EMPOWERING STREAMLINED STUDENT ACTIVITIES VIA WEB-BASED PUSAT ISLAM MANAGEMENT SYSTEM (PMIS)

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Abstract

PIMS is an initiative specially designed to improve the management of activities in Pusat Islam Politeknik Sultan Mizan Zainal Abidin (PSMZA). The system is carefully designed based on the needs of the Pusat Islam management committee, with an emphasis on the creation of Pusat Islam activity scheduling, activity reports, student attendance management and organizational chart display. Through careful analysis of needs, PIMS enables the committee of the Pusat Islam to manage their activities more efficiently and contribute to the role of the Pusat Islam in the Muslim community at PSMZA. Next, the clear scope of PIMS determines the roles and responsibilities of admin, user and manager in this system. This helps streamline activity management, improve data security and ensure that every element of the organization functions better. The agile approach used in the methodology of this project allows PIMS always to be ready to adapt to changing needs and customer feedback. The programming languages used are PHP, HTML5, CSS, Javascript, JQuery, and SQL. White box testing or unit testing and User Acceptance Testing (UAT) have been conducted on this system. The result from system testing is positive meaning it is performed as expected from the given input. In conclusion, the PIMS is an important step to empower Pusat Islam's role in providing better services to members of Pusat Islam. With customized features and a responsive approach, PIMS is expected to lead to an overall improvement in the management of Pusat Islam activities and services.

Keywords: *Activity scheduling; Activity report; Attendance management; PMIS; Pusat Islam PSMZA*

I. INTRODUCTION

Web-based system is a type of operating system or applications that is hosted on a server accessed through a web browser allowing users to access it from anywhere in the world via the internet such as learning Management System (LMS) [1]. LMS is a web-based system that provides flexibility for users to create and manage learning activities independently and effectively.

Web-based applications are software that allows users to interact with a remote server through a web browser interface. They have seen a huge increase in popularity in recent years, replacing desktop applications and becoming a crucial instrument for education, industries, edutainments, business, and others. Nowadays, web-based applications have become a requirement for strategic management to solve any problems in an organization. Web-based systems can solve problems and support more efficient management [2].

The organization's needs can be met through the web-based system that is developed because it is through structured planning and meets the objectives. Pusat Islam Management System (PMIS) is a web-based application that was developed to simplify activity scheduling, enhance student attendance management and streamline activity reports to help the Pusat Islam management committee manage all the activities at Pusat Islam Politeknik Sultan Mizan Zainal Abidin.

Finding reports on Pusat Islam activities poses a challenge due to the absence of organization by session, month, or year, leading to significant time wastage during searches. Additionally, tracking student attendance for these activities encounters

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obstacles stemming from an inefficient and inaccurate recording process. The irregular and disorganized scheduling of activities exacerbates the risk of overlaps, compelling the reconstruction of schedules from scratch. Consequently, users are inconvenienced and prompted to reconsider their schedules. The implementation of a structured scheduling method is imperative to ensure efficiency and mitigate the occurrence of activity duplication.

The objectives of the Pusat Islam Management System are as follows: Firstly, to study and identify the system's requirements. Secondly, to design and develop the Pusat Islam Management System based on the identified requirements. Lastly, to conduct testing on the developed system to ensure its functionality and effectiveness.

The Pusat Islam Management System (PIMS) is a specialized initiative aimed at improving the management of activities within Pusat Islam. Custom-designed to meet Pusat Islam's distinct requirements, the system focuses on generating activity reports, managing student attendance, scheduling activities, and displaying organizational charts. By addressing these needs, PIMS enables Pusat Islam members to manage their activities more efficiently, strengthening the organization's role within the Muslim community at Polytechnic Sultan Mizan Zainal Abidin.

II. LITERATURE REVIEW

The study was conducted based on equivalent systems to glean insights from existing management systems and find the best practices for developing Pusat Islam Management System. A comparative analysis (shown in Table 1) of different perspectives [3] will help the researcher spot similarities and differences among them and develop a better new system.

Some of the studied systems include the Online Mosque Management System (MAKHTAB) [4] and the Case Management System (CMDB) [5]. The Makhtab is designed to cater to two types of users: administrators and staff. Its primary purpose is to record and update information related to the management of various activities and programs conducted at the Islamic centre, particularly those initiated by Committee members. Additionally, it offers capabilities for viewers to access information about upcoming events. Committee Members can also fill in information about the activities carried out in the event filling section. The main software used are PHP and MySQL. On the other hand, the CMDB centralizes all case-related information in one location, simplifying access and reducing paperwork, thereby ensuring that each case is managed effectively. Its primary purpose is to record and update information related to the management of various case activities. Additionally, it offers capabilities for viewers, such as staff members, to access information about all types of cases. The main software use are PHP and MySQL. The Figure 1 and Figure 2 are shown the interface of system studied.

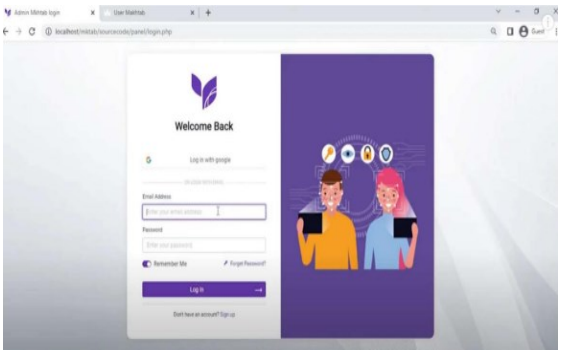

Figure 1: Online Mosque Management

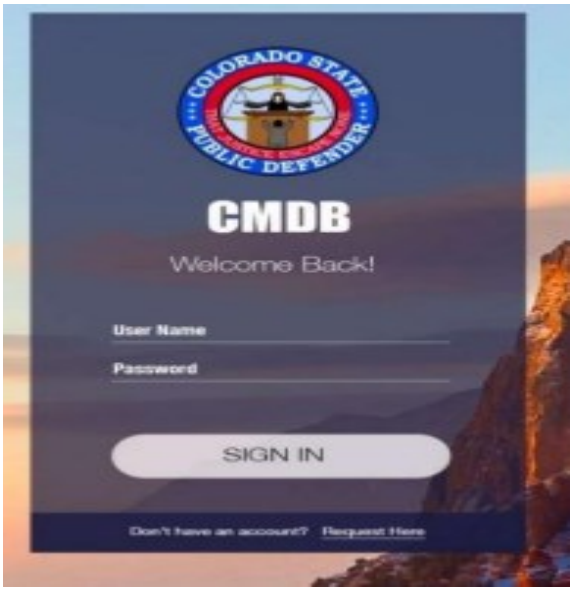

Figure 2: Case Management System

Table 1: Comparison of application software

System / Feature	MAKHTAB	CMDB
Type of system	Web-based	Web-based
Login Page	Available	Available
Help Page	No	Yes
User Friendly	No	Yes

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Interface	Attractive	Not Attractive
Speed	Responsive	Responsive

III. RESEARCH METHODOLOGY

There are several methodologies that are often used in the software or application development process such as waterfall model development, iterative model development, agile model, rapid application development, prototype development, lean development and scrum development [6]. System developers must choose the most suitable methodology for the project to be developed so that the project development process is more orderly, systematic and managed [7].

The Agile methodology as shown in Figure 3 is chosen as a guide to applied in this system's development. Agile is a term to describe the interaction of software development approaches that emphasize gradual delivery, team collaboration, continuous planning, and continuous learning [8]. This choice is based on its flexibility, adaptability, and its focus on collaboration among project teams. It promotes interaction between clients from PMIS and developers. Involving clients from PMIS in every phase of development improves the developer's understanding of the clients' requirements.

Figure 3: Agile Methodology [9]

The planning phase marks the initial step in the defining project objectives, gathering requirements, categorization process, necessitating careful consideration and agreement between developers and users. During this phase, various activities are undertaken, including interviews, observations, and reviewing existing document archives. It also includes time for the development and delivery of each iteration. System developer will produce a Gantt chart to illustrate a project schedule that represent a project plan overtime.

Following the needs analysis, the design stage focuses on constructing a model based on identified requirements. This modelling process employs various tools like Entity Relationship Diagram (Figure 4), Context Diagram (Figure 5), Data Flow Diagram (Figure 6), Flow Chart (Figure 7,8 & 9).

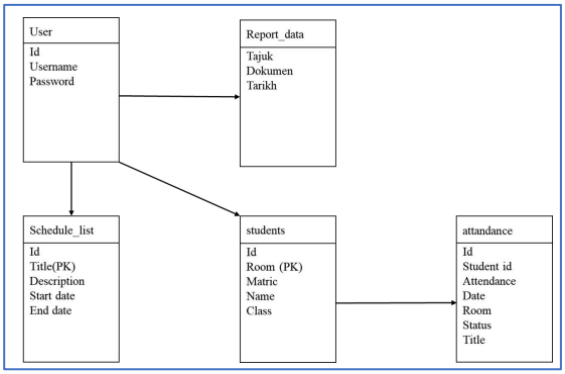

Figure 4: Entity Relationship Diagram

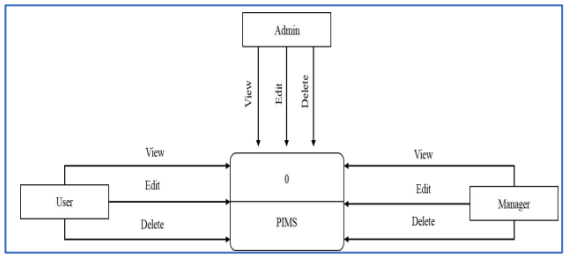

Figure 5: Context Diagram

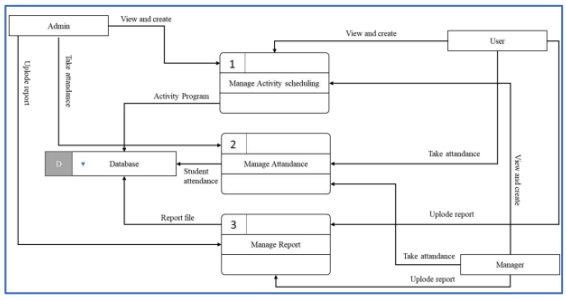

Figure 6: Data Flow Diagram

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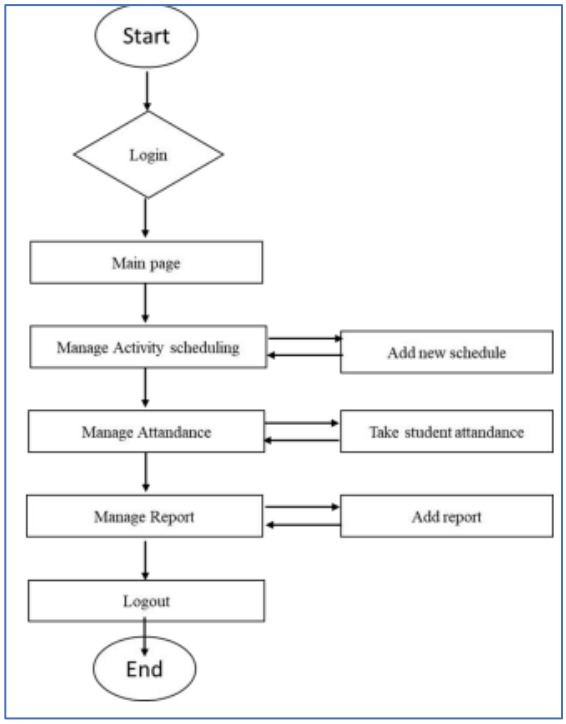

Figure 7: Admin Flow Chart

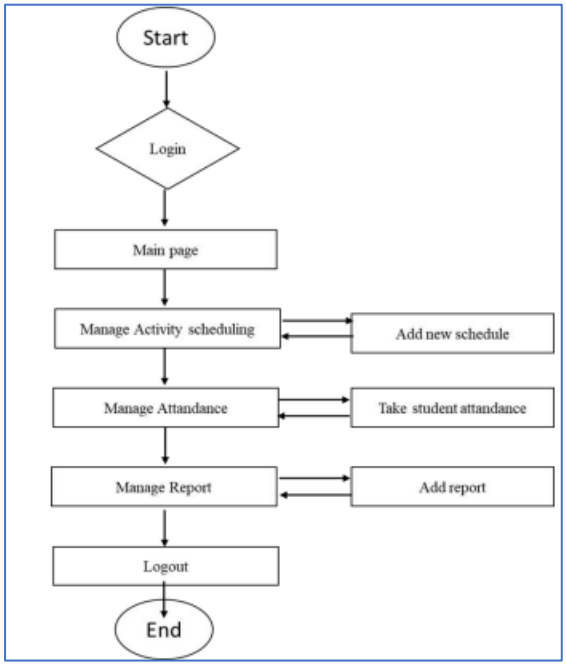

Figure 8: Manager Flow Chart

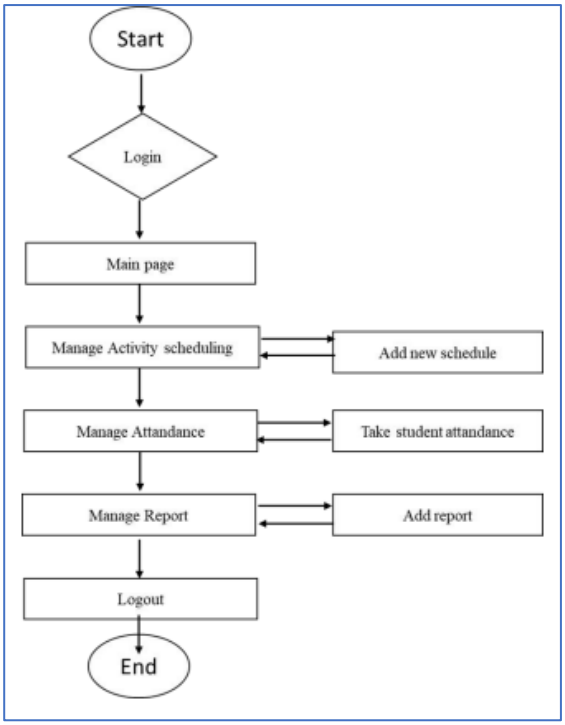

Figure 9: User Flow Chart

Once all system designs are complete, developers proceed to build the system according to user specifications. The development phase includes all related production tasks such as UX/UI design, architecting and coding. Developing the first iteration of a software product is often the longest stage of the agile application development lifecycle. Interfaces that related are as shown in Figure 10, Figure 11, Figure 12, Figure 13 and Figure 14.

Figure 10: Log in interface

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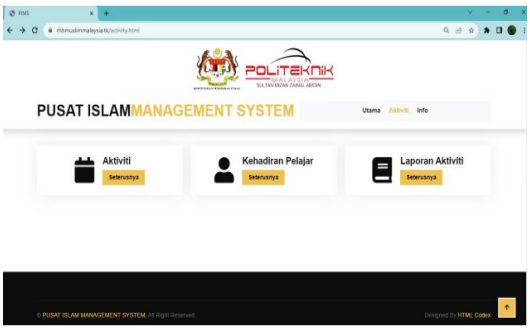

Figure 11 : Home Page

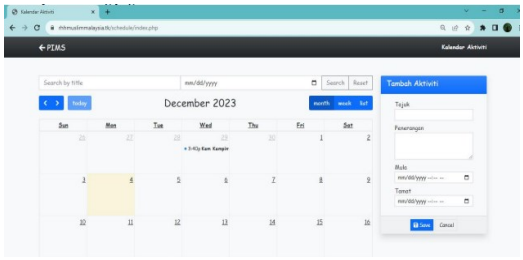

Figure 12: Activity Scheduling Page

Figure 13 : Attendance Page

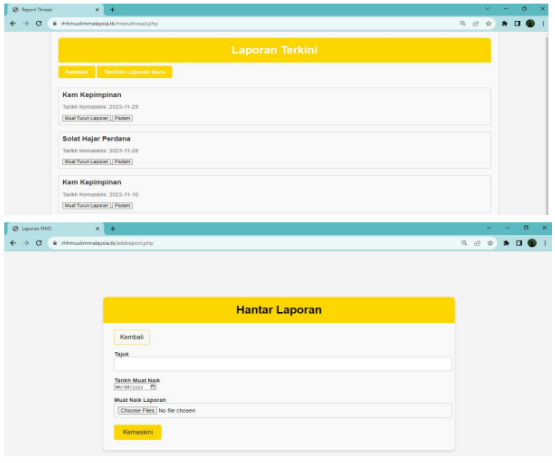

Figure 14 : Report Page

Subsequently, the testing phase becomes crucial, where developers code and test the new software to ensure its functionality and identify any errors or bugs. Deployment involves disseminating information about service updates to customers and conducting further testing to confirm that the system meets requirements. Finally, a thorough review is conducted to ensure that all user and system requirements are met, and that the system operates effectively.

Thus, communication among stakeholders is important for this project. Next, it allows changes throughout development. It provides flexibility to both parties, the clients from PMIS and the developer, thus improving the clients‟‟ satisfaction. It also can handle uncertainties in requirements very well. It can adopt new or changing requirements and can be fixed throughout the period as clients from PMIS are still uncertain about what they need and want from the system. It also makes the process of system development more practical and effective as it allows continuous delivery or release of useful software.

It improves the quality of the system as in every iteration; all phases are conducted; thus, defects can be found and fixed quickly. Not only that but works are also prioritized based on user stories; thus, important functionalities or needs of the system will be developed first based on user requirements. By using this methodology, it is easier to track the progress of the project to ensure that the project is delivered according to the planned schedules. To sum up, all requirements of the project are almost impossible to identify correctly before other phases, such as design and implementation, happen. However, traditional methodology, such as waterfall methodology, assumes that such a thing is possible. Thus, by adopting agile methodology in this project, changes can be made prior to clients' requirements and clients' feedback that is received at every sprint or increment of the project.

IV. RESULT AND DISCUSSION

The testing phase has been implemented to identify errors that occur in the project after the implementation phase has been completed. White box testing or unit testing is carried out to identify the correctness of the developed software process as well as verify that each unit in the software code runs according to plan. The main purpose for unit testing is to ensure that each user unit of the system works according to its specifications [10].

Table 2: Analysis Based on Unit Testing

No	Criteria	Pass(%)	Fail(%)
1	User Registration	100	0
2	User Login	100	0

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3	Menus organizational chart display	100	0
4	Menus Activity Scheduling	100	0
5	Menus Attendance	100	0
6	Menus Report Activity	100	0

Table 2 shows the results of the unit testing analysis, detailing the performance of various criteria within the system like user registration, user login, menus organizational chart display, menus activity scheduling, menus attendance and menus report activity. Each criterion underwent testing, with a pass rate of 100%, indicating successful implementation without any failures. These results affirm the reliability and robustness of the system across key functionalities such as user registration, login, organizational chart, activity scheduling, attendance management, and activity reporting. Such high pass rates underscore the effectiveness of the system's development process, reflecting meticulous attention to detail and adherence to quality standards. Moving forward, these findings in still confidence in the system's ability to function seamlessly in real-world scenarios, contributing to enhanced user experience and overall system performance. In conclusion, based on the results of the Pusat Islam Management System (PMIS), it has passed the tests carried out.

User Acceptance Testing (UAT) or known as end-users testing also conducted involves the real users which are the committee of Pusat Islam Management involved 30 students and 5 lecturers from student's project management unit. This is the final testing performed once the functional, system and regression testing are completed to determine whether application can be accepted or not. The main purpose of this testing is to validate the application against the business requirements. A set of questionnaires was given after the UAT done. There are 4 criteria that have been evaluated by the tester which are technical, user interface, data accuracy and system functionality. Each criterion has 5 question items. Table 3 show the analysis of average mean score after analysed.

Table 3: Analysis Based on Unit Acceptance Testing

Criteria	Mean Score
Technical	4.37
User Interface	4.27
Data Accuracy	4.45
System Functionality	4.61

Based on table 3, users find the system's functionality to be particularly effective or satisfactory because these criteria received the highest rating with a mean score of 4.61. Following closely behind is data accuracy achieving 4.45 mean score, indicating a significant level of trust in the system's data accuracy and reliability. The Technical criteria also received favourable responses, with a mean score of 4.37, signifying users' recognition of the system's technical proficiency The User interface received a mean score of 4.27, suggesting that while generally satisfactory, there may be some room for improvement in terms of user experience and interface design. In general, the data reflects a strong performance across all criteria, with system functionality being the standout feature, while also highlighting areas for potential enhancement in user interface design.

V. CONCLUSION

In conclusion, the Pusat Islam Management System (PIMS) stands as a crucial project designed to effectively oversee activities within Pusat Islam. With a clearly defined scope that assigns responsibilities to administrators, users, and managers, PIMS facilitates streamlined activity management including report generation, student attendance tracking, and event scheduling. It also boosts organizational efficiency with clear graphical displays and simplifies activity management, tailored to meet the unique needs of Pusat Islam. Operating under the guidance of Agile methodology, PIMS remains flexible to accommodate evolving needs, representing a significant advancement in strengthening Pusat Islam's role within Politeknik Sultan Mizan Zainal Abidin. It provides a responsive management system capable of addressing both present and future challenges.

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VI. RECOMMENDATION

The proposed enhancements for the Pusat Islam Management System (PIMS) encompass several key areas. In terms to Communication improvements involve sharing announcements and event messages, fostering discussions and chats to encourage member interaction, and facilitating quick updates through emails or messages. Event management features include enabling members to easily sign up for events online and gathering feedback for continuous improvement. The system also emphasizes centralizing document storage and accessibility, maintaining user profiles with role details, issuing reminders for membership renewals and organizing volunteers. These enhancements collectively aim to create a more comprehensive and user-friendly PIMS that addresses a broader spectrum of Pusat Islam's need.

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