OOAD-Based Monitoring Information System in Software Production Making in PT. XYZ

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1. INTRODUCTION

In order to realize the effectiveness and efficiency related to the production of a company it is better to have a good planning concept in determining the steps of the production process. The goal of a quality product according to the standard, which is obtained within a certain time with the optimal cost is what is expected by a company. Likewise with PT. XYZ, a company engaged in software services where the work process that starts from receiving proposals for software development and maintenance requests to the completion of the software is made very important to note. Therefore a comprehensive monitoring system is needed in the work process in the company.

The idea to create a monitoring system begins with the difficulty of monitoring the current conditions of a project such as monitoring user requirements that have been executed, monitoring the timeline and monitoring other documents that are all physically stored on paper documents. Documents that are stored and written on paper will tend to be easily damaged, difficult to find and possibly tucked. The monitoring process can actually be done using a project management software such as MsProject or the like, but the disadvantage of using this software is the input process that is carried out by only one person through meetings that are conducted regularly. This is usually done by the project manager in each meeting.
This condition is quite troublesome, where the updating of data will be delayed because it is done within a certain period of time, depending on certain parts that may not necessarily be present at every meeting and input monitoring is carried out by only one person.

With a monitoring system in which each section directly input data when their work is done, making data available in the system is always up-to-date. The monitoring process can be carried out more flexibly, both by each section given authority and by one particular person.

2. RESEARCH METHODE

With the increasingly complex systems in the industrial world today related to the integration of new technology, activities are needed to maintain and monitor that requires no small cost. This has spurred researchers to continue to conduct research to find innovations related to monitoring (Snatkin, 2015: 1).

In the 1970s very few people understood the definition of software, while today almost everyone and professionals understand it. From the definitions in many textbooks, software definitions can be grouped as follows (Pressman, Roger S., 2001: 6):

a. A collection of computer program instructions that when executed will provide the desired function or appearance
b. Data structures that can make computer programs manipulate information
c. Documents showing the use and operation of computer programs

This software will be able to answer questions or statements such as solutions to certain problems, used for entities with certain characteristics in solving problems, entities and solutions for steps taken in solving problems, entities that will be made for certain solutions, disclosure and resolution of errors which occurs based on a particular approach and becomes a support for correction, adaptation and improvement requested by the user (Pressman, 2012: 21).

The design and manufacture of software is closely related to software engineering, it is very necessary to create a reliable information system without defects in a long time. A good understanding of what is needed by the user, translating it into the right information, choosing the right method of implementation, constructing data in the analysis and design phase, transforming it into program code will be a critical factor for the success of making a software.

To produce a quality software product, we need to take certain steps called the software creation model (Jalote, 2008: 13). Many models of software making in modern industry today, which focus on software production activities, such as designing, coding and testing. This software making model is used as quality control in addition to being an activity in project completion. The manufacturing process chosen will provide an explanation of what needs to be done, step by step, so that all points that the user needs can be met. The selected process will direct the project path to obtain quality output. Here are some models that present the overall ideal process of a cycle of making or developing software and the latest models that are usually carried out in modern industry to be able to complete projects quickly.

Waterfall is the simplest and oldest model ever made, which illustrates step by step in a linear form. This model was first created by Royce in 1970 and has been developed in many variations depending on workflow control and the activities carried out (Royce, 1970: 328-338). The procedure is complete and ideal, so it is widely used in education. This model starts with a feasibility analysis, requirements analysis, then the project starts. After that, design, coding, testing and installation or deployment are carried out. The next stage of day-to-day operational use of the system can be done, followed by maintenance along with the use of the software.
A software development and development model that focuses on the ability to adapt to work conditions and is oriented to customer satisfaction with rapid project completion, which consists of a combination of iterative and incremental processes, is called Agile (SDLC – Agile Model, 25 Agustuts 2019). This model emphasizes the following criteria (Rumpe, 2017: 25):

a. Perform the steps as efficiently as possible and the entire process as ideal as possible
b. The reaction to changing requirements or changes in the work environment is very high, because the process must be able to quickly adapt and be carried out in the short term
c. Can adapt well to project conditions both external and internal, called adapted flexibly
d. A simple design and implementation approach makes it simple and practical to do
e. Customer oriented and active integration with customers throughout the project

The capabilities, knowledge and needs of all participants can be seen during the project. The Agile Model is divided into iterations, where for each iteration it includes the following work functions: (1) Planning, (2) Requirement analysis, (3) Design, (4) Coding program building, and (5) Unit testing.
When a software design will be built and/or has been built, a testing process is needed to ensure that the design or software is appropriate for use and as expected by the user. Black-box testing, also known as behavioral testing, focuses on the functions needed in software (Pressman, 2001: 259). This test detects errors for the following categories: (1) missing or incorrect functions, (2) errors in the interface, (3) errors in the data structure or in database access, (4) errors in software performance, and (5) error initiation or termination of the software. Whereas the software testing strategy can be analogous to spiral. Testing starts from individual components called unit testing. Then proceed with integrated testing that highlights issues related to construction and verification of programs that are made. Followed by validation testing that checks all functions, behavioral and performance meet all requirements.

In this study using a descriptive methodology based on object oriented analysis and design. Descriptive research includes survey work and the discovery of facts from a variety of different things (Kothari, 2004: 2). The main purpose of this methodology is to describe the status of the relationship of the problem or process or condition with one another at this time. Its main characteristic is that the researcher has no control over these variables, he can only report what has and is happening. The methods used are surveys of all types of problems, including correlation and comparison methods.

Whereas in software engineering there are several methodologies known to solve device design and maintenance problems software, one of which is object oriented analysis and design (OOAD). In OOAD, all entities in the world are considered as objects. These objects cover many aspects of our lives, such as
natural entities, entities that are man-made, internal entities business, in the products produced, that we use and others so. These objects can be described, categorized, organize, combine, manipulate and create. Therefore, this methodology has been used extensively for manufacturing and software development especially in terms of analysis and design (Pressman, 2001: 541), plus software or language lately Object-based programming is growing rapidly.

Figure 4. Figure 4 + 1 of UML 2.0 (Kruchten, 1995 and its development on White Paper issued by FCGSS)

3. RESULT AND ANALYSIS

PT. XYZ is a business company engaged in the field of IT consultants. Founded on January 28, 1992, this company is a subsidiary of a group of holding companies that has many business networks including hospitality, food and property. At the beginning of its establishment, PT. XYZ is engaged in the contracting business. In 1995 due to the monetary crisis, the holding company vacuum from its business activities, so the company switched to IT business and became a software house company until now. This company has a vision to be a company that can provide information technology solutions to business values that not only have a big impact now, but also the future for its customers. The organizational structure of the company can be seen in Figure 5.

Figure 5. Organizational Structure of PT. XYZ
Decomposition of Current System Functions

PT. XYZ has several divisions and subdivisions with their respective duties and functions that represent the overall activities of the company for which it is intended. The main transaction of this company is to provide consulting services in the IT field which can be translated into certain functions as can be seen in Figure 6 regarding the description or decomposition of the functions of the system that runs at this time.

![Figure 6. Decomposition of Current System Functions](image)

The owner still has a role in the company, namely as a controller of the overall course of the project where the position is commonly called the project manager, as well as other positions filled by employees as development managers, system analysts, unit testing and programmers.

Proposed System Analysis

The author gives a proposal of the original function decomposition that runs in the company today with a more comprehensive and complete function decomposition with the addition of several more detailed functions as shown in Figure 7.

![Figure 7. Proposed System Function Decomposition](image)
Preliminary work is maintained with a slight difference in details. Kick Off is added with several details, continued development, user acceptance test and deployment along with the details of each of which are all under the monitoring function.

In the use case diagram in Figure 8 it appears that all cases, except preliminary work, including 'monitoring' by entering a few parameters such as the project name in the 'kick off meeting' case by a project manager, the number and type of specs in working on the program in the case 'development' by system analysts, as well as project progress in development cases that are inputted by the development manager. For case users acceptance tests will be inputted by unit testing, and if an error occurs or deficiencies in the process will be returned to the case development, specifically state update progress in figure 9 show the activity diagram. While the case deployment will be inputted by the programmer who is also accompanied by the presence of a project manager inside His meeting with the client also marks the end of the project the. To see details of activities carried out at cases this can be seen in the activity diagram in Figure 9

![Figure 8. Proposed 'Use Case' Diagram]
The activity diagram shown in Figure 9 gives an explanation of what each personnel does in the "monitoring" case in the previous use case diagram. For the state "update the remaining specs" carried out by system analysts and "progress updates" carried out by the development manager, the programmer has given an update related to the state change.

The sequence diagram in Figure 10 shows the stages inside programming to display project data. Starting from the project manager login to the monitoring form, then proceed to control, a place where logic processes lead to the system. After that process reading data to NamaProject, TotalSpek, Progress and User Acceptance Test done. For deployment does not need to be represented into a file, because the process can be done on the NamaProject file by changing the status to "done" and the estimated time relatively fast, only in the hour range.
Black-Box Testing

Black-box test is a test that is suitable for use on object-oriented concepts as in this study. Usually consists of three object components as shown in Figure 11. The three components consist of a selection menu, screen and document text that appears. The relationship of the three objects can also be defined as shown in Figure 11 (Pressman, 2001: 461).

![Figure 11. Black-box test](image)

The selection menu is represented by the document text. The time needed to display the results of the menu selection is less than 1.0 seconds. The results of the display can be edited, in the sense of the word inputting a certain value to produce the desired output value obtained based on the reading of a particular file.

The details of the test are as shown in sequence diagram above. The monitoring display program that will be created later it starts with inputting the user name and password for the login which is verified directly by the system regarding its validity. If one or both of them do not meet the requirements the system will deny access. Then proceed by inputting the name of the project that will access several files directly in sequence, is Project Names, Number of Specs, Progress and User Acceptance Test. The program flow will be made so that it is appropriate with the design of the sequence diagram.

4. CONCLUSION

From the results of the research that has been done, it is hoped that the model that has been created can be used as a reference for designing a monitoring information system. This model can be used for all types of industries that do not focus solely on the software production industry. The results of the design can be used as a basis for development into the form of coding or programming by referring to the sequence diagrams that are displayed.

The design of this research can also provide alternative functions in general project work. A project manager will no longer need to attend every meeting involving all employees. Its role can be digitized by monitoring each phase through a computer screen. Concerns can be discussed with representatives, such as development managers and system analysts.
Reference