

COSC 341 Project

[Project Step 1](#)

[Project Step 2](#)

[Project Step 3](#)

[Project Step 4](#)

Project Step 1

Carpooling and car-sharing app

Usability Criteria:

Briefly explain three primary usability goals of your system. Translate these goals mentioned above into criteria (two for each goal, specific and measurable).

Effectiveness

Effectiveness is one of the most important usability goals for this app. Users would expect the app to fulfill their intended purpose, and may not return if the app fails to do so.

The two main functions of our app will be finding carpool partners and managing car sharing. Any information gathered should be stored securely and retrieved briskly when necessary. The information must be used effectively to compute the best results at the moment for all users. Each task completed should be made obvious to the user to avoid confusion and anxiety.

To check for the effectiveness of the app, we could have a page in the app to accept feedback and concerns.

Efficiency

Efficiency directly impacts the user's ability to quickly and easily achieve their goals, such as finding and booking a car using our app. An efficient app would help users save time and effort and would encourage returning customers.

One way to increase the efficiency of our app for users could be by limiting the number of operations necessary. For example, the app could have a main menu that could navigate to all other pages to avoid unnecessary steps.

Another way to increase efficiency would be to minimize the time necessary for a user to successfully book their car or ride. This could be done by decreasing the number of operations and by reducing the loading speed of tasks.

Learnability

Learnability is essential, especially for new users, as a user-friendly app without a steep learning curve will attract and retain users. The key component of learnability is keeping the interface easy to understand and navigate through.

Ideally, a user should become comfortable and confident navigating the app after using it several times. Although it may take longer to achieve new tasks, we will try to keep the app simple and consistent to avoid confusions.

We will also ensure that most tasks and buttons will have an undo feature to let users fix any mistakes they may make. The feature would reduce errors, specifically “slips”, and avoid building frustration towards the system.

User experience goal:

Explain two key user experience goals for the system.

Satisfying:

The platform aims to develop a sense of satisfaction from users. Since the app is dedicated for carsharing and carpools, we want the users to have a good experience.

We will achieve this by toasting messages when the user successfully completes their task of either finding their carpools partner or makes an appointment for a shared car.

Motivating:

The platform also aims to develop a sense of motivation from users. The carpools and car sharing processes can be a little complicated so we will ensure the users complete the process step by step. Also, we will have help buttons when users encounter issues or get stuck.

User Profile:

Provide three user profiles for your selected project (Include at least one primary and one secondary user profile). Describe how they relate to the system.

1. Carpool passenger: primary user, 28 years old, female, Kelowna downtown, pursuing computer science masters at UBC, 10 years of computer experience, no experience with carpools apps, mobile & laptop, uses app ~4 times per week
This user will likely have limited options for the time and locations of his travel. Our app must offer a variety of options and filters to help users choose carpool partners who best suit their lifestyles.

2. Carpool passenger: primary user, 50 year old, female, Rutland, Superstore cashier, bachelors in psychology, limited experience with computers, no experience with carpooling apps, mobile, uses app ~ 6 times per week, difficulty reading fine prints and low contrast

As this user has limited experience with mobile systems and carpooling apps, our app must be easy to navigate through and offer assistance where necessary. We must also ensure the app uses larger fonts and high contrast for users with potential difficulties.

3. Car sharing user: secondary user, 45 year old, male, Glenmore, retired, bachelors in business, 20 years of computer experience, some experience with other carpooling apps, mobile & laptop, uses app ~2 times per month, may have others navigate the app on their behalf

This user only occasionally uses our app, so it would be helpful to increase the learnability and offer assistance where necessary. They may also have others help make appointments on our app on their behalf.

Persona:

Create one persona from the primary user profile and one persona from the secondary user profile (two personas in total).

Primary user profile:



*Down-to-earth
Easy-going
Independent*

Emily

Age: 28
Location: Kelowna, BC
Status: Single
Occupation: Student

BIO

Emily is a 28-year-old computer science student who lives in a densely populated city and goes to UBC Okanagan. She does not own a car and relies on public transportation or walking for her daily commute. Emily is environmentally conscious and is looking for cost-effective and sustainable transportation options. She has a smartphone and is comfortable using various mobile apps.

HOBBIES AND INTERESTS

- Cycling
- Hiking
- Taking care of plants

GOALS AND NEEDS

- To find convenient and affordable transportation options for her daily commute.
- To reduce her carbon footprint and expenses.
- Values a user-friendly app that allows her to easily find carpool partners or nearby shared vehicles and schedule rides on-demand.

FRUSTRATIONS

- Too expensive to buy a car
- Taking public transportation is too time consuming

FAVOURITE BRANDS



Columbia



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Secondary user profile:

David

*Friendly
Disciplined
Strong*

BIO

David is a 45-year-old car owner who lives in the suburbs and commutes to work in the city. He has a sedan but is interested in reducing the costs of car ownership and helping the environment. He's open to occasionally offering rides to others who have similar commuting routes. David uses both a smartphone and a computer for various tasks.

GOALS AND NEEDS

- To offset the expenses of owning a car
- To contribute to a sustainable environment by offering carpooling services.
- Values an app that helps him find carpooling passengers with minimal effort
- Simple interface for tracking earnings and coordinating rides.

FAVOURITE BRANDS



DEMOGRAPHIC INFORMATION

- Age: 45
- Location: Kelowna, BC
- Status: Married
- Occupation: Retired Software Developer

CHALLENGE

- Finding riders who match his commuting route and schedule.
- Values assurances about the reliability and safety of passengers he shares rides with.



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Project Step 2

User Information

Primary user 1:

John, a carpool driver, is a primary because he would use the app on a daily basis.

Primary user 2:

Emily, a carpool passenger, is a primary user because she would use the app on a daily basis.

Secondary user 1:

David, a carpool passenger, is a secondary user because he would only occasionally use the app and may have someone else book rides on his behalf.

Secondary user 2:

Mike, a carsharing user, is a secondary user because he would rarely use the app.

Requirement Gathering Technique and Rationale

We will be utilizing **questionnaires** to collect data for developing our app. We chose to use questionnaires over other requirement gathering techniques because it is fast and convenient for respondents.

Users' Feedback

Summary of Functional Requirements:

- Users are typically willing to travel up to 1-3 km to reach their shared car, which indicates a preference for short-distance carpooling.
- They have a moderate level of leniency (10-20 minutes) in arrival time, suggesting flexibility in the app's trip schedules.
- Users are willing to travel up to 10-20 km to reach carpool passengers, which indicates a commitment to serving a broader range of passengers.
- The preference for being a carpool driver aligns with a need for a feature-rich driver interface in the app.
- Users are interested in carpooling 1-4 times a week and car sharing more than once a day, indicating frequent usage of the app.

Summary of Data/Resource Requirements:

- Users expect the app to cater to both drivers and passengers, implying the need for a comprehensive user profile setup.
- The preference for frequent carpooling and car sharing suggests a requirement for efficient data management and scheduling features.
- The preference for using the app from home and work highlights the need for location-based services.
- While some users don't use external software, there may be those who do, necessitating compatibility with such tools.
- The preference for not sharing ride information indicates a need for robust data privacy controls.

Summary of Environment Requirements:

- Users intend to use the app from various locations, including home and work, indicating a need for widespread availability.
- The willingness to use the app in various settings, such as cafes or restaurants, shows a versatile use case.
- The openness to using external software may require the app to function well in diverse technological environments.

Summary of Usability Requirements:

- Users prefer not to have larger fonts and color contrasts, suggesting a standard or preferred interface size.
- They express a preference for email and app notifications, emphasizing the importance of communication for ride appointments.
- The overall satisfaction with carpooling apps suggests that users expect a smooth and user-friendly experience.
- The favorite outdoor activity (hiking) provides insight into the users' interests and potential carpooling destinations or meeting points.
- These insights should be considered when designing and developing the carpooling app, focusing on user flexibility, data security, and notification features, while ensuring a user-friendly experience.

Scenarios

Scenario 1 (Passenger Interaction):

User: Emily

Situation: Emily is a daily commuter who uses the carpooling app to go to school. It's a Monday morning, and she needs to find a ride for her daily commute.

Interaction: Emily opens the carpooling app, enters her current location, destination, and preferred departure time. She browses available rides, views driver profiles, vehicle details, and reviews from other passengers. After finding a suitable ride, she books a seat for her morning commute, pays the fare through the app, and receives a confirmation with pickup details.

Scenario 2 (Driver Interaction):

User: John

Situation: John owns a car and offers rides to earn extra income. He has just logged into the carpooling app and wants to update his ride availability.

Interaction: John accesses his driver profile on the app, checks his existing ride schedule, and updates his availability for the day. He sets his preferred pickup locations, defines the number of available seats, and specifies the fare. Shortly after updating, he receives booking requests from passengers interested in sharing his ride. John reviews the requests, accepts a few passengers for his upcoming trip, and communicates pickup details through the app. He also tracks the location of his passengers and provides a safe and comfortable ride.

Requirement Gathering Materials

Questionnaire:

#	Question type	Question	Answer options
1	Warm-up questions (User demographics)	What is your age range?	a) 0~17 b) 18~30 c) 31~50 d) 51~70 e) 70~
2	Warm-up questions (User demographics)	What is your gender?	a) Male b) Female c) Other/ prefer not to answer
3	Warm-up questions (User demographics)	How often do you use a mobile device?	a) Every day b) 4~6 times a week c) 1~3 times a week d) Rarely/never
4	Warm-up questions (User demographics)	Do you have experience using similar apps?	a) Yes b) No c) Other (please specify)
5	Main session (Functional)	How far are you willing to travel to your shared car?	a) 0~300 m b) 300 m ~ 1 km c) 1 km ~ 3 km d) 3 km or more e) N/A
6	Main session (Functional)	If you are a carpool driver/passenger, how much leniency would you have in arrival time?	a) 0~5 min b) 5~10 min c) 10~20 min d) 20 min or more e) N/A
7	Main session (Functional)	If you are a driver, how far are you willing to travel to reach your carpool passengers?	a) 0~5 km b) 5~10 km c) 10~20 km d) 20 km or more e) N/A
8	Main session (Data)	Are you often a driver or a passenger when carpools?	a) Driver b) Passenger c) Both/depends d) Other (please specify)

9	Main session (Data)	How often would you like to carpool?	a) More than once a day b) 5~7 times a week c) 1~4 times a week d) Never / rarely
10	Main session (Data)	How often would you like to car share?	a) More than once a day b) 5~7 times a week c) 1~4 times a week d) Never / rarely
11	Main session (Environment)	At what location would you likely use the app? (select all that apply)	a) From home b) From work c) From cafe/restaurant/bar d) Outdoors e) Other (please specify)
12	Main session (Environment)	Would you use external softwares together with the app? (eg. text to speech)	a) Yes b) No c) Other (please specify)
13	Main session (Environment)	Would you share your ride information with others?	a) Yes b) No c) Other (please specify)
14	Main session (Usability requirements)	Would you prefer larger fonts and larger color contrasts?	a) Yes b) No c) Does not matter d) Other (please specify)
15	Main session (Usability requirements)	Would you require email and/or app notification for your ride/car share appointments?	a) Yes b) No c) Does not matter d) Other (please specify)
16	Main session (Usability requirements)	How would you rate your overall experience and ease of use with carpooling apps?	a) Very satisfied b) Satisfied c) Neither satisfied or dissatisfied d) Dissatisfied e) Very dissatisfied
17	Cool-off questions	What is your favorite outdoor activity?	a) Hiking b) Cycling c) Camping d) Beach Volleyball e) Picnicking f) Other

Information used in Introduction

Objective:

- Questionnaires used to collect information of current commuter situations, what users want in our app, and what features we could consider implementing
- Purpose of app is to make commute easier for people by offering a community for carpooling and car sharing

Ethical issues: None

No recording used in requirement gathering method so not applicable

Questions and Individual Responses

User demographics:

- What is your age range?
18~30
- What is your gender?
Male
- How often do you use a mobile device?
Every day
- Do you have experience using similar apps?
Yes

Functional:

- How far are you willing to travel to your shared car?
1 km ~ 3 km
- If you are a carpool driver/passenger, how much leniency would you have in arrival time?
10~20 min
- If you are a driver, how far are you willing to travel to reach your carpool passengers?
10~20 km

Data:

- Are you often a driver or a passenger when carpooling?
Driver
- How often would you like to carpool?
1~4 times a week
- How often would you like to car share?
More than once a day

Environment:

- At what location would you likely use the app?
From home
From work
- Would you use external software together with the app? (e.g., text to speech)

No

- Would you share your ride information with others?

No

Usability requirements:

- Would you prefer larger fonts and larger color contrasts?

No

- Would you require email and/or app notification for your ride/car share appointments?

Yes

- How would you rate your overall experience and ease of use with carpooling apps?

Satisfied

Cooling-off questions

- What is your favorite outdoor activity?

Hiking

Project Step 3

Project title: Carpooling and car-sharing app

Team members: Karen Masuda, Taiji Hirano, Subaru Sakashita, Yuki Isomura

1. Five major tasks:

Task 1: Create a Ride Request

- Users should be able to create a ride request by specifying their current location, destination, and preferred time of travel.
- Include options for users to set preferences such as gender preferences, smoking or non-smoking, and other relevant details.

Task 2: Find and Join a Carpool

- Provide a search functionality for users to find existing carpools that match their route and schedule preferences.
- Allow users to view details of available carpools, including driver information, route, and any specified preferences.
- Enable users to request to join a carpool, with the driver having the option to accept or decline requests.

Task 3: Create a Ride Offer

- Drivers should be able to offer a ride by providing details such as departure location, destination, time of departure, and the number of available seats.
- Allow drivers to set preferences for potential passengers, such as gender preferences or any other relevant criteria.
- Implement a system for drivers to manage ride requests, including accepting or declining requests.

Task 4: Payment and Cost Sharing

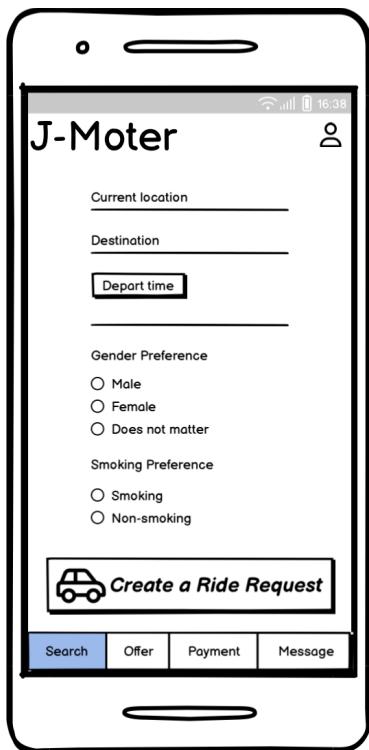
- Implement a secure and convenient payment system for users to handle transactions related to carpooling services.
- Provide a cost-sharing mechanism where passengers can contribute their share of the travel expenses, and drivers can receive payments seamlessly.

Task 5: Ride Management and Communication:

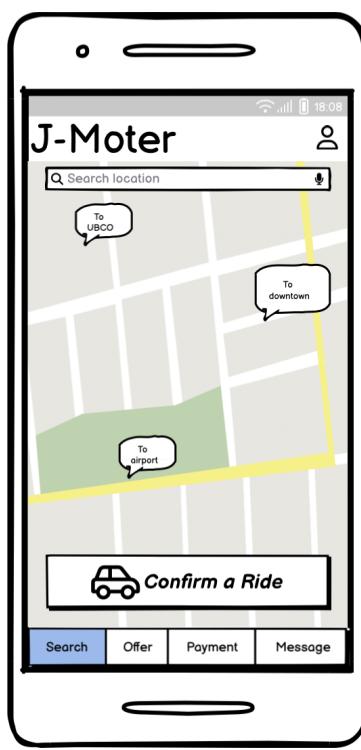
- Create a platform for users to communicate with each other, both before and during the ride, to coordinate details or address any concerns.
- Implement features for users to track the status of their rides, including real-time location tracking of the vehicle.
- Develop a rating and review system for both drivers and passengers to provide feedback and help build a trustworthy community.

2. Paper Prototypes for Major Tasks:

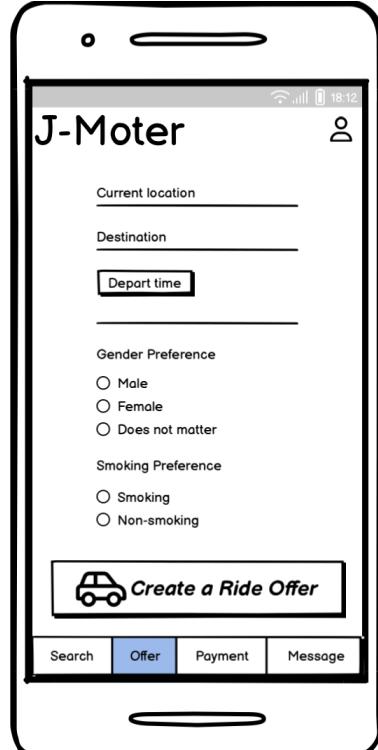
Task 1: Create a Ride Request



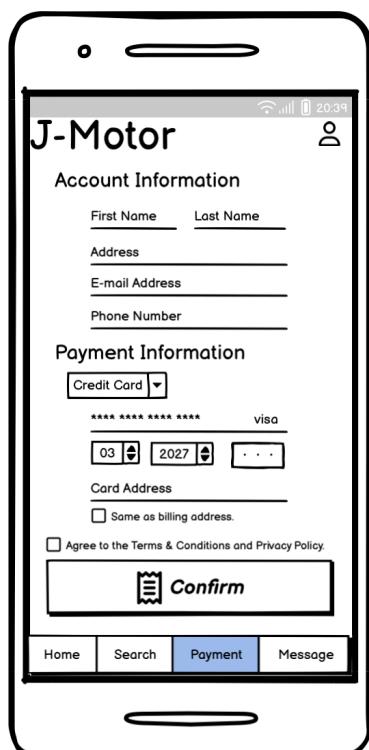
Task 2: Find and Join a Carpool



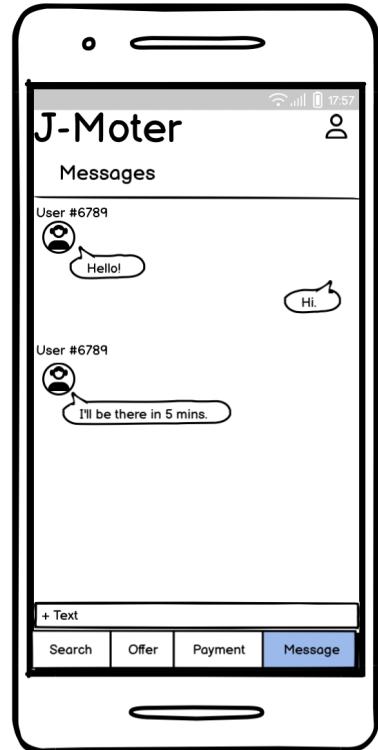
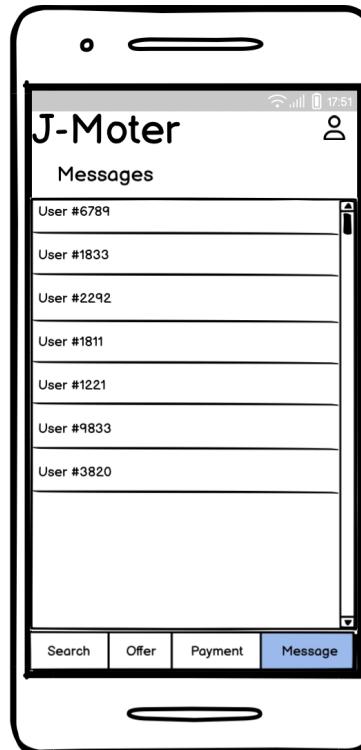
Task 3: Create a Ride Offer



Task 4: Payment and Cost Sharing



Task 5: Ride Management and Communication:



3. Initial evaluation:

User 1 feedback:

- Positive Feedback: The message allows communication between the passenger and the driver which minimizes misconceptions
- Constructive Feedback: It would be helpful to have more customization options for ride preferences, such as specific pickup/drop-off points and the ability to specify additional stops.

User 2 feedback:

- Positive Feedback: The preference makes the platform more user oriented because some people prefer non-smoking passengers/cars.
- Constructive Feedback: Consider adding a feature for users to set preferences for the type of vehicle (e.g., sedan, SUV) they prefer to ride in.

User 3 feedback:

- Positive Feedback: The map functionality allows users to better keep track of available carpooling options
- Constructive Feedback: It would be helpful to have more flexibility in scheduling rides, especially for recurring rides. Options for daily or weekly schedules could cater to users with consistent commuting needs.

User 4 feedback:

- Positive Feedback: The app in general is simple which increases usability.
- Constructive Feedback: There is a redundant menu option at the bottom. One of the “Search” and “Offer” buttons is enough.

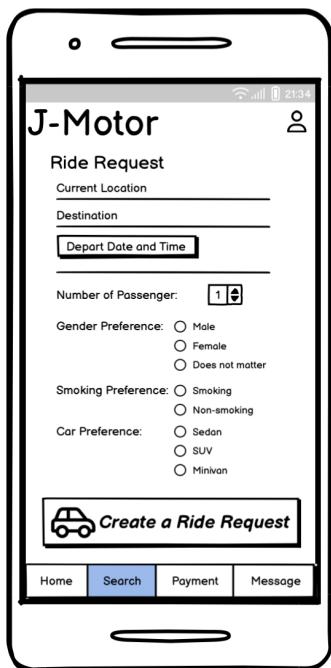
4. Modification:

Major feedback that you received

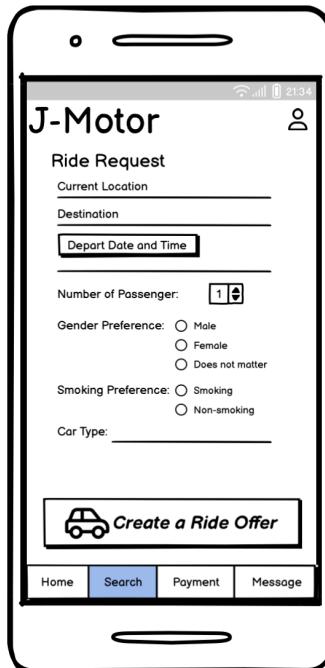
What did you change (to your original prototypes) - Key differences

- Added more preference options in Ride Request and Ride Offer
- Added Recent Request and Recent Offer pages in Account icon for recurring users.
- Added Complete option in the Message (Entering PIN in Driver's app completes the Ride)
- Added ratings in the Complete page

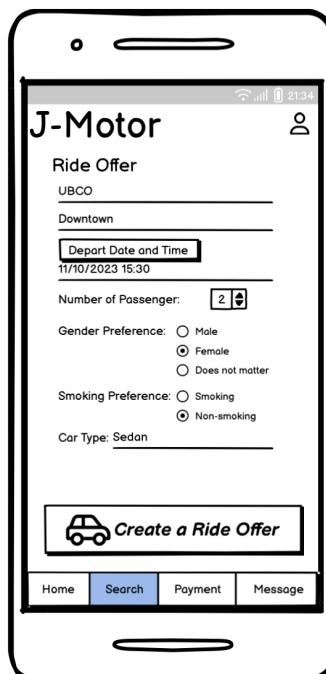
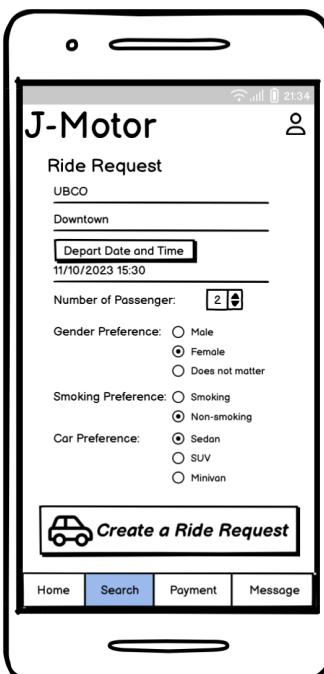
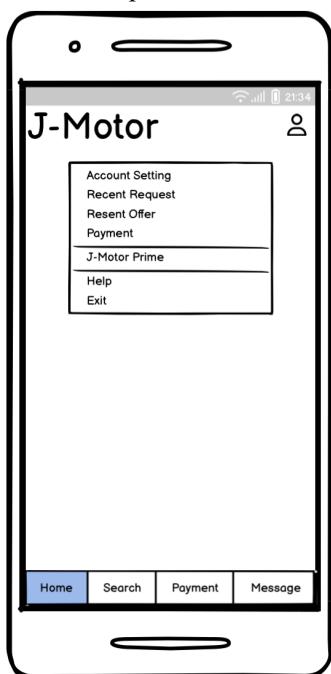
Task 1: Create a Ride Request



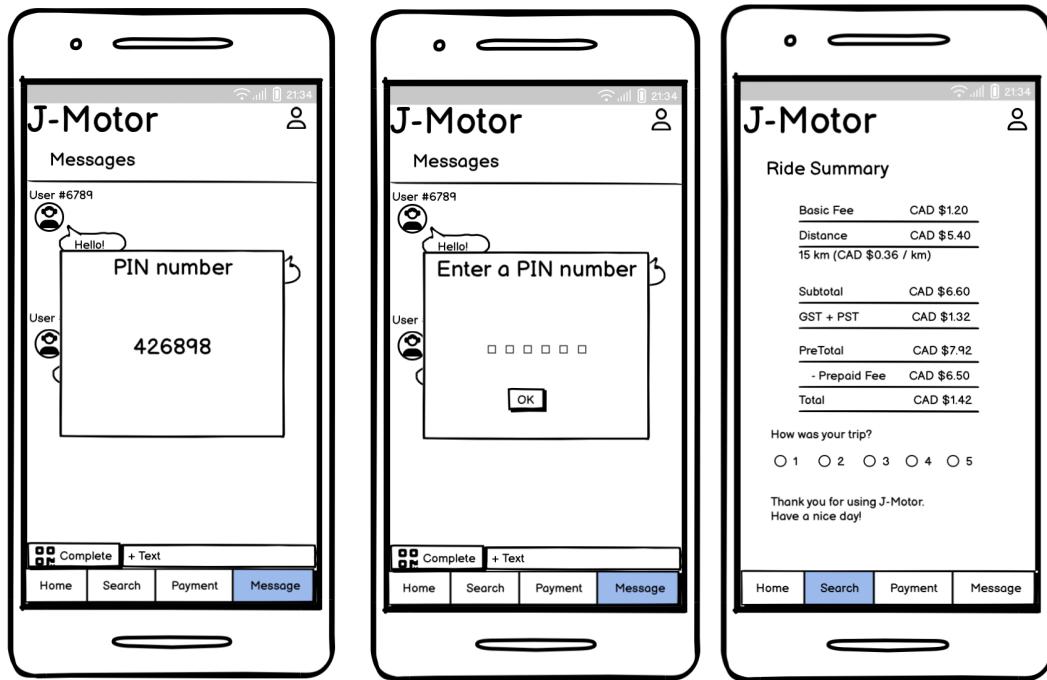
Task 3: Create a Ride Offer



Recent Request and Offer



Task 5: Ride Management and Communication:



5. Second evaluation:

User 1 feedback:

- Positive feedback: Setting the number of passengers would improve user experience as they will not have to encounter problems like the number of passengers exceeding the car capacity.
- Constructive feedback: The entities in the home page should be bigger so they fit the entire page

User 2 feedback:

- Positive feedback: The PIN number minimizes inappropriate actions by the driver and passenger
- Constructive feedback: It would be better if the car type is initialized in the user settings.

User 3 feedback:

- Positive feedback: The order summary is concise which improves transparency of the price.
- Constructive feedback: It is better to have a range for the destination, so the passenger can get off at the nearest place to the destination.

User 4 feedback:

- Positive feedback: The rating grants trust for the driver and the passenger.
- Constructive feedback: It looks good to me.

6. Video link for all five tasks: <https://youtu.be/2PRi6-4QdNs>

Project Step 4

Project title: Carpooling and car-sharing app

Team members: Karen Masuda, Taii Hirano, Subaru Sakashita, Yuki Isomura

Vertical Prototype:

Passenger - Users who create a ride request

Driver - Users who create an offer request

Task 1: Create Ride/Offer Request

- Users can create ride/offer requests by providing details such as pickup location, destination, date, time, number of passengers, and preferences (gender, smoking, car type).
- For passengers, the order summary is displayed once the rider clicks the “Create a Request” button so that the billed money is more transparent.
- For drivers, it shows a list of incoming requests from the passenger, which is described in Task 3.
- Changes from Paper Prototype: Used the button (+/-) to select the number of passengers instead of using a spinner for easier selection.

Task 2: Enter Payment Information (Passenger)

- Users input payment information for secure transactions.
- Changes from Paper Prototype: No significant changes.

Task 3: Confirm incoming requests (Driver)

- Once a driver creates an offer request, it lists the passengers who are there to get a ride.
- Drivers may select one of them and accept their request. This is considered as matching.
- Changes from Paper Prototype: No significant changes.

Task 4: Message/Complete Ride (Passenger)

- Once matching has been found, passengers may talk to drivers through the text message.
- On the top right of the screen, there is a “Complete Ride” button to show a 4-digit number, which needs to be shown to the driver after the ride.
- Changes from Paper Prototype: Moved the “Complete Ride” button to the top right for better visibility.

Task 5: Message/Complete Offer (Driver)

- Once drivers accept one of the incoming requests, they can talk to passengers through the text message.
- On the top right of the screen, there is a “Complete Ride” button where drivers enter the 4-digit number given by the passenger after the ride.
- Changes from Paper Prototype: Move the “Complete Ride” button to the top right for better visibility.

Background Process:

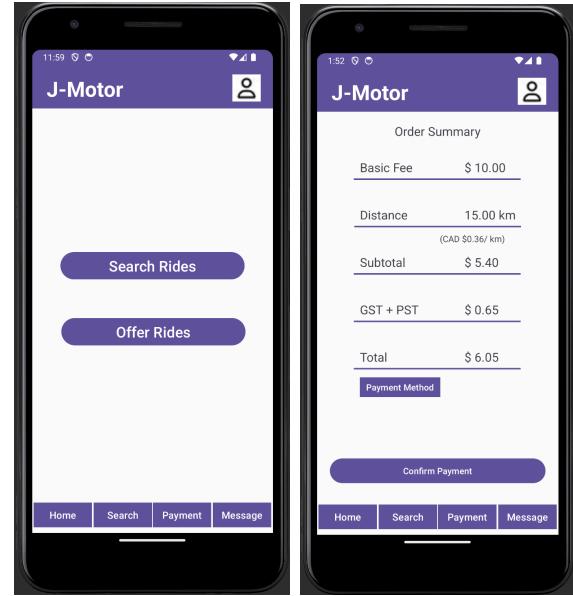
Behind the scenes, the system operates with a database containing numerous ride requests from both passengers and drivers. The background AI continuously searches for suitable matches based on location, time, and preferences. When a match is found, the corresponding rider is added to the driver's

incoming request list. Upon a driver accepting a passenger's request, the same request is removed from other drivers' lists. After the ride, the driver enters a 4-digit code provided by the passenger, marking the completion of the transaction. The driver's earnings are then deposited into their pre-linked bank account.

Design Principles:

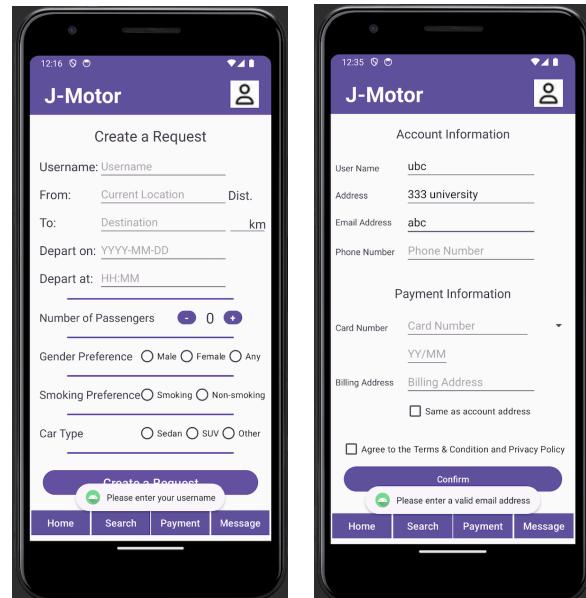
Visibility

- A clearly visible navigation menu on the bottom and on the home screen, displays essential options for “Search Rides,” and “Offer Rides.”
- When a user creates a ride request, a summary of the order, including pickup location, destination, and preferences, is displayed before confirming the request.



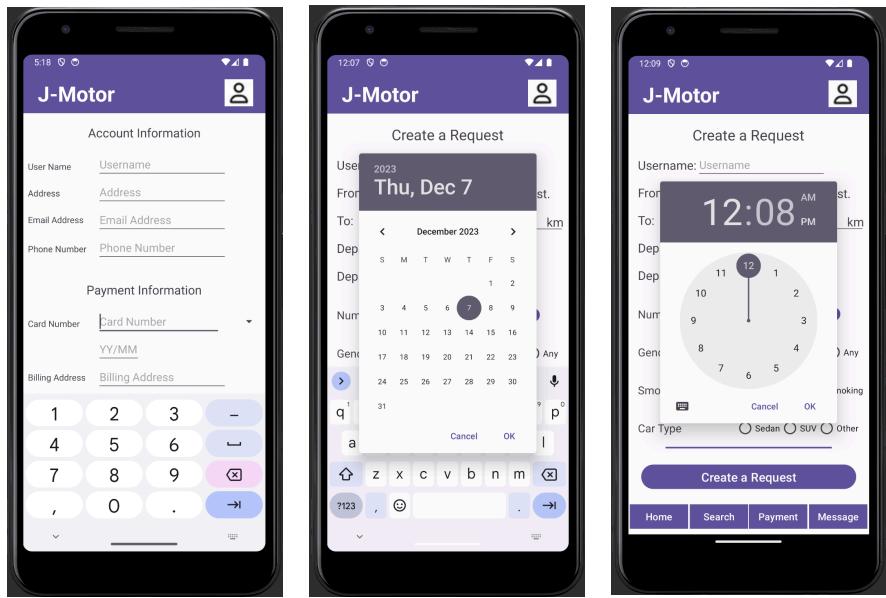
Feedback

- Show feedback when there is an empty field.
- Show feedback when the users enter invalid values.



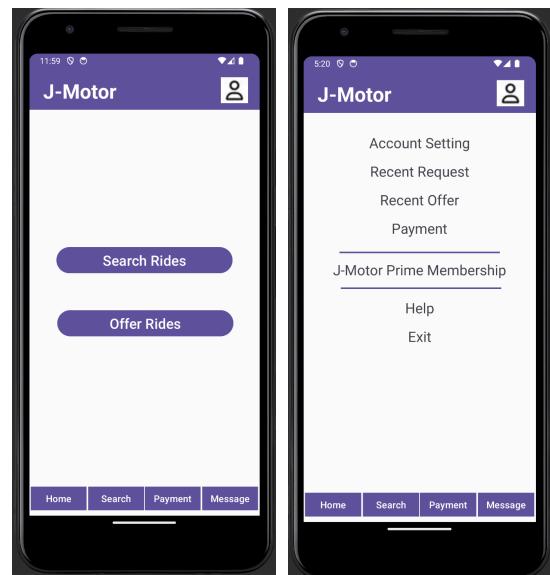
Constraints

- The textbox for the card number also has constraints such that only numbers can be entered.
- Date and time picker instead of typing them out.



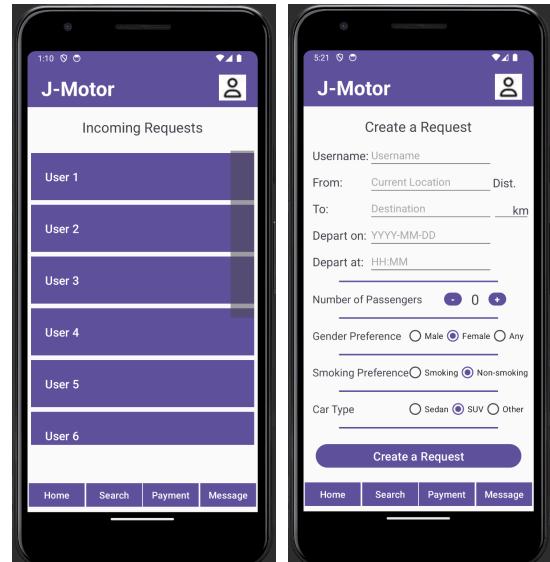
Consistency

- Elements and operations within the interface have consistency
- Headers and bottom buttons remain consistent across the entire app



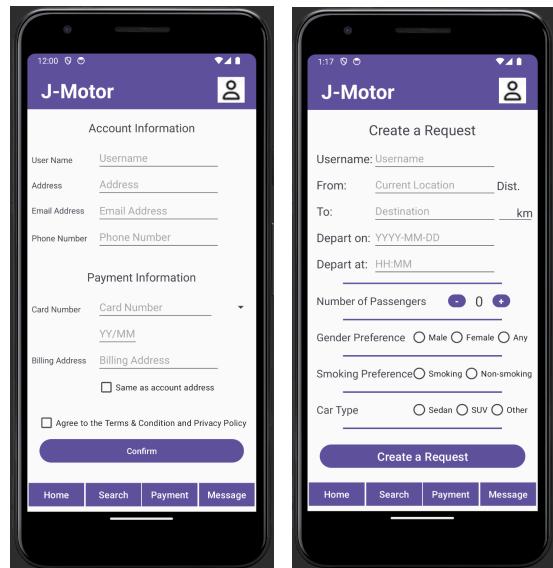
Affordances

- A larger scroll bar may suggest a longer content area and less content outside the visible boundary.
- Radio buttons give a clue that only one item can be selected
- Horizontal lines to separate tasks and radio groups to avoid confusion.



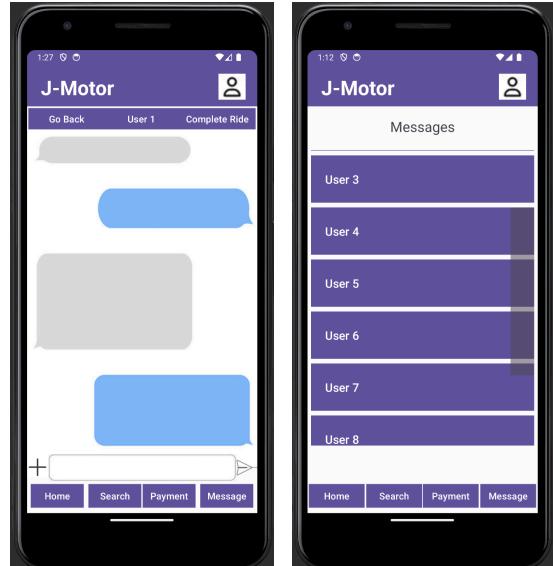
Simplicity

- Buttons and textboxes are arranged for intuitive operation
- There are few activities to avoid confusion because of many transitions.



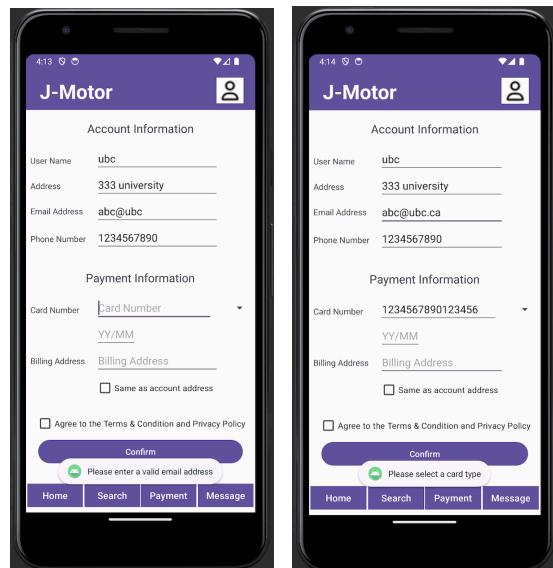
Matching

- The paper plane icon suggests sending a message.
- The scroll bar for the message screen matches the movement of scrolling up and down.
- The user icon at the top right of the header suggests user account and settings.



Help

- When users enter incorrect information, it displays a toast message providing the hint.
- In each textbox, there is a hint.
- When a user does not enter all necessary information, they cannot proceed to the next page, and displays a message to enter all information.
- In the worst case scenario, the user can press the "Home" button to start everything all over again.



Summary of Updates:

Update 1: Improved User Flow

Change: Rearranged intents to transition directly to the Message Page after completing a ride request or offer.

Justification: Streamlining the user flow by connecting relevant actions enhances the overall user experience, making communication more immediate and intuitive.

Update 2: Enhanced Visibility of Key Action

Change: Relocated the “Complete Ride” button to the top right of the interface.

Justification: Improving visibility by moving the key action button to a more prominent location ensures users can easily locate and interact with it, contributing to a more user-friendly interface.

Update 3: Optimal Visibility Through Design Modification

Change: Instead of reducing the size of radio buttons, inserted horizontal lines to separate radio groups.

Justification: Recognizing that decreasing radio button size could compromise visibility, the insertion of horizontal lines maintains clarity by visually distinguishing between radio groups, promoting an effective and easily comprehensible page layout.

Video link for all five tasks: <https://youtu.be/Q4iQzjcO6zs>

Heuristic Evaluation:

User 1:

Problem:

After accepting a request, the driver is directed to the Message page, where the contacts of all engaged passengers are displayed. However, this may impact program efficiency since the driver has to manually open the chat page to communicate with the passenger. For a smoother experience, it would be better for the platform to automatically transition to the chat page upon the driver accepting a request, as they are likely eager to initiate a conversation with the passengers.

Severity: 1 out of 4

User 2:

Problem:

I could not figure out how to “Complete Ride” and show the PIN for passenger or driver. The feature should be located in a relevant and visible location to increase the usability of the app. This violates the visibility heuristic.

Severity: 3 out of 4

User 3:

Problem:

The radio groups with each of their radio buttons were difficult to tell apart because they’re clustered together. The visibility on the page is not good. The page should have less radio groups or make the radio buttons smaller.

Severity: 1 out of 4