Design and Development of an Interactive Prayer Schedule Application Using a User-Centered Design Approach

Nova Mayasari, Suheri, Muslim

Abstract

An effective user interface plays a significant role in improving user experience in digital applications, including those displaying prayer schedules. This study focuses on designing and developing an interactive prayer schedule application by applying the User-Centered Design (UCD) approach. The research methodology includes key UCD stages such as user needs analysis, wire frame creation, prototype development, and usability testing. The results show that applying the UCD approach leads to an intuitive, informative, and user-friendly interface that accommodates users from diverse backgrounds. This application is expected to serve as an effective digital medium for presenting prayer schedules interactively and enhancing user engagement with religious content.

Keywords: User Interface Design, User-Centered Design, Prayer Schedule, User Experience

\

Nova Mayasari[1]
[1]Bachelor of Computer Science, Universitas Pembangunan Panca Budi, Indonesia e-mail: maya7886@pancabudi.ac.id[1]

Suheri[2], Muslim[3]
[2,3]Bachelor of Computer Science, Universitas Pembangunan Panca Budi, Indonesia e-mail: suheri@pancabudi.ac.id[2], imoeslimchan@gmail.com[3]
2nd International Conference on Islamic Community Studies (ICICS)
Theme: History of Malay Civilization and Islamic Human Capacity and Halal Hub in the Globalization Era

Introduction

Digital applications that provide religious information, including prayer schedules, are increasingly needed as mobile devices become the primary source of information for many users. However, not all applications successfully deliver an effective and user-friendly interface. Complex navigation and poor interface design often hinder users from accessing essential information efficiently, leading to a reduced overall user experience [1]. Several studies emphasize that interface design plays a crucial role in enhancing usability and user engagement. A well-designed interface should not only focus on visual appeal but also prioritize functionality and accessibility [2].User-Centered Design (UCD) principles have been widely adopted as an effective approach to ensure that digital products align with user needs and expectations [3]. This approach highlights the importance of understanding user characteristics, usage context, and interaction goals [4]. Previous research on religious and prayer schedule applications indicates that many existing platforms provide basic information but lack interactivity or intuitive navigation [5]. Studies also suggest that structured processes such as wire framing, prototyping, and usability testing significantly improve the quality and usability of digital applications [6],[7]. Therefore, integrating these stages into the development of a prayer schedule application is essential to ensure an intuitive and user-friendly interface [8]. Based on previous findings, there is still an opportunity to develop a more interactive and useroriented prayer schedule application. The novelty of this research lies in the comprehensive implementation of the UCD approach from user needs analysis to usability testing which has not been fully applied in many existing religious applications [9]. Thus, this study aims to design and develop an interactive prayer schedule application using the UCD approach to enhance user experience [10}.

Literature Review

Prayer schedule applications represent a form of digital technology designed to provide accurate prayer time information based on user location. These applications typically rely on astronomical calculation algorithms and timezone data, presented through interfaces that are easy to read and navigate [1]. The need for prayer schedule applications has increased significantly due to the widespread use of mobile devices as a daily source of religious information [2]. Consequently, an effective user interface plays a vital role in ensuring that information is delivered clearly and efficiently.

User Interface (UI) and User Experience (UX) design are central aspects in the development of religious applications. A well-designed UI helps deliver prayer time information through clear visual presentation, while UX ensures that users can interact with the application comfortably and efficiently [3]. Previous studies indicate that intuitive UI design enhances user interaction and engagement, especially in religious applications that require a focused and structured presentation of information [4]. Other studies highlight the importance of accessibility, including proper color selection, typography, and navigation structures that accommodate users of various ages and digital literacy levels [5].

The User-Centered Design (UCD) approach is one of the most widely adopted methodologies in system development due to its strong emphasis on user needs, capabilities, and limitations. UCD requires developers to understand users deeply through observation, interviews, need analysis, and iterative evaluation of design prototypes [6]. The approach consists of several key stages such as user requirement analysis, wireframe design, prototype creation, and usability testing to assess design effectiveness [7]. Numerous studies confirm that

UCD improves user comfort and satisfaction because the resulting design truly reflects actual user needs [8].

Previous research utilizing UCD in religious or time-based applications has also demonstrated positive results. Studies on worship-related applications show that integrating UCD leads to interfaces that are more user-friendly and interactive compared to conventional design methods [9]. Other research confirms that user involvement during the design process increases system requirement accuracy and reduces design errors at later stages [10]. Interactive prayer schedule applications developed with UCD tend to be more effective in enhancing user engagement because they offer informative visuals, simple navigation flows, and interfaces that are easy to learn [11].

Despite the growing body of research on UCD in digital application development, there remains a notable research gap in its application to highly interactive prayer schedule systems. Most existing applications focus primarily on presenting static prayer time data and have not fully integrated interactive elements that adapt to user preferences [12]. Furthermore, only a limited number of studies have combined comprehensive user needs analysis with structured usability evaluation to produce truly optimized interfaces [13]. This gap reveals an opportunity to create a prayer schedule application that fully prioritizes user convenience through a holistic UCD approach.

Therefore, this literature review highlights that the complete implementation of UCD in developing an interactive prayer schedule application provides substantial value, including improved user experience, more intuitive interface designs, and more effective user interactions. This study contributes to filling the existing research gap by developing a prayer schedule application based on user needs and evaluating it using a structured and comprehensive usability assessment [14], [15].

Research Methodology

This research employs the User-Centered Design (UCD) method as the primary framework for developing an interactive prayer schedule application. The UCD approach places users at the center of the design process, ensuring that the resulting application aligns with their needs, preferences, and usage behavior. The methodology consists of four stages: user needs analysis, wireframe design, prototype development, and usability testing. Each stage contributes to solving the research problem of creating an intuitive and informative prayer schedule interface.

3.1 User Needs Analysis

The research begins with gathering user data to understand how individuals interact with digital prayer applications, what challenges they face, and what features they prioritize. Data were collected using online questionnaires and semi-structured interviews. Interviews provided deeper insights into user expectations, color preferences, navigation tendencies, and essential features. The data analysis used descriptive techniques to summarize recurring patterns and formulate core user requirements.

3.2 Wireframe Design

Based on the identified user needs, the next stage involved creating low-fidelity wireframes using design tools such as Figma. These wireframes represented the fundamental structure of each screen, including information hierarchy, layout organization, and navigation flow. The goal of this stage is to ensure that all essential content such as prayer times, date

information, and location options is presented clearly and logically. Several variations were created to explore alternative layouts, and the most intuitive design path was selected for development.

3.3 Prototype Development

After wireframes were finalized, a high-fidelity interactive prototype was developed. This prototype incorporates visual design elements, including typography, color palette, icons, and interactive components. The prototype simulates real interactions, enabling users to perform tasks like switching prayer time locations, navigating menus, or viewing detailed schedules. At this stage, iterative refinement was performed based on user feedback and design evaluation to ensure consistency and usability across screens.

3.4 Usability Testing

The final stage involves conducting usability testing to evaluate the application's efficiency, effectiveness, and user satisfaction. Participants were assigned specific tasks such as checking prayer schedules, changing settings, and navigating between menus.

Results

The development of the Interactive Prayer Schedule Application resulted in a functional prototype that aligns with user needs gathered during the research process. The application was designed to provide accurate prayer times, interactive reminders, a clean interface, and easy navigation, all based on the User-Centered Design (UCD) principles. The final prototype includes several core interfaces that represent the main functionalities of the system. The following figures present the primary display screens of the application.

4.1 Main Home Page

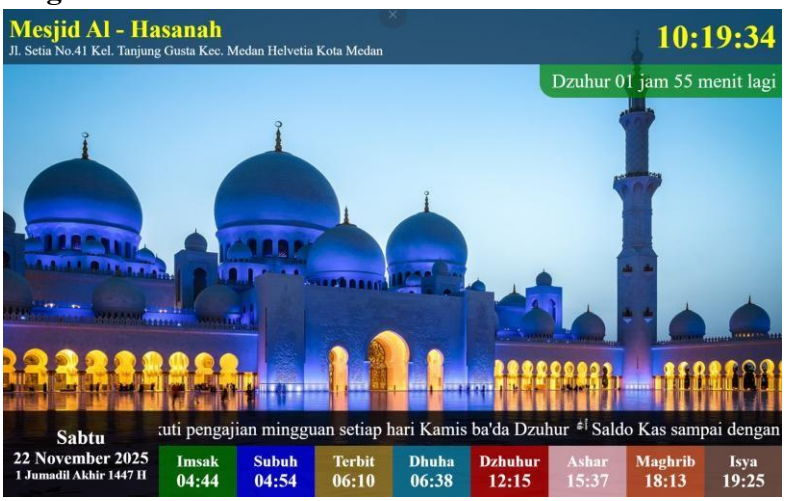
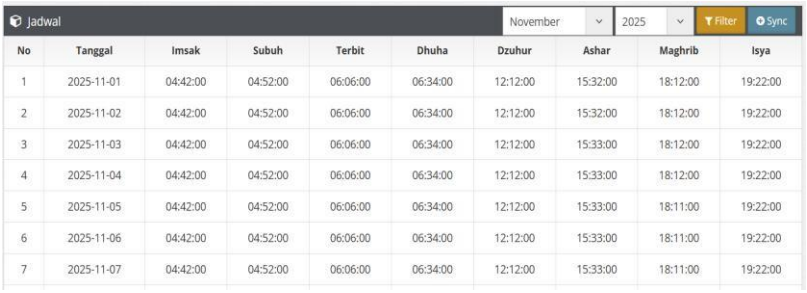


Figure 1. Main Home Page

The Main Home Page serves as the central entry point of the application. It presents an overview of the prayer schedule for the current day, quick-access buttons to additional features, and a clean layout designed to minimize cognitive load. The interface was structured to ensure clarity, ease of navigation, and focus on essential religious information.

4.2 Daily Prayer Schedule Page



No	Tanggal	Imsak	Subuh	Terbit	Dhuha	Dzuhur	Ashar	Maghrib	Isya
1	2025-11-01	04:42:00	04:52:00	06:06:00	06:34:00	12:12:00	15:32:00	18:12:00	19:22:00
2	2025-11-02	04:42:00	04:52:00	06:06:00	06:34:00	12:12:00	15:32:00	18:12:00	19:22:00
3	2025-11-03	04:42:00	04:52:00	06:06:00	06:34:00	12:12:00	15:33:00	18:12:00	19:22:00
4	2025-11-04	04:42:00	04:52:00	06:06:00	06:34:00	12:12:00	15:33:00	18:12:00	19:22:00
5	2025-11-05	04:42:00	04:52:00	06:06:00	06:34:00	12:12:00	15:33:00	18:11:00	19:22:00
6	2025-11-06	04:42:00	04:52:00	06:06:00	06:34:00	12:12:00	15:33:00	18:11:00	19:22:00
7	2025-11-07	04:42:00	04:52:00	06:06:00	06:34:00	12:12:00	15:33:00	18:11:00	19:22:00

Figure 2. Daily Prayer Schedule Page

This page displays detailed prayer times for Fajr, Dhuhr, Asr, Maghrib, and Isha, all synchronized based on the user's location. Data is automatically retrieved from a reliable prayer time API. The interface emphasizes readability, with structured time listings and visual indicators to help users easily identify upcoming prayer times.

4.3 Time Adjustment Settings Page

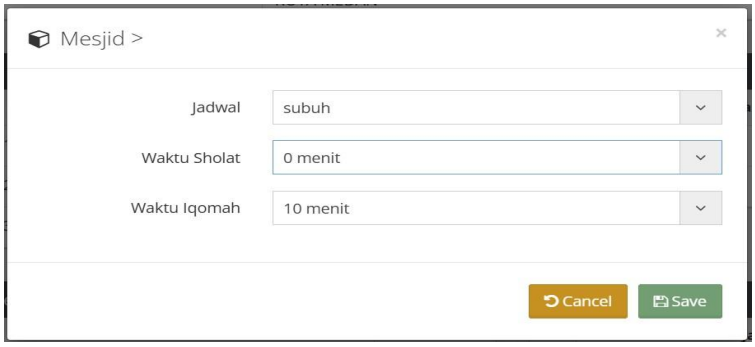


Figure 3. Daily Prayer Schedule Page

The Time Adjustment Settings allow users to fine-tune prayer times manually. This feature accommodates variations due to different calculation methods or local mosque adjustments. Users can increase or decrease each prayer time by a defined margin, ensuring that the application aligns perfectly with their preferred schedule.

4.4 Theme Customization Page

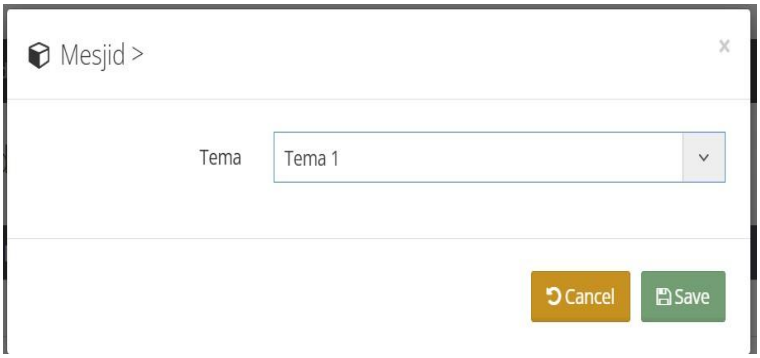


Figure 4. Theme Customization Page

The Theme Customization Page enables users to personalize the appearance of the application. Several color themes and layout styles are available, allowing for a more comfortable visual experience. This feature was implemented based on user feedback emphasizing the need for flexibility in aesthetic preferences.

4.5 Running Text Configuration Page

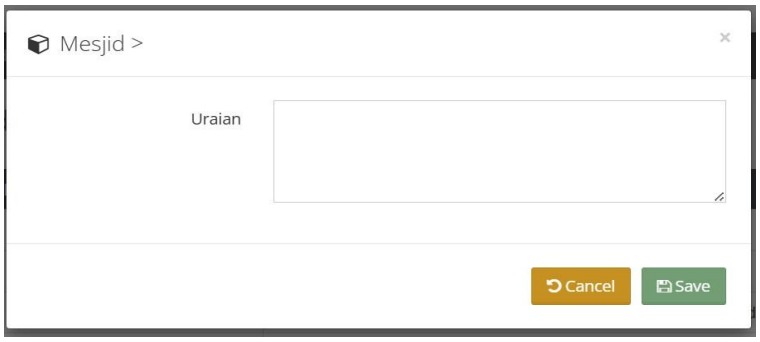


Figure 5. Running Text Settings Display

This page allows users to create and manage the running text displayed on the home screen. Users can input motivational Islamic reminders, announcements, or personal notes. The interface provides options to adjust text speed, size, and display duration, enhancing the application's functionality as a dynamic information board.

Conclusion

This study developed an interactive prayer schedule application using the User-Centered Design (UCD) approach. The UCD process ranging from user needs analysis to usability testing, helped produce an interface that is simple, intuitive, and aligned with user expectations. The final application includes key features such as adjustable prayer times, theme customization, running text settings, and banner management. Overall, the system is effective in presenting prayer schedules interactively and improving user engagement. Future enhancements may focus on broader customization.

References

[1] N. A. Fadhila and S. Nugroho, “Pengembangan Antarmuka Aplikasi Mobile Berbasis Kebutuhan Pengguna,” Jurnal Teknologi Informasi, 2020.

[2] R. Azuma, Y. Baillot, R. Behringer, S. Feiner, S. Julier, and B. MacIntyre, "Recent advances in augmented reality," IEEE Comput. Graph. Appl., vol. 21, no. 6, pp. 34–47, 2001.

[3] M. Y. Pratama, “Analisis User Experience pada Aplikasi Mobile Menggunakan Metode heuristic Evaluation,” Jurnal Sistem Informasi, 2021

[4] S. Rahman and A. Wahyudi, “Analisis Kualitas Aplikasi Jadwal Salat Menggunakan Metode Usability,” Jurnal Informatika Indonesia, 2019

[5] A. Nugraha, “Penerapan Wireframe dan Prototype dalam Pengembangan Aplikasi,” Jurnal Teknologi Informasi dan Komputer, 2020.

[6] L. Santoso and M. Putri, “Penerapan Prototyping untuk Pengembangan Aplikasi Keagamaan,” Jurnal Sistem Informasi, 2019.

[7] R. Hidayat, “Implementasi Pendekatan UCD dalam Aplikasi Edukasi Islam,” Jurnal Teknologi dan Pembelajaran, 2020

[8] S. Arifin, “Pengembangan Desain Antarmuka dengan UCD untuk Aplikasi Mobile,” Jurnal Riset Teknologi Informasi, 2022

[9] U. Karim, “User Interaction Patterns in Religious Mobile Apps,” International Journal of Computer Applications, 2021

[10] H. Amir and L. Lee, “Designing Mobile Interfaces for Daily Worship Activities,” IEEE Access, 2020

[11] A. Basri, “Evaluating Accessibility in Mobile App Design,” Indonesian Journal of HCI, 2022.

[12] M. Setiawan, “Improving UX on Islamic Apps Through Iterative Design,” International Journal of Information Systems, 2021.

[13] K. Abdullah, “Mobile App Usability for Religious Content Consumption,” Journal of Islamic Computing, 2019.