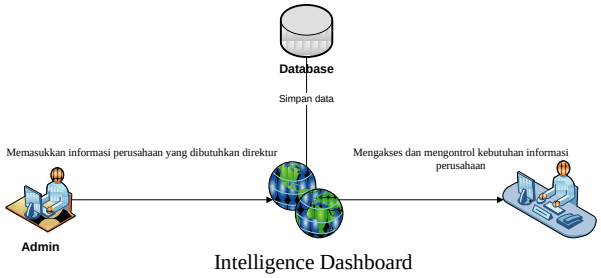
Picture 1. Company Organizational Structure

4.2.3 *Analysis*

Analysis of system requirements and system description describe in the rich picture below.



Picture 2. Rich Picture of Ongoing System



Picture 3. Rich Picture of Proposed System

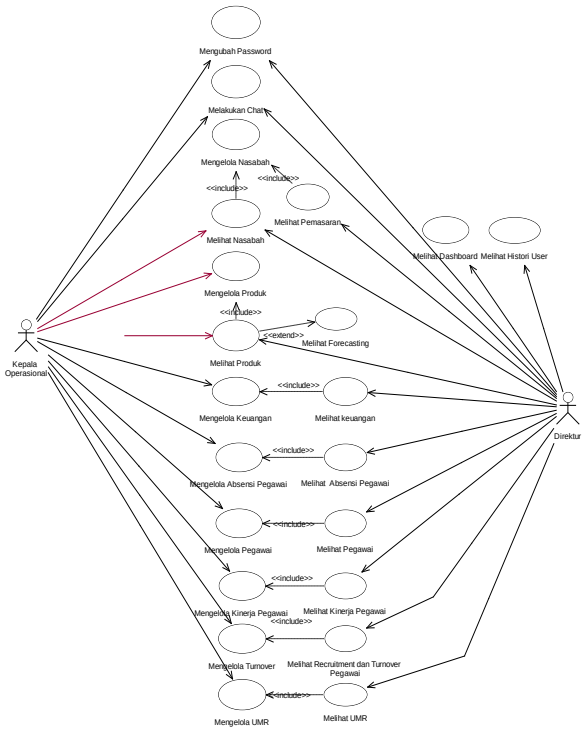
4.3. Select Intelligence Dashboard Software

At the stage select intelligence dashboard software, researchers using the programming language PHP. PHP programming language can be dynamic because in addition to cover all the features needed in the development of the intelligence dashboard, PHP adopting features of client / server and web-based which recently needed to replace the intelligence dashboard application development features which previously only usual client / server. So that executives can access the intelligence dashboard applications from anywhere available internet access service in the region.

4.4. Prepare Prototype

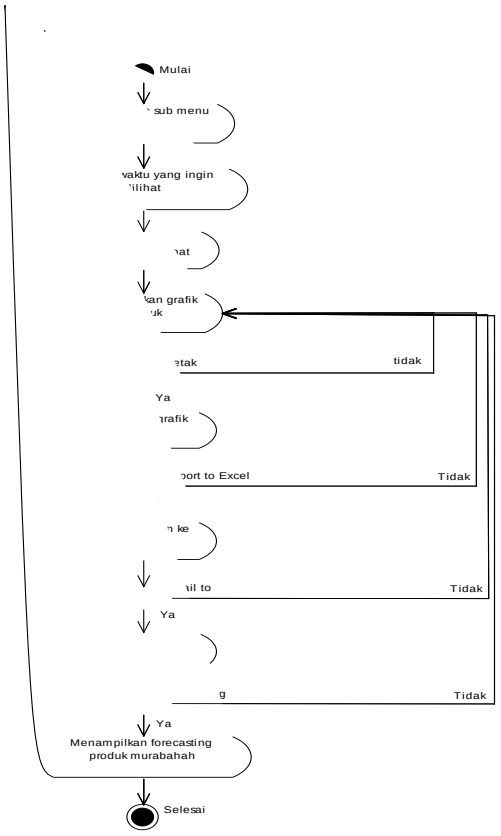
4.4.1 Design Process

4.4.1.1 Use Case



Picture 4. Use Case Diagram

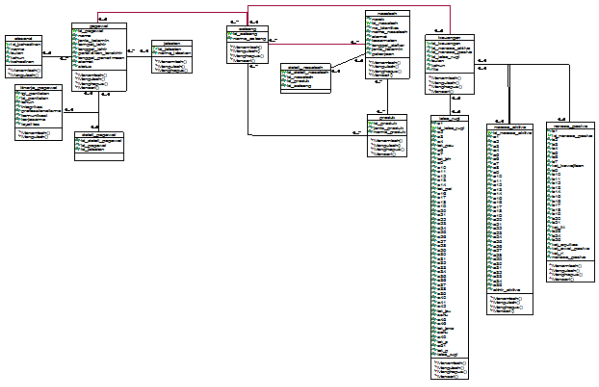
4.4.1.2 Activity Product Information



Picture 5. Activity Diagram Product Information

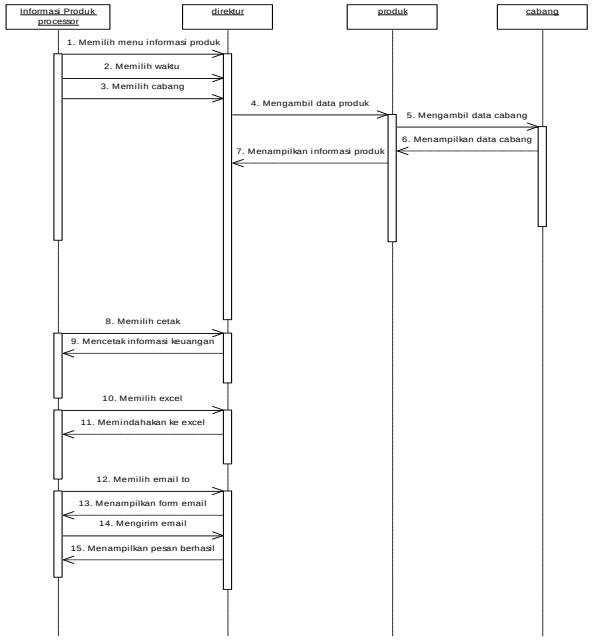
Activites that occur in the image above are the activity director product information on the sub menu. In this sub director can see and monitor the product graph BMT Al-Munawwarah. Before looking at the graph product, the director can choose the desired branch and must choose the time it want to display. Once it have selected, the system will display graphic products.

3.1.1. *Class Diagram*



Picture 6. *Class Diagram*

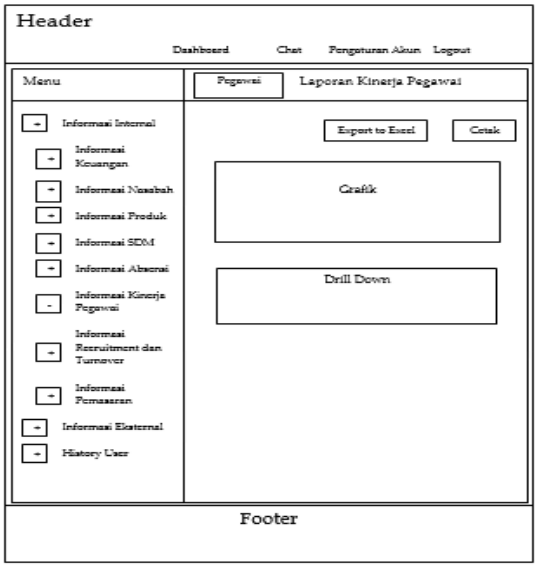
4.4.4 Sequence Product Information



Picture 7. Sequence Diagram Product Information

Sequence depicted in the image above is the actors in the sub menu choose the product information. In the process, the sub menu will be connected with the product information and product object object branch.

4.4.2. Desain Interface



Picture 8. Design Interface

4.5. Prepare Data

Based on the prototype test conducted by researchers also director of BMT Al-Munawwarah, there are some

additions that should be entered into the system, as for some of the additions are:

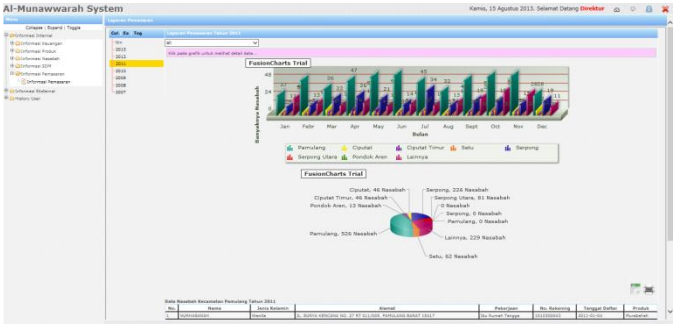
1. The addition of sub menu employee turnover information on human resource information menu.
2. The addition of a sub menu of marketing result information on the human resources information menu.

4.6. DESIGN SCREENS

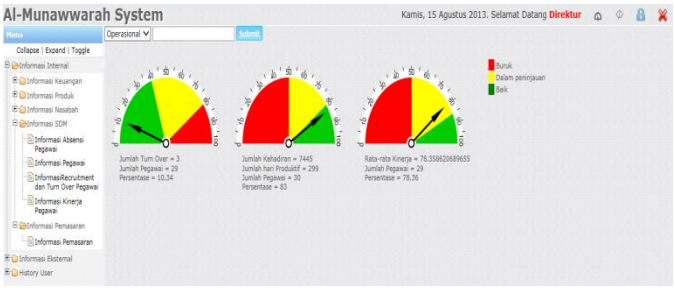
4.6.1 Interface Design

For interface design, there are 2 (two) additional interface designs for user interface layout. There are additional layouts for director of recruitment: employee turnover and marketing result information.

Picture 9. Login



Picture 10. Graphic of Marketing Result



Picture 61. Dashboard

4.6 Rollout Initial Versions

Based on the system development methods, it suggests alpha testing method using black-box test-case conducted in this research, by entering data into the system and see the outcome, as expected.

5.1. CONCLUSIONS

Based on the discussions that have been described, it can be concluded that:

1. Corporate executives can make decisions as well as strategic planning in accordance with the CSF using a corporate intelligence dashboard.
2. Intelligence dashboard produces display required information in the form of graphs that help executives see a meaningful picture of the information presented.
3. Intelligence dashboard is made to display internal and external information consisting of financial, customer, product, employee attendance, employee performance, employee turnover, exceptional report, and information about province minimum wages. The information presented is for the executive to be able to know the progress of the company growth.

5.2 SUGESTION

So far from the intelligence dashboard design, suggestions for further research are:

1. Using the prediction by different methods such as exponential smoothing method.
2. Perform application development up to the next stage and implementing the tighter security system.
3. Add significant external information such as competitor information.

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