



**Final Year Project**  
**Proposal**

**<Project Title>**

IU Nav Bus

**<Submitted by>**

Group No 7

Syed Haider Raza Naqvi (13330)

Hamza (13192)

Muhammad Owais (13254)

Syed Itrat Hussain Zaidi (13107)

**<Supervisor>**

MA'AM GHAZALA SHAFI

**<Coordinator>**

Dr Mansoor Ibrahim

A handwritten signature in blue ink, appearing to read "Syed Haider Raza Naqvi", with a large, sweeping flourish extending from the bottom left.

## **ACKNOWLEDGMENT**

First, we thank Almighty Allah who praise us with the ability to think, work and deliver what we are assigned to do. Secondly, we would like to express my special thanks of gratitude to my supervisor Ms. Ghazala Shafi who gave us to the golden opportunity to do this wonderful project on the topic Iqra Nav Bus, which also helped us in doing a lot of research which helped us to know about so many new things and learning and enhancing our skills.

Lastly, we would like to express our gratitude to all of the faculty members in our respective departments for their collaborative efforts during the project's duration.

"THANKS AGAIN TO ALL WHO SUPPORTED"

## **DECLARATION**

I hereby declare that the work has been done by myself to fulfill the requirement of the BS (Computer Science) and no portion of the work contained in this report has been submitted in support of any application for any other degree or qualification of this or any other university or institute of learning.

I hereby further declare that in the event of any infringement of the provision of the Act whether knowingly or unknowingly the university shall not be liable for the same in any manner whatsoever and undertake to indemnify and keep the university indemnified against all such claims and actions.

## **FACULTY OF ENGINEERING, SCIENCE AND TECHNOLOGY**

### **Approval**

We have approved this manuscript for submission and presentation as a fulfillment of the Bachelor of Computer Science.

DR. Mansoor Ebrahim  
HOD

Date:

## Table of Content

|   |    |
|---|----|
| 1) List of Abbreviations and Acronyms .....               | 3  |
| Section 1.....  | 4  |
| 1.1) Project Identification.....                          | 4  |
| 1.2) The Problem:.....                                    | 7  |
| Section 2.....  | 9  |
| 2.1) Introduction.....                                    | 9  |
| 2.1.1) Challenges.....                                    | 9  |
| 2.1.2) Motivation and Need.....                           | 10 |
| 2.2) Aim and Objectives.....                              | 11 |
| 2.3) Benefits .....                                       | 12 |
| 2.3.3) Technology Transfer/Diffusion Approach.....        | 15 |
| Section 3.....  | 16 |
| 3.1) Literature Review .....                              | 16 |
| 1) Moovit .....   | 16 |
| 2) Swvl.....  | 19 |
| 3) TootBus .....  | 22 |
| 4) Sunway Shuttle Bus Tracker .....                       | 25 |
| 5) People bus service Karachi.....                        | 28 |
| 6) Shuttl .....   | 31 |
| 7) Transit (Subway and bus times): .....                  | 34 |
| 8) City Mapper.....                                       | 37 |
| 9) Comparison.....  | 39 |
| Section 4.....  | 41 |
| 4.1) Research Approach.....                               | 41 |
| 4.1.1) Functional and Non-Functional Requirements .....   | 41 |
| 4.2) Flow Charts .....                                    | 42 |
| 4.3) Agile Development Model .....                        | 43 |
| 4.4) Key Milestones and Deliverables.....                 | 49 |
| 4.5) Annexure–A: Project Schedule / Milestone Chart ..... | 51 |
| Section 5.....  | 52 |
| 5.1) Entity Relationship Diagram (ERD): .....             | 52 |
| 5.2) Use Case Diagram:.....                               | 53 |
| 5.3) Narrative Use Case Diagram:.....                     | 54 |
| Section 6.....  | 57 |
| 6.1) Proto-typing .....                                   | 57 |
| Section 7.....  | 62 |
| 7.1) Budgeting.....                                       | 62 |
| Annexure–B: Proposed Budget.....                          | 62 |
| Section 8.....  | 63 |
| 8.1) Business Canvas Model .....                          | 63 |
| Section 9.....  | 64 |
| 9.1) Poster Design .....                                  | 64 |
| Section 10.....   | 65 |
| Weekly Logs .....   | 65 |

## List of Abbreviations and Acronyms

|                |  |
|----------------|--|
| <b>ERD</b>     | Entity Relationship Diagram  |
| <b>SDK</b>     | Software Development Kit   |
| <b>DB</b>      | Database   |
| <b>Flutter</b> | A UI toolkit for building natively compiled applicationsfor mobile, web, and desktop   |
| <b>Dart</b>    | Dart" is a programming language developed by Google.It's primarily used for building mobile, desktop, server, and web applications |
| <b>(MVP)</b>   | Minimum Viable Product   |
| <b>QA</b>      | Quality Assurance  |
| <b>API</b>     | Application Programming Interface  |
| <b>SQL</b>     | Structured query language  |

## **Final Year Project Proposal**

### **Section -1**

#### **Project Identification:**

**Project Title:**

IU Nav Bus: Streamlining Campus Transportation for Iqra University Students.

**Group Leader (GL):**

|    |            |  |        |                        |
|----|------------|--|--------|------------------------|
| 1. | Name:      | <b>Syed Muhammad Haider Raza Naqvi</b> |        |                        |
|    | Reg #:     | 13330                                  |        |                        |
|    | CGPA:      | 3                                      |        |                        |
|    | Mobile # : | 03323993241                            | Email: | syed.13330@iqra.edu.pk |
|    | Signature: | <hr/>                                  |        |                        |

**Group Members (GM's):**

|    |            |                       |        |                            |
|----|------------|-----------------------|--------|----------------------------|
| 2. | Name:      | <b>Muhammad Owais</b> |        |                            |
|    | Reg #:     | 13254                 |        |                            |
|    | CGPA:      | 3.2                   |        |                            |
|    | Mobile # : | 03152741206           | Email: | muhammad.13254@iqra.edu.pk |
|    | Signature: | <hr/>                 |        |                            |

|    |       |                                 |  |  |
|----|-------|---------------------------------|--|--|
| 3. | Name: | <b>Syed Itrat Hussain Zaidi</b> |  |  |
|----|-------|---------------------------------|--|--|

|  |            |             |        |                        |
|--|------------|-------------|--------|------------------------|
|  | Reg #:     | 13107       |        |                        |
|  | CGPA:      | 3.17        |        |                        |
|  | Mobile # : | 03132009772 | Email: | syed.13107@iqra.edu.pk |
|  | Signature: | _____       |        |                        |

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

|    |            |             |        |                         |
|----|------------|-------------|--------|-------------------------|
| 4. | Name:      | Hamza       |        |                         |
|    | Reg #:     | 13192       |        |                         |
|    | CGPA:      | 3           |        |                         |
|    | Mobile #:  | 03323603473 | Email: | HAMZA.13192@iqra.edu.pk |
|    | Signature: | _____       |        |                         |

**What technology is core to your product?** *(Please mark ☐ where applicable)*

☐ 3D/4D Printing    ☐ Augmented Reality / Virtual Reality

☐ Big Data, Artificial Intelligence    ☐ Blockchain

☐ Cloud    ☐ Neurotech

☐ Robotics    ☐ Shared economy

☐ The Internet of Things    ☐ Wearables, Implantables ☐ Others (specify):    **Mobile**

**application development**

\_\_\_\_\_



**What is the target market(s) for the products?** *(Please mark ☐ where applicable)*

- ☐ Automotive, aviation, marine      ☐ Business, marketing, finance      ☐ Defence, security, safety      ☐ Education and training  
☐ Environment, water management      ☐ Entertainment, tourism, sport/recreation      ☐ Food, livestock, agribusiness      ☐ Healthcare  
☒ Infrastructure, housing & transport      ☐ Mining equipment technology & services      ☐ Oil, gas, energy  
☐ Textiles, clothing, footwear  
☐ Others (specify):

**Other Organizations Involved in the Project:** *(Please identify all affiliated organizations collaborating in the project, and describe their role/contribution to the project.)*

**Academic Organizations:**

| #  | Organization Name       | Role / Contribution       |
|----|-------------------------|---------------------------|
| 1. | Iqra University Karachi | Resources and Supervision |
| 2. |                         |                           |

**Industrial Organizations:**

| #  | Organization Name | Role / Contribution |
|----|-------------------|---------------------|
| 1. | None              | None                |
| 2. |                   |                     |

**Funding Organizations:**

| #  | Organization Name            | Role / Contribution |
|----|------------------------------|---------------------|
| 1. | Iqra University North Campus | None                |
| 2. |                              |                     |

**Key Words:** *(Please provide a maximum of 5 key words that describe the project)*

University Shuttle Tracking,  
 Real-time Bus Location,  
 Mobile App Development, Cross-platform Solution,

**Research and Development Theme:** *(please identify the Research Theme.)*

Innovation in campus transit. Focuses on improving university transportation by integrating smart mobility solutions and promoting sustainability, aiming for enhanced user experience and reduced environmental impact.

**Project Status:** (Please mark ☐)

☒ New ☐ Modification to previous Project ☐ Extension of existing project

**Project Duration:**                **12 Months**

**Proposed Budget:**                **100000 PKR**

## **THE PROBLEM**

The problem that the Iqra Nav Bus Shuttle Service App aims to address is the lack of an efficient and streamlined transportation system for Iqra University north campus students. Currently, students face challenges in accessing reliable information about shuttle bus routes, schedules, and real-time updates. The absence of a centralized platform for booking, reservations, and the receiving timely notifications adds to the inconvenience.

The opportunity lies in providing a comprehensive solution that enhances the overall commuting experience for students. By developing this app, we aim to bridge the gap between students and the university shuttle service, offering a user-friendly interface that simplifies the booking process, provides real-time tracking, and ensures timely communication of an important information.

The need for such a solution arises from the growing student population at Iqra University and the increasing demand for a more organized and tech-driven approach to shuttle services. The current manual or fragmented systems contribute to the inefficiencies, such as missed buses, lack of awareness about schedule changes, and difficulties in making reservations. The Iqra NavBus app seeks to streamline these processes, providing a centralized hub for all shuttle-related information, from routes and schedules to personalized notifications.

Overall, the need is to create a reliable, convenient, and user-centric platform that not only addresses the existing challenges, but also sets the foundation for future improvements and scalability. By meeting these needs, the app aims to enhance the daily commuting experience for Iqra University students, promoting a more efficient and connected campus transportation system.

## **SYPNOSIS**

The Iqra Nav Bus Shuttle Service App is a user-friendly solution designed to revolutionize the commuting experience for Iqra University students. With real-time tracking, intuitive scheduling, and secure booking features, the app ensures students can effortlessly navigate the university's shuttle services. The product benefits include enhanced convenience, reduced wait times, and improved communication.

The target market is the Iqra University student body, providing them with a reliable tool to streamline transportation. The basic technology involves a mobile application with features like route tracking, personalized profiles, and push notifications. Commercial partners may include local transport authorities and service providers. Investors interested in innovative campus solutions could find value in supporting this project. Potential customers are university students and staff seeking an efficient, tech-driven transportation system. Overall, the Iqra NavBus app aims to create a seamless and connected experience for users while fostering partnerships and attracting investment for sustainable growth.

## Section 2:

### Introduction:

The Iqra Nav Bus project is a groundbreaking initiative designed to transform the daily commuting experience for students of Iqra University's north campus. This innovative mobile app seeks to address the complex challenges related to bus schedules, stop locations, and real-time updates. By providing a user-friendly platform with features such as real-time tracking, interactive maps, and personalized profiles, the app aims to streamline transportation logistics, enhance student well-being, and contribute to a more sustainable campus environment.

The project prioritizes security, reliability, and compliance with university policies, embodying a commitment to revolutionize the campus transportation landscape and elevate the overall student journey.

### Challenges:

**Various Needs for Commuting:** Addressing the varied commuting needs of a diverse student body poses a significant challenge. Students have different class schedules, preferences, and routes, requiring a system that accommodates these specific details smoothly.

**Ensuring Safety at Night:** Navigating the campus during late hours raises safety concerns. The app should address these by offering well-lit routes, security notifications, and an emergency feature for students traveling during the night.

**Real-time Updates:** Keeping track of the real-time location of shuttle buses is crucial for students to plan their arrivals at bus stops. Iqra Nav Bus addresses this by providing accurate and reliable real-time tracking updates, minimizing uncertainty and wait times.

**Traffic and Route Changes:** Unexpected traffic or sudden changes in bus routes can cause confusion and delays.

## Motivation and Need:

**Enhancing Student Lives:** Iqra Nav Bus is all about making life better for students at Iqra University's north campus. We want to help because we know students deal with problems like figuring out bus schedules, finding stops, and getting real-time updates. Our aim is to create a solution that makes transportation easier. It's not just about making it work; it's about creating a feeling of connection among everyone on campus.

**Integral Part of Student Experience:** The motivation behind this project is rooted in the belief that a well-designed shuttle service app becomes more than a functional tool, it becomes an integral part of the student experience. The aspiration is to go beyond basic functionality, creating an app that not only meets transportation needs but enhances the overall campus journey for students.

**Enhancing Student Well-being:** The motive goes beyond improving the wellbeing of the students. Iqra Nav Bus seeks to improve students' mental and emotional health by lowering the stress brought on by unreliable commutes. Students at Iqra University north campus find the app to be a helpful companion in their everyday life since it simplifies transportation logistics.

**Simplifying Transportation Logistics:** Students at Iqra University's north campus often face problems with bus schedules and finding stops. That's where the Iqra Nav Bus app comes in. It's designed to tackle these issues, giving real-time updates and making the whole transportation thing much simpler. The need for this app is clear - we want to make a platform that's easy to use, so students can concentrate on their studies without any unnecessary hassles during their daily commutes.

**User-Friendly and Intuitive Platform:** We're building the Iqra Nav Bus app to be super easy for users. The idea is to make it friendly and intuitive so that students can smoothly go about their daily commutes without any interruptions, letting them focus on their studies without any unnecessary hassle.

**Technological Integration for Efficiency:** The implementation of technology is essential to improving the efficiency of campus transportation. Iqra NavBus is aware of this requirement and works to take maximum advantage of technology. The app seeks to be a state-of-the-art solution that surpasses the technical demands of today's student body, as well as meeting them.

## **Aim and Objectives:**

### **Aim:**

The aim of the Iqra Nav Bus Shuttle Service App project is to enhance the overall campus experience for Iqra University north campus students by providing a comprehensive, user-friendly, hassle free, and technologically advanced solution for efficient and the secure campus transportation. The app aims to address the diverse commuting needs of students, building a sense of community, and contribute to a safer and more connected campus environment.

### **Objectives:**

#### **1. User Registration and Authentication:**

- Develop a user registration system allowing users to register using their university credentials. Implement a secure login mechanism with multi-factor authentication.

- Create a password recovery mechanism to assist users in case of forgotten passwords.

#### **Shuttle Bus Routes and Schedules:**

- Develop functionality to display a comprehensive list of shuttle bus routes.
- Implement a system to showcase schedules and timings for each route.
- Integrate real-time updates on bus locations and estimated arrival times.

#### **2. Bus Stop Information:**

- Create a feature to display a list of bus stop locations within the university.
- Implement interactive maps for users to easily find nearby bus stops.

#### **3. User Profiles:**

- Develop a system allowing users to create and customize profiles.
- Include settings for personal preferences, such as favorite routes and notification preferences.

#### **4. Notifications and Alerts:**

- Implement a push notification system for upcoming rides, delays, and route changes.
- Provide additional notification options via email and SMS for enhanced communication.

#### **5. Feedback and Reporting:**

- Develop a user-friendly interface for users to submit feedback and suggestions.
- Implement a system for reporting issues or incidents during rides, ensuring timely resolution.

#### **6. Contact and Support:**

- Provide emergency contact information within the app for quick assistance.
- Offer in-app customer support options for users to seek assistance or information.

## BENEFITS

### Expected Outcomes:

1. **Mobile Application Deployment:** Develop and launch the Iqra Nav Bus mobile application on Android and iOS platforms.
2. **Efficient Campus Transportation:** A fully functional and efficient shuttle service app catering to the diverse commuting needs of Iqra University north campus students.
3. **User-Friendly Interface:** A user-friendly app interface that simplifies transportation logistics, ensuring a seamless experience for users.
4. **Technical Documentation:** Develop comprehensive technical documentation for the Iqra Nav Bus app, including user manuals and system architecture documentation.
5. **Real-Time Tracking and Updates:** Implementation of a strong real-time tracking system providing accurate bus locations and estimated arrival times.
6. **Bus Routes and Schedules Database:** Maintain a database containing detailed information about shuttle bus routes, schedules, and timings.
7. **Enhanced Safety Features:** Integration of safety features, including well-lit routes and security notifications, ensuring the safety of students, especially during night travels.
8. **Community Building:** Building a sense of community through the app, with features that connect students and provide a supportive environment.
9. **Feedback-Driven Improvements:** Implementation of an effective feedback mechanism, contributing to continuous improvements in app functionality and user experience.
10. **Marketing and Promotion:** Integration of marketing and promotion features to enhance user engagement and awareness of the app.
11. **Secure and Reliable System:** Implementation of security measures, including encrypted data transmission and secure password storage, ensuring a reliable and secure system.
12. **Compliance with Regulations:** Ensuring the app's compliance with university policies, regulations, and data protection and privacy laws.
13. **Intuitive User Profiles:** Allowance for users to create and personalize profiles, enhancing their overall experience and engagement with the app.



## Key Benefits and Beneficiaries:

### 1. Enhanced Campus Experience:

**Benefit:** Improved overall campus experience for Iqra University north students.

**Beneficiaries:** Students, faculty, and staff members who regularly commute within the university campus.

### 2. Time and Resource Savings:

**Benefit:** Significant time savings and resource optimization through efficient shuttle service.

**Beneficiaries:** Students with busy schedules, faculty, and staff members relying on campus transportation.

### 3. User-Friendly Interface:

**Benefit:** Easy and intuitive app interface, simplifying transportation logistics.

**Beneficiaries:** All app users, especially those who may not be tech-savvy.

### 4. Safety and Security:

**Benefit:** Enhanced safety features, including well-lit routes and security notifications.

**Beneficiaries:** Students, particularly those traveling during night hours, and individuals concerned about campus safety.

### 5. Community Building:

**Benefit:** Fostering a sense of community and connection among students.

**Beneficiaries:** The entire student body, as well as faculty and staff, seeking a supportive campus environment.

### 6. Real-Time Tracking Accuracy:

**Benefit:** Accurate real-time tracking of bus locations and arrival times.

**Beneficiaries:** All users relying on timely and precise information for their commutes.

### 7. Feedback-Driven Improvements:

**Benefit:** Continuous improvements based on user feedback.

**Beneficiaries:** App users who actively contribute to enhancing the app's functionality and features.

### 8. Emergency Support:

**Benefit:** Quick access to emergency contact information and in-app customer support.

**Beneficiaries:** All app users in need of urgent assistance during their commutes.

### 9. Compatibility with Latest Devices:

**Benefit:** Compatibility with the latest Android and iOS versions and various devices.

**Beneficiaries:** Users with different smartphones and tablets.

### 10. Secure and Reliable System:

**Benefit:** Security measures ensuring a reliable and secure app environment.

**Beneficiaries:** All app users concerned about the privacy and security of their data.

## **Technology Transfer/Diffusion Approach:**

- Implement a multi-channel communication strategy to inform and educate the university community about the Iqra Nav Bus app.
- Utilize various communication channels, including university websites, social media platforms, posters, and direct email communication to reach a broad audience.
- Conduct orientation sessions and workshops to introduce the app's features, functionalities, and benefits to students, faculty, and staff.
- Provide hands-on training during these sessions to ensure that users are familiar with the app's interface and capabilities.
- Develop in-app tutorials and guides to assist users in navigating the features and functionalities of the Iqra Nav Bus app.
- Ensure that these resources are easily accessible within the app, providing on-the-go support for users.
- Establish a dedicated technical support team and helpdesk to address any issues or concerns raised by users.
- Provide timely assistance through various channels, including in-app chat support, email, and a helpline.
- Partner with student organizations and clubs to promote the app within the student community.
- Leverage student leaders to advocate for the app and encourage their peers to download and use it.
- Implement accessibility features within the app to ensure inclusivity for users with diverse needs.
- Promote these features to showcase the app's commitment to providing an accessible and user-friendly transportation solution.

## **Technology Transfer/Diffusion Approach:**

- Implement a multi-channel communication strategy to inform and educate the university community about the Iqra Nav Bus app.
- Utilize various communication channels, including university websites, social media platforms, posters, and direct email communication to reach a broad audience.
- Conduct orientation sessions and workshops to introduce the app's features, functionalities, and benefits to students, faculty, and staff.
- Provide hands-on training during these sessions to ensure that users are familiar with the app's interface and capabilities.
- Develop in-app tutorials and guides to assist users in navigating the features and functionalities of the Iqra Nav Bus app.
- Ensure that these resources are easily accessible within the app, providing on-the-go support for users.
- Establish a dedicated technical support team and helpdesk to address any issues or concerns raised by users.
- Provide timely assistance through various channels, including in-app chat support, email, and a helpline.
- Partner with student organizations and clubs to promote the app within the student community.
- Leverage student leaders to advocate for the app and encourage their peers to download and use it.
- Implement accessibility features within the app to ensure inclusivity for users with diverse needs.
- Promote these features to showcase the app's commitment to providing an accessible and user-friendly transportation solution.

## Section 3:

### Literature Review

#### i. Moovit:

##### Introduction:

In 2012, Moovit launched as a free app for iOS, Android and for Web browsers to Guide people in getting around town an the effectively ad conveniently using any mode of transit. Over the years we've grown to now serve over 1.7B riders in 3,500 cities across 112 countries, in 45 languages. We help people change the way they consume mobility by fully integrating all forms of transport, including all modes of public transit, local bicycle services, ride-hailing (Uber / Lyft), scooters, car- sharing, carpooling, and more into the Moovit app. Moovit amasses up to 6B anonymous data points a day to add to the world's largest repository of transit data. The data gathering is aided by Moovit's network of more than 875,000 local editors called 'Moovitters'. The Moovit app was named "Best Local App" by Google in 2016, a finalist in the "Build for Billions" category in 2018, and one of Apple's Best Apps of 2017.

##### Working model:

Moovit operates as a public transportation app that assists users in navigating transit systems. It aggregates data from transit agencies, providing real-time tracking information and trip planning. The app's user-friendly interface allows users to input their travel details, and algorithms determine optimal routes.

Moovit also sends service alerts, notifying users of disruptions. Additionally, the app incorporates a user feedback mechanism for continuous improvement. The working model centers on delivering accurate and real-time transit information to enhance the user experience.

##### Advantages:

- Helping users plan the most efficient routes for their journeys.
- Providing real-time information on the location and arrival times of transportation options.
- Offering an easy-to-use and intuitive app interface.
- Providing users with cost-effective transportation choices.
- Allowing users to seamlessly switch between different modes of transportation (bus, train, metro, etc.).
- Keeping users informed about any service disruptions, delays, or changes.
- Allowing users to share their experiences and read reviews for different transportation options.

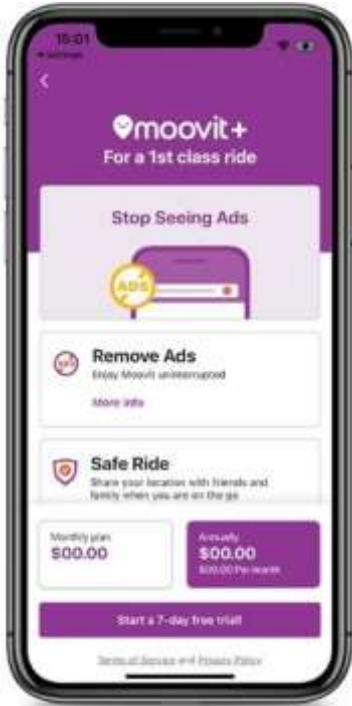
##### Disadvantages:

- Transportation apps rely on technology and network connectivity. Disruptions in service or lack of internet access can hinder the user experience.
- Real-time tracking and arrival time predictions are dependent on accurate data. Technical glitches, errors, or delays in data updates can affect the reliability of the information provided.
- Some transportation apps may have limited coverage areas, which can be a disadvantage for users in regions not covered by the service.
- Users may have concerns about the security of personal information, especially when using apps that require registration and payment details.
- While apps often provide convenient options, the cost of using them may not always be competitive with other modes of transportation, especially in certain regions.
- If the app relies on third-party transportation services, the quality of service may vary, impacting the overall user experience.

## Summary:

Moovit uses both crowdsourced and official public transit data to provide. Routeplanning to users as well as transit data APIs to transit companies, cities, and transit agencies. Because Moovit integrates crowdsourced data, it can provide transit information for areas where no data is officially available. Moovit helps users plan their journeys by offering multiple route options using various modes of transportation, including buses, trains, subways, trams, and more. The app provides real-time tracking of public transportation vehicles allowing users to monitor the current location and estimated arrival times of buses, trains, or other transit options.

## Screen Shots:



## Reference:

<https://play.google.com/store/apps/details?id=com.tranzmate&hl=en&gl=US>  
<https://moovitapp.com/>

## **ii. Swvl:**

### **Introduction:**

Swvl is a transportation network company that operates in various cities globally, providing innovative and tech-driven solution to urban commuters. The company's name "Swvl" is derived from "Swivel," emphasizing its flexibility and adaptability in the addressing modern transportation challenges. Swvl offers an alternative to traditional public transportation by leveraging the technology to optimize commuting experiences. The company's focus is on improving the reliability, efficiency, and comfort of daily commuting for urban residents. Swvl is Dubai-based provider of tech-enabled mass transit solutions, offering intercity, B2B and B2G transportation products and services. Swvl operates in 135 cities in 20 countries across Latin America, Europe, Africa and Asia. The company went public in March 2022 and is traded on the NASDAQ stock exchange under the ticker SWVL.

### **Working model:**

Swvl operates through an app-based model where users register and input. Their travel details. The app provides fixed routes with scheduled timings, and users can conveniently book seats, receive real-time updates, and track the location of buses. Swvl's fleet management optimizes schedules for a comfortable and predictable commuting experience. Payment is typically done through the app, promoting cashless transactions. The real-time tracking feature enhances user convenience, while the app may include a feedback mechanism for continuous improvement. Swvl's focus on technology, transparency, and reliability collectively contributes to its innovative approach in the transportation industry.

### **Advantages:**

- Users benefit from fixed routes and scheduled timings, providing predictability in their daily commute.
- The mobile app allows users to easily book seats, plan routes, and receive real-time updates, enhancing overall the convenience.
- The real-time tracking feature enables users to monitor the location and arrival times of buses, reducing uncertainty of and wait times.
- Swvl emphasizes providing a comfortable commuting experience with air-conditioned buses, ergonomic seating, and other amenities.
- By optimizing routes and promoting shared rides, Swvl contributes to reducing traffic congestion in urban areas.

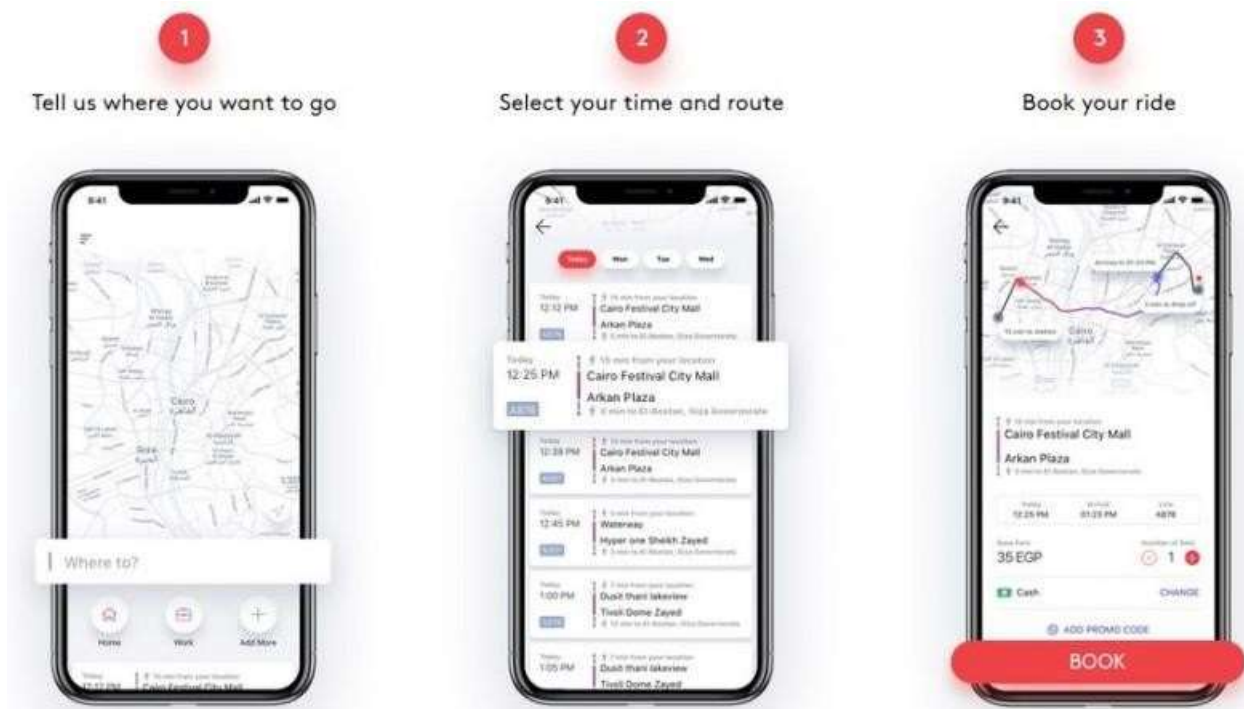
### **Disadvantages:**

- Swvl's services may be limited to specific cities or regions, disadvantaging users in areas not covered by the service.
- If Swvl relies on third-party transportation services, the quality of service may vary, affecting the overall user experience.
- Any disruptions in the Swvl service, such as unexpected delays or changes in routes, can inconvenience users and impact service reliability.
- While Swvl offers convenience, the cost of using the service may not always be competitive with other modes of transportation.
- While Swvl offers convenience, the cost of using the service may not always be competitive with other modes of transportation.

**Summary:**

Swvl is a transportation service that revolutionizes urban commuting through its app-based platform. Users benefit from fixed routes and schedules, enhancing predictability. The mobile app offers convenient features such as real-time tracking and easy booking, contributing to an overall comfortable and reliable commuting experience. Swvl's emphasis on transparent pricing and reduced congestion sets it apart in the transportation industry. However, challenges include limited service areas

## Screenshot:



## Reference:

<https://play.google.com/store/apps/details?id=io.swvl.customer&hl=en&gl>  
<https://en.wikipedia.org/wiki/Swvl>



### **iii. TOOTBus:**

#### **Introduction:**

TootBus London, formerly The Original Tour is a London bus tour operator using open-top double-decker buses. It also holds the franchise to run City Sightseeing's London tour. Based in Wandsworth, it is a subsidiary of RATP Dev. The Original Tour was founded in June 1951 by the London Transport Executive at the time of The Festival of Britain. In 1986 it was privatized, being sold to London Coaches Blue Triangle. In December 1997 it was sold to Arriva. In March 2001 the London Pride Sightseeing business was purchased. TootBus is more than just a bus app; it's your reliable guide to efficient and convenient travel. Whether you're a daily commuter or an occasional traveler, TootBus is designed to simplify your journey from start to finish.

#### **Working Model:**

The TootBus London app is a comprehensive mobile application designed to streamline and enhance the experience of navigating the vibrant city of London. Offering a user-friendly interface, the app provides features such as real-time tracking of buses, enabling users to monitor arrival times and plan their journeys with precision. With a focus on simplicity and efficiency, the app allows users to seamlessly browse and book bus rides, access detailed information about routes and stops, and receive timely notifications about any service updates or changes. Additionally, the TootBus London app incorporates a feedback mechanism, empowering users to provide valuable insights and suggestions, contributing to continuous improvements in the overall commuting experience. Whether for daily commuters or tourists exploring the iconic landmarks, the TootBus London app serves as a reliable companion for navigating the bustling cityscape.

#### **Advantages:**

- Real-time tracking feature for accurate arrival time information.
- User-friendly interface simplifies the booking process.
- Detailed route and stop information enhance user awareness.
- Timely notifications keep users informed of service changes.
- Feedback mechanism fosters continuous improvements based on user insights.
- Ideal for both daily commuters and tourists exploring London.
- Efficient and reliable solution for navigating the dynamic cityscape.
- Streamlines the transportation experience, reducing uncertainties.

#### **Disadvantages:**

- Dependency on network connectivity for real-time tracking and updates.
- Potential limitations in service coverage, impacting accessibility in certain areas.
- User reliance on technology, which may be a disadvantage for those unfamiliar or uncomfortable with mobile apps.
- Possible competition with other transportation modes, leading to varied user preferences.
- The need for regular updates and maintenance to address bugs or improve features.
- Challenges related to privacy concerns and data protection, particularly with user information and feedback.
- The app's effectiveness might be impacted by fluctuations in network reliability and connectivity issues.

## Summary:

The TootBus London app offers a transformative approach to navigating the bustling city with its real-time tracking, user-friendly interface, and comprehensive route information. Users benefit from accurate arrival times, simplified booking processes, and detailed insights into routes and stops, enhancing overall awareness. Timely notifications and a feedback mechanism contribute to improved reliability and user engagement. Despite potential challenges such as network dependency and competition with alternative transportation modes, the app stands as an efficient solution for both daily commuters and tourists exploring London's dynamic landscape. Continuous updates and careful consideration of user feedback are essential for maintaining the app's effectiveness and addressing potential privacy concerns.

## Screenshot:



## Reference:

<https://play.google.com/store/apps/details?id=com.ratpdev.esight&hl=en&gl=US>

[https://en.wikipedia.org/wiki/Tootbus\\_London](https://en.wikipedia.org/wiki/Tootbus_London)

#### **iv. Sunway Shuttle Bus Tracker:**

##### **Introduction:**

Sunway Shuttle Bus Tracker, a tailored mobile application designed to enhance your commuting experience within the vibrant Sunway University campus and its surrounding areas. This innovative app brings real-time tracking and dynamic scheduling to your fingertips, ensuring that you have accurate and timely information about the shuttle bus services. With a user-friendly interface, the Sunway Shuttle Bus Tracker simplifies your journey by providing instant access to bus locations, schedules, and service updates. Whether you're a student, faculty member, or visitor, this app aims to streamline your daily transportation needs, offering a reliable and efficient solution for navigating the Sunway community.

Experience the convenience of smart commuting with the Sunway Shuttle Bus Tracker as it becomes your go-to companion for staying connected and informed on the move.

##### **Working Model:**

The working model of the Sunway Shuttle Bus Tracker is a mobile application designed to provide real-time tracking and scheduling information for shuttle buses within the Sunway University campus. Users can easily track bus locations, access schedules, and receive timely notifications about service changes or delays. The app offers a user-friendly interface and a feedback mechanism for continuous improvement. Security measures ensure the privacy of user data, while regular updates and maintenance guarantee optimal performance and user satisfaction. Overall, the app aims to streamline commuting experiences and enhance convenience for students, faculty, and visitors.

##### **Advantages:**

- A great way to increase efficiency and make sure your buses run on time helps to university students and faculty.
- They allow you to monitor the location, speed, direction of travel, and other metrics about your fleet in real-time. This information is valuable for planning routes, schedules, and even maintenance schedules.
- Whether for daily commuters or occasional visitors, the app caters to a diverse user base, providing a personalized and user-centric experience.
- Users receive timely alerts about service changes, delays, or any relevant updates, keeping them informed and reducing uncertainties.
- User friendly environment.

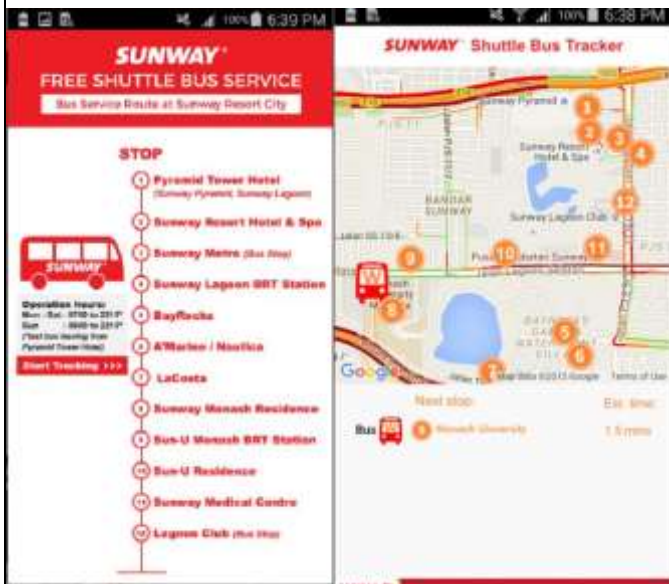
##### **Disadvantages:**

- The effectiveness of real-time tracking and notifications is contingent on a stable network connection, which may be a limitation in certain areas.
- Encouraging widespread adoption among the user base may be a challenge, especially if some individuals prefer traditional methods of obtaining information.
- Challenges related to privacy concerns and data protection, particularly with user information and feedback.
- Users may have concerns about the security of personal information, especially when using apps that require registration and payment details.

## Summary:

The Sunway Shuttle Bus Tracker app is a user-centric solution designed to enhance commuting within the Sunway University campus and its surroundings. This mobile application offers real-time tracking, efficient bus booking, and comprehensive information about routes and schedules. Users benefit from timely notifications, fostering informed decision-making and reducing uncertainties during their journeys. The app encourages user engagement through a feedback mechanism, contributing to continuous improvements. While promoting tailored experiences for diverse users, the app faces challenges related to technology dependency, network reliance, privacy concerns, and competition with alternative transportation methods. Maintenance and regular updates are crucial for sustaining the app's effectiveness and ensuring a seamless commuting experience for its users.

## Screenshot:



## References:

<https://play.google.com/store/apps/details?id=my.sunway.sunwayshuttle&hl=en&gl=US>  
<https://sunwayuniversity.edu.my/sustainability/themes/travel-and->

## **v. People bus service Karachi:**

### **Introduction:**

The Sindh People's Bus Service Project is designed to improve public transportation options within Sindh, making it easier for residents to commute within Karachi and between districts. It aims to provide a cost-effective and environmentally friendly mode of transportation while reducing congestion and enhancing overall mobility in the region. SMTA plays a pivotal role in managing all aspects of this initiative, from bus procurement to daily operations and maintenance, to ensure its success. A dynamic and innovative mobile application designed to revolutionize the commuting experience in Karachi. This app aims to simplify and enhance the way people navigate the city's bus services, offering a range of features to streamline daily travel.

### **Working model:**

People Bus Service App brings to life a simplified yet dynamic experience for users navigating the city of Karachi. With a focus on real-time tracking and user-friendly design, the model allows users to seamlessly access essential features such as live bus locations, detailed route information, and personalized user profiles.

Simulated notifications provide a glimpse into the timely alerts users would receive about bus arrivals and service updates. The working model aims to capture the essence of convenience and connectivity, showcasing the potential of the People Bus Service App as an indispensable tool for streamlined and efficient commuting in Karachi.

### **Advantages:**

- The People Bus Service App provides real-time tracking for efficient journey planning.
- User friendly Environment.
- Users can access detailed data about bus routes, schedules, and stops, enhancing travel planning.
- The app sends alerts for bus arrivals, delays, or service updates, reducing uncertainties during travel.
- To deliver and manage this integrated mass transit system, catering to the needs of the ever expanding travelling public and helping Sindh and Karachi emerge with a world class mass transit system.

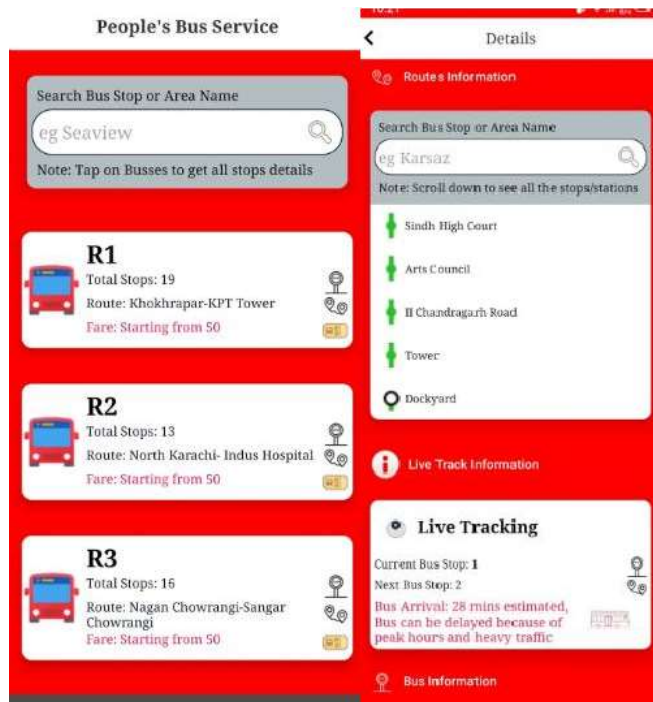
### **Disadvantages:**

- Network Reliance.
- Encouraging widespread adoption may be challenging, especially among those favoring traditional methods.
- Regular updates if addition of routes and stops etc.
- Users not accustomed to mobile apps may experience challenges, impacting accessibility.

### **Summary:**

For all people – not just vehicles – to be able to make their journeys in Karachi on a mass transit system that is efficient, economically and environmentally sustainable, and allows all who need or want to travel, to do so affordably, safely and with dignity. Sindh Mass Transit Authority (SMTA) is committed to provide sustainable modern mass transit system accessible to public to commute safely, timely with reasonable fare. Striking a balance between user adoptions and addressing privacy concerns, the app requires regular maintenance and updates for sustained effectiveness.

## Screenshot:



## References:

<https://play.google.com/store/apps/details?id=com.karachibreeze.mertosystem.app&hl=en&gl=US>  
<https://smta.sindh.gov.pk/>

## **vi. Shuttl:**

### **Introduction:**

Shuttl is a mobile app-based office commute bus aggregator based out of Gurugram, India. The company was founded in 2015. It operates in more than 6 metro cities across the country. The Shuttl app revolutionizes urban commuting by providing a convenient and efficient solution for daily travelers. Designed with a focus on simplifying the complexities of city transport, Shuttl offers a user-friendly platform for booking comfortable and reliable bus rides. With real-time tracking, commuters can plan their journeys effectively, reducing waiting times and uncertainties. The app caters to the diverse needs of urban dwellers, offering flexible routes, easy booking, and a cashless payment system. Shuttl aims to transform the daily commute experience, making it not only efficient but also comfortable and environmentally sustainable. Whether for the daily office run or occasional travel, Shuttl stands as a reliable companion in navigating the bustling streets of the city.

### **Working Model:**

The Shuttl app is a mobile-based office commute aggregator providing convenient and reliable bus rides in multiple Indian metro cities. Users can book seats, track buses in real-time, and enjoy cashless transactions for a hassle-free experience. With a focus on predictable schedules and optimized routing, Shuttl aims to simplify urban commuting while reducing waiting times and uncertainties. However, reliance on technology and network connectivity may pose occasional service interruptions, and users transitioning from traditional transportation methods might face a learning curve. Overall, Shuttl stands as a transformative solution, offering comfort, efficiency, and sustainability in daily commuting experiences.

### **Advantages:**

- Its commitment to predictable and reliable schedules. Commuters can rely on timely arrivals and departures, reducing uncertainties in their daily schedules.
- The app's smart routing system ensures that I reach my destination through the most optimized and time-efficient route, saving me both time and potential commuting stress.
- The convenience of cashless transactions is a major plus. It streamlines the boarding process and eliminates the need to carry cash, providing a hassle-free payment experience.
- Reservation and booking of seat.

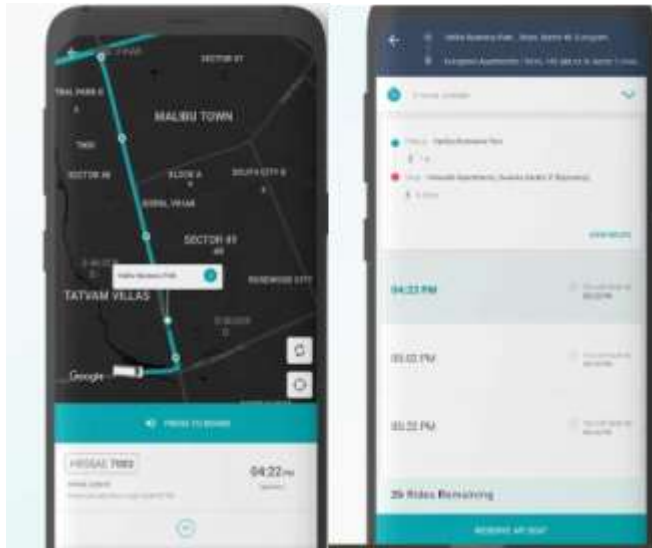
### **Disadvantages:**

- The app's reliance on technology and network connectivity could result in service interruptions during technical glitches or in areas with poor network coverage.
- Users who are accustomed to traditional modes of transportation might face a learning curve in adapting to the app, potentially causing initial hesitation or resistance.

### **Summary:**

The Shuttl app is a mobile application designed to transform the daily commute experience, particularly for office-goers, by providing convenient and comfortable shuttle bus services. Users can book seats on air-conditioned buses along specific routes, benefiting from features like real-time tracking, comfortable seating, and cashless transactions. While Shuttl aims to offer a streamlined and efficient commuting alternative, potential challenges include limited coverage, subscription costs, and dependency on technology. Users should consider both the advantages and potential drawbacks when evaluating the app for their commuting needs.

### Screenshots:



### References:

[https://play.google.com/store/apps/details?id=app.goplus.in.myapplication&hl=en\\_IN](https://play.google.com/store/apps/details?id=app.goplus.in.myapplication&hl=en_IN)

<https://en.wikipedia.org/wiki/Shuttle>



## **vii. Transit (Subway and bus times):**

### **Introduction:**

Transit is a user-friendly mobile application designed to simplify and enhance the public transportation experience for users across various cities worldwide. Serving as a comprehensive transit companion, the app offers real-time information on bus, train, subway, and other public transport options. With features like trip planning, real-time arrival updates, service alerts, and step-by-step navigation, Transit aims to empower users to navigate urban landscapes with ease. By providing accurate and up-to-date information, Transit transforms the way individuals plan and execute their journeys, promoting efficient and stress-free public transportation utilization.

### **Working model:**

The working model of the transit app seamlessly integrates user-friendly trip planning, real-time information, and interactive maps to enhance the public transportation experience. Users can effortlessly register and authenticate, plan trips from their starting point to destination, and receive live updates on transit schedules and disruptions. The app incorporates interactive maps for intuitive navigation and allows users to set personalized preferences in their profiles. Push notifications keep users informed about service alerts, and a robust feedback mechanism enables user input. Accessibility features and offline functionality ensure inclusivity and uninterrupted use. Integration with payment systems and community features, such as real-time updates and a sense of community, further enrich the user experience. Regular updates and maintenance solidify the app's reliability and compatibility with evolving user needs and technological advancements.

### **Advantages:**

- Users can easily plan their journeys with multiple route options, optimizing travel time and convenience.
- Access to live updates on transit schedules, arrivals, and service alerts improves the accuracy of trip planning and reduces wait times.
- Visual representations of transit routes and stops on interactive maps enhance user understanding and navigation during the journey.
- The ability to access certain features offline addresses potential connectivity issues during transit, maintaining app usability.
- Push notifications keep users informed about service disruptions, delays, or any changes, providing real-time updates for a seamless journey.
- In-app community features foster a sense of belonging, allowing users to share real-time updates, tips, and engage with fellow commuters.

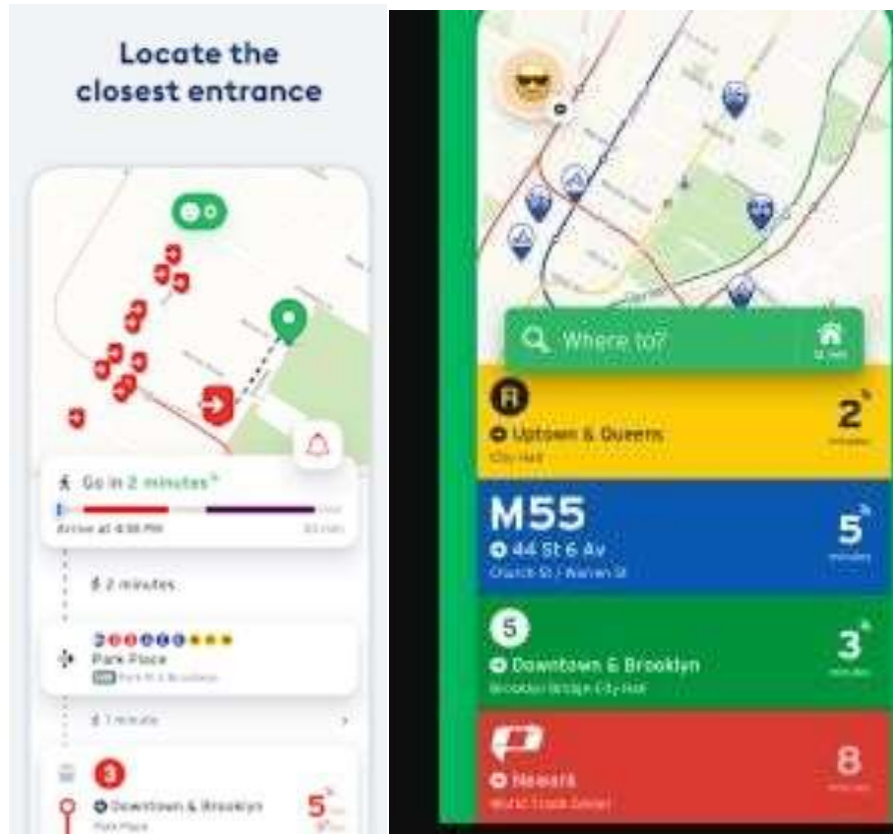
### **Disadvantages:**

- The app's functionality may be compromised in areas with poor network connectivity, hindering real-time updates and features that require an internet connection.
- Users without access to smartphones or those unfamiliar with technology may face challenges in utilizing the app, potentially excluding a portion of the population.
- Users may have reservations about data privacy and the app's collection and usage of personal information, potentially leading to concerns about security.
- If the app operates on a subscription model, costs may be a barrier for some users, impacting its accessibility and affordability.

### Summary:

The transit app offers a user-friendly solution for efficient and convenient public transportation. With features such as real-time trip planning, live updates on schedules and service alerts, and interactive maps, the app enhances the overall commuting experience. User personalization through customizable profiles, push notifications, and seamless payment integration further contributes to a tailored and user-centric interface. However, challenges include potential limitations in coverage, subscription costs, and the need for consistent network connectivity.

### Screenshot:



### References:

<https://play.google.com/store/apps/details?id=com.thetransitapp.droid&hl=en&gl=US>

## **viii. City Mapper:**

### **Introduction:**

City mapper, a dynamic and user-centric mobile application, revolutionizes urban navigation by providing a comprehensive solution for commuters in bustling cities worldwide. This innovative app seamlessly integrates real-time data on various public transit options, including buses, trains, subways, and alternative modes of transportation. With an intuitive interface, City mapper offers users detailed trip planning, step-by-step navigation, and timely service alerts. Embracing a global presence, City mapper has become a go-to resource for urban dwellers seeking efficient and optimized routes to navigate the complexities of city transit systems.

### **Working model:**

City mapper's working model encompasses real-time integration of diverse public transit options, including buses, trains, and alternative modes. Users input their journey details, and the app provides optimized routes, step-by-step navigation, and live service updates. The intuitive interface and global coverage make City mapper a go-to solution for urban commuters, streamlining the complexities of city transit systems with efficiency and convenience.

### **Advantages:**

- Intuitive design and easy navigation contribute to a positive user experience, catering to a wide range of users.
- Customizable user profiles allow for saved preferences, favorite routes, and frequent destinations, tailoring the app to individual needs.
- Payment systems simplify the ticketing process, providing a convenient and cashless payment experience.

### **Disadvantages:**

- During peak hours, shared services facilitated by the app may become crowded, affecting the comfort and convenience of the commute.
- Technical glitches, app updates, or maintenance periods may result in service interruptions, impacting real-time information and notifications.
- Users accustomed to traditional transportation methods may find adapting to the app's features challenging, potentially leading to a learning curve.

### **Summary:**

City mapper, a leading mobile application in urban navigation, offers a comprehensive solution for commuters worldwide. With real-time data integration on diverse public transit options, the app provides efficient trip planning, step-by-step navigation, and timely service alerts. Its intuitive interface and global coverage make it a go-to resource for users seeking optimized routes in complex city transit systems. The advantages of City mapper include efficient trip planning, real-time information, a user-friendly interface, personalization, notifications, interactive maps, and global accessibility. However, potential challenges may include dependency on technology, connectivity issues, a learning curve, and concerns about crowded services. Overall, City mapper plays a vital role in streamlining and enhancing the urban commuting experience.

## Screenshots:



## References:

<https://play.google.com/store/apps/details?id=com.citymapper.app.release&hl=en&gl=US>

<https://citymapper.com/?lang=en>

## Comparison

| Features                | Iqra Nav bus  | Other shuttle apps                                  |
|-------------------------|---|---|
| Interactive Maps        | ✓ Includes maps for finding nearby bus stops                    | ✗ Maps might not be as interactive or user-friendly |
| Emergency Support       | ✓ Provides in-app emergency contact information                 | ✗ May lack dedicated emergency support features     |
| Feedback Mechanism      | ✓ Users can submit feedback and report issues                   | ✗ Limited or no built-in feedback mechanism         |
| Personalization         | ✓ Users can customize profiles and Saved their address or route | ✗ Limited personalization options                   |
| Compliance              | ✓ Adheres to university policies and data protection laws       | ✗ Compliance measures may vary                      |
| Social Integration      | ✓ Allows social media integration for easy sharing              | ✗ Limited or no integration with social platforms   |
| Marketing and Promotion | ✓ Incorporates features for marketing and promotions            | ✗ Marketing features may not be as robust           |

### WHY WE MAKE THIS PROJECT?

The Iqra Nav Bus app prioritizes the ease and convenience of students by offering a seamless and the efficient tracking system. Through real-time tracking features, students can effortlessly monitor the current location of buses, access information about upcoming stops, and stay informed about the entire route. The app's intuitive interface ensures that students can easily navigate and visualize the bus's progress, contributing to a hassle-free commuting experience. This emphasis on real-time tracking aligns with the goal of providing students with accurate and timely information, enhancing their ability to plan and optimize their journeys within and around the university campus.

### WHY OUR APPLICATION WILL BE BETTER?

The Iqra NavBus application stands out as a superior solution for Iqra University north campus students, offering a tailored and user-centric commuting experience. The app's seamless integration with university credentials ensures a familiar on boarding the process, while its real-time tracking features empower students to efficiently monitor bus locations and plan routes. Safety is a top priority, with in-app emergency contact information and dedicated customer support options, showcasing a commitment to user well-being.

## Section 4:

### Research Approach

#### Functional and Non-Functional Requirements:

##### Functional Requirements:

- 1. User Registration and Authentication:**
  - Allow users to register using university credentials.
  - Implement secure login and authentication mechanisms.
  - Provide a password recovery mechanism.
- 2. Shuttle Bus Routes and Schedules:**
  - Display a list of shuttle bus routes.
  - Show schedules and timings for each route.
  - Provide real-time updates on bus locations and estimated arrival times.
- 3. Bus Stop Information:**
  - Display a list of bus stop locations.
  - Include interactive maps for finding nearby bus stops.
- 4. User Profiles:**
  - Allow users to create and customize profiles.
  - Include settings for personal preferences and notifications.
- 5. Notifications and Alerts:**
  - Send push notifications for upcoming rides, delays, and route changes.
  - Provide additional notification options via email and SMS.
- 6. Feedback and Reporting:**
  - Allow users to submit feedback and suggestions.
  - Implement a system for reporting issues or incidents during rides.
- 7. Contact and Support:**
  - Provide emergency contact information for quick assistance.
  - Offer in-app customer support options.

##### Non-Functional Requirements:

- 1. Performance:**
  - The app should load promptly to provide a seamless user experience.
  - Real-time tracking updates should have low latency for immediate and accurate information.
- 2. Security:**
  - All user data should be encrypted during transmission.
  - Passwords should be stored securely using industry-standard hashing algorithms.
- 3. Usability:**
  - The app should have an intuitive and user-friendly interface.
  - Users should be able to complete essential tasks without requiring external assistance.
- 4. Compliance:**
  - The app should comply with university policies and regulations.
  - It should adhere to data protection and privacy laws.

## Flow Charts:

### 1) For Admin:

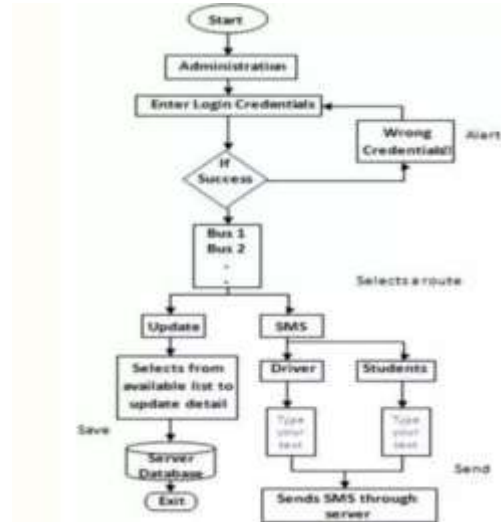


Fig 4.1

### 2) For Driver:

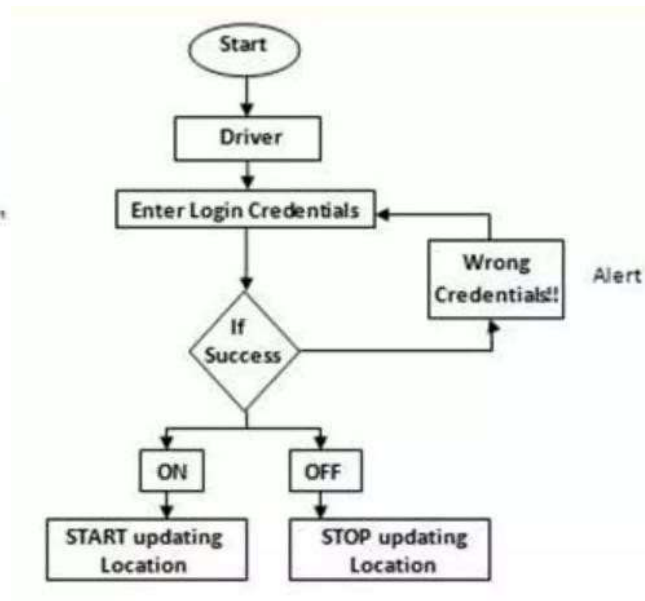


Fig 4.2

### 3) For Student and Bus Information:

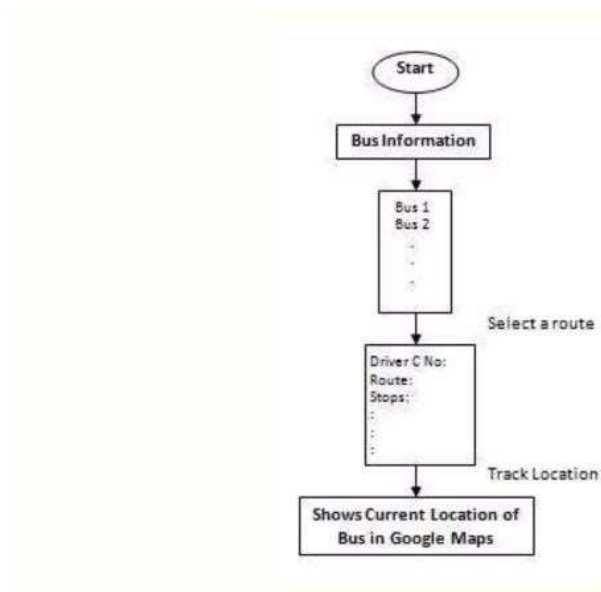


Fig 4.3

# Agile Development Model

The Agile Development Model is an iterative and customer-centric approach to software delivery. Unlike traditional methods, Agile focuses on incremental development, breaking projects into smaller iterations for flexibility and adaptability. Each iteration, typically lasting one to four weeks, involves the complete software development life cycle.

## Key Steps in Agile Development:

- **Requirements Gathering and Analysis:** Identify project requirements, assess market opportunities, and plan project timelines and efforts.
- **Design:** Collaborate with stakeholders to define project requirements visually, using tools like user flow diagrams or UML diagrams.
- **Coding:** Developers and designers begin working on the project, incorporating minimal functionality and iterating for enhancements.
- **Testing/Quality Assurance:** The Quality Assurance team rigorously tests the product to identify and address any bugs or issues.
- **Deployment:** Release the product to the customer's work environment.
- **Feedback:** Gather feedback after product launch, incorporating reviews and re-evaluating requirements.

## Principles of Agile Model:

- Customer involvement and clear communication are paramount, with a customer representative present in the team.
- Prioritization of working software over extensive documentation.
- Frequent delivery of incremental versions to stakeholders.
- Encouragement of requirement modifications throughout the project.
- Emphasis on efficient team collaboration through face-to-face communication.
- Deployment of Pair Programming for code quality and error reduction.

## Advantages of Agile Model:

- Efficient Pair Programming results in well-written, error-free code.
- Reduction in overall project production time.
- Customer representatives gain insights into modified software products after each iteration, facilitating easy requirement of the changes.

## Disadvantages of Agile Model:

- Uncertainty due to a lack of formal documentation.
- Challenges in project maintenance without proper documentation.

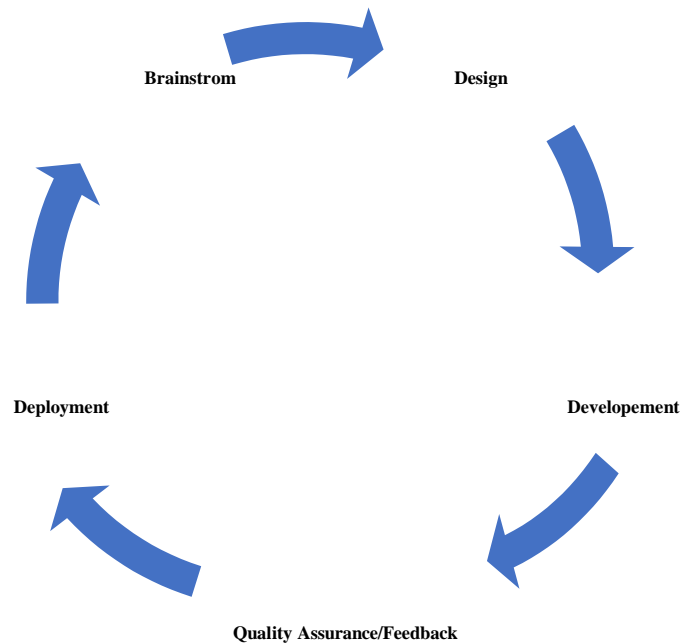


## Why choosing Agile Development Model?

Selecting the Agile Development Model for our project, Iqra Nav Bus, is driven by several strategic considerations that align with the unique requirements and dynamics of our shuttle service application. Here are the key reasons behind choosing the agile model:

- **Customer-Centric Approach:** The nature of our project, which involves providing a service to Iqra University students, requires continuous and close collaboration with end-users. Agile's emphasis on customer involvement and frequent feedback aligns perfectly with our goal of creating a user-friendly and responsive shuttle service.
- **Flexibility in Requirements:** The Agile model's iterative and incremental nature allows us to be responsive to changing requirements. In a university environment, where student needs and preferences may evolve, having the flexibility to adapt quickly is crucial for the app's success.
- **Early Delivery of Value:** Agile's focus on delivering working software in short iterations enables us to provide tangible value to users early in the development process. This aligns with our objective of delivering a Minimum Viable Product (MVP) quickly, allowing students to start benefiting from the app sooner.
- **Risk Mitigation:** Breaking the project into smaller iterations reduces the overall risk. We can identify and address issues early in the development process, ensuring that any challenges are addressed before they become significant obstacles.
- **Continuous Improvement:** Agile's iterative cycles, including regular retrospectives, foster a culture of continuous improvement. This means that as we progress through the development, we can reflect on our processes, identify areas for enhancement, and adjust to ensure optimal efficiency and quality.
- **Enhanced Collaboration:** The collaborative nature of Agile, with its cross-functional teams and emphasis on face-to-face communication, fosters a cohesive and efficient working environment. This is particularly important for a project like ours, where effective coordination is vital for success.
- **Quick Adaptation to User Feedback:** The Agile model's iterative nature allows us to incorporate user feedback rapidly. This is critical for refining the app based on real-world usage, ensuring that it meets the evolving needs and expectations of Iqra University students.
- **Efficient Team Management:** Agile recommends small, efficient development teams. This approach promotes effective communication and a collaborative work atmosphere, enabling team members to actively participate in decision-making and problem-solving.

## Working Flow Diagram of Agile Development Model:



## Key Advantages of Agile Model for Iqra NavBus Project:

Some other benefits are also considered best for our Project as follow:

1. **Adaptability to Changing Circumstances:** The Agile model excels in environments where requirements are subject to change. In the context of a university setting, where student schedules, preferences, and transportation needs can evolve, Agile's adaptability allows us to accommodate these changes seamlessly.
2. **Increased Transparency:** Agile promotes transparency throughout the development process. Regular meetings, reviews, and a focus on open communication ensure that all stakeholders, including university administrators, have a clear understanding of the project's progress, challenges, and outcomes.
3. **Reduced Time to Market:** By delivering a Minimum Viable Product (MVP) in short iterations, Agile accelerates the time it takes to bring a functional product to market. This is crucial for Iqra NavBus, enabling students to benefit from the app's features sooner rather than later.
4. **Enhanced Quality Assurance:** The iterative testing and quality assurance practices embedded in Agile contribute to the creation of a robust and reliable application. By addressing issues early and continuously validating the product, we ensure a high-quality user experience.
5. **Increased Stakeholder Engagement:** Agile's collaborative approach involves stakeholders, including the university officials, throughout the development process. This continuous engagement ensures that the app aligns with the university's vision, policies, and overall objectives.
6. **Cost-Efficiency:** Agile's iterative development and emphasis on delivering value incrementally contribute to the cost-efficiency. The ability to adjust based on user feedback in early stages helps prevent costly rework later in the project.

7. **Motivated and Empowered Teams:** Agile principles empower team members by giving them a sense of ownership and involvement in decision-making. This can lead to higher motivation, increased creativity, and a stronger commitment to project success.
8. **Early Identification of Risks:** Agile's iterative cycles allow for the early identification of potential risks and the most challenges. By addressing issues as they arise, the project team can proactively mitigate risks, preventing them from escalating into significant obstacles.
9. **Encourages Innovation:** The iterative and collaborative nature of Agile encourages a culture of innovation. The Team members are empowered to suggest and implement improvements continuously, fostering an environment where creative solutions can emerge.
10. **Positive Impact on Project Culture:** The Agile model fosters a positive project culture by promoting open communication, teamwork, and a focus on delivering value. This contributes to a dynamic and engaging work environment for the project team.

## Agile Model Phases for Our Project (Iqra NavBus):

Here are a couple of Agile Model Phases for our project,

### 1. Problem Identification:

**Objective:** Identify key challenges and areas of improvement.

**Activities:** Clearly define problems affecting the app's functionality.

Propose solutions, assign responsibilities, and outline the resolution strategy.

Align problem resolution with the overall app-making strategy.

### 2. Structure Map Creation:

**Objective:** Visualize app specifications, requirements, and development timeframes.

**Activities:** Develop a structured map outlining app specifications and requirements.

Define a loose timeframe for the development of each app requirement.

Help the team visualize the interconnected parts of the project.

### 3. Work Plan Drafting:

**Objective:** Create a team timetable for the release of each iteration.

**Activities:** Draft a detailed work plan outlining the development stages.

Allocate timeframes for specific tasks and milestones.

Provide a clear roadmap for the team to follow.

### 4. Daily Meetings Planning:

**Objective:** Facilitate regular team meetings for progress updates.

**Activities:** Plan daily or bi-daily meetings to discuss ongoing progress.

Avoid excessive meetings to maximize development time.

Use meetings to address current challenges and catch mistakes early.

### 5. Sprint Reviews Arrangement:

**Objective:** Showcase working problem status to stakeholders for review.

**Activities:** Organize sprint reviews to present the status of ongoing developments.

Allow stakeholders to provide feedback and insights.

Ensure alignment with stakeholder expectations.

### 6. Sprint Evaluation and Adaptation:

**Objective:** Assess sprint performance and plan for improvements.

**Activities:** Conduct evaluations to draw conclusions about the completed sprint.

Discuss lessons learned and identify areas for improvement.

Adapt the workflow based on feedback and emerging requirements.

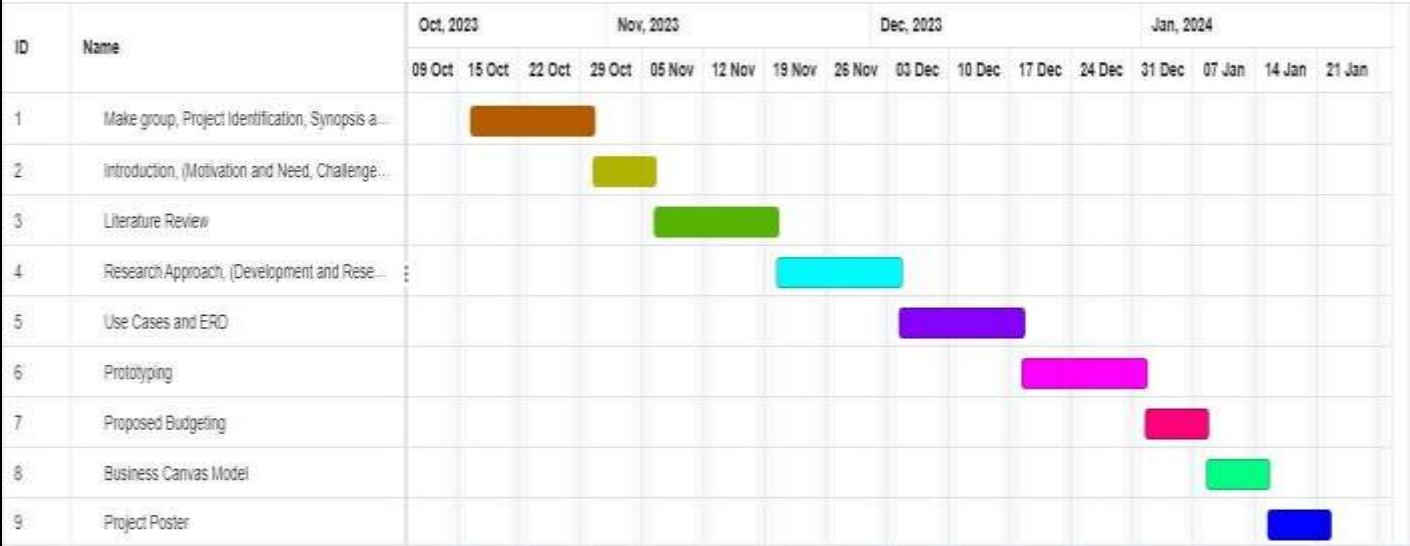
**Conclusion:**

Embracing the Agile model for the Iqra NavBus project encourages a dynamic and efficient development approach. By focusing on problem resolution, structured planning, and continuous adaptation, the team aims to deliver a responsive and user-centric shuttle service app. This methodology prioritizes user validation and aims to resolve challenges promptly, ensuring a streamlined and effective development process.

**Key Milestones and Deliverables:**

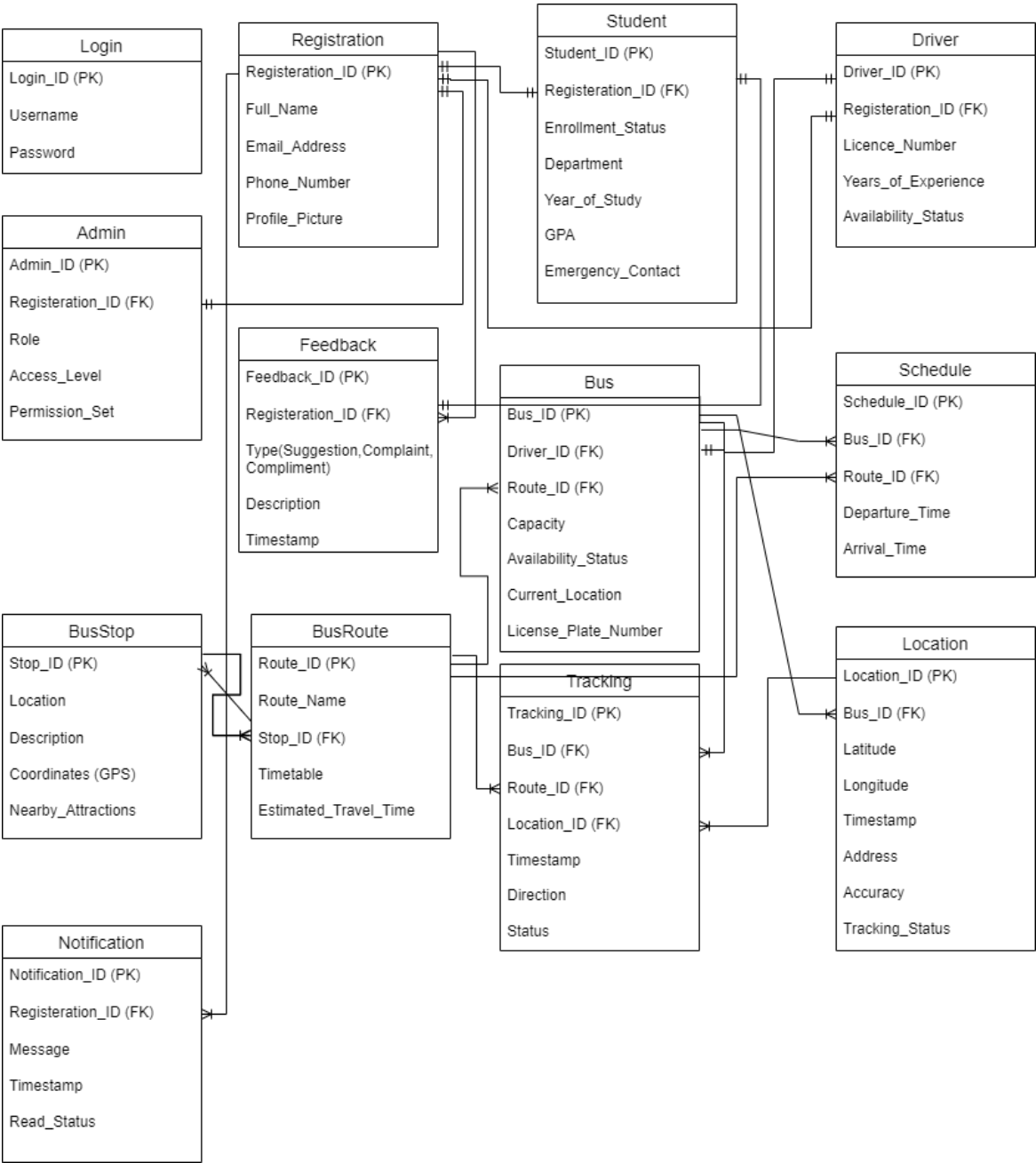
| S. No | Elapsed time since start of the project | Milestone  | Deliverable  |
|-------|---|--|--|
| 1.    | Week 01 – 04                            | Pitching ideas and Project Finalizing  | Report on Approved Project Ideas.  |
| 2.    | Week 05 – 08                            | Working on Project Title, Requirements Gathering, and Scope  | Report on Project Title, Functional & Non-Functional Requirements and Literature Review. |
| 3.    | Week 09 – 12                            | Research on the project development and resource analysis, developing system diagrams (Use case and ERD) to identify functionalities | Report on Research Approach and Methodology, ERD, Use Case.                              |
| 4.    | Week 13 – 16                            | Creating Design of the Application   | Report on Proto-type, Business Canva Model, Project Poster.                              |
| 5.    | Week 17 – 20                            | Complete Project Report  | Finalize report and poster.  |
| 6.    | Week 20 – 24                            | Working on Android app development and testing   | --   |
| 7.    | Week 25 – 32                            | Working on Android app development and testing   | -  |
| 8.    | Week 32 – 36                            | Working on Android app development and testing   | -  |
| 9.    | Week 37 – 40                            | Deployment on PlayStore  | -  |
| 10.   | Week 40-44                              | Feedback   | -  |

# Annexure–A: Project Schedule / Milestone Chart

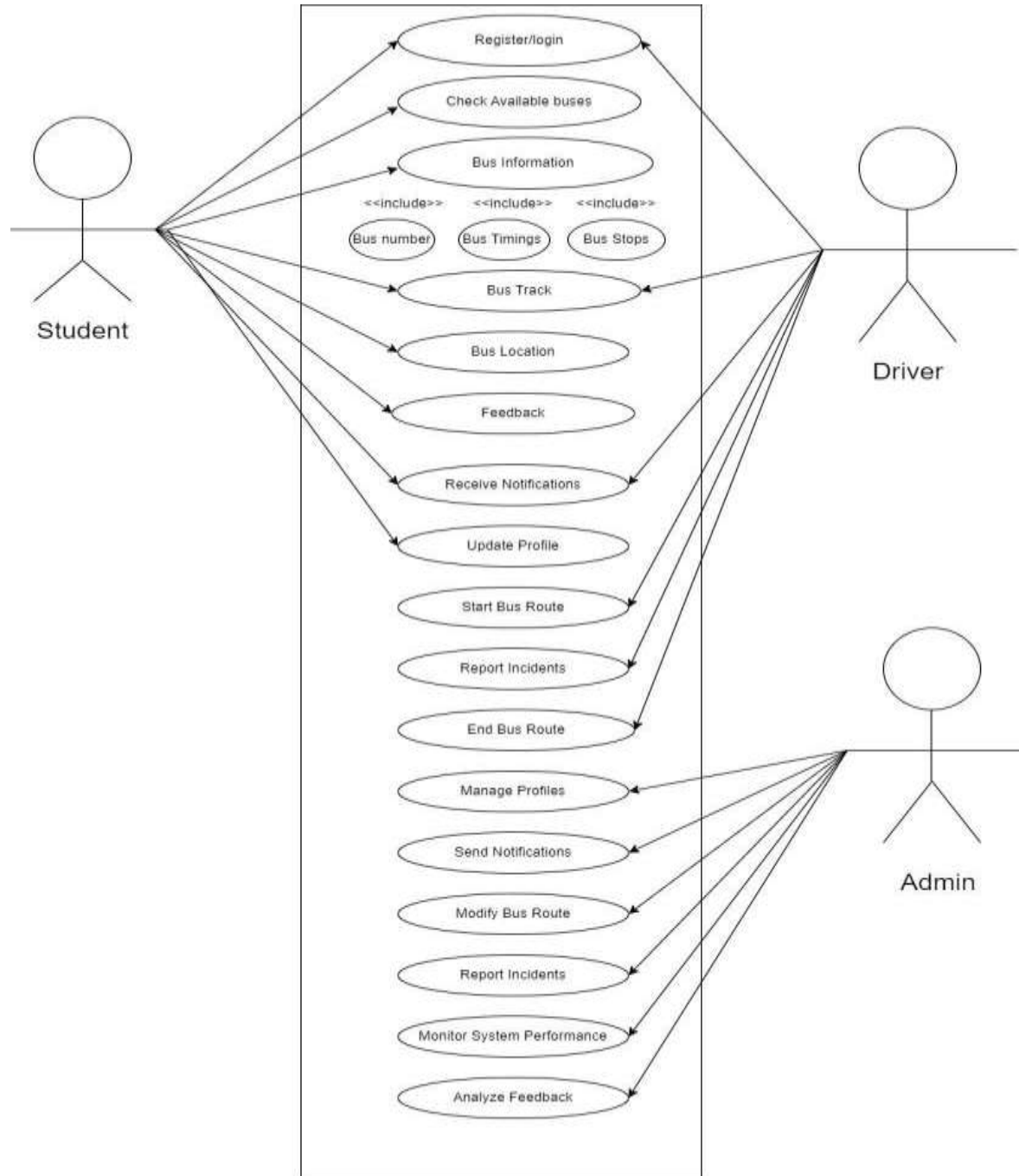


Section 5:

Entity Relationship Diagram (ERD)

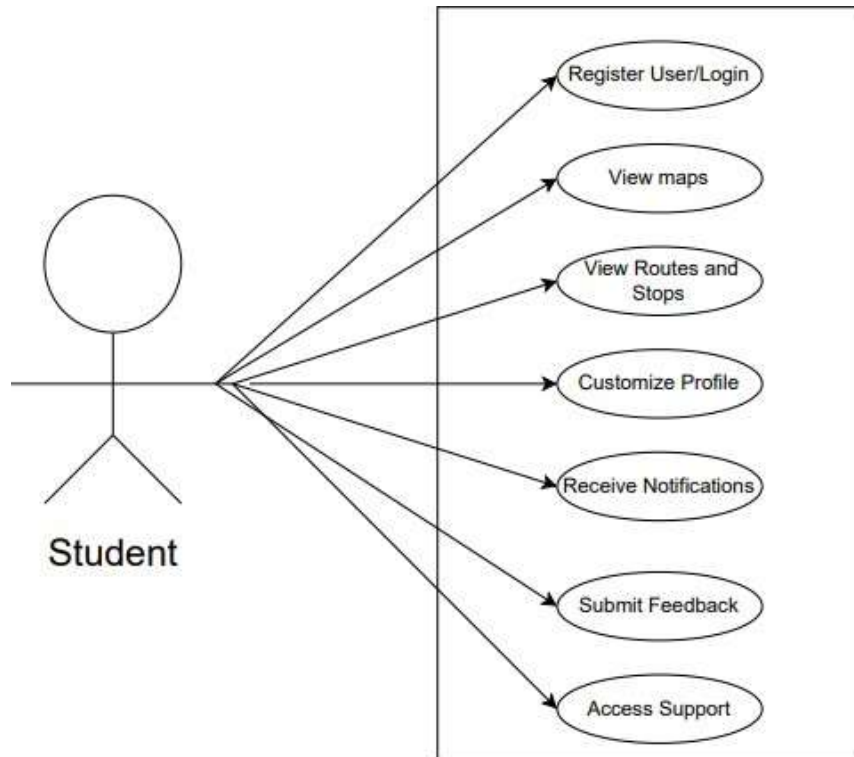


## Use Case Diagram



## Narrative Use Case Diagram

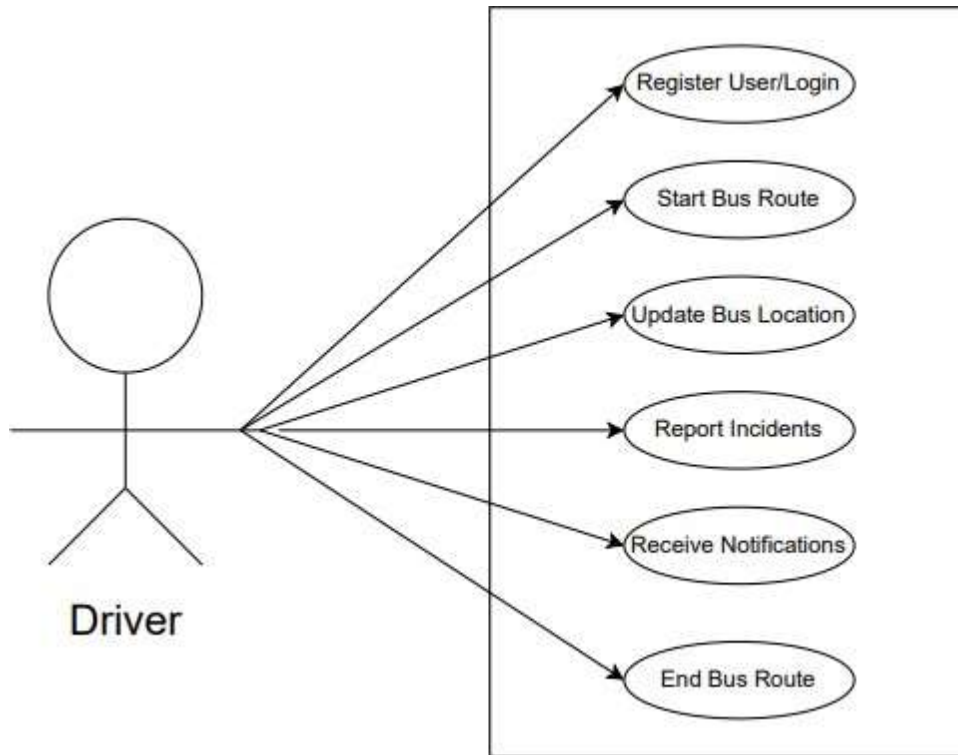
### Student Use Case Diagram



|                               |   |  |
|-------------------------------|---|--|
| <b>Use Case Name:</b>         | Student   |  |
| <b>ID:</b>                    | 1.1   |  |
| <b>Actors Involved:</b>       | Student   |  |
| <b>Brief Description</b>      | The student searches and plans a bus journey, views available routes, and checks bus schedules. |  |
| <b>Pre-Conditions</b>         | The student is logged into the Iqra Nav Bus app.  |  |
| <b>Post-Conditions</b>        | The student has a planned bus journey.  |  |
| <b>Normal Flow of Events:</b> | <b>Actor Action</b>   | <b>System Response</b>   |
|                               | Student selects "Student" option.<br>Student selects a route and views the schedule.            | App displays available routes and bus schedules.<br>App provides real-time updates on bus locations. |



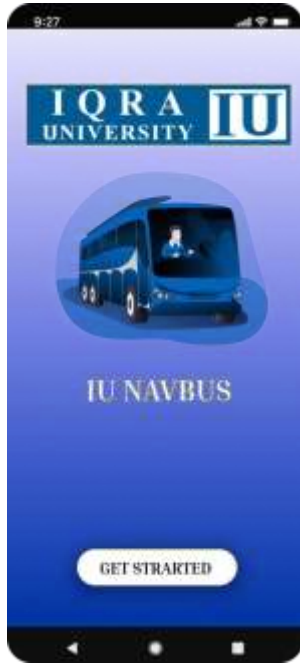
## Driver Use Case Diagram



|                               |  |   |
|-------------------------------|--|---|
| <b>Use Case Name:</b>         | Driver   |   |
| <b>ID:</b>                    | 2.2  |   |
| <b>Actors Involved:</b>       | Driver   |   |
| <b>Brief Description</b>      | The driver updates the bus location in real-time, allowing users to track the bus on their app. The driver reports incidents, accidents, or technical issues during the journey, initiating appropriate responses. |   |
| <b>Pre-Conditions</b>         | The driver is logged into the Iqra NavBus app.   |   |
| <b>Post-Conditions</b>        | The bus location is updated in the system and incident is reported, and appropriate actions are taken.   |   |
| <b>Normal Flow of Events:</b> | <b>Actor Action</b>  | <b>System Response</b>  |
|                               | Driver selects "Update Bus Location."<br>Driver inputs the current bus location.   | App prompts the driver to input location.<br>App updates the bus location in real-time. |

## Section 6:

## Proto-typing



9:27



← Sign Up

Name

Enter Your Name :

Email

Enter Your Email

Password


Enter Your Password

\*Must be at least 8 character

CREATE AN ACCOUNT

Already have an account? [log in](#)

9:27



← Log In

Email

Enter Your Email

Password

Enter Your Password


☐ Remember Me

Log In

[Forgot Password ?](#)

CREATE AN ACCOUNT



9:27



← You Are

Student

Driver

9:27



← Forgot Password

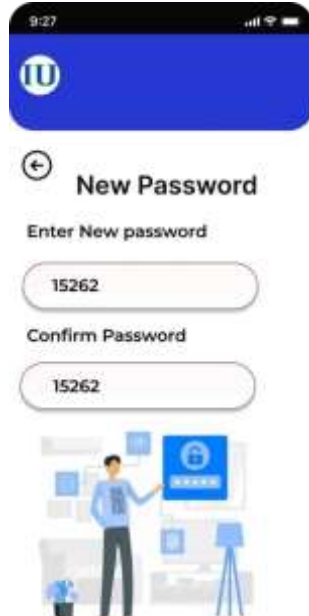
Enter Email Address

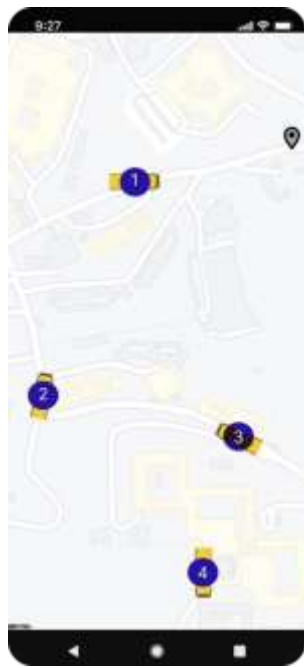
example@gmail.com



Send OTP

[Didn't receive code? Resend again](#)







## Section 7:

## Budgeting

### Annexure–B: Proposed Budget

Please use the embedded Excel Worksheet for providing budget details. Double click the icon to open the worksheet.

## IORA NAVBUS APPLICATION FYP PROJECT

## Proposed Budget

**Summary:**

(Do not enter the summary amounts (Sr.# 1-6) as they are automatically updated.)

[illegible]

## Section 8:

### Business Canvas Model

#### Lean Buisness Model Canvas








Model Name: Bus Navigation System

| Problem  | Solution   | Unique Value Proposition   | Unfair Advantages   | Customer Segments   |
|--|--|--|---|---|
| <ul style="list-style-type: none"> <li>➤ Inefficient Bus Navigation</li> <li>➤ Lack of Real-Time</li> <li>➤ Tracking Ineffective Route Planning</li> </ul>   | <ul style="list-style-type: none"> <li>➤ Real-time Bus Tracking</li> <li>➤ Route Optimization</li> <li>➤ Customizable Features for Specific Needs</li> </ul> | <ul style="list-style-type: none"> <li>➤ Real-Time Tracking</li> <li>➤ Real-Time Bus Tracking</li> <li>➤ Notifications</li> <li>➤ Feedback</li> <li>➤ Community-Driven Routes</li> </ul> | <ul style="list-style-type: none"> <li>➤ Proprietary Algorithm for Accurate Predictions</li> <li>➤ Exclusive Partnerships with Local Communities</li> <li>➤ Seamless Integration with Existing Transportation Infrastructure</li> </ul> | <ul style="list-style-type: none"> <li>➤ Corporate Sectors</li> <li>➤ Educational Institutions (Colleges, Universities)</li> <li>➤ Government Organizations</li> <li>➤ Transit Authorities</li> </ul> |
| <b>Key Metrics</b> <ul style="list-style-type: none"> <li>➤ User Engagement</li> <li>➤ App Downloads</li> <li>➤ Customer Satisfaction</li> </ul>   |  | <b>Channels</b> <ul style="list-style-type: none"> <li>➤ Mobile App Stores (iOS, Android)</li> <li>➤ Social Media Platforms</li> <li>➤ Local Community Meetings and Events</li> </ul>    |   |   |
| <b>Cost Structure</b> <ul style="list-style-type: none"> <li>➤ Development and Maintenance Costs</li> <li>➤ Marketing and Sales Expenses</li> <li>➤ Tech infrastructure, communication expenses.</li> <li>➤ Server and data storage expenses.</li> <li>➤ Team salaries, customer support costs.</li> </ul> |  | <b>Revenue Streams</b> <ul style="list-style-type: none"> <li>➤ Advertising Revenue</li> <li>➤ Affiliate Marketing</li> <li>➤ Geo-Targeted Promotions</li> </ul>                         |   |   |




## Section 9:

### Poster Design

|  |   |   |
|--|---|---|
| <b>Group Members</b> <ul style="list-style-type: none"> <li>• Syed Haider Naqvi 13330</li> <li>• Syed itrat Hussain Zaidi</li> <li>• Muhammad Owais 13254</li> <li>• Hamza 13192</li> </ul>  |   | <b>Internal advisor</b><br>Ma'am Ghazala Shafi  |
| <b>Objectives and Goals</b><br>Iqra nav bus providing a real-time tracking, convenient route planning, and timely notifications to students. Our app Reducing uncertainty about bus arrival times.   |   | <b>Software</b><br>   <b>Dart</b><br>  |
| <b>Features</b> <ul style="list-style-type: none"> <li>• Real time tracking</li> <li>• User friendly Interface</li> <li>• Interactive maps</li> <li>• Notifications</li> <li>• Save your route</li> <li>• Feedback mechanism</li> <li>• Emergency support</li> </ul> |  | <b>Scope</b><br>The scope of Iqra NavBus aims to provide a comprehensive and user-centric solution for improving campus transportation services and fostering a positive student experience.  |
| <b>Project Description</b><br>Develop an efficient and reliable shuttle service app to streamline transportation for Iqra University students, reducing waiting times and improving overall commuting experience.  |   |   |

Section 10:

Weekly Logs



1

## FYP WEEKLY LOG

13 November 2023

|   |  |
|---|--|
| <div>S M HAIDER RAZA NAQVI13330</div> <div>PROBLEMS</div> <div></div> <div></div> <div></div> <div></div> <div></div> | <div>SYED ITRAT HUSSAIN ZAIDI13107</div> <div>SYNOPSIS</div> <div></div> <div></div> <div></div> <div></div> <div></div> |
| <div>MUHAMMAD OWAIS13254</div> <div>PROBLEMS</div> <div></div> <div></div> <div></div> <div></div> <div></div>        | <div>HAMZA13102</div> <div>SYNOPSIS</div> <div></div> <div></div> <div></div> <div></div> <div></div>                    |
| <div>SUPERVISOR'S COMMENTS</div> <div></div> <div></div> <div></div> <div></div> <div></div>                          | <div>COORDINATOR COMMENTS</div> <div></div> <div></div> <div></div> <div></div> <div></div>                              |

## FYP WEEKLY LOG

20 November 2023

S M HAIDER RAZA NAQVI 13330

### KEY BENEFITS

---

---

---

---

---

MUHAMMAD OWAIS 13254

### AIMS

### OBJECTIVES

---

---

---

### SUPERVISOR'S COMMENTS

---

---

---

---

---

---

SYED ITRAT HUSSAIN ZAIDI 13107

### TECHNOLOGY

---

---

---

---

---

HAMZA 13192

### CHALLENGES

### MOTIVATION

### NEEDS

---

---

---

### COORDINATOR COMMENTS

---

---

---

---

---

---

## FYP WEEKLY LOG

27 November 2023

S M HAIDER RAZA NAQVI 13330

COMPETITOR: TOOT BUS

COMPETITOR: SHUTTL

COMPARISION CHART

---

---

---

MUHAMMAD OWAIS 13254

COMPETITOR: SWVL

COMPETITOR: SUNWAY SHUTTLE BUS

COMPARISION CHART

---

---

---

SUPERVISOR'S COMMENTS

---

---

---

---

---

---

SYED ITRAT HUSSAIN ZAIDI 13107

COMPETITOR: MOOVITT

COMPETITOR: PEOPLE BUS SERVICE

COMPARISION CHART

---

---

---

HAMZA 13192

COMPETITOR: TRANSITT

COMPETITOR: CITY MAPPER

COMPARISION CHART

---

---

---

COORDINATOR COMMENTS

---

---

---

---

---

---

## FYP WEEKLY LOG

4 December 2023

**S M HAIDER RAZA NAQVI 13330**

**FUNCTIONAL REQUIREMENTS**

**FLOW CHARTS**

---

---

---

---

**MUHAMMAD OWAIS 13254**

**AGILE DEVELOPMENT MODEL**

**KEY MILESTONES**

**AND DELIVERABLES**

---

---

---

**SUPERVISOR'S**

---

---

---

---

---

---

**SYED ITRAT HUSSAIN ZAIDI 13107**

**NON-FUNCTIONAL REQUIREMENTS**

**CONCLUSION**

---

---

---

---

**HAMZA 13192**

**AGILE DEVELOPMENT MODEL**

**MILESTONE CHART**

---

---

---

---

**COORDINATOR COMMENTS**

---

---

---

---

---

---

## FYP WEEKLY LOG

11 December 2023

S M HAIDER RAZA NAQVI 13330

ERD DIAGRAM

---

---

---

---

---

MUHAMMAD OWAIS 13254

NARRATIVE USE CASE DIAGRAM

---

---

---

---

---

SUPERVISOR'S COMMENTS

---

---

---

---

---

---

SYED ITRAT HUSSAIN ZAIDI 13107

USE CASE DIAGRAM

---

---

---

---

---

HAMZA 13192

ERD DIAGRAM

---

---

---

---

---

COORDINATOR COMMENTS

---

---

---

---

---

---

## FYP WEEKLY LOG

18 December 2023

S M HAIDER RAZA NAQVI 13330

PROTO-TYPING

---

---

---

---

---

MUHAMMAD OWAIS 13254

PROTO-TYPING

---

---

---

---

---

SUPERVISOR'S COMMENTS

---

---

---

---

---

---

SYED ITRAT HUSSAIN ZAIDI 13107

PROTO-TYPING

---

---

---

---

---

HAMZA 13192

PROTO-TYPING

---

---

---

---

---

COORDINATOR COMMENTS

---

---

---

---

---

---

## FYP WEEKLY LOG

25 December 2023

S M HAIDER RAZA NAQVI 13330

BUDGETING

---

---

---

---

---

---

MUHAMMAD OWAIS 13254

BUDGETING

---

---

---

---

---

---

SUPERVISOR'S COMMENTS

---

---

---

---

---

---

SYED ITRAT HUSSAIN ZAIDI 13107

BUDGETING

---

---

---

---

---

---

HAMZA 13192

BUDGETING

---

---

---

---

---

---

COORDINATOR COMMENTS

---

---

---

---

---

---



## FYP WEEKLY LOG

1 January 2024

S M HAIDER RAZA NAQVI 13330

BUSINESS CANVAS MODEL

---

---

---

---

---

MUHAMMAD OWAIS 13254

BUSINESS CANVAS MODEL

---

---

---

---

---

SUPERVISOR'S COMMENTS

---

---

---

---

---

---

SYED ITRAT HUSSAIN ZAIDI 13107

BUSINESS CANVAS MODEL

---

---

---

---

---

HAMZA 13192

BUSINESS CANVAS MODEL

---

---

---

---

---

COORDINATOR COMMENTS

---

---

---

---

---

---

## FYP WEEKLY LOG

8 January 2024

S M HAIDER RAZA NAQVI 13330

POSTER DESIGN

---

---

---

---

---

MUHAMMAD OWAIS 13254

POSTER DESIGN

---

---

---

---

---

SUPERVISOR'S COMMENTS

---

---

---

---

---

---

SYED ITRAT HUSSAIN ZAIDI 13107

POSTER DESIGN

---

---

---

---

---

HAMZA 13192

POSTER DESIGN

---

---

---

---

---

COORDINATOR COMMENTS

---

---

---

---

---

---

























