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An Undergraduate Internship on ”Ushuttle” Application

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An Undergraduate Internship on "Ushuttle" Application

By

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Autumn, 2022

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Department of Computer Science & Engineering

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January 31, 2023

Dissertation submitted in partial fulfillment for the degree of Bachelor of Science in Computer Science

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

This certificate is to confirm that the report titled Ushuttle (App) has been completed by me, Abid Hossain Shipow (1822149), and submitted as part of the requirements for the Degree of Computer Science and Engineering from Independent University, Bangladesh (IUB). It was completed with the guidance of my supervisor, Md. Asif Bin Khaled. I also certify that the work is entirely mine, based on what I have learned from my internship. All sources used in this project and report have been credited.

Abid. 31.01.23

Signature Date

Abid Hossain Shipow

Name

Acknowledgement

First, I am immensely thankful to Allah (SWT) for providing me with the courage, strength, and knowledge to efficiently complete my internship report within the scheduled timeline. I am immensely thankful for His divine guidance and support throughout the duration of this project.

I am immensely thankful to the Faculty of Computer Science and Engineering for providing me with the opportunity to gain invaluable hands-on experience through their internship credit program. This has enabled me to explore the corporate world in an area of my interest and passion. I am deeply grateful to my lecturer, Md. Asif bin Khaled from the Department of Computer Science and Engineering at Independent University, Bangladesh, for his unwavering support and guidance during my internship and for helping me to create this report. His insightful instructions, inspiring suggestions, and thoughtful advice were invaluable and greatly appreciated.

I am grateful to my supervisor for their invaluable guidance and support throughout the process of writing this report. Their expertise and time were instrumental in ensuring its successful completion. I would like to extend my heartfelt gratitude to my team for their continual help and for providing me with thoughtful ideas. I am also immensely thankful to my family for never ending support and encouragement that kept me motivated throughout.

Letter of Transmittal

Md. Asif Bin Khaled
Lecturer
Department of Computer Science and Engineering
School of Engineering and Computer Science
Independent University, Bangladesh

Subject: Submission of Internship Report.
Dear Sir,

I am proud to present my Internship Report on the Ushuttle (App) project. This report documents the work I have done under the guidance and supervision of you. It is an important milestone in my Bachelor Program in Computer Science and Engineering, and I am grateful for the opportunity to work on this innovative project. This internship has provided me with invaluable academic and practical experiences. I have had the opportunity to build professional connections in the corporate world and put my skills to the test. In this report, I have attempted to provide comprehensive information about my experiences during the internship period. I have followed the instructions and provided the necessary details to make my report as informative and organized as possible.
I am confident that this report will effectively fulfill the purpose of the internship program. I am grateful for the chance to submit this report and appreciate your consideration and feedback. I have worked hard to ensure that it meets a high standard, but I understand that perfection is difficult to achieve. I am eager to hear your thoughts on my efforts and hope that you are satisfied with the results.

Sincerely Yours,

Abid Hossain Shipow
ID- 1822149
Department of Computer Science and Engineering
Independent University, Bangladesh

Evaluation Committee

Asif Bin Khaled

Signature

Asif Bin Khaled 30.01.23

Name

Supervisor

Signature

Mahmudul Islam

Name

Internal Examiner

Payel 30.01.23

Signature

Md. Mahmudul Kabir Payel

Name

External Examiner

Signature

Name

Head, Department of Computer Science and Engineering

Abstract

Ushuttle is a mobile app designed to make transportation easier for Student who need to get to the University quickly and safely. It allows users to find their buses from Mirpur to Bashundhara R/A and Bashundhara to Mirpur. User also can track their journey in real time. Ushuttle is designed to make the entire ride experience more convenient and reliable for users by providing multiple payment options, live customer support and detailed safety protocols.

The app also provides users with real-time updates on shuttle services, so they can keep track of their rides. Ushuttle also provides users with an option to pay for their rides directly through the app. This project involves developing a full stack application using Flutter.

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Chapter 1

Introduction

1.1 Overview

A major issue in Dhaka is the traffic jam, which is extremely problematic for students. The current local bus system is inadequate, making it difficult for students in the Bashundhara area to arrive to university in a timely manner or feel safe during their travels, especially for female students. Additionally, there is a lack of direct transportation from Mirpur to Bashundhara, making it a challenge for those with early morning classes. Therefore, this project is being conducted to address these issues. This Ushuttle application will be of great assistance to those needing to get around. So, this Ushuttle Transport system app will be useful to people who are seeking convenient transportation to their desired destination.

1.2 Objectives

The objectives of this project are to create a user-friendly application that meets the client's requirements, is within budget and is delivered by the specified deadline. The application should be specifically designed to meet the needs of the client and should be measurable in terms of its functionality and performance. The aim is to create an application that is both efficient and satisfying to use.

- The apps show the real time location.
- It also has Card punching system.
- Payment gateway.
- Bus payment history.
- Ride history.
- Users can reserve this system for (7days / 15 days (about 2 weeks) /30 days).

1.3 Scopes

This app is designed to make commuting from Mirpur to Bashundhara R/A faster and easier for students. It provides real-time information on bus schedules and routes, as well as an online booking system for tickets. Additionally, it offers a map view of the journey to help users stay on track. This app offers an efficient solution to get to school or home on time without any delays or the need to find alternative transportation.
This application-based real-time 'Ushuttle' transport system enables users to register and then log in to the main page to track the location of the bus in real time. From the home page, they can purchase tickets and use them using a QR code. Additionally, users can get up-to-date notifications, fare information, schedules, stoppage information, and announcements. It also includes features that allow drivers to share the live location of the bus, scan tickets, sell tickets and make updates.

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

To fulfill its commitment to the formation of responsible, mature, and educated citizens, the university prioritizes teaching and learning as well as the learning process. My undergraduate studies gave me the information and abilities that helped me with my tasks. In object-oriented programming, data structures are described as objects, each with a unique set of characteristics. Because OOP requires less work, it can also be used in applications related to design and manufacturing. The knowledge I gained from Web Applications and Internet course in HTML , CSS , JavaScript , and PHP has helped me in putting my project work into practice since I am now working on front-end development for my project.

I was able to create my project work with the help of the System Analysis and Design course's lessons on functional and non-functional requirements, UML diagrams, data flow diagrams, and activity diagrams. Database Management course has taught me about SQL, ER Diagrams, and other things that will help me with my project's back-end development. My knowledge of creating mobile applications has increased due to Mobile Application Development course. As a result, I believe the knowledge I gained from this course will be useful when I put the project together.

2.2 Related works

The project I am working on is the transport system. Where students can go to their university safely and on time. This project is like "Uber" or "Pathao" but this project is following the bus system rather than car or motorcycle. This system will follow all the beneficial sides of those ride systems.

So, We Relate this App to "Uber" And "Pathao". Back in 2015, ride-hailing apps were first presented to the people of Dhaka, and since then, the number of providers offering

this service has grown to over two dozen. In 2009, Uber became the first company to offer a ride-hailing app for smartphones, providing users with a convenient and reliable way to get a ride. The app quickly became popular and the phrase "getting an Uber" became synonymous with using a ride-hailing service. [1]

In 2016, Uber began operations in Bangladesh, initially offering car services in Dhaka and then expanding to include motorcycle services within a year, making Bangladesh one of the company's most important markets.In the two years since its launch in mid-2016, Pathao has experienced remarkable growth, having amassed over 100,000 drivers and over 1 million users by March 2018.[2]

Both Uber and Pathao launched their ride-sharing applications in 2016.

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

A Work Breakdown Structure is a graphical representation of a project's components and the relationships between them. It is used to break the project down into manageable parts, identify potential risks and ensure that all necessary deliverables are accounted for. It lays out the scope, responsibilities, communication points, costs and guarantees associated with the project. Using a top-down approach, the team has created a WBS (Work Breakdown Structure) for the project to facilitate brainstorming and collaboration. This will allow us to break the project down into smaller tasks and prioritize them accordingly.[3]

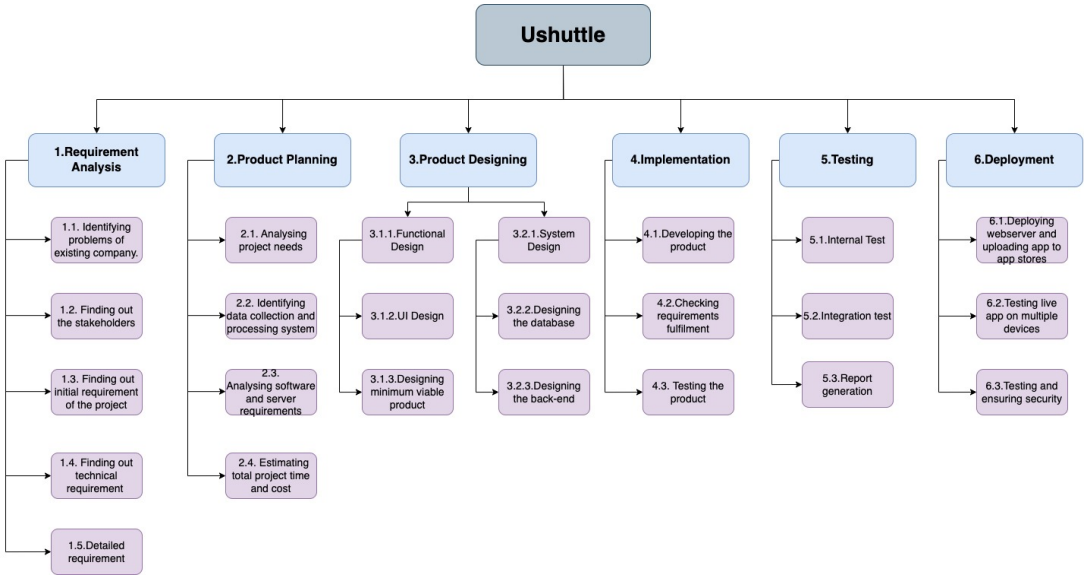


Figure 3.1: Work Breakdown Structure

3.2 Activity wise Time Distribution

For this project, I have allocated time in the Work Breakdown Structure to ensure the project is completed on time. The following table shows the time allocated for each task:

Index	Task	Dependency	Duration
A	Proposal	T1	7 Days
B	Acceptance	T2	5 Days
C	Gathering Requirements	T3	5 Days
D	Project Planning	T4	5 Days
E	UI UX Design	T5	2 Days
F	Adding Live map	T6	14 Days
G	Adding Server	T7	2 Days
H	Designing database	T8	5 Days
I	Adding Database	T9	2 Days
J	Server integration	T10	5 Days
K	Testing	T11	5 Days
L	Finding and solving bugs	T12	5 Days
M	Retesting	T13	2 Days
N	Final touch	T14	10 Days
O	Deploying to consumer	T15	5 Days

Table 3.1: Activity wise Time Distribution

3.3 Gantt Chart

I created a Gantt Chart to map out and organize the various tasks that needed to be completed to successfully finish the project. This Gantt chart provides a visual representation of the timeline for UShuttle. It shows the tasks that need to be completed, along with the allotted time for each task. The tasks are represented by numbers and the time is represented by green bars. This helps to provide an easy way to track the progress of the project and identify any potential delays or issues.

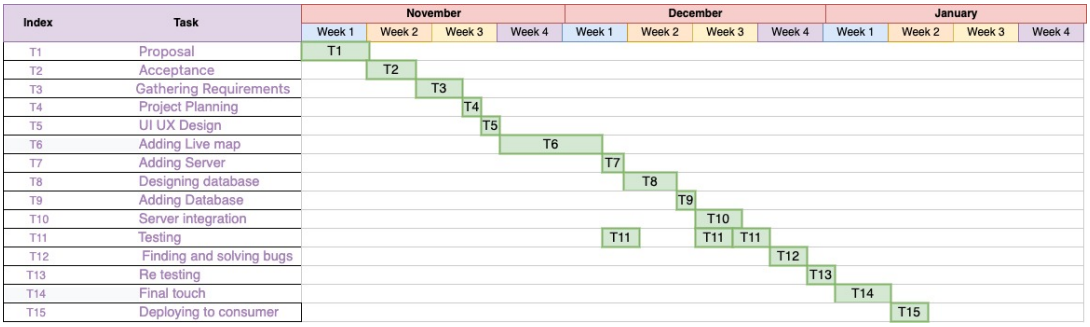


Figure 3.2: Gantt Chart

3.4 Estimated Costing

The estimated cost of the Ushuttle app development is zero(Taka). This cost includes the technology used, the cost of the Map API, and the cost of domain, hosting, and publishing. The cost of technology used such as Flutter, Node.js, Android, and iOS depends on the complexity of the app and the type of technology used. The cost of the Map API is zero, and the cost of domain, hosting, and publishing are also zero. Therefore, the total cost spent for the Ushuttle app is estimated to be zero(Taka). [4]

Chapter 4

Methodology

The general plan and justification for our undertaking are referred to as us methodology. To create a strategy that meets our aims, it is necessary to research the approaches currently being employed in our industry as well as the theories or guiding concepts underlying the selection process. The methodology is a set of techniques we employ in a particular field of inquiry or activity. The technique describes the specific steps taken to find, pick, process, and evaluate data on a subject. The Agile Methodology is what we have chosen for this project. Iterative development can also be successful at times. Agile is a process through which a team can manage a project by segmenting it into various stages, involving ongoing discussion with stakeholders, continuous improvement, and iteration at each level. Customers' descriptions of how the final product will be used and the problem it will resolve serve as the basis for this method. Instead of building an entire structure overnight, it expands gradually.[5]

For this project, we have chosen the Agile Methodology. This method of project management allows for a step-by-step approach, where the project is split into multiple stages and stakeholders are consulted at each stage. This allows for an iterative development process, where teams can make changes as they go along.It starts with the customer indicating what the finished product will be used for and the issue it will solve, and then builds the solution gradually, allowing for continuous improvement and iteration.

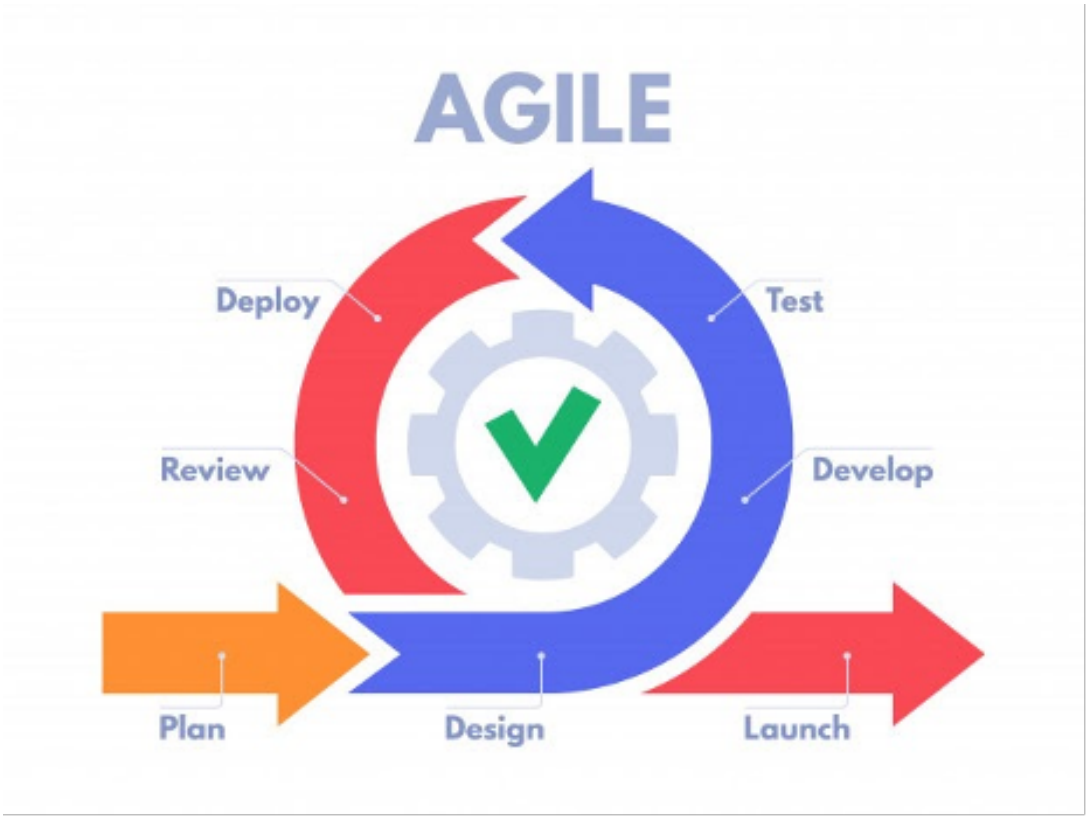


Figure 4.1: Agile Methodology

Reasons for choosing agile methodology:
We decided to employ the Agile method while constructing the Ushuttle app as it is a swift and flexible way to build software that puts customers' satisfaction and fast delivery of working features first. Furthermore, agile encourages active involvement between development teams, stakeholders, and customers, which was especially important in our case since we needed to work closely with our clients in order to develop a subscription-based shuttle bus service.
By utilizing Agile methodologies, we were able to divide up the development process into more manageable parts, granting us the opportunity to quickly produce functional elements of the mobile application. This method further enabled us to identify and tackle any issues early on, leading to a well-crafted and user-friendly android app built with Flutter. This approach proved to be a great choice in the case of the Ushuttle app as it enabled us to deliver a practical, responsive, and user-friendly program for our customers and end-users.

Chapter 5

Body of the Project

5.1 Work Description

This application offers a convenient solution for students who travel between Mirpur and Bashundhara R/A every day. It is designed to make the journey faster and smoother, eliminating the problems and delays associated with the lack of direct transport between the two locations. The app provides an easy-to-use system that will help students get to their university and back home on time and safely.

To use the application, user must first register an account. After doing so, they can log in and begin using the app.When a user logs in to the app, they will be brought to a live map page, where they can view the exact location of the bus and track its progress.On the home page of the App, there is an option for users to purchase tickets. By clicking this option, users can complete the ticket purchase process.With mobile ticket scanning, users can quickly and easily validate their bus tickets without having to show physical tickets.

This technology allows users to scan their tickets directly from their smartphones, tablets, or other mobile devices, allowing them to board the bus quickly and securely. This process eliminates the need to carry physical tickets, saving time and making the boarding process much more convenient.The Fare option allows users to view the ticket prices for their journey, the Schedule option allows them to plan their travel times, and the Stoppage option provides information about the various stops along the way.A live notification system will provide real-time updates to users when certain events occur. It will allow users to stay up to date with valuable information and changes, enabling them to take quick action when needed. The notifications could be sent via email, text message, or push notification, depending on the user's preferences.

5.2 Requirement Analysis

Rich Picture

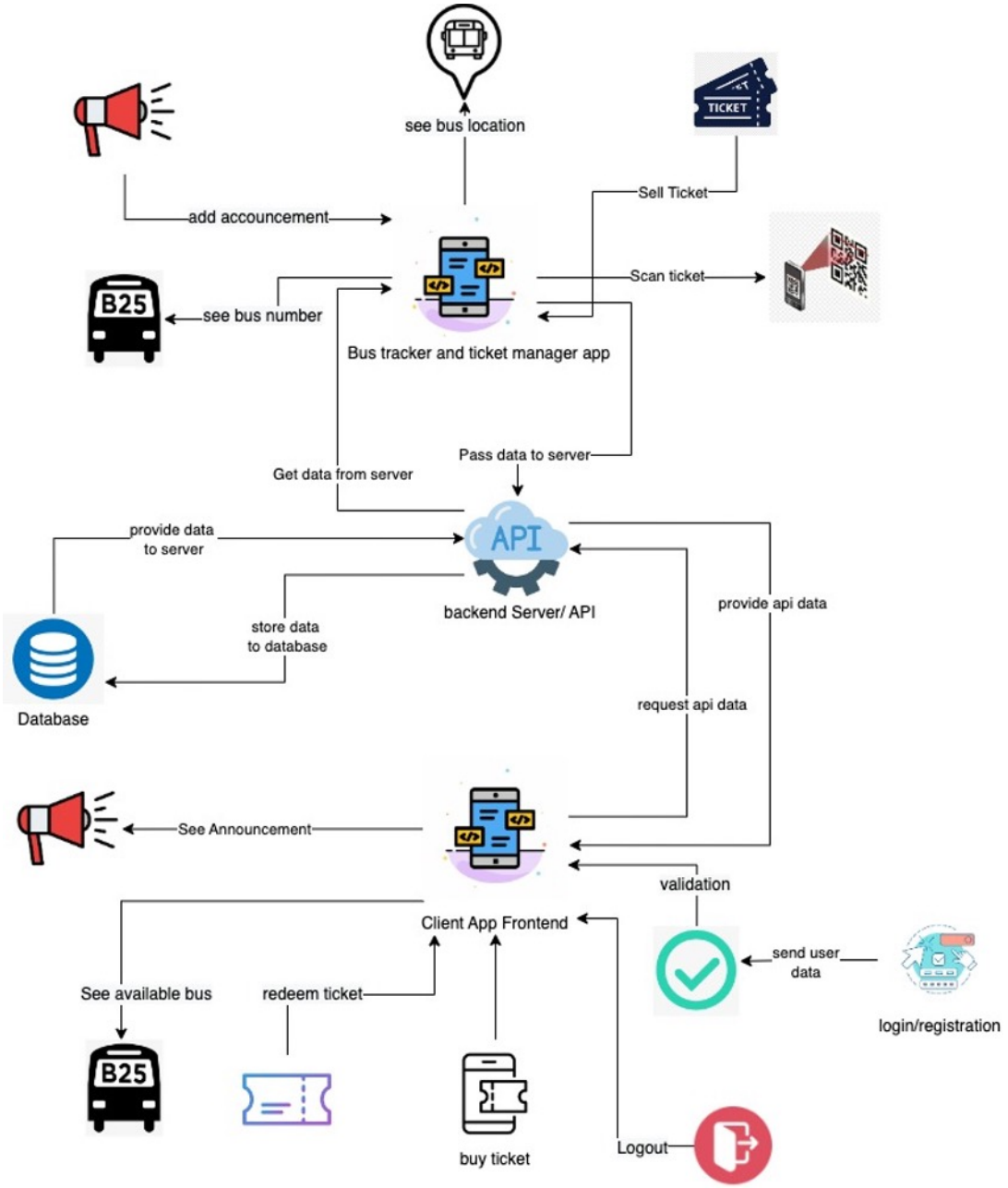


Figure 5.1: Rich Picture

Functional and Non-Functional Requirements

Functional Requirements –

- The "Ushuttle" service allows users to track the real-time location of their shuttle bus by accessing the website or downloading the mobile app.

- The system should provide users with the ability to securely purchase tickets digitally, ensuring the safety and security of their payment information.
- To ensure the most effective transportation for students, the shuttle bus service must coordinate with local schools and universities to develop efficient routes and schedules that include the most convenient pickup and drop-off points.
- Passengers must be able to travel safely and securely in a controlled environment provided by the service, which should involve background checks for drivers and regular vehicle maintenance to ensure safety measures are in place.[6]

Non-Functional Requirements –

- The "ushuttle" service must be dependable, providing consistently high levels of availability and minimal amounts of disruption.
- The interface of the service should be designed to be user-friendly, providing clear instructions and an intuitive navigation system for users to easily find their way around.
- As the service grows, it must be capable of scaling to accommodate an increasing number of users and routes, ensuring that the service can meet the growing demand.
- The service should be available on multiple platforms and web browsers, allowing users to access the service from any device.
- To ensure user data is secure and unauthorized access is prevented, the service must have robust security measures in place.

5.3 System Analysis

5.3.1 Six Element Analysis

Process	System Roles					
	Human	Non-Computing Hardware	Computing hardware	Software	Database	Network and communication
Login/registration	Admin and user can register and login	N/A	Android or iOS smartphone	Vs Code, android studio, node.js, XCode	Firebase	Internet
Live bus tracking	Admin and user can see live update	N/A	Android or iOS smartphone	Vs Code, android studio, node.js, XCode	Firebase	Internet and GPS
Purchase ticket	Users can purchase ticket	N/A	Android or iOS smartphone	Vs Code, android studio, node.js, XCode	Firebase	Internet
Use ticket	Users can use available tickets	N/A	Android or iOS smartphone	Vs Code, android studio, node.js, XCode	Firebase	Internet
Sell ticket	Bus manager can sell ticket	N/A	Android or iOS smartphone	Vs Code, android studio, node.js, XCode	Firebase	Internet

Figure 5.2: Six Element Analysis

5.3.2 Feasibility Analysis

A feasibility analysis is a process used to evaluate the potential success of a project. It involves assessing and validating the assumptions, restrictions, choices, and methods used in the design, planning, and implementation of the project to ascertain whether or not it can be accomplished successfully. This process is critical for determining whether

the project should move forward or not.There are the main parts of feasibility analysis for this project –

- Technical Feasibility: To successfully deliver a product or service to customers, technical feasibility must be evaluated. This includes details such as the software and hardware requirements, the personnel needs, the materials necessary, the transportation needs, the physical location of the business, and the technology required to link all these components together. All these factors must be taken into consideration when assessing the technical feasibility of a proposed system. Ushuttle was created using the Flutter framework and Node.js for the back-end. And for database we have used Firebase. It was designed to offer a fast and efficient way of getting around.

- Operational Feasibility: Operational feasibility assesses whether a proposed system can be realistically implemented within the given resources and constraints. It looks at the costs, benefits and risks associated with the system and whether it will be practical and beneficial to develop and implement the system. It is essential to evaluate the potential of the proposed system to solve the problems and satisfy the system requirements identified in the scope definition and problem analysis phase.

- Economic feasibility: Economic feasibility is an important element when considering implementing a new system. It involves assessing the costs associated with development and production, as well as the potential benefits that may come from its use. The benefits of such a system may include a reduction in costs associated with human energy, pens, and paper. The economic feasibility of this system can be determined by evaluating cash flow and assigning values to the costs and benefits associated with its use.

- Legal Feasibility: To ensure the legality of this project, all relevant laws, such as data protection acts, social networking regulations, e-cab rules and zoning laws were thoroughly evaluated prior to its commencement.

5.3.3 Problem Solution Analysis

The biggest challenge facing app developers throughout the development process is that the requirements are constantly in flux. This can be a source of frustration and necessitates the need for significant flexibility and adaptability.Gathering the requirements for a project is an essential first step in ensuring its successful completion. To do this, stakeholders should come together to discuss and describe the project's scope in detail to ensure no assumptions are made. Communication between teams is paramount to accurately list all requirements and involve the client from the start. This will help to

ensure the project is created in accordance with the desired outcomes.
Project Management requires a skilled planner to ensure the work flows smoothly and is structured in a way that avoids multitasking, which can create more problems than it solves.Having a clear plan of action when embarking on a project can be critical in ensuring its smooth and successful completion.
Strategies such as determining the steps involved, allocating resources, and establishing deadlines can help to keep track of the process and ensure that the project is organized and efficient. They should also be able to manage expectations, communicate effectively with stakeholders, and identify potential risks and solutions. With a solid plan and effective management, a project can be completed successfully and on time.

5.3.4 Effect and Constraints Analysis

Before, students had a hard time getting to university on time because there was no direct bus and they had to switch buses at multiple stops, making it hard to know when the right bus would arrive. With this app, however, students can now easily figure out what time their bus will be there, making it much easier for them to get to university on time. Initially, the cost of the software was an issue for the organization, however once modifications were made to reduce certain features and workloads, it was able to meet the budget. This software proved useful for the company, saving both time and money.

5.4 System Design

The process of systems design involves the definition of the components, interfaces, architecture, and modules of a system, as well as the data needed, to meet the specific requirements of a business or organization. Systems engineering is the process of creating a system to meet the needs of an enterprise by defining, developing, and designing it.

UML Diagrams

UML diagrams are a graphical representation of a system using the Unified Modeling Language. These diagrams can be used to convey information about the system before a project is launched, and to document the system for future reference. UML diagrams can be applied to any field, and their purpose is to help teams visualize the functioning of the project and make alterations accordingly.[7]



Figure 5.3: Use Case Diagram

Architecture

An app architecture provides the framework for how the app will operate and manage data. It defines the structure of the app, including how data will be transferred and stored, as well as how the app will function. The architecture of our application allows users to communicate with the front-end, from which their requests are sent to the Firebase. This service then retrieves and stores the necessary data from both the file system and the Firebase database and sends it back to the front-end for the users to view as a response.

5.5 Implementation

The implementation phase for the "UShuttle" project was divided into several steps to ensure that the mobile app and back-end system were developed, tested, and deployed efficiently and effectively. First, the design of the mobile app and back-end system was finalized, which involved creating detailed UML diagrams and writing code using the Flutter framework for the mobile app and the Node.js platform for the back-end.
The development process then began, which involved writing code, configuring servers, and integrating the Firebase database and any necessary third-party systems or services. After the mobile app and back-end system had been developed, they were thoroughly tested to ensure that they were functioning correctly and meeting the requirements of the project. Once the mobile app and back-end system had been tested and were ready for use, they were deployed to a production environment. This involved installing the system on servers, setting up any necessary infrastructure, and configuring any necessary third-party systems or services.

5.6 Testing

Here are some images from this app.

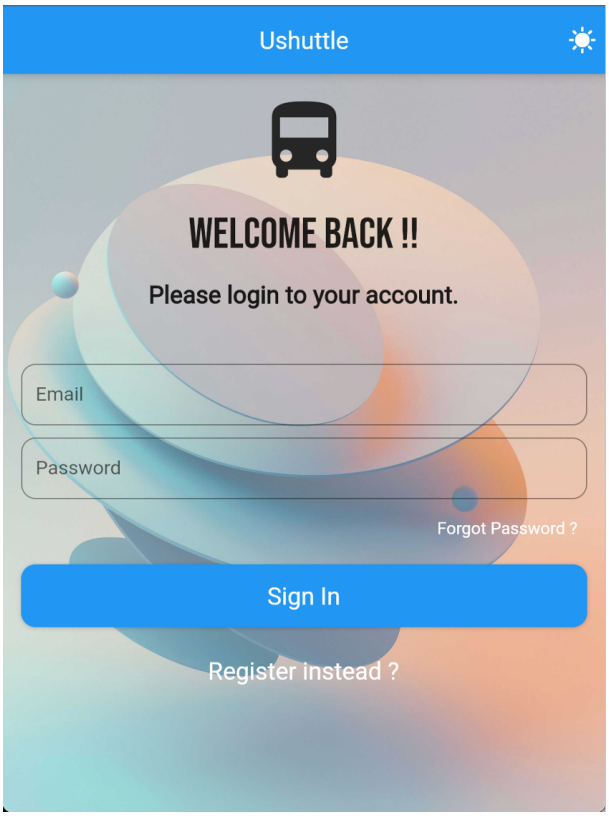


Figure 5.4: Login Page

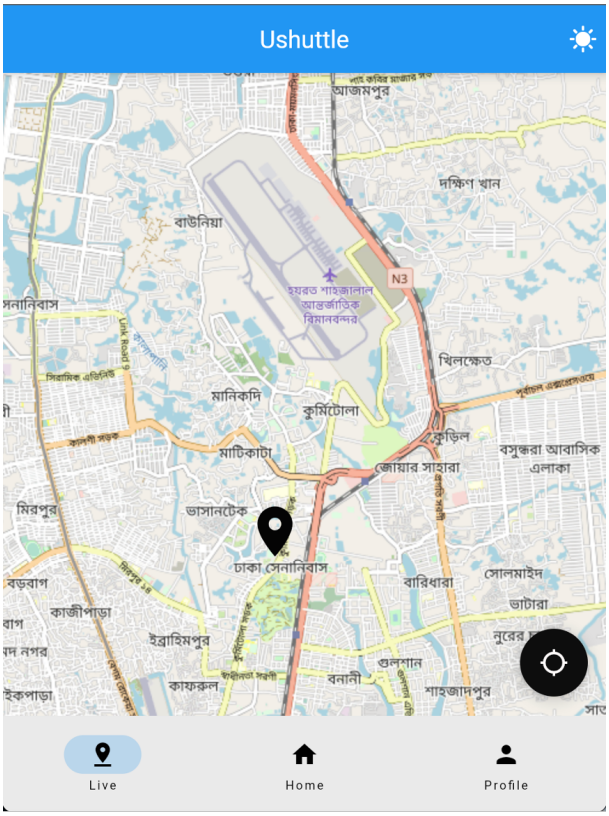


Figure 5.5: Live Map Page

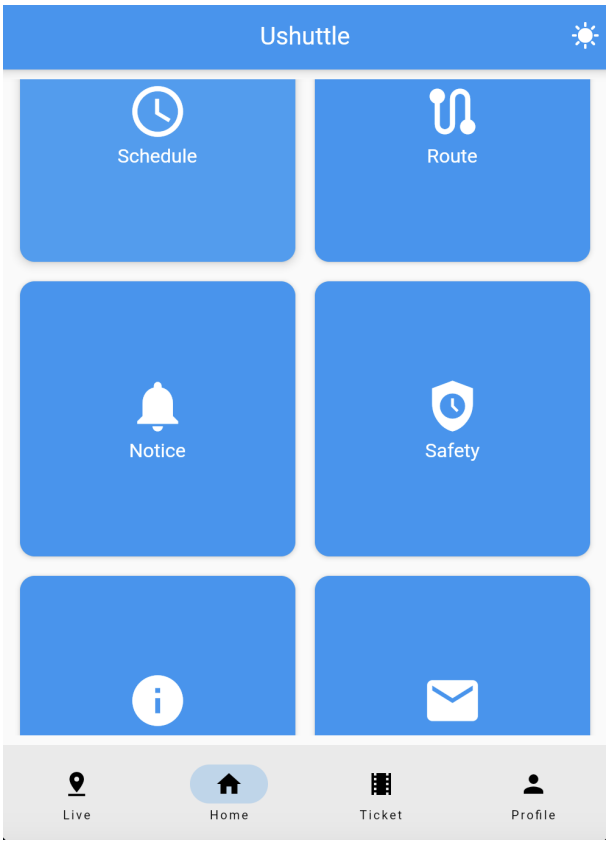


Figure 5.6: Home Page

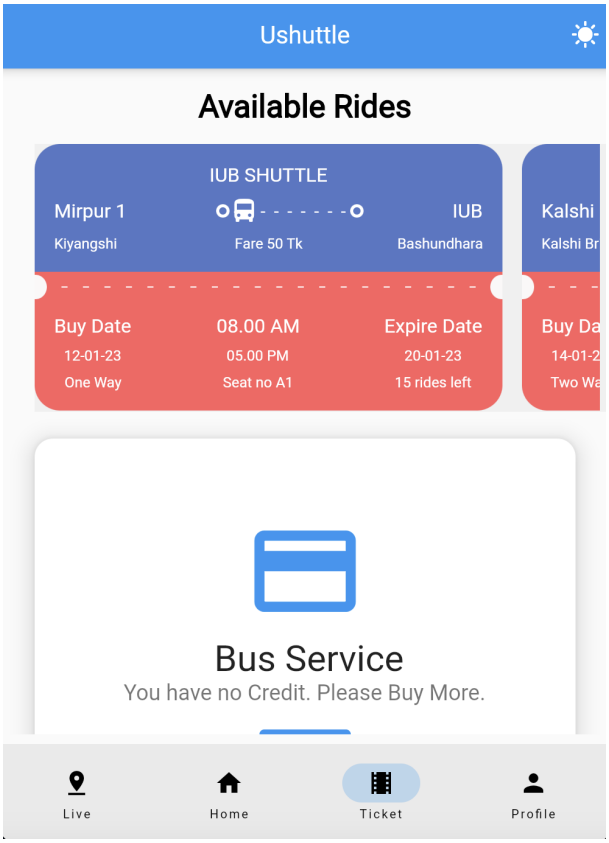


Figure 5.7: Ticket Page

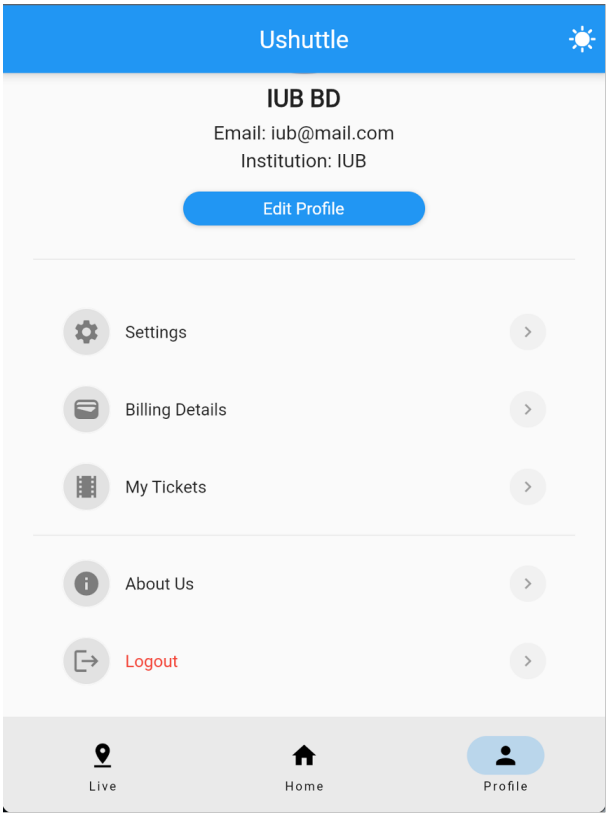


Figure 5.8: Profile Page

Features	**Status**
Registration, Login	OK
Reset Password	OK
Track Live Location (From Client Side)	OK
Track Live Location (From Admin Side)	OK
GPS Server	OK
Ticketing System (From Client Side)	Ok
Ticket Scanner (From Admin Side)	OK
Virtual Ticket Card	OK
Schedule	OK
Profile	OK
Emergency Contacts	OK
Safe Home	Not Implement
Logout	OK
Notice (From Admin Side)	OK
Notice (From the Client Side)	OK
Theme (Dark/Light)	OK
Online Payment System (bkash, Nagad)	Not Implement
Payment History	Not Implement
Back-end Server	OK

Table 5.1: Testing Results

Chapter 6

Results & Analysis

In the results section, the writer should report the findings of the analysis without attempting to evaluate or interpret them, as this should be left to the discussion section. The analysis should already have been performed in order to write the results section. The results should be reported, revealing the analysis that was done with the data found. It is essential to understand what the analysis covered, even though no extra information is required.

Features	Attempted	Success	Failure	Success Rate (percentage)	Final Status
Login, Registration	10	8	2	80%	OK
Password Reset	2	2	0	100%	OK
GPS Server	10	10	0	100%	OK
Live Map (Admin)	10	10	0	100%	OK
Live Map (Client)	10	8	2	80%	OK
Ticket Scanner (Admin)	5	5	0	100%	OK
Ticketing System (Client)	5	5	0	100%	OK
Virtual Ticket Card	5	5	0	100%	OK
Notice (Admin)	3	3	0	100%	OK
Notice (Client)	3	3	0	100%	OK
Schedule	1	1	0	100%	OK
Emergency Contacts	3	3	0	100%	OK
Profile	5	4	1	90%	OK
Safe Home (Client)	1	0	1	0%	Not Implemented
Live Safe (Client)	3	3	0	100%	OK
Theme	10	10	0	100%	OK
Backed Server	5	5	0	100%	OK
Online Payment	1	0	1	0%	Not Implemented
Payment History	1	0	1	0%	Not Implemented
Logout	5	5	0	100%	OK

Table 6.1: Results and Analysis

The results and analysis of the Ushuttle app show that it is a great choice for commuters who want to get around quickly and easily. The interface of the app is designed to be straightforward and user-friendly, allowing users to effortlessly book shuttles and monitor their progress. The app also offers real-time tracking of shuttles, allowing users to know exactly when their ride is arriving. The app also offers a wide range of payment

options.The Usuhttle app is a helpful tool designed to make life easier for students by providing useful services. It is designed to provide students with the assistance they need in their day-to-day lives.

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project

As we all live in a world of ever-evolving technology, the sustainability of any product is of paramount importance. In Bangladesh, smart phones have become a staple of everyday life, and people have come to rely on the internet for solutions to their daily problems. Therefore, for any application to be successful, it must be maintained and regularly updated to meet the needs of its user base.

- Community Sustainability: Ushuttle is an app that connects passengers with drivers in a safe and efficient manner. The app allows passengers to choose their preferred driver and make payments quickly and securely. Through the app, passengers can also book a shuttle ride ahead of time, providing convenience and reliability. This app is helping to make cities more sustainable by reducing the number of cars on the road, which in turn reduces air pollution and helps to reduce traffic congestion. Additionally, Ushuttle's commitment to creating a safe and reliable ride-sharing experience is helping to make communities more connected and engaged, creating a sense of community, and helping to foster local economic growth.

- Financial Sustainability: Ushuttle is a ride-sharing app that provides an affordable, convenient, and safe way to get around town. The app has been developed to make transportation more accessible and to reduce traffic congestion. Ushuttle offers an innovative approach to transportation that is both cost-effective and sustainable. Ushuttle's financial sustainability is based on a combination of revenue streams, cost control, and efficient operations. The company has established an on-demand pricing model to ensure that riders get the best value for their money. Ushuttle also offers various incentive programs and discounts to encourage riders to use their services.

- Organizational Sustainability: Ushuttle is an app designed to support organizational sustainability by helping organizations to manage their transportation needs. The app allows employers to create custom shuttle routes, control the frequency of their shuttles, and monitor their shuttle usage. It also provides employees with access to real-time shuttle information and allows them to track their shuttle usage. The app is designed to reduce costs associated with transportation and provide employers with a cost-effective alternative to public transportation. Ushuttle also helps to reduce the environmental impact of transportation by providing a more efficient and environmentally friendly way to get around. Additionally, Ushuttle supports the development of a greener, more sustainable workplace by encouraging the use of public transportation and reducing the need for individual vehicle use.

7.2 Social and Environmental Effects and Analysis

- Social Effects: The Ushuttle app has had a positive social impact by providing a safe, convenient, and affordable way for people to travel. It has made it easier for people to travel to work, school, or other destinations, and has given people more freedom and flexibility in their daily lives. It has also been beneficial for people who do not have access to public transportation or who may have difficulty navigating public transportation systems. As the app has become more popular, more people are using it to travel. This has led to more people meeting and interacting with one another, as well as more people being exposed to different cultures and lifestyles. It has also helped to reduce the amount of traffic on the roads, as people are using the app to get around instead of driving.

- Environmental Effects: The Ushuttle app has had a environmental impact by reducing the amount of pollution and emissions that come from vehicles. By providing an alternative to driving, the app has helped to reduce the amount of air and noise pollution that is produced by cars. The app also helps to reduce the amount of fuel that is consumed, as people are able to get around more efficiently using the app. Additionally, the app has helped to reduce the amount of traffic on the roads, which in turn helps to reduce the amount of emissions that are produced. Finally, the app has made it easier for people to get around without having to own a car, which helps to reduce the amount of cars that are on the roads.

7.3 Addressing Ethics and Ethical Issues

- Respect for user privacy: Ushuttle app should respect the privacy of its users and ensure that their personal information is not shared with any third-party sources.

All data collected must be used in a way that is transparent and ethical.

- Transparency in pricing: Ushuttle app should ensure that its pricing structure is transparent and easily understood by its users. All pricing should be clearly outlined prior to the user agreeing to use the app, and there should not be any surprises or hidden charges.
- Avoiding discrimination: Ushuttle app should ensure that all users are treated fairly and without bias, regardless of race, gender, religion, or other factors. Ushuttle app should also ensure that its algorithms are not biased, and that pricing is based solely on distance and time.
- Safety and security: Ushuttle app should ensure that all its users are safe and secure while using the app. This includes adequate background checks on its drivers, as well as ensuring that the app has the latest security measures in place.

Chapter 8

Lesson Learned

8.1 Problems Faced During this Period

1. Time Management: Working on the project was very difficult as I had to manage my time between work and studies.
2. Communication: It was hard for me to communicate my ideas to the team members as I was new to the team and was not familiar with the company culture.
3. Technical Challenges: Working with the technical aspects of the project was very challenging as I was new to the technology and the library used.
4. Stress: I had to manage my stress levels as I was taking on a lot of tasks at the same time.
5. Interpersonal Relationships: Working with a team was very difficult as I had to build relationships with the team members and work in tandem with them.

To overcome all these challenges, I had to take initiatives and be proactive. I actively participated in discussions and listened to the ideas of my colleagues. I also tried to keep up with the latest technologies and practiced coding in my free time. I also had to learn to prioritize my tasks and manage my time effectively. I also tried to communicate my ideas more clearly and sought feedback from my colleagues. Overall, my internship experience was a great learning experience for me.

8.2 Solution of those Problems

I also got to learn some new technologies and tools during this journey. For example, I have learned how to use certain frameworks, databases, and various command-line tools. I have also learned how to debug software, write unit tests and check for errors. All these skills help me to become a better programmer and help me to contribute to the projects

that I work on. Moreover, I also learned how to work with a team and collaborate with others. It allowed me to understand the meaning of working together towards a common goal. I am now more confident in making decisions and taking initiatives. The last four years as an undergraduate student have taught me several important lessons that I will carry throughout my life. I am now more confident in my abilities and more experienced in the field of software engineering. I am also more prepared to take on larger challenges and responsibilities in my upcoming endeavors.

Chapter 9

Future Work & Conclusion

9.1 Future Works

There are several potential improvements that can be made to the Ushuttle app. These include:

1. Improve the user interface: The user interface of the app could be made more intuitive and user- friendly. This could include simplifying the navigation, adding more visuals and animations, and making the text more readable.

2. Add more features: The app could be enhanced by adding new features such as real-time tracking and notifications, an estimated time of arrival calculator, and the ability to view the shuttle schedule and make reservations in advance.

3. Improve the accuracy of the GPS tracking: The GPS tracking system could be improved to provide more accurate information about the location and speed of the shuttle.

4. Add support for multiple languages: The app could be made more accessible by adding support for multiple languages.

5. Improve security: The security of the app could be improved by adding two-factor authentication and encryption.

6. Improve customer service: The customer service of the app could be improved by adding a live chat feature and a customer support portal.

9.2 Conclusion

The Ushuttle app is a great choice for students who want a stress-free and cost-effective way of getting to and from university. With features such as real-time tracking, easy

booking and a variety of payment options, the app provides an efficient and affordable transportation option. Furthermore, its customer service is good, and it has a simple design, making it a great choice for anyone who wants a reliable and convenient way to get to university.

This application also will offer advantages that other ride systems don't, such as reducing the cost of transport for students as buses are cheaper than private cars or motorbikes, since Uber and Pathao only provide private car and bike services, which can be expen- sive.The app will also help to reduce traffic congestion as it will allow more people to be transported at once. This will help to reduce the time needed to travel from one place to another. It will also reduce air pollution as fewer vehicles will be needed to transport people. The app will also help to increase safety.

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The student modified the internship final report as per the recommendation made by his or her academic supervisor and/or panel members during final viva, and the department can use this version for achieving.

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