Group Project of group 8

Project – Car Rental Mobile Application

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Part A

Deliverable #1:

Section 1 "Introduction" and sub sections:

(Deliverable #1 is in charge of Adilet Masalbekov, and rest of section 2 with 3 is in charge of Jin Hoi Lee)

1.1 Purpose: This new software product, a car rental mobile application, will address the need for a seamless and efficient car rental process. The application will allow users to sign up, browse available cars, manage their chosen car, and pay rental fees, all from the convenience of their mobile device. Additionally, it will provide navigation and route suggestions, user reviews, and a Q&A section for user support. This comprehensive solution aims to simplify the car rental experience for customers, rental agents, and administrators alike, making car rental more accessible and user-friendly.

1.2 Document Conventions:

Use of Bold Text: Bold text is used to highlight the main sections and subsections of the document, such as "Section 1 "Introduction" and sub sections" or "Section 2 "Overall description" and subscriptions". This helps to clearly delineate the different parts of the document and guide the reader's attention to key areas.

Numbered Lists: Numbered lists are used to outline the main features of the car rental mobile app, the operating environment, and assumptions and dependencies. This helps to organize information in a clear, easy-to-follow manner.

Bullet Points: Bullet points are used to list the different types of users and the software that the app will interface with. This helps to present information in a concise and visually appealing way.

Use of Parentheses: Parentheses are used to provide additional information or clarification, such as the internal or external status of users, or the specific details of the operating environment.

Stakeholder Tables: Tables are used to organize information about stakeholders, including their position, whether they are internal or external, their contact details, and their operational or executive interest. This provides a quick and easy reference for understanding the different stakeholders involved in the project.

1.3 Intended Audience and Reading Suggestions:

1. Customers: Customers would be interested in the functionalities of the app, such as sign up, browsing available cars, managing a chosen car, paying fees, and navigation features.

2. Rental Agents: Rental agents would be interested in the operational aspects of the app, such as managing car availability and bookings.

3. Investors: Investors would be interested in the overall scope of the project, its unique selling points, and the potential return on investment.

4. Administrators: Administrators would be interested in the technical aspects of the app, such as the programming language and framework used, the database management system, and error handling and crash reporting.

5. Fleet Managers: Fleet managers would be interested in how the app manages car availability and bookings, and how it interfaces with hardware devices such as GPS sensors.

6. Payment Processors: Payment processors would be interested in how the payment system is integrated into the app and the security measures in place to protect financial transactions.

7. IT Support: IT support would be interested in the technical aspects of the app, including error handling and crash reporting, and the security and integrity of the application's database.

8. Marketing Manager: The marketing manager would be interested in the unique selling points of the app, the different customer segments, and the strategies for promoting the app and managing online reviews and ratings.

1.4 Project Scope:

- The project in focus is a car rental mobile application. The software is designed to streamline the car rental process, making it more efficient and user-friendly. The application's purpose is to provide a platform where users can easily sign up, browse available cars, manage their chosen car, and pay rental fees. It also includes features for navigation and route suggestions, user reviews, and a Q&A section for user support.

- The benefits of the application include convenience for the users, who can manage their car rental needs from their mobile devices, and efficiency for rental agents and administrators, who can manage car availability and bookings through the app. The application also aims to provide a platform for user feedback and support, enhancing the overall customer experience.

- The objectives of the project include developing a user-friendly application with a wide range of features to meet the needs of different users, and ensuring the security and reliability of the application, particularly in terms of payment processing and data management.

- The goals of the project align with the corporate goals of providing high-quality services to customers, improving operational efficiency, and staying competitive in the car rental market. The application is part of the business strategy to leverage technology to enhance customer service and gain a competitive edge in the market.

1.5 References:

- https://www.grandviewresearch.com/industry-analysis/car-rental-market
- https://www.emizentech.com/blog/car-rental-mobile-app-development-cost-features.html
- https://concisesoftware.com/blog/car-rental-app-key-features/
- https://www.rst.software/blog/how-to-build-a-car-rental-app-like-enterprise-or-hertz

Section 2 "Overall description" and subscriptions:

2.1 Product Perspective: The car rental mobile app is not a product that has been copied or common in the market. It is a significant and unique product.

2.2 Product Features (Functions): The main features of the car rental mobile app include:
1. Sign up and login
2. Browsing available cars
3. Managing a chosen car
4. Paying the fees
5. Navigating and suggesting best routes
6. Commenting sections for user reviews
7. Q&A and user support

2.3 User classes and Characteristics
Customers: Rifat khan (External), Seonwoo Lee (Internal)
Administrators: Jin Hoi Lee (Internal)
Managers: Shawn San Diego (Internal), Bruce Lee (External)
Payment Processors: Alex Turner (External)
IT Support: David Johnson (Internal)

2.4 Operating Environment: Our app will work in the environments below:
1. Hardware: Mobile devices (Android)
2. OS: Android OS
3. Software components: server, database, and payment.

2.7 Assumptions and dependencies: Assumptions and dependencies for the app can contain:
1. Trustable internet connection that makes customers to use our app
2. Comprehension of payment, navigator, and user review.
3. Required legal information that are related to our services.

Section 3 "External interface requirements":

3.1 User Interfaces: Users will reach to our product, the car rental app, by using their mobile devices. Android supports various mobile devices, and as ours uses it, it has big domain of the available devices. Its easy design will make users to do better that they can do thorough our

product, searching a car, making an appointment, and handle the appointment.

3.2 Hardware Interfaces: The car rental mobile app interface with hardware devise

For example:

1. GPS sensors
2. Scanners
3. Cameras

3.3 Software Interfaces: Other various software will be able to be interacted with our mobile app, including:

- Google maps, rocketman, etc
- Payment for secured processing
- Reviewing platform

Deliverable #2 (in charge of Rifat)

Stakeholder Name	Stakehold-er Position	External/ Internal	Stakeholder Contact Details	Operational / Executive	Interest (High/Medium/ Low)
Rifat Khan	Customer	External	rifat123@gmail.com	Operational	High
Seonwoo Lee	Rental Agent	Internal	seonwoo.lee@gmail.com	Operational	High
Adilet Masalbekov	Investor	External	adilet321@yahoo.com	Executive	High
Jin Hoi Lee	Administrator	Internal	jinhoi.lee@gmail.com	Operational	Medium
Shawn San Diego	Fleet Manager	Internal	shawn789@email.com	Operational	Medium
Alex Turner	Payment processor	External	alex@payment.com	Operational	High
David Johnson	IT Support	Internal	davidit@gmail.com	Operational	Low
Bruce Lee	Marketing Manager	Internal	brucepunchlee@email.com	Executive	High

Deliverable #3 (in charge of Adilet Masalbekov)

Interview Questions		
Question	Stakeholder position	Answer
1) Which programming language and framework are you using to develop the car rental mobile application?	Software Developer	We are using React Native framework with JavaScript as the programming language.
2) How are you managing the availability and booking of cars in the app?	Software Developer	We have implemented a real-time database using OracleSQL. This allows us to track the availability of cars, handle bookings, and update the inventory in real-time as users make reservations or return cars.

3) How are you incorporating error handling and crash reporting in the app?	Software Developer	We are going to do error monitoring and crash reporting using softwares like Crashlytics. These tools will help us to identify and fix any issues.
4) How does the app find nearby rentals or show available cars based on the user's location?	Software Developer	We are including GPS applications like Google Maps to enable location-based services. Users can search for nearby rental locations and view available cars based on their current location.
5) How are you integrating the payment system into the car rental app?	Software Developer	We are adding PayPal as a payment gateway in our app for secure and seamless transactions. Users can pay for rentals using credit/debit cards or other payment methods.
1) Which social media will you use to promote our brand and engage our target audience?	Marketing officer	At first we will use all social media like Instagram, Facebook and others to advertise the product. We will also promote advertisements which will show up in other car related websites.

2) How do you plan to target and engage our app with the appropriate customer segments?	Marketing officer	We have conducted different researches and developed buyer personas to understand the different customer segments and their preferences. Based on this, we will tailor our messaging, advertising, and promotional efforts to resonate with each target segment.
3) Do you have a plan for monitoring and managing online reviews and ratings of our app?	Marketing officer	Yes, we will actively monitor and respond to reviews and ratings on app stores and other review platforms. This will allow us to address any negative feedback, gather insights for improvements, and maintain a positive online reputation.
4) Will you use email marketing to engage with our users?	Marketing officer	Yes, we will implement email marketing campaigns to keep users informed about new features, discounts, and exclusive offers. We will segment our email list based on user preferences and behavior to deliver personalized and relevant content.
5) How do you plan to differentiate our car rental app from competitors in the market?	Marketing officer	We have studied the market to find out what makes us special and better than our competitors. Our app will be easy to use and have many different cars to choose from. We'll have good prices, and users can book a car whenever they need it.

		We'll also give them great service. We'll make sure our rental cars are always reliable, clean, and in good condition.
1) Which database management system are you using for the car rental mobile application's data storage?	Database administrator	We will use software applications such as MySQL and PostgreSQL to store all the data of our app.
2) How do you ensure the security and integrity of the application's database?	Database administrator	We have strong security measures in place to control who can access our database. Only authorized people are allowed to access it. We will also regularly backup the database to prevent data loss and will make sure to protect sensitive information stored in the database.
3) How often will you check the database to ensure that all the data is protected and there are no any issues?	Database administrator	Our database team consisting of 5 database experts will monitor and check the stored information every 2 days.
4) Do you regularly maintain the database by optimizing performance, removing	Database administrator	Yes, we schedule regular maintenance tasks to optimize database performance and efficiency. This includes tasks such as

unnecessary data, and improving errors?		database cleanup and data cleansing to remove unnecessary and old data.
5) How do you manage database updates and changes when updating or releasing the application?	Database administrator	We transfer and adapt all our data into the new version of the mobile application.
1) How do you manage communication and collaboration among the development team, stakeholders, and other project contributors?	Project manager	We make sure to communicate well and regularly with our team. We use tools to work together and keep track of our progress. We want everyone involved to stay informed and on the same page during the project.
2) How do you ensure the quality of the car rental mobile application throughout its operation?	Project manager	We have a quality assurance process in place to ensure our app is of high quality. We set quality standards, perform testing at every stage. We also involve users or testers to get their feedback and make sure the app is at the highest level of quality.
3) How do you manage project risks?	Project manager	We identify possible risks at the beginning of the project and keep a record of them. We regularly assess these risks, make backup plans, and assign tasks to handle them. By

		closely monitoring risks and acting quickly, we minimize their impact on the project.
4) What is the estimated timeline for developing the car rental mobile application?	Project manager	The estimated timeline for developing the car rental mobile application is approximately six months. This includes all the phases of development, such as requirements gathering, design, development, testing, and deployment.
5) How do you plan to ensure the smooth operation of the mobile car rental application?	Project manager	We will conduct thorough user research and testing to understand the needs and preferences of our target audience. We will also focus on making our app user friendly as much as possible.
1) What are the key features and functionalities you expect in the car rental mobile application?	Customer	As a customer, I expect the car rental mobile application to have features such as easy car search and booking, secure payment options, reliable customer support, and the ability to view and manage reservations.
2) How important is the integration of other services such as	Customer	Integration with these services is highly important to me. Having navigation assistance, information on

navigation, fuel stations, or parking information in the mobile application?		nearby fuel stations, and available parking options would greatly make my experience easier and more convenient
3) How important is the availability of customer support? What methods would you prefer for requesting help from the customer support team?	Customer	Having accessible customer support is very important to me. I would prefer multiple options of support, such as in-app chat, email, and a call helpline, so that I can reach out for support whenever needed. Fast response times and knowledgeable support agents are highly valued.
4) Are there any localization requirements or language preferences you have for the car rental mobile application?	Customer	I would appreciate it if the car rental mobile application is available in my preferred language or supports multiple languages. Also if it can provide localized information, such as local driving regulations or area-specific recommendations, that would be beneficial for a safe driving experience.
5) Are there any other general specific requirements and preferences you would like to have in the car rental application?	Customer	Yes, I would like to choose the car which meets my needs most. I would like a process in the app where I input my needs, priorities, and preferences and the system displays me all appropriate cars.

Deliverable #4 (in charge of Seon Woo)

Functional Requirements list

Requirement ID	Requirement title	Short Description	Priority	Requester
FR01	Log-in feature	The System should provide a secure log-in feature that allows users to create accounts, access their profiles, and perform various actions such as reserving cars or leaving reviews.	Medium	Customer, Administer
FR02	User's profiles	The System should allow users to create and manage their profiles, and administrators should provide their service base on that information	High	Customer
FR03	Car's Information	The system should display detailed information about the available cars for rental. This includes specifications, pricing, availability, images, and any additional features or restrictions.	High	Administrator
FR04	Searching and filtering	The system should offer an intuitive search and filtering functionality, allowing users to find cars based on specific criteria such as location, dates, car type, price range	High	Customer
FR05	Reserving and paying	The system should enable users to reserve their chosen car by selecting the desired rental dates and making a payment. It should provide a	High	Customer

		seamless and secure payment process, integrating with popular payment gateways.		
FR06	Review	The system should allow users to leave reviews and ratings for the cars and the overall rental experience. These reviews can help future users make informed decisions when choosing a car.	Medium	Customer
FR07	Alert	The system should have an alert feature to notify users about important updates, such as reservation confirmations, payment reminders, or changes to their rental details.	Medium	Customer
FR08	Pick-up & Return location	The system should provide a selection of pick-up and return locations for the rented cars, allowing users to choose the most convenient option for them.	High	Customer, Administer
FR09	Insurance Selection	The system should offer users the choice to select insurance options for their rental cars, providing coverage and protection during the rental period.	High	Insurance company
FR10	Frequently asked questions FAQ	The system should include a comprehensive FAQ section where users can find answers to common inquiries related to the rental process, policies, terms, and conditions.	Medium	Administrator

Nonfunctional Requirements list

Requirement ID	Requirement title	Short Description	Priority	Requester
NFR01	Security	The system should be equipped with security features to protect users' personal and payment information and to prevent illegal access or data leakage.	High	IT security officer
NFR02	Performance	The system should provide fast and efficient performance, allowing users to have a smooth experience. Quickly process rental vehicle searches, bookings, payments, etc.	High	IT administrator
NFR03	Usability	The system should provide a user-friendly interface and intuitive functionality that makes it easy for users to use.	High	IT administrator
NFR04	Mobile & Web compatibility	The system should be compatible with both mobile devices and web browsers, allowing users to use the website on any platform.	High	IT administrator
NFR05	Scalability	The system has the flexibility to respond flexibly to the growth of users or traffic. The system provides consistent performance to users by expanding or contracting resources according to load.	High	IT administrator
NFR06	Reliability	The system should provides a reliable and reliable operating environment.	High	IT administrator