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# Developing a Web-based Information System Information System to Enhance Operations in Hajj and Umrah Travel (Case Study: PT. Mutiara Cinta Imani)

Rosalina[1], Muhammad Syahir[2]
[1] Informatics Study Program, Faculty of Computing, President University, Bekasi, Indonesia
[2] Information System Study Program, Faculty of Computing, President University, Bekasi, Indonesia
E-mail: rosalina@president.ac.id[1]

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***Abstract*— This research addresses the substantial challenges arising from the prolonged reliance on manual inputting methods, notably paper and Excel, within the operational framework of PT. Mutiara Cinta Imani in the context of Hajj and Umrah travel. The inherent inefficiencies, potential errors, and constraints associated with traditional data management practices have prompted a critical examination of the existing system. Recognizing the imperative for a more contemporary approach, this study focuses on the development and implementation of a Web-based Information System. The primary goal is to enhance operational efficiency, mitigate errors, and overcome the limitations inherent in manual data management. By conducting a case study on PT. Mutiara Cinta Imani, this research seeks to provide a comprehensive understanding of the challenges faced and propose a technologically advanced solution to optimize data input processes. The envisioned Web-based Information System aims to revolutionize operations, offering real-time access, scalability, and increased reliability, thereby paving the way for improved practices in the Hajj and Umrah travel domain.**

***Index Terms*—hajj; travel agency; umroh, web-based Information System.**

## I. INTRODUCTION

In the context of Hajj and Umrah, information system innovation has significantly enhanced various facets of the pilgrimage journey through technological interventions [1]. A specific focus on Hajj involves a study [2] investigating the use of information and communication technology (ICT) for crowd management, presenting cutting-edge strategies and tools to improve coordination and security during the pilgrimage, offering valuable insights for the crowd management community. Another study [3] concentrates on the implementation of a website for booking Hajj, Umrah, and tour tickets using the Waterfall Method, emphasizing a systematic development approach. Additionally, a separate paper [4] introduces web-based information system Hajj simulation software, emphasizing the importance of interactive tools in facilitating Hajj learning and contributing to the broader discourse on technology in religious education.

The integration of digital tools, internet platforms, and mobile applications has revolutionized communication and pilgrimage management for both pilgrims and organizing entities [5],[9],[13]. Khan and Shambour's research [6] provides an analytical examination of mobile applications for Hajj and Umrah services, exploring their features and functionalities. Another contribution by Ilias et al. [7] discusses the development of mobile applications for monitoring and managing Hajj and Umrah pilgrimages. Furthermore, Elazhary introduces a cloud-based, context-aware mobile application and framework for Hajj and Umrah management [8]. Together, these endeavors shape the evolving landscape at the intersection of technology and religious education, enhancing the overall pilgrimage experience.

Various studies have contributed to the integration of technology in the management and enhancement of Hajj and Umrah experiences. Yamin et al. [10] discuss the integration of social media and mobile apps into Hajj management, providing insights into leveraging these platforms for effective coordination and communication during the pilgrimage. Elazhary [11] introduces a cloud-based, context-aware mobile application and framework for Hajj and Umrah management, offering a technological solution to streamline pilgrimage logistics.

Sayudin et al. [12] contribute a management analysis of Hajj and Umrah travel services, providing practical insights into the operational aspects of

pilgrimage travel. Budiawan and Afrianto [13] focus on the development of an Android-based monitoring application for Hajj and Umrah pilgrims, demonstrating the potential of mobile technology in enhancing the monitoring and management of pilgrimage activities. Kabir et al. [14] explore a virtual reality (VR)-based interactive and educative experience of Hajj and Umrah for the people of Bangladesh, showcasing the application of VR technology in religious education. Suhaimi et al. [15] contribute to the development of a Pilgrim's Automatic Counting System and Health Monitoring using Machine Learning, showcasing the potential of machine learning in ensuring the well-being of pilgrims during their journeys. Together, these studies exemplify the diverse applications of technology in optimizing various aspects of the Hajj and Umrah experiences, ranging from logistics and management to education and health monitoring.

Utilizing manual paper-based procedures and antiquated systems to manage participant data, PT Mutiara Cinta Imani, a pilgrimage travel company with operations in Gresik, Probolinggo, Madura, Pasuruan, and Lamongan, is currently facing difficulties. The business's reliance on antiquated techniques emphasizes how urgent it is to adopt technologically advanced solutions for streamlining and improving operations. Data management can be revolutionized by switching from manual to automated information systems, improving workflow overall and efficiency and precision. Upgrading to modern technologies should increase the organization's capability and guarantee a more efficient functioning. At this crucial point, PT Mutiara Cinta Imani has to embrace new information technology in order to fully realize its potential in today's digital landscape.

The need to address issues with manual entry methods—which primarily use paper and Excel—motivates this research at PT. Mutiara Cinta Imani. Acknowledging inefficiencies and possible mistakes in these conventional methods, the business actively works together to describe the participant data input procedure as it is currently implemented. The goal of the project is to present a game-changing technical solution that will improve accuracy, optimize processes, and create a more effective data management system. This modernization addresses the shortcomings of the current data input procedures and is in line with industry trends. It also highlights PT. Mutiara Cinta Imani's proactive attitude to enhancing operational capabilities and competitiveness in the changing travel industry landscape.

## II. METHODS

Due to its capacity to provide high-quality solutions quickly, the Rapid Application Development (RAD) method was chosen for the proposed Information System Development. Iterative development is given priority by RAD, which enables the rapid development of working prototypes. This iterative process makes sure that the technology closely matches the unique requirements of travel operations for the Hajj and Umrah. Rapid Application Development (RAD) shortens the time to market without sacrificing the quality of the final product by placing an emphasis on collaborative involvement and constant feedback loops[16]. RAD's agility stands out as a critical component in attaining both efficiency and precision in the dynamic world of travel operations, where adaptation is essential. Through the use of the RAD methodology, this research approach ensures a dynamic and iterative approach to the Web-based Information System development, facilitating quick progress, stakeholder involvement, and ongoing modifications based on changing requirements and input from PT. Mutiara Cinta Imani.

Each stage in the RAD implementation cycle plays a crucial role in achieving the overarching goal of rapid and effective system development. Let's delve into an elaborate explanation of each stage:

1. Requirements Planning: Stakeholders, including PT. Mutiara Cinta Imani, contribute to project specifications.
2. User Design: Collaborative sessions produce mock-ups, ensuring the system aligns with user needs.
3. Construction: Programmers convert designs into usable parts, allowing for iterative modifications.
4. Testing and Integration: Components undergo extensive testing to ensure expected functionality and smooth integration.
5. Implementation: Verified modules are incorporated into the system, deployed in a controlled environment.
6. Evaluation: PT. Mutiara Cinta Imani actively assesses system performance, suggesting improvements for enhanced efficacy.
7. Feedback and Adjustments: Ongoing feedback drives refinements and quick fixes, ensuring responsiveness to changing requirements.
8. Repeat Cycles: RAD's iterative nature allows for multiple cycles, improving the system based on user input and evolving needs.

## III. RESULT AND DISCUSSION

### *A. Current System Analysis*

The current system of PT. Mutiara Cinta Imani has various flaws that require attention and improvement. Currently, the organization relies largely on manual operations, particularly data input, which is accomplished through a combination of paper-based methods and Excel spreadsheets. This manual approach creates substantial obstacles to the efficiency and accuracy of operations, particularly for Hajj and

Umrah Travel participant data.

*Manual Data Input*

1. Issue: The use of paper forms and Excel sheets for human data input increases the possibility of errors, delays, and inconsistencies.
2. Impact: Incorrect participant data could cause logistical concerns, processing delays, and potential travel challenges.

*Limited Technological Integration*

1. Issue: The current system lacks technological integration, which impedes real-time collaboration and data availability.
2. Impact: Decision-making procedures become inefficient, and a lack of fast access to important information reduces the travel agency's overall responsiveness.

*Branch Management Challenges*

1. Issue: With the existing decentralized structure, managing participant data across different branches (Gresik, Probolinggo, Madura, Pasuruan, and Lamongan) becomes difficult.
2. Impact: It becomes more difficult to maintain accuracy and consistency in data handling, which could result in differences between branches.

*Excel Limitations*

1. Issue: There may be restrictions on the scalability, data security, and collaborative features of using Excel for data management.
2. Impact: The limitations of the current system may make it more difficult to handle participant data smoothly as the firm expands, which would reduce overall operational efficiency.

*Lack of Automation*

1. Issue: The lack of automated procedures for managing participant data, such as passports and meningitis letters, increases the amount of labor that must be done by hand and increases the risk of errors.
2. Impact: An increase in the amount of manual labor required could cause delays and increase the chance that important participant documentation will be overlooked.

A new system was developed from the issues already present, and numerous suggestions for enhancing the current system were made. Employee registration will be facilitated by this information system, which will also reduce the likelihood of document loss brought on by the numerous paperwork needed for Hajj and Umrah journeys. In addition, employees will find it easier to manage Hajj and Umrah packages with this system; keep in mind that these packages can occasionally change to reflect current events. Employees will also be able to set the ritual schedule, handle payments, and create departure and financial reports with greater precision and accuracy.

## *B. Proposed Solutions*

Use case diagrams are visual representations in software engineering that illustrate interactions between a system and external entities, such as users or other systems. They play a crucial role in depicting the functionality and behavior of a system, providing a high-level overview of how the system responds to various scenarios. Use case diagrams detail the specific features and functionalities a system offers and the actors (users or external systems) involved in these interactions. The Use case diagram of the proposed solutions is depicted in Figure 1 and Figure 2, meanwhile the activity diagram is depicted in Figure 3.

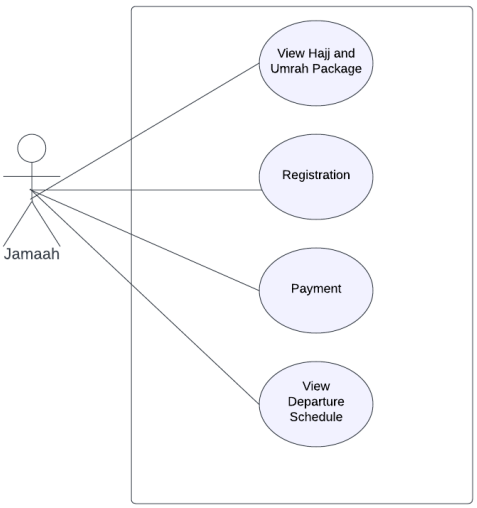


Fig. 1. Use Case Diagram

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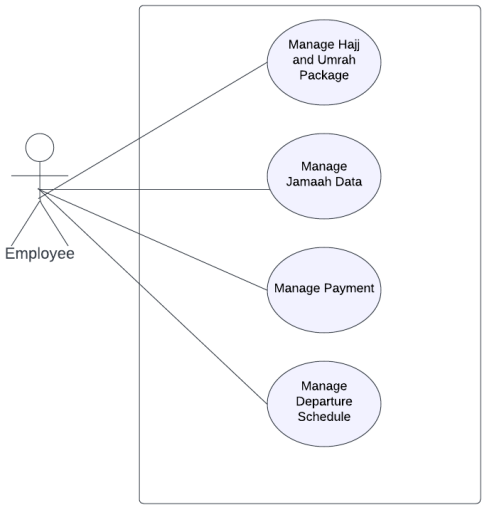


Fig. 2. Use Case Diagram (Cont')

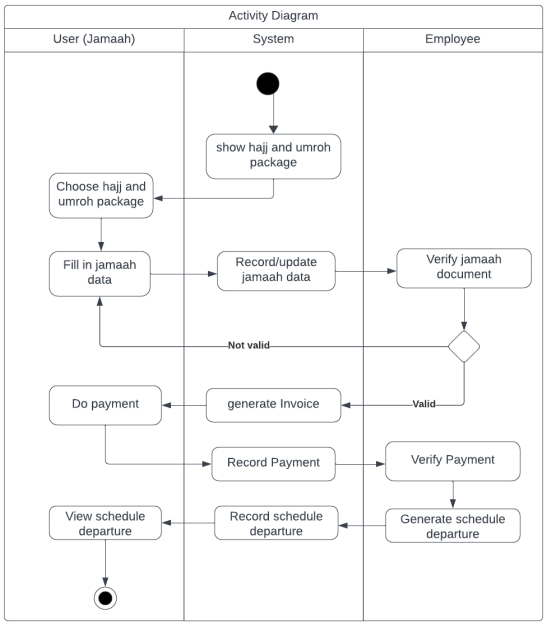


Fig. 3. Activity diagram

## C. *Implementation Results*

As shown in Figure 4, the Login Page of the system presents a striking visual identity with the predominant use of PT Mutiara Cinta Imani's core colors, Red and Gold, fostering brand recognition. The design is purposefully simplistic yet elegant, prioritizing user-friendly navigation. It features a single login form indicating the page's title, two textboxes for login credentials, and two distinct buttons. The submit button facilitates the login process, while the href button serves a separate function outside the login session. This thoughtful design creates an intuitive and visually appealing entry point for admin and Admin, enhancing the overall user experience.

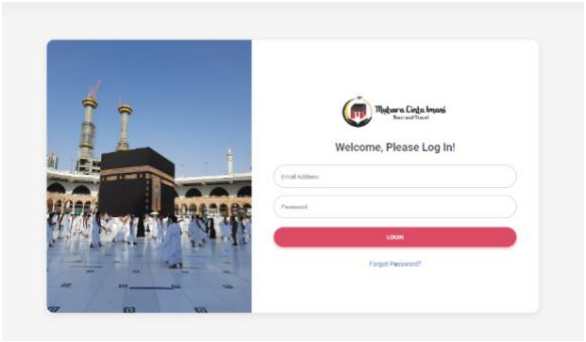


Fig. 4. Login Page

The "Paket Umroh" page serves as a centralized hub for managing and organizing Umrah travel packages. This feature empowers administrators to efficiently create, update, and delete packages, providing a streamlined and user-friendly interface as can be seen in Figure 5.

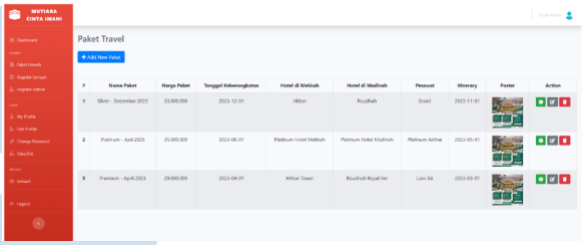


Fig. 5. Travel Package Page

The Dashboard page shown in Figure 6, serves as a personalized and informative welcome hub for users, offering a warm greeting and displaying their logged-in account name. This personalized touch enhances the user experience and establishes a connection. One prominent feature is the showcase of new Hajj/Umrah packages recently created by the admin, presented in a table format. This table provides a snapshot of essential package information, facilitating a quick overview. The user-friendly design incorporates an "Info" button for each package, allowing users to delve into comprehensive details by seamlessly redirecting to the Detail Paket page. This enhances user engagement, enabling them to make informed decisions about the available travel options. The table's structured format ensures clarity, displaying key details such as package names, itineraries, and pricing.

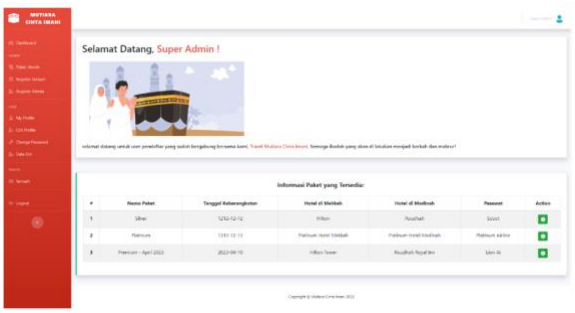

Fig. 6. Dashboard Page

Meanwhile "Register Jamaah" page as can be seen in Figure 7 has a form that the administrator can utilize to set up a new Jamaah account. The admin only needs to fill out the requirements and click the "register account" button to complete the procedure.

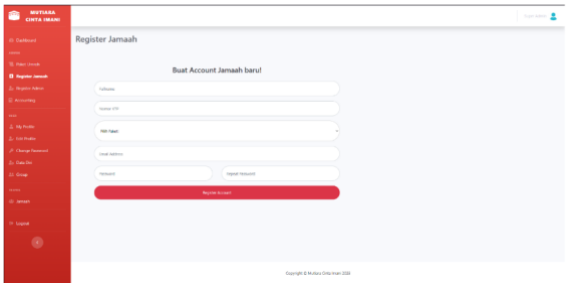


Fig. 7. Jamaah Registration Page

The "Edit Jamaah" page serves as a comprehensive platform for updating specific Jamaah data, facilitating efficient data modification (Shown in Figure 8). The page features a well-organized layout with input forms for various details, ensuring a thorough update process. Key input fields include Full Name, Package, Place and Date of Birth, Gender, Age, Sex, Mobile Phone Number, Family Mobile Phone Number, Passport Number, KTP Number, Education, Occupation, Biological Father, Biological Grandfather, Nationality, Departure Date, and various document scans such as Passport, KTP, Birth Certificate, Marriage Book, and Vaccination.

Navigation is user-friendly, with a Back button at the top for quick return to the Jamaah page. The Save button at the bottom finalizes the data modifications. The navbar and title prominently indicate the current page, enhancing user orientation within the system. This page streamlines the process of updating Jamaah data, ensuring accuracy and completeness. Its intuitive design encourages efficient navigation and seamless data management for administrators overseeing Jamaah information within the system.

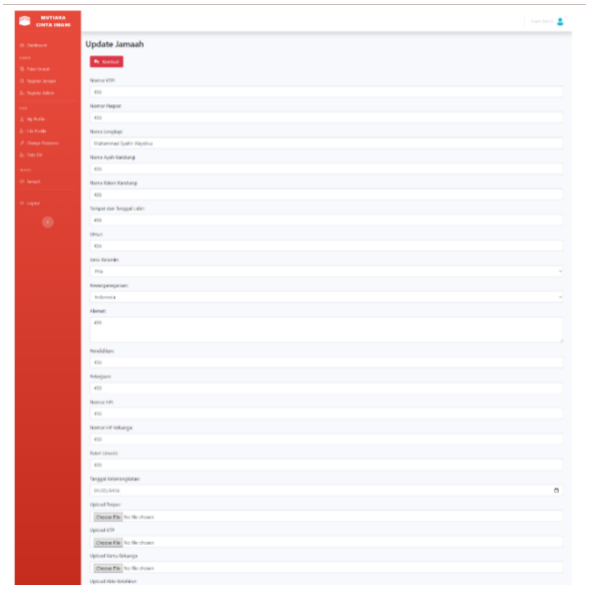


Fig. 8. Edit Jamaah Page

The Accounting Page functions as an extensive dashboard, affording administrators a centralized platform to delve into intricate financial details, as depicted in Figure 9. This feature goes beyond mere visualization, offering valuable insights and metrics crucial for informed decision-making within the business. The page likely encompasses various elements such as a summary of total Jamaah, gender-based metrics, and overall earnings. Administrators can track income per package and analyze financial performance on a monthly basis. The inclusion of detailed graphs, charts, or tables aids in visualizing financial trends, further enhancing the analytical capabilities of administrators.

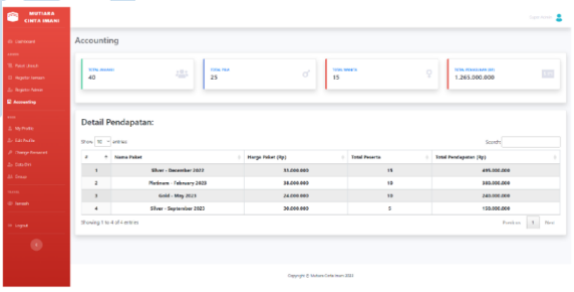


Fig. 9. The Accounting Page

System testing is carried out using black box testing techniques so that the system can function in accordance with defined display and system algorithms. The testing result related to choosing Hajj and Umrah packages is presented in Table 1.

TABLE 1. TESTING RESULT

| No | Scenario | Expected Result | Actual Result |
|---|---|---|---|
| 1. | User can Access Paket Umroh Page | User Access Paket Umroh Page | As Expected |

| | | | |
|---|---|---|---|
| 2. | User can See List of Paket inside the Table | System show list of Paket data in a table | As Expected |
| 3. | User can See the detail of the Package | User will be redirected by system to specific detail package | As Expected |
| 4. | User can Create a new Package | System accepts and created new package | As Expected |
| 5. | User can Update Package | System accepts and updated the package | As Expected |
| 6. | User can Delete Package | System accepts and deleted the package | As Expected |

## IV. CONCLUSION

In summary, PT Mutiara Cinta Imani's Management Information System (MIS) deployment has greatly improved business facilities and operating procedures while also accomplishing its intended goals. The main objective of the research, to improve data management, has been accomplished, facilitating staff oversight and monitoring of participant and package data. The switch to a digital system has successfully reduced the amount of paper used, which has a positive environmental impact in addition to increasing efficiency and data security.

Travel package management, admin and participant account creation, and participant data management are all made possible by the MIS, which facilitates smooth administrative operations. This improves overall data security and accuracy while streamlining internal procedures. The web-based Information System interface of the system makes it easier for participants to participate and input data, making the experience more user-friendly. Moreover, users are empowered with real-time connectivity through the internet accessibility of the centralized database, which guarantees data integrity. The effective use of this research places PT Mutiara Cinta Imani at the front of technical innovation in the travel sector for the Hajj and Umrah, promoting better service delivery and opening the door for future expansion and success in the digital age.

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