BIOS: Jurnal Informatika dan Sains
Volume 2 Number 02, 2024, DOI 10.54209/bios.v1i02
E.SSN 2988-6910(Online)
https://seaninstitute.or.id/bersinar/index.php/bios/index

Design and Development of the HelpDesk Application for the Faculty of Information Technology, Tarumanagara University (FTI UNTAR) using the Agile Scrum Methodology

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ABSTRACT

At the Faculty of Information Technology, there is currently no structured division of tasks, so the task management process is carried out manually through the WhatsApp application. This causes difficulties in monitoring and completing tasks efficiently, and has the potential to cause confusion and delays. Therefore, a system is needed that can manage tasks and tickets effectively. The general theory discussed in this text covers the basic concepts and principles underlying the research topic, including relevant theories in the chosen field of study as well as methodological approaches. Websites play an important role in presenting interactive web pages for various purposes such as information dissemination, online transactions, communication, entertainment, and education. Websites can be static or dynamic, built using technologies such as HTML, CSS, and JavaScript. Systematic helpdesk management helps in resolving user issues efficiently through automated processes and structured communication channels. The Agile Scrum method is applied for agile development in designing a web-based ticketing helpdesk system, focusing on incremental delivery of value through user stories, product backlog management, sprints, and user acceptance testing. Use case scenarios, activity diagrams, and sequence diagrams are used for clear system visualization and documentation, ensuring efficient system development to meet user needs.

Keywords:
Website, Helpdesk system, Agile scrum, Timesheet

INTRODUCTION

In an increasingly advanced digital era, the role of information technology is crucial in supporting various aspects of life, including in the academic environment. Higher education as a center of education must prioritize service quality and operational efficiency. To achieve these goals, a system is needed that can support the daily activities of students and staff, especially in terms of help desk ticketing management and time sheets. The helpdesk ticketing system is very important to manage and solve various problems faced by students and staff (S. I. Adam., et al 2020). On campus, problems such as internet network interruptions, hardware breakdowns, and administrative issues often arise and can disrupt

the teaching and learning process if not handled quickly and efficiently. Without an efficient system, solving these problems will take a long time and reduce service quality and student satisfaction. As critical students, the existence of this system is vital to ensure all technical and non-technical needs can be resolved quickly and efficiently.

Helpdesk ticketing is a system or process used to manage, track, and resolve problems or requests from users. In this system, every problem or request reported by a user is considered a “ticket” which will be processed through several stages until it is completed (F. Wicaksono., et al 2020). The process starts when users submit their problems or requests through communication channels such as email or web forms (S. Tinggi., et al 2023). The ticketing system converts the report into a ticket, which includes a description of the issue, contact information, and priority. Once tickets are created, they are categorized and assigned to the relevant technician or team, based on the type of issue and level of urgency. The status of the ticket is then updated regularly to reflect the progress of resolution.

Currently, the management of time sheets in FTI is still done manually, where students and staff have to fill in and input their data manually in Excel. This manual process is prone to human error, time-consuming, and inefficient. The time sheets management system serves to record and monitor the working time and activities of students who work part-time on campus or staff. (M. Fauzi., et al 2021) The use of a web-based helpdesk ticketing system has made it easier for users to submit reports and support IT technicians in providing solutions to reported problems. With structured and automated timesheets, campuses can monitor productivity, manage work schedules, and ensure attendance and performance are as expected (P. Mai, 2024). For students, it is a very important tool to ensure that the time and effort they invest is properly recorded and compensated accordingly (D. B. Priyatna., et al 2023). As a critical student, it is important to have a transparent and efficient system for recording work activities, so that no time is wasted and all efforts made are properly recognized.

A helpdesk website allows users to resolve issues, track the status of their problems, and get help with products or services (D. Kurnaedi., et al 2022). Administrative processes and office work rely heavily on information technology (IT). Therefore, if there is a problem with IT facilities, assistance from the IT department is indispensable. However, often the department reporting the disruption does not know how long it will take to solve their problem, because the process of queuing work is not clearly visible and feels slow.

The implementation of helpdesk ticketing websites and time sheets on campus is not only about improving operational efficiency, but also about providing a better experience for students (Nurwati, 2012). As a critical student, the existence of this system can help in solving problems more quickly and efficiently, as well as managing time and tasks better. Overall, the development of this application aims to create a more responsive, efficient, and satisfying campus environment. With the support of technology, it is expected that the problem-solving process can be expedited and time management become more effective, ultimately improving the overall quality of education and campus operations. For critical students, this is an important step towards ensuring that every aspect of campus life runs smoothly and productively.

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METHOD

Literature Review

The following is the general theory or basis that is relevant and underpins the thesis research work, involving various fundamental concepts and principles that underlie the research topic. These fundamentals include theories related to the chosen area of study, as well as methodological approaches and frameworks used to collect, analyze, and interpret data. The theories provide a solid foundation for understanding the phenomenon under study, support the formulation of hypotheses, and provide guidance in designing an appropriate research methodology.

A website is a collection of web pages that are interconnected and accessed via the internet. These pages can contain text, images, videos, and interactive elements (J. Hassan Noor, 2024). Websites are hosted on web servers and can be accessed using a web browser on devices such as computers, smartphones, or tablets. Websites can have various purposes, such as providing information, facilitating online transactions (M. S. Eko Sutrisno., 2022), enabling communication, providing entertainment, or offering educational materials. The technologies used to build websites include HTML, CSS, and JavaScript. Websites can be static, with content that remains fixed until changed, or dynamic, with content that can be updated automatically (R. Mustakim., 2024).

Websites are divided into several types based on their functionality, such as static websites that only present unchanging content, or dynamic websites that can interact with users and modify content based on user input or automatically generated data [19]. In addition, websites can be designed for various purposes, such as business, education, entertainment, social media, e-commerce, and community. Business websites, for example, can be used to promote company products and services, provide contact information, and even provide online shopping facilities for notepad customers (web app).

A helpdesk system is an integrated platform designed to manage, track, and resolve problems or requests submitted by users or customers (J.F. Soeharjo., et al 2024). This system serves as a coordination center that facilitates communication between users and service providers, with the main goal of increasing problem-solving efficiency and user satisfaction in an organization. Helpdesk ticketing plays an important role in improving operational efficiency by automating support processes and ensuring that every request is handled in a structured and organized manner. The system also improves the quality of customer service by providing clear and responsive communication channels for technical support and customer service, as well as enabling effective priority management. The system uses “tickets” as the unit of information for each request or problem report made by a user. The ticket records all pertinent details, such as problem description, time, priority, and resolution status (P. D. Ridzuan., 2024). A helpdesk ticketing system allows the support team to monitor, prioritize, and respond to each request in a structured way, as well as providing a means for users to track the progress or status of their tickets. This system makes it easier for the support team to provide quick and appropriate solutions, and helps in identifying and fixing problems systematically.

Timesheets system is a tool or application used to record and manage time spent by employees or teams in completing certain tasks or projects (K. D. Kent Darryl M., et al). In the

context of ticketing systems, timesheets serve to record the duration of time spent by staff or technicians in handling each incoming ticket, starting from the time the ticket is opened until the ticket is completed or closed.

Research Method

The design of the ticketing helpdesk website was carried out by applying the Agile Scrum method, which focuses on continuous iteration and feedback. In this context, the design process uses the Unified Modeling Language (UML) to ensure a clear and organized structure, by including various diagrams such as Use Case Diagram, Use Case Scenario, Activity Diagram, and Sequence Diagram. Each of these diagrams has a specific role in documenting and visualizing the functionality and interactions of the system which serves to describe the flow of data and processes in this information system comprehensively. By using this approach, it is expected that system development can run more efficiently and meet user needs better. The Scrum stages can be seen in **Figure. 1**

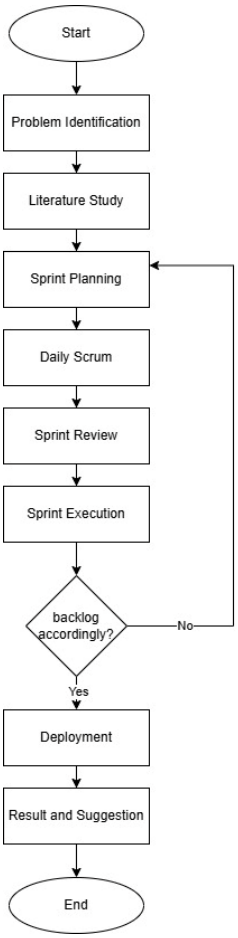

Figure 1. *Scrum Stages*

In developing the FTI Ticketing Helpdesk application, the Agile Scrum method offers a structured and flexible approach. User Story is a brief description of a feature from the end user's point of view, which helps the team understand user needs and goals. Product Backlog

is a list of all User Stories, features, fixes, and other work required for the helpdesk system. This list is managed by the Product Owner and is constantly updated based on feedback and changing needs. A sprint is a short iteration, usually lasting 2-4 weeks, in which the Development Team works to complete selected items from the Product Backlog. Each sprint results in a functional increment or improvement of the system, allowing the team to deliver value incrementally and be responsive to its users' needs.

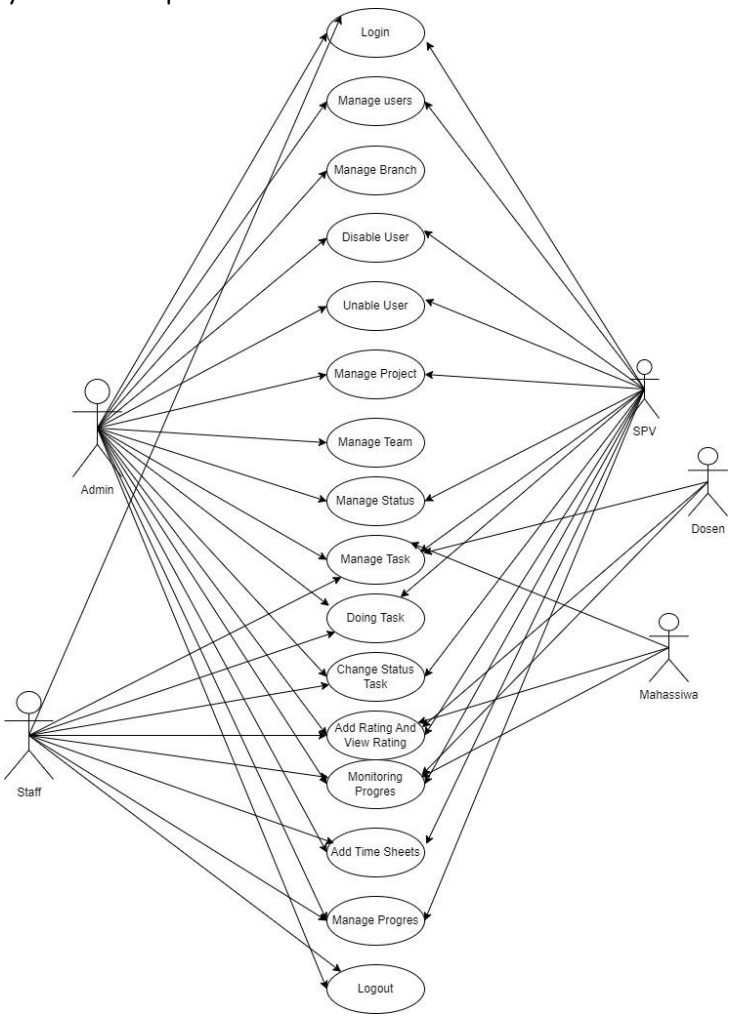

Figure 2. Usecase Diagram

The use case diagram design in this design involves four actors, namely an admin in charge of managing users, branches, activating and deactivating users, managing projects, managing teams, managing status, managing tasks, working on tasks, changing task status, giving ratings and comments on tasks, monitoring the task process, filling timesheets, managing processes, and logging out. The second actor is SPV, SPV itself is the boss who is responsible for its members in the SPV actor has access to managing users, activating and deactivating users, managing status, providing ratings and comments on tasks, working on tasks, monitoring the task process, filling timesheets, managing processes, and logging out then the third actor is staff, staff is an actor who obeys orders from the SPV in carrying out the tasks given by the SPV, where this staff has natural access to manage the tasks given, work on tasks that have been created or given, change the status of tasks, provide comments

and ratings on tasks, monitor tasks, fill out timesheets. manage processes, and log out. Manage processes, and log out. The fourth actor is the student, this actor is more likely to report problems and create tasks by students, then students can access managing tasks, providing reviews and ratings and seeing the progress of tasks that have been done by staff and SPVs. The last actor is a lecturer, and lecturer actors have the same access as students.

RESULTS AND DISCUSSION

The following is the system interface of the design that has been made, which serves as a guide for users in operating this system. This interface is designed to be easy to understand and use, so as to facilitate the process of user interaction with the system and ensure that all available features can be accessed efficiently. The page in **Figure. 1** allows users to add new tickets or tasks to the system. Users can enter important information related to the task or ticket, such as task description, priority, and deadline. Once filled, the ticket will appear in the main list for further monitoring and management.

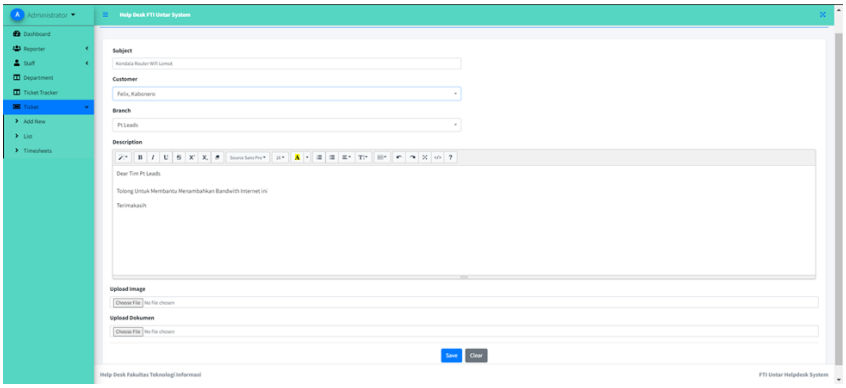

Figure 1. add ticket/task

On this page Fig. 2, users have the option to update the ticket status from Pending to Processing to Close. If needed, users can also add supporting evidence such as document files or photos to reinforce the information previously mentioned.

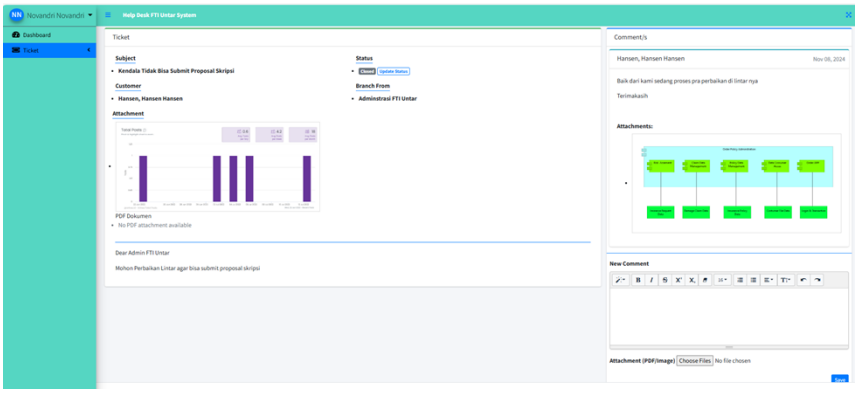

Figure 2. view comments and status page

The page in Fig. 3 displays complete information about the ticket from the admin's perspective. The admin can view the entire history of the ticket, including the time when the ticket was created until it was resolved. This helps the admin to better monitor the completion progress of each ticket.

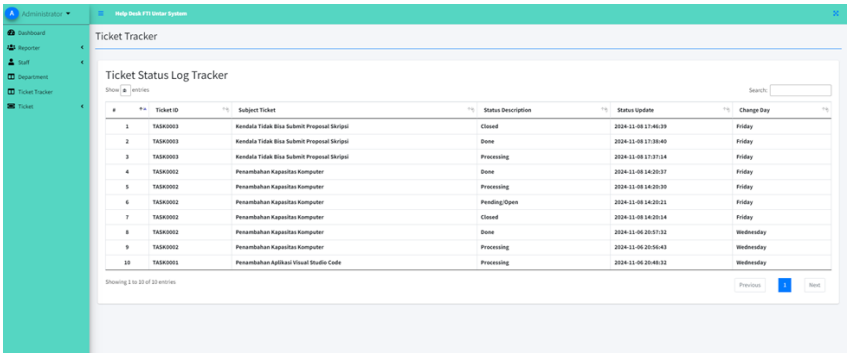

Figure 3. View ticket status page

Page on Fig. 4 Staff can access the Timesheets menu to record time spent on each task. Admins have access to monitor these timesheets, so they can monitor staff performance based on time spent on each task.

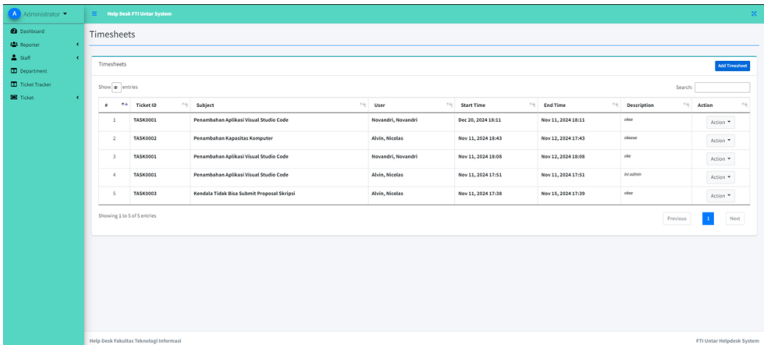

Figure 4. Timesheet fill page

CONCLUSION

In the digital era, information technology plays a crucial role in supporting various sectors, particularly in education. Higher education institutions must prioritize quality service and operational efficiency, which can be achieved through systems like helpdesk ticketing and timesheet management. The helpdesk ticketing system is vital for managing issues faced by students and staff, such as internet problems or hardware failures, ensuring that these problems are resolved promptly to maintain smooth academic operations. The system allows users to submit reports, which are then processed through a structured workflow involving categorization, assignment, and resolution tracking. This efficiency leads to higher user satisfaction. Currently, time sheet management at universities is done manually, often leading to human errors and inefficiency. An automated, web-based time sheet system could streamline tracking of students' and staff's work hours, enhancing productivity and ensuring

accurate compensation for students working part-time. By integrating both helpdesk and time sheet systems, campuses can improve operational management, reduce workload for staff, and provide a better user experience for students, ensuring that all activities are efficiently tracked and accounted for. The system's design uses the Agile Scrum methodology, which facilitates continuous improvement through iterative development. Key system actors include admins, supervisors, staff, students, and lecturers, each with different access and roles. The system's interface is designed to be user-friendly, enabling easy task management, status updates, and time tracking. With such systems in place, campuses can improve problem resolution times, streamline administrative tasks, and enhance the overall quality of the educational environment, ultimately ensuring that both academic and operational functions run smoothly and efficiently.

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