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COMPARISON OF WATERFALL MODELS AND PROTOTYPING MODELS OF MEETING MANAGEMENT INFORMATION SYSTEMS

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ABSTRACT

In implementing a method or algorithm on a problem. It takes a general methodology used in the development of an information system we can choose the System Development Life Cycle or SDLC as a general methodology used to develop information systems. The SDLC itself consists of several parts or phases starting from the planning, analysis, design, implementation to system maintenance phases. The SDLC concept is widely used for software development to form a framework for planning and controlling the creation of information systems. There are 2 SDLC models that are commonly used, including Waterfall and Prototyping. In writing this thesis, thediscussion related to the software development model is found in Chapter 2 of Information Systems Development. From thecomparison of the two waterfall and prototyping models, it states that the waterfall model is more suitable for generic systems or software, meaning that the system can be identified all the needs of the system to be built according to the research topic chosen until the product isrun. In the prototyping model, it is more suitable to be used in a system or software that is created based on certain requests and needs (even situations or conditions) or that are customized. Meeting activities are routine activities that are often held, especially in a school agency, the existence of the meeting serves to find a solution to a problem that is expected to reach a consensus, solution and determine a decision. In supporting the meeting activities at Sahid Vocational High School Jakarta which are held almost every day, some problems are related to the administrative process and storage of activity files that are still not neatly arranged and centralized. In building the Information System, the supporting activities of the meeting at Sahid Vocational High School Jakarta, the author uses the waterfall method. Model waterfall is a development used in this system, using with stages of analysis, design, code, trial, and maintenance. With the management information system for Sahid Vocational High School Jakarta meeting activities, it is able to provide solutions, starting from the process of inputting activity data can be carried out quickly, efficiently, accurately and easily accessible anywhere, stored centrally, and can display the data needed as a whole, namely in the form of meeting agenda information, documentation of meeting results that are usually documented after the meeting activities take place.

1. Introduction

In order to enter the new academic year, usually every school will organize and hold meetings which are usually held before the start of the learning process. This meeting was attended by all Educators (Teachers) and Management. In the process there are meeting activities that aim to carry out joint activities in order to achieve the goals that have been set together by deliberation. So that certain problems can be resolved, and are commonly used to determine new school policies, things that are usually discussed are school planning for the next year, division of teaching schedules, division of homeroom teachers and subjects, school

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preparation, school regulations, especially in Sahid Vocational High School Jakarta, so as to produce useful information later.

This statement is supported by research conducted by (Anggraeni, Elisabet Yunaeti., 2017) which states that information is data that has been processed to be useful and meaningful for the recipient, and reduces uncertainty during the decision-making process regarding a situation.

Meeting activities are routine activities that are often held, especially in all schools, the existence of these meetings serves to find solutions to problems that are expected to reach consensus, solutions and determine a decision. In supporting the meeting activities at Sahid Vocational High School Jakarta, which will be held, experienced several obstacles such as the administrative process and storage of activity archives which are still not neatly organized and centralized.

Sallata, R. (2016). Meeting is a meeting or group activity in an organization, company, government agency in both formal and informal situations to discuss, negotiate, and solve a problem that concerns the interests of the organization or company. In KBBI. Meeting activities can also be interpreted as activities, in other words, activities are activities or efforts carried out by one or several work units as part of achieving measurable targets in a program. Meeting activities are routine activities that are often held especially in all schools, the existence of these meetings serves to find solutions to problems that are expected to reach consensus, solutions and determine a decision. This statement is supported by research conducted by (Sallata, R., 2016). Bhavati, A. D. (2014, February 24), defines Meeting Activities are activities that aim to make decisions by deliberation by way of consensus.

In this study the author made it using the PHP programming language, according to Supriatno in (Agung Baitul Hikmah., 2015:1),[24]"PHP is short for the word Hypertext Preprocessor. PHP is classified as open source software which is regulated in general purpose licenses (GPL) rules. Based on some of the opinions expressed above, it can be concluded that PHP is a script programming language that is stored on a server and is classified as open source software which is regulated under general purpose licenses.

PHP itself stands for Personal Home Page Tool. This script will make an application can be integrated into HTML so that a web page is no longer static, but becomes dynamic. The nature of the server side means that the execution of the program code is carried out on the server, and then the results are sent to the browser. This statement is supported by research conducted by (Ignatius, Joko Dewanto., 2006).

In making this Meeting System application the author pays attention to information systems. According to (Kadir. Abdul., 2009) Information systems are a number of components (humans, computers, information technology and work procedures), something is processed (data into information), so as to achieve a target or intended purpose. In other literacies, it states that the information system is an integrated and interrelated processed data unit complement that produces output in the form of images, sound and writing. (Al-Bahra Bin Ladjamudin, 2005 in the journal (Muslihudin, Muhamad. Dkk. 2015).

This is also in accordance with the statement (Ladjamudin, Al-Bahra Bin., 2005) which is a systems approach that focuses more on components that can be defined that the system is an incorporated to carry out an activity or complete a certain goal.

2. Literature Review

2.1 Types of Research

The types of research can be classified by purpose, method, degree of explanatory and data analysis.

a. Based on the objectives: basic research and applied research.
b. Based on Explanatory Level: Descriptive, Comparative and Associative Methods.
c. Based on Analysis and Data Type: Quantitative, Qualitative, Combined.

2.2 System Development Life Cycle

SDLC (Systems Development Life Cycle) or Systems Life Cycle, concept that exists generally refers to computer or information systems. SDLC is the process of creating and changing systems as well as the models and methodologies used to develop a system is also a pattern taken to develop a software system, which consists of the stages or fase-phases contained in the SDLC including: Systems Planning; Systems Analysis; System Design; Systems Implementation; Systems Maintenance .

The concept of SDLC underlies other software development models. The software development models include waterfall, prototype, iterative, spiral, rapid application development (RAD) and others. In methtodology-methodology forms a framework for planning and controlling the creation of information systems, that is, the process of software development.

SDLC (Systems Development Life Cycle) or Systems Life Cycle, in systems engineering and software

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engineering, is the process of creating and modifying systems and the models and methodologies used to develop those systems. This concept generally refers to a computer or information system. SDLC is also a pattern taken to develop a software system, which consists of the following stages: analysis, design, implementation, testing and maintenance [Britton, Carol; Jill Doake (2001). Object-Oriented Systems Development. McGraw-Hill. pp. 27-34, 268. ISBN 0-07-709544-8.] In software engineering, the concept of SDLC underlies many types of software development methodologies. this methodology forms a framework for planning and controlling the manufacture of information systems, namely the software development process.

There are 3 types of system life cycle methods that are commonly used, namely:

a. Traditional system life cycle,
b. Life cycle using prototyping.
c. Oriented system life cycle.

The SDLC is also a common methodology in system development that marks the advancement of analysis and design efforts.

The system is a procedural approach and a component approach. The system can be defined as a procedural approach, as a collection of procedures that have a specific purpose. An example is the financial accounting system. This system is defined as the process of cash receipts, cash disbursements, sales, purchases and the general ledger. By using the component approach, the system can be interpreted as a collection of components that are interconnected with each other to form a single unit to achieve certain goals. For example on a computer system which is defined as a collection of hardware and software This statement is supported by research conducted by (HM, Jogiyanto., 2003).

2.3 Model Waterfall

The Waterfall method is one of the methods in the SDLC (System Development Life Cycle) which has the characteristic of work, namely that each phase in the waterfall must be completed first before proceeding to the next phase. This means that the focus on each phase can be done optimally because there is rarely a parallel work even though pararealism can occur in the waterfall. This statement is supported by research conducted by (Yurindra., 2017)

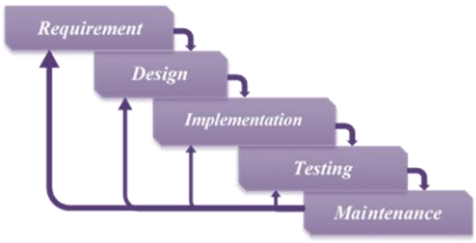

Figure 1. Waterfall Development Methods

a. Needs Analysis
At this stage the author investigates what are the prerequisites of the framework, ranging from the practical needs of the framework and the prerequisites of the useless framework.

b. System Design
The planning stage is a high-level testing stage where it presents a utilization plan, for example an interface plan, and a data set plan that will be applied to the framework to be created.

c. Implementation
This stage is carried out after testing to ensure that the system is as expected or not

d. Program Testing
At this stage, the author applies the database design and interface design into the programming language, where the programming language used is to utilize the PHP language for websites. After that, the testing stage in the waterfall method uses blackbox testing techniques.

e. Maintenance
The final stage in the waterfall model. Ready-made software, run as well as performed maintenance. Maintenance is included in fixing errors that were not found in the previous step.

2.4 Model Prototyping

The prototyping model is a technique to quickly collect certain information about the user's information

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needs. Focuses on presenting aspects of the software that will be visible to customers or users. The prototype will be evaluated by the customer/user and used to filter out software development needs. These stages of the prototyping development model are depicted in figure 2. Prototyping Development Model.

Figure 2. Prototyping Development Methods

3. Research Methods

The approach used in this study is a quantitative approach using a descriptive method, namely conducting a comparative study to compare the phenomena found and make a classification sourced to a standard.

The research steps include:

a. Identifying and formulating problems
b. Arrange tracing sources of literature
c. Conduct observations and interviews
d. Interpreting research conditions with the data obtained
e. Perform data analysis
f. Make a comparison of the desired model according to the characteristics of the development model and the running system
g. Make scientific research reports.

4. Results And Discussion

Based on the results of the system design, analysis can be carried out by comparing between the Waterfall Model and the Prototype Model so that the following results are obtained: Choosing one of the previously described software development methods requires time for research and long-term planning. Knowing the strengths and weaknesses of our team, will help in determining what method is most suitable to use. Choose a method that suits your team's way of working and the capabilities of your team, then narrow down the options by comparing which model works best for the client in the project you want to work on. Generally, the software development method most frequently requested by our clients is the waterfall method. This statement is supported by research conducted by Badr-interactive.com (2020, April 14)

TABLE 1.
COMPARISON OF WATERFALL AND PROTOTYPING MODELS

Systems Planning	Starting from the needs	Starting from the needs
Systems Analysis	Data needs must be analyzed from scratch completely and thoroughly. Data or functional changes will change the entire process at the next stage.	Data needs can be added according to user needs, when the trial is completed. Changes can be made as long as the system or software is still in prototype form.

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System Design	The trial is carried out when all the stages on the model are completed. It cannot give a clear picture of the system being built, because the system can be seen if all the stages have been carried out.	Testing can be done when the prototype has been built, so that the test results can change the system design. Providing a prototype as an overview of the system will be built, so that the user can view and interact directly with the system overview. Users play an active role in the development of the system built will correspond to user wishes
Systems implementation	Implementing a good design process, Evaluation is carried out when the system has been built, prioritizing the functional needs of the system	Not implementing a good design process, evaluation is carried out when the prototype has been built, prioritizing aspects of user comfort
Systems Maintenance	Done as agreed	Done as agreed

TABLE 2.
COMPARISON OF ADVANTAGES AND DISADVANTAGES OF THE WATERFALL MODELS AND PROTOTYPE MODELS

System Model	Excess	Deficiency
Waterfall	Easy to understand, very suitable for beginners, Simple design, easy to test and analyze, Small projects are quick to implement with clear needs, Easy to manage because each stage has its own results and review process	This method is not suitable for maintenance projects or long-term projects, This method is only suitable for projects with very clear requirements with detailed requirements that can be delivered at the beginning, Inflexible: when the application is launched, it is not possible to modify or change the system thatis made t, Can not make other software until the whole waterfall process is completed
Prototype	Since we have identified the risks and issues that may occur at the beginning, we can also reduce the risk of failure, With this method, we can provide the client with an earlier experience for the software to be used and improve and complement it with the feedback provided by the client, Intense communication between the client and the development team will strengthen the relationship between the two parties	Too many modifications will interfere with the workflow of the development team, prototyping is quite expensive. On the other hand, prototyping can reduce risks, so we can minimize the potential for a wasted budget at the beginning of time, Engagement at the beginning with the client can be a bad thing, they may interfere too much and ask for a lot of changes without fully understanding the project as a whole This statement is supported by research conducted by Badr-interactive.com (2020, April 14)

5. Conclusions And Suggestions

5.1 Conclusion

Based on the results of analysta by comparing the two models in making a Management Information System for Meeting activities at Sahid Vocational High School Jakarta, it can be concluded that:

a. It can be known the characteristics, advantages and disadvantages of the Waterfall Model and prototype model.
b. In model waterfall development is very suitable for the design of generic or software type systems, meaning that the system canbe known all its needs from the beginning with general specifications and is

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suitable for the final project / thesis which has the aim of building a system from scratch that collects the needs of the system to be built according to the selected research topic to product testing .

c. Prototype development model is more suitable for customized systems or software, meaning software that is made based on certain requests and needs (for example: situations or conditions) and is suitable for the final project / thesis that has the aim of applying certain methods or algorithms in a case.
d. From the two models, the author chose model waterfall development in writing the final project / thesis because the process is very appropriate and saves time for its creation and a more systematic process..

5.2 Suggestions

In this study, there are still many shortcomings, here are some things that need to be developed better in the future, for further research.

a. Comparing more other software models as reference material that can be used for the final project / thesis topic in the System Informasi study program.
b. Make comparison results of other software development models as a complement to teaching materials for Information System Analysis and Design in the Information Systems Study Program.
c. Find other different and better software development models.

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