Traverse Windsor

Project Proposal

University of Windsor

Table of Contents

Objective:

The purpose of this document is to define the objectives and requirements of the project into consideration. It focuses on our solution to promoting tourism and building a community in Windsor. From the technical aspect, this document will describe the functional and non-functional requirements of the project, the software development tools, the technical stack to be used in the development, and the technical constraints if any. From a business point of view, this document provides an analysis of the target audiences, market and cost analysis, provisional planning, and quality assurance plan during the development phase.

Authors:

Author Name	Author SID
Sarwat Til Vusqa	110037645
Anisha Gharat	110035491
Adhiraj Singh	110035454
Vishal Solanki	110060480
Rizvi Ahmed	110046863
Shoaib Ahmed	110055055
Ravleen Kaur	110058066
Purvesh Patel	110060353

Sent to:

Submitted To
Dr. Aznam Yacoub

ID : Project4
State : **Proposed**

1. PROJECT DESCRIPTION

1.1 Abstract

The Covid-19 pandemic has not only negatively affected the travel and tourism industry but has also taken away the sense of belonging to a community. This has hence been taken as a high priority issue to be resolved, now, that there has been ease in the pandemic restrictions. Addressing this need, a mobile-based solution has been proposed to facilitate the tourism industry and increase the engagement within the Windsor community. We have focused on all the high as well as the low priority features of our application supported by diagrams and models. The market and cost analysis were thoroughly conducted to deem our solution fit in the current scenario. Furthermore, we have devised a quality assurance plan to ensure our solution will be of utmost quality.

1.2 Introduction and Background

The recent coronavirus (Covid-19) has triggered a worldwide concern. It has harmed many industries. The pandemic has not only affected them economically but also politically and socially. There has been a halt in the strong historical growth in the travel and tourism industry amid the Covid-19 pandemic. With airplanes on the ground, hotels closed, and restrictions on international borders, travel and tourism became the most affected sectors in the world.

The city of Windsor has been an attractive tourist destination in Canada. However, sources cite "There is a gigantic, looming question mark hanging over summer tourism season in Windsor" [1]. There has been a halt in various social events across the city and the same continues with the extension of the stay-at-home orders in the province of Ontario.

However, the city is now working on economically boosting the tourism sector as the pandemic restrictions curb [2]. Keeping this in mind, a social and tourism-based solution can greatly help in the boost. A single medium to connect the residents of the city by joining multiple social events that would take place across the city could be truly beneficial. Tourists can benefit from the same medium if it provides them with a simplified and eye-catching way of navigating through the various places around.

Thus, in this digital era, we can help the tourism industry by attracting the local as well as international tourists in Windsor. One solution focused on building a cross-platform mobile application that would also help curb the social gap between the residents and allow a boost for tourism in Windsor.

1.3 Proposed Solution

To address the need of boosting tourism post pandemic, we are proposing a mobile application that will change the way we see city of Windsor. Developing a cross-platform application, we are ensuring that the complete population is the potential user base by deploying our application on both Android and iOS phones.
Our application, namely Traverse Windsor, will become the go-to app for all the residents as well as tourists in Windsor. To ensure this, we are providing a city exploration feature in Augmented Reality (AR) that also has an AR-based navigation system. Not only this, but once a user decides to visit a place, they will be able to see the events, if any, at that place as well. The events feature alone is a highly engaging addition to Traverse Windsor as it will allow certain (customer-chosen) organizations and individuals to post about events that they are hosting. These events would then be available to the masses and give them option to RSVP to the event. Through the addition of our events functionality, we are helping in rebuilding the community post pandemic.
Traverse Windsor also shows users a list of trending places, that are defined as trending by the people of Windsor themselves. This is achieved by giving the individuals a check-in option that they utilize when they visit a place. This helps our application keep track of places that are frequently visited and show the same to the users.

2. MARKET STUDY

2.1 Market Analysis

As part of our market analysis, we have engaged the people of Windsor in a short survey to assess the usage of our competing applications. You can find the survey here: *Google Form Survey*

2.1.1 Survey Results

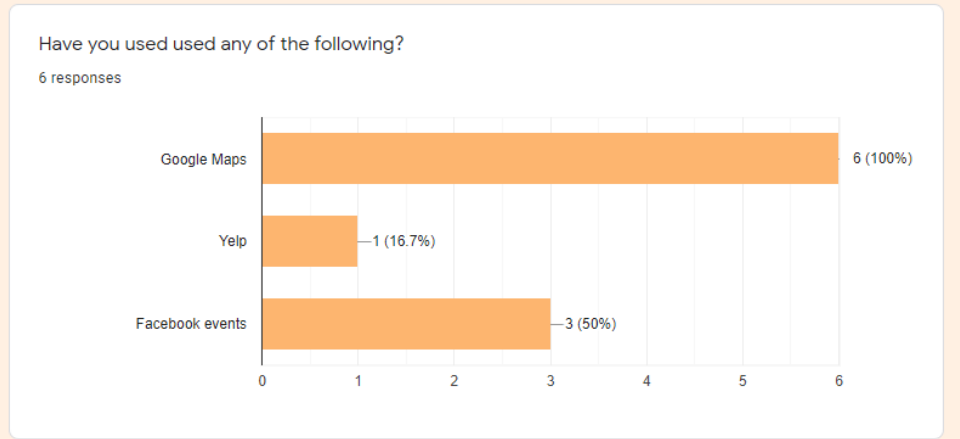


Fig 2.1.1

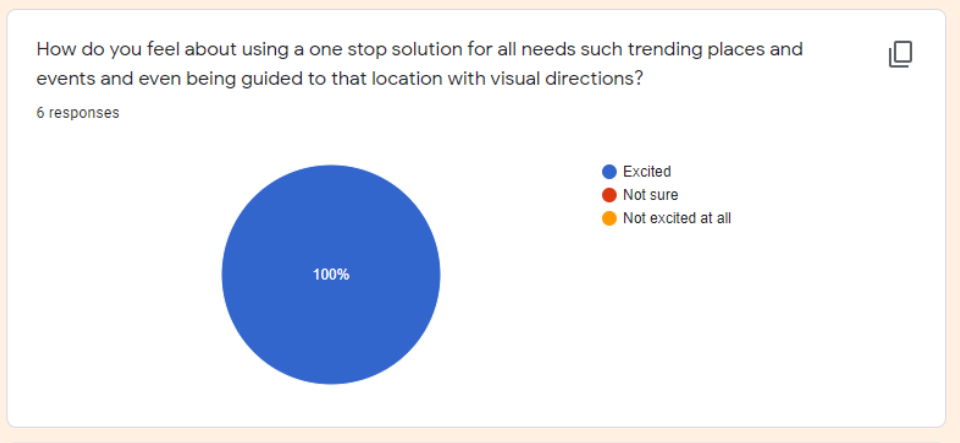


Fig 2.1.2

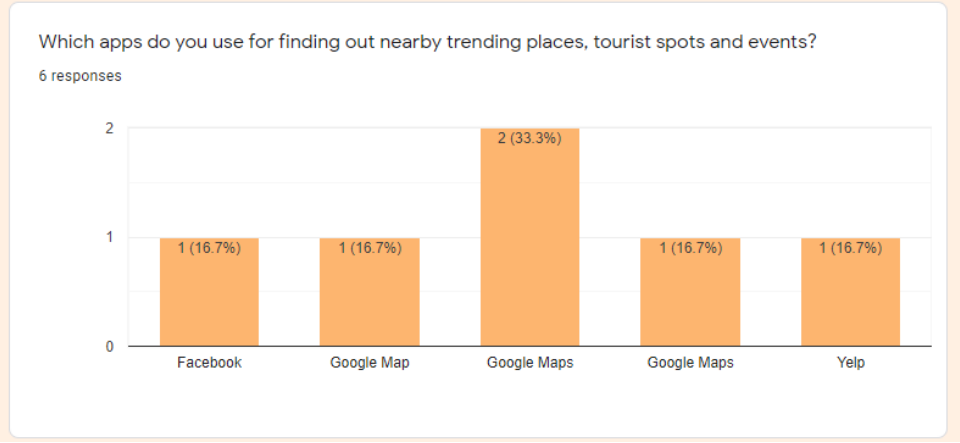


Fig 2.1.3

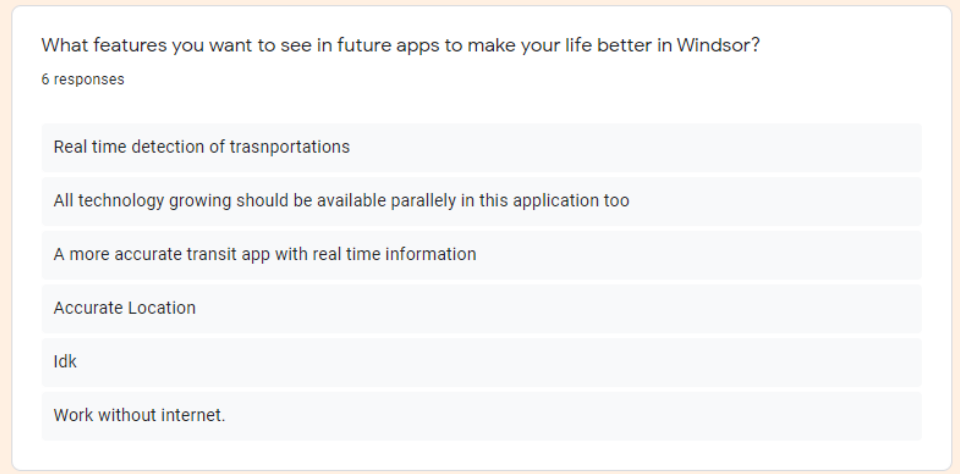


Fig 2.1.4

2.1.2 Trend Analysis

The below chart shows the trend of how the COVID-19 pandemic impacted the international tourism in the year 2020 [3].

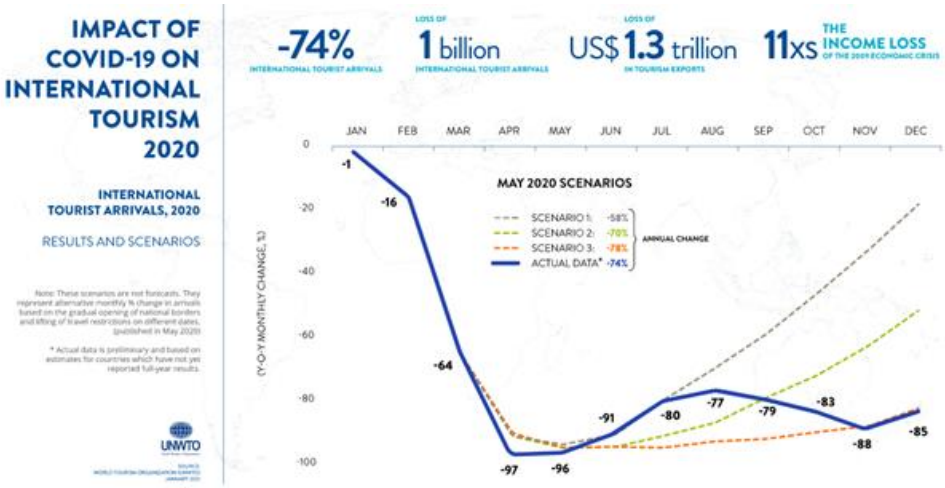


Fig 2.2.1

We can see a considerable drop from Jan 2020 to April 2020 and since then due to mutations in the covid-19 virus causing multiple waves in the country, the tourism industry has not been able to revive back but as the people are getting vaccinated the tourism industry is going to

boom back with more force than before as the people have been confined to their homes since more than a year and are eager to explore places.

We can see in the below chart that the international tourism industry graph is expected to move upwards from 2021 anticipating more tourists coming to Windsor to explore.

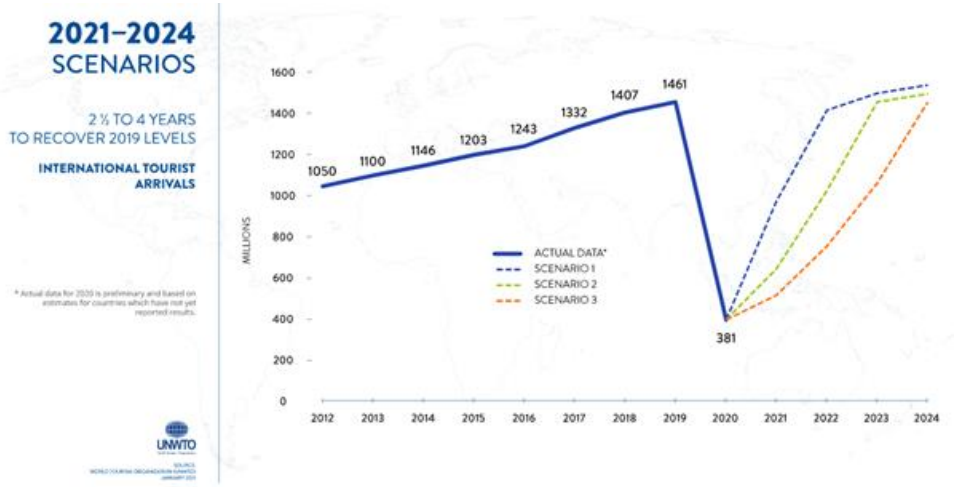


Fig 2.2.2

2.1.3 Unique Selling Point

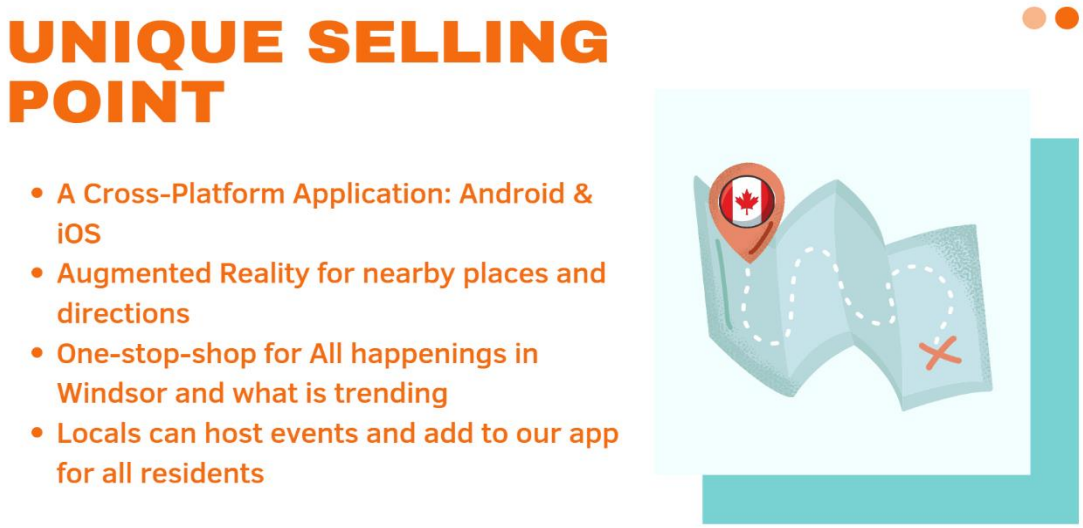


Fig 2.3.1

2.1.4 Market Analysis

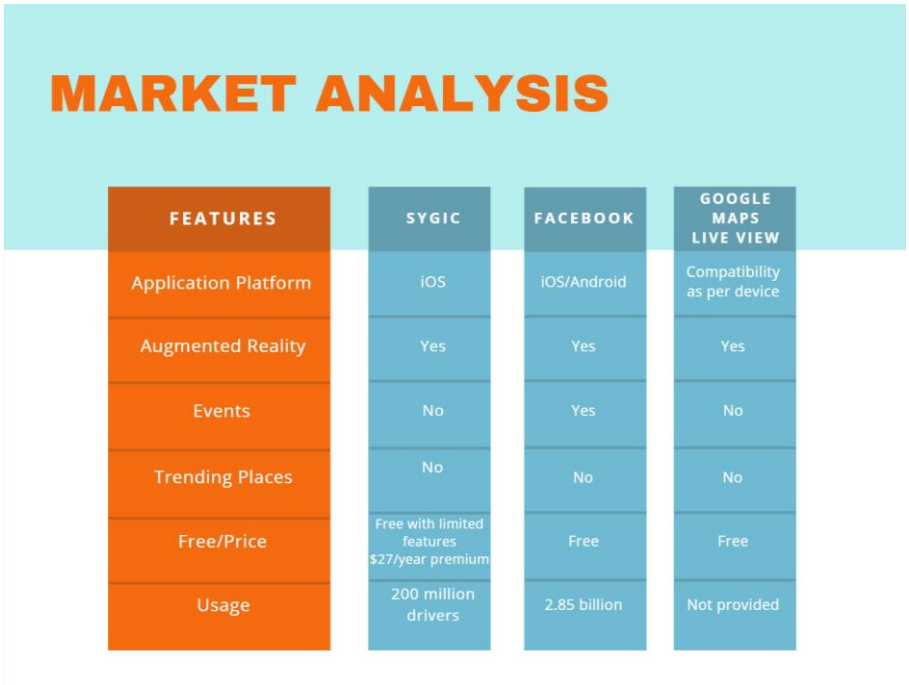


Fig 2.3.2

2.2 Marketing Strategies

- There are multiple Facebook and Instagram groups for promoting tourism in Windsor. Our app would be introduced to these groups and pages for the people to join and explore it. As more people start using the app, with word-of-mouth the news would spread across the city and hence, our app usage will increase.
- We are planning to reach out to bloggers and forum contributors to market our product. A lot of people follow travel related blogs and forums, so they are an ideal platform to publicize our application.
- Placing our app stickers on places like notice boards, that are publicly visible.

3. REQUIREMENTS ANALYSIS

3.1 Application Requirements

There are mainly two types of requirements:

3.1.1 Functional Requirements

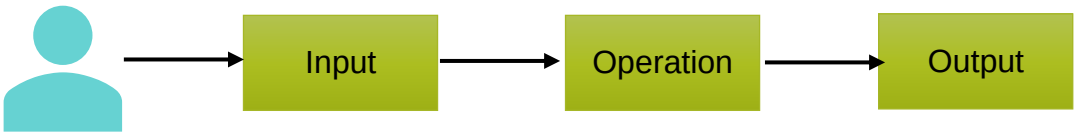


Fig 3.1.1

These are the requirements that the end-user specifically demands that the system should offer. These define a set of inputs given by the user to the system. The system then performs certain operational logic to deliver the final output to the users.

We have categorized our list of application features based on the priority:

High-priority Features

Feature Name	Feature Functionality
Home Page	1) The user is directed to this screen when he opens the application. • There are options to navigate to the other screens of the application. 2) The user can navigate to the following screens from here: • Explore Windsor • Trending • Events
Explore Windsor	*Hardware Component* Camera of the user's mobile 1) This feature pops up the various places (restaurants, tourist places, parks etc.) within the radius of the user's camera angle, on the screen of the user's mobile. 2) The user can get more information of a particular page along with the rating of the place. 3) User can check-in to a place if he decides to go to that place.

	4) The user can navigate to the following screens from here: • Navigation • Events (If any at the place)
Navigation	1) Allows the user to navigate to the desired place and defines the arrival time, distance to cover etc. 2) The user can check-in once he reaches the desired place.
Trending	1) Allows the user to view all the trending places based on the number of check-ins in that place.
Events	1) Allows the user to view upcoming events in the city. 2) The user can like the event or RSVP to the event. 3) The user can navigate to the following screen from here: • Add Event
Add Event	1) Only gives option to those who have admin code to post an event.

Table 3.1.1.1

Low-priority Features

Feature Name	Feature Functionality
Explore Indoors	The users can see pop-ups of places within any particular building which appear within the radius of their camera angle. Example: Pop-ups of sim, money exchange counters and restrooms at the airport.
Events Navigation	The user can view the event location on map and navigate to that event location
Trending Places Navigation	The user can navigate to the place of interest.
Reviews and Comments	The users can add comments and reviews to any particular place which will be visible to all the other users of the application.
User Registration	The users can register and create their account to log in into every time they use the application.
User Login	The user can log in with their credentials after registering in the application.
Social Platform	The users can interact with each other by sending messages etc.

Table 3.1.1.2

3.1.2 Non - Functional Requirements

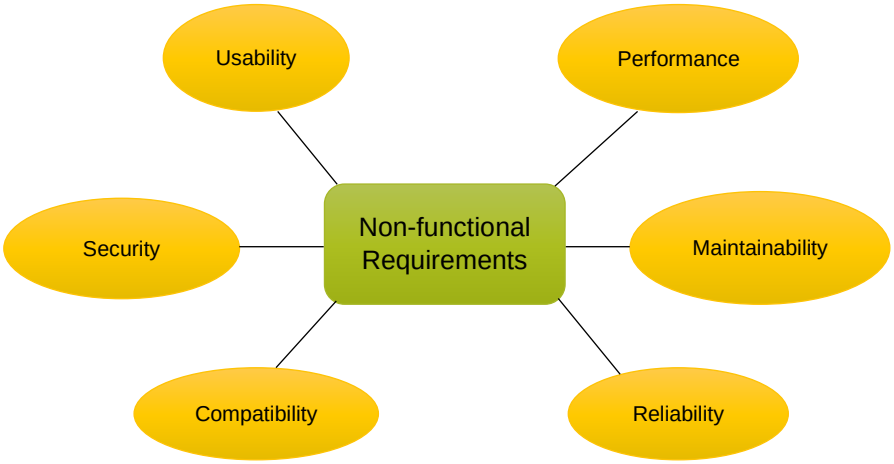


Fig 3.1.2

These define the quality attribute of a system. They define a set of quality constraints that are defined by the contract and are a must for the product to adhere to.

Non – Functional Requirement	Description
Usability	Our application will be user friendly such that users between 13-65 years of age can use it with ease.
Performance	The user will not experience minimal response to receive an output, given the input.
Security	The software will have encrypted data at rest and in transit and the confidentiality of any data stored for the application will be protected at all costs.
Maintainability	The downtime in case of any failures or upgrades in any of the modules will be minimal.
Compatibility	The application is a cross platform one which will work on both, iOS and Android platforms.
Reliability	The application will be available to the users 24*7, except for any minimal downtime.

Table 3.1.2

3.2 Activity Diagram

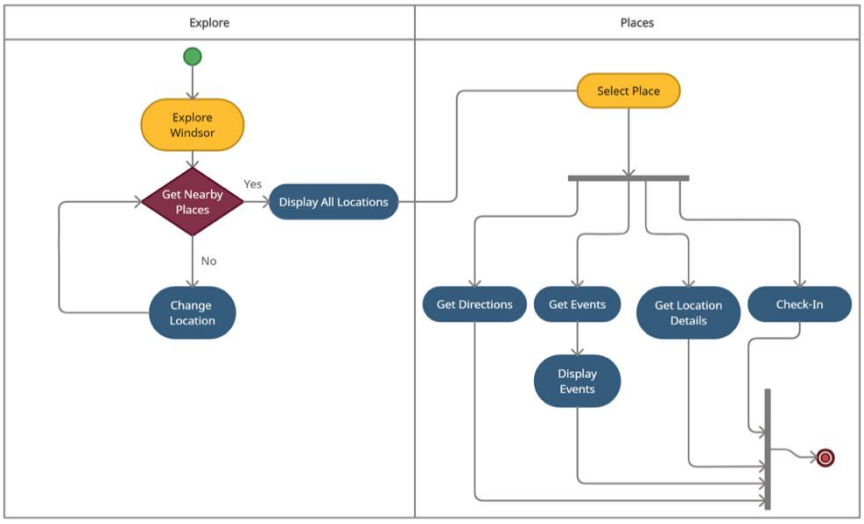


Fig 3.2.1

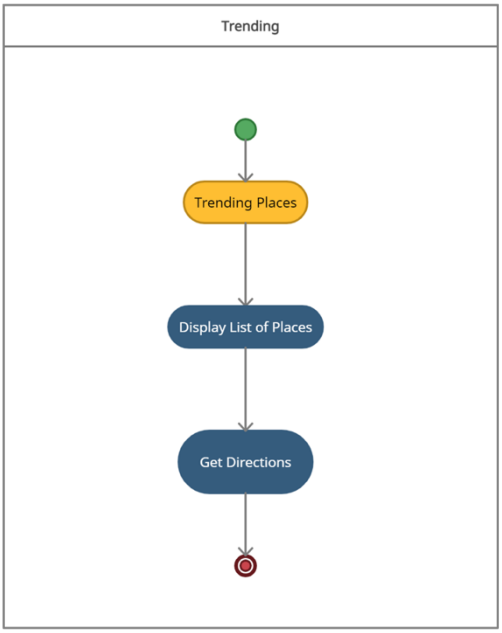


Fig 3.2.2

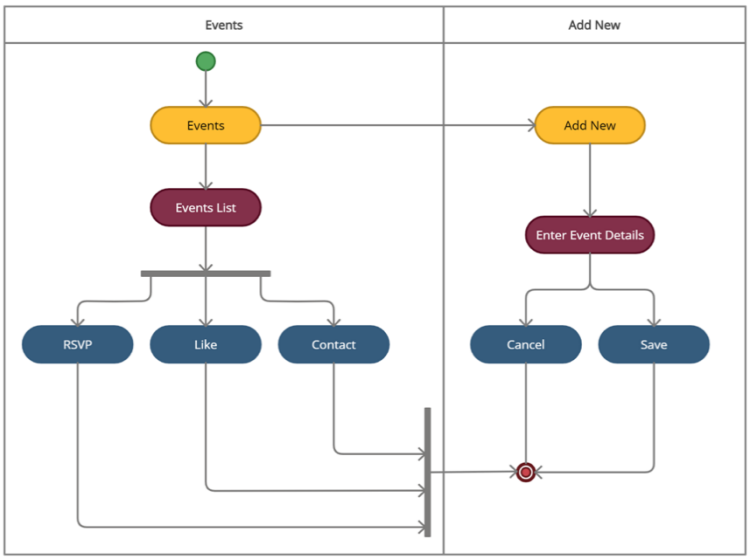


Fig 3.2.3

3.3 Use Case Diagram

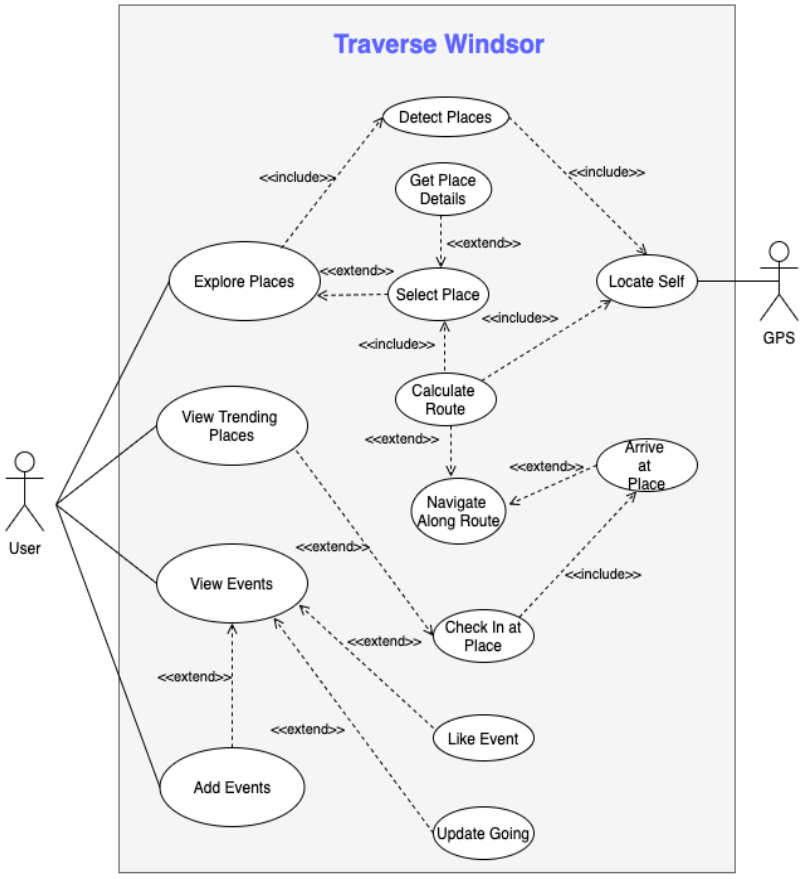
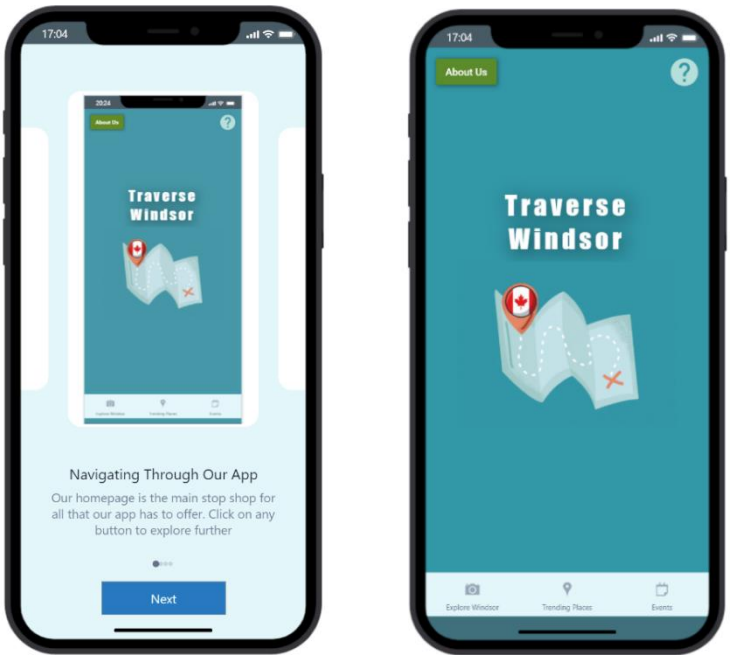


Fig 3.3.1

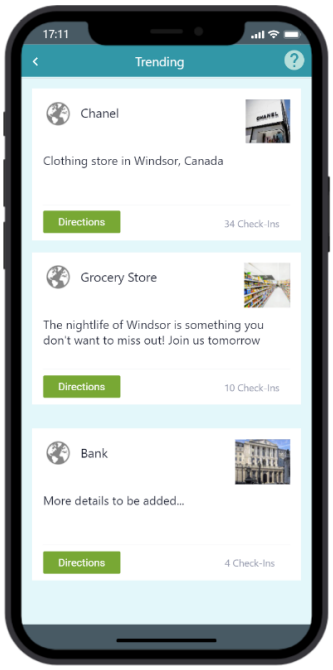
3.4 Prototype

View the executable prototype here at How It Works

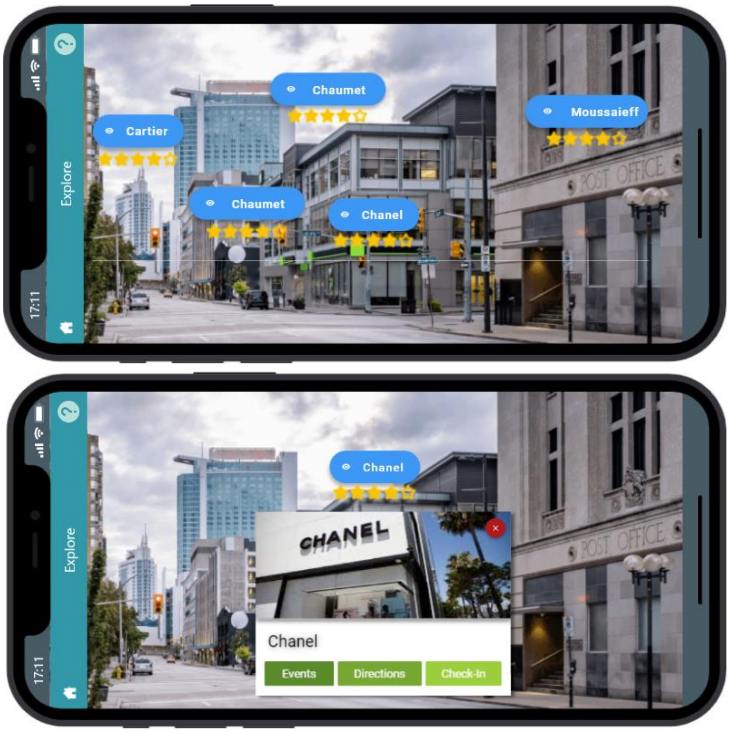
3.4.1 Help and Home Page:



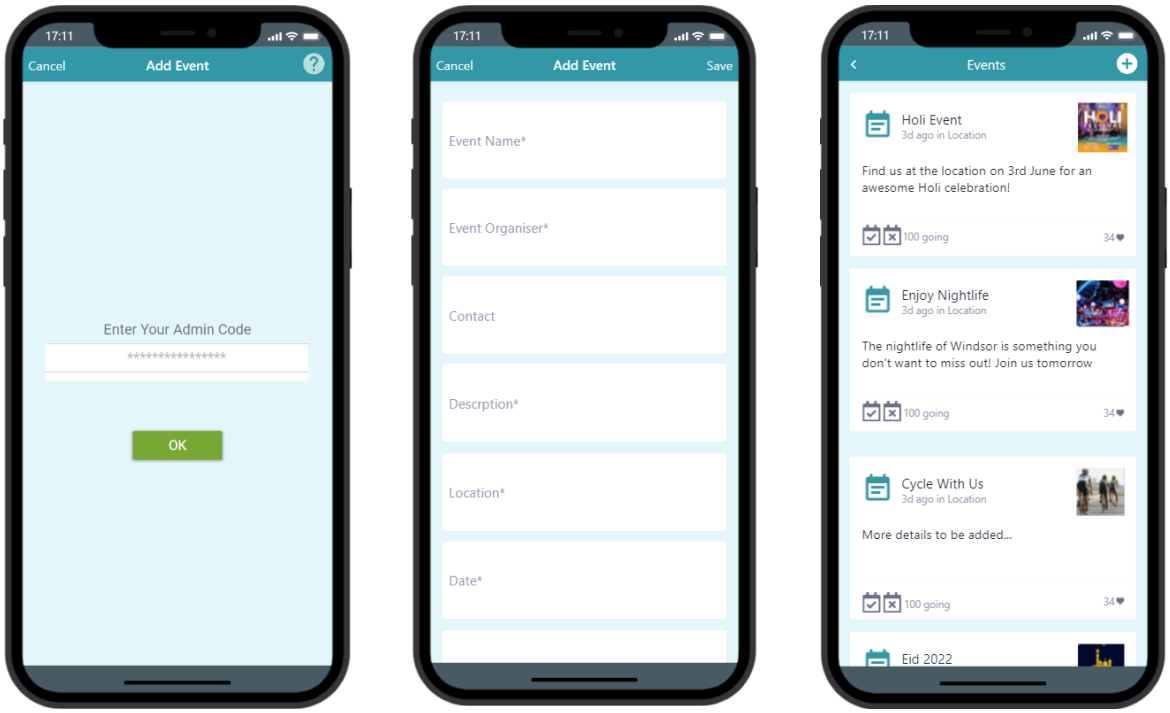
3.4.2 Trending Places:



3.4.3 Explore Windsor:



3.4.4 Events:



4. COST ANALYSIS

Following is the analysis done by the management based on:

- The salary of the human resources allocated to the project.
- The market availability with respect to licenses which will be needed for the project.
- The server required to run the project as per client expectations.
- 4 months of software development cycle.

Note: The production cost will differ in terms of licensing and database servers, depending on the number of users using the application.

4.1 Development Cost

- **Human Resources**

Resource	Cost
Full Stack Developers * 5	200K CAD
Scrum Master * 1	40K CAD
Tester * 2	50K CAD

Table 4.1.1

- **Licensing**

License	Cost
mapbox – Maps SDK for mobile	$4.00/user monthly after 25,000 users

Table 4.1.2

- **Database Servers**
  Assumptions: Data stored in the tables(GB), number of reads and writes per month in the on demand mode. Link to the detailed estimated cost using AWS pricing calculator.

Server	Cost
DynamoDB	1.3K CAD

Table 4.1.3

4.2 Deployment Cost

Licensing	Play Store	30 CAD
	App Store	200 CAD/year

Table 4.2.1

5. PROVISIONAL PLANNING

5.1 Provisional Planning & Gantt Chart

SCRUM is a software development methodology that allows us to deliver the project requirements quickly and efficiently. This process takes place throughout the project lifecycle and allows collaboration and transparency within the team.

The application into consideration is a short-term project of 10 weeks and delivering the project requirements quickly while maintaining communication among the team members is a necessity. This is the reason our team decided to use the SCRUM methodology for fast and iterative delivery.

5.1.1 Project Timeline

- Start Date: 13st May 2021
- End Date: 10th August 2021

5.1.2 Planned Objective of Each Iteration

1) Features in Sprint 1
    - User Interface for Home Page
    - User Interface for Explore Windsor Page
    - User Interface for Navigation Page
    - MapBox API integration for Navigation
    - AR component design for Explore Windsor

2) Features in Sprint 2
    - AR component design for Explore Windsor
    - AR component integration for Explore Windsor

- User Interface for Events Page
- Integration of Explore Windsor with Navigation

3) Features in Sprint 3
    - Integration of Explore Windsor with Navigation
    - User Interface for Add Events Page
    - Backend integration for Add Events

4) Features in Sprint 4
    - Integration of Explore Windsor with Navigation
    - User Interface for Add Events Page
    - Backend integration for Add Events
    - User Interface for Trending Page
    - Backend integration for Trending
    - Integration of Explore Windsor with Events

5) Features in Sprint 5
    - Integration of Explore Windsor with Navigation
    - Backend integration for Trending
    - Integration of Explore Windsor with Events
    - Integration of other preliminary features like rating and places description

5.1.3 Project Milestones and Deadlines

- Project proposal – May 28
- Milestone 1 – June 11
- Milestone 2 – July 2
- Milestone 3 – July 16
- Milestone 4 – July 30

Release Date: 11th August 2021

5.1.4 Gantt Chart

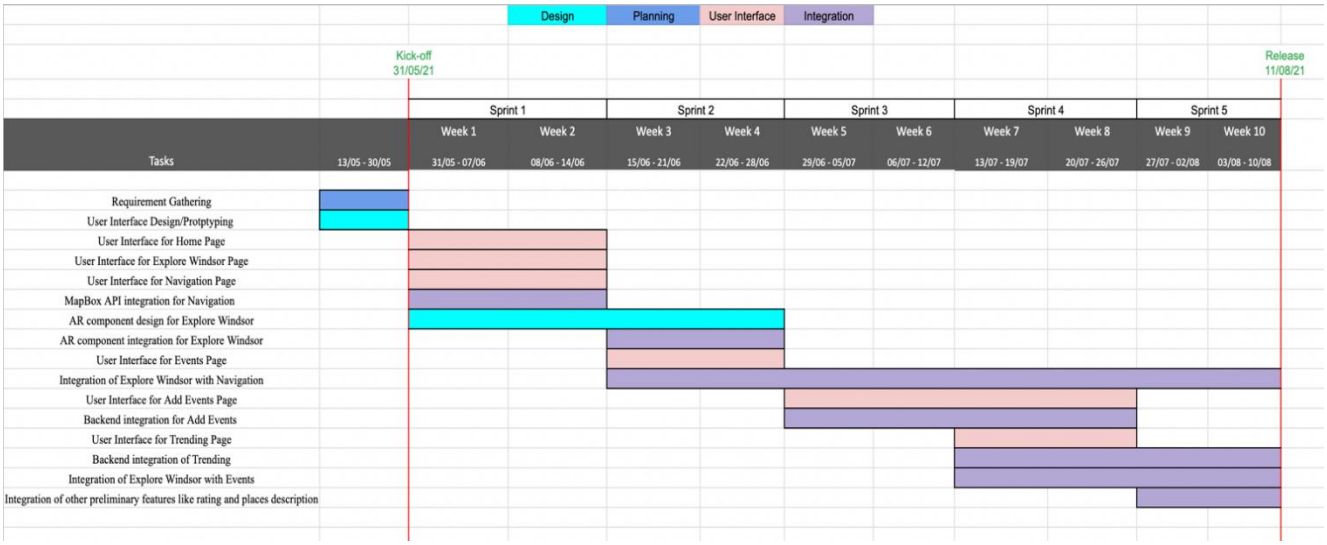


Fig 5.1.4

View the Gantt Chart in expanded mode

5.2 Technical Requirements

Technical Constraint	Tools and Languages
Target OS	Android, iOS
Languages	JavaScript
Development Platform	ViroReact
Framework	React Native, ARCore, ARKit
External APIs	Mapbox
Database	AWS - DynamoDB
Additional Tools	JIRA, GitHub
Simulation Tools	Android Studio/Xcode
Deployment	Play Store & App Store
Time Scales	Complete the product with a deadline 9th August 2021 so that we have buffer of two days before release date.

Table 5.2.1

Why ViroReact? [4]

- As we are having a strict time constraint of developing our application in just 10 weeks, ViroReact uses web-like concepts making it easy to learn. So that we won't be having to spend much time in learning this platform to start our development process.
- Development is fast in ViroReact, we can see changes just by reloading the page avoiding long compile times.
- It is open source under MIT License.
- It uses React Native which provides the Cross Platform functionality, and it provides support to build AR applications using Android's ARCore and Apple's ARKit

6. QUALITY ASSURANCE PLAN

6.1 Development Lifecycle

"*SCRUM* is a way for teams to work together to develop a product."

The main aim of using Scrum is that it is completely based on continuous learning and it can naturally adapt to changing conditions based on the user requirements. In our application we must take into consideration the changes in the requirements from point to point based on the customer's feedback. It helps in short release cycles, so as a team while developing a project we can constantly get feedbacks and improve. This strategy will help us in improving communication and collaboration.

Role	Members
Scrum Master	Anisha Gharat
Product Owner	Sarwat Til Vusqa
Scrum Team	Ravleen Kaur, Vishal Solanki, Adhiraj Singh, Shoaib Ahmed, Purvesh Patel & Rizvi Ahmed

Table 6.1.1

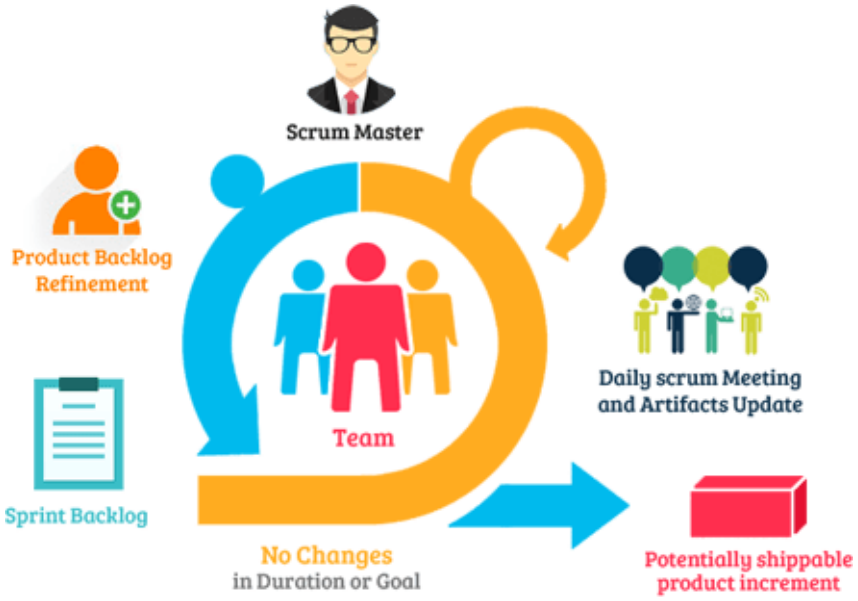


Fig 6.1.1

We are going to follow the following steps while implementing Scrum:

1. Product Owner will gather the requirements from the customer.

   Requirement Gathering Techniques

Fig 6.1.2

2. The development team along with the Product Owner will create a Product Backlog.

Our Product Backlog

- User Interface for Home Page
- User Interface for Explore Windsor Page
- User Interface for Navigation Page
- MapBox API integration for Navigation
- AR component design for Explore Windsor
- AR component integration for Explore Windsor
- User Interface for Events Page
- Integration of Explore Windsor with Navigation
- User Interface for Add Events Page
- Backend integration for Add Events Page
- User Interface for Trending Page
- Backend integration of Trending
- Integration of Explore Windsor with Events
- Integration of other preliminary features like rating and places description

Fig 6.1.3

3. The sprint meeting is held to create the Sprint Backlog which would consist of the user stories or bug fixes, the development team or the testers need to work on in the current sprint.

6.2 Our Sprint Plan

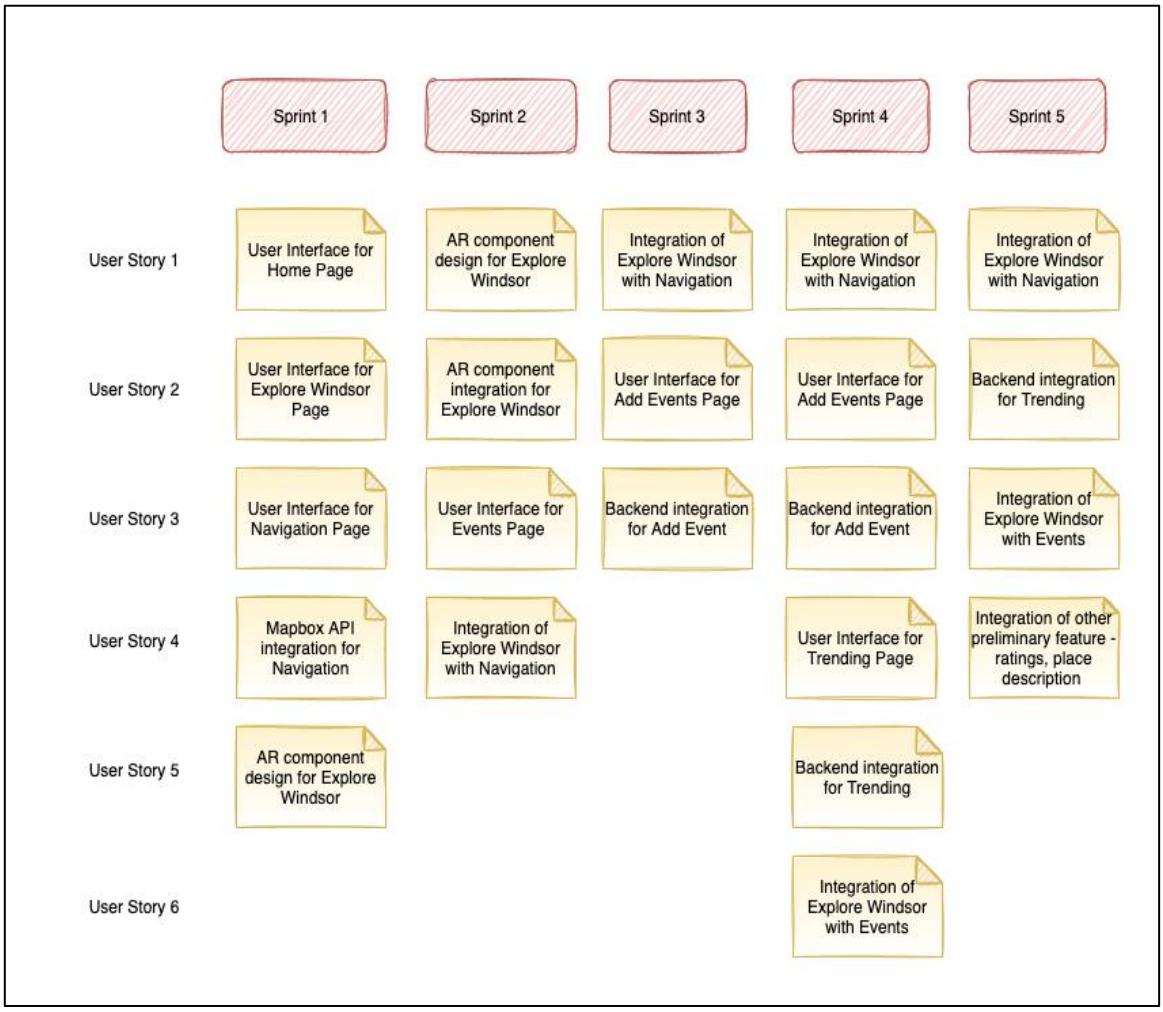


Fig 6.2.1

4. The team will start working on the sprint. The team will adhere to the timelines mentioned during the sprint planning. Usually, our sprint lasts for 2 weeks. The developers must update their tasks on the going.

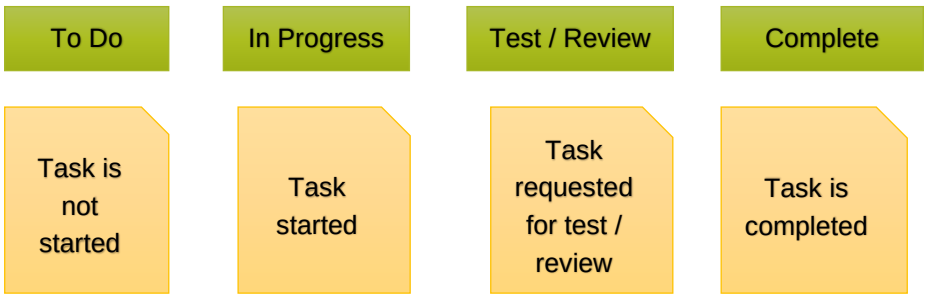


Fig 6.2.2

5. There will be a daily scrum meeting, where the Scrum Master will ensure all the tasks are on track and documented and all the team members are aligned. Our team is of 8 members so a 15 minutes meeting would be sufficient for the same.
6. Each team member will have to update the following questions during the scrum meetings:
    a. What did I work on yesterday?
    b. What will I work on today?
    c. Any roadblocks/hindrance during the work?
7. At the end of every sprint, an incremental deliverable feature of the software product is made ready. The delivery can be communicated with the help a fixed template.

6.3 Sprint Deliverable Template

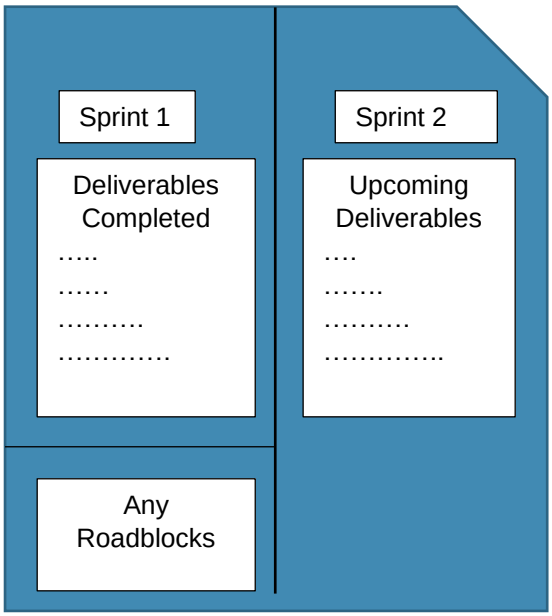


Fig 6.2.3

6.4 Our Milestones

Milestone	Deliverables
Milestone 1	28th May: • Project Proposal

Milestone 2	11th June:
	• Frontend:
	  ○ Home Page
	  ○ Explore Windsor
	• MapBox API call
	• Database architecture

Milestone 3	2nd July: • Synchronise Mapbox API data with database • AR component design • Camera functionality with AR
Milestone 4	16th July: • Adding data and components to Places scene in AR • Events frontend and backend
Milestone 5	30th July: • Adding data and components for Navigation scene in AR • Trending places frontend and backend

Table 6.4.1

6.5 Software Quality Procedures & Tools

6.5.1 Testing

Test scripts and test cases will be created covering all aspects of our application. Unit testing would then be performed internally to ensure that our application requirements are being met. This would be performed using the Viro Media's testbed app and can also be simulated in Android Studio. Compatibility testing would ensure that all the components are fully integrated and that our application is functional on all devices as required. Usability testing would ensure that the customer needs are being met in terms of a user-friendly interface and overall satisfaction from the application.

6.5.2 Communication

Internal Scrum meeting would be ensured daily through Microsoft Teams and will be documented using Microsoft's excel sheet.

Sheet for our daily scrum meeting update

Furthermore, meetings will be held with the customer and project director at least once a week only by appointment. For any queries or contact, we will be using Microsoft Outlook and Teams. JIRA would also ensure that we are in sync with the expectations of the customer and project director.

6.5.3 Deployment

Our code will be regularly deployed on GitHub:
https://github.com/AnishaGharat/Traverse-Windsor
DEV – Dev environment is the one created and maintained by Development team for writing the code in GitHub Dev branch. This environment is used by Dev team for each component deployment and unit testing.
UAT – User acceptance Test is an environment where the testing is conducted by the business users in UAT branch. This is done after the system/Integration testing has been completed. The major intention is to test the system from the business point of view.
PROD – The PROD environment is the actual live environment which is exposed to the customers through the Prod Branch.

6.6 Set of Standards

To ensure that quality and standards are being followed, we will be maintaining documentation at each phase of the software development cycle. This would include:

- Creating a software requirements specification document to capture complete specifications.
- A regularly maintained quality assurance plan.
- UAT documentation with complete test plans and scripts
- A comprehensive user guide with release notes

Furthermore, we will be applying the IEEE and ISO 9126 model standards of software engineering that are readily available to ensure our development is up to the international standards. We will also be following the concept of technical debt in software engineering to ensure that at every milestone we have a functional deliverable.

6.7 Risk Analysis

Risk Identification is the process of identifying risks that could prevent the team to achieve its objectives. Following are the areas that can be impacted by the unforeseen risks:

- Cost
- Schedule
- Success
- Quality
- Morale of team

We have used SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis for risk identification. Following are the risks that we have identified which are further supported by our SWOT analysis:

- Considering that the entire team is new to the domain of Augmented Reality, there is a steep learning curve in the same.
- Without good time management skills, it will be difficult to adhere to a rigorous timeline of 10 weeks.
- Unforeseen requirements may arise while integrating the different components of the software.
- Additional requirements proposed by the customer can change our deliverables for the upcoming milestones.

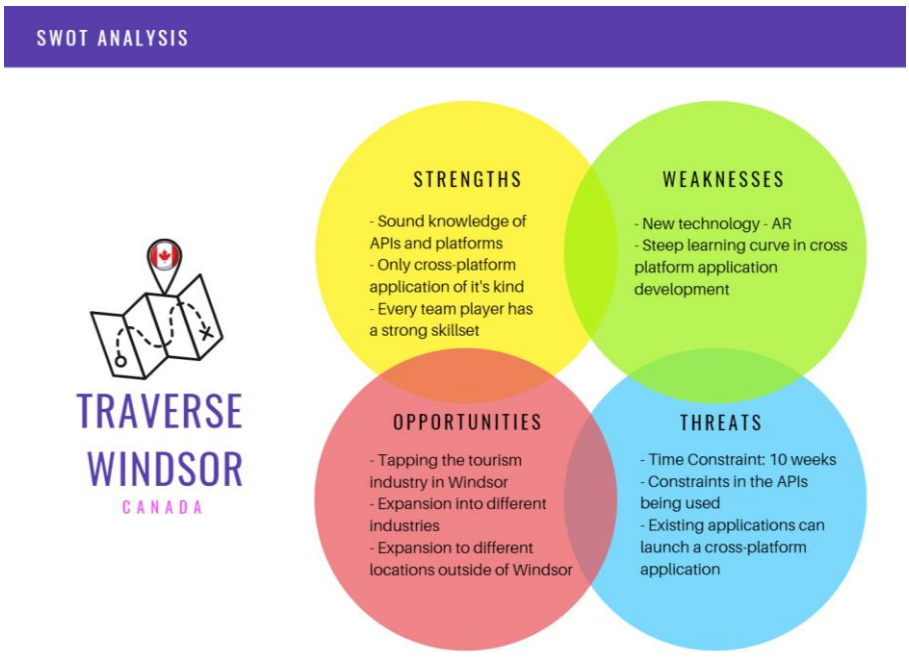


Fig 6.7.1

6.8 Team Members: Roles and Responsibilities

Holding daily meetings, or stand-ups, serves as a tool for managing changing requirements. These meetings take place at the same time each day and give team members a chance to talk about the tasks they have completed and any obstacles standing in their way. So even if the team members swap their roles, it does not affect the tasks in that iteration.

Team Member	Role
Sarwat Til Vusqa	Front-End Development, Back-End Development
Anisha Gharat	Front-End Development, Back-End Development, Database Development
Adhiraj Singh	Front-End Development, Back-End Development, Database Development
Vishal Solanki	Back-End Development
Rizvi Ahmed	Front-End Development, Database Development, Testing
Shoaib Ahmed	Back-End Development
Ravleen Kaur	Front-End Development, Back-End Development
Purvesh Patel	Front-End Development, Testing

Table 6.8.1

7. REFERENCES

[1] R. Garton, "'Gigantic, looming question mark' hanging over summer tourism season in Windsor-Essex, say operators," 13 May 2021. [Online]. Available: https://windsor.ctvnews.ca/gigantic-looming-question-mark-hanging-over-summer-tourism-season-in-windsor-essex-say-operators-1.5426816.

[2] CBC, "CBC News," 29 June 2020. [Online]. Available: https://www.cbc.ca/news/canada/windsor/windsor-essex-500k-local-tourism-boost-covid19-1.5631754.

[3] "UNWTO," [Online]. Available: https://www.unwto.org/covid-19-and-tourism-2020.

[4] V. Media, "Viro Media," [Online]. Available: https://viromedia.com/viroreact.