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|  | **MINISTRY OF EDUCATION AND TRAINING** |

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| --- |
| **FPT UNIVERSITY** |
| Capstone Project Document |
| [MoveMate Application] |

|  |  |
| --- | --- |
| **GFA24SE06** | |
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| **Capstone Project code** | FA24SE085 |

- Ho Chi Minh, Dec 2024 -

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# Acknowledgment

After four years of studying and practicing at FPT University with a major in Software Engineering, this capstone project is an important milestone that marks the completion of our team members' duties in the university lecture hall.

First and foremost, we are extremely grateful for our family. They are the driving force behind our daily efforts. Without their sacrifices, we would not be where we are today. We are much obliged to them for nurturing, teaching, caring for, and investing in us. We want to dedicate this achievement to them, and we want them to know that their sacrifices throughout the years were not in vain.

At the same time, we would like to offer our heartfelt appreciation to the supervisor on our graduation project. Miss. Nguyễn Thị Cẩm Hương are their names. She has been an endless supply of inspiration and support, as well as constructive feedback and useful suggestions. She was also incredibly generous with their time and knowledge, and she was always accessible to answer our inquiries and resolve our concerns. We are quite grateful for her guidance and expertise.

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Finally, my name is Cổ Phước Vinh, and I am the team leader for the MoveMate project. I truly thank everyone on the team. Thank you for giving it your all, despite the fact that our job is extremely stressful and difficult. Thank you for persevering through the most difficult stage of the project. I am extremely grateful and proud of you guys. I am really happy and excited to work with you guys.

# Definition and Acronyms

|  |  |
| --- | --- |
| **Acronym** | **Definition** |
| PWM | Psychology website |
| AWS | Amazon Web Services |
| BA | Business Analysis |
| BR | Business Rule |
| ERD | Entity Relationship Diagram |
| GUI | Graphical User Interface |
| PM | Project Manager |
| SDD | Software Design Description |
| SPMP | Software Project Management Plan |
| SRS | Software Requirement Specification |
| UAT | User Acceptance Test |
| UC | Use Case |
| API | Application Program Interface |

# I. Project Introduction

## 1. Overview

### 1.1 Project Information

* Project name: MoveMate Application
* Project code: GFA24SE06
* Group name: FA24SE085
* Software type: Web application and Mobile application

### 1.2 Project Team

|  |  |  |  |
| --- | --- | --- | --- |
| **Full Name** | **Role** | **Email** | **Mobile** |
| Nguyễn Thị Cẩm Hương | Lecturer | HuongNTC2@fe.edu.vn | 0909912347 |
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## 2. Product Background

Moving houses or offices can be a stressful and time-consuming process for individuals, families, and small businesses. Traditionally, people spend hours coordinating with moving services, trying to determine the right vehicle size, porter selection for loading and unloading, and dealing with costs that are often unclear. This process typically involves multiple calls, in-person meetings, and unforeseen issues that add to the stress.

Users often face challenges such as miscommunication with service providers, and time-consuming to find an appropriate service provider. These inefficiencies lead to wasted time, frustration, and sometimes even increased costs. Additionally, with no real-time tracking available, customers are left in the dark about the status of their service, increasing anxiety about the entire process.

Recognizing these pain points, the MoveMate app was created to streamline and simplify the entire moving experience. By integrating essential features like vehicle booking, porter service selection, transparent pricing, and real-time tracking. The idea was raised by customers who wanted a more efficient, modernized approach to managing moving houses without the typical challenges of dealing with multiple service providers and unclear processes.

## 3. Existing Systems

### 3.1 Lalamove

Lalamove is a logistics service that helps individuals and businesses move goods by booking trucks on demand. The platform focuses on providing fast and flexible delivery options through a large fleet of vehicles, including vans and trucks.

#### Pros:

▪ Fast and flexible delivery options.

▪ Real-time tracking for transparency.

▪ Wide range of vehicle options for different delivery needs.

▪ Convenient mobile app.

#### Cons:

▪ Doesn’t offer specific house-moving services.

▪ Limited scope in terms of customized pricing for larger homes and offices.

### 3.2 Ahamove

Ahamove is a logistics service designed for both individuals and businesses to book trucks and vehicles for moving goods on demand. It focuses on fast delivery and real-time tracking, similar to Lalamove

#### Pros:

▪ Easy-to-use app for booking deliveries.

▪ Real-time tracking and pricing transparency.

#### Cons:

▪ Lacks specific house-moving services.

▪ Limited coverage for larger, customized moves like office relocations.

▪ Pricing options may not be suitable for complex moving needs.

## 4. Business Opportunity

The demand for moving services is on the rise, particularly in urban areas where more people are relocating for work and lifestyle changes. However, the moving process remains stressful due to unclear pricing, and unreliable labor. Traditional moving companies often lack transparency, leading to inefficiencies and customer dissatisfaction.

Market Trends: As urban relocations and demand for convenient, digital services rise, MoveMate is perfectly positioned to offer a mobile-first, on-demand solution, aligning with modern consumer preferences for transparency and efficiency.

## 5. Software Product Vision

For individuals and families looking to move who need a simple and efficient way to schedule moving services. The MoveMate is a comprehensive moving service platform that streamlines the booking process, connects users with reliable movers, and offers real-time tracking, unlike traditional moving services that often involve lengthy phone calls and fees not clear. Our Product provides a transparent, user-friendly interface with integrated features for scheduling, communication, and payment.

## 6. Project Scope & Limitations

### 6.1 Major Features

|  |  |
| --- | --- |
| **Feature ID** | **FEATURE DESCRIPTION** |
| FE1: Booking Management | This feature enables customers to create, manage, and modify booking requests by specifying details such as date, time, truck type, and pick-up/drop-off locations. Once a booking request is made, drivers and porters receive notifications and can review the details. Reviewers assess the booking information to recommend suitable trucks based on customer requirements. Additionally, customers have the option to approve or reject any proposed changes to their booking, including adjustments to services, fees, or truck type. Drivers and porters can request real-time updates to the booking details, ensuring flexibility and responsiveness throughout the booking process. |
| FE2: Service Management | This feature allows managers to define and manage the various services offered, including standard truck rentals, specialty services (like packing or loading). Customers can browse and select from available services when making a booking, ensuring they receive the right support for their booking needs. Reviewers can assess the demand for specific services and suggest updates or changes based on customer feedback and usage data. Drivers are informed about the specific services included in each rental request, allowing them to prepare accordingly for each job. |
| FE3: Truck Management | This feature allows managers to manage the fleet of trucks, including adding new trucks and updating truck information. Reviewers can view truck availability and assign trucks to specific rental requests based on customer needs and truck suitability. Drivers can update the status of their assigned trucks(PENDING, AVAILABLE, IN\_USE, MAINTENANCE). |
| FE4: User Management | This feature enables administrators to create, update, and manage user accounts, including setting roles and permissions for users, reviewers, drivers, and porters. Admins can update their personal information. Additionally, managers can review, approve, and reject driver and porter registrations |
| FE5: Fee Management | This feature enables managers to set and adjust rental fees based on factors like truck type, rental duration, distance, and additional services. Customers can view estimated costs for their rental requests, receive detailed invoices, and choose from multiple payment options such as credit cards or digital wallets. Reviewers can verify fee calculations for each rental request to ensure accuracy before confirming the booking. |
| FE6: Discount Management | This feature enables customers to collect and apply vouchers to their bookings. Managers are responsible for managing discount codes, ensuring customers benefit from special offers. Customers can view available discounts and apply them to their rental requests at checkout. |
| FE7: Payment Management | This feature enables customers to pay for their moving service either online or via cash. Drivers are responsible for updating the payment status when cash is received. Managers can monitor and oversee financial reports, ensuring payment accuracy and proper accounting. |
| FE8: Real-Tracking Booking | This feature allows customers to track the progress of their booking in real-time, including the current location of the truck, estimated arrival time, and status updates throughout the move. Drivers, reviewers and porters can update their status during each phase of the move, such as when they are en route, arriving, loading, or unloading. They can also notify customers and administrators of any delays or issues. Managers can monitor the overall progress of all active bookings, ensuring that services are delivered on time and addressing any potential issues promptly. |
| FE9: Incident Management | This feature allows customers to report issues during the booking process. Drivers and porters can also report incidents like vehicle breakdowns or furniture damage. Managers then review and handle compensation requests |
| FE9: Communication Management | This feature allows seamless communication between customers, drivers, porters, reviewers, and managers through an in-app chat. |
| FE10: Notifications  Management | All roles receive notifications for updates, incidents, and other booking-related information, allowing for swift response and coordination. |
| FE11: Schedule management | This feature allows managers to create and manage the work schedules of reviewers, drivers, and porters, ensuring optimal coverage for bookings and operations. Reviewers can view their assigned shifts, manage their availability, and request time off or shift changes as needed. Drivers can access their schedules, receive notifications for upcoming assignments, and report their availability for new bookings. Porters can manage their shifts and communicate with drivers regarding loading and unloading schedules to ensure efficient operations. |

### **6.2 Limitations & Exclusions**

#### 6.2.1. Limitations

This system is not the best and most optimal solution.

The mobile application only supports Android OS

The system lacks integration with certain third-party services such as Lalamove or Ahamove specialized logistics providers and additional transport systems.

MoveMate's integration with payment services is currently limited to basic features, and advanced financial services like installment payments are not available.

#### 6.2.2. Exclusions

The system does not handle damage insurance claims for goods in transit. Customers will receive process claims directly after finishing the payment.

MoveMate does not offer a service for storing goods temporarily if the move-in location is unavailable.

It does not support direct communication between customers and drivers before a booking is confirmed.

# II. Project Management Plan

## 1. Overview

## 1.1. Scope & Estimation

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **WBS Item** | **Complexity** | **Est. Effort**  **(man-days)** |
| **1** | **Initiating** |  | **10** |
| 1.1 | Create a project management plan | Complex | 5 |
| 1.2 | Rent a server, buy a domain | Medium | 2 |
| 1.3 | Define required functionality | Medium | 1 |
| 1.4 | Define required screens | Medium | 1 |
| 1.5 | Define tables, relationships, and data schemas | Medium | 5 |
| **2** | **Planning** |  | **40** |
| 2.1 | Technology Training | Medium | 5 |
| 2.2 | Requirement Analysis | Complex | 4 |
| 2.3 | BRS – Business requirement specification | Complex | 4 |
| 2.4 | ERD Design | Complex | 4 |
| 2.5 | UI Design (Figma Design) | Medium | 10 |
| 2.6 | Database Design | Medium | 2 |
| 2.7 | Create test cases | Medium | 3 |
| 2.8 | Team meeting | Simple | 1 |
| 2.9 | Supervisor meeting | Medium | 1 |
| 2.9 | Create Source Base | Complex | 5 |
| **3** | **Executing** |  | **100** |
| **3.1** | **Iteration 1** |  | **20** |
| 3.1.1 | Write software requirement specification | Complex | 7 |
| 3.1.2 | Write software design document | Complex | 5 |
| 3.1.3 | Create test cases | **Medium** | 4 |
| 3.1.4 | Login and logout | Simple | 4 |
| 3.1.5 | Forgot password | Simple | 3 |
| 3.1.6 | Re-generate tokens | Simple | 2 |
| **3.2** | **Iteration 2** |  | **35** |
| 3.2.1 | Create a new booking | Medium | 2 |
| 3.2.2 | Update an existed booking information | Medium | 2 |
| 3.2.3 | View list of booking and view booking details | Simple | 2 |
| 3.2.4 | Update a booking status | Medium | 3 |
| 3.2.5 | Delete an existed booking | Medium | 1 |
| 3.2.6 | Track the moving process | Medium | 5 |
| 3.2.7 | View moving schedule | Simple | 1 |
| 3.2.8 | Update moving schedule | Medium | 1 |
| 3.2.9 | Delete moving schedule | Medium | 2 |
| 3.2.10 | Create a new promotion | Medium | 1 |
| 3.2.11 | View list of promotion | Simple | 2 |
| 3.2.12 | Delete a promotion | Medium | 1 |
| 3.2.13 | Review staff quality | Medium | 1 |
| 3.2.14 | Report problems during moving | Medium | 2 |
| 3.2.15 | Report damage to items during transportation | Medium | 3 |
| 3.2.16 | Resolve issues | Complex | 3 |
| 3.2.17 | Recharge money into the wallet in the system | Medium | 2 |
| 3.2.18 | View wallet information | Simple | 4 |
| 3.2.19 | Create payment for customer | Medium | 5 |
| 3.2.20 | View transaction history | Simple | 5 |
| **3.3** | **Iteration 3** |  | **35** |
| 3.3.1 | Create a new driver, porter, reviewer and manager | Medium | 2 |
| 3.3.2 | Update an existed driver, porter, reviewer and manager  information | Medium | 2 |
| 3.3.3 | View list of driver, porter, reviewer and manager and view driver, porter, reviewer and manager details | Simple | 1 |
| 3.3.4 | Updatedriver, porter, reviewer and manager status | Medium | 1 |
| 3.3.5 | Delete an existed driver, porter, reviewer and manager | Medium | 1 |
| 3.3.6 | Refund to customer's wallet | Complex | 2 |
| 3.3.7 | View list of truck category and view truck details | Complex | 1 |
| 3.3.8 | Update a truck status | Medium | 2 |
| 3.3.9 | Create a new service | Medium | 1 |
| 3.3.10 | View list of services and view service details | Medium | 3 |
| 3.3.11 | Update an existed service | Simple | 5 |
| 3.3.12 | Delete an existed service | Complex | 2 |
| 3.3.13 | Chat between customers and reviewer, driver, porter and manager | Complex | 5 |
| 3.3.14 | Create a new fee | Complex | 3 |
| 3.3.15 | View list of fees and view fee details | Simple | 2 |
| 3.3.16 | Update an existed fee | Medium | 4 |
| 3.3.17 | Delete an existed fee | Simple | 1 |
| **3.4** | **Iteration 4** |  | **7** |
| 3.4.1 | Unit testing | Simple | 7 |
| 3.4.2 | Integration testing | Medium | 10 |
| 3.4.3 | System testing | Complex | 12 |
| 3.4.4 | Optimizing Performance and Security | Medium | 3 |
| 3.4.5 | Testing in staging environment | Medium | 12 |
| 3.4.6 | Deploy code in product environment | Medium | 3 |
| 3.4.7 | Testing in product environment | Medium | 14 |
| 4 | **Monitoring and Controlling** |  | **7** |
| 4.1 | Monitoring and Controlling | Complex | 4 |
| 4.2 | Scope of control | Medium | 1 |
| 4.3 | Tracking progress | Medium | 1 |
| 4.4 | Monitoring and controlling risks | Complex | 2 |
| **5** | **Closing** |  | **2** |
| 5.1 | Lesson learn | Simple | 1 |
| 5.2 | Final project report | Simple | 1 |
| 5.3 | Project archive | Simple | 1 |
| ***Total Estimated Effort (man-days)*** | | | ***77*** |

### **1.2. Project Objectives**

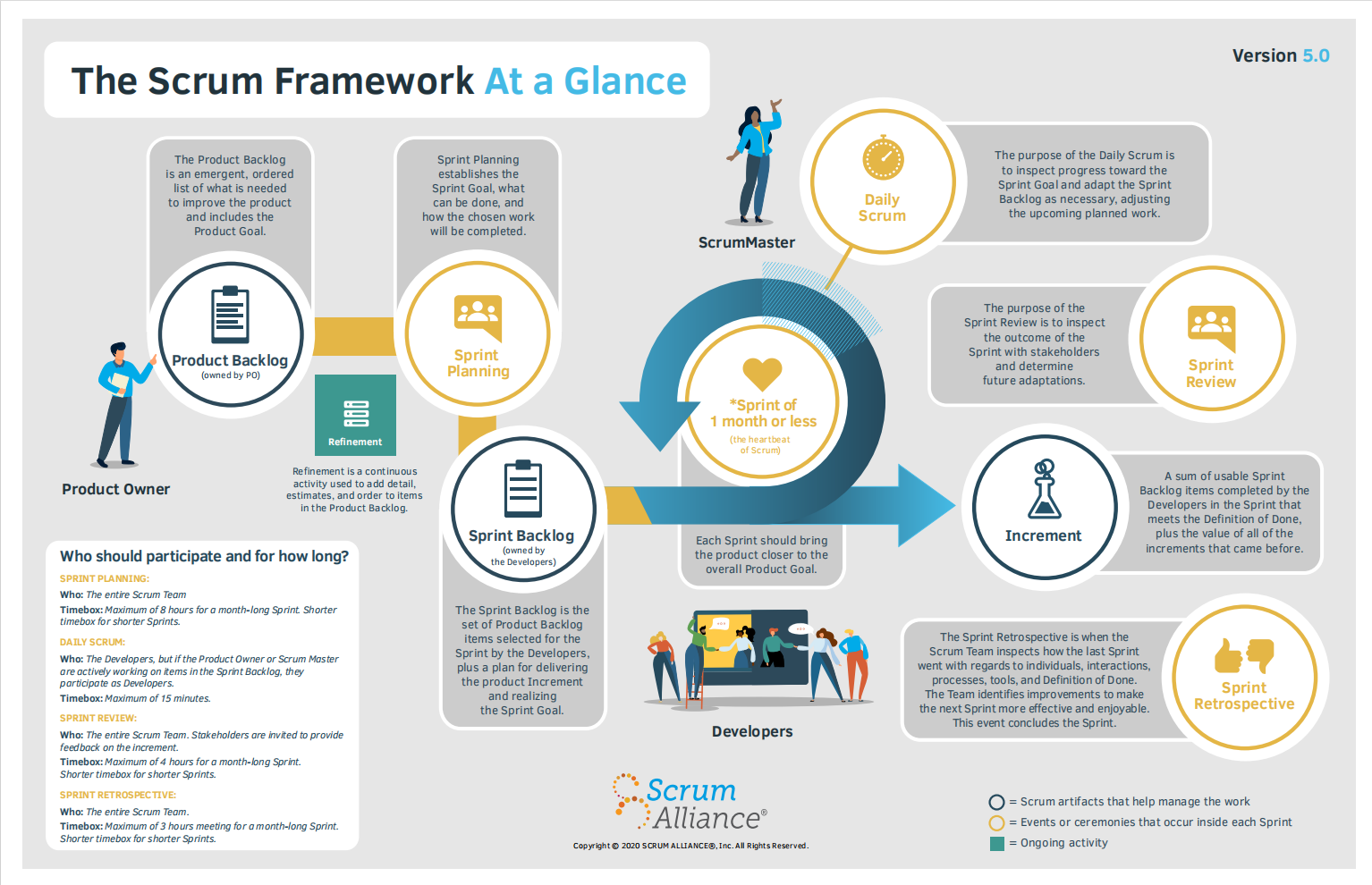
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Testing Stage** | **Test Coverage** | **No. of Defects** | **% of Defect** | **Notes** |
| 1 | Integration Test | 300 | 25 | 8,3% |  |
| 2 | System Test | 300 | 25 | 8,3% |  |

### **1.3. Project Risks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Risk Description** | **Impact** | **Possibility** | **Response Plans** |
| 01 | Driver/Porter/Reviewer No-shows or Unavailability | High | Medium | Create an automated backup assignment system or notify managers for manual assignment; incentivize backup staff. |
| 02 | Technical challenges in integrating real-time tracking and map services into the app. | High | Medium | Allocate more resources for technical research, and work closely with third-party service providers to resolve integration issues. |
| 03 | Server instability or downtime affecting user access to the MoveMate platform. | High | High | Implement backup servers and monitor server performance closely |

## 2. Management Approach

### 2.1 Project Process

**

*Source:<https://www.scrumalliance.org/about-scrum>*

We chose to build this project using the Scrum framework from Agile because:

It allows us to adapt to the unpredictable requirements of customers. By breaking the development down into smaller, manageable parts, we can refine the process step by step, ensuring that the final system truly meets the customer’s vision.

### 2.2 Quality Management

In this project, we employ the following strategy to raise project quality:

· API convention:

o Name the API Route that corresponds to the system entity.

o The response of APIs must be returned following:

* 200, 400, 401, 403, 404, 500 and 520 are the status codes used in the system.
* Message body must be returned in JSON format.

· Coding convention:

o Set the meaningful names for variables.

o Add comments to code can be confusing.

o Use Pascal case for naming Class, Interface, Method, Property, Constant.

o Use Camel case for naming Variable.

o Use Screaming snake case for naming Enum.

### 2.3. Training Plan

|  |  |  |  |
| --- | --- | --- | --- |
| **Training Area** | **Participants** | **When, Duration** | **Waiver Criteria** |
| ASP.NET Web API Core 8 with Entity Framework | Cổ Phước Vinh  Lê Hàn Anh | Week 1, 7 days | Mandatory |
| Flutter | Nguyễn Thành Vinh  Phan Văn Tuấn  Đặng Nguyễn Hoài Phương | Week 1, 7 days | Mandatory |
| SQL Server | All members | Week 1, 7 days | Mandatory |
| GitHub | All members | Week 1, 7 days | Mandatory |
| Trello | All members | Week 1, 7 days | Mandatory |
| Figma | All members | Week 1, 7 days | Mandatory |
| Firebase | All members | Week 1, 7 days | Mandatory |

## 3. Project Deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **Iteration** | **Sprint objective** | **Duration** | **Deliverable** |
| 1 | Project Initialization, User Stories, SRS Document | 14 days | Project planning, Software Requirements and defined user stories |
| 2 | Basic authentication and initial booking module | 14 days | Working authentication module, basic booking system, demo |
| 3 | Service management module and booking enhancements | 14 days | Service management module, expanded booking features, functional testing |
| 3 | Schedule management, wallet integration and transaction module | 14 days | Schedule management, wallet and transaction integration, testing |
| 3 | Staff Management and Truck Management Modules | 14 days | Working staff management and truck management modules, integration tests |
| 3 | Discount and Fee Management Module | 14 days | Discount and fee management module, system test cases, and feedback |
| 4 | End-to-End System Testing, Bug Fixes | 14 days | System testing, bug fixes, usability improvements, ready for demo |
| 5 | User Manual and Final Documentation | 14 days | User guides, final system testing, final report, and deployment |

## 4. Responsibility Assignments

|  |  |  |
| --- | --- | --- |
| **Fullname** | **Role** | **Responsibility** |
| Nguyễn Thị Cẩm Hương | Supervisor | · Instruct project team  · Supervise project status  · Review deliverables  · Answer questions about the project |
| Cổ Phước Vinh | Leader | · Managing process  · Track backlog  · Clarifying requirements  · Prepare documents  · Quality management  · Support other team members  · Arrange meeting |
| Lê Hàn Anh  Đặng Nguyễn Hoài Phương  Phan Văn Tuấn  Nguyễn Thành Vinh | Team members | · Designing database  · Clarifying requirements  · Prepare documents  · Coding  · Create test plan  · Testing  · GUI design  · Support other team members |

## 5. Project Communications

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Communication Item | Who/ Target | Purpose | When, Frequency | Type, Tool, Method(s) |
| Supervisor  communication | Nguyen Thi Cam Huong and team members | · Review documentation  · Demonstrate features  · Evaluate progress and result | 2 times per week | Face to face, Google Meet, Zalo |
| Daily meeting | Team members | · Raise opinions, problems  · Ask for help from other members  · Report working status to leader | Always | Face to Face, Messenger, Google Meet,  Zalo |

## 6. Configuration Management

### 6.1. Document Management

We use Google Drive, Office 365, Trello to manage documents since they supply real-time data synchronization. Team members can easily collaborate in real-time thanks to Google Drive. Each participant can at once view the outcomes of the others. We can also evaluate document updates in Office 365 so that we can do so whenever necessary.

### 6.2. Source Code Management

We decided to manage our source code on GitHub. The version control system makes it possible for team members to work together on source code efficiently, conveniently, and easily to resolve conflict. It is especially useful for looking back in time and at once recognizing changes a collaborator made.

### 6.3. Tools & Infrastructures

#### 6.3.1. Tools

|  |  |
| --- | --- |
| Type | Tools |
| IDEs/Editors | Visual Studio Code, Visual Studio, Figma, |
| UML tools | lucid.app |
| Source Version Control | GitHub |
| Project Management Tool | Trello |

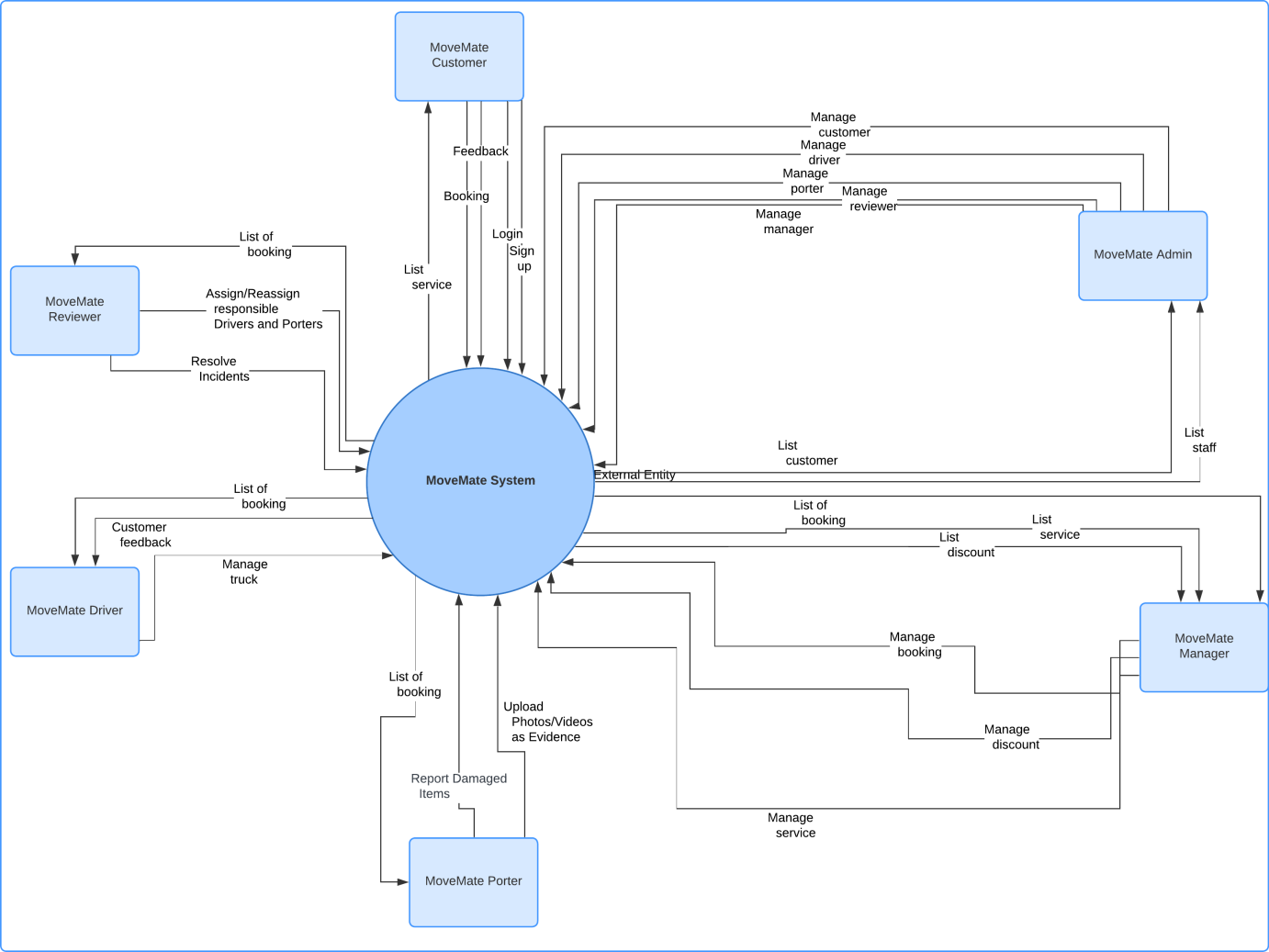
#### 6.3.2. Infrastructures

|  |  |
| --- | --- |
| Type | Infrastructure |
| Framework | Entity Framework Core 8 (Backend),  Flutter (Mobile),,  Nest, |
| Programming Languages | Typescript, C#, Dart |
| DBMS | SQL Server |
| Deployment Server | Github Action, VPS - Ubuntu server - NGINX |
| Storage | Firebase Database, Cloudiary |

# III. Software Requirement Specification

## 1. Product Overview

MoveMate is a web and mobile app created to make moving houses easier for individuals, families, and small businesses. It simplifies everything, from planning to execution, by offering features like vehicle booking, loading services, and real-time tracking. MoveMate takes care of the tough parts of moving, helping users figure out the right truck size, manage labor, and get clear, upfront pricing. It’s designed to remove the hassle and uncertainty, making the moving process smoother and more efficient.

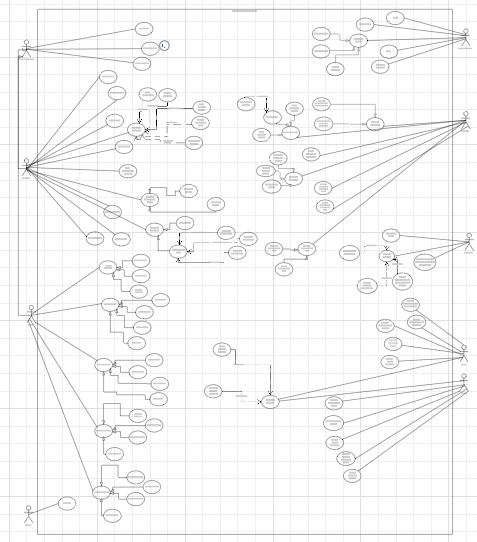


## 2. User Requirements

### 2.1 Actor

|  |  |  |
| --- | --- | --- |
| **No** | **Actor** | **Description** |
| 1 | Admin | The admin is responsible for managing the system related to managing accounts in the system including accounts of Managers, Drivers, Porters, Reviewers, and Customers. |
| 2 | Manager | Manages bookings, services, and discounts. Reviews and approves driver and their truck registrations. Reviews and approves compensation claims, assigns driver, porter and reviewer in case of incidents |
| 3 | Driver | Receives moving jobs. Updates the status of the booking and handles cash payments if required. |
| 4 | Porter | Receives jobs for loading/unloading services. Updates booking statuses, reports any issues or damages, and provides proof (photos/videos) of completed tasks. Reports incidents during the move. |
| 5 | Reviewer | Visits the customer’s house to review and assess the moving requirements or review online based on information of customer provided. Updates booking details based on customer information, recommend services (e.g., vehicle type), and assigns lead drivers and lead porters for the job. |
| 6 | Customer | The customer books moving services, provides details about their house, and tracks their booking in real-time. They can modify their booking or submit claims if occur incident. |
| 7 | System handler | The system is responsible for automatically assigning drivers, porters, and reviewers to the moving process and automation notifications, enabling chat communication, handling OTP verification, and tracking the real-time progress of services. |

### 2.2. Use Case Diagram



### 2.3. List of Use Case Descriptions

#### 2.3.1. Customer Use Case Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Actor** | **Use case** | **Use case description** |
| 01 | Customer | Log in by account | The customer logs into the MoveMate system to access the booking and service features. |
| 02 | Customer | View profile | The customer views their personal profile |
| 03 | Customer | Update profile | The customer updates their personal information such as address, contact details |
| 04 | Customer | Forgot password | The customer resets their password by following a recovery process if they have forgotten it |
| 05 | Customer | Feedback | The customer provides feedback on services, including rating the drivers, porters, or overall service |
| 06 | Customer | Register booking | The customer register a booking by selecting type truck and service details such as date, time, and type of service |
| 07 | Customer | Pay by third party | The customer selects a third-party payment option (PayOS, VNPAY, or MoMo) during checkout |
| 08 | Customer | Update time booking | The customer updates the time of their booking once time |
| 09 | Customer | Upload image and video | The customer uploads images or videos of their household items for review |
| 10 | Customer | View booking details | The customer views the detailed information about their booking, including driver details, service status,... |
| 11 | Customer | Book round-trip | The customer books a round-trip moving service if they need to transport more items |
| 12 | Customer | Cancel booking | The customer cancels an existing booking |
| 13 | Customer | View transaction history | The customer views their transaction history, including past payments and deposits |
| 14 | Customer | Login by Google | The customer is redirected to Google for authentication. Upon successful login, the system retrieves their information and logs them into the app. If it's their first time logging in, additional registration information may be required. |
| 15 | Customer | Withdraw money | The customer withdraws money from their MoveMate wallet |
| 16 | Customer | Recharge money | The customer recharges or adds funds to their MoveMate wallet for payments or services. |
| 17 | Customer | Pay in cash | The customer chooses to pay in cash, after completing the move, the driver or porter collects the cash and updates the system to reflect the payment status |
| 18 | Customer | Report issues | The customer reports any issues or incidents during the move (e.g., damages, delays) to seek resolution |
| 19 | Customer | Give bonus | The customer can give bonuses or tips to drivers or porters for exceptional service |
| 20 | Customer | View services | The customer views all services provided |

#### 2.3.2. Driver Use Case Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Actor** | **Use case** | **Use case description** |
| 01 | Driver | Log in by account | The driver logs into the system using their registered account (by phone number and password) |
| 02 | Driver | View profile | The driver can view their profile details, such as personal information, contact details, and work history |
| 03 | Driver | Forgot password | The driver enters their phone number and receives OTP to reset their password |
| 04 | Driver | Report driver incidents | The driver can report incidents that occur during the moving process (e.g., accidents, delays, or damages) |
| 05 | Driver | Confirm driver team arrival | The lead driver confirms that all assigned team members have arrived at the location |
| 06 | Driver | Update status of truck | The driver updates the status of the truck, such as "Available," "In Transit," "At Pickup Location," or "Delivered." |
| 07 | Driver | Update Booking Status of driver | The driver updates the current status of their booking (e.g., "On Route," "Loading," "In Transit," "Completed"). |
| 08 | Driver | Update Payment Status | The driver updates the payment status after receiving payment (e.g., cash payment collected or electronic payment confirmed). |
| 09 | Driver | View booking details | The driver can access detailed information about their assigned bookings, including the customer’s address, schedule, job specifics, and any additional services requested. |
| 10 | Driver | Request booking update | The driver can request updates or changes to a booking (e.g., change in pickup time, additional services needed) if circumstances change or if they encounter issues |

#### 2.3.3. Porter Use Case Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Actor** | **Use case** | **Use case description** |
| 01 | Porter | Log in by account | The porter logs into the system using their registered account (by phone number and password) |
| 02 | Porter | View profile | The porter can view their profile details, such as personal information, contact details, and work history |
| 03 | Porter | Forgot password | The porter enters their phone number and receives OTP to reset their password |
| 04 | Porter | Report porter incidents | The porter can report incidents that occur during the moving process (e.g., accidents, delays, or damages) |
| 05 | Porter | Confirm Porter Team Arrival | The lead porter confirms that all assigned team members have arrived at the location |
| 06 | Porter | Update Booking Status of porter | The porter updates their booking status during different stages of the moving job (e.g., "Packing," "Loading," "Completed") |
| 07 | Porter | Upload Photos/Videos as Evidence | The porter uploads photos or videos as proof of their work (e.g., items packed, conditions of items). This may be used to verify service completion or to document any issues for later review. |
| 08 | Porter | View booking details | The porter can access detailed information about the booking, including the customer's address, job schedule, specific tasks, and any additional services or instructions for the job. |
| 09 | Porter | Request booking update | The porter can request updates or changes to the booking if any issues arise or if adjustments are needed (e.g., additional time required, request for more staff) |

#### 2.3.4. Reviewer Use Case Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Actor** | **Use case** | **Use case description** |
| 01 | Reviewer | Log in by account | The reviewer logs into the system using their registered account (by phone number and password) |
| 02 | Reviewer | View profile | The reviewer can view their profile details, such as personal information, contact details, and work history |
| 03 | Reviewer | Forgot password | The reviewer enters their phone number and receives OTP to reset their password |
| 04 | Reviewer | Assign/Reassign responsibleDrivers and Porters | The reviewer assigns or reassigns drivers and porters to a specific booking |
| 05 | Reviewer | Review booking | The reviewer evaluates the booking by examining details such as the number of rooms, items, and overall requirements. They may conduct online or offline reviews to assess the situation accurately. |
| 06 | Reviewer | Upload Photos/Videos During Offline Review | Review During an offline review, the reviewer can capture and upload photos or videos of the customer’s items, space, or conditions |
| 07 | Reviewer | Update Booking Information | The reviewer can update the booking information (e.g., adjust the service type, change vehicle type, or add/remove services) after the review process |
| 08 | Reviewer | View booking Information | The reviewer can view detailed booking information, including customer details, assigned staff, and any special instructions provided during booking. |
| 09 | Reviewer | Update time review | The reviewer can update the scheduled time for the review if there is a change in availability or if the customer requests a different time |

#### 2.3.5. Admin Use Case Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Actor** | **Use case** | **Use case description** |
| 01 | Admin | View customer | The admin views customer profiles, contact information, their booking history |
| 02 | Admin | Ban customer | The admin bans a customer from accessing the system |
| 03 | Admin | Remove customer | The admin removes a customer's account and all associated data from the system |
| 04 | Admin | Create driver | The admin creates a new driver account, including personal details, driving license, and vehicle information |
| 05 | Admin | Update driver | The admin updates a driver’s profile, modifying details like contact information, assigned vehicle, or work status |
| 06 | Admin | Remove driver | The admin removes a driver from the system |
| 07 | Admin | View driver | The admin views driver profiles |
| 08 | Admin | Create porter | The admin creates a new porter account with details porter’s profile, contact information |
| 09 | Admin | Update porter | The admin updates a porter’s information, contact details, or work status |
| 10 | Admin | Remove porter | The admin removes a porter from the system, ending their access to porter-related tasks |
| 11 | Admin | View porter | The admin views porter profiles |
| 12 | Admin | Create reviewer | The admin creates a new reviewer account with details reviewer’s profile, contact information |
| 13 | Admin | Update reviewer | The admin updates a reviewer’s information, such as changing their contact details, work status |
| 14 | Admin | Remove reviewer | The admin removes a reviewer from the system |
| 15 | Admin | View reviewer | The admin views reviewer profiles |
| 16 | Admin | Create manager | The admin creates a manager account, assigning permissions |
| 17 | Admin | Update manager | The admin updates a manager’s profile, modifying details such as their permissions |
| 18 | Admin | Remove manager | The admin removes a manager from the system, terminating their administrative access and control. |
| 19 | Admin | View manager | The admin views manager profiles |
| 21 | Admin | Log in by account | The admin logs into the system using their registered account (by email number and password) |
| 22 | Admin | View profile | The reviewer can view their profile details, such as personal information, contact details |
| 23 | Admin | Forgot password | The porter enters their email and receives OTP to reset their password |

#### 2.3.6. Manager Use Case Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Actor** | **Use case** | **Use case description** |
| 01 | Manager | Track booking status | The manager monitors the status of ongoing bookings |
| 02 | Manager | Resolve issue | The manager resolves any incidents or issues (e.g., delays, vehicle breakdowns) that arise during a booking. |
| 03 | Manager | View booking details | The manager views detailed information about specific bookings, including customer details and assigned staff |
| 04 | Manager | Remove discount codes and promotions | The manager deletes outdated or invalid discount codes and promotional offers from the system |
| 05 | Manager | Create discount codes and promotions | The manager generates new discount codes and promotional offers for customers |
| 06 | Manager | Reply customer feedback | The manager responds to customer feedback |
| 07 | Manager | Remove services offered | The manager removes services that are no longer offered from the system |
| 08 | Manager | Modified services offered | The manager updates the details of existing services (e.g., price, description) to reflect current offerings |
| 09 | Manager | Add services offered | The manager adds new services to the list of available options for customers |
| 10 | Manager | Reject application register for driver | The manager declines a driver's application to join the system, if it does not meet requirements |
| 11 | Manager | Approve application register for driver | The manager approves a driver's application to join the system, including approving the driver's truck |
| 12 | Manager | Approve compensation claim | The manager approves customer claims for compensation related to service issues |
| 13 | Manager | Reject compensation claim | The manager rejects customer claims for compensation if they do not meet the necessary criteria |
| 14 | Manager | Update time booking | The manager updates the scheduled booking time based on customer requests or operational needs |
| 15 | Manager | Log in by account | The manager logs into the system using their registered account (by email and password) |
| 16 | Manager | View profile | The manager can view their profile details, such as personal information |
| 17 | Manager | Forgot password | The porter enters their email and receives OTP to reset their password |

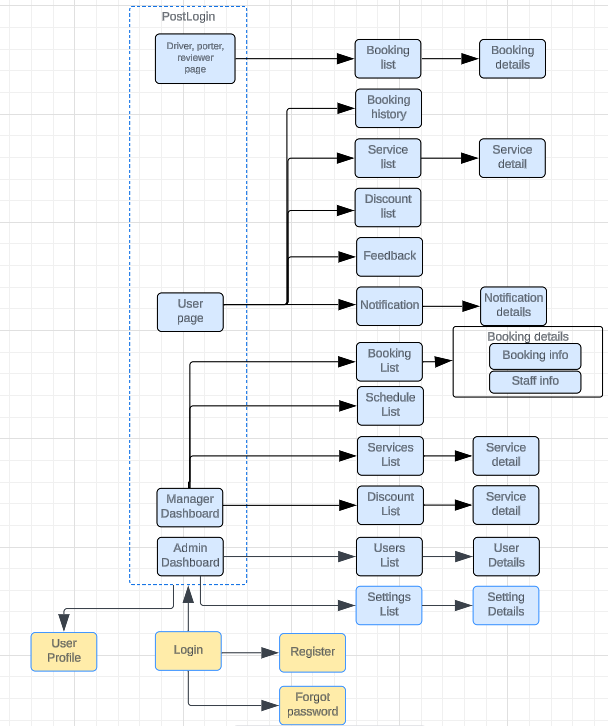
#### 2.3.7. System Handler Use Case Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Actor** | **Use case** | **Use case description** |
| 01 | System Handler | Chat | The system facilitates real-time messaging between customers, drivers, porters, and reviewers |
| 02 | System Handler | Notification | The system sends notifications to customers, drivers, porters, and reviewers to inform them of booking updates, arrivals, or changes in real-time. |
| 03 | System Handler | OTP | The system generates and sends a one-time password (OTP) for authentication |
| 04 | System Handler | Tracking real-time | The system provides real-time tracking of vehicles and staff (drivers, porters) during the moving process, visible to customers and managers |
| 05 | System Handler | Assign driver | The system automatically assigns a driver to a booking based on availability, location, and other predefined criteria |
| 06 | System Handler | Assign porter | The system automatically assigns porters to a booking based on availability, location, and other predefined criteria |
| 07 | System Handler | Assign reviewer | The system automatically assigns a reviewer for offline reviews based on availability and proximity to the customer’s location |

## 3. Functional Requirements

### 3.1 System Functional Overview

#### 3.1.1 Screens Flow

**

#### 3.1.2 Screen Descriptions

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Feature** | **Screen** | **Description** |
| 1 | Booking Management | Booking List | Displays a list of all active bookings available to the user based on role. |
| 2 | Booking Management | Booking Details | Displays detailed information of a selected booking from the booking list. |
| 3 | Service Management | Service List | Displays the list of services offered to customers. |
| 4 | Service Management | Service Details | Shows detailed information about the selected service. |
| 5 | Discount Management | Discount List | Displays the list of active discounts available for customers. |
| 6 | Feedback Management | Feedback | Shows customer feedback with options to manage or respond. |
| 7 | Notification System | Notification | Displays system-generated notifications for users. |
| 8 | Notification System | Notification Details | Shows more detailed information about a selected notification. |
| 9 | Schedule Management | Schedule List | Displays scheduled tasks and appointments for users. |
| 10 | User Management | User Profile | Displays the user profile and settings options. |
| 11 | Admin Dashboard | Admin Dashboard | Shows an overview of the system’s metrics and control panels for administrators. |
| 12 | User Management | User List | Displays a list of all users in the system with options to manage them. |
| 13 | Settings Management | Settings List | Displays various system settings available to administrators. |
| 14 | Settings Management | Settings Details | Shows detailed information about a selected system setting. |

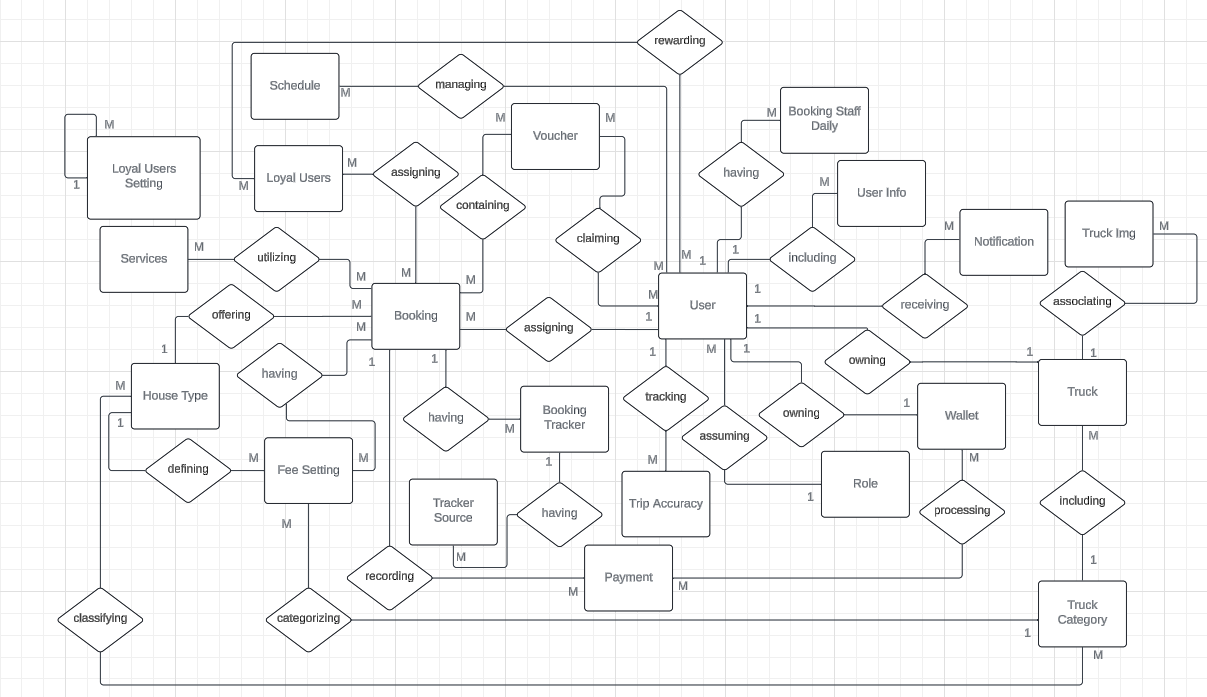
#### 3.1.3 Screen Authorization

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Screen** | **Manager Role** | **Driver Role** | **Porter Role** | **Reviewer Role** | **Customer Role** | **Admin Role** |
| Booking List | X | X | X | X | X |  |
| View Booking Details | X | X | X | X | X |  |
| Service List | X |  |  | X | X |  |
| View Service Details | X |  |  | X | X |  |
| Discount List | X |  |  |  | X |  |
| Feedback | X |  |  |  | X |  |
| Notification | X | X | X | X | X | X |
| View Notification details | X | X | X | X | X | X |
| Schedule List | X | X | X | X |  |  |
| User Profile | X | X | X | X | X | X |
| Admin Dashboard | X |  |  |  |  | X |
| User List | X |  |  |  |  | X |
| Settings List | X |  |  |  |  | X |
| View Settings Details | X |  |  |  |  | X |

#### 3.1.4 Non-Screen Functions

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Feature** | **System Function** | **Description** |
| 01 | Send notification | Send notification | The system will send notifications in the following cases:   * Successful order placement confirmation * Driver assigned to the booking * Driver en route to the pickup location * Driver arrival at the location * Issue encountered during the moving process * Order completion notification * Schedule changes for moving date * Payment request * Order cancellation * Successful review booking confirmation * Reviewer en route to the location * Reviewer arrival at the location * Completion of the house review * Request for additional house information before review * Changes in review schedule * Review schedule cancellation * Request to update house information for review * Issue encountered during the review process |
| 02 | Send sms | Send sms | The system will send sms in the following cases:   * Forget password * Register new account |

#### 3.1.5 Entity Relationship Diagram



Entities Description

|  |  |  |
| --- | --- | --- |
| **#** | **Entity** | **Description** |
| 1 | User |  |
| 2 | Meal |  |
| 3 | Meal Subscription |  |
| 4 | … |  |

### **3.2 Customer Features**

#### **3.2.1 Register booking**

Function Trigger:

The customer enters house information, selects the desired truck type, and chooses a service to create a new booking.

Frequency of Use: High

Function Description:

Actors: Customer

Purpose: To allow customers to create a new moving booking based on their specific needs.

Preconditions: The customer is logged into the system

Post-conditions: The booking is successfully created and stored in the system.

Function Details:

Data:

* Date/Time: Input fields for the preferred booking date and time.
* Location: Fields for pick-up and drop-off addresses.
* House type: number of rooms and floors
* Truck Type and Services: Dropdowns for truck type and optional services.
* Cost Estimate: The system calculates the estimated cost based on customer inputs

Validation:

Required Fields: Date, time, location, truck type, and service type must be completed (BR-12).

Timing Restrictions: Services can only be reviewed between 6:00 A.M. and 8:00 P.M. local time (BR-16).

Deposit Requirements: Bookings require a deposit within 24 hours of confirmation (BR-17).

Business Rules:

* BR-12: All required booking information fields must be completed to proceed.
* BR-13: The booking must be reviewed either online or offline.
* BR-14: If the customer selects an offline review, they must confirm a meeting and place a deposit before the reviewer visit.
* BR-15: If the customer selects an online review, they must deposit upon accepting the reviewer's proposed updates.
* BR-16: MoveMate reviews are restricted to the hours of 6:00 A.M. - 8:00 P.M., Monday through Sunday.
* BR-17: The deposit must be made within 24 hours of booking confirmation; otherwise, the booking will be automatically canceled.

Functionality:

Normal Cases:

1. Customer enters booking details, and the system validates entries.
2. The estimated cost is calculated and displayed.
3. The customer confirms the booking and review type (online/offline).
4. The system stores the booking and displays a confirmation message.

#### **3.2.2 Book Round-Trip**

Function Trigger:  
The customer selects the [Vận chuyển lần 2] checkbox during the booking creation process or when a booking has already taken place.

Frequency of Use: Moderate

Function Description:

Actors: Customer

Purpose: Enables customers to schedule an additional round-trip for their move, accommodating a second leg of transportation.

Preconditions: The customer must be logged into the system.

Post-conditions: The round-trip booking is successfully created, and both trips are reflected in the booking summary.

Function Details:

Data:

* Date/Time: Input fields for preferred booking date and time for each leg of the round-trip.
* Location: Fields for pick-up and drop-off addresses for both trips.
* Truck Type and Services: Dropdowns for selecting truck type and additional services as needed for the second trip.
* Cost Estimate: The system calculates an adjusted estimated cost for both legs of the journey.

Validation:

* Required Fields: Date, time, location, truck type, and service type must be completed (BR-12).
* Round-Trip Similarity: Both legs must be similar in details (BR-18).
* Cost Adjustment: The system recalculates the booking cost to reflect the added round-trip (BR-19).

Business Rules:

* BR-18: Both legs of the round-trip must include similar details (e.g., truck type, location).
* BR-19: The booking fee is adjusted to incorporate both trips.
* BR-12: Required booking information must be filled out for both legs of the journey.

Functionality:

Normal Cases:

1. The customer initiates a new booking.
2. The customer selects the [Vận chuyển lần 2] checkbox to indicate the need for a round-trip.
3. The system validates the input information and calculates an estimated cost covering both trips.
4. The customer reviews and confirms the booking for the round-trip.
5. The system stores the round-trip booking details and displays a confirmation message to the customer.

#### **3.2.3 Cancel booking**

Function Trigger:  
The customer selects the [Hủy chuyến] (Cancel Trip) button in their booking details screen after successfully creating a booking.

Frequency of Use: Low to Moderate

**Function Description:**

**Actors**: Customer

**Purpose**: Allows customers to cancel an existing booking if they no longer require the service.

**Preconditions**: The customer is logged into the system (PRE-04).

**Post-conditions**: The booking is canceled, and the status is updated in the system to reflect the cancellation (POST-10).

Function Details:

**Data:**

* **Booking ID**: Identifier for the specific booking to be canceled.
* **Cancellation Confirmation**: A prompt asking the customer to confirm the cancellation.
* **Updated Status**: The booking status is updated to "Canceled" upon confirmation.
* **Cancellation Fee (if applicable)**: The system checks if a cancellation fee applies and informs the customer accordingly.

**Validation:**

* **Required Fields**: The booking ID and cancellation confirmation must be provided (BR-20).
* **Timing**: Cancellation must occur within a specified timeframe prior to the driver’s arrival to be eligible (BR-20).
* **Refund Policies**: Any applicable cancellation fees or refund policies are calculated based on the time of cancellation (BR-21).

**Business Rules:**

* **BR-20**: Cancellations are only allowed within a certain time limit before the scheduled driver arrival.
* **BR-21**: A cancellation fee may apply depending on the time of cancellation relative to the booking start time.

Functionality:

**Normal Cases:**

1. The customer navigates to an active booking.
2. The customer selects the [Hủy chuyến] button to initiate the cancellation.
3. The system prompts the customer to confirm the cancellation.
4. Upon confirmation, the system updates the booking status to "Canceled."
5. The customer receives a confirmation message indicating successful cancellation.

#### **3.2.4 Upload image and video**

**Function Trigger:**  
Customer selects the [Tải lên ảnh/video] (Upload Image/Video) button during the booking registration process to upload media.

**Frequency of Use:** Moderate

**Function Description:**

**Actors**: Customer

**Purpose**: To allow customers to upload images or videos of items to be moved, providing additional information for a more accurate moving assessment.

**Preconditions**: The customer must be logged into the system (PRE-04).

**Post-conditions**: The uploaded media files are successfully saved and associated with the booking (POST-11).

Function Details:

**Data:**

* **Media Files**: Image or video files selected by the customer.
* **File Metadata**: Information such as file size, format, and upload timestamp.
* **Booking ID Association**: Each media file is linked to a specific booking ID.

**Validation:**

* **File Size & Format**: Media files must meet file size and format requirements as defined by the system (BR-22).
* **Security & Access Control**: Uploaded media should be securely stored and restricted to authorized personnel only (BR-23).
* **Community Standards**: Media content must adhere to community guidelines to ensure appropriateness (BR-24).

**Business Rules:**

* **BR-22**: All media uploads must comply with predefined file size limits and supported formats (e.g., JPEG, PNG, MP4).
* **BR-23**: Uploaded media must be stored securely, with restricted access based on authorization levels.
* **BR-24**: Media content should not violate community standards (e.g., no offensive or prohibited content).

Functionality:

**Normal Cases:**

The customer taps [Tải lên ảnh/video] to initiate the upload.

The customer selects the media files from their device.

The system uploads the files, performs validation checks (size, format, content), and securely stores the files associated with the booking.

A confirmation message appears, notifying the customer of a successful upload.

#### 3.2.5 View Transaction History

**Function Trigger:**  
Customer touches [Đơn hàng của tôi] on the home page to access their transaction history.

**Frequency of Use:** Moderate

**Function Description:**

Actors: Customer

Purpose: To allow customers to view a detailed history of their transactions, including booking payments, recharges, and withdrawals.

Preconditions: The customer must be logged into the system (PRE-04).

Post-conditions: The transaction history is displayed to the customer (POST-14).

**Function Details:**

**Data:**

* **Transaction List**: A list containing transaction details such as date, amount, type (payment, recharge, withdrawal), and status.

**Validation:**

* **User Authentication**: Only authenticated users can access transaction history.

**Business Rules:**

* **BR-27**: Only the customer can view their own transaction history.

**Functionality:**

**Normal Cases:**

1. The customer navigates to [Đơn hàng của tôi] on the home page.
2. The system retrieves and displays a list of transactions with relevant details (date, amount, type)

#### 3.2.6 Withdraw Money

**Function Trigger:**  
Customer touches [Rút tiền] (Withdraw Money) on the home page to initiate a withdrawal.

**Frequency of Use:** Low

**Function Description:**

* **Actors**: Customer
* **Purpose**: To allow customers to withdraw funds from their MoveMate account to a linked payment method.
* **Preconditions**: The customer must be logged into the system (PRE-04).
* **Post-conditions**: The requested amount is transferred, and the account balance is updated (POST-15).

**Function Details:**

**Data:**

* **Withdrawal Amount**: The amount the customer wishes to withdraw.
* **Payment Method**: The linked payment method to which the funds will be transferred.

**Validation:**

* **Withdrawal Limits**: Ensure the withdrawal amount does not exceed the available balance.

**Business Rules:**

* **BR-28**: The customer can withdraw all available funds in their MoveMate wallet to a linked payment method.

**Functionality:**

**Normal Cases:**

1. The customer navigates to [Rút tiền].
2. The customer enters the withdrawal amount.
3. The system processes the transfer to the linked payment method and updates the account balance.

#### 3.2.7 Recharge Money

**Function Trigger:**  
Customer touches [Nạp tiền] on the home page to add funds.

**Frequency of Use:** Moderate

**Function Description:**

* **Actors**: Customer
* **Purpose**: To allow customers to add funds to their MoveMate account for easy payment of bookings and services.
* **Preconditions**: The customer must be logged into the system (PRE-04).
* **Post-conditions**: The account balance is updated with the recharged amount (POST-16).

**Function Details:**

**Data:**

* **Recharge Amount**: The amount the customer wishes to add to their account.
* **Payment Method**: The method chosen for the recharge (credit card, bank transfer, etc.).

**Validation:**

* **Minimum Recharge Limit**: Ensure that the recharge amount meets any minimum requirements set by the system.

**Business Rules:**

* **N/A**

**Functionality:**

**Normal Cases:**

1. The customer navigates to [Nạp tiền].
2. The customer selects the payment method and enters the recharge amount.
3. The system confirms the recharge and updates the balance accordingly.

#### **3.2.8 Pay in Cash**

**Function Trigger:**

Customer selects [Thanh toán bằng tiền mặt] when booking is completed.

**Frequency of Use**: Moderate

**Function Description:**

**Actor**: Customer

**Purpose**: Allows customers to pay in cash upon service completion, providing an alternative to online payment options.

**Preconditions**: PRE-05: Customer has chosen the cash payment option.

**Post-conditions**: POST-18: Cash payment is collected, and the booking is marked as paid.

**Function Details:**

**Business Rules**: BR-30: Only eligible bookings can use cash payments, based on location and booking terms.

**Functionality:**

**Normal Flow**:

* 1. Customer selects [Thanh toán bằng tiền mặt] after the booking is completed.
  2. Driver/porter collects payment upon service completion.
  3. System confirms payment as received and updates the booking status to "paid."

#### **3.2.9 Pay by third party**

**Function Trigger:**

Customer taps [Thanh toán bằng các phương thức chuyển khoản] when booking is completed.

· **Frequency of Use**: Moderate

**Function Description:**

· **Primary Actor**: Customer

· **Secondary Actors**: Third-party payer

· **Purpose**: Enables the customer to arrange payment by a third party (individual or entity) on their behalf.

· **Preconditions**: PRE-06: Third party has authorized the payment.

· **Post-conditions**: POST-19: Booking is marked as paid once the third-party payment is confirmed.

**Function Details:**

**Business Rules**: BR-31: Third-party payment requires prior authorization and identification of the third party.

**Functionality:**

**Normal Flow**:

1. Customer selects [Thanh toán bằng các phương thức chuyển khoản] during booking.
2. Customer provides the third-party payment details.
3. System confirms completion of payment and marks the booking as "paid."

### **3.3 Reviewer Features**

#### 3.3.1 Update Booking Information

* **Function ID and Name**: MM25 - Update Booking Information
* **Primary Actor**: Reviewer
* **Secondary Actors**: N/A
* **Trigger**: Tap on the "Cập nhật" button on the booking detail screen.
* **Description**: Allows the reviewer to modify booking details, such as date, time, or requested services.
* **Preconditions**:
  + PRE-14: Reviewer is logged into the system.
  + PRE-18: Booking exists in the system.
* **Post-conditions**:
  + POST-30: Booking information is updated in the database, and notifications are sent to affected parties.
* **Normal Flow**:
  1. Reviewer navigates to “Công việc của tôi.”
  2. Selects a booking.
  3. Clicks “Cập nhật.”
  4. Makes necessary modifications.
  5. Confirms updates.
  6. System updates information and sends notifications.
* **Priority**: High
* **Frequency of Use**: Moderate
* **Business Rules**:
  + BR-56: Any booking changes must be confirmed by the system and may incur fees.
  + BR-58: Only authorized personnel can modify booking details.

#### 3.3.1 Upload Photos/Videos During Offline Review

* **Function ID and Name**: MM26 - Upload Photos/Videos During Offline Review
* **Primary Actor**: Reviewer
* **Secondary Actors**: N/A
* **Trigger**: Tap on the "Tải lên ảnh/video" button during the offline review.
* **Description**: Allows the reviewer to upload photos or videos taken during an offline review to document item or service conditions.
* **Preconditions**:
  + PRE-14: Reviewer is logged into the system.
* **Post-conditions**:
  + POST-31: Uploaded media is stored in the database and linked to the relevant booking.
* **Normal Flow**:
  1. Reviewer conducts an offline review.
  2. Clicks "Tải lên ảnh/video."
  3. Selects media from the device.
  4. Confirms upload.
  5. System stores the media and links it to the booking.
* **Priority**: Moderate
* **Frequency of Use**: Low
* **Business Rules**:
  + BR-22: Media uploads must meet system file size and format restrictions.
  + BR-24: Uploaded media must comply with community standards.

### 3.4 Driver Features

#### 3.4.1 Update Booking Status of Driver

**Function ID and Name:**  
MM30 - Update Booking Status of Driver

**Primary Actor:**  
Driver

**Trigger:**  
Driver taps the "Cập nhật trạng thái" button in the booking details screen.

**Description:**  
Enables drivers to update their current booking status (Received, Coming, In-progress, Complete) to reflect their progress within the system.

**Preconditions:**

* **PRE-23:** The driver is logged into the system.

**Post-conditions:**

* **POST-36:** The booking status is updated in the system.
* **POST-37:** The customer receives a notification of the status change.

**Normal Flow:**

1. The driver navigates to view current booking details.
2. Selects the relevant booking status.
3. Confirms the status update.

**Priority:**  
High

**Frequency of Use:**  
High

**Business Rules:**

* **BR-66:** Status updates must follow the predefined order of the booking process (e.g., from “Received” to “Coming,” then “In-progress,” and finally “Complete”).

#### 3.4.2 Update Payment Status

**Function ID and Name:**  
MM31 - Update Payment Status

**Primary Actor:**  
Driver

**Trigger:**  
Driver taps the "Cập nhật trạng thái thanh toán" button after a transaction is completed.

**Description:**  
Allows the driver to confirm the payment status for a completed booking, ensuring both the system and customer are updated on payment completion.

**Preconditions:**

* **PRE-23:** The driver is logged into the system.

**Post-conditions:**

* **POST-37:** The customer receives a notification of the status change.
* **POST-38:** The payment status is updated in the system.

**Normal Flow:**

1. The driver selects the completed booking.
2. Taps on the "Cập nhật trạng thái thanh toán" button.
3. Confirms the current payment status.

**Priority:**  
High

**Frequency of Use:**  
Moderate

**Business Rules:**

* **BR-67:** Payment status updates are only allowed for bookings that have been marked as “Complete.”

### 3.5 Porter Features

#### 3.5.1 Upload Photos/Videos as Evidence

**Function ID and Name:**  
MM34 - Upload Photos/Videos as Evidence

**Primary Actor:**  
Porter

**Trigger:**  
Porter taps the "Tải lên minh chứng" button after completing the packing or loading of items.

**Description:**  
Enables the porter to upload photos or videos as evidence of the item condition or placement after the move, providing a record for customer and company review.

**Preconditions:**

* **PRE-26:** Porter is logged into the system.

**Post-conditions:**

* **POST-41:** The media evidence is stored in the system.

**Normal Flow:**

1. The porter accesses the booking details.
2. Selects "Tải lên minh chứng" to begin the upload process.
3. Uploads the media files (photos or videos) as required.

**Priority:**  
High

**Frequency of Use:**  
Moderate

**Business Rules:**

* **BR-22:** Media uploads must comply with system file size and format restrictions.
* **BR-23:** Uploaded media should be securely stored and accessible only to authorized users.
* **BR-24:** Media content must meet community standards.

#### 3.5.2 Update Booking Status of Porter

**Function ID and Name:**  
MM35 - Update Booking Status of Porter

**Primary Actor:**  
Porter

**Trigger:**  
Porter selects "Cập nhật" on the current booking.

**Description:**  
Allows the porter to update the status of their assigned booking in real time, reflecting task progress for both customer and system tracking.

**Preconditions:**

* **PRE-26:** Porter is logged into the system.

**Post-conditions:**

* **POST-42:** The status update is logged in the system, and the customer receives a notification of the status change.

**Normal Flow:**

1. The porter navigates to the booking they are assigned to.
2. Taps "Cập nhật" to begin updating the status.
3. Confirms the new status.

**Priority:**  
High

**Frequency of Use:**  
High

**Business Rules:**  
N/A

## 4. Non-Functional Requirements

#### 4.1: Performance

* The system will respond to booking requests within 3 seconds.
* GPS tracking updates will be pushed to the user interface every 10 seconds.
* The system will handle up to 1000 simultaneous users without degradation in performance.

#### 4.2: Scalability

* Cloud infrastructure (e.g., AWS or Google Cloud) will be used to dynamically scale server resources

#### 4.3: Security

* User authentication will be managed with OAuth 2.0, ensuring secure login with third-party services like Google.

## 5. Requirement Appendix

### 5.1 Business Rules

|  |  |
| --- | --- |
| **No** | **Business Rule** |
| BR-01 | Users must have a valid account with the system to use this login method. |
| BR-02 | The system should securely handle and store user credentials. |
| BR-03 | Account lockout measures may be implemented to enhance security. |
| BR-04 | Only authenticated users can access profile information. |
| BR-05 | Profile data must be securely handled and displayed. |
| BR-06 | Password length must be between 8 and 50 characters. It must include at least one uppercase letter, one lowercase letter, one digit, and one special character |
| BR-07 | The system must securely manage and handle Google OAuth authentication. |
| BR-08 | The system should request only the necessary permissions from Google to authenticate the user. |
| BR-09 | Profile information must be valid (e.g., email format, phone number format). |
| BR-10 | The system must ensure profile updates are secure and validated before saving. |
| BR-11 | Feedback can only be submitted for completed services |
| BR-12 | All required booking information must be completed |
| BR-13 | The booking must be reviewed |
| BR-14 | If customer choose to review offline, they must deposit and confirm a meeting for the reviewer coming |
| BR-15 | If the customer chooses to review online, they must deposit after accepting the reviewer's updates. |
| BR-16 | MoveMate services can only be reviewed between 6:00 A.M. and 8:00 P.M. local time, Monday through Sunday. |
| BR-17 | Booking deposit payment must be made within 24 hours of booking confirmation. Failure to do so will result in automatic booking cancellation |
| BR-18 | Both legs of the second time booking must be similar. |
| BR-19 | The system adjusts the booking fee to include both trips. |
| BR-20 | Bookings can only be canceled within a certain time before the driver arrives. |
| BR-21 | Cancellation fees or refund policies apply based on the time of cancellation. |
| BR-22 | Media uploads must comply with the system’s file size and format restrictions. |
| BR-23 | Uploaded media should be securely stored and accessible only to authorized users. |
| BR-24 | Must upload media that complies with community standards |
| BR-25 | Only future bookings can have their times updated. |
| BR-26 | Updated booking times can only be done once after the booking has been successfully registered. |
| BR-27 | Only the customer can view their own transaction history. |
| BR-28 | Withdrawal all amount in MoveMate wallet  to a linked payment method |
| BR-29 | All reported issues must be acknowledged by customer support within a predefined timeframe. |
| BR-30 | Only eligible bookings can use cash payments, based on location and booking terms |
| BR-31 | Third-party payment requires prior authorization and identification of the third party. |
| BR-32 | Bonuses are non-refundable once given |
| BR-33 | Service information should be updated regularly to reflect current offerings. |
| BR-34 | Services may be filtered or sorted based on customer preferences (e.g., location, price range). |
| BR-35 | Username must be in Email format. All usernames used for customer or staff accounts must follow the standard email format (e.g., example@domain.com). |
| BR-36 | Password must be hashed by the MD5 algorithm on the client-side before being sent to the server-side for user authentication |
| BR-37 | Password length must be between 8 and 50 characters. It must include at least one uppercase letter, one lowercase letter, one digit, and one special character |
| BR-38 | User can only update booking date once for free. Any additional booking date changes will incur a fee, calculated based on the services booked |
| BR-39 | Booking deposit payment must be made within 24 hours of booking confirmation. Failure to do so will result in automatic booking cancellation |
| BR-40 | Reviewers are required to upload photos or videos during offline reviews to ensure booking accuracy. |
| BR-41 | Drivers and porters must confirm their arrival at the customer's location within the app before starting any work. This triggers the "Arrived" status for the booking. |
| BR-42 | If a reviewer or staff member cancels a booking, the system must notify the customer and provide an option to reschedule or request a refund within the app |
| BR-43 | Customers can cancel a booking before the reviewer or driver arrives, subject to a cancellation fee, which varies based on how close it is to the scheduled booking time. |
| BR-44 | Booking time slots are available in 30-minute intervals, starting on the hour and half-hour. |
| BR-45 | MoveMate services can only be reviewed between 6:00 A.M. and 8:00 P.M. local time, Monday through Sunday. |
| BR-46 | All services in a single booking must be completed for the same customer and at the same location. |
| BR-47 | Payments for a single booking must be made using one payment method (e.g., cash, third-party payment). |
| BR-48 | Only registered customers can make bookings for moving services. |
| BR-49 | Cancellations made within 24 hours of the scheduled service time will incur a cancellation fee. |
| BR-50 | Large or bulky items must be declared during the booking process; otherwise, additional charges may apply. |
| BR-51 | Drivers and porters must check in at the service location within 15 minutes of the scheduled time. |
| BR-52 | Drivers and porters must update the booking status at key stages: arrival, loading, transit, and delivery. |
| BR-53 | Reviews for offline bookings must be completed within 48 hours after the initial review request. |
| BR-54 | Payments via third-party services (e.g., MoMo, VNPAY, PayOS) must be processed before the service begins. |
| BR-55 | Customers are required to provide accurate contact information and address details during the booking process. |
| BR-56 | Any changes to the booking, such as date, time, or service, must be confirmed by the MoveMate system and may incur fees. |
| BR-57 | All customer data, including personally identifiable information (PII), must be stored securely and encrypted. |
| BR-58 | Only authorized employees (e.g., administrators, managers) can modify booking details or assign staff. |
| BR-59 | Damage claims must be reported within 24 hours of service completion for review and possible compensation. |
| BR-60 | A customer must be present during the pickup and delivery unless prior arrangements are made. |
| BR-61 | Vehicles and equipment used must comply with local regulations regarding size, safety, and maintenance. |
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### 5.2 Application Messages List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Message Code** | **Message Type** | **Context** | **Content** |
| 1 | MMA-01 | Toast message | Đăng nhập sai tài khoản hoặc mật khẩu | Email hoặc mật khẩu không hợp lệ. |
| 2 | MMA-02 | Toast message | Đăng nhập với tài khoản bị vô hiệu hóa | Tài khoản đã bị vô hiệu hóa. |
| 3 | MMA-03 | Toast message | Đăng nhập thành công | Đăng nhập thành công. |
| 4 | MMA-04 | Toast message | Đổi mật khẩu thành công | Đổi mật khẩu thành công. |
| 5 | MMA-05 | In-line | Tạo/Cập nhật đơn hàng với địa chỉ không hợp lệ | - Địa chỉ không được để trống. |
| - Địa chỉ cần ít hơn hoặc bằng 255 ký tự. |
| 6 | MMA-06 | In-line | Nhập ngày hoặc giờ không hợp lệ | - Ngày và giờ phải hợp lệ. |
| - Ngày và giờ phải ở thời điểm trong tương lai. |
| 7 | MMA-07 | Toast message | Đơn hàng được tạo thành công | Đã tạo đơn hàng thành công. |
| 8 | MMA-08 | Toast message | Đơn hàng được cập nhật thành công | Đã cập nhật đơn hàng thành công. |
| 9 | MMA-09 | Toast message | Hủy đơn hàng thành công | Đã hủy đơn hàng thành công. |
| 10 | MMA-10 | Toast message | Chọn loại xe không hợp lệ | Vui lòng chọn loại xe hợp lệ. |
| 11 | MMA-11 | Toast message | Tạo/Cập nhật hồ sơ với email không hợp lệ | - Định dạng email không hợp lệ. |
| - Email phải dưới hoặc bằng 100 ký tự. |
| 12 | MMA-12 | Toast message | Cập nhật hồ sơ thành công | Cập nhật hồ sơ thành công. |
| 13 | MMA-13 | In-line | Tạo/Cập nhật đánh giá với nội dung không hợp lệ | - Đánh giá không được để trống. |
| - Đánh giá phải ít hơn hoặc bằng 500 ký tự. |
| 14 | MMA-14 | Toast message | Gửi đánh giá thành công | Đánh giá đã được gửi thành công. |
| 15 | MMA-15 | Toast message | Gửi phản hồi thành công | Phản hồi đã được gửi thành công. |
| 16 | MMA-16 | Toast message | Không thể xử lý thanh toán | Thanh toán thất bại. Vui lòng thử lại. |
| 17 | MMA-17 | Toast message | Thanh toán thành công | Đã thanh toán thành công. |
| 18 | MMA-18 | Toast message | Không đủ số dư để thanh toán | Số dư không đủ. Vui lòng nạp tiền để tiếp tục. |
| 19 | MMA-19 | Toast message | Phân công tài xế thành công | Đã phân công tài xế thành công. |
| 20 | MMA-20 | Toast message | Không thể lấy vị trí hiện tại | Không thể lấy vị trí hiện tại. |
| 21 | MMA-21 | Toast message | Tạo/Cập nhật báo cáo sự cố với chi tiết không hợp lệ | - Chi tiết sự cố không được để trống. |
| - Chi tiết sự cố phải ít hơn hoặc bằng 500 ký tự. |
| 22 | MMA-22 | Toast message | Báo cáo sự cố thành công | Báo cáo sự cố thành công. |
| 23 | MMA-23 | Toast message | Tặng thưởng thành công | Đã tặng thưởng thành công. |
| 24 | MMA-24 | Toast message | Xảy ra lỗi hệ thống | Có lỗi xảy ra. Vui lòng thử lại sau. |
| 25 | MMA-25 | Toast message | Mất kết nối | Không có kết nối Internet. Vui lòng kiểm tra và thử lại. |
| 26 | MMA-26 | Toast message | Tài khoản không hợp lệ | Tài khoản không tồn tại hoặc đã bị khóa. |
| 27 | MMA-27 | Toast message | Đơn hàng không tìm thấy | Không tìm thấy đơn hàng yêu cầu. |
| 28 | MMA-28 | Toast message | Thông tin tài khoản được cập nhật thành công | Cập nhật thông tin tài khoản thành công. |
| 29 | MMA-29 | Toast message | Xóa tài khoản thành công | Tài khoản đã được xóa thành công. |
| 30 | MMA-30 | Toast message | Không thể tải lên tệp đính kèm | Không thể tải lên tệp đính kèm. Định dạng hoặc dung lượng tệp không hợp lệ. |
| 31 | MMA-31 | Toast message | Tải lên ảnh thành công | Tải lên ảnh thành công. |
| 32 | MMA-32 | Toast message | Đơn hàng đã được xác nhận | Đơn hàng của bạn đã được xác nhận. |
| 33 | MMA-33 | Toast message | Đơn hàng bị từ chối | Đơn hàng của bạn đã bị từ chối. Vui lòng kiểm tra lại thông tin. |
| 34 | MMA-34 | Toast message | Hoàn thành di chuyển | Đơn hàng di chuyển đã hoàn thành. |
| 35 | MMA-35 | Toast message | Bắt đầu di chuyển | Tài xế đã bắt đầu di chuyển đến địa điểm của bạn. |
| 36 | MMA-36 | Toast message | Đã đến địa điểm | Tài xế đã đến địa điểm của bạn. |
| 37 | MMA-37 | Toast message | Bắt đầu quá trình bốc xếp | Quá trình bốc xếp đã bắt đầu. |
| 38 | MMA-38 | Toast message | Kết thúc quá trình bốc xếp | Quá trình bốc xếp đã hoàn thành. |
| 39 | MMA-39 | Toast message | Đánh giá tài xế thành công | Đánh giá tài xế đã được gửi thành công. |
| 40 | MMA-40 | Toast message | Tải lên chứng từ thành công | Tải lên chứng từ (ảnh hoặc video) thành công. |

### **5.3 Other Requirements**

#### 5.3.1 Pre-condition

|  |  |
| --- | --- |
| **No** | **Pre-condition** |
| PRE-01 | The user has a valid email and password. |
| PRE-02 | The user is logged into the system. |
| PRE-03 | The customer has a valid Google account. |
| PRE-04 | The MoveMate system is integrated with Google OAuth for authentication. |
| PRE-05 | The customer is logged into the system |
| PRE-06 | The customer has completed a service with the MoveMate platform |
| PRE-07 | The customer has chosen a cash payment option. |
| PRE-08 | The third party has authorized the payment. |
| PRE-09 | The service must be completed. |
| PRE-10 | The customer must have sufficient funds in their account to cover the bonus amount. |
| PRE-11 | The reviewer is logged into the system. |
| PRE-12 | The user has an active account and is able to receive proposals |
| PRE-13 | The review must be assigned to the booking that initiated the request to change the review time. |
| PRE-14 | The reviewer is logged into the system. |
| PRE-15 | The reviewer has access rights to the list of available drivers and porters. |

#### 5.3.2 Post-condition

|  |  |
| --- | --- |
| **No** | **Post-condition** |
| POST-01 | The user is successfully authenticated and logged into the system using their account credentials. |
| POST-02 | The user successfully views their personal profile information. |
| POST-03 | The user successfully resets their password and can log into the system with the new password. |
| POST-04 | The customer is successfully authenticated and logged into the MoveMate system. |
| POST-05 | If it’s the customer’s first time logging in, the system may prompt for additional registration information. |
| POST-06 | The customer successfully updates their profile information, and the system stores the changes. |
| POST-07 | The customer successfully submits their feedback |
| POST-08 | The booking is successfully created and stored in the system. |
| POST-09 | The second time booking is successfully stored, and both trips are included in the booking details. |
| POST-10 | The booking is canceled, and the status is updated in the system. |
| POST-11 | The booking details are displayed to the customer. |
| POST-12 | The uploaded files are successfully saved and associated with the booking |
| POST-13 | The booking time is updated and confirmed to the customer. |
| POST-14 | The customer views truck details and selects a preferred truck type, if applicable. |
| POST-15 | Transaction history is displayed to the customer. |
| POST-16 | The requested amount is transferred, and balance is updated. |
| POST-17 | Account balance is updated with the recharged amount. |
| POST-18 | Issue is logged in the system and escalated for support. |
| POST-19 | Cash payment is collected, and the booking is marked as paid. |
| POST-20 | Booking is marked as paid once payment is completed. |
| POST-21 | The bonus is successfully transferred to the driver or porter's account. |
| POST-22 | The transaction is recorded in the customer's and service provider’s transaction history. |
| POST-23 | Customer has an understanding of the available services and can make an informed booking decision. |
| POST-24 | If approved, the review time is updated in the database, and both the staff member and user are notified of the successful change. |
| POST-25 | If rejected, the review time remains unchanged, and the staff member is informed of the rejection and any user feedback. |
| POST-26 | Booking status change to WAITING. |

# IV. Software Design Description

*[Provide final software design information follow the template as part II in the Report #4]*

## 1. System Design

### 1.1 System Architecture

*[The content of this section includes the overall diagram which includes the sub-systems, the external systems, and the relationship/connection among them. You need also provide the explanation for each of the diagram components (modules, sub-systems, external systems, etc.)].*

### 1.2 Package Diagram

*[Provide the package diagram for each sub-system. The content of this section includes overall package diagram(s) and the explanation for each package (or namespace)]*

## 2. Database Design

*[Provide the files description, database table relationship & table descriptions]*

## 3. Detailed Design

### 3.1 <Feature/Function Name1>

*[Provide the detailed design for the feature <Feature Name1>. It includes Class Diagram, Class Specifications, and Sequence Diagram(s);* ***For the features/functions with the same structure of class & sequence diagrams, you need to provide the diagrams once for one feature/function and refer to those diagrams from other features/functions****]*

#### 3.1.1 Class Diagram

*[This part presents the class diagram for the relevant feature]*

***3.1.2 <Sequence Diagram Name1>***

*[Provide the sequence diagram(s) for the feature]*

***3.1.2 <Sequence Diagram Name2>***

***3.1.3 …***

### 3.2 <Feature/Function Name2>

…

# V. Software Testing Documentation

*[Provide final software testing information follow the template as part II in the Report #5]*

## 1. Scope of Testing

*[Describe the scopes of the test. Those include the target-of-test’s features, functions, and non-functional requirements that will or will not be tested.*

*Describe the stages/levels of testing that would be applied to your project - Unit, Integration, or System test. Each includes the in-charge, inputs/time, focuses, acceptance criteria.*

*List any constraints or assumptions made during the development of this document that may impact the design, development or implementation of testing]*

## 2. Test Strategy

*[List out and describe all testing types (you can refer the test types listed below or any other test types to selected the suitable ones for the project; for each selected test types you need to provide the following information: test objective, technique, completion criteria, etc.), test levels that those test types would be performed, & the details of test supporting tools would be used in the project]*

### 2.1 Testing Types

*[List out and describe here the testing types which you would apply in your project. You need to mention following information for each type of testing: objective, technique, completion criteria]*

### 2.2 Test Levels

*<List out and describe here the testing levels which you would execute in your project. Besides, clearly state the test types which are performed in each test level that you plan for this project>*

### 2.3 Supporting Tools

*<List of the test supporting tools which will be employed for this project>*

## 3. Test Plan

### 3.1 Human Resources

*[List and provide the details on roles and responsibilities of the project members who would involve in testing works]*

### 3.2 Test Environment

*[List and provide the details about the tools (software, hardware, infrastructure) which the project would use for testing]*

### 3.3 Test Milestones

*[Separate test milestones, which should be identified to communicate project status accomplishments]*

## 4. Test Cases

*[Prepare the details on the test cases following the provided template*

* *Unit Test Cases: Report5\_Unit Test.xls*
* *Other Test Cases (IT, ST, AT): Report5\_Test Report.xls]*

## 5. Test Reports

*[Provide the test result, statistics and the relevant test analysis for your testing in the project]*

# VI. Release Package & User Guides

*[Provide final software testing information follow the template as part II in the Report #6]*

## 1. Deliverable Package

*[The section will list all source programs, scripts, documents with version number in this release. You can see the example following table for reference, can customize or delete if not using belong to each project characteristics]*

| **No.** | **Deliverable Item** | **Description** |
| --- | --- | --- |
| 1 | Schedule/Task Tracking |  |
| 2 | Project Backlog |  |
| 3 | Source Codes |  |
| 4 | Database Script(s) |  |
| 5 | Final Report Document |  |
| 6 | Test Cases Document |  |
| 7 | Defects List |  |
| 8 | Issues List |  |
| 9 | Slide |  |

## 2. Installation Guides

### 2.1 System Requirements

*[Define any system requirements necessary to support the application, including the software and relevant configurations]*

### 2.2 Installation Instruction

*[Includes installation instructions and configuration guidelines]*

## 3. User Manual

### 3.1 Overview

*[Descript the overview of the application and if could, insert the features workflow to help user has the overview of all the features in this application]*

### 3.2 Workflow 1

*[Describe the purpose of this workflow, draw workflow diagram and other relevant diagrams]*

*[Describe the detailed guides for the workflow by providing the brief description, step by step guides (attached with user interface) of how to use that function]*

### 3.3 Workflow 2

…