Concordia University

SOEN 6481 - Software Design Methodologies

Deliverable 1

Requirement Analysis for Ticket Vending Machine

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GitHub Address: `https://github.com/mahavir0/iGo---SOEN-6461-SDM`

Contents

Problem 1

1.1 Introduction

In this document, the online ticket vending machine that is available in Montreal, Canada, will be examined and discussed. The project's goal is to produce a collection of related artifacts for the issue at hand as well as the domain of the software solution for a useable, secure, maintainable, and (environmentally) sustainable TVM.

The requirements and use cases are recorded in the pictorial representation with the help of problem domain, stakeholders and use case modelling and various other UML diagrams to understand different perspectives of the system.

1.2 Description of iGo

The term "TVM" refers for "Ticket Vending Machine," a self-service kiosk where customers may buy tickets for public transportation, including buses, trains, and subways. TVMs are intended to reduce the need for human interaction and speed up boarding time by making the ticket purchase procedure quick and simple for commuters.

After drawing inspiration from the present version of the TVM that STM has deployed notably in the metro system of Montreal, Canada, we chose to give alternatives for purchasing a ticket in numerous conceivable ways with our version of iGo. The various possible ways include single trip pass, one-day pass, two-day pass, weekly pass, and monthly pass. Customers may tap their card at any metro station to move effortlessly between different locations with the use of only one electronic fare card.

Moreover, users of iGo will have access to an online portal to reload their electronic cards and track all transactions from a single location. iGo will also make use of developing technology for making payments via secure channels utilising debit/credit cards.

With iGO, it is assumed that metro stations and buses have kiosks on which the application will be installed, to scan and validate the electronic tickets. Notwithstanding the fact that there is no provision in iGo for maintaining the existing physical TVMs available at metro stations in Montreal.

At the end of our project, we want to have created software that is useful and with capabilities similar to those of the Montreal metro TVM.

iGo will provide a range of services related to purchasing and managing the transit tickets. Some of the services that will be provided include:

- **Ticket purchasing:** iGo will enable users to swiftly and conveniently tickets, minimising the need for human interaction and speeding up boarding time.

- **Ticket type selection:** Users can choose between single trip tickets, day passes, weekly or monthly passes, and other sorts of transit prices.

- **Payment processing:** iGo will accept cash, credit, or debit card payments, and even allow mobile payments like apple pay or phonepe.

- **Ticket printing:** iGo will provide tickets electronic tickets which the user can scan at the metro stations using the kiosks available there.

- **Multilingual support:** As Montreal is a French dominated city hence iGo will provide the support for two major languages namely English and French.

- **Account management:**iGo will allow its users to manage their transit accounts, by reloading or renewing passes, monitoring transaction history, and altering account information.

It should be noted here that implementing the payment gateways for purchasing the tickets is currently not within the scope for this project. However, a Payment option is added which can be extended for realization.

1.3   Future Scope

Considering historical experience, we may anticipate that as Montreal's economy expands, additional stations will be built in the future years. We will attempt to develop the TVM software so that it will be simple to update and add new needs while keeping these modifications in mind.
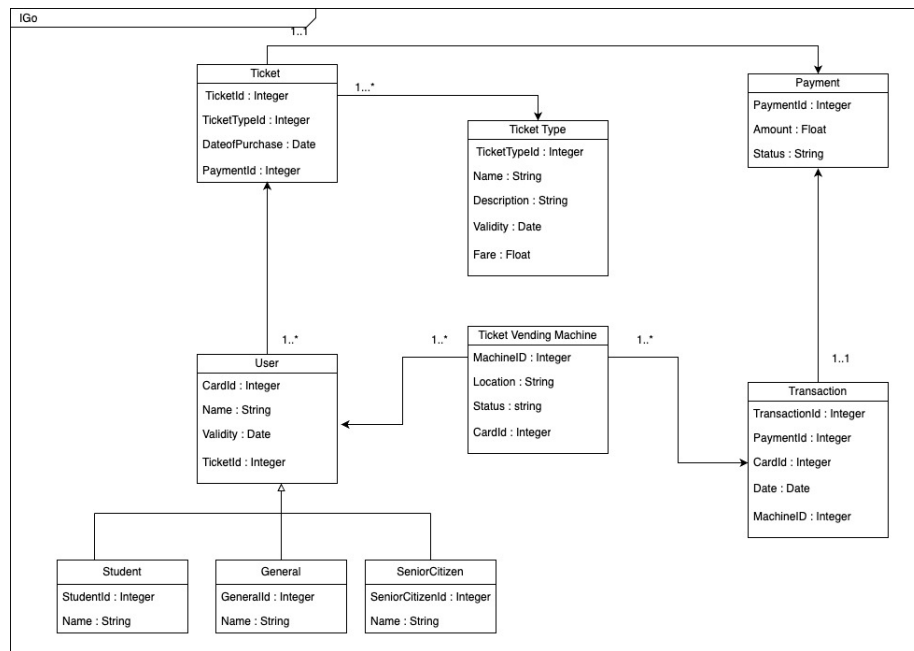
Problem 2

Figure 2.1: UML Class diagram for iGo TVM

2.1 Description about Classes

The domain model consists of the following classes:

- **Ticket:** This class represents a ticket that can be purchased from the TVM for a means of public transportation. It has the following attributes:

  - validityPeriod: the duration for which the ticket is valid
  - purchaseDate: the Date on which ticket was purchased
  - payment: the details about the payment of this purchase

- **TicketType:** This class represents the types of tickets that can be purchased from the TVM. It has the following attributes:

  - name: the name of the ticket type
  - description: a description of the ticket type

    – validityPeriod: the duration for which the ticket is valid

    – fare: the cost of the ticket

Payment: This class represents a payment made by the user to purchase a ticket from the TVM. It has the following attributes:

- amount: the amount of money paid by the user

- paymentMethod: the method used for payment (e.g. cash, credit card, mobile payment

- paymentStatus: the current status of the payment (e.g. success, fail)

- **User:** This class represents a user of the TVM system. It has the following attributes:

    – name: the name of the user

    – email: the email address of the user

    – password: the password of the user's account

    – validity: the validity of the user's account

    This class has three subclasses:

    – Student

    – General

    – Senior Citizen

TVM: This class represents the ticket vending machine itself. It has the following attributes:

- location: the physical location of the TVM

- status: the current status of the TVM (e.g. operational, out of order)

- serialNumber: the unique identifier for the TVM

Transaction: This class represents a transaction made by a user at the TVM to purchase a ticket. It has the following attributes:

- ticket: the ticket that was purchased

- payment: the payment made by the user for the ticket

- user: the user who made the transaction

- date: the date and time the transaction was made

- Machine: the machine used to make the transaction

2.2 Description about Relationship among Classes

- Ticket has a composition relationship with TicketType, as each Ticket is associated with a specific TicketType.

- Transaction has a composition relationship with Ticket and Payment, as each transaction involves the purchase of a ticket and a payment made by the user.

- Transaction has an association relationship with User, as each transaction is associated with a specific user.

- Transaction has an association relationship with TVM, as each transaction is associated with the TVM that was used to make the transaction.

Problem 3

3.1 Mind Map

The mind map for the ticket vending machine has several branches, each of them representing the different aspects of the given project. The main point for creating the mind map could be Ticket Vending Machine.

The given mind map includes mainly six branches security, Tasks, Payment Methods, User, Accessibility, and Usability. These branches could provide a summary of the report and their findings, as well as any recommendations for future improvements.

Overall, The given mind map for the ticket vending machine provides the scenario of various topics covered in this report. It would also help the reader to understand the structure and the flow of various tasks and make it easier for the presentation.
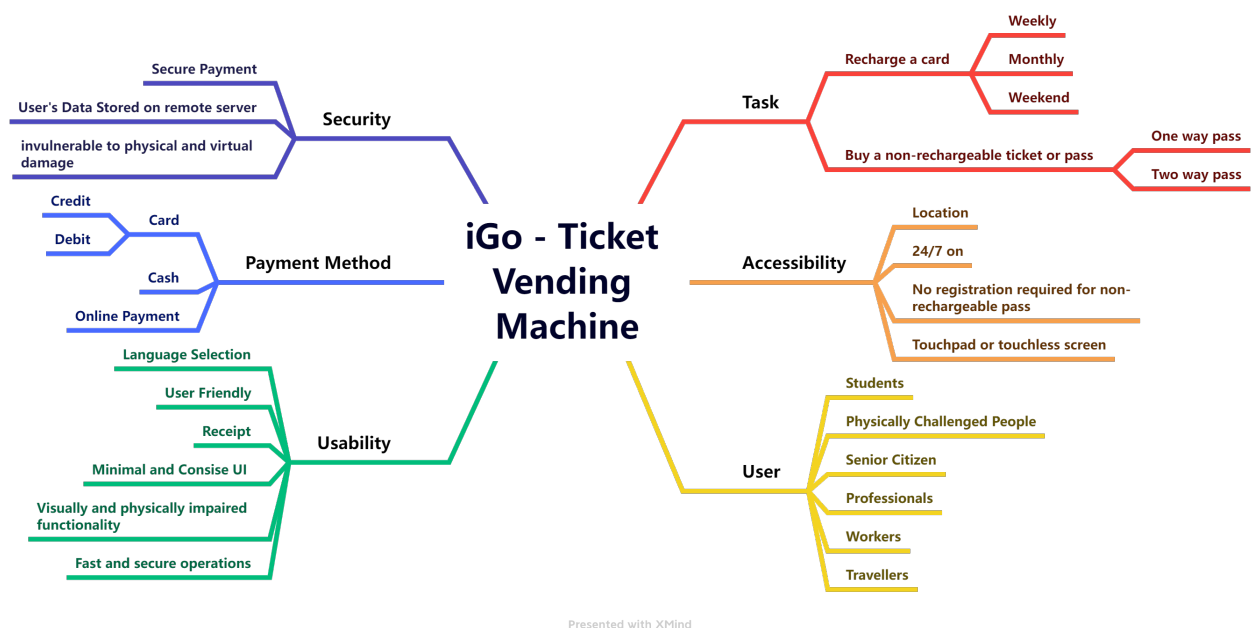

Figure 3.1: Mind Map for Interview of iGo TVM
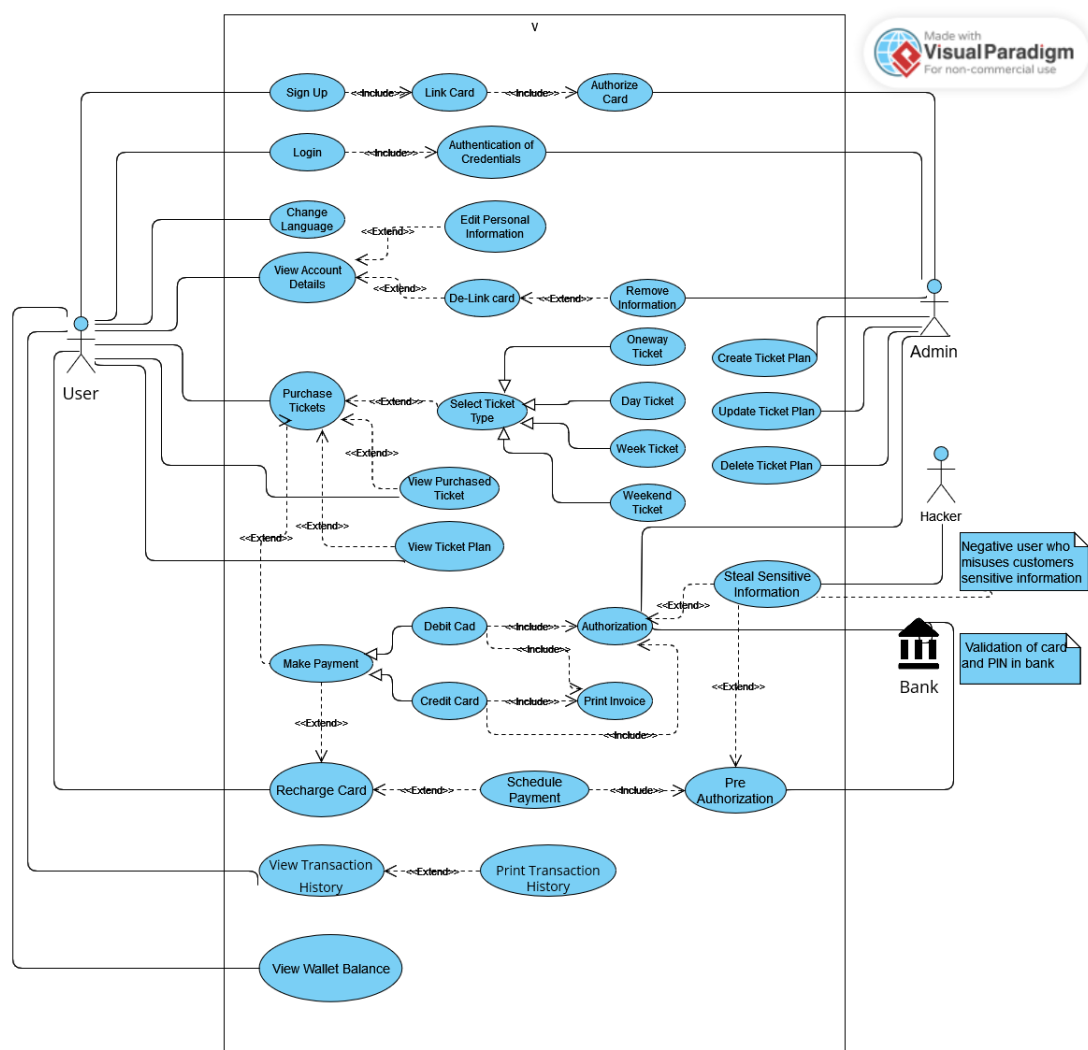
Problem 4

4.1 Use Case Modeling

Figure 4.1: Use Case Model for iGo TVM

The iGo Ticket Vending Machine and the commuter or user are the key two actors in the use case model. The user's use cases include logging in or signing up, choosing a language, purchasing tickets, topping off cards, paying for tickets and cards, and accessing account information,

including transaction history and wallet balance. Whereas iGo will handle the internal connection to the bank and the sorts of tickets that are shown. In addition to these actors, there are two more: the Bank, which handles the authentication and verification of all credit card and debit card payment transactions, and the negative use case actor, the Hacker, who could attempt to breach the system, steal user data, and exploit it for their own advantage.

Name	Sign Up
ID	UC1
Description	Customers want to Sign Up for TVM.
Actors	Customer and TVM System
Main Success Scenario	- Customer needs to provide details like name, age, email address, password,date of birth etc. - Customers may have to provide valid documents if needed. - Customers have to submit the form. - Customers are asked to login in TVM.
Pre-Condition	Customers need to have some pre knowledge about how to use TVM.
Post-Condition	Customers need to login.
Exceptions/Alternatives	Customers failed to provide correct details.

Name	Login
ID	UC2
Description	Customers want to login in the TVM System.
Actors	Customer and TVM System
Main Success Scenario	- Customers have to know about login Credentials. - Customers are logged into the TVM System. - Customers can see the entire application.
Pre-Condition	Customers have to be aware of their credentials.
Post-Condition	Customers easily see all the details of the application.
Exceptions/Alternatives	- Customers have to check the credentials. - Customers need to register first if they do not already have an account.

Name	Change Language
ID	UC3
Description	Users want to change the language.
Actors	Customer and TVM System
Main Success Scenario	• Customers can alter the language between French and English
Pre-Condition	N/A
Post-Condition	They successfully change it.
Exceptions/Alternatives	Language is not available which they want.

Name	View Account Details
ID	UC4
Description	Customers want to see the details related to their account.
Actors	Customer and TVM System
Main Success Scenario	• Customers can see all the details which are a part of their personal profile. • Customers can also edit these details. • Customers can delink their registered card. • Customers can remove some details like saved payment methods.
Pre-Condition	They must know the credentials of the TVM System.
Post-Condition	It gives the option for users to edit or delete certain information.
Exceptions/Alternatives	Users have to provide some necessary additional information.

Name	Purchase Tickets
ID	UC5
Description	Customers are able to purchase tickets from various options available.
Actors	Customer and TVM System
Main Success Scenario	- Customer can look at the different type of tickets available like one day pass,week pass, weekend pass and one way trip pass. - Customers can view their purchased ticket. - Customers can also view the plan they purchased like monthly recharge, 3 month recharge or limited trip recharge.
Pre-Condition	They must login to the TVM system.
Post-Condition	It provides the details about the ticket plan or ticket purchased.
Exceptions/Alternatives	- Users have to login first to see plans. - Customer has not booked any tickets.

Name	Make Payment
ID	UC6
Description	Customer makes the payment.
Actors	Customer,Bank and TVM System
Main Success Scenario	- Customers get different options related to payment method like cash, credit card or debit card. - Customers need to select the method and proceed with the payment according to the given instructions. - the payment is by card, Bank will provide verification and provide the authorization to make the payment. - Customer can also cancel the payment and go for change the plan. - After the payment is successful users get the option for printing their invoice.
Pre-Condition	Users must select the plan of Tickets.
Post-Condition	Users get the details of the bill and method of the payment.
Exceptions/Alternatives	- Users need to check the details of the card or pin which they provide to make payments. - Cancel the payment and want to go back?

Name	Recharge Card
ID	UC7
Description	Users also recharged the card.
Actors	Customer,Bank and TVM System
Main Success Scenario	• User needs to select the card recharge option namely one month unlimited, 3 month unlimited or limited trips recharge. • User needs to enter the details of their electronic card. • Users can proceed with the payment.
Pre-Condition	Users must insert the card.
Post-Condition	Customers have to confirm and have to proceed with payment.
Exceptions/Alternatives	• Please select from the above mentioned option only. • Cancel the payment.

Name	View Transaction History
ID	UC8
Description	Customers also see all the transactions which they did till date.
Actors	Customer and TVM System
Main Success Scenario	• Customers get the details like date and time of the transaction, method of payment etc of all the transactions successfully. • Customers can also print the transaction history available.
Pre-Condition	Users have to log in with their credential
Post-Condition	They get all the history of transactions.
Exceptions/Alternatives	N/A

Name	View Wallet Balance
ID	UC9
Description	Users can view their wallet balance.
Actors	Customer and TVM System
Main Success Scenario	• They get the information about how much balance is available in their wallet. • Users also get an option to add more money in their wallet.
Pre-Condition	Users must be logged in to the TVM System.
Post-Condition	Users get the information in their account.
Exceptions/Alternatives	N/A

Name	Steal Sensitive Information
ID	UC10
Description	Hackers use the TVM System unethically.
Actors	Hackers and TVM System
Main Success Scenario	• Hackers used the TVM system improperly. • The user's sensitive information is stolen by Hackers. • Hackers use this sensitive information for thrie personal gain.
Pre-Condition	The user inserted the card and entered the pin.
Post-Condition	The TVM System was hacked.
Exceptions/Alternatives	Perform illegal activity in your account.

Name	Create Ticket Plan
ID	UC11
Description	Administrator wants to create the ticket plan.
Actors	Administrator and TVM System
Main Success Scenario	• Administrator creates the new ticket plan. • Administrator can create a new ticket by adding all related information.
Pre-Condition	Administrator is logged in.
Post-Condition	New tickets are clearly visible in the Ticket plan screen.
Exceptions/Alternatives	N/A

Name	Update Ticket Plan
ID	UC12
Description	Administrator wants to update an existing ticket plan.
Actors	Administrator and TVM System
Main Success Scenario	• Administrator selects the tickets which they want to update. • Then modify it properly. • Administrator saves the changes.
Pre-Condition	Administrator is logged in.
Post-Condition	Update tickets are clearly visible in the Ticket plan screen.
Exceptions/Alternatives	N/A

Name	Delete Ticket Plan
ID	UC13
Description	Administrator wants to delete the ticket plan.
Actors	Administrator and TVM System
Main Success Scenario	• Administrator selects the ticket plan which they want to delete. • Administrator deletes it.
Pre-Condition	Administrator is logged in.
Post-Condition	Delete tickets are not visible in the Ticket plan screen.
Exceptions/Alternatives	There are no tickets selected to delete.

Problem 5

5.1 Temporal Use Case Modeling: Activity Diagram

Activity diagrams show how multiple levels of abstraction of activities are coordinated to produce a service. Typically, an event must be accomplished by some operations, especially when the operation is meant to accomplish several different things that call for coordination. Another common requirement is how the events in a single use case relate to one another, especially in use cases where activities may overlap and require coordination. It may also be used to illustrate how a set of related use cases interact together to reflect business operations.
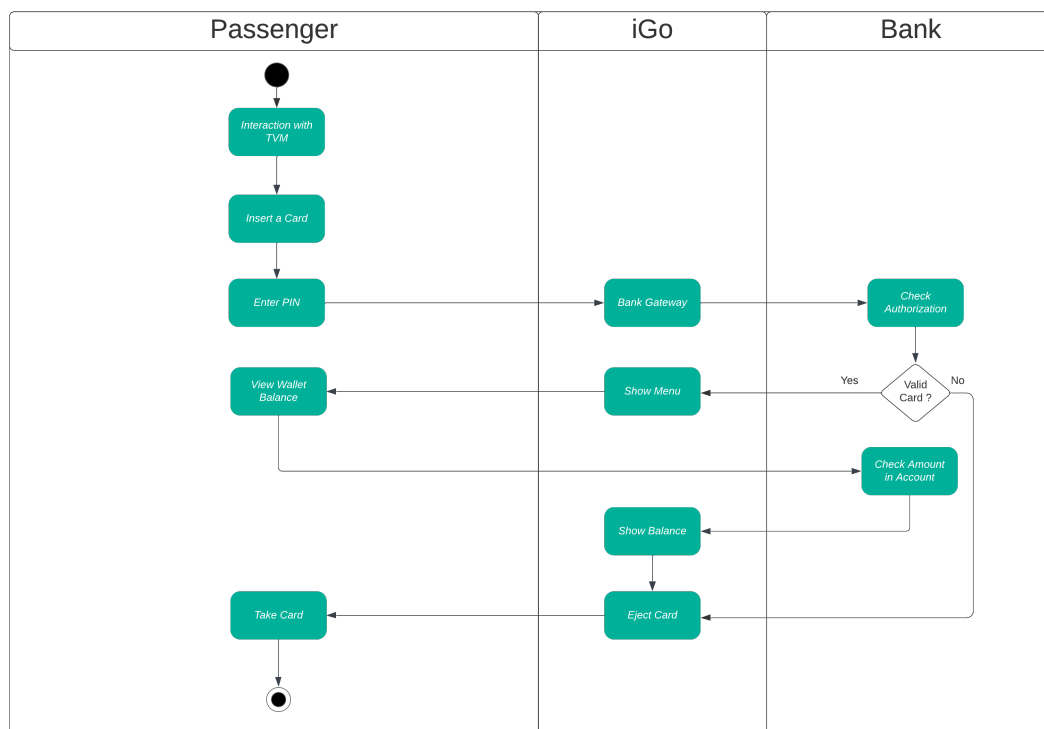

Figure 5.1: UML Activity Diagram : View Wallet Balance

This activity diagram shows how to examine an access card's remaining balance. The process begins by asking the user to insert the card and then enter a PIN. After that, the control travels to the bank gateway to verify the authorization; if it is successful, the balance is displayed; otherwise, the user is prompted to eject the card.
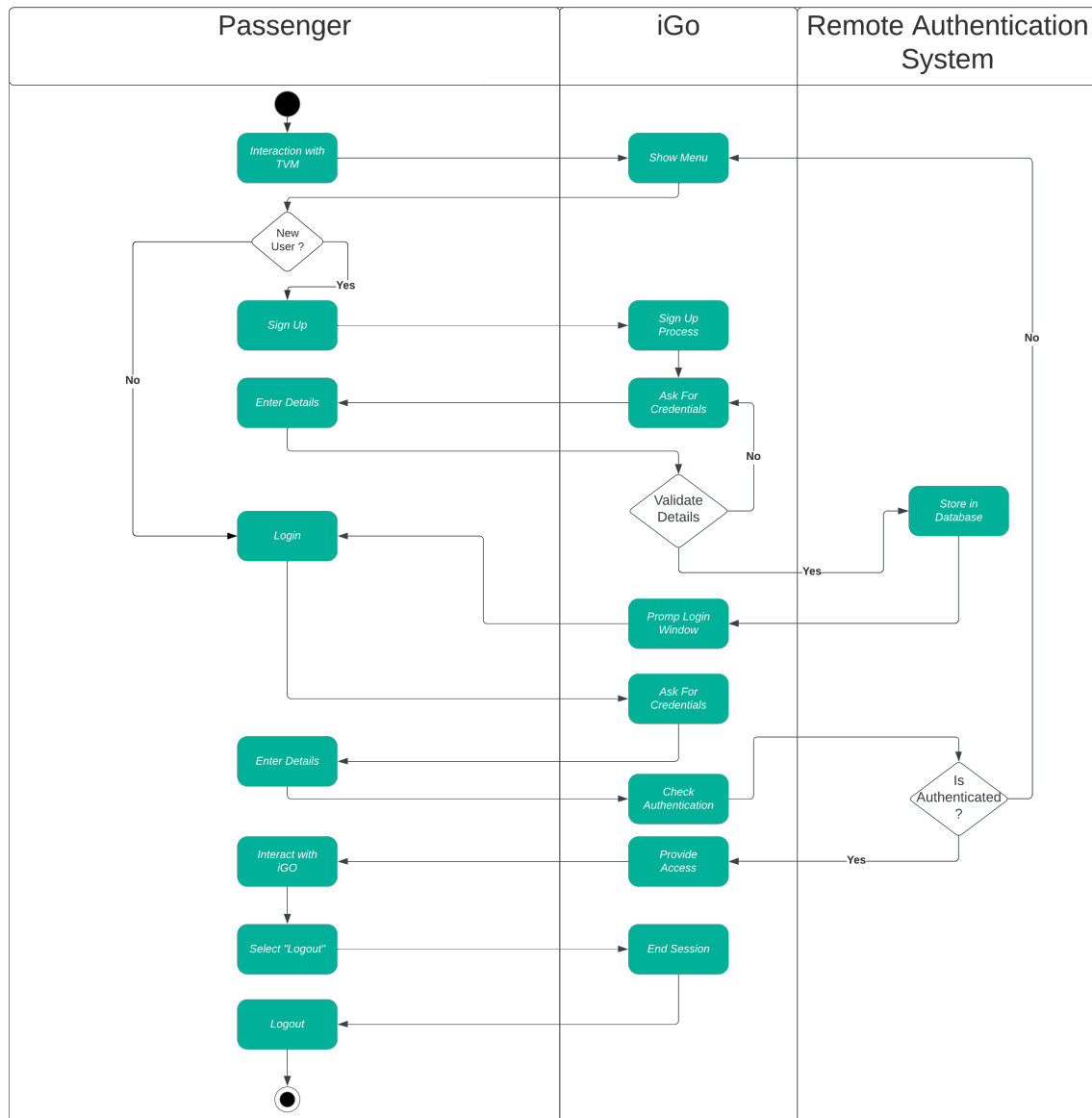
Figure 5.2: UML Activity Diagram : Login/SignUp Process
This activity diagram shows how a user logs in and registers. In both circumstances, the
user's information is verified. If the person is inexperienced, it asks them to complete the
sign-up process. The information is subsequently authenticated using a remote authentication
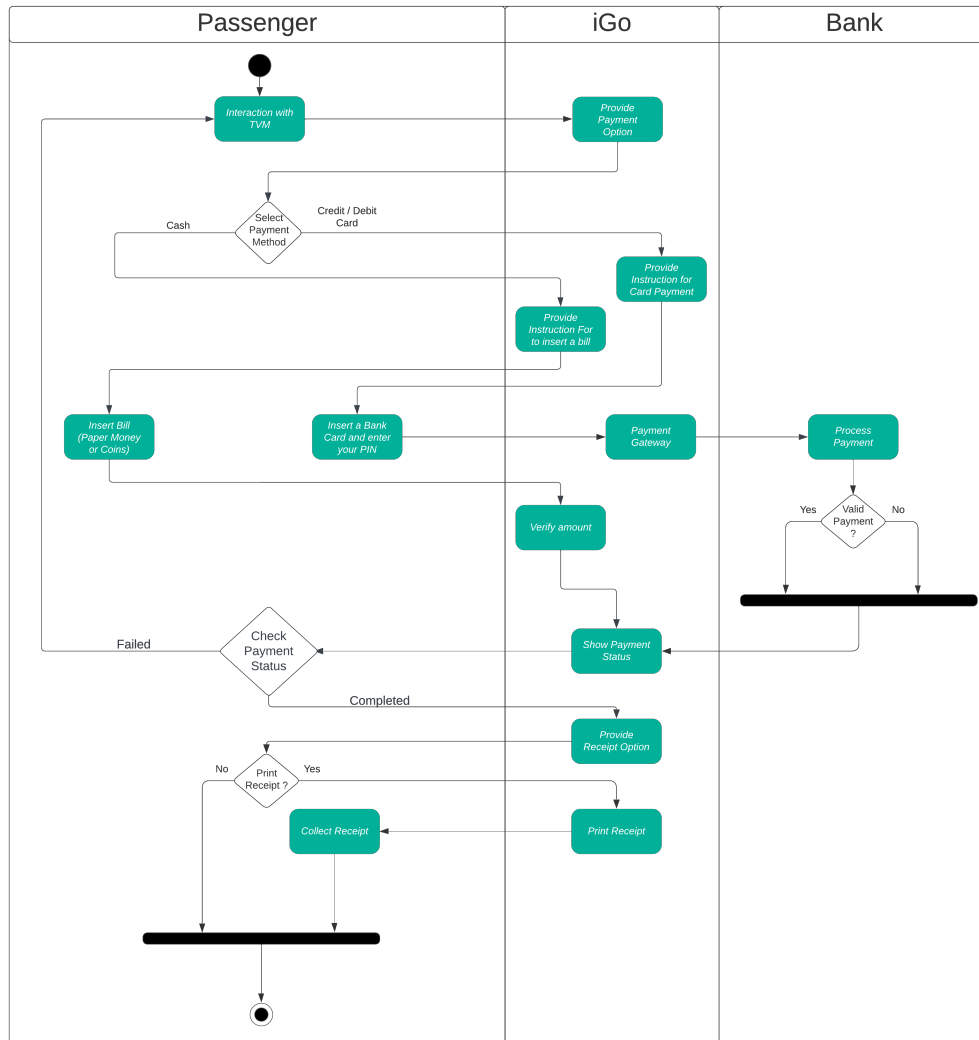mechanism, and if it is successful, the system can continue processing.

Figure 5.3: UML Activity Diagram : Payment Method

The use case scenario for two payment methods—cash and credit/debit card—is shown in this activity diagram. Following the selection of the selected choice, the system displays the appropriate payment instructions before passing control to the payment gateway to verify the payment, if made with a debit or credit card, or to authenticate it if made with cash. After showing the payment status, a prompt to print a receipt is displayed to the user.
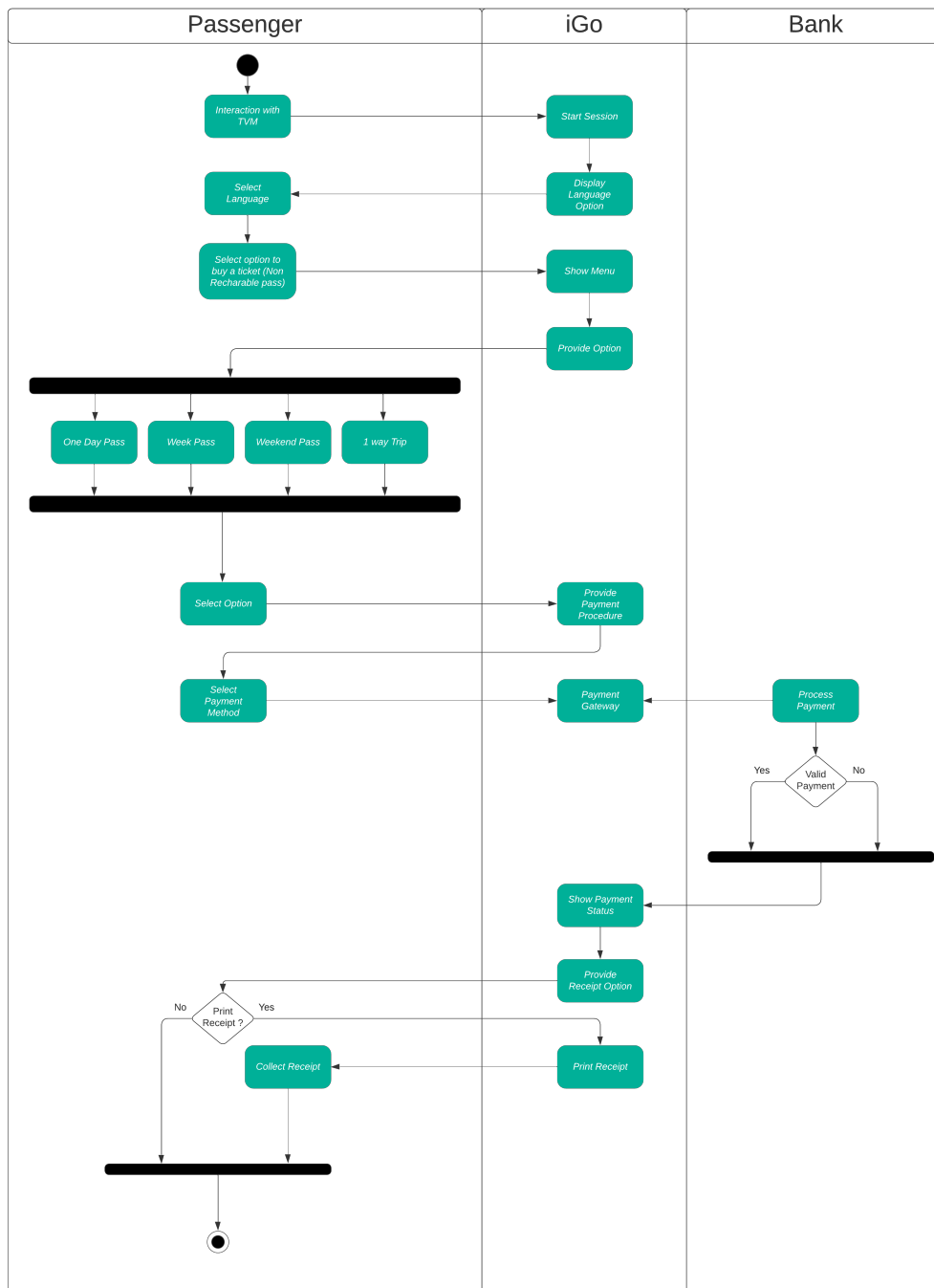
Figure 5.4: UML Activity Diagram : Ticket Purchasing
The use case scenario of buying a ticket is illustrated in this activity diagram. It begins by asking the user to choose the option to purchase a ticket, after which a menu is displayed. After choosing an option, the user is then prompted to print a receipt before the control moves to the payment gateway and the payment process is authenticated.
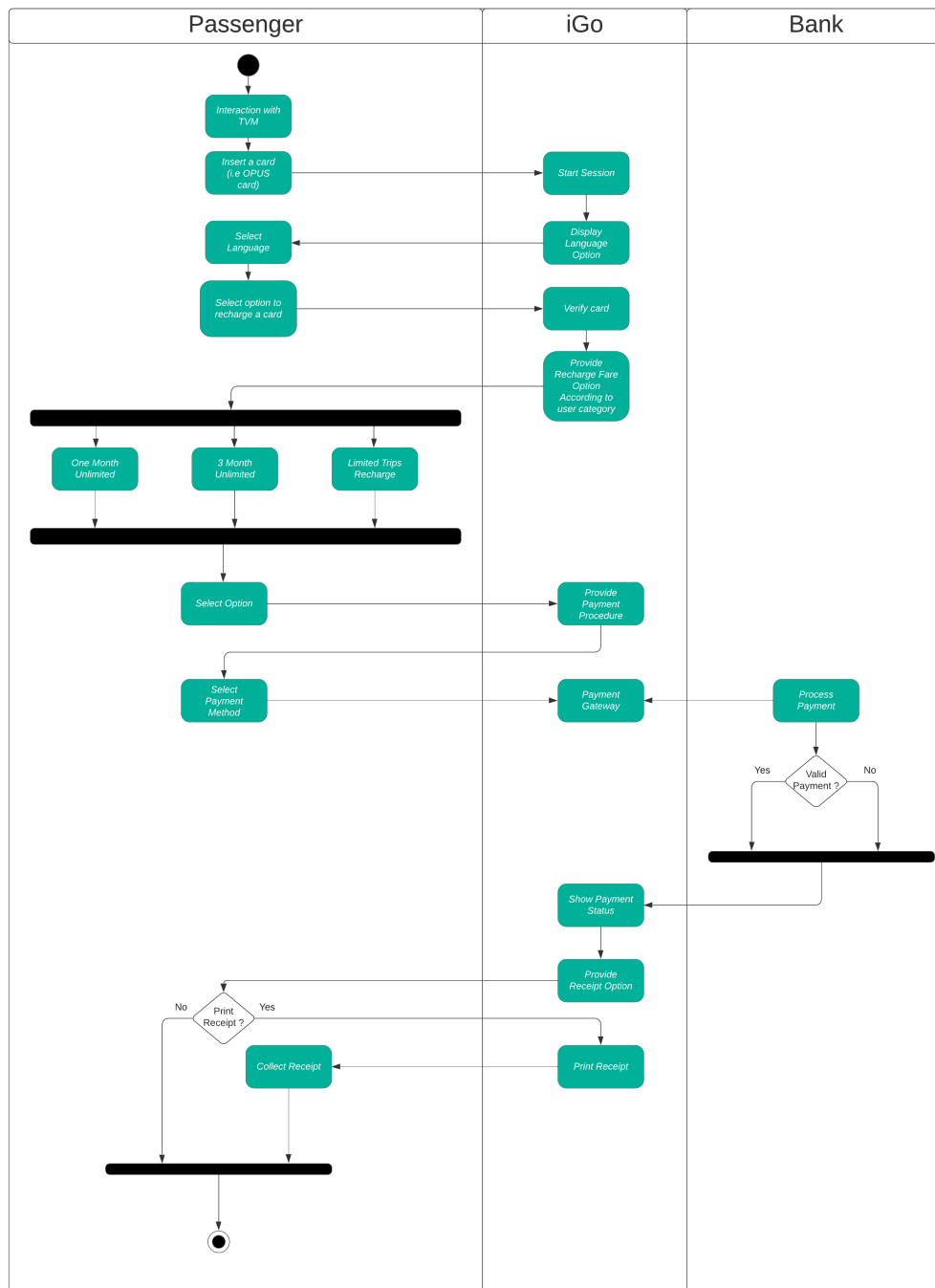
Figure 5.5: UML Activity Diagram : Recharge a Card
This activity diagram illustrates the use case scenario of recharge an accsess card. It begins by requesting the user to enter their access card, then presents them with a variety of menu alternatives. When the payment is authenticated by the payment gateway, the user is prompted to print the receipt.
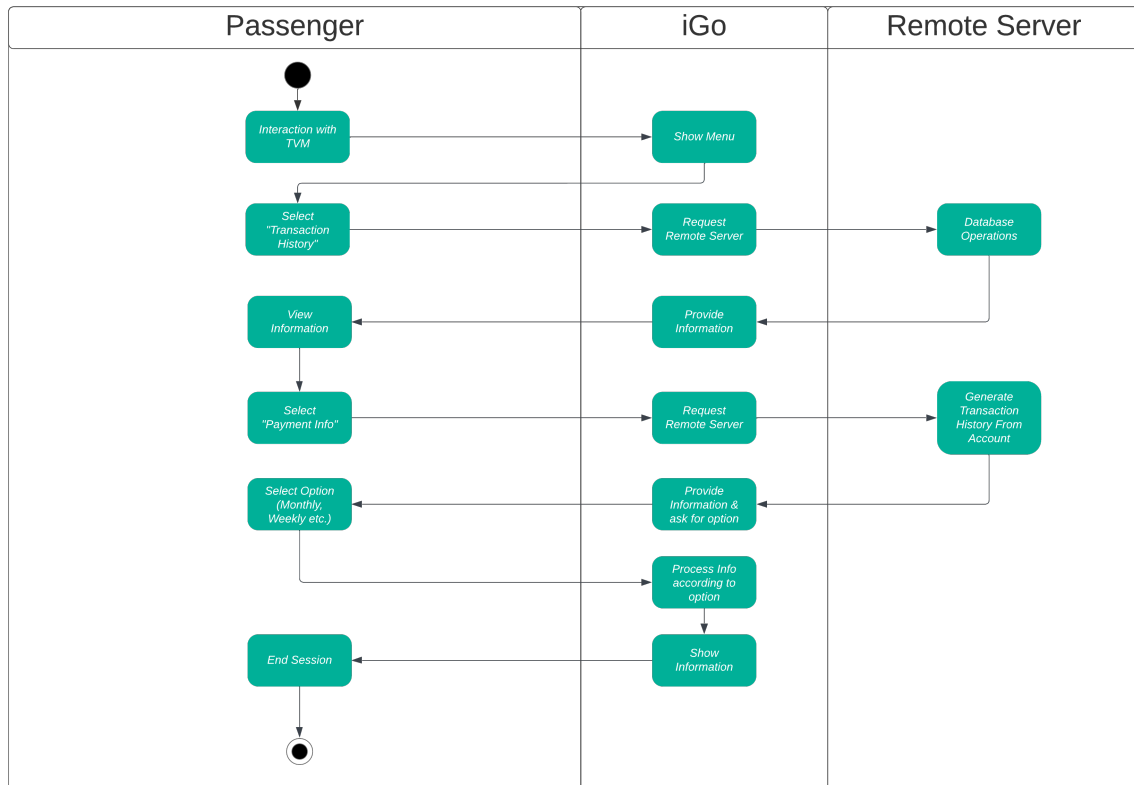
Figure 5.6: UML Activity Diagram : View Transaction History
This activity diagram shows the use case scenario for transaction history viewing. If the user chooses the option for transaction history after the options are displayed, a request for information is sent to a remote server. The requested information is displayed if the user chooses Payment Details.

Glossary

- iGo - iGo The online Ticket Vending Machine Web Application.

- Positive Stakeholder- Stakeholder who wishes to make a constructive contribution to the project.

- Negative Stakeholder- Stakeholder who intends to hurt the project or make a negative contribution.

- OPUS - The STM travelling card known as OPUS, which is produced and distributed by STM agencies, is used by passengers to travel by the STM metro.

- TVM - Ticket Vending Machine

- STM - Société de transport de Montréal public transportation company.

Tools Used

- Overleaf

- Xmind

- LucidChart

- GitHub

- Google drive

References

1. PANKAJ KAMTHAN (2023) "Brainstorming and Mind mapping "

2. PANKAJ KAMTHAN (2023) "Introduction to Diagramming"

3. PANKAJ KAMTHAN (2023) "Introduction to Interviews"

4. PANKAJ KAMTHAN (2023) "Introduction To Domain Modeling"

5. PANKAJ KAMTHAN (2023) "Introduction To Use Case Modeling"

6. `https://www.lucidchart.com/pages/uml-activity-diagram`

7. `http://www.stm.info/en`

Appendix

Interview Questions
Interview 1 link

Date – 28th February,2023, 5:45 PM

Interviewers – Mahavir, Krishna

Interviewee – Sharad Patel

Q1. - Have you ever used the TVM before? (Yes or no)

Ans – Yes

Q2. – Have you ever used any public transportation? If yes, how often do you use public transportation?

Ans – Yes, Everyday

Q3. – Which kind of public transportation you have used the most? (Metro, Bus, or Both)

Ans – Both

Q4. – Have you used any TVM at public transportation? (Yes or no)

Ans – Yes

Q5. – Did you faced any difficulties using the any TVM? (Yes or no)

Ans – Yes

Q6. – What kinds of difficulties you have faced when using the TVM for the first time?

Ans – System Error and if they make any changes in plans or something, like recently they divided Montreal in three zones and they have changed their monthly or weekly plans for different zones.

Q7. – How difficult is to use TVM on a scale 1 to 10 for the first time?

Ans – 4

Q8. – Did you need any guidance when you first encountered the TVM at public transportation? if yes what kind of feasible solution helps to mitigate these problems?

Ans – no

Q9. – Where do you find the TVM at public transportation? like for at bus station or metro station.

Ans – Metro station

Q10. – which place do you think is more accessible for the TVM? (Inside the station or outside the station) and why?

Ans – Inside the station because of long que and weather outside the station

Q11. – have you ever found any differently abled person to use the TVM? (Yes or no)

Ans – yes

Q12. – How difficult is to use current TVM for the differently abled person on a scale 1 to 10?

Ans – 8

Q13. – what kind of feasible solution do you think helps to ease the process at TVM for differently abled people?

Ans – Long que and waiting time.

Q14. – How many TVMs do you usually finds at any station?

Ans – One

Q15. – do you find any scenario where the TVM was not working at any station?

Ans – Yes, many times

Q16 – how many TVMs do you think are required for any metro station? and why?

Ans – At least five because of long waiting time

Q17. – what do you prefer from rechargeable card or non-rechargeable ticket or pass?

Ans – Rechargeable card

Q18. – does the current TVM support both types of passes like rechargeable card or non-rechargeable card?

Ans – yes

Q19. – What is the process to get the rechargeable card?

Ans – Go to the transport office and they will provide one after identity verification.

Q20. - Do you want to add functionality to the current TVM like to get the rechargeable card from the TVM itself? (Yes or no)

Ans – yes

Q21. – what kinds of passes or non-rechargeable tickets do you mostly purchase? (Daily, Weekly, 1 day, 3-day, Unlimited evening)

Ans – monthly

Q22. – which kind of interface do you prefer? (Digital or physical (Mechanical) interface)

Ans – digital

Q23. – when you have to recharge a card? and usually what kind of fare-option do you select when you are recharging your card? (Monthly, 3-monthly, etc)

Ans – monthly

Q24. – which type of payment do use the most? (Cash or Card)

Ans – card

Q25. – which kind of payment receipt do you prefer the most? (Paper-receipt or e-receipt)

Ans – e-receipt

Q26. – what additional payment option (like apple-pay) do you think can be added to current metro station? and why?

Ans – Apply pay and google pay.

Q27. – do you think instead of buying the rechargeable card like OPUS is more convenient rather than to use a digital card like you have in your digital wallet in the smart-phone?

Ans – Digital wallet card

Q28. – which kind pf the payment process do you think is more convenient for you? (Manually or automatic)?

Ans – manually

Q29. – do you want to add the pre-authorised recharge payment option to your OPUS card?

Ans – no

Q30. – Do have any other suggestion which you would like to have at the current TVMs at the metro stations?

Ans – Digital wallet card and apple pay.

Interview 2 link

Date – 26th February,2023, 3:41 PM

Interviewers – Mahavir, Krishna

Interviewee – Kartik Faldu

Q1. - Have you ever used the TVM before? (Yes or no)

Ans – Yes

Q2. – Have you ever used any public transportation? if yes, how often do you use public transportation?

Ans – Yes, Everyday

Q3. – Which kind of public transportation you have used the most? (Metro, Bus, or Both)

Ans – Both

Q4. – Have you used any TVM at public transportation? (Yes or no)

Ans – Yes

Q5. – Did you faced any difficulties using the any TVM? (Yes or no)

Ans – Yes, Sometimes

Q6. – What kinds of difficulties you have faced when using the TVM for the first time?

Ans – After providing money sometimes ticket doesn't come out.

Q7. – How difficult is to use TVM on a scale 1 to 10 for the first time?

Ans – 7

Q8. – Did you need any guidance when you first encountered the TVM at public transportation? if yes what kind of feasible solution helps to mitigate these problems?

Ans – no

Q9. – Where do you find the TVM at public transportation? like for at bus station or metro station.

Ans – Metro station

Q10. – which place do you think is more accessible for the TVM? (Inside the station or outside the station) and why?

Ans – Inside the station because of harsh weather in Canada

Q11. – have you ever found any differently abled person to use the TVM? (Yes or no)

Ans – No

Q12. – How difficult is to use current TVM for the differently abled person on a scale 1 to 10?

Ans – 8

Q13. – what kinds of feasible solution do you think helps to ease the process at TVM for differently abled people?

Ans – For blind people they can provide plates for direction of use.

Q14. – How many TVMs do you usually finds at any station?

Ans – Two

Q15. – do you find any scenario where the TVM was not working at any station?

Ans – No

Q16 – how many TVMs do you think are required for any metro station? and why?

Ans – Two is enough because of the availability of staff at the service desk.

Q17. – what do you prefer from rechargeable card or non-rechargeable ticket or pass?

Ans – Rechargeable card

Q18. – does the current TVM support both types of passes like rechargeable card or non-rechargeable card?

Ans – yes

Q19. – What is the process to get the rechargeable card?

Ans – visit the STM centre and pay deposit they will provide card after identity verification.

Q20. - Do you want to add functionality to the current TVM like to get the rechargeable card from the TVM itself? (Yes or no)

Ans – yes

Q21. – what kinds of passes or non-rechargeable tickets do you mostly purchase? (Daily, Weekly, 1 day, 3-day, Unlimited evening)

Ans – unlimited evening

Q22. – which kind of interface do you prefer? (Digital or physical (Mechanical) interface)

Ans – both

Q23. – when you have to recharge a card? and usually what kind of fare-option do you select when you are recharging your card? (Monthly, 3-monthly, etc)

Ans – monthly

Q24. – which type of payment do use the most? (Cash or Card)

Ans – card

Q25. – which kind of payment receipt do you prefer the most? (Paper-receipt or e-receipt)

Ans – e-receipt

Q26. – what additional payment option (like apple-pay) do you think can be added to current metro station? and why?

Ans – Apply pay is good but it can be added as an alternative option

Q27. – do you think instead of buying the rechargeable card like OPUS is more convenient rather than to use a digital card like you have in your digital wallet in the smart-phone?

Ans – both digital wallet card and physical card

Q28. – which kind pf the payment process do you think is more convenient for you? (Manually or automatic)?

Ans – Automatic

Q29. – do you want to add the pre-authorised recharge payment option to your OPUS card?

Ans – yes

Q30. – Do have any other suggestion which you would like to have at the current TVMs at the metro stations?

Ans – No

Interview 3 link

Date – 26th February,2023, 4:21 PM

Interviewers – Mahavir, Krishna

Interviewee – Neha Deshmukh

Q1. - Have you ever used the TVM before? (Yes or no)

Ans – Yes

Q2. – Have you ever used any public transportation? if yes, how often do you use public transportation?

Ans – Yes, 4-5 times a week

Q3. – Which kind of public transportation you have used the most? (Metro, Bus, or Both)

Ans – Both

Q4. – Have you used any TVM at public transportation? (Yes or no)

Ans – Yes

Q5. – Did you faced any difficulties using the any TVM? (Yes or no)

Ans – No

Q6. – What kinds of difficulties you have faced when using the TVM for the first time?

Ans – language barrier

Q7. – How difficult is to use TVM on a scale 1 to 10 for the first time?

Ans – 6

Q8. – Did you need any guidance when you first encountered the TVM at public transportation? if yes what kind of feasible solution helps to mitigate these problems?

Ans – Yes

Q9. – Where do you find the TVM at public transportation? like for at bus station or metro station.

Ans – Metro station

Q10. – which place do you think is more accessible for the TVM? (Inside the station or outside

the station) and why?

Ans – Inside the station because of extreme weather conditions

Q11. – have you ever found any differently abled person to use the TVM? (Yes or no)

Ans – No

Q12. – How difficult is to use current TVM for the differently abled person on a scale 1 to 10?

Ans – 8

Q13. – what kinds of feasible solution do you think helps to ease the process at TVM for differently abled people?

Ans – Staff by the STM.

Q14. – How many TVMs do you usually finds at any station?

Ans – 2-3 for large station and 1 for small station

Q15. – do you find any scenario where the TVM was not working at any station?

Ans – No

Q16 – how many TVMs do you think are required for any metro station? and why?

Ans – 4

Q17. – what do you prefer from rechargeable card or non-rechargeable ticket or pass?

Ans – Rechargeable card

Q18. – does the current TVM support both types of passes like rechargeable card or non-rechargeable card?

Ans – yes

Q19. – What is the process to get the rechargeable card?

Ans – Registered yourself at STM office.

Q20. - Do you want to add functionality to the current TVM like to get the rechargeable card from the TVM itself? (Yes or no)

Ans – yes

Q21. – what kinds of passes or non-rechargeable tickets do you mostly purchase? (Daily, Weekly, 1 day, 3-day, Unlimited evening)

Ans – weekly

Q22. – which kind of interface do you prefer? (Digital or physical (Mechanical) interface)

Ans – Digital

Q23. – when you have to recharge a card? and usually what kind of fare-option do you select when you are recharging your card? (Monthly, 3-monthly, etc)

Ans – Monthly

Q24. – which type of payment do use the most? (Cash or Card)

Ans – Card

Q25. – which kind of payment receipt do you prefer the most? (Paper-receipt or e-receipt)

Ans – e-receipt

Q26. – what additional payment option (like apple-pay) do you think can be added to current metro station? and why?

Ans – yes it would be awesome.

Q27. – do you think instead of buying the rechargeable card like OPUS is more convenient rather than to use a digital card like you have in your digital wallet in the smart-phone?

Ans – digital wallet card would be best.

Q28. – which kind pf the payment process do you think is more convenient for you? (Manually or automatic)?

Ans – Manually

Q29. – do you want to add the pre-authorised recharge payment option to your OPUS card?

Ans – yes

Q30. – Do have any other suggestion which you would like to have at the current TVMs at the

metro stations?
Ans – Apple Pay

Interview 4 link
Date – 27th February,2023, 11:38 PM
Interviewers – Mahavir, Krishna
Interviewee – Vishnu
Q1. - Have you ever used the TVM before? (Yes or no)
Ans – Yes
Q2. – Have you ever used any public transportation? if yes, how often do you use public transportation?
Ans – Yes, Often
Q3. – Which kind of public transportation you have used the most? (Metro, Bus, or Both)
Ans – Both
Q4. – Have you used any TVM at public transportation? (Yes or no)
Ans – Yes
Q5. – Did you faced any difficulties using the any TVM? (Yes or no)
Ans – Yes, Sometimes
Q6. – What kinds of difficulties you have faced when using the TVM for the first time?
Ans – understanding the buttons.
Q7. – How difficult is to use TVM on a scale 1 to 10 for the first time?
Ans – 2
Q8. – Did you need any guidance when you first encountered the TVM at public transportation? if yes what kind of feasible solution helps to mitigate these problems?
Ans – Yes, need a staff near the machine
Q9. – Where do you find the TVM at public transportation? like for at bus station or metro station.
Ans – Metro station
Q10. – which place do you think is more accessible for the TVM? (Inside the station or outside the station) and why?
Ans – Inside the station
Q11. – have you ever found any differently abled person to use the TVM? (Yes or no)
Ans – No
Q12. – How difficult is to use current TVM for the differently abled person on a scale 1 to 10?
Ans – 7
Q13. – what kinds of feasible solution do you think helps to ease the process at TVM for differently abled people?
Ans – height of the TVM machine
Q14. – How many TVMs do you usually finds at any station?
Ans – Two
Q15. – do you find any scenario where the TVM was not working at any station?
Ans – No
Q16 – how many TVMs do you think are required for any metro station? and why?
Ans – 3
Q17. – what do you prefer from rechargeable card or non-rechargeable ticket or pass?
Ans – Rechargeable card
Q18. – does the current TVM support both types of passes like rechargeable card or non-rechargeable card?
Ans – yes

Q19. – What is the process to get the rechargeable card?

Ans – Nearest STM office.

Q20. - Do you want to add functionality to the current TVM like to get the rechargeable card from the TVM itself? (Yes or no)

Ans – yes

Q21. – what kinds of passes or non-rechargeable tickets do you mostly purchase? (Daily, Weekly, 1 day, 3-day, Unlimited evening)

Ans – depends on occasion.

Q22. – which kind of interface do you prefer? (Digital or physical (Mechanical) interface)

Ans – Digital

Q23. – when you have to recharge a card? and usually what kind of fare-option do you select when you are recharging your card? (Monthly, 3-monthly, etc)

Ans – monthly

Q24. – which type of payment do use the most? (Cash or Card)

Ans – card

Q25. – which kind of payment receipt do you prefer the most? (Paper-receipt or e-receipt)

Ans – e-receipt

Q26. – what additional payment option (like apple-pay) do you think can be added to current metro station? and why?

Ans – Don't think that's required.

Q27. – do you think instead of buying the rechargeable card like OPUS is more convenient rather than to use a digital card like you have in your digital wallet in the smart-phone?

Ans – digital wallet card would be good.

Q28. – which kind pf the payment process do you think is more convenient for you? (Manually or automatic)?

Ans – Manually

Q29. – do you want to add the pre-authorised recharge payment option to your OPUS card?

Ans – yes

Q30. – Do have any other suggestion which you would like to have at the current TVMs at the metro stations?

Ans – If the put the whole system online rather than the TVM machine