Design of Internet Problem Report Management System in Diskominfos Bali Province

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Abstract- Management system is very important Internal management reporting is a fundamental element of the entire management structure, the most important instrument of control in technology enterprise management. Diskominfos in Bali Province is an agency located in the province of Bali, which have tasks to provide internet bandwidth to all Office in the provincial government area of Bali but the process of manage problem report about internet problem is still manual and not efficient. This study purpose to provide a solution to the problem by designing an information system to simplify the internet report problem management at diskominfos in Bali Province.

Index Terms- Information System, Fountain Model, Kanban, PIECE Method, Report Problem Management.

I. INTRODUCTION

Utilization of technology in the business world is a necessity, because with the technology of an information can be retrieved in real time. Fast and accurate information is one of the factors that make a company can be more superior than the other. With the support of information quickly then a decision can also be quickly obtained which it is one important factor in the business world [1].

The globalization of economic relations, use of modern information systems and current information processing technologies have specific requirements for provision of organization management with detailed information in the context of business processes, forms and activities segments. There is need in reflection of costs and revenues in financial and mainly management accounting, in forming the specialized reporting, creating the system of analysis and processes and activities monitoring [2]. The document and report templates that are an essential part of any software application or information system are most often predefined, and the user can only choose from the predefined templates to generate documents or reports [3].

Internal management reporting is a fundamental element of the entire management structure, the most important instrument of control in technology enterprise management.

Diskominfos in Bali Province is an agency located in the province of Bali, which have tasks to provide internet bandwidth to all Office in the provincial government area of Bali. Due to the large number of Office in the provincial government area of Bali that must be served and the minimum number of teams tasked with repairing or maintaining the internet problem, sometimes the team can't work optimally because there is no system that records internet problems. reporting on internet problems only uses social media so it is considered less effective.

This internet problem management information system specifically for handling internet problem reporting is designed using a software development cycle that uses the fountain model to see the effectiveness in designing this information system and uses the kanban model for its design. The stages of analysis were carried out using the PIECES method and the system design was based on the software development cycle method.

II. LITERATURE REVIEW

A. Agile

Agile development methods are defined in four values commonly called the Agile Alliance's Manifesto, including [4]:

a. **Interaction and personnel** are more important than processes and tools, in agile interactions between team members are very important, because without good interaction the software manufacturing process will not run according to plan.

b. **Functional software** more important than complete documentation, when performing a demonstration process with clients, software that works properly will be more useful than complete documentation.

c. **Collaboration with clients** more important than contract negotiations, one characteristic of agile is that clients are part of the software development team. Good collaboration with clients during the software manufacturing process is very important when using agile. Because the functions of the software developed must be continuously discussed and improvised according to the wishes of the client.

d. **Response to changes** more important than following the plan, agile development methods focus on the speed of the team's response when the client wants changes during the process of making software.

B. Kanban

Just in time is an approach is based on a lean manufacturing system that develops to optimize and improve manufacturing efficiency by reduce manufacturing lead time through eliminates waste [5]. Just in time is a production technique and inventory control for produce the required units and quantities [6]. Definition of production on time often called the Toyota production system, because Toyota is the pioneer of production just in time because of the oil crisis on 1973 [7]. Kanban needs to know the number of spare parts requested by the work station after that from the previous assembly process. The number of kanban in circulation must be limited to control the number of sections experience circulation. Because more and more kanban in circulation, more and more the number of parts on the production line. So on the other hand, the number of kanban is decreasing the less the number of parts on the production line, so it can lead to the occurrence of the stop line. Avoid the occurrence of this event is necessary determine the number of kanban in circulation sequentially the system can run properly [8].

Kanban is an approach to software development based on simple but powerful ideas. It aims to make the work flow fast through the whole value chain, from idea or concept to software in production, delighting your customers. The tools that make this happen are a few simple yet powerful principles: visualizing your work and policies, limiting the amount of work in progress, and helping the work to flow better through the process. these tools can guide you to continuously improve your process to gain an even faster, smoother flow of work through that process. This is a never-ending quest that will help you and your team to improve, little by little, every day [9]. Kanban According to Hammarberg and Sunden has 3 basic principles:

1. Visualize Work
    Kanban Board is a visual model to describe its workflow which helps to observe and check the flow from start to finish. Kanban boards are made in accordance with the stages for carrying out software development.
2. Limit Work in Progress
    The team at the initial stage determines the work limit on each flow on the kanban board which is called "Work in Progress (WIP)". The purpose of this WIP is to reduce waste and help the team to focus on completing the existing work on progress and then starting new work afterwards.
3. Focus on Flow of Work
    The effective result obtained from kanban is that the team must focus on the flow of project work from inception to completion of the project. By following the two principles outlined above to assist in achieving this focus. The focus on the flow of work on this project directs the team to describe the bottlenecks that will occur and follow up on them, so that the flow of work on this project can continue [10].

C. Fountain Model

The fountain model is proposed as a way to represent the life cycle of highly repetitive software development. Although most processes have a natural sequential flow in their development life cycle, software is one area where coding can begin even before the design is truly mature. This is because the initiation and incremental modifications for implementation during the design phase are usually not very expensive. Furthermore, expert programmers have a tendency to express their design in programming languages, not in natural languages. Design and implementation are thus, no longer disjoint in the traditional sense and current CASE tool technology languages, help hasten the overlap between the analysis, design and implementation phases [11] [12]. The fountain model is a logical refinement of the waterfall model whose steps and sequences are still same as the waterfall model. In the fountain model, a process can take precedence in designing and developing a system, but there are sequences or processes that cannot be skipped such as through the design stage the process to the coding stage, that stage cannot be skipped because the design is needed first before process to the coding stage, if it is skipped there will be an overlap in the SDLC cycle [13] [12].
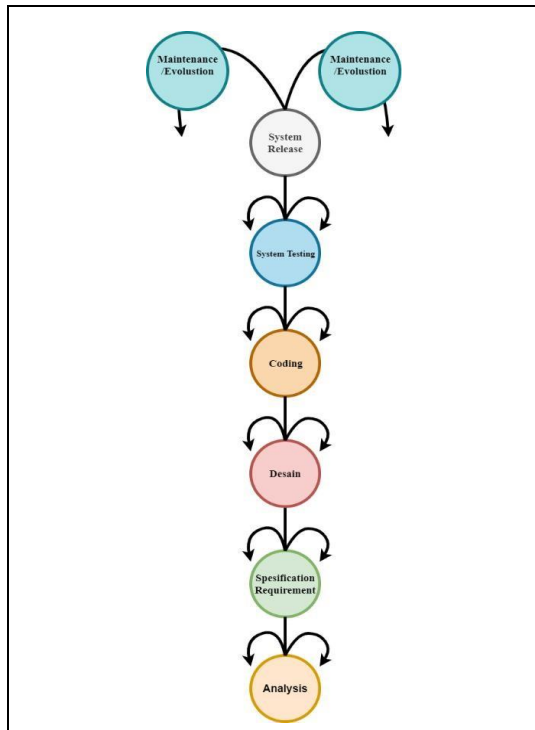
Figure 1 Fountain Model

1. Analysis User Requirement
   Analyzing the requirement of users both in ways that are easy and efficient use of the system needed by user.

2. User Requirement Specification
   Enhancements to the requirement of user are sought specifically, to find out the requirement in detail from user on the system to be developed.

3. Preliminary Design
   Preliminary design or conceptual design of a system that developed taking into account the software and hardware requirements of the system.

4. Detailed Design
   Making design that approach the physicality of the system or design in detail from each part of the system design that is developed.

5. Coding

   Implement design to coding

6. System Testing
   System testing ensures that every part in the design or development meets the requirement. Repetition may be needed between this phase and the

previous one depending on the completeness of the design was be planed.

7. System Release
   User can test the system that has been produced and can be taught to use a system that has been designed and developed. User generated feedback will improve the system that was designed because it looks back through the previous stage

8. Maintenance and Evolution
   Systems that are designed and developed need to do improvements in avoiding some defects that occur when the system is run and update to avoid errors in the system. Feedback from users is needed to see the parts that must

   be repaired from the system that has been made [11].

D. P.I.E.C.E Analysis Method
   PIECES Framework is a method used to classifying a problems, opportunities and directives that can be in the scope definition, analysis dan system design section. This method can produce new solutions that can be taken into consideration in system development [14].

   The PIECE Method consists of six variables used in analyzing information system as follows, namely: [15]

1. Performance
   Performance is the ability of the system to complete tasks quickly in accordance with the requirement to be achieved. Performance is measured by the amount of production and time spent adjusting for work shifts.

2. Information
   Information is important because with this information, management and user can communicate easily. If the information system runs well, the user will get accurate, timely and relevant information as expected.

3. Economic
   Utilization of cost used from the utilization of information. Increases in economic requirement affect cost control and increase benefits.

4. Control
   This analysis is used to compare system analyzed based on the terms of accuracy, ease of access and accuracy of the data processed.

5. Efficiency
   Efficiency is related to how the source can be used properly and optimally. Operation in a company can be said to be efficient or not usually based on the duties dan responsibilities in carrying out activities.
6. Service
   Improved services show a variety of categories. The selected project is a better service improvement for management, users and other division that are the quality of an information system.

III. RESEARCH METHODOLOGY

The flow of research methodology in this research is starting from the study of literature, collecting data by interview, system analysis and system design. Following is the flow of evaluation of the research conducted.
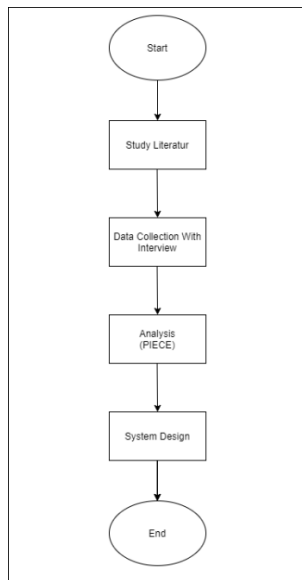

Figure 2 Flow of Research Methodology

1. Study of Literature

Study of literature conducted is looking for references and theory about system analysis using PIECES analysis and system design using waterfall and fountain model.

2. Interview

Data was collected by interview method to find the requirement of user in design the system needed.

3. System Analysis

Analysis was performed using PIECES analysis based on interview and analysis of system design using the waterfall and fountain model.

4. System Design

The system design is carried out in accordance with the result of the previous analysis.

IV. ANALYSIS AND RESULT

A. System Analysis

System analysis is performed using PIECES analysis obtained based on the result of interviews with Diskominfos employees who will be users of the system.

Table 1 PIECE SYSTEM ANALYSIS

No.	Analysis	Result
1	Performance	The system used in get information about problem just using social media and telephone
2	Information	Employees are still looking about problem information from admin and not have history of maintenance
3	Economic	Reporting is still done manually and maintenance report using paper and ink
4	Control	Data history using maintenance report and using history data from media social
5	Efficiency	Time and effort needed in search history data because there is no system for recording history maintenance data
6	Service	Service are slower because admin get information about problem using media social or telephone and the admin can't provide much information from it.

B.   System Design

This Problem management system is designed to have several features such as the general system description using the use case diagram as follows:
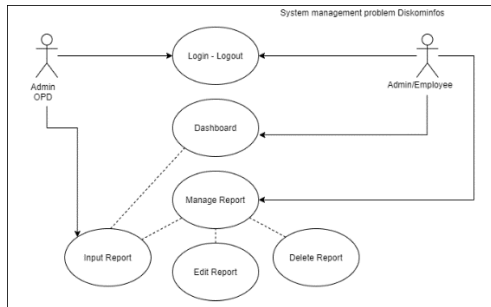

Figure 3 System Overview

Fig. 3 is a general description of the problem management system at Diskominfos. The system is designed to focus on recording the report and make sure all the employee can see all the report, see progress of the problem and see how the problem can be solved.

Figure 4 Kanban Board

Using KANBAN board, all employees can see reports of internet problems that occur and determine which problems are resolved first and can arrange the work to be done next

System design that has done the analysis using the PIECE method, and system development obtain as follows.

Table 2 PIECE System

No	Analysis	Result
1	Performance	Process input problem and manage problem using an information system and recording problem can be done in the system information.
2	Information	Information can be fully seen and obtained using the system. History maintenance be recorded on the system dashboard to make it easier to see the record of the problem
3	Economic	The system designed can provide report and records digitally without having to incur cost
4	Control	Data management fully carried out in the system to avoid data manipulation and data loss suddenly
5	Efficiency	Process maintenance will be more efficient because all employee can see the problem and know the progress of the problem and how the problem has been solved
6	Service	Services provided by the system can me information accurately and quickly

V.   CONCLUSION

Base on the research conducted, it can be concluded that in problem report management it is necessary to have a system that provide convenience in managing information about the problem, the working progress and how the problem solved. Thanks to the KANBAN system that visualizes the entire workflow rather than seeing the results of each process which has the aim of the balancing internet repair request with available capacity.

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