

CONCORDIA UNIVERSITY

SOEN 6481 - SOFTWARE SYSTEM REQUIREMENT
SPECIFICATION

Ticket Vending Machine

iGo

Deliverable 2

Team C

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Google Drive - <https://drive.google.com/drive/folders/1vEFxx7GrXZmW6P5igyta-238Bn9SCu1t?usp=sharing>

GitHub - <https://github.com/Surya64/SOEN-6481-SRS>

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1 User Stories

1.1 Description

We have aimed to elicit the user stories for iGo TVM which describes the requirement of the software system. The Quality of user stories are considered to be the driving factor for the software system as it describes the functionality of the system. The user stories are free from technical terminologies making it easily understand.

The user stories maintains the same theme and consistence. It contains meta information like identifier which are unique and look like TVM_TC_00X, name and individual constraint. We have prioritized the user stories based on high - medium - low which assists to choose the most important features what has to be dealt first as per the business value.

Some User stories are elicited from different types of users and each related to particular persona.

Type of User	Related Persona
Minor (12-19 years)	Janhavi W
Student	Maria Henry
Working Professional	Frederick James
Senior	Peter Hasting
Disabilities	Andrew Bond

Below are the some of the global constraints related to TVM product quality concerns.

- Maintainability specific: The TVM software is developed following all the coding standards namely,
 - consistent and proper use of code layout
 - Naming Conventions
 - Presence of comments to describe the functionality

- Security-specific: The Communication from TVM to server are protected end to end with data encryption.
- Sustainability-specific: the software is developed such that it consume low power and system goes on power saver mode whenever the system is idle
- Usability-specific:
 - The software involves few navigation and easily recognizable and understandable design features.
 - The Audio assistance volume can be varied to limit where it can heard up to 5m radius
- Accessibility-specific: the TVM is basically installed near the Metro station and screens at the position such that it can be accessible to disabled person.

Other each local individual constraints for a user stories are mentioned in the user story template.

The User stories are estimated using the planning poker technique and story points are assumed as per the Table 1.





Type of Complexity	Fibonacci Series(Story Point)
Extremely trivial	1
Trivial	2
Slightly Complex	3
Complex	5
Very Complex	8
Too Complex(Can't fix in Project Timeline)	13

Table 1: User Story Estimation Based on Complexity





1.2 Persona





 PICTURE & NAME	 DETAILS	 GOAL
 <p>Andrew Bond Age Group : 21-26</p>	<p>Andrew is a young boy pursuing his undergraduate in Fine Arts & Music. He's a jazz pianist. Andrew met with an accident when he was 8 and unfortunately his eyes were damaged. He is partially visually impaired, although he doesn't like to be sad about it. He's quite motivated and very enthusiastic towards his career. He has won several awards in Music. He's currently associated with a Jazz band too. He likes to be surrounded with good people. Andrew lives near Jacques Cartier bridge right beside Papineau metro Station. He generally travels from school to home and vice-versa. He is very comfortable using public transit because he generally gets assistance from the people around travelling on public transit. People help him giving ways and guiding to train seats. He uses a monthly smart card which allows him a student discount on it. He says travelling is the best time because he can listen to music and sometimes it encourages him to compose some new tunes as well.</p>	<ul style="list-style-type: none"> - As a partially visually impaired user, Andrew takes assistance of passenger care cabins placed near the metro stations where in he can communicate with a real person and get his monthly transit card renewed. - Andrew would like to experience TVM with audio assistance. - He would like to stay updated with the transit fare promotions.





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 PICTURE & NAME	 DETAILS	 GOAL
 <p>Peter Hastings Age Group: 55-60</p>	<p>He is 58 years old and recently retired as safety consultant. He is born and raised in Canada. He enjoys doing gardening and other household activities. He uses bus to go around the city for groceries and movies. He says that he uses public transportation more often than his car as its eco friendly and he feels it easy considering the difficulties involved in finding parking. He claims to have difficulties in remembering things so he would like to receive all his transactions via email so he can keep track. He finds it difficult to wait in long queues to recharge the card every month.</p>	<ul style="list-style-type: none"> -He would like to purchase ticket quickly without having to wait in long queues. -He would like to get his receipt via email. -He wants to purchase the ticket using audio assistance. - Peter would like to know about the promotions and discounts offered in December for Christmas and New Year.

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 PICTURE & NAME	 DETAILS	 GOAL
 <p>Maria Henry Age Group: 20-25</p>	<ul style="list-style-type: none"> - She is a 23 year old, female who is pursuing her masters in Mc Gill University. - She stays on the outskirts of city and she depends on public transportation for travelling. - She is young, motivated individual who likes to change the world by being eco friendly. - She is a person who always says think before you print. -Maria likes to travel using public transport preferably metro and bus as she doesn't have a car. - She travels regularly on weekdays to attend school and occasionally on weekends to attend parties, - She likes to plan her budget correctly and save even small amount of money for her future. 	<ul style="list-style-type: none"> - She wants to buy tickets efficiently and quickly with less navigation - She wants to be able to identify content easily. - Prefer to receive promotional discounts ads during the purchase. - She likes to complete her payment transaction quickly using an interac method as she doesn't like to stand in a long queue to purchase ticket. - Prefer to receive the transaction receipt through email.

 PICTURE & NAME	 DETAILS	 GOAL
 <p>Frederick James Prinze Jr.</p> <p>Age Group : 27-32</p>	<p>Fred is a young professional who commutes to work every day from downtown Montreal to Cote Vertu. On an average day, Fred leaves home at 7.50AM to arrive to the metro before rush hour peak time, and reaches his destination station by 8.20AM. He always ensures to renew his monthly pass ahead of time, but on some occasions, Fred forgets to do so and has to stand in line for a long time on the first day of the month when everyone else is also trying to do the same.</p> <p>Fred has been looking into buying a used car as an alternative means of transportation, but with his company Summer's new incentives to subsidise transportation fees, he is less encouraged to do so. It is worth noting that Fred's favourite part about commuting by metro is being able to read his favorite fiction novels freely. Despite the surrounding noise, he is able to immerse himself in a separate universe altogether and truly experience the book he's reading. Having this active "breather" yet productive activity to start the day with allows him to thrive in his job.</p>	<ul style="list-style-type: none"> - As a strictly anglophone user, Fred would like to be able to preview all available options in English - Fred would like proceed with TVM purchases quickly. He spends time waiting for the receipt to print only to end up recycling the paper later. It would be nice to save time and resources and have the details emailed to him instead. - Fred would like the ability to "add to cart" multiple types of fares, not just the monthly pass and checkout everything in a single transaction. That is mainly because on some days, Fred likes to purchase a few "single pass" and have them as backup alongside his monthly pass.

 PICTURE & NAME	 DETAILS	 GOAL
 <p>Janhavi W. Age 17-21</p>	<ul style="list-style-type: none"> - Janhavi is a high school student. Her age is 20 years. She is using STM bus and metro service since 1.5 year and had a nice experience till now. - She daily uses STM metro for travelling to college and for attending her Tennis classes. - The best part Janhavi talks about commuting through STM metro and buses is that, she can study while travelling. It helps her during exam times a lot, that she can prepare herself till reaching to the destination. - The only disadvantage Janhavi talks about is during winter where suburbs of montreal metros are not covered and buses are super late sometimes which made her wait for for several hours. - Janhavi also shared experience during new year's eve, that the service will be available all night and super busy and sometimes they give offers like free tickets, free rides. 	<ul style="list-style-type: none"> - Being a student, Janhavi does payment by cash for his OPUS recharge. And her main concern is to get a cash back when more amount is inserted into the TVM. - Janhavi likes to receive discounts during festive times. - Janhavi would like to receive email of the receipt instead of printing it on paper. Because she doesn't like wasting paper and also when people sometimes throw those receipts on station itself.

1.3 List of User Stories

ID	TVM_TC_001
Name	Select Available Fares
Statement	As : A user(Maria) I want : be able to list all options in terms of available fares So that: I can select the pertinent option.
Constraints	1. User can select only one option in the available fare types
Priority	Medium
Estimation	2 Story Points
Acceptance Test	1. The User inserts the iGo card in the TVM. 2. Once, the card is authenticated and validated, the system should display a button to redirect to all the fare options. 3. On selection of the button, the available fare options should be displayed with respect to the iGo card inserted by the User.

ID	TVM_TC_002
Name	Select Preferred Language
Statement	As: A user(Frederick) I want: to change system language So that: I can understand my options.
Constraints	The User does not have an option to select a language other than English/French.
Priority	Medium
Estimation	1 Story Points
Acceptance Test	1. The system should display options in English by default. 2. On selection of a preferred language, the options should be displayed in English/French.

ID	TVM_TC_003
Name	Summary of Ticket Purchase
Statement	As : A user(Maria) I want : to see the summary of my purchase before finalizing So that: I can confirm correctness.
Constraints	1.The user should select atleast one fare to display the summary.
Priority	Medium
Estimation	1 Story Points
Acceptance Test	1. The system should display the summary before directing to payment. 2. The TVM should display the fare according to the quantity of fares user selected.

ID	TVM_TC_004
Name	Choose Payment using card (Debit/Credit/Interac)
Statement	As: A user(Frederick) I want: choose to make a payment by card (Interac /credit / debit) So that: I can conveniently pay and complete transaction
Constraints	1. Credit Cards accepted are only Master credit card and Visa credit card. 2. Debit Cards accepted are only those issued by Canadian Banks. 3. Cards should have an Interac functionality enabled. 4. The currency accepted is CAD only.
Priority	High
Estimation	8 Story Points
Acceptance Test	1. The User has selected either the tickets or the Smart card recharge option and is required to pay the corresponding fee. 2. The User selects card (credit/debit/Interac) as method of payment when prompted by TVM. 3. The card (credit/debit/Interac) inserted is valid. 4. The card (credit/debit) PIN entered is valid. 5. The payment transaction is validated, approved by the Bank gateway and received by the TVM

ID	TVM_TC_005
Name	Select Payment by Cash
Statement	As : A user(Janhavi) I want : to make a payment by cash So that: I can conveniently purchase the ticket.
Constraints	1. The User cannot insert other currencies apart from Canadian dollars. 2. The User cannot insert fake currency. 3. The User Should have enough money to complete the transaction
Priority	High
Estimation	5 Story Points
Acceptance Test	1. After the User has selected “Pay by Cash”, the system should show the amount due and accept Canadian currency only. 2. The User inserts the cash and TVM accepts the same. 3. After all the validations, TVM returns if there’s any cash back.

ID	TVM_TC_006
Name	Print Receipt of Ticket Purchase
Statement	As : A user(Peter) I want : to print receipt of my purchase So that: I can track my records.
Constraints	1.The user must complete ongoing transaction before requesting to print receipt. 2. TVM contains blank cards/papers to print the receipt
Priority	Medium
Estimation	2 Story Points
Acceptance Test	1. Once transaction completes, TVM will prompt option to user whether to print receipt or not. 2. If user selects to print the receipt detailing the transaction parameters as Data & Time, Ticket Type, Amount, Payment Mode 3. TVM must not print the receipt, if user select option as not to print the receipt.

ID	TVM_TC_007
Name	Enable audio assistance
Statement	As : A visually-impaired user(Andrew) I want : enable audio assistance So that: I can conveniently listen to and understand all my options
Constraints	1. Output audio from the physical TVM is tuned to an optimal volume which may be deemed low in a crowded public setting. 2. Audio sentences may not be rewound once they are said. 3. The voice assistant may not be able to adequately process voice input.
Priority	Medium
Estimation	5 Story Points
Acceptance Test	1. The User is able to request voice assistant and receive initial guidance. 2. The User hears and understands the response from the TVM. 3. The TVM hears and understands the requests from the user.

ID	TVM_TC_008
Name	System Maintenance
Statement	As : A System(TVM) Maintainer (Operator) I want : I want to be able to configure the system So that : TVM captures the latest fares and offered trips
Constraints	1. Maintainer must have access to secured storage areas of TVM wherein money, tickets and blank cards for printing receipts are stored. 2. Maintainer must have authority to power off the TVM
Priority	High
Estimation	5 Story Points
Acceptance Test	1. TVM must verify maintainers credentials/details before allowing access to secure storage area. 2. TVM must display the status, when maintainers completes loading of tickets, inserting blank cards for printing receipts, collecting money and configure changes

ID	TVM_TC_009
Name	Use invalid credit card
Statement	As: A bad user (Crook) I should not: use an invalid credit card to make a payment So that: I do not circumvent the security of the TVM.
Constraints	The User can use any credit card (stolen or not) so long as it is valid in terms of information and expiration date.
Priority	High
Estimation	8 Story Points
Acceptance Test	1. The system should validate payment method. 2. On insertion of an invalid credit card, the transaction should immediately be rejected.

ID	TVM_TC_010
Name	Manipulate the fares
Statement	As : A bad user (Crook) I want : should not be able to make config changes So that: it would impact the users and owners of the system.
Constraints	The user(bad) tries to use any credentials to login to the server without undergoing authentication.
Priority	High
Estimation	3 Story Points
Acceptance Test	1. TVM should not allow the hacker to change the fare details. 2.TVM should show error message when a hacker is trying to login to the server.

2 Traceability Matrix

The traceability matrix for user stories describes the tracing of every feature back to its associated requirement. It represents tracing each requirement back to its sources. Backward traceability also helps in verifying that the user stories are in scope with other requirement artifacts.

The Traceability Matrix for all user stories is presented in the table below.

User story ID	UseCase Model	Domain Model	User Story	Interview	Constraints
TVM_TC_001	✓			✓	
TVM_TC_002	✓	✓			
TVM_TC_003				✓	
TVM_TC_004	✓	✓		✓	
TVM_TC_005	✓	✓			
TVM_TC_006	✓	✓		✓	
TVM_TC_007	✓	✓		✓	
TVM_TC_008	✓				✓
TVM_TC_009	✓		✓		✓
TVM_TC_010	✓		✓		✓

3 Implementation of User Stories

As part of implementation to ensure the realizable of each user stories, each member implemented below user stories and tested for the acceptance criteria.

Source Code are available in the below path: https://drive.google.com/drive/folders/1E3WD97q2F1XtsizKSM72uXV-VEQ8B_Hn?usp=sharing

User Story ID	Implemented By
TVM_TC_009	Jatan Gohel
TVM_TC_002	Ghalia ElKerdi
TVM_TC_003	Surya Prakash
TVM_TC_004	Kundana Gangam
TVM_TC_005	Ashutosh Ramesh

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