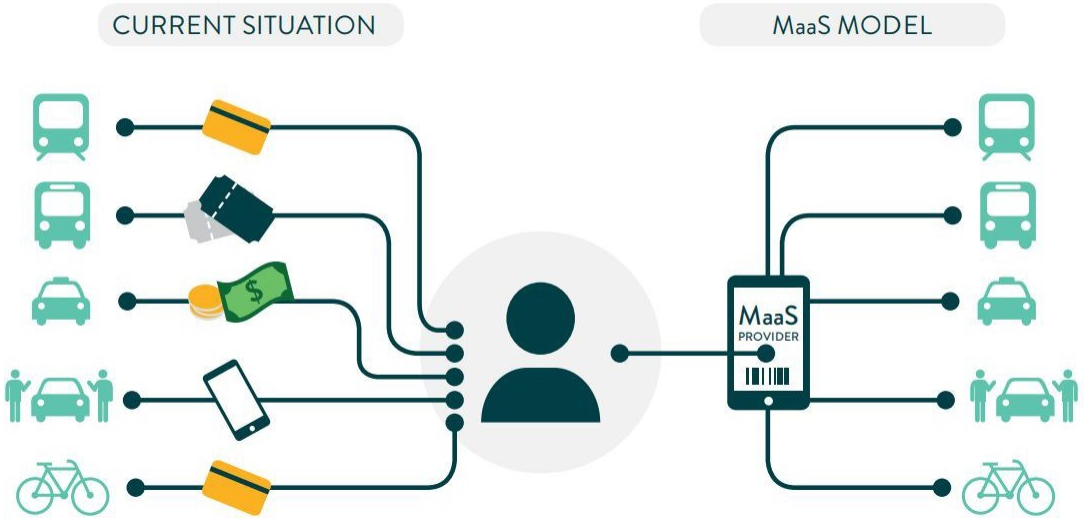
Proposal of Mobility as a Service (MaaS) System for TfNSW

Content

1. Project Scope

Project Name	MaaS System
Project Objective	Devise a system that enables the collection of relevant information both from MaaS operators and customers.
Project Purpose Statement	Offer the client a system to gather and utilize the real-time information of Maas operators and enable trip planning for customers.
Scope Description	In scope: 1. Enable MaaS operators to share General Transit Feed Specification (GTFS), General Transit Feed Specification Realtime (GTFS Realtime), General Bikeshare Feed Specification (GBFS), and real-time vehicle information with Transport for NSW (TfNSW). 2. Gather all information of MaaS operators into the database, including Opal, Uber, Lime and taxi companies. 3. Unify the information into the same form in the database. 4. Come up with integrated trip plans including MaaS operators. 5. Enable customers to select special needs (baby seat, accessible services, big car with 7 seats). Out of scope: 1. Booking and payment. 2. The technological part of how to build Application Programming Interface (API) for MaaS system.

2. Problem Statement



Due to MaaS operators differ in how they store data and what data they stored based on the vehicle service they operate and hardware and software they current adopt, their ability to share data and the data compatibility vary, which is the fundamental problem for devising a system that enables collection of relevant information both from MaaS operators as well as customers so that customers ultimately can access all MaaS services that are relevant to them.

According to Dylan, the manager of TfNSW Digital Accelerator, MaaS operators can be broadly described as falling three categories:

(1) Public transport: have timetable and accessible for all people who carry baby seat or use a wheelchair, can track and real-time updates.

(2) Sophisticated third-party operators: can real-time tracking, digital planning, booking and payment of their transportation service but don't offer an option for people who use a wheelchair, carry a baby seat, or want a car with more than four seats.

(3) Unsophisticated third-party operators: can't track their vehicles, fail to real-time update on the location or availability of their service because of the absence of necessary software, hardware, and processes, with the same circumstances to fail to meet customer special needs.

To enable MaaS operators shown in the same trip plan after customer entering all his requirement such as origin, destination, arrive at, departure by and special needs, this project needs to address the problem of the limited ability of data sharing of unsophisticated third party operators and data compatibility issue when integrated.

3. System Narrative

David is a male teenager aged 26 who lives in Bondi Junction. Furthermore, he owns a sedan car which can mostly contain five people. One day, David invited six friends to come to his home and have lunch. After lunch, one of the friends suggested going to Cockatoo Island. The other people all agreed with this suggestion, so they decided to move immediately.

Due to that one of the friends drove to David's home and David owned a car himself, the first thought of how to get to the island was to drive two cars because one car could contain all the customers. However, parking cars seemed a little inconvenient after arrival, and there would also generate parking fees for two cars. Furthermore, David and his friends all felt that driving two cars would do more harm to the environment. Determining not to drive their cars, they were looking for ways to arrive at the island as quickly as they could because they were all expecting this short journey.

They wanted to know if they had other ways such as booking a large car containing all the people nonstop to the island, or any other better ways they did not come up with. Therefore, David clicked on his phone to open an app called Opal Travel, which is a transportation planning and booking platform applying different ways served by various operators or the combination of different operators. He firstly input the start and destination in the corresponding columns. There is an extra column for him to input if he had some special requirements, and David input "6 people, a large car" in it. The app then immediately showed various transporting schedules for him, including the combination of train and circular quay, the combination of bus and circular quay, and directly by two cars from Uber. Moreover, the app gave a choice to book a large car served by a small operator called Rydo, which charged lower fees than the cost of Uber providing two cars. David and his friends all preferred the final choice because they did not want to change the vehicles halfway since it was inconvenient and wasted their time.

Based on the above consideration, David clicked on the final choice, and the app immediately booked a large car for him. After a few seconds, the interface showed a successful book of a large car served by a small operator, with other fundamental information of the car and driver on it. Waiting for about five minutes, the driver arrived at the start to pick David and his friends to go to Cockatoo Island. After 30 minutes, David and his friends arrived at the destination.

Mike is a male middle-aged driver, owning a large car that can mostly contain 7 people at one time. He has participated in Rydo which is a small operator so that he could receive the orders through the organization's channel. In the afternoon of one day, Mike was driving around Bondi Junction because the last order had been here, and he was waiting for the new order.

Soon, Mike received a message from the app. Then he opened the app and observed an order from Bondi to Cockatoo Island, and customers were about 2 kilometres far from him. The message was to ask him if he was willing to implement this order. Mike accepted the order and then received the fundamental information of the customer including his phone number and the real-time location. He immediately drove to the start. After picking six customers up, he clicked on the "start" button on the interface of the order. Then, he started to drive to Cockatoo island. After about 30 minutes, Mike arrived at the island and immediately clicked on the "end" button because the order was completed.

To end, consumers such as Mike can achieve their special requirements such as needing a sedan car through the system. For small operators such as Rydo, they can receive more orders by matching consumers' special requirements through the platform of Opal Travel than those before participating in this system.

A story board with the interface of a MaaS mobile app is provided in Appendix 1.

4. Use Case: Plan a Trip

Description:

This use case walks through the process of a registered customer plans a trip on MaaS Platform. Customer inputs the requisition of his/her trip, then MaaS Platform will generate related plan list. Afterwards, a customer selects one trip and MaaS Platform provides the detailed route to the customer.

Actors:

Customer

MaaS Platform

TfNSW Data Lake

Pre-conditions:

1. Customer has registered downloaded MaaS Platform.
2. TfNSW Data Lake has generated data in a unified form.

Post-condition

Customer acquires the route with detailed information about his/her trip.

Basic flow of events:

Step	Actor	Description
1	Customer	Customer opens MaaS Platform and searches for a trip by inserting origin, destination, time and special need. If Customer wants to leave now, then AF-1. If Customer wants to depart at a specific time, then AF-2. If Customer wants to arrive by a specific time, then AF-3. If Customer has a special need, then AF-4. If Customer wants to sort the route options, then AF-5.

2	MaaS Platform	MaaS Platform receives the request of Customer. If MaaS Platform does not receive the request (e.g. no Internet), then AF-6.
3	MaaS Platform	MaaS Platform queries TfNSW Data Lake.
4	TfNSW Data Lake	TfNSW Data Lake returns to MaaS Platform the data of each part ofthe route (cost of money and time, GTFS Real Time, vehicle information).
5	MaaS Platform	MaaS Platform creates a route list based on the data.
6	MaaS Platform	MaaS Platform returns route options with cost of time and money to Customer.
7	Customer	Customer chooses a route. End of use case.

Alternative flows (AF)

AF-1: Leave now

Step	Actor	Description
1	Customer	Customer selects the “leave now” button.
2	MaaS Platform	MaaS Platform gets the time at present. End of use case.

AF-2: Depart at

Step	Actor	Description
1	Customer	Customer selects the “depart at” button.
2	Customer	Customer inserts a specific time he/she wants to depart at.
3	MaaS Platform	MaaS Platform gets the specific time. End of use case.

AF-3: Arrive by

Step	Actor	Description
1	Customer	Customer selects the “arrive by” button.

2	Customer	Customer inserts a specific time he/she wants to arrive by.
3	MaaS Platform	MaaS Platform gets the specific time. End of use case.

AF-4: Special need

Step	Actor	Description
1	Customer	Customer selects the “special need” button.
2	Customer	Customer inserts his/her special need (accessible services, baby seat or big car with 7 seats).
3	MaaS Platform	MaaS Platform gets the special need. End of use case.

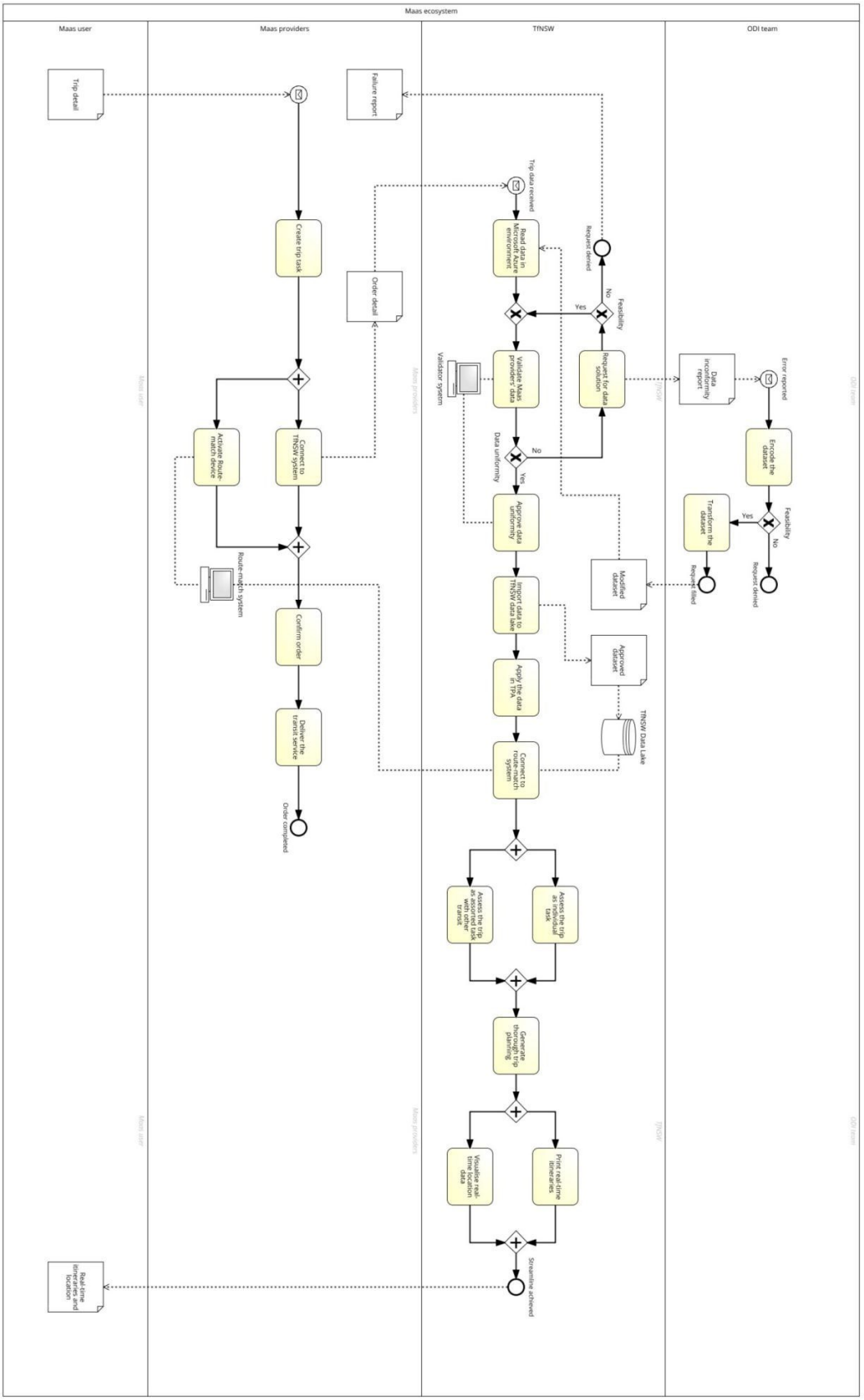
AF-5: Sort by

Step	Actor	Description
1	Customer	Customer selects the “sort by” button.
2	Customer	Customer clicks his/her preference (fastest, lowest costs, fewest transfers, least walking or most environmentally friendly).
3	MaaS Platform	MaaS Platform provides a new routes list. End of use case.

AF-6: No Internet

Step	Actor	Description
1	MaaS Platform	MaaS Platform provides a page saying “cannot get the information, no Internet”.
2	Customer	Customer refreshes the page. End of use case.

5. Business Process Modeling Notation (BPMN)

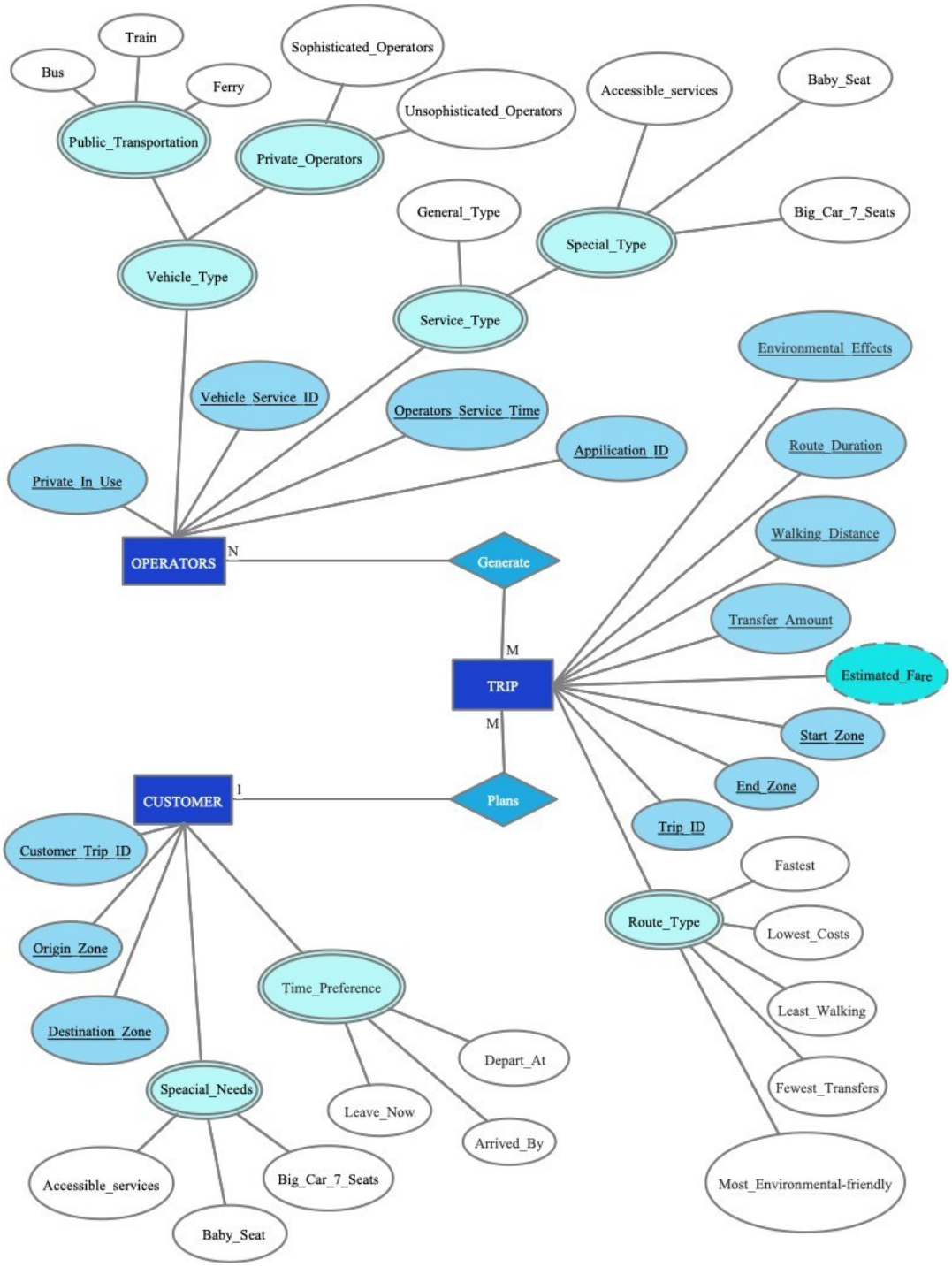


In this designed BPMN, booking and payment process are assumed to proceed in this model to illustrate the core function of this set of designed logic flows, which is, ultimately screen out data inconformity and achieve real-time itineraries and position. Additionally, this BPMN is not only designed to be a streamlined process for day-to-day operation but also as a mechanism to examine data uniformity. Essentially, for new incoming MaaS providers, this process provides an instant reflection on their data compliance, accordingly, it is useful for them to improve data uniformity towards systematic data processing.

6. Data Structure

6.1 Entity Relationship Diagram (ERD)

To show the relevant information about planning a trip for a customer, drawing an ERD in Chen style notation (Open Data, 2019).



Assumption:

Operators upload real-time information about vehicle type, service type and service time to a system. A customer uses an app to plan for a trip by entering origin, destination, time preference and individual needs. The system matches the information between operators and the customer to generate five different route types. The customer views five plans for a trip on the app.

6.2 Operator

This file is used to describe the relevant information of operators that must be stored in the system.

Name	Type	Format/Units	Max Chars	Description	Example
Vehicle_Service_ID	String	SSSSSS	64	ID of the vehicle service shift. This ID should be preceded with Application ID.	2000-001
Application_ID	Numeric	NNN	6	ID of the Application. Refer to Section 4.3.1 for the values.	001
Operator_Service_Time	Time	HH:mm:ss	8	Duration for operator service.	10:23:25

Reference Tables of Operators

Note: All the lists of reference tables are not exhaustive. The lists can be expanded as per request.

(1) Application

The table below list the values to be used for MaaS system providers' mobile or web application.

ID	Name
001	Uber
002	Rydo

(2) Vehicle Type

The table below list the values to be used for the vehicle type.

ID	Name
001	Bus
002	Taxi

(3) Service Type

The table below list the values to be used for service type.

ID	Name
0	General service
1	Accessible service
2	Baby seat
3	Big car with 7 seats

(4) The Use of Private Car

The table below list the values to be used for making sure the private car in use or not when needed.

ID	Name
0	Yes
1	No

6.3 Customer

This file is used to describe the customer's trip from point A to point B.

Name	Type	Format/Units	Max Chars	Description	Example
Cunstomer_Trip_ ID	String	SSSSSS	64	ID of the referenced customer's trip.	2000-001
Origin_Zone	String	SSSSSS	50	The defined zone of the destination. This can be zip code, Google plus codes, or the name of the suburb. The local jurisdiction should define one type of data for this field.	4RRH4694+ MF
Destination_Zone	String	SSSSSS	50	The defined zone of the destination. This can be zip code, Google plus codes, or the name of the suburb. The local jurisdiction should define one type of data for this field.	4RRH4694+ MF

Reference Tables of Customer

Note: All the lists of reference tables are not exhaustive. The lists can be expanded as per request.

(1) Special Needs

The table below list the values to be used for customer's special needs.

ID	Name
1	Accessible service
2	Baby seat
3	Big car with 7 seats

(2) Time Preferences

The tables below list the values to be used for customer's time preferences.

ID	Name
01	Leave now
02	Depart at
03	Arrived by

ID	Time Period
0000	0000hrs and 0015hrs
0015	0015hrs and 0030hrs
0030	0030hrs and 0045hrs

6.4 Trip

This file is to describe a customer trip plan.

Name	Type	Format/Units	Max Chars	Description	Example
Trip_ID	String	SSSSSS	64	ID of the trip plan.	2000-001
Start_Zone	String	SSSSSS	50	The defined zone of the destination. This Zone should be preceded with Origin_Zone.	4RRH4694+ MF
End_Zone	String	SSSSSS	50	The defined zone of the destination. This Zone should be preceded with Destination_Zone.	4RRH4694+ MF
Route_Duration	Time	HH:mm:ss	8	The whole time of the route.	00:30:00
Estimated_Fare	Numeric	NNN	20	Total fare in cents for the trip. This includes any service fee that is being collected from the customer.	111

Environmental_ Effects	Numeric	N	5	The total amount of pollution in terms of scale.	2
Walking_ Distance	Numeric	NNN	10	Total walking distance in meters for the customer.	400
Transfer_Amou nt	Numeric	N	5	The total amount of transfer for the trip.	3

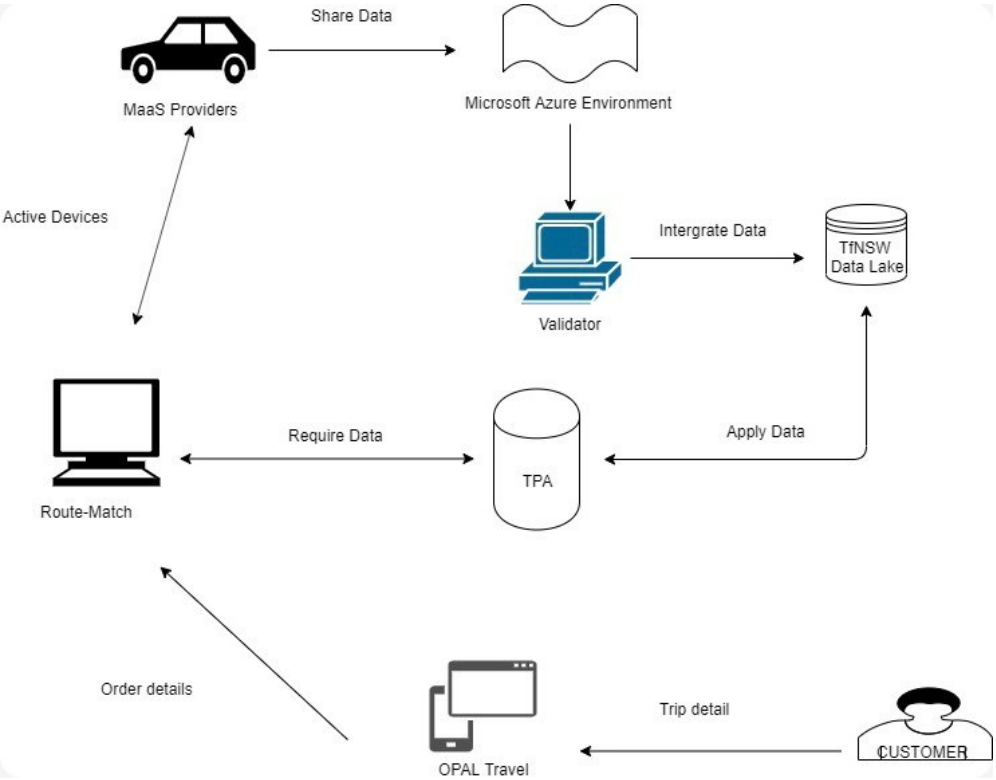
Reference Tables of Trip

The table below list the values to be used for different route types. ONLY the listed values are to be used.

ID	Name
1	Fastest
2	Lowest costs
3	Fewest transfers
4	Least walking
5	Most environmental-friendly

7. Suggested System Architecture

MaaS system architecture aims to archive real-time data reflection and provide continuous transit solutions, hence MaaS operators can be part of the Maas puzzles to achieve higher mobility and a diverse ecosystem soon (Open Data, 2019; Routematch, 2019).



Solution:

Software: Routematch in-vehicle technology, a feasible solution that requires small Maas providers to equip the in-vehicle technology device, and the Maas central system to access the route-match database or establish data interaction with its server.

Hardware: PC, smartphone, mobile device, Route-match in-vehicle device.

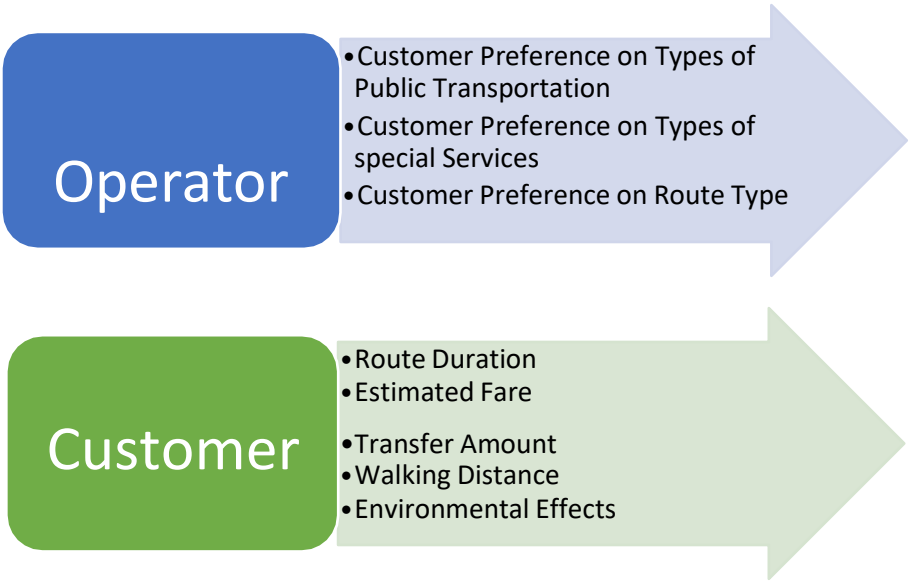
Note: the actual binding across different devices, systems, databases, however, is assumed that established for this illustration. Most importantly, data compliance is assumed for the system to function smoothly.

Based on the solution support by this system architecture, Maas as the mobility providers, can:

1. Access real-time trip information and vehicle location.
2. Enhance customer interaction and user experience.
3. Generate multimodal or point-to-point itineraries to suit various transit demand and achieve utilization of transit resources.

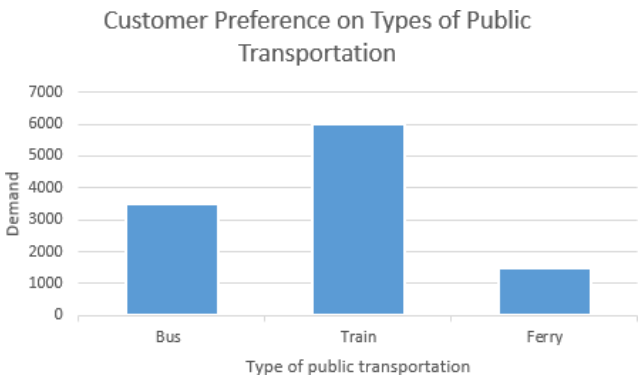
8. Reporting Structure

This part will present reports for two user groups, the operator and customer, using the information produced by the system.



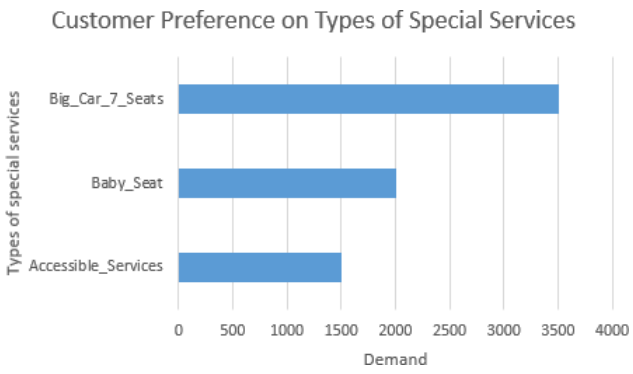
8.2 Operator

(1) Customer Preference on Types of Public Transportation



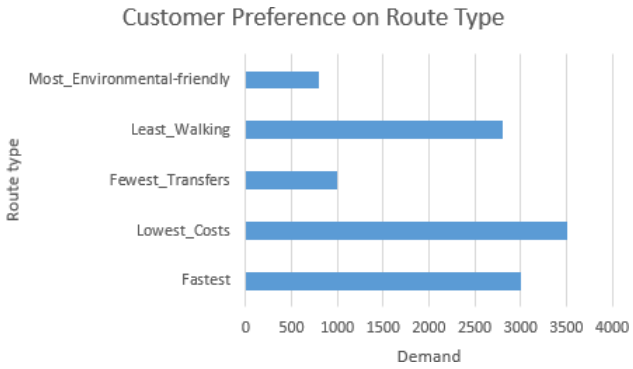
Presenting the number of demands on bus, train and ferry, a clustered column chart can be useful for TfNSW to evaluate the customer preference on three public transportation to further allocate its resources.

(2) Customer Preference on Types of Special Services



Presenting the number of demands on a big car with 7 seats, vehicle with baby seat and vehicle with accessible service, a clustered bar chart can be useful for MaaS operators because they may want this information to access the actual demand of the vehicleand then be agile to it.

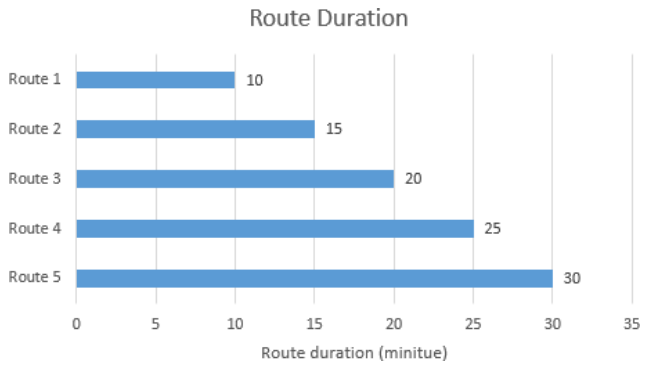
(3) Customer Preference on Route Type



Presenting the number of demands on route type which is most environmental-friendly, least walking, fewest transfers, lowest costs or fastest, a clustered bar chart can be useful for MaaS operators to adjust to meet the customer preference.

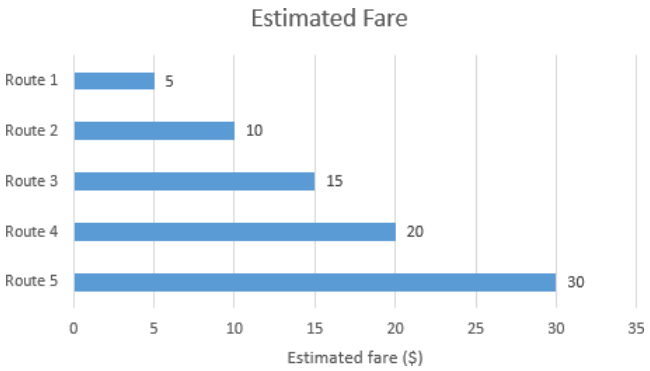
8.2 Customer

(1) Route Duration



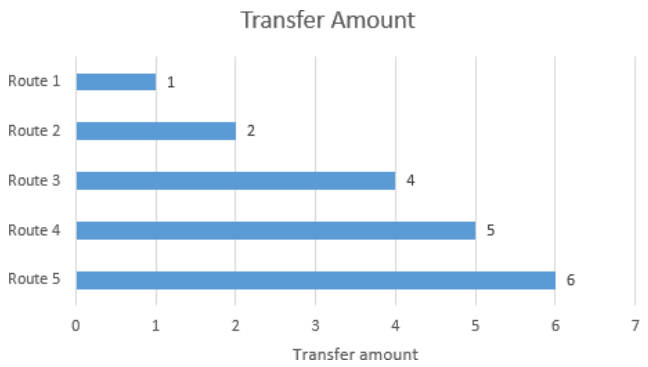
Presenting the duration of different routes, a clustered bar chart can be useful for customers; they may want to know which route has the shortest duration (fastest) because short duration can save their time.

(2) Estimated Fare



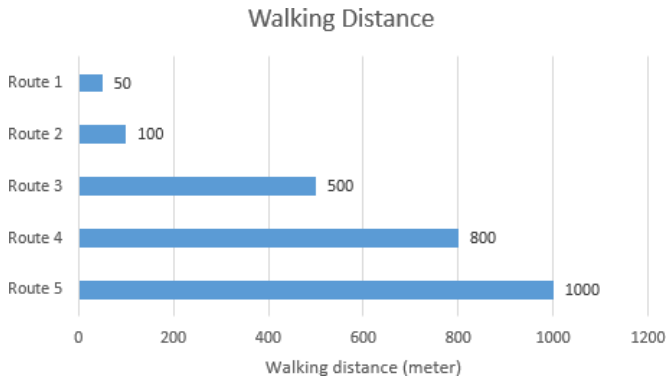
Presenting the estimated fare of different routes, a clustered bar chart can be useful for customers; they may want to know which route has the lowest estimated fare (lowest costs) because low estimated fare can save their money.

(3) Transfer Amount



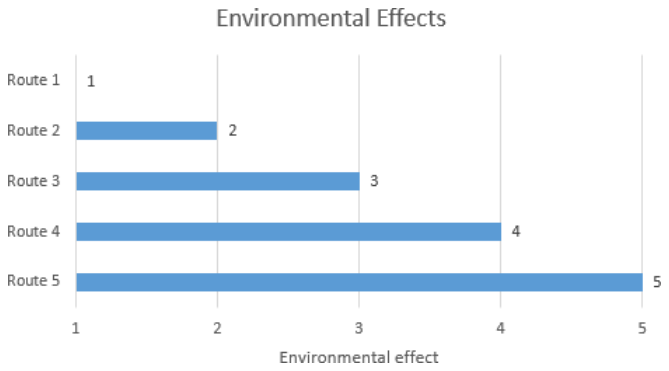
Presenting the number of transfers of different routes, a clustered bar chart can be useful for customers; they may want to know which route has the fewest transfers because fewer transfers, more convenient.

(4) Walking Distance



Presenting the walking distance of different routes, a clustered bar chart can be useful for customers; they may want to know which route has the shortest walking distance because customers may not like to walk a lot.

(5) Environmental Effects



Presenting the environmental effects of different routes in terms of a scale from little pollution to much pollution (1 to 5), a clustered bar chart can be useful for customers; they may want to know which route has the least pollution (most environmental-friendly) because some customers may have a strong mind to protect the environment.

9. Requirements Gathering

Conducting three interviews with different user groups, the analysis is provided below, and the interview transcripts are provided in Appendix 2.

9.1 Customer

Customers sometimes have various special requirements which the general transportation cannot achieve. For example, customers with babies or children require baby seats; the disabled need accessible services, and some customers may need a big car with 7 seats.

Furthermore, different customers may have different time preferences. Except departing immediately, some customers prefer to book a later departure time, and some customers may expect a guaranteed arrival time.

Then, they have different focuses on the advantages. Some customers care about which is the fastest way, while some may care about whether it is the cheapest way. Other customers may also mostly value non-stop factors or environmental-friendly factors.

Additionally, if our system can give them suitable suggestions (travelling by the combination of train and bus or other combinations of both public and private vehicles, which is faster than single by a car in the crowded traffic), customers who are used to travelling by a single vehicle seem willing to try the combination of different vehicles. And this kind of wishes will be stronger if the system can make the combination more convenient to them, such as enabling the customers to directly book all vehicles just by using our system.

9.2 Operator

Furthermore, some small operators who want to improve their business through our

system, by getting the platform to be shown to the customers and being a choice to the customers. And his requirement can be satisfied. To explain, the interviews with customers show that, customers are likely to accept small operators if small operators can also satisfy their requirements on the same or even higher degrees compared by Uber or other main operators.

9.3 IT Solution Provider

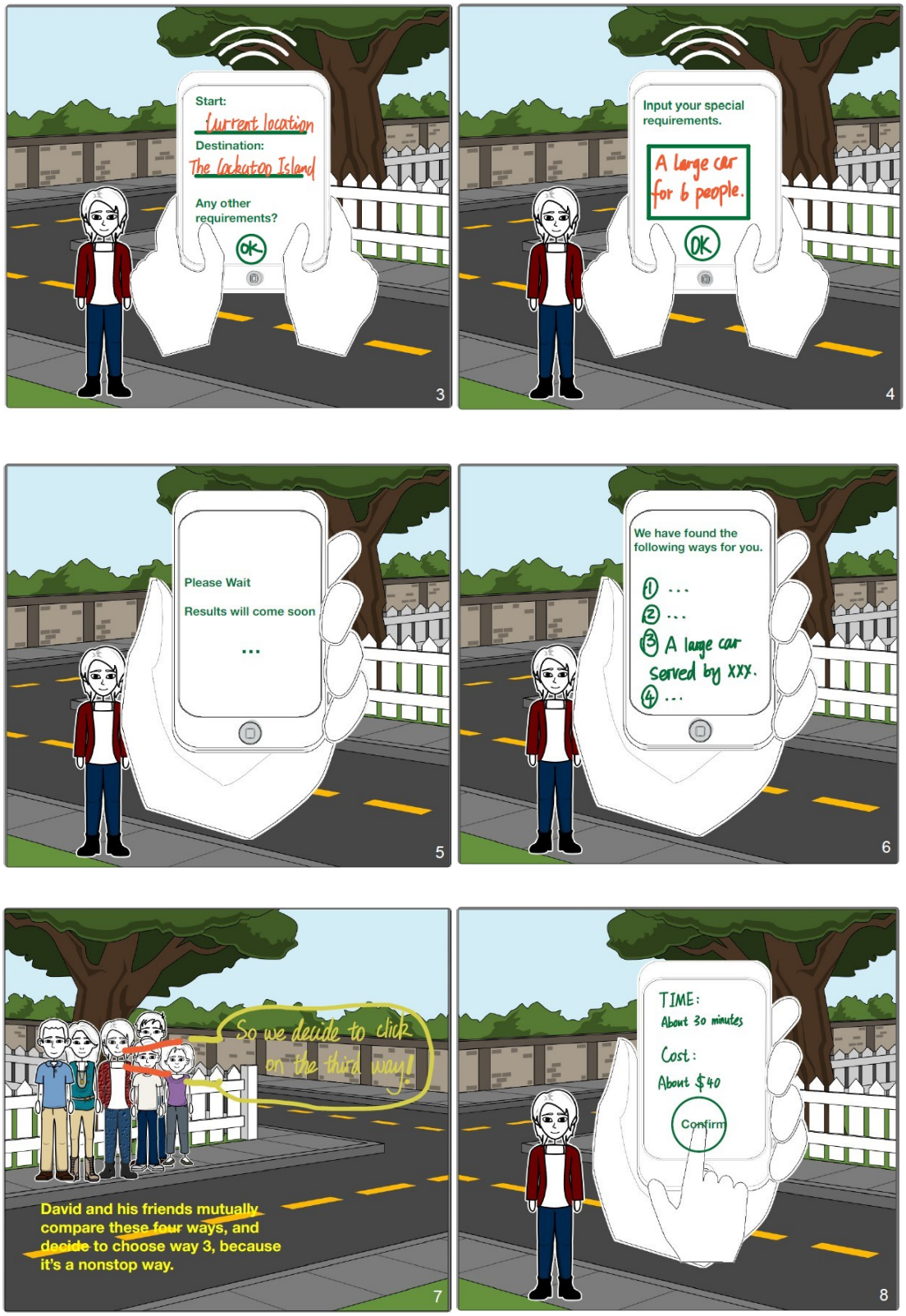
Moreover, as an IT solution provider, Routematch can provide an integrated solution for MaaS system. It emphasizes the dynamic environment of transportation Sao that the promptness of MaaS system is necessary. To enhance its ability to reduce uncertainty, MaaS system should overstep its current operation and respond in a new mode.

10. References

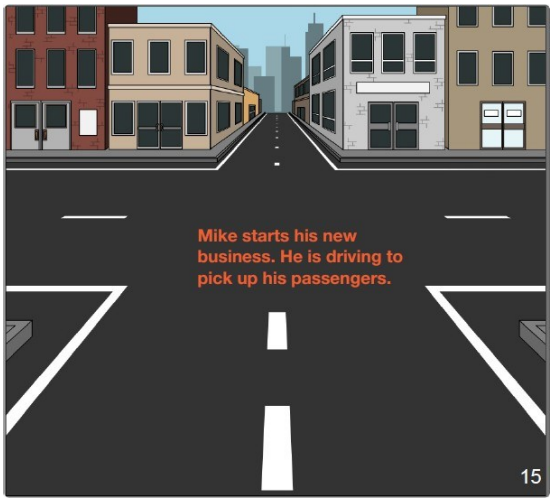
Open Data. (2019). *MaaS Data Specification*. Retrieved from https://opendata.transport.nsw.gov.au/maas-data-specification

Route Match. (2019). *In-vehicle Technology*. Retrieved from https://www.routematch.com/ivt/

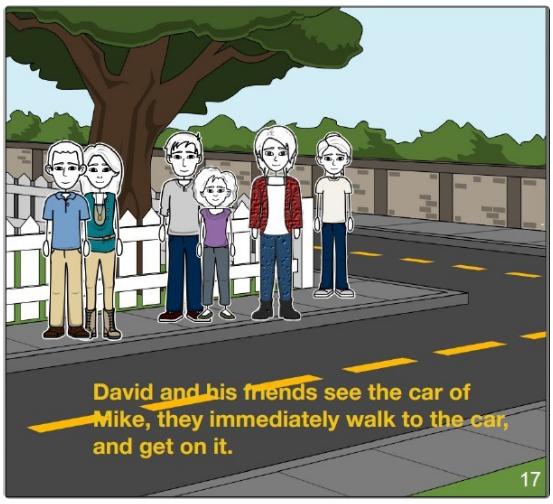
Appendix 1. Story Board with Interface


Start:
Current location
Destination:
The Lackaton Island
Any other requirements?
OK
3
Input your special requirements.
A large car for 6 people.
OK
4
Please Wait
Results will come soon
...
5
We have found the following ways for you.
① ...
② ...
③ A large car served by XXX.
④ ...
6
So we decide to click on the third way!
David and his friends mutually compare these four ways, and decide to choose way 3, because it's a nonstop way.
7
TIME:
About 30 minutes
Cost:
About $40
Confirm
8


We have received your order.
Please wait for a moment...
9
We have found a driver serving for you
About Driver:
Name : Mike
Phone number:
xxx xxx xxx
Current location
5 mins
10
Mike is a driver from a small operator,. His car can mostly contains 7 people.
Oh! Let me check the phone. Maybe it's a new order.
One day, he has completed the last order to the Bondi Junction. He is waiting for a new business now.
11
The passengers are 3km far away from you.
Start: xxx, the Bondi Junction
Destination: the Cockatoo Island
Accept
12
Please wait...
We are allocating this new order for you.
13
Information about passengers
Phone Number:
xxx xxx xxx
Location:
5 mins
14

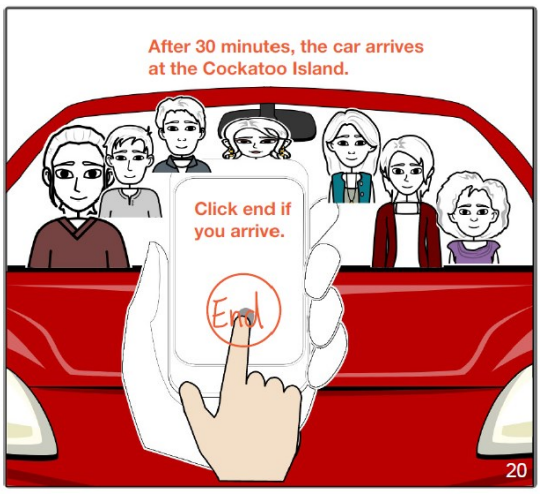

Mike starts his new business. He is driving to pick up his passengers.
15


When he arrives at the start, he clicks on the button of arrival.
I have arrived at the start
16


David and his friends see the car of Mike, they immediately walk to the car, and get on it.
17


If passengers gets on the car, you can start the journey.
Start
18


Moving to the Cockatoo Island...
19


After 30 minutes, the car arrives at the Cockatoo Island.
Click end if you arrive.
End
20

Appendix 2. Interview Transcripts

(1) An Interview with Customer

Interviewee background:

Interviewee A: An Australian stay-at-home mom called Helen. Helen has a one-year-old daughter. She has no car.

Interviewee B: William, a director of a film crew, usually need to travel with 4 to 5 members together. They usually need to move to the Island because their work need the scene by sea view.

Question 1: Do you have some special requirements in your daily transportation?

A: Yes, of course, because my daughter is only one year old, I usually expect that there could be a baby seat in the car.

B: Yes, we have. I need to transport with my members, and sometimes we need to carry some heavy equipment. Thus, s seven-seat car is better.

Question 2: Do you have some time preferences on your transportation such as departing now, departing at a fixed booking time, or arrive by an expected time?

A: I mean. Sometimes I would prefer to depart at a booking time, because, you know, going out with a baby need some preparations, filling a feeding bottle, checking her

diapers, and so on.

B: On most of the time, we expect to depart as soon as possible. For my profession, punctuality is an important factor when our customers assess us.

Question 3: Which advantages you mostly value when you decide the way of your daily transportation? (For example: Fastest? The lowest cost? Fewest transfers? Least walk? More environmental-friendly?)

A: For me, emmmm, a lower cost is also attractive to me, but the most important advantages should be the fewest transfers. My daughter likes sleeping on the way, and I don't expect to wake her up. Furthermore, I don't want to carry a stroller halfway.

B: As I mentioned before, I would prefer the fastest way. However, I believe you also have experienced the traffic jam in Sydney. It's challenging to achieve.

Question 4: We now provide you with a system, which can satisfy your special needs, time preferences. And if you expect no transfer, the system might help you order a car with a baby seat from a small operator you may not know about before, instead of Uber. Would you like to try our system?

A: Uber is my most familiar way. Small operators? What I care about is whether it is safe and professional in transporting. If it can achieve the same as Uber, and additionally serve me with a baby seat. Yes, I think I will try.

Question 5: We now provide you with a system, which can satisfy your special needs, time preferences. as you expect a big car, the system might help you order a car with a capacity of 7 people. The car is provided by a small operator you may not know about before, instead of Uber. And the small provider might charge less. Would you like to try our system?

B: Yes. Why not?

Question 6: We remember that you mentioned the traffic jam. Comparing with by car, it may be smarter to choose the public vehicles. Our system can also provide you with various solutions, such as the combination of train and ferry if your destination is the island. Moreover, you can book the ferry on our system. Would you like to transfer to the combination of different vehicles, no matter it is public or private? And would you be more satisfied with our system?

B: If the real can be what you describe, I think both answers will be yes.

(2) An Interview with Operator

Company Background:

Rydo is an Australian based technology company bringing the best of technology to the professional taxi and hire car industry. Established six months ago, Rydo already achieved tracking and real-time data updating.

Question 1: What is your advantage?

Rydo is flexible, it allows to you book in advance, it allows you to pay in the app, or pay in advance. It allows you to book a wagon, a people mover or a wheelchair-friendly cab. It will give you an estimated fare and allow you to travel in a fully insured vehicle witha professional driver, with security cameras.

Functions are great but so are benefits. When calls are slow you can request a fixed price fare. When times are busy our rates never go up, but if you are really in a hurry you can offer a driver a tip to pick you up pronto!

Question 2: What do you need to improve?

It is hard to believe that we launched our Rydo taxi app only 6 short months ago. In that time, we have grown, brought on thousands of new drivers, and completed tens of thousands of rides.

We are not saying we are perfect. But we are always learning, adding services and improving the app. In just the last 3 months we have made some great improvements to the app and how it works.

Question 3: Do you focus on customers' special needs? If so, what are the special needs?

We give customers more options to book a taxi to tailor their trip to your needs. We allow customers to book a wagon, a people mover or a wheelchair-friendly cab. When they book their taxi, they have a choice of type of taxi. Would you like a maxi? Not a problem! Or maybe you have a lot of shopping and you need a wagon? Our regular taxis are great but now you also have the option to book or pre-book a London Taxi.

You can only book or pre-book a London Taxi using the Rydo app. London Taxis are great for bigger groups of 5 or even that special occasion.

If you are off to the airport, you can let us know how many bags you have plus any other special requests or notes for the driver.

Question 4: What technology do you use to get customers from A to B?

Any industry that deals with a user's physical location and delivery to another, like the taxi industry, needs mapping and geolocating. Depending on which operating system is being used, taxis are located either via CoreLocation (Apple) or Google's Location API's (Android). Both use different technologies but deliver the same location needs across many apps.

In Google maps, there are two methods of location known as "fine" and "coarse". One uses the obvious GPS and the other some not so specific information.

Google was pinged for collecting Wi-Fi positions when collecting data for the street view and there may be any number of pieces of information that provide this pinpoint accuracy when dealing with coarse locators.

Providing the routes requires access to other technologies, in the case of Android, it is Google Maps Android API. These allow routing maps to become available to a user's app. Most travel apps tend to use Google Maps as they provide the most comprehensive technology.

So, in a nutshell, you are located, your destination is mapped and the two are then joined via routing technology.

This is a very brief explanation of how you are found and how apps get you to where you are going. The collusion of all these processes and API's allow you to connect with taxis and rides via your apps, and that is exactly the result of sending the tavern boy out, but much more convenient!

(3) An Interview with IT Solution Provider

Company background:

Routematch Software brings innovative passenger transportation technologies that help more than 600 transit agencies transform rider experiences and manage operational costs. Its technologies span from scheduling, computer aided dispatching (CAD), routing, analytics, automated vehicle location, and reporting on the "back office" to user- friendly automated fare collection, mobile applications for "where's my bus?" information, and other multi-modal trip planning tools on the "rider side".

Question 1: What is Mobility on Demand?

It's a very good question. It's a relatively new concept. Probably hundreds of definitions are floating around, and there's still a lot of confusion in the industry.

Routematch tries to be intentional about separating the terms because really mobility and on-demand services are two separate things. On-demand is nothing more than a service delivery mode, as is fixed-route or demand-response for paratransit. I don't think on-demand is much more than a way to provide a microtransit service when a rider wants it. But microtransit is just one piece of the bigger mobility puzzle.

Question 2: How does the Routematch Mobility platform know which kind of vehicle to send?

When you're setting up a service, you're able to assign attributes to any of your assets, meaning your infrastructure. So, every vehicle will have a profile associated with it. When a rider goes in to book a trip, he or she also has a rider profile. As an example, I can talk about my grandmother. Some days, she uses a wheelchair. Other days, when she's feeling good, she is ambulatory. She can change the attributes associated with her dynamically for each trip. To accommodate the attributes assigned to each customer, the Routematch platform will find an appropriate vehicle to dispatch.

Question 3: What are the different service models for Mobility on Demand?

The most popular service models are curb-to-curb, curb-to-hub, hub-to-hub, or an intermodal journey. But within each of those, there's still a lot of optionality for how an agency wants to deliver a service.

Question 4: What is the most common question you get from agencies regarding Mobility on Demand?

I often get a question that's in some form of, "Can I take the service that I'm already running and make it on-demand?" I don't think that's the right question. It gets at the mindset shift that I mentioned earlier. There's this preconceived notion of how a transit agency–provided service should work. The goal shouldn't be, "Let's try to copy and paste this service we're doing and make it on-demand."

Another question I get all the time is about subscription trips or standing orders - if a rider wants to be picked up every weekday morning at seven o'clock, for example. Our platform doesn't handle standing orders because no-shows and driver wait time have been proven to decrease efficiency and increase the cost. In the on-demand world, everything is going to look so different, so we must think about service delivery differently.

Question 5: How do you measure the success of an on-demand mobility platform?

That question brings up another shift in mindset regarding measuring results. In an on-demand world, there's not the concept of on-time performance. With Mobility, it's not so much about being early or late. It's about: "I asked for a trip now; how long's it going to take to get to me?" You're looking at an average wait time. Instead of an on-time performance result, you'll be scoring an agency's spontaneity. That will also require a shift in reporting for the NTD, the National Transit Database. So much of success in transit is tied to improving the health of a community, be it economic, environmental, or physical and emotional wellbeing. I recognize that abstract concepts can be difficult to measure. It will make sharing data with all the partners within the community that are a part of service delivery, in addition to tracking outcomes that we're currently not tracking.