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Islamic Study Schedule Search Website with Automatic WhatsApp Reminder Feature Using Extreme Programming Method in Jakarta

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ABSTRACT

This paper presents the development of a website for searching Islamic study schedules in Jakarta equipped with an automatic reminder feature via WhatsApp. The system is designed for Muslim residents in Jakarta to provide easy access to accurate and up-to-date information on Islamic study activities. Users can search schedules based on location, study theme, and preacher. The reminder feature is integrated with WhatsApp to automatically notify users before scheduled activities. The development follows the Extreme Programming (XP) methodology, which includes planning, design, coding, and testing. System testing demonstrates that all implemented features function according to requirements.

I. Introduction

Islamic study activities play an important role in improving religious knowledge and strengthening social interaction among Muslims. In urban areas such as Jakarta, Islamic study events are held frequently in mosques, prayer halls, and community centers. However, information related to these activities is commonly distributed through posters, instant messaging groups, or social media platforms, which are fragmented and not well organized. As a result, many potential participants miss important study sessions due to a lack of timely information or reminders.

The advancement of web technology provides an opportunity to develop centralized information systems that can integrate search and notification features. A web-based information system enables users to access data anytime and anywhere, while notification services can assist users in remembering scheduled events. WhatsApp is one of the most widely used messaging applications in Indonesia, making it an effective medium for delivering automatic reminders.

Several previous studies have discussed the development of web-based information systems and scheduling applications. However, research that specifically integrates Islamic study schedule search with WhatsApp-based reminders remains limited. Therefore, this study aims to design and implement a website-based Islamic study schedule search system with an automatic WhatsApp reminder feature using the Extreme Programming development method.

The proposed system is expected to facilitate both organizers and participants of Islamic study activities. Event organizers can easily manage and publish study schedules through a centralized platform, ensuring that information is updated and accessible to the public. Meanwhile, users can search for Islamic study events based on location, date, speaker, or topic, allowing them to find activities that match their interests and availability more efficiently.

The Extreme Programming (XP) method was chosen because it emphasizes flexibility, continuous feedback, and rapid development cycles. This approach is suitable for developing systems that require frequent changes and close interaction with users. By applying Extreme Programming, the development process can adapt to user needs, improve system quality through iterative testing, and ensure that the resulting application effectively supports the dissemination of Islamic study information and enhances community participation.

II. Literatur Review

A. Website

A website is an information page provided via the internet, making it accessible anywhere as long as an internet connection is available. A website consists of a collection of pages containing information in the form of text, images, and videos that can be accessed anytime and by anyone through internet technology [1]

B. Islamic Studies

Islamic studies represent an interdisciplinary field that focuses on understanding Islam from various perspectives, including normative and historical approaches. This field not only examines sacred texts such as the Qur'an and Hadith but also encompasses the social, cultural, and historical dimensions of Muslim communities. Such an approach emphasizes that Islamic studies are dynamic in nature, as they are influenced by the societal context in which Islam is studied. Consequently, Islamic studies have evolved from purely normative interpretations toward broader and more contextual analyses [2].

C. Extreme Programming

Extreme Programming (XP) is one of the agile software development methodologies that emphasizes intensive collaboration, short development iterations, and rapid feedback throughout the development process. XP is defined as a software development approach that prioritizes teamwork, open communication, and continuous improvement through fast and iterative development cycles [3].

In addition, XP is characterized by the application of core practices such as small releases, Test-Driven Development (TDD), and Continuous Integration (CI) [4]. These practices aim to simplify the development stages so that the system can be tested and refined continuously. By applying iterative development combined with frequent testing, XP enables early detection of errors and allows the system to evolve in accordance with user requirements.

D. WhatsApp

WhatsApp has evolved beyond a personal communication tool and has become a supporting medium for digital literacy [5]. In the educational context, WhatsApp has been widely used as a platform for distance learning, particularly during the COVID-19 pandemic. The group feature enables lecturers and teachers to create interactive class discussion forums and facilitates the sharing of learning materials in the form of documents, images, and links. These features demonstrate that WhatsApp effectively supports digital transformation in the education sector. In addition, the notification feature allows WhatsApp to function as an effective reminder tool for scheduled activities and important events.

Furthermore, WhatsApp is recognized as a multi-platform communication medium that can be accessed not only via smartphones but also through desktop applications and WhatsApp Web [6]. This cross-platform accessibility improves coordination in both personal and professional contexts by allowing users to remain connected across different devices. The flexibility of WhatsApp access enhances communication efficiency and supports its use as a reliable notification and coordination medium.

E. Framework

A framework can be defined as a structured collection of pre-integrated files that contain program code and basic functions designed to perform specific tasks [7]. Frameworks provide reusable components that simplify software development by offering predefined functionalities, such as database connectivity and application logic management. By utilizing a framework, programmers can reduce development complexity, improve code consistency, and increase development efficiency.

F. CodeIgniter

CodeIgniter, commonly referred to as CI, is a PHP-based framework designed to facilitate structured and efficient web application development by applying the Model–View–Controller (MVC) architecture [8]. The MVC concept separates application logic, user interface, and data management into distinct components, namely Model, View, and Controller. This separation simplifies code organization and maintenance, allowing developers to focus on functionality without the need to extensively review previously written scripts or documentation. By adopting the MVC approach, CodeIgniter improves development efficiency and supports the creation of scalable and maintainable web applications.

G. Fonnte WhatsApp API

Fonnte is a cloud-based WhatsApp Gateway service that provides a simple application programming interface (API) for sending automated WhatsApp messages [9],[10]. This service enables external systems to communicate with WhatsApp using HTTP POST requests that include parameters such as destination number, message content, and an API token. By utilizing a cloud-based architecture, Fonnte eliminates the need for local server deployment and simplifies system integration. In addition, Fonnte supports various message formats, making it suitable for implementing automated notification features in web-based information systems.

III. Method

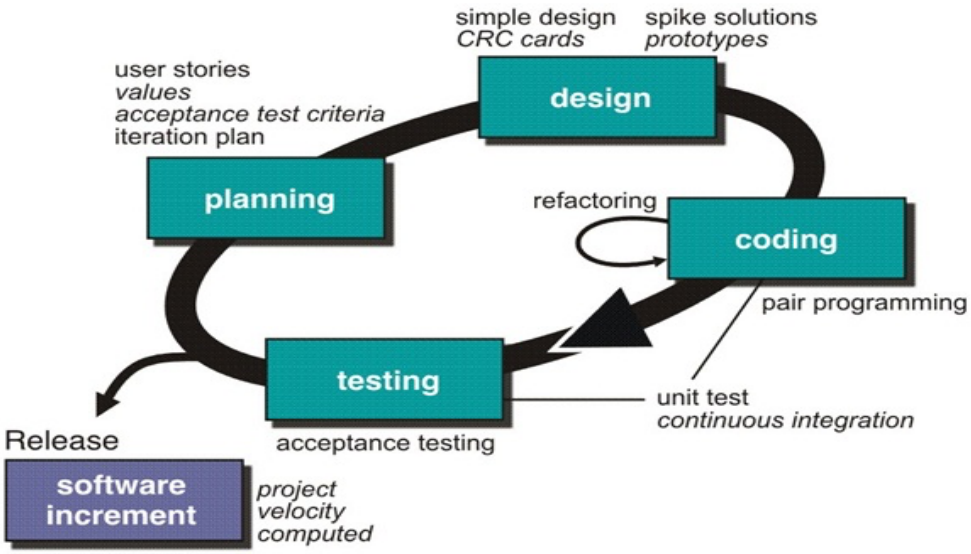

Fig 1. Extreme Programming Development Method

A. Planning

The planning stage focuses on identifying system requirements through a literature study and documentation study. Relevant scientific articles, journals, and technical documentation are reviewed to determine system functionalities, including schedule search filters, reminder mechanisms, and automated WhatsApp notification triggers. This stage ensures that the proposed system design is aligned with existing research and documented best practices.

B. Design

In the design phase of the Extreme Programming method, system design is simplified to illustrate the main functionality required by users. One form of design used is the Use Case Diagram, which aims to show the interactions between actors and the system.

This Use Case Diagram illustrates the actors involved in the system and the main functions each actor can perform. This diagram helps the development team and users quickly understand the system's scope without excessive technical detail, in accordance with the Simple Design principle of Extreme Programming.

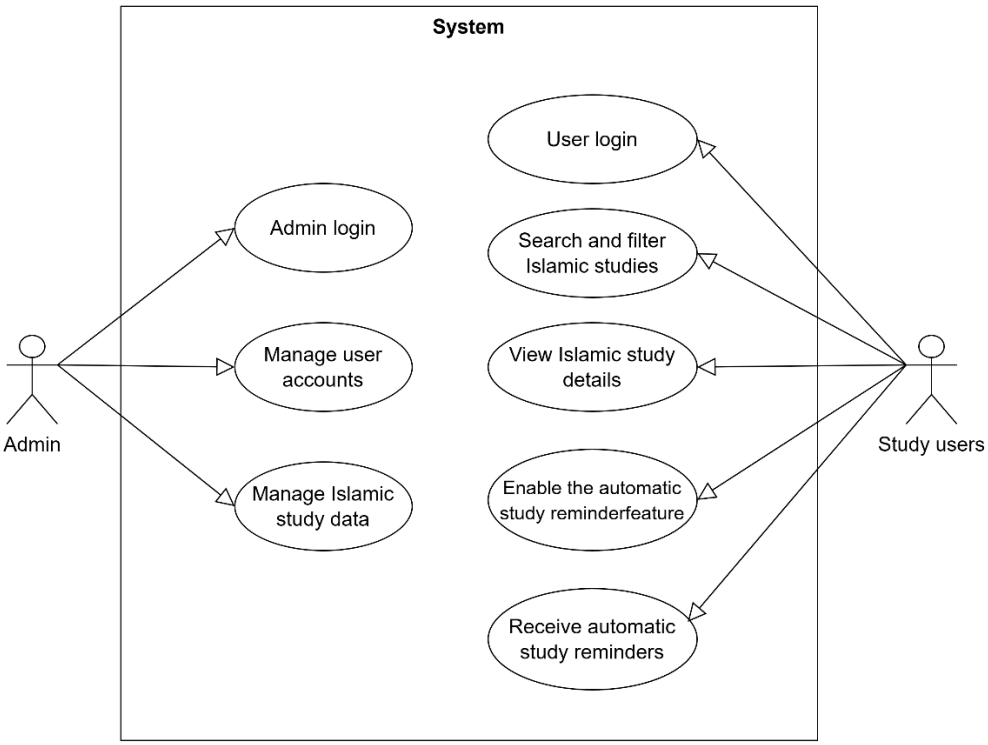

Fig 2. Use Case Diagram of the System

C. Coding

In the coding stage, the system design is implemented into a functional web-based application. The application is developed using PHP with the CodeIgniter framework, Bootstrap for the user interface, and MySQL as the database management system. Integration with the WhatsApp API is implemented to enable automated reminder message delivery.

D. Testing

The testing stage is conducted to ensure that the developed system operates according to the specified requirements. Black-box testing is used to validate system functionality, while white-box testing is applied to evaluate internal logic and program flow. This stage verifies the accuracy of schedule search features, reminder timing, and WhatsApp notification delivery.

IV. Results and Discussion

The development of the proposed web-based Islamic study schedule system integrated with an automated WhatsApp reminder feature produced several functional outcomes aligned with the defined requirements. The system successfully implements schedule management, search functionality, and automated notification delivery, demonstrating the applicability of the Extreme Programming (XP) methodology for this type of information system.

A. Islamic Study Home Page Interface

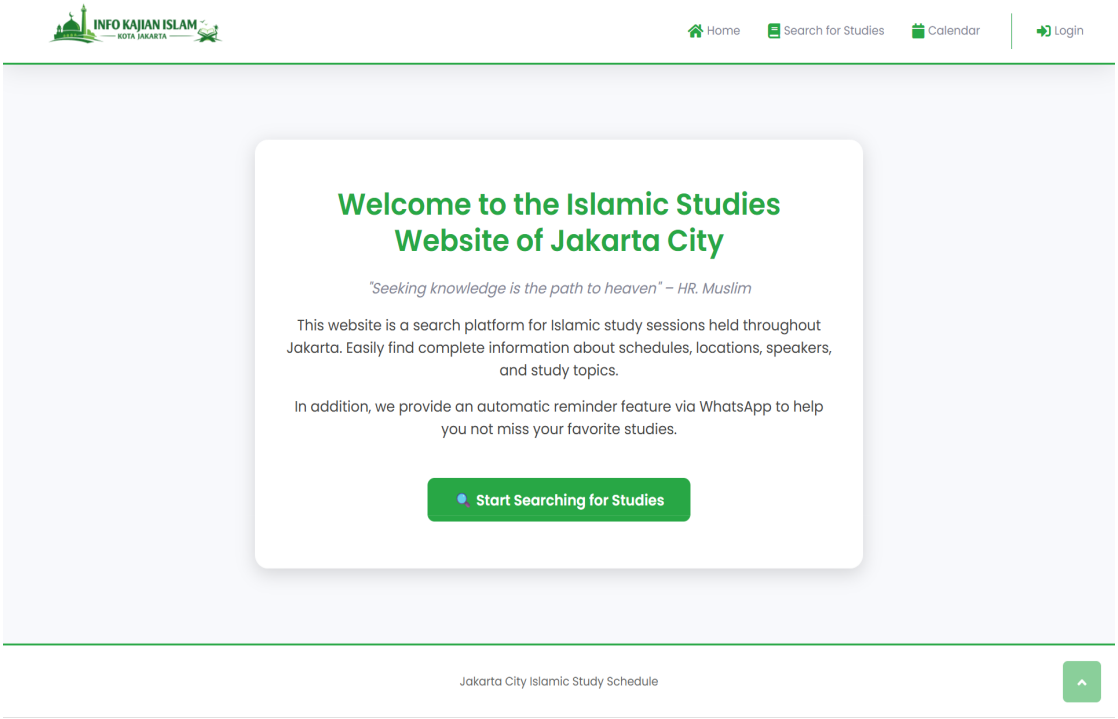

Fig 3. Islamic Study Home Page Interface

On the study's homepage, visitors are greeted with an inspiring welcome message accompanied by a Hadith quote, explaining that the platform facilitates comprehensive information search, from schedules and locations to speakers. It also offers a premium feature in the form of automatic reminders via WhatsApp. Simple navigation, with the main "Start Searching for Study" button in the center of the screen, provides an efficient user experience for anyone seeking to deepen their religious knowledge in an organized manner.

B. Login Page Interface

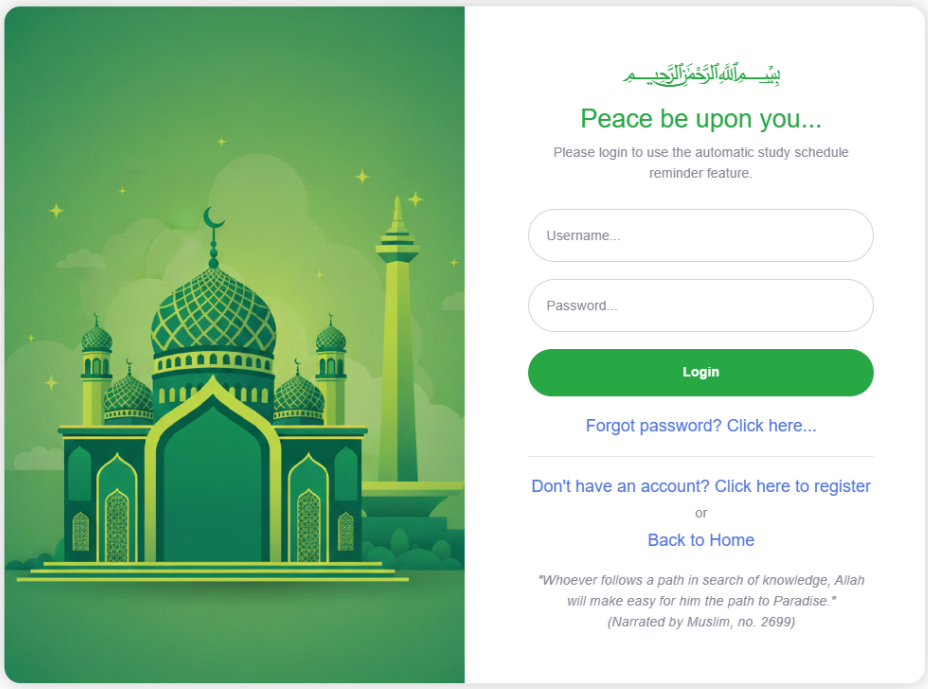

Fig 4. User and Administrator Login Interface

The login page serves as an authentication gateway for users to access their accounts and access personalized features, particularly the automatic study schedule reminder system via WhatsApp. Through the provided form, users can validate their identity by entering a username and password to ensure the security of their personal data. In addition to these primary functions, this page also provides an account recovery feature for users who forget their password, a registration menu for new members who don't yet have an account, and navigation to return to the main page if users simply want to view general information without logging in.

C. Islamic Study Data Management Page Interface

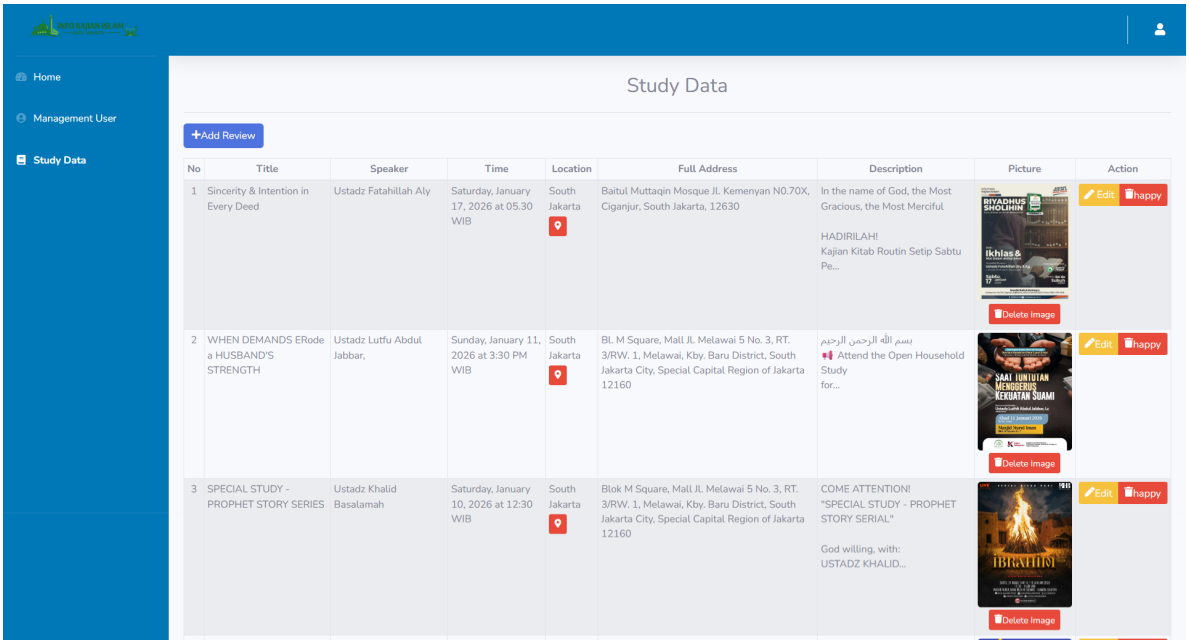

Fig 5. Islamic study data management interface

The Islamic study data management page serves as the main content management module where administrators can organize all information on religious propagation that will be displayed to users. On this page, administrators have full control over compiling a study database that includes theme titles, names of speakers, implementation times, and specific locations and complete addresses within the Jakarta area. In addition to a neat table inventory function, this page also features an "Add Study" feature for entering new schedules, a feature to upload posters or study images for visual appeal, and "Edit" and "Delete" action buttons to ensure the information presented in the application is always accurate and up-to-date.

The Islamic study search page serves as a primary feature for congregants to find specific study schedules through search filters based on study title, speaker name, and location within Jakarta. On this page, information is presented in the form of structured study cards containing complete details such as activity posters, speaker names, specific addresses, and a "View Location" link for direct navigation. A crucial feature on this page is the presence of status indicator labels such as "Completed" on study cards, which automatically inform congregants in real-time that the study time has ended so they can move on to find other active schedules. Furthermore, a "Read more" button is available on each card to access a detailed description of the material that will be or has been presented, ensuring users receive comprehensive information before deciding to attend.

D. Islamic Studies Search Page Interface

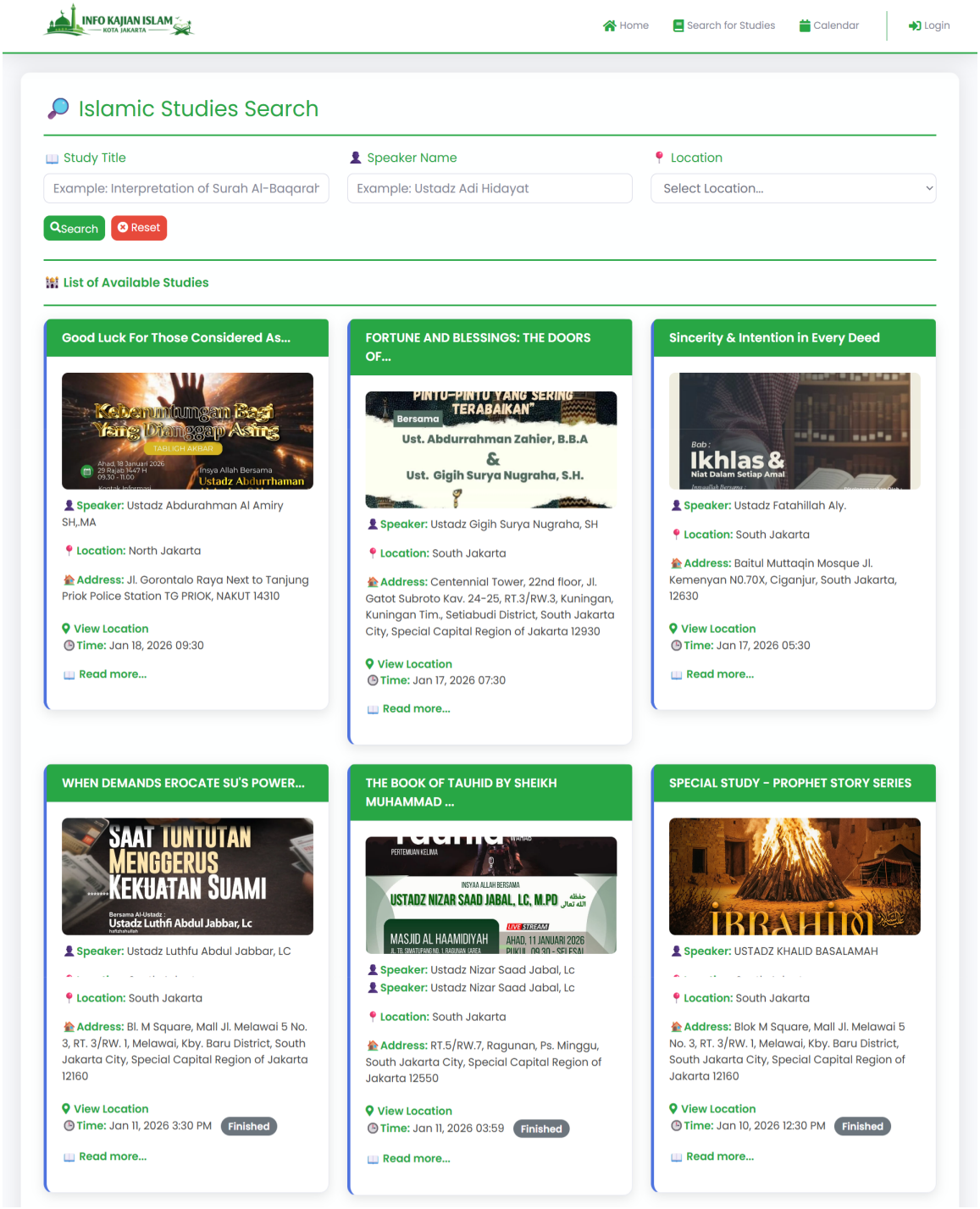

Fig 6. Islamic Studies Search Page Interface

E. Islamic Studies Search Page Interface

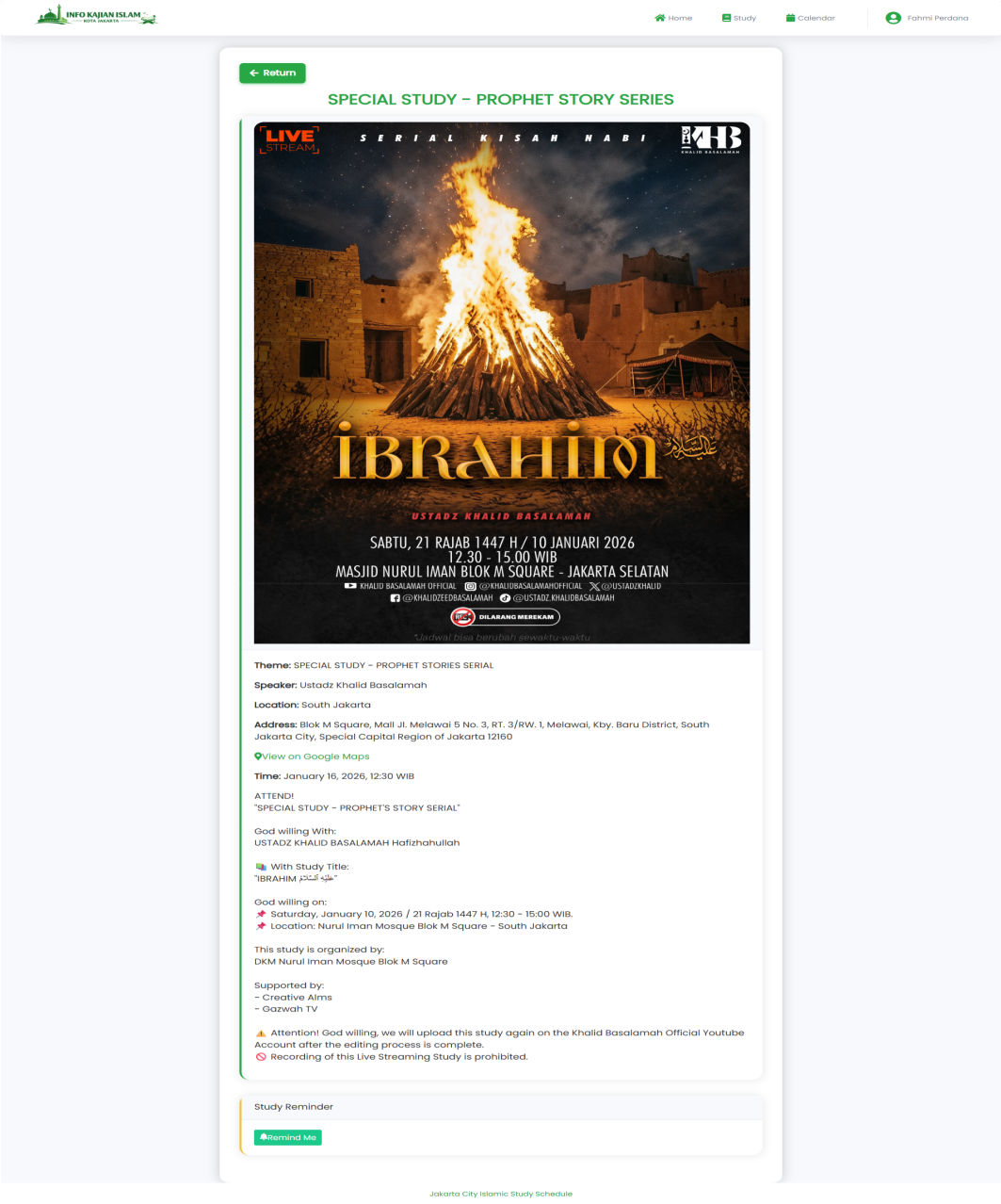

Fig 7. Islamic Study Detail Page Interface

The study details page serves as a comprehensive source of information, providing participants with in-depth details about a specific study agenda. This page displays the full activity poster and contains very detailed textual data, starting from the study theme, the name of the speaker, to the implementation time, including the day, date, and time. To facilitate the mobility of study participants, the complete address of the event location is provided along with the "View on Google Maps" integration feature that allows direct navigation to the location point. The main interactive function on this page is the "Remind Me" button in the Study Reminder box, which allows study participants to activate the automatic reminder feature via WhatsApp so they don't miss the study schedule.

F. Study Reminder Activation Message Interface Via Whatsapp

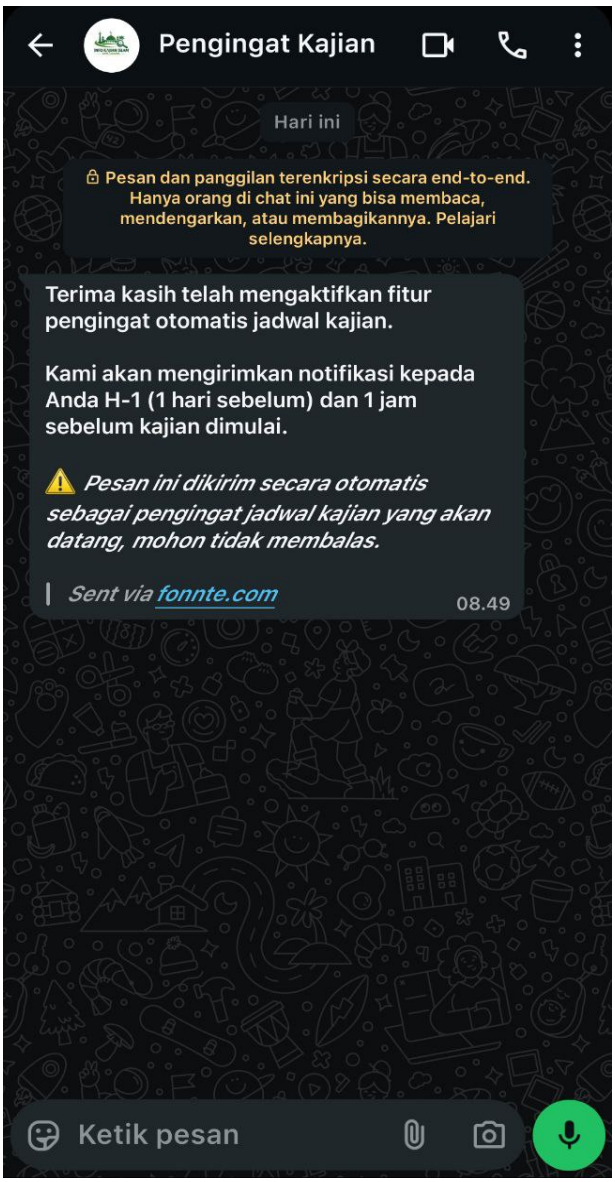

Fig 8. Automated Whatsapp Reminder Notification

This image shows an automated WhatsApp reminder message generated by the system after a user activates the reminder feature by clicking the “Remind Me” button. The message confirms that the reminder has been successfully activated and informs the user that a notification will be sent at a predetermined time, one day before and one hour before the Islamic study session begins. This notification is sent automatically through the WhatsApp gateway without requiring further user interaction. The results demonstrate that the system is capable of triggering scheduled reminders accurately and effectively to support user awareness of upcoming Islamic study activities.

This page shows an automated WhatsApp reminder message sent one hour before an Islamic study session begins. The message contains detailed information about the study event, including the study topic, speakers, date, time, location, and a Google Maps link for navigation. The reminder is sent automatically by the system without requiring user interaction, ensuring that users receive timely and complete information just before the event begins. These results demonstrate the system's effectiveness in providing last-minute reminders to reduce the likelihood of users missing scheduled Islamic study sessions.

G. Study Reminder Activation Message Interface Via Whatsapp

Fig 9. Whatsapp Reminder Notification One Hour Before the Study Session

V. Conclusion

This study has successfully developed a web-based Islamic study schedule system integrated with an automated WhatsApp reminder feature using the Extreme Programming methodology. The system is capable of displaying study schedules, providing search functionality, and delivering reminder notifications automatically at predefined times.

The implementation results show that the system functions as intended and effectively supports the dissemination of Islamic study information. The automated WhatsApp reminders help improve user awareness and reduce the possibility of missing scheduled study sessions. Based on the results, the proposed system can be considered a practical solution for managing and distributing Islamic study schedules in a digital environment.

References

[1] E. R. Rahmi, E. Yumami, and N. Hidayasari, "Analisis metode pengembangan sistem informasi berbasis website: Systematic literature review," REMIK (Riset dan E-Jurnal Manajemen Informatika Komputer), vol. 7, no. 1, pp. 821–834, 2023, doi: 10.33395/remik.v7i1.12177.

[2] H. Anjasmara, T. Kamal, and R. Hakim, "Islam sebagai objek studi dan pendekatan keilmuan," pp. 51–62.

[3] A. Rokhim, F. I. Azhar, and W. E. S., "Implementasi metode extreme programming untuk meningkatkan pengembangan perangkat lunak pada UMKM: Studi kasus di sektor e-commerce," vol. 6, no. 1, 2024.

[4] A. Lisdiyanto, R. A. Nugroho, A. Andhyka, A. Wibowo, and B. Winarti, "Pengembangan aplikasi bengkel las di Kediri dengan metode extreme programming," Jurnal Teknologi dan Sistem Informasi Bisnis, vol. 7, no. 1, pp. 63–69, 2025, doi: 10.47233/jteksis.v7i1.1740.

[5] E. Karlina, P. Suratriadi, T. Mutiah, and F. K., "WhatsApp sebagai media literasi digital untuk pembelajaran jarak jauh (PJJ) di masa pandemi," Jurnal Sosial Teknologi, vol. 2, no. 2, pp. 41–50, 2021, doi: 10.60132/edu.v2i2.271.

[6] V. R. Adawiyah, N. A. Reffiansyah, and B. F. A., "Teknologi pembelajaran: Peran WhatsApp dalam interaksi pendidik dan peserta didik," Jurnal Edukasi, vol. 2, no. 2, pp. 84–98, 2024, doi: 10.60132/edu.v2i2.271.

[7] N. Nilfaidah, A. S. Miru, and M. L., "Pengembangan sistem absensi mahasiswa realtime menggunakan PHP, MySQL, SMS gateway, dan framework CodeIgniter," Eprints, vol. 3, pp. 1–6, 2021.

[8] Marlina, Masnur, and M. Dirga F, "Aplikasi E-Learning Siswa SMK Berbasis Web," J. Sintaks Logika, vol. 1, no. 1, pp. 8-17, Jan. 2021.

[9] I. M. B. Waton, A. N. Weking, and B. Deta, "Penerapan API WhatsApp Fonnte untuk sistem pengingat jadwal bimbingan tugas akhir mahasiswa berbasis web," Jurnal Teknik Mesin, Elektro dan Ilmu Komputer, vol. 5, no. 2, pp. 229–241, 2025, doi: 10.55606/teknik.v5i2.7614.

[10] Ichsan, Feri Susilawati, and Muhammad Haykal, "Design and Build a Web-Based Village Information System for Acceleration of Village Services in Gampong Jantho Makmur", JI, vol. 8, no. 1, pp. 155-161, Apr. 2023.