

# Application of the Rational Unified Process Method in the Application of Hajj and Umrah at PT. Arminareka Perdana Bengkalis

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## Abstract

Hajj and Umrah are worships that are carried out every year by Muslims. PT. Arminareka Perdana Bengkalis is a company engaged in the field of hajj and umrah services. The problem that occurs in this company is the process of managing hajj and umrah pilgrim data which still uses paper recording, so that the administration process is less efficient and prone to errors. This study aims to apply the Rational Unified Process method in creating hajj and umrah applications. The development process will be carried out iteratively and structured with 4 main stages, namely inception, elaboration, construction, and transition. This method is applied because it allows adaptation to changing needs during the development process and ensures system quality through user testing and evaluation. The results of this study are the application of the RUP method which produces an application that is able to manage hajj and umrah registration, payments, and documentation digitally and provide easy information for prospective pilgrims.

**Keywords:** *Rational Unified Process, Hajj and Umrah Application, Reservation*

## 1. Introduction

The Hajj and Umrah are an important part of Muslim life, the Hajj is one of the main acts of worship in Islam which is obligatory for every Muslim who is able to carry it out, in accordance with the provisions and instructions set by Allah. However, Umrah can be performed at any time (every day, month, or year) and only in Makkah, but there are certain days when it cannot be performed, such as the days of Arafah and Tasyrik [1]. According to a report from the Ministry of Religion of the Republic of Indonesia, Indonesia's Hajj quota in 2023 is the largest in the world at 221,000 pilgrims. This number shows the high interest of Indonesian Muslims to perform the Hajj and Umrah, so more efficient and effective services are needed for the preparation and departure of pilgrims [2].

PT. Arminareka Perdana Bengkalis is a branch of a Hajj and Umrah travel service provider that has been operating since 1990 and began operating in Bengkalis in 2015. Despite this company's extensive experience, they still face various issues in data management, registration, and services, which are still carried out using paper and Excel records by the admin in the office. This leads to errors in managing prospective pilgrim data and delays in providing information. Furthermore, the lack of integrated information technology also makes it difficult for the company to manage pilgrim data in real time, resulting in frequent obstacles in the monitoring and data management process.

To address this issue, an application is needed that can facilitate online registration, payment, document management, and information provision for prospective pilgrims. This study applies the Rational Unified Process (RUP) method to the application development process. RUP was chosen because it is a structured and iterative software development method that can handle the risk of changing requirements and allows for testing at every stage of development. [3]

RUP has four main phases: inception, elaboration, construction, and transition, which allow the development team to conduct continuous evaluation and adjustments based on user feedback [4]. The application of the RUP method in the development of this Hajj and Umrah application is expected to improve operational efficiency, reduce data errors, and provide more responsive services for prospective pilgrims. The focus of this research is on user needs analysis, system design, and application development. With this approach, PT. Arminareka Perdana Bengkalis can improve service quality and better meet the needs of pilgrims.

## 2. Methodology

In this study, researchers used the Rational Unified Process (RUP) system development method. RUP is an iterative software development process developed by Rational Software. RUP is a software development method that focuses on object-oriented mode. This process aims to strengthen team performance by providing easy access to information containing guides, examples, and various tools for each important stage in the development process [5].

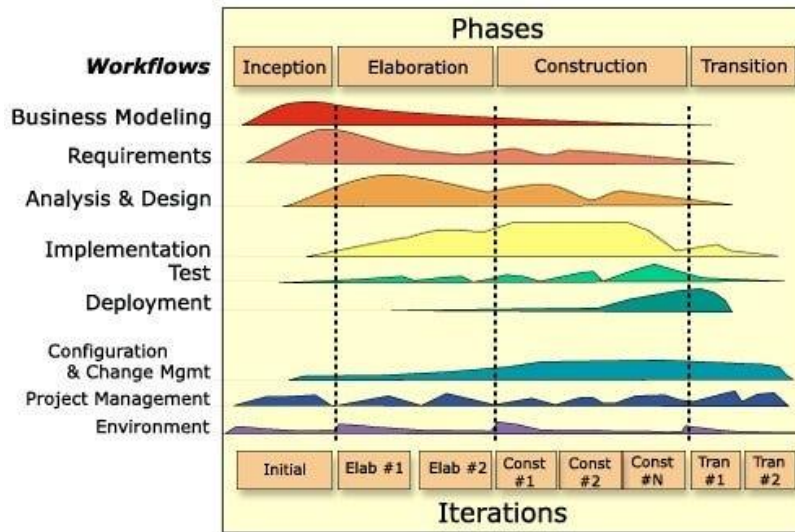


Fig. 1: Rational Unified Process Method

The RUP project cycle consists of four stages: inception, elaboration, construction, and transition.

1. Inception (Initiation)  
This stage is crucial because the software developer interacts with the customer. It aims to identify the desired system requirements.
2. Elaboration (Design)  
This stage is the stage for developing a complete system design based on the analysis results from the inception stage. This stage aims to determine whether the system design can be realized. This stage focuses on system analysis and design, as well as system implementation, with an emphasis on prototyping.
3. Construction (Construction)  
This stage implements the design results and tests the implementation results.
4. Transition (Transition)  
This stage is the final stage of the RUP method, conducted to finalize the final product. It aims to analyze whether the software meets user needs and whether there are any errors that need to be corrected. This stage is related to installation and rollout.

## 3. Results and Discussion

### 3.1. Inception

Inception is the first stage in the RUP method. This stage focuses on the initial steps in the system development process to ensure the project's needs and objectives are clearly defined. The output of this stage is the data and requirements for the system to be developed.

#### 3.1.1. Pengumpulan data

##### 1. Observation

The first step in data collection is observation, which involves directly observing ongoing operational activities. This observation aims to identify and understand the workflow and procedures implemented at PT. Arminareka Perdana Bengkalis, thereby gaining an overview of the current system.

##### 2. Interviews

The interview with the Head of PT. Arminareka Perdana Bengkalis aimed to obtain more in-depth information regarding the problems occurring in the company and to collect data related to the needs required to resolve the problems.

#### 3.1.2. Analisis Kebutuhan Fungsional

##### a. Admin

1. Log in to the application as an admin
2. View, add, change, and delete user data
3. View, add, change, and delete Hajj package data
4. View, add, change, and delete Umrah package data
5. View, add, change, and delete article data
6. View, add, change, and delete gallery data
7. View, add, change, and delete manasik data

- 8. View and change location data
- 9. View, change, and delete order data
- 10. View and delete payment data

b. Customers

- 1. View and order Hajj packages
- 2. View and order Umrah packages
- 3. View articles
- 4. View gallery
- 5. View manasik
- 6. View locations
- 7. View orders
- 8. Make payments
- 9. View payment history
- 10. View and change profile
- 11. View about

3.1.3 Analisis Kebutuhan Non Fungsional

- a. Users will easily understand the system's interface.
- b. The system is accessible 24/7.
- c. The system must have login categories (user and admin).

3.2. Elaboration

At this stage, researchers begin the system design process based on the analysis results from the inception stage, with the goal of designing the system's structure and workflow to meet the identified needs. Design is carried out using system modeling tools such as use case diagrams, activity diagrams, class diagrams, and interface designs.

3.2.1. Use Case Diagram

Use case diagrams are used to illustrate the relationships between actors and systems, thus showing how users interact with the system's features. These diagrams provide an overview of the roles of each actor and the processes carried out within the system.

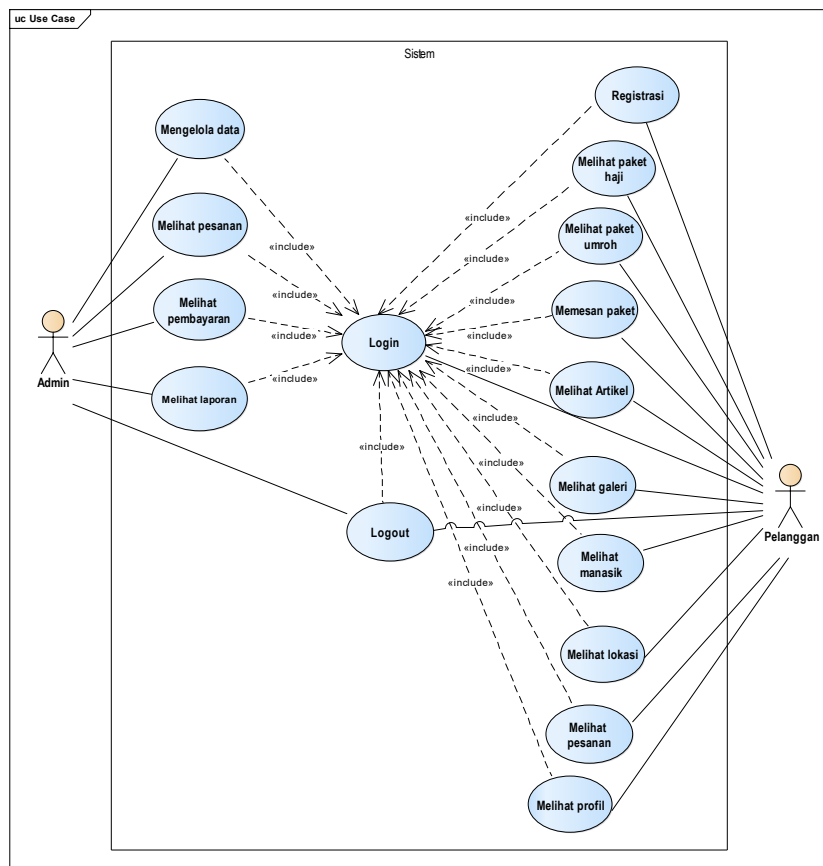


Fig. 2: Use Case Diagram

The explanation of the use case diagram above is as follows:

- a. Admin: Admins can log in, manage data, view orders, view payments, view reports, and log out.

b. Customers: Customers can log in, view Hajj packages, Umrah packages, order packages, view articles, view the gallery, view rituals, view locations, view orders, view profiles, and log out.

3.2.2. Activity Diagram

An activity diagram is a UML diagram that depicts the processes or workflows occurring within a system. This diagram helps visualize the steps in a business process or use case.

a. Managing data

The admin opens the "Manage Data" page, then the system displays the available data. The admin can add, change, or delete data. When adding or changing data, the admin fills out a form, and the system validates the input. If valid, the data is saved or updated, and the system displays a success message. Otherwise, the system displays an error message. Once successful, the system returns to the data management page.

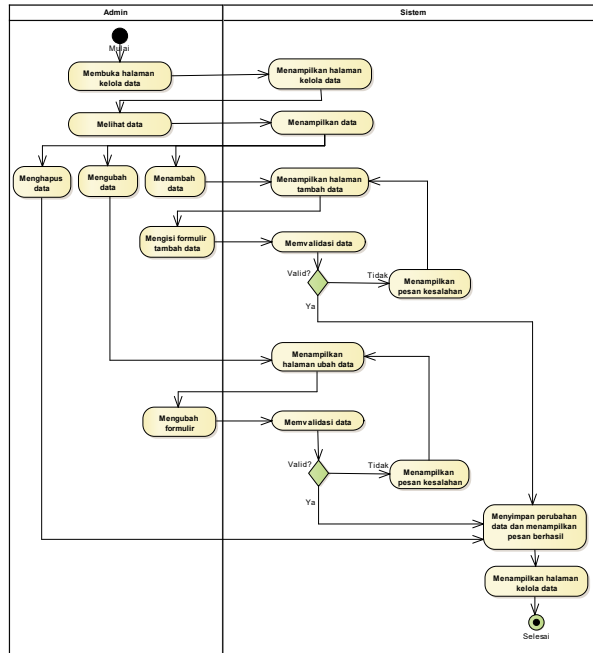


Fig. 3: Activity diagram for managing data

b. Order a package

The customer opens the Hajj/Umrah page, selects a package, clicks "Continue ordering," and enters their details. The system displays the package details, displays the order page, and then validates the data. If the data is valid, the system saves the data and displays a success message, then displays the order page. If the data is invalid, the system displays an error message and then redisplay the order page.

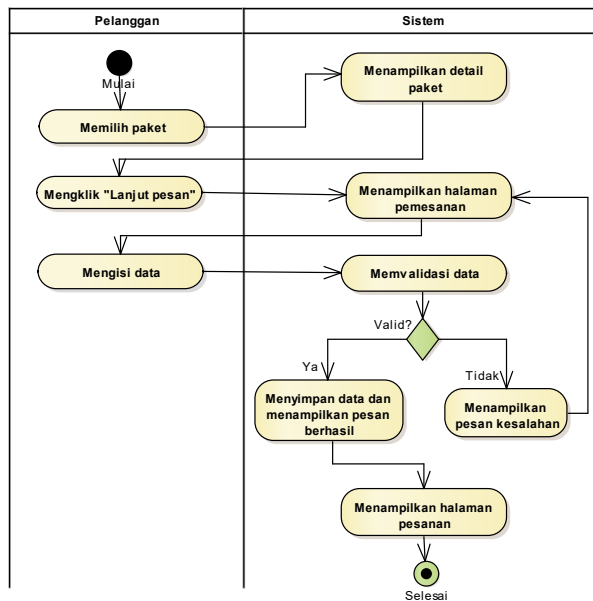


Fig. 4: Activity diagram order a package

### 3.2.3. Class Diagram

Class diagram dirancang untuk menggambarkan struktur yang ada dalam sistem dengan jelas. Diagram ini memiliki berbagai entitas, yaitu pengguna, pemesanan, pembayaran, paket haji dan umroh, galeri, artikel, manasik, dan lokasi.

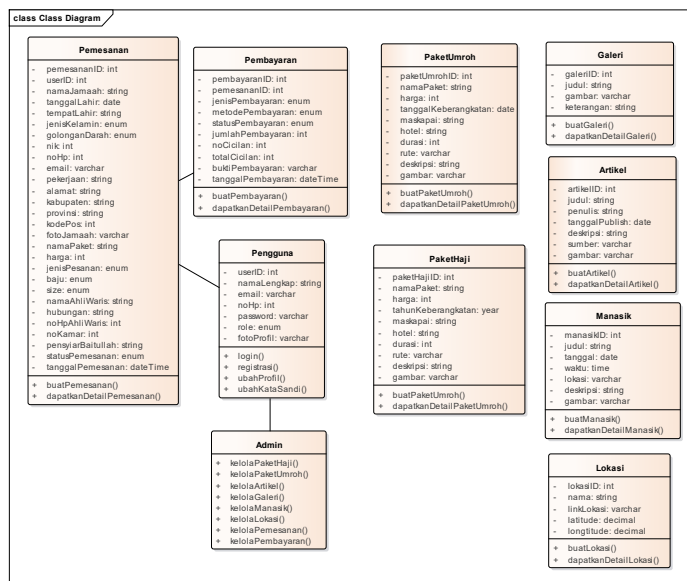


Fig. 5: Class diagram

### 3.3. Construction

The construction phase of this research focuses on the development and implementation of the Hajj and Umrah application for PT. Arminareka Perdana Bengkalis. In this phase, the system is designed, developed, and tested to ensure its functionality meets the requirements of the previous phase.

#### 3.3.1. Implementation on the admin website

##### a. Login page

The login page on the admin website is used to log in to the website by entering your existing email address and password.

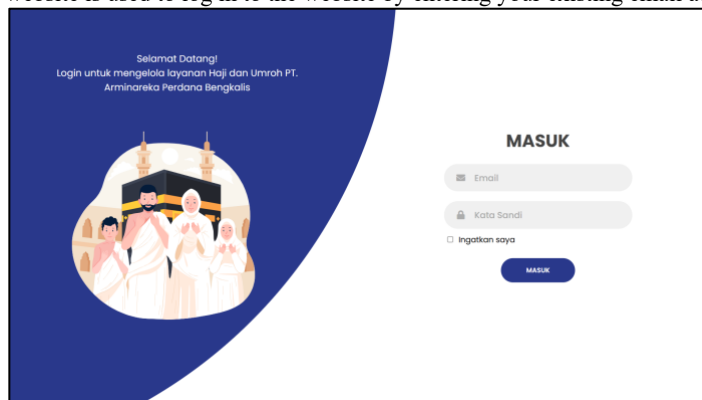


Fig. 6: Login page

##### b. Dashboard page

The dashboard page displays the menus on the admin website. It includes a data management menu, which includes users, Hajj packages, Umrah packages, articles, galleries, manasik (practices), and locations, an order menu, a payment menu, and a report menu.

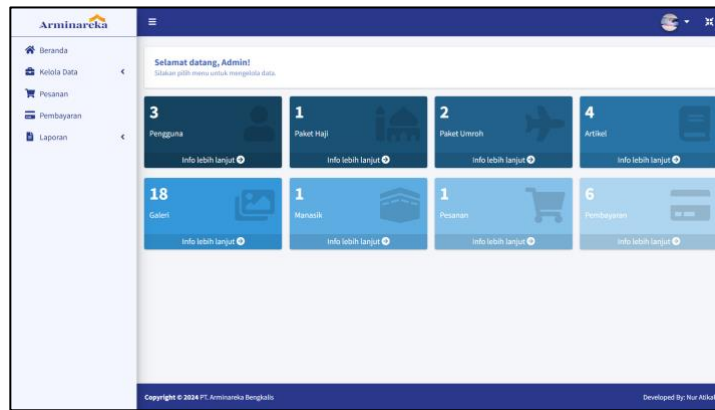


Fig. 7: Dashboard page

c. Umrah Packages Page

The Umrah Packages page displays available Umrah packages. Admins can view details, add, edit, and delete Umrah package details.

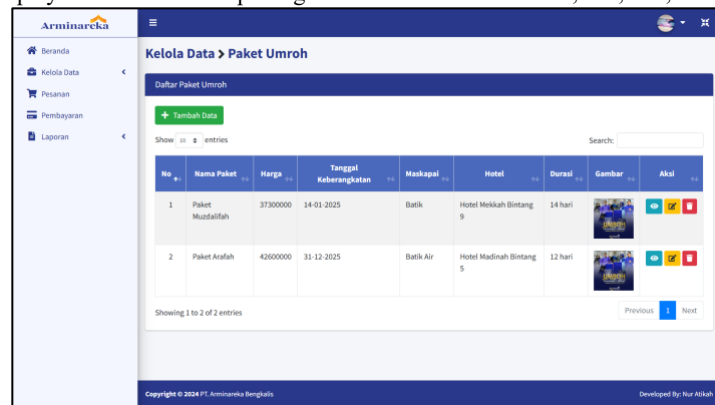


Fig. 8: Umrah Packages Page

d. Orders page

The orders page displays data on incoming Hajj and Umrah orders. Admins can view details, edit, and delete order data. The order details also provide direct access to the payment history for each order.

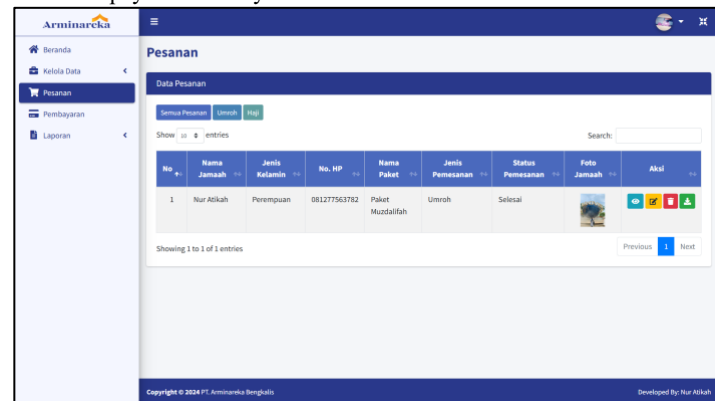


Fig. 9: Orders Page

e. Payment page

This payment page displays more complete payment details. This page includes categories that make it easier to view outstanding and paid payments.

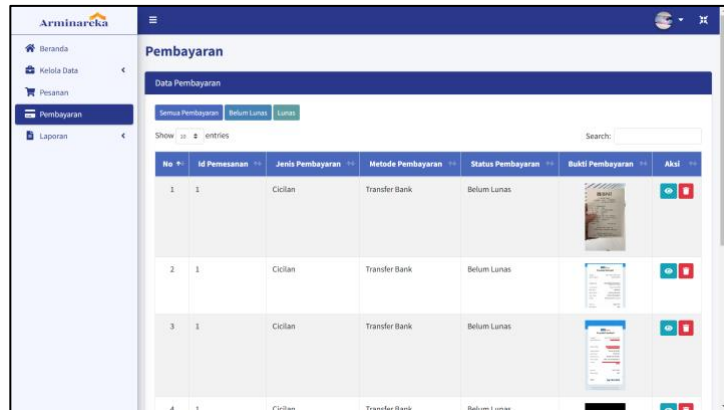


Fig. 10: Payment Page

3.3.2. Implementation on mobile applications

a. Homepage

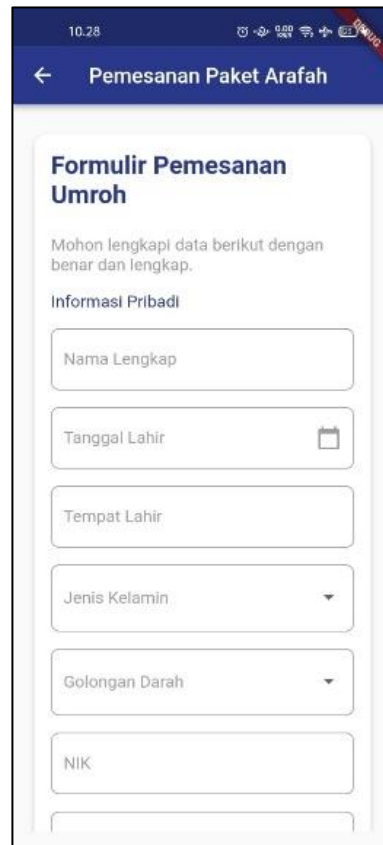
This homepage displays the app's menus, including Hajj and Umrah, articles, galleries, manasik (practices), and locations. Each menu provides more detailed information. To make a booking, select the Hajj or Umrah menu, which will provide package details and a booking form.



Fig. 11: Homepage

b. Umrah booking form page

The Umrah booking form page can be accessed by selecting the Umrah menu on the homepage, which will display the available Umrah package options. Selecting an Umrah package will bring up the package details page, with a "Book" button that will direct you to the Umrah booking form page.



10.28

← Pemesanan Paket Arafah

### Formulir Pemesanan Umroh

Mohon lengkapi data berikut dengan benar dan lengkap.

Informasi Pribadi

Nama Lengkap

Tanggal Lahir

Tempat Lahir

Jenis Kelamin

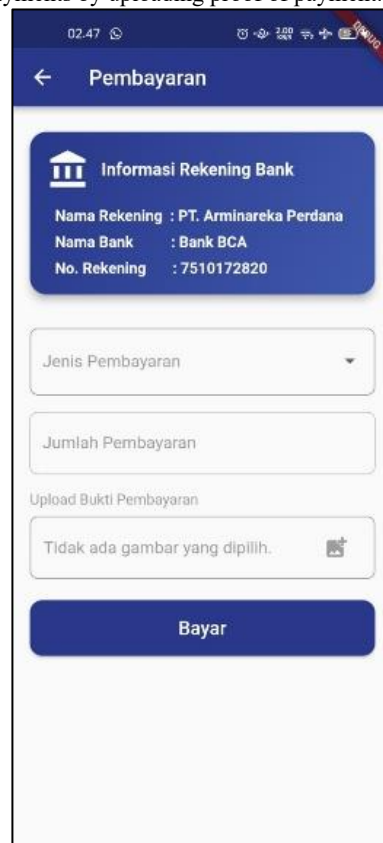
Golongan Darah

NIK

Fig. 12: Umrah booking form page

c. Customer payment page

This customer payment page is for making payments by uploading proof of payment.



02.47

← Pembayaran

### Informasi Rekening Bank

Nama Rekening : PT. Arminareka Perdana  
Nama Bank : Bank BCA  
No. Rekening : 7510172820

Jenis Pembayaran

Jumlah Pembayaran

Upload Bukti Pembayaran

Tidak ada gambar yang dipilih.

Bayar

Fig. 13: Customer payment page

### 3.4. Transition

The transition phase aims to ensure that the developed Hajj and Umrah application is well-received and used by users. The main activity in this phase is product socialization to users, starting with introducing and teaching users how to use the application and ensuring it is ready for use.

This phase also includes user testing, which in this study included the head and administrators of PT. Arminareka Perdana Bengkalis, as well as customers. The technique used in this study is User Acceptance Testing (UAT). UAT testing is a direct evaluation involving interaction between users and the system to ensure that the developed features meet user needs. Typically, UAT is conducted at the final stage after the system development process is complete. The results of this testing serve as proof that the system is ready for use by end-users [7].

#### 3.4.1. Evaluation Test Results From Admin Side

**Table 1:** Evaluation test results from admin side

Feature	Results accepted/not accepted	Information
Manage data	Accepted	This feature can display, add, modify, and delete data.
Payment data	Accepted	Testing yielded expected results and was easy to understand. This feature can display and delete payment data.
Reports	Accepted	Testing yielded expected results and was easy to understand. This feature can display annual Hajj and Umrah reports in PDF format.

#### 3.4.2. Evaluation Test Results From User Side

**Table 2:** Evaluation test results from user side

Feature	Results accepted/not accepted	Information
Home	Accepted	This feature displays the app's menus, including Hajj, Umrah, articles, gallery, rituals, and locations.
Orders	Accepted	This feature displays orders currently in progress and completed orders. Processed orders have payment and detail buttons.
Payment	Accepted	This feature displays the payment page, where installment payments can be made.
Profile	Accepted	This feature displays the user's profile photo, name, and email address. This page also displays menus for changing profile, changing password, about, and logging out.
Hajj	Accepted	This feature displays available Hajj packages. Clicking on them displays details and a booking button.
Umrah	Accepted	This feature displays available Umrah packages. Clicking on them displays details and a booking button.
Gallery	Accepted	Testing yielded expected results and was easy to understand. This feature displays images related to PT. Arminareka Perdana Bengkalis.
Articles	Accepted	This feature displays articles related to PT. Arminareka Perdana Bengkalis.
Maintenances	Accepted	This feature displays the schedule for Hajj and Umrah rituals.
Locations	Accepted	This feature displays the location of PT. Arminareka Perdana Bengkalis and a link to Google Maps.

## 4. Conclusion

Based on the results of the research conducted, several conclusions can be drawn, namely:

1. This research successfully implemented the RUP method in developing a Hajj and Umrah application at PT. Arminareka Perdana Bengkalis. This method assists in modeling the system in a step-by-step and orderly manner, resulting in a system that meets user needs.
2. This application makes it easy for users to obtain information and make reservations. The application also allows administrators to manage information, monitor reservations and payments, and access reports.

## 5. Suggestions

Here are some suggestions for further research related to the application of the RUP method in Hajj and Umrah applications that can be developed in future research:

1. A payment due date system with installments linked to notifications. This notification can notify prospective pilgrims when the payment due date is approaching. This feature should also be equipped with more detailed information regarding the remaining bill and the installment payment deadline.
2. Adding a chat feature to the application for communication between pilgrims and PT. Arminareka Perdana Bengkalis, so that questions and issues related to bookings and schedules can be promptly addressed.

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