

Agile Development of an Integrated Hajj and Umrah Services Platform: A Case Study of Raudhoh Wisata Bahari

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Abstract

The growth of Hajj and Umrah pilgrimage services in Indonesia demands travel agencies to improve service quality through information technology. Many agencies still manage reservation, payment, and pilgrim data manually, causing service delays, recording errors, and lack of transaction transparency. This study designed and built a web-based Hajj and Umrah reservation and tour management system integrated with Midtrans payment gateway, using the Scrum development methodology. The system supports pilgrim registration, travel package selection, pilgrim data management, and online payment. Black box testing was applied to verify all functional requirements. Results show the system successfully automated reservation and payment confirmation, reducing processing time from 30–60 minutes to 5–10 minutes, improving data accuracy and operational transparency for PT Raudhoh Wisata Bahari.

Keywords: Reservation System, Hajj and Umrah, Payment Gateway, Scrum, Web-Based Information System.

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1. Introduction

The growth of Hajj and Umrah pilgrimage services in Indonesia has been significant in recent years. Data from Siskohat shows that as of 2024, there are 5.4 million pilgrims on the waiting list, with waiting periods ranging from 17 to 48 years. Travel agencies (biro perjalanan) play a critical role in facilitating this growing demand [6]. PT Raudhoh Wisata Bahari is a licensed Hajj and Umrah travel agency (PPIU No. U.521 Tahun 2021) operating since 2018. The company still relies on manual processes for pilgrim registration, payment confirmation, and document management a process that is time-consuming and error-prone [5].

Several studies confirm the benefits of web-based reservation systems. Previous research has shown that these systems improve efficiency in travel management [4], reduce administrative delays through payment gateway integration [9], and enhance transaction efficiency as well as customer satisfaction through integrated online payment services [12]. This study aims to design and develop a web-based Hajj and Umrah reservation and management system integrated with Midtrans payment gateway using Scrum methodology, to automate reservation, payment verification, and document management at PT Raudhoh Wisata Bahari.

2. Research Method

This research uses the Scrum agile development methodology, carried out in three stages: Sprint Planning, Sprint Backlog, and Sprint Execution. Data was collected through observation, interviews, and literature review. Observation identified manual processes at PT Raudhoh Wisata Bahari. Interviews

were conducted with management (Narasumber 1) and admin staff (Narasumber 2). Literature review covered journals on web-based reservation systems, Midtrans integration, and the Laravel framework [16].

Scrum structured development into iterative sprints. Sprint Planning prioritized features from the Product Backlog. The Sprint Backlog defined tasks: UML design, UI/UX mockup, Laravel implementation, and testing. Each sprint produced an evaluated increment based on stakeholder feedback [14] [15]. The system uses Laravel (PHP) with MySQL. It supports three user roles: Admin, Receptionist, and User (Jamaah). Payments are handled via Midtrans supporting bank transfer, credit card, and e-wallet. UML artifacts (use case, activity, sequence, class diagrams) were created with Draw.io [10] [11]. Black box testing evaluated all functional requirements by testing inputs against expected outputs. Features tested: login, registration, package management, reservation, payment gateway, document upload, reservation history, user management, and logout [13].

3. Result and Discussion

The results are written based on a logical order to form a story. It shows facts/ data instead of discussing the results. Tables and Figures can be used but not repeating the same data in the same image, table and text. To further clarify the description, subtitles can be used. This section presents data collection results, system implementation, black box testing, and comparative analysis before and after system implementation [17]. Observation identified five key problems: manual pilgrim registration via physical forms or WhatsApp; manual bank transfer payment with separate confirmation; inactive company website; error-prone manual pilgrim data management; and no

automated payment validation [18] [19]. Interview findings confirmed these issues. Management requested a system to automate registration, package selection, and online payment. Admin staff noted that manual payment confirmation was especially burdensome during peak seasons [20]. The developed system includes the following key interfaces: Login Page authenticates users via email and password with role-based routing (Admin, Receptionist, User) and password recovery feature [1] [2]. The system displays an error message when invalid credentials are entered, as shown in Figure 1.

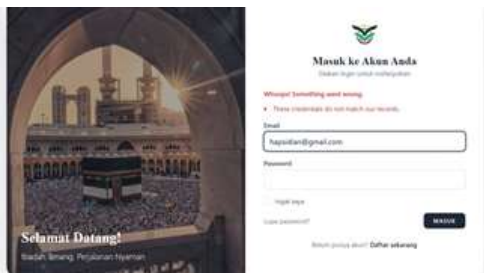


Figure 1. Login Page Invalid Credentials Warning

Reservation and Payment: After selecting a package and filling in pilgrim data, users proceed to Midtrans payment gateway. Figure 2 shows the Midtrans payment interface with Bank BCA virtual account option [3].



Figure 2. Midtrans Payment Gateway Interface

Upon successful payment, the system automatically records the transaction and displays a payment confirmation as shown in Figure 3.



Figure 3. Payment Successful Confirmation

User Dashboard displays an overview of total reservations, facility reviews, ratings, and occupancy rate, along with recent activity [7] [8], as shown in Figure 4.



Figure 4. User Dashboard Overview

Reservation History page displays all past reservations with booking code, package name, booking time, number of pilgrims, and total price, as shown in Figure 5.

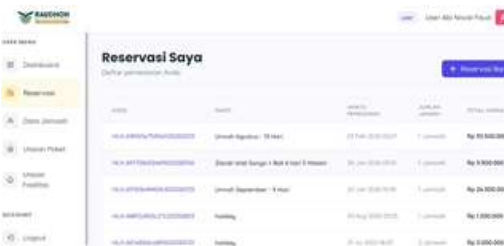


Figure 5. Reservation History Page

Admin Dashboard provides a management panel displaying total packages, facilities, gallery items, and company profile management, as shown in Figure 6.



Figure 6. Admin Dashboard Management

Package Management page allows admins to view, add, edit, and delete travel packages. Each package displays total capacity, occupancy, rating, and booking count, as shown in Figure 7.



Figure 7. Package Management (Room Management)

User Management page allows admins to manage all registered accounts including name, email, verification status, phone, and role assignment, as shown in Figure 8.



Figure 8. User Management Page

Black box testing was conducted on all system modules. All test scenarios returned valid results confirming expected system behavior. Next Login Page Testing on Table 1.

Table 1. Login Page Testing

No	Test Scenario	Expected Result	Test Result	Status
1	Login with incorrect email	System rejects with warning 'These credentials do not match our records'	System rejects login and displays appropriate warning	Valid
2	Login with incorrect password	System rejects with warning 'These credentials do not match our records'	System rejects login and displays appropriate warning	Valid
3	Login with correct credentials	User enters system and dashboard is displayed	User logged in, dashboard shown per role	Valid
4	Click 'Forgot Password'	Email input form for password recovery displayed	System displays email recovery form successfully	Valid

Table 2. Registration Page Testing

No	Test Scenario	Expected Result	Test Result	Status
1	Register with complete valid data	New account created, user can log in	Account created, redirected to login page	Valid
2	Register with already-used email	System rejects, shows email already registered message	System shows error: email already in use	Valid
3	Submit form with incomplete fields	System shows required field validation warning	System displays form validation for empty fields	Valid

Table 3. Package Page Testing

No	Test Scenario	Expected Result	Test Result	Status
1	Access package page	System displays all available travel packages	Complete package list displayed	Valid
2	Admin adds new package	New package appears in the package list	System saves and displays new package	Valid
3	Admin edits package data	Package data updated and displayed	System updates package data successfully	Valid
4	Admin deletes package	Deleted package no longer appears in list	System deletes package data successfully	Valid

Table 4. Reservation Page Testing

No	Test Scenario	Expected Result	Test Result	Status
1	Click 'Reservasi Sekarang'	Reservation form for selected package displayed	System displays reservation form	Valid
2	Submit complete valid reservation	System processes reservation, redirects to payment gateway	Data processed, Midtrans payment page displayed	Valid
3	Submit incomplete reservation form	System shows validation warning on unfilled fields	System displays form validation messages	Valid
4	Successful payment via gateway	System records transaction, displays payment success confirmation	Reservation saved, success notification displayed	Valid
5	Payment cancelled or failed	System shows payment failure warning, reservation not saved	System displays payment failure message	Valid

Table 5. Document Upload Testing

No	Test Scenario	Expected Result	Test Result	Status
1	Upload supported format (PDF/JPG/PNG)	Document uploaded and stored in system	System saves and displays uploaded document	Valid
2	Upload unsupported format	System shows unsupported file format warning	System displays file format error message	Valid
3	Receptionist views pilgrim documents	System displays pilgrim documents as uploaded	System shows pilgrim documents to receptionist	Valid

Table 6. Reservation History Testing

No	Test Scenario	Expected Result	Test Result	Status
1	User accesses reservation history	System displays all reservation history for user	Reservation history list displayed	Valid
2	User views reservation invoice detail	System displays detailed invoice for reservation	Invoice shown correctly	Valid
3	Receptionist views all pilgrim reservations	System displays all reservation data from all pilgrims	Comprehensive reservation data displayed	Valid

Table 7. User Management Testing

No	Test Scenario	Expected Result	Test Result	Status
1	Admin accesses user management	System displays list of registered users	User management page displayed	Valid
2	Admin adds new user	New user added and appears in user list	System saves and displays new user	Valid
3	Admin edits user data	User data updated with changes made	System updates user data successfully	Valid
4	Admin deletes user	Deleted user no longer appears in list	System deletes user data successfully	Valid
5	Admin changes user role	User role changed, access rights adjusted accordingly	System updates role and access rights	Valid

Table 8. Logout Button Testing

No	Test Scenario	Expected Result	Test Result	Status
1	User clicks Logout button	User exits system and returns to login page	System logs out and displays login page	Valid

The following tables compare operational conditions before and after system implementation at PT Raudhoh Wisata Bahari. Next Operational Comparison Before and After System on Table 9.

Table 9. Operational Comparison Before and After System

No	Aspect	Before System (Manual)	After System (Digital)
1	Processing Time	± 30–60 minutes	± 5–10 minutes
2	Data Recording	Books / simple Excel	Automatically stored in database
3	Error Risk	High (human error)	Low (system validation)
4	Information Access	Limited (must visit office)	Online, accessible anytime
5	Data Security	Not guaranteed	Secured (login & system)
6	Reservation Report	Manual, time-consuming	Automatic & real-time

Table 10. Detailed Process Comparison

No	Before System	After System
1	Registration via physical forms or WhatsApp	Online registration via website anytime
2	Manual bank transfer with separate confirmation	Online payment via Midtrans with auto-confirmation
3	Admin confirms payments one-by-one manually	System validates payments automatically
4	Physical documents prone to loss or damage	Documents uploaded digitally and stored securely
5	Package info requires direct admin inquiry	All package info accessible anytime on website
6	Reservation reports require manual preparation	Reports generated automatically on demand
7	Receptionist cannot monitor documents in real-time	Real-time document status monitoring
8	Pilgrims must visit office for registration	Full online access without visiting office

The system successfully addresses all research objectives. Midtrans integration provides automated

payment validation, reducing processing time by ~75%. Scrum facilitated adaptive development mid-sprint additions such as Tawk.to live chat and document verification adjustments were incorporated without restarting development. Laravel's built-in features enabled rapid, focused development. Identified limitations: stable internet required; email/SMS notifications not yet fully implemented; comprehensive financial reporting absent; integrated pilgrim manifest management not yet available; and Midtrans currently in sandbox mode, not yet tested in production.

4. Conclusion

This study successfully developed a web-based Hajj and Umrah tour reservation and management system for PT Raudhoh Wisata Bahari, integrated with Midtrans payment gateway using Scrum methodology. Black box testing confirmed all functionalities operate as expected. Processing time was reduced from 30–60 to 5–10 minutes, data accuracy improved, and pilgrims can now access services fully online. Future development should implement full email/SMS notifications, comprehensive financial reporting, pilgrim manifest management, and migrate Midtrans to production mode.

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