

FIT 3175 Usability

Drive Application

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Tables of Content

1.0 Innovations	1
2.0 User Personas	3
2.1 Drivers	3
2.2 Passengers	5
3.0 User Stories	7
3.1 Drivers	7
3.2 Passengers	8
4.0 Prototypes	9
5.0 UCD Process	12
6.0 References	14

1.0 Innovations

According to the article “P-Plate Drivers Thirty Times More Likely To Crash,” (n.d.), probationary drivers are 30 times more likely to run into an accident than competent drivers. Therefore, the first innovation **Drive** is to ensure that a driver does not hold a P license i.e. drivers must have 2 or more years of driving experience.

According to the director of brand agency Hulsbosch, Jaid Hulsbosch, consumer trust creates loyalty to the brand (Mitchell, 2018). Therefore, **Drive** is licensed by all relevant government bodies and complies to terms and conditions of application release in the Apple and Google Play store to gain consumers’ trust.

Based on the “**Affordance**” principle of Norman’s 7 Principles, users can use the “Help and Support” option for any assistance they might need when using the app.

Drive also supports multiple languages. This follows Shneiderman’s Golden Rule of “**Keep Users in Control**” by allowing a user to use the app in their preferred language.

When signing up, the app will ask the users to enter key personal information for security purposes. This follows the “**Constraints**” principle from Norman’s 7 principles by ensuring that the user is who they say they are.

Drive has a rating system where drivers can rate troublesome passengers poorly and vice-versa to ensure both sides maintain good behaviour. As an added incentive, passengers can accrue points based on their ratings and redeem various rewards in **Drive**. Rating system follows “**Effectiveness**” and “**Satisfaction**” criteria from the ISO definition of usability by ensuring that drivers and passengers maintain good behaviour and can have a comfortable experience. Points accrued by passengers based on ratings earned follows the aforementioned features by further incentivising passengers to maintain a good behaviour. Olenski (2014), stated that loyalty programs such as this are imperative for growth.

Drive has separate interfaces for passengers and drivers which complies with Norman’s principle “**Mapping**” as the roles of users map clearly to each interface. This also follows Shneiderman’s “**Keep Users In Control**” as there is freedom in choosing user role.

The **Drive** allows bookings in real-time or in-advance. Passengers select the convenient drive based on pickup-points on map set by drivers. Driver can be monitored and passenger can see if a driver is close using the map. This follows Norman’s 7 Principles “**Visibility**” as passengers get real-time feedback on the driver and drive booked. Drivers can also view the bookings they have accepted.

When planning a route using **Drive**, drivers can see a heatmap based on areas where bookings are more frequent. They can use that information to choose their points however they like. This follows the “**Effectiveness**” and “**Efficiency**” criteria from the ISO definition of usability as drivers can quickly and effectively choose pickup points.

Drive displays several details such as estimated time of arrival, speed limit, current vehicle speed, etc. in the form of push notifications. This follows the “**Feedback**” principle from

Norman's 7 Principles and Shneiderman's Golden Rule of "**Offer Informative Feedback**" as both Passengers and Drivers are constantly kept up to date with various key details. The further comply with the "**Satisfaction**" criteria from the ISO definition of usability by giving users the satisfaction of knowing all that is going on.

Drive has voice and speech recognition systems to allow users to discreetly and quickly ask for help from emergency contacts, **Driving Change** and the police. This is done by having the user record a special code word using their voice. A default help SMS is sent to the emergency contacts when the user says this code word out loud. This follows Shneiderman's Golden Rule of "**Keep Users in Control**" as the code is set by users. As there is only one possible outcome for using the code, this also follows the "**Constraint**" principle from Norman's 7 Principles.

Drive allows users to upload images of themselves and for drivers, their vehicles as well. This is because businesses with more than 10 photos on their page generate 12 times more customers monthly (Schwartz, 2019).

Drive allows users (both drivers and customers) to undo a cancellation or acceptance of a booking, if it is done within 5 minutes. This follows Shneiderman's Golden Rule of "**Permit easy reversal of actions**" as the users can easily undo a specific choice made by them.

Drive allows passengers to save frequented locations, thus allowing quick selection of locations when they need to. This uses **Hick's Law** as it reduces the time taken for users to make a decision, as they do not have to type in or search through a large list of locations.

Another innovation of **Drive** is multiple payment platform. This adheres to ISO definition of "**Satisfaction**" as user is not limited to only one choice i.e. debit card, credit card and cash.

Based on Shneiderman's Golden Rule of "**Prevent Errors**", there is payment confirmation and booked drive cancellation confirmation to prevent users from making errors easily.

Drive always keeps the passengers updated with any changes in the state of their booking. This follows "**Visibility**" principle of Norman's 7 Principles, as passengers are kept updated any changes made by the driver or drive progress through notifications and app chat.

Drive also keeps users up-to-date with the latest available promotions. This allows **Drive** to have a large customer traffic during promotion periods (Mishra, 2015), thus being useful for **Driving Change** as a business.

Drive has car selection filter so that passengers can choose the type of preferred vehicle. This follows Shneiderman's "**Keep User In Control**" as user have control over their choices.

Drivers can block or reject troublesome or disturbing passengers. This follows Shneiderman's "**Keep User In Control**" and ISO definition "**Satisfaction**" as drivers have control over choice of passengers and protect themselves from meeting troublesome people.

There is also a daily revenue estimation calculator for drivers. This helps drivers to be able to gauge potential daily revenue based on the driver's driving history. This also gives an incentive to drivers to use **Drive**, thus promoting business of **Driving Change**.

2.0 User Personas

2.1 Drivers

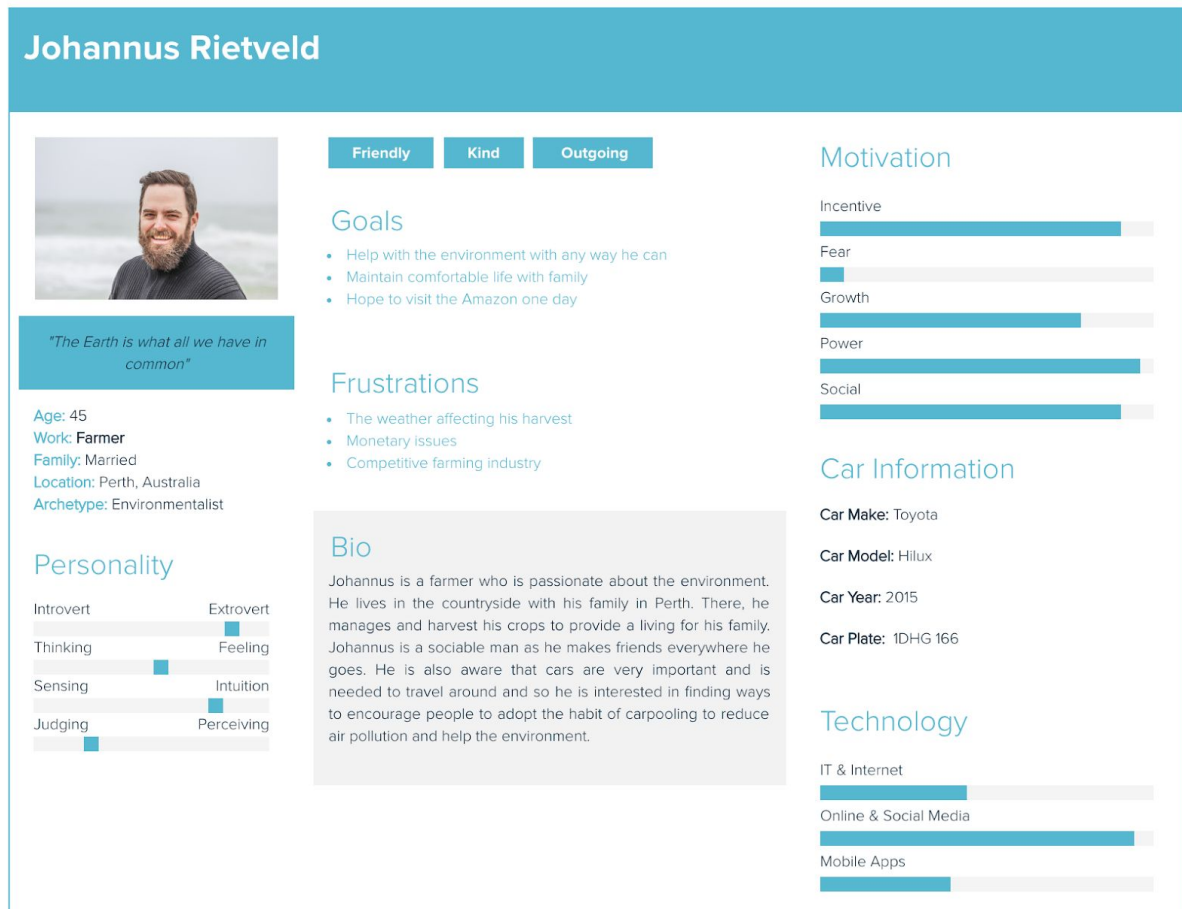


Figure 2.1.1: First user persona of *Drive* driver (Savage, 2016)

Amanda Parks



"Being a parent requires a lot of sacrifice, and I would do anything to ensure that I can afford an education for them"

Age: 29
Work: Freelancer
Family: Married, kids
Location: Melbourne, Australia
Archetype: The Cool Mom

Personality



Strong Determined Hopeful

Goals

- Provide a good life for her sons
- Her sons grows up happy and healthy
- Live a content life

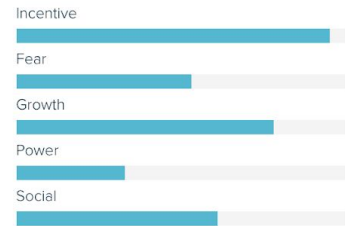
Frustrations

- Afraid that her sons would be distant from her
- Her husband and her are not on the same page on how to raise their sons
- Raising college funds for her sons

Bio

Amanda is a mother to a pair of twins. She chose to be a freelancer as she wanted to spend more time with her sons but at the same time also contribute and provide for her family. As her sons are very active in school and outside school, Amanda is constantly on the road from picking them up from school to sending them for soccer practice. As she is constantly on the go, she is looking for a way to earn money through driving. However, the current e-hailing applications in the market is not an option for her because she prefers to fetch passengers on the way to her destination as she has to be on time to pick her kids up, going through unpredictable traffic. Even though the money might not be much, but to Amanda, a little goes a long way.

Motivation



Car Information

Car Make: Toyota
Car Model: Corolla
Car Year: 2017
Car Plate: YCU 503

Technology

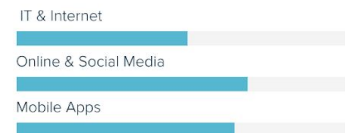


Figure 2.1.2: Second user persona of *Drive* driver (ajr_images, 2017)

2.2 Passengers

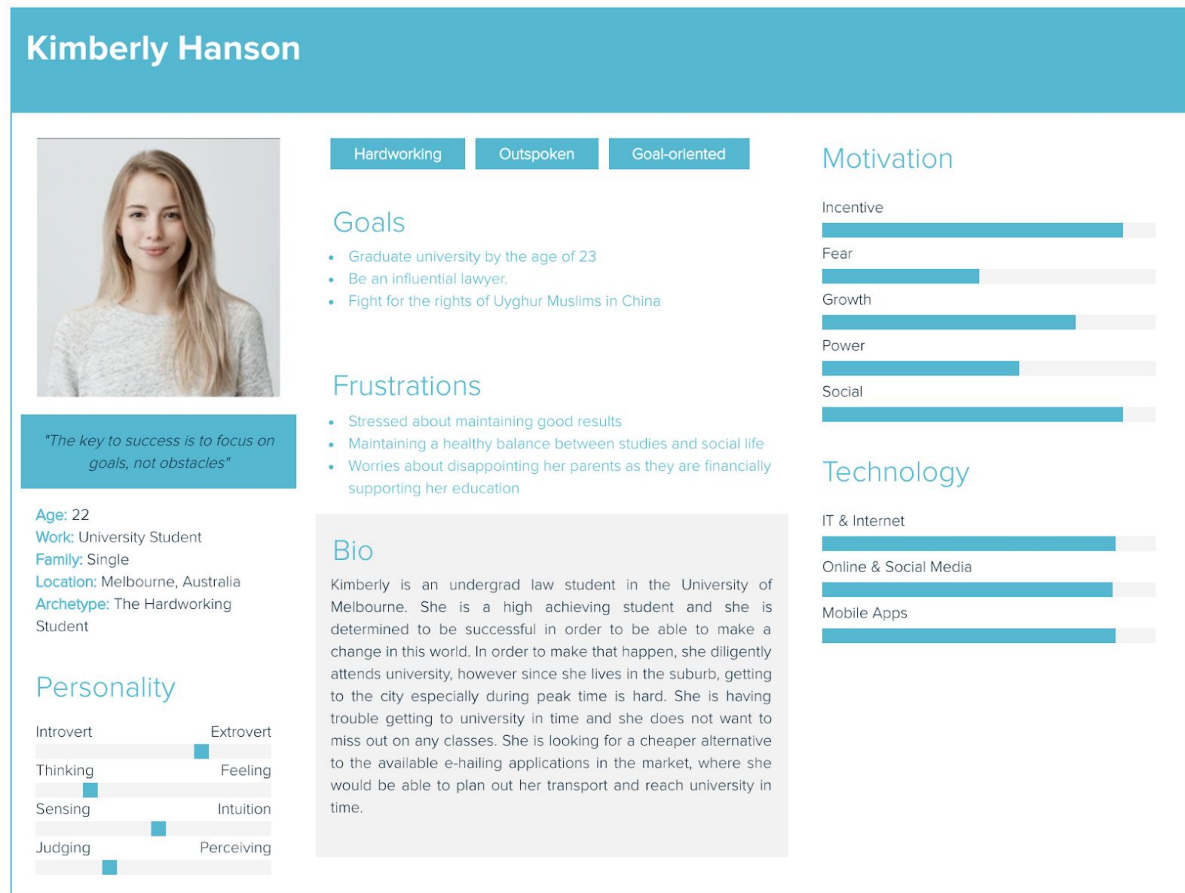


Figure 2.2.1: First user persona of *Drive* passenger (Cookie Studio, n.d.)

Casey Ford



"Success only comes with hard work and determination."

Age: 25

Work: Sales representative

Family: Single

Location: Sydney, Australia

Archetype: The Struggling Millennial

Personality



Determined

Optimistic

Sincere

Goals

- To be able to support his elderly parents
- Achieve a managerial position before the age of 30
- Live a long and healthy life

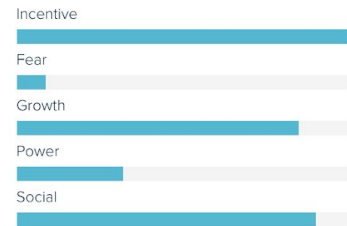
Frustrations

- Not able to afford a car .
- Was not provided an education like his peers due to family poverty
- Has to work harder than his peers in order to obtain the same opportunity

Bio

Casey is a 25 year old man trying to make ends meet as he did not had the opportunity of an education after high school. He works as a sales representative, which requires him to travel a lot in order to seek out clients. Due to his financial situation, he could not afford a car. Thus, in order to do his job he has to rely on public transport or e-hailing applications. However, sometimes public transport breaks down and affects his daily schedule which affects his performance in his job. E-hailing applications is another alternative however, sometimes they can be quite pricy, which is not ideal for a man who has financial struggles. Casey is looking for an alternative, that is cheaper and also allows him to plan his trip ahead in order to meet clients in time and better his performance and achieve success in his job.

Motivation



Technology

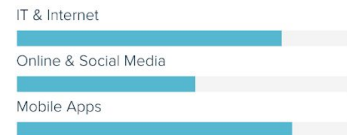


Figure 2.2.2: Second user persona of **Drive** passenger (Ridofranz, 2016)

3.0 User Stories

3.1 Drivers

1. As an environment-friendly individual, Johannus wants to know which areas have many passengers so that he can pick up as many passengers as possible and pollution is kept at a minimum.
2. As a farmer who lives in the countryside, Johannus wants to use an in-app navigation so that he does not get lost when driving to each stop.
3. As an individual who is facing monetary issues, Johannus wants to know the route with the lowest number of tolls for each stop so that he does not need to spend excessively.
4. As a busy farmer who also values quality family time, Johannus wants to see the estimated time for a pick-up and drop-off so that he could manage his time better.
5. As an individual who frequents social media, Johannus wants to leave reviews about his passengers and overall application experience so that he can voice his opinions to the general public.
6. As a farmer who needs to make ends meet, Johannus wants to be notified on promotional deals for drivers so that he could get more out of his hard work.
7. As a sociable person, Johannus wants to be able to discreetly alert his emergency contacts when he senses that his passenger's behaviour is off when interacting during the car ride so that his safety is not compromised.
8. As an individual who is always on the go, Amanda wants to be able to share her ride location in real time so that she gets connected to passengers who are rather close to her location.
9. As a freelancer who is looking for side income, Amanda wants to be prompted via alerts for a passenger who has booked her car so that she does not miss out on any opportunities to accept bookings.
10. As an individual who travels around a lot to run errands, Amanda wants to know the shortest distance to each pick-up and drop-off stop so that she does not need to spend too much time on the road.
11. As a woman driver, Amanda wants to be able to block passengers with unethical behaviour so that she can protect her own safety.
12. As the owner of a relatively new car, Amanda wants to be able to upload a picture of her vehicle so that she could attract more passengers.
13. As a busy mother who has to prioritise picking up her kids, Amanda wants a chat option so that she can let passengers know when she's on the way or running late.
14. As a freelancer with an unpredictable schedule, Amanda wants to be able to cancel after accepting a car booking so that she can attend other events with higher priority if they happen to clash.
15. As a mother who is saving up for her children's college education, Amanda wants to be able to estimate her revenue daily by inputting when she wishes to start and stop driving so that she knows how much money to expect from the application and whether it will be enough with her current salary.

3.2 Passengers

1. As an undergraduate student, Kimberly wants to be able to save her home and university addresses so that she does not have to search for her home and university locations everytime she books a ride.
2. As a future lawyer and an advocate of consumerism, Kimberly wants the know which government agencies licensed the application so that her rights as a consumer are well protected.
3. As a high-achieving student, Kimberly wants to see a penalty system implemented for late drivers so that all drivers will be punctual in the future ensuring that she can attend all her classes on time.
4. As an individual who frequents social media, Kimberly wants to leave reviews about the drivers and overall application experience so that she can voice her opinions to the general public.
5. As a tech-savvy individual, Kimberly wants to receive mobile push notifications about changes in her car bookings so that she can always stay updated.
6. As an individual living in a lively suburb, Kimberly wants to be able to rebook her trip after cancellation so that she does not have to search for a new ride option if her plans change abruptly.
7. As a travelling salesperson, Casey wants to know the estimated time to reach his destination for the driver he chose so that he can meet his clients on time or reschedule if necessary.
8. As an individual who received formal education until high school, Casey wants the application to support multiple language options so that he can navigate within the application easier by reading in his native language.
9. As a salesperson who travels long distances to meet clients, Casey wants to know the manufacturing year of the driver's vehicle so that he can reach his destination without running into the risk of the chosen vehicle breaking down.
10. As an individual who books multiple rides in a day, Casey wants to link his credit card to his profile so that he can pay for rides faster and easier without cash.
11. As a lower income individual, Casey wants to receive notifications about any promotional deals so that he will not miss out on opportunities to reduce transportation costs.
12. As an individual who uses e-hailing services as a back-up plan when other transportation options are not available, Casey wants to know the level of competency of the driver so that accidents can be averted.
13. As a sociable person, Casey wants several drivers to be displayed so that he can choose the option most suitable for his sociable personality.
14. As a travelling salesperson who carries multiple documents to meet clients, Casey wants to be able to call the driver after he leaves the ride so that he may arrange to retrieve any missing items left in the vehicle.
15. As a salesperson who might need to travel with clients, Casey wants to be able to specify the vehicle type for his ride so that the vehicle is suitable to pick him up and his clients.

4.0 Prototypes

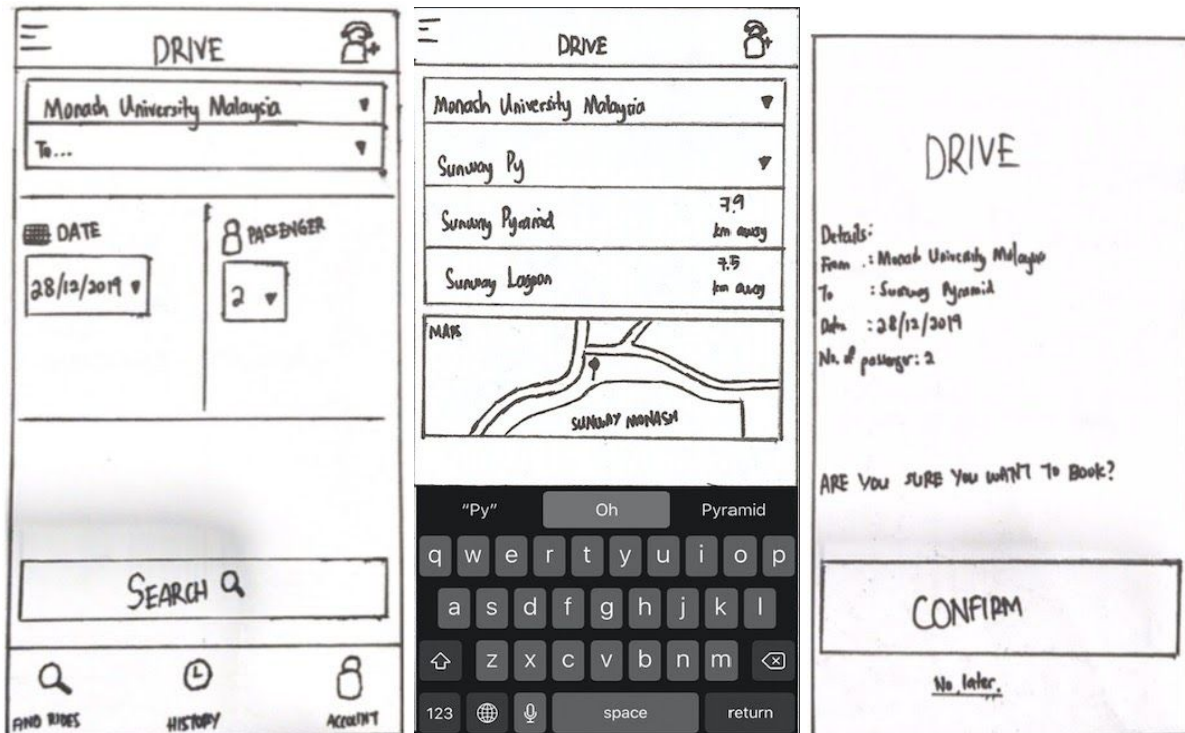


Figure 4.1: First prototype of **Drive** booking system

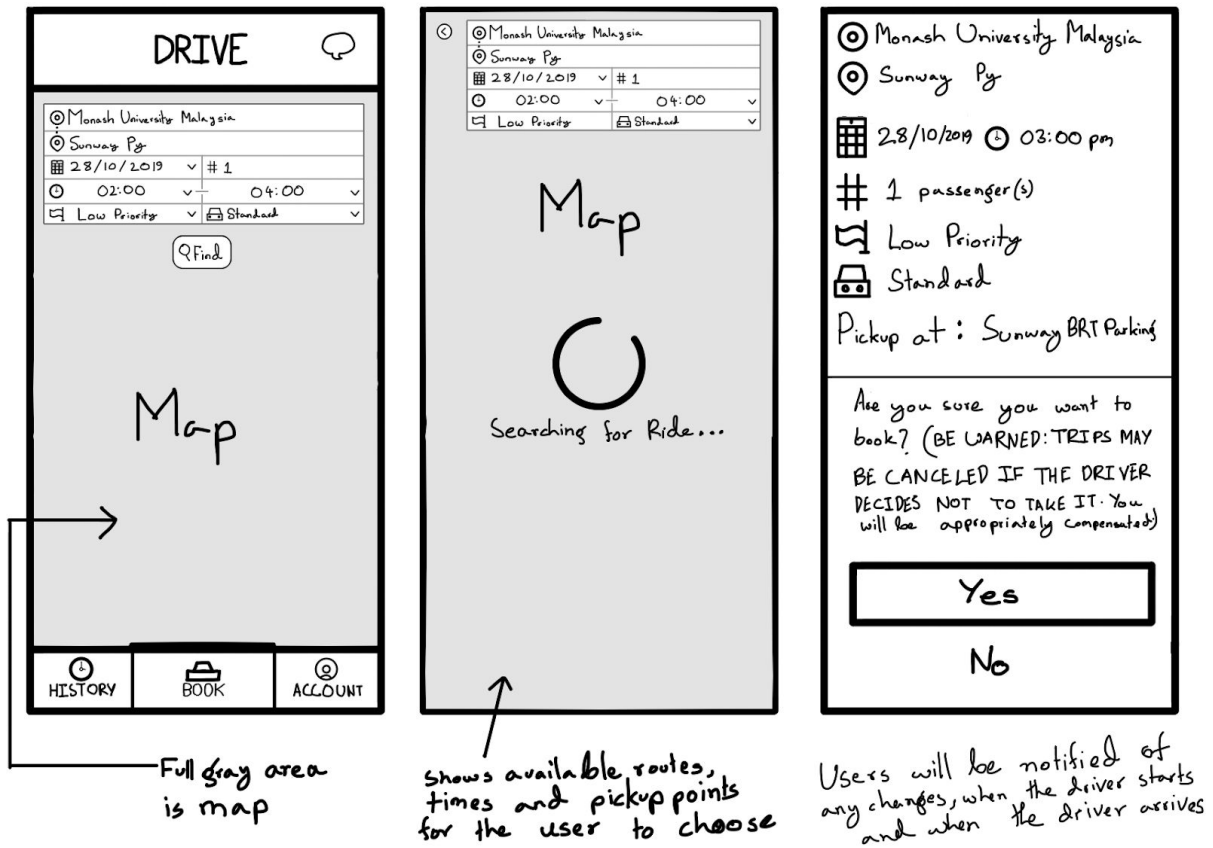


Figure 4.2: Second prototype of **Drive** booking system

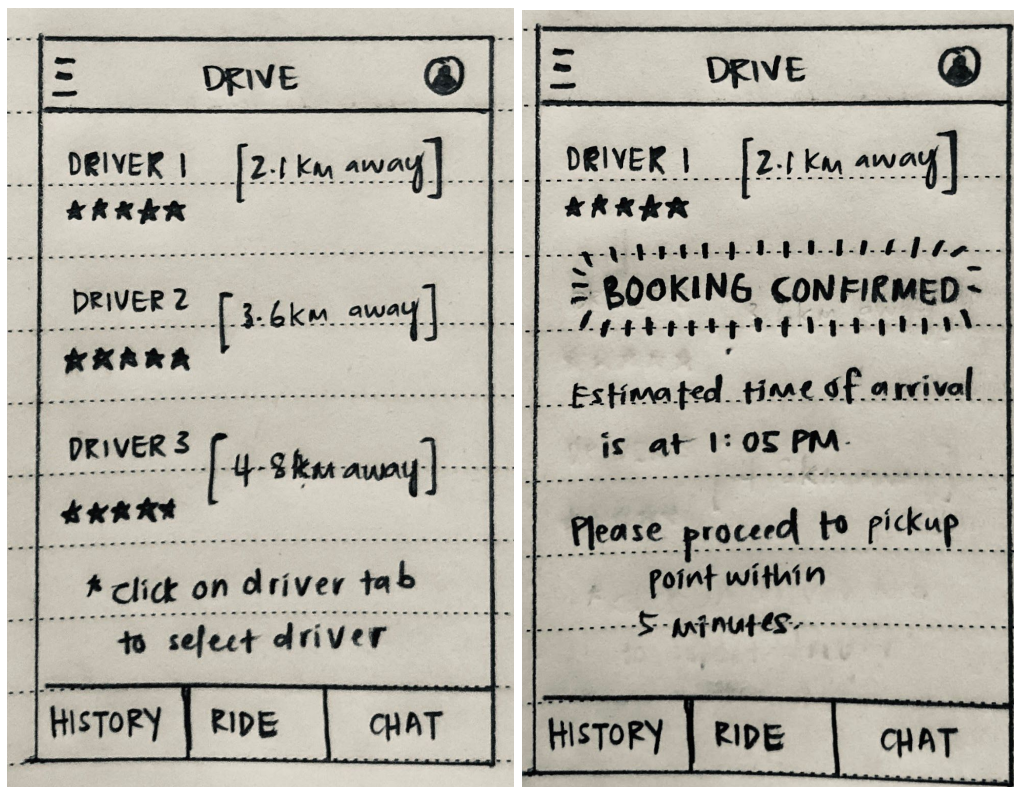
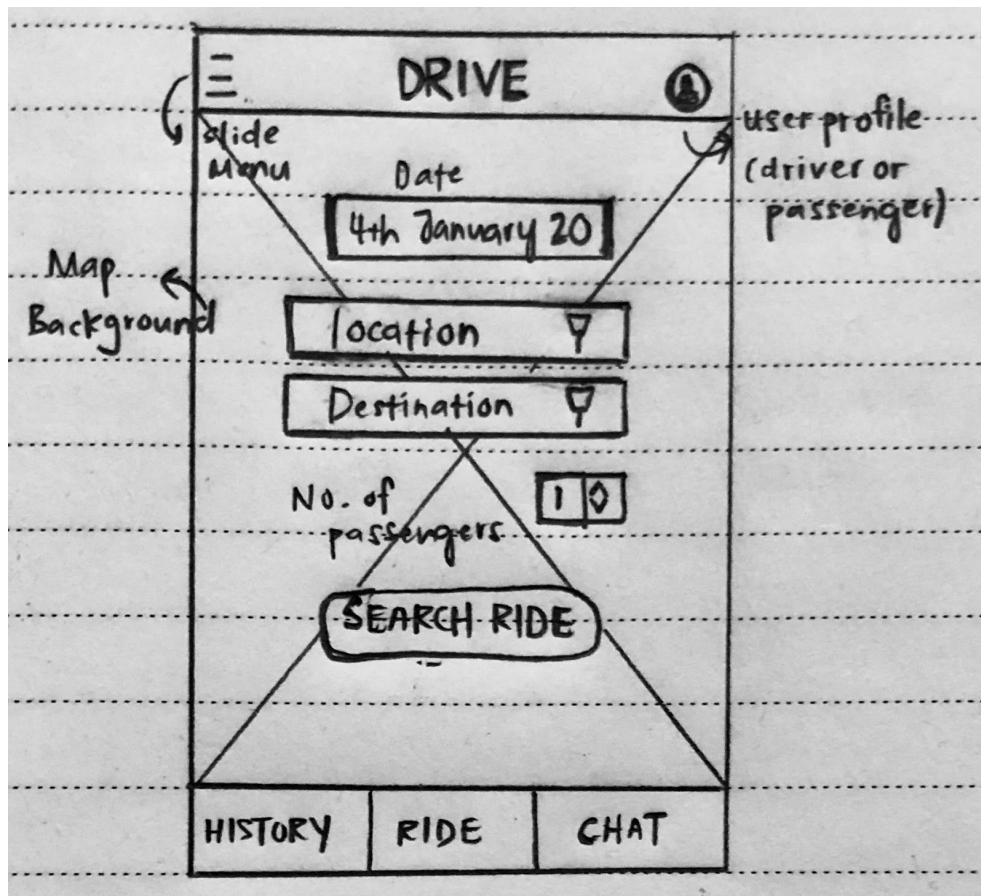


Figure 4.3: Third prototype of *Drive* booking system

5.0 UCD Process

Our team adapted a combination of Agile UX and Lean UX as our UCD process. This is because the design aspects of both approaches are useful when designing **Drive**. Based on Agile UX, we managed to break down the innovations into smaller parts to be more well-defined. Based on Lean UX, we defined the problem statements of **Drive** users and made assumptions about the solution to come up with the innovations of the app. We also managed to understand more about the users of the app and the problems they want to solve with the app by applying this combination of Agile UX and Lean UX.

The initial phase of requirements gathering involved brainstorming. Our team gathered together as a group to discuss the various innovations that the **Drive** app will have. The primary focus of the app is to prioritise the driver, so we discussed what kinds of features would be beneficial for a driver using the app. We also kept customers in mind when discussing these features because, while drivers are the users of higher priority, there needs to be a balance so that customers are not severely inconvenienced by the behaviours of drivers.

For data collection we used “Observation” as our preferred method. This is because our team is comprised of seven different people from a multitude of backgrounds with varying degrees of experience with driving and using ride-hailing apps such as **Grab**, **Uber** etc. As such, our observations and experiences allowed us to ensure a high quality when brainstorming for innovations.

We used user personas and user stories to refine the innovations that we came up with for the **Drive** app. Personas and stories allow us to delve deeper into the minds of the actual users of the app. As a result, they provide us with a better sense of the use cases of the app and allow us to define a proper vision and direction for the app. This vision and direction lets us come up with intuitive and user-friendly designs and systems for the app, thus ensuring that the app is able to reach its utmost potential.

To come up with user personas, we thought back to the app, our innovations and problem statements that we needed to solve. We also looked at the data that we collected through the observations and experiences of each member in the group. As a result, we were able to visualize two driver personas and two customer personas as clearly as possible. We also ensured that each persona is unique, relatable, reasonable and well-defined.

For coming up with user stories, we looked at the personalities, goals and frustrations, and technological skills of each user persona. We further looked at the many ways they might use the app, the features they might want, and how and why our innovations relate to the users’ needs and desires. This ensured that the stories we came up with were cohesive, reasonable, relatable, practical and of high quality.

For the initial phase of requirements, we brainstormed for the possible user pain points and made assumptions to solve them. We set up a meeting and got the team together to discuss the problems of ride-hailing and came up with various innovations of **Drive**. We also decided

which innovation would have the higher priority based on risks and unknowns. Our brainstorming process relates to Lean UX where the team defines the problem and comes up with a set of assumptions about the solution.

After brainstorming for the innovations, we then evaluated each of the innovations and refined it to be more specific and relevant to the app using user stories. The refined innovations define the app better and has a smaller scope. This is because each unrefined innovation has a broader scope. This process of evaluating and refining innovations relates to Agile UX where a project is broken down into user stories which are features users would want in the app.

Therefore, our UCD process is a combination of Agile UX and Lean UX.

The prototype design determined to be the best by the team is the design shown in **Figure 4.2**. The first reason for this is its application of **Perception** theory, which makes it easy to understand the system at a glance. The design uses **Gestalt Law of Similarity** by grouping similar objects together as seen with the booking related user-interface elements. These elements are also nearer than the design shown in **Figure 4.1**. The **Von Restorff effect**, not seen in the design shown in **Figure 4.3**, is also at play in this design as the current tab being viewed appears distinct from the others due to highlighting, thus standing out to users. Furthermore, the design uses **Fitts' Law** as users would be more reluctant to return to main page since the back button on the second page is located at a distant location, i.e. top left of page.

Several of Norman's 7 Principles are used in the design shown **Figure 4.2**. Firstly, **Visibility** is used as the result of each action is easily seen, as shown in the page searching for rides, which appears immediately after the user presses the "Find" button, notifying them that it is searching for a ride for the user. There is also good **Affordance** as the buttons and icons can be easily understood, making the apps usage easier. Furthermore, there is good **Mapping** as the buttons and icons are self-defined. Users are able to easily recognize the icons on each user-interface element and the icons are always on the left of each respective box.

This design also incorporates multiple Shneiderman's Eight Golden Rules. **Prevent Error** is seen where there is a prompt for booking confirmation to prevent any accidental bookings. The warning detail displayed is more informative than design in **Figure 4.1**. On the other hand, the design in **Figure 4.3** does not have any error prevention for booking. The design shown in **Figure 4.2** also follows **Design Dialogs to Yield Closure** by designing Yes and No buttons for booking confirmation and displaying details of booking. Furthermore, it conforms to **Offer Informative Feedback** with the progress circle when the system is searching for rides so that user knows the state of their input. The design also adheres to **Permit Easy Reversal of Action** as seen with the back button in the page searching for rides and the "No" button in the booking confirmation page. There is no back button in the other 2 designs.

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