Development of Project Management Information Systems to Support Operations

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ABSTRACT
In the current digital era, the development of information systems is needed to facilitate digital transformation through integrated technology solutions. Many companies in Indonesia are still experiencing difficulties in managing their projects effectively due to the lack of an integrated project management system. Most of the time, communication related to project progress is done through various platforms, such as WhatsApp, email, or other communication tools. This causes project information to be scattered and uncentralized, which can lead to confusion, project delays, and difficulties in monitoring overall performance. Along with the trend of digital transformation and the increasing need for remote work amid the pandemic and technological developments, having an efficient project management system is becoming increasingly important. A web-based project management system can be a solution that allows companies to monitor projects in real-time, ensure clear communication flows, and improve coordination between teams. Thus, the company can achieve more efficient time and cost targets. In the development of this web-based project management system, the methodology applied is Scrum. The selection of Scrum was made because of its flexibility that allows adaptation to changes during development, as well as its ability to produce results that can be tested and evaluated in the short term through the task cycle. The development of a web-based project management system provides an effective solution in project management. This system is able to increase efficiency in team coordination, task recording, and real-time project progress monitoring.

Keywords: *Management Information System 1, Human Resources Management 2, Project Management 3.*

1. INTRODUCTION

As the era of digitalization develops, the need for information technology that can support project management efficiently becomes increasingly important, especially for companies that face challenges in team coordination and project progress tracking. However, many small to medium-sized companies in Indonesia still rely on manual methods or devices that are not integrated in project management. This results in recording errors, ineffective communication, and difficulties in monitoring the progress of the project thoroughly.

Through the development of this system, it is hoped that solutions can be created that not only help companies manage projects more efficiently, but also be able to provide added value in the form of flexibility and ease in task tracking and team collaboration. This system is designed to answer the needs of companies in utilizing technology to achieve more optimal project targets, both in terms of time and cost.

2. RESEARCH METHODS

In the development of this web-based project management system, the research methodology used is scrum, which is a framework designed for the development of software in stages and continuously. Scrum was chosen for its flexibility in dealing with changes during the development process, as well as its ability to deliver results that can be tested and evaluated in a short period of time through a cycle called a task.

In addition, scrum is very suitable to be applied in this project because of the need to dynamically adjust the system, considering that every week there are often changes, new additions, or innovations that need to be integrated. Using scrum, system development can be done iteratively, allowing teams to quickly adjust priorities and complete tasks as needed to keep up with evolving needs. This ensures that development results are always relevant to the needs of users and supports the sustainability of the development process.

2.1. Needs List

In the initial stage, all the functional and non-functional needs of the system are collected and documented in the form of a feature list. This list includes key features such as team management, scheduling (timeline), project status, user authentication, and so on. The list of needs will be continuously updated as the project progresses, adjusting to existing priorities and needs.

2.2. Task Planning

In each task cycle, the team determines a list of tasks from the needs to be completed. Each task in this project is planned to last for 1 to 2 weeks. At this stage, the tasks are broken down into smaller parts for easier work and management.

2.3. Task Execution

Each team member performs tasks according to the division set at the beginning of the task cycle. At this stage, feature development, testing, and bug fixing are carried out on an ongoing basis. The implementation of features such as team management, project scheduling, and status updates is done gradually in each task.

2.4. Rapat Mingguan (Weekly Scrum Meeting)

Every week, a short meeting is held to discuss the development of tasks, obstacles faced, and future work plans. The purpose of these meetings is to keep the team in sync and resolve issues that arise quickly.

2.5. Task Review

After each task cycle is completed, an evaluation of the results of the task is carried out. The system is tested to ensure that the developed features run according to the specifications. If there is an unfinished task, it will be included in the next task or adjusted to a new priority.

2.6. Retrospektif Tugas (Task Retrospective)

At the end of each task, a retrospective is conducted to evaluate the teamwork process. This includes an analysis of what is already going well and what needs to be improved for the next task cycle. The main objective of this retrospective is to continuously improve the productivity and quality of project development.

3. RESULTS AND DISCUSSIONS

3.1. Web-Based Project Management

The application of the Scrum framework to the development of web-based project management applications is divided into the following roles:

3.1.1 Product Owner

Responsible for managing and prioritizing product *Backlogs*. They serve as a liaison between the development team and *stakeholders*, ensuring that user needs and expectations are reflected in product development. *The Product Owner* also collects and documents user needs, prioritizes features and tasks in *the Backlog* based on business value and feedback from users and provides feedback and clarification on features under development.

3.1.2 Project manager

Responsible for the overall monitoring, control and management of the project and providing direction and support for the project team. *The project manager* is also responsible for leading the planning and execution of the project. In the development of web-based project management applications*, the Product Owner* is played by the *project manager*, because the role carried out is the same, namely responsible for managing *the Product Backlog*.

3.1.3 UI/UX designer

Responsible for designing a visually appealing application interface and providing an optimal user experience. They ensure that applications are easy to use through research on user needs, wireframe and prototype creation, and conduct user experience trials. UI/UX *designers* also collaborate with the development team to implement the design that has been designed and continue to improve the design based on user feedback. The UI/UX *designer* position is played by 3 designers.

3.1.4 Software development team

Responsible for developing, testing, and maintaining applications based on project needs. This team is made up of software developers who work closely with other teams to ensure features run smoothly and applications work optimally. They are also responsible for *debugging*, updating, and implementing best practices in software development. The *software development* position is played by 3 *programmers*.

3.2. Manajemen Proyek Berbasis Web

This project framework uses an Input-Process-Output (IPO) approach to describe how a web-based project management system works. This approach helps in understanding how data is processed in the system and how the final results are displayed to the user.

The Project Management System Application is a digital platform designed to facilitate the management of project activities, tasks, and HR (Human Resources) performance. This system aims to unite various management processes, ranging from creating and organizing projects, distributing tasks in the form of kanban boards, tracking activity progress, to user account administration. Thus, all data collected and processed in this system can be accessed by project directors (pd), team members, and administrators to support comprehensive performance monitoring and evaluation

4. CONCLUSION

This research study involves *Scrum* as a structure for creating a web-based project management system framework. The development of the project management system was carried out in 3 sprints, the first sprint lasted for 24 days, the second sprint lasted for 24 days and the third sprint lasted for 18 days. The results of the study show that *Scrum* can overcome problems by developing a project management system framework that is worked on with a small team.

The results of this study also show how much flexibility compared to Waterfall in handling changing project needs, Scrum has flexible stages compared to Waterfall which has rigid stages where to get to the next stage must first complete the previous stage

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