Leading University
Department of Computer Science and Engineering

CSE 4801

LU bus tracker

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23rd February, 2023

Project/Thesis Title

A Project submitted to the

Department of Computer Science and Engineering

Leading University

Sylhet - 3112, Bangladesh

in partial fulfillment of the requirements for the degree of

Bachelor of Science in Computer Science and Engineering

By

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Supervisor

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Lecturer

Department of Computer Science and Engineering

23rd February, 2023

Recommendation Letter from the Project/Thesis Supervisor

The project entitled *LU bus tracker* submitted by the student

1. Sajid Mohammad Ikram

is a record of project work carried out under my supervision and I, hereby, approve that the report be submitted in partial fulfillment of the requirements for the award of their Bachelor Degrees.

Signature of the Supervisor:

Prithwiraj Bhattacharjee

Date: 23rd February, 2023

Certificate of Acceptance of the Project

The project entitled *LU bus tracker*
submitted by the student

1. Sajid Mohammad Ikram

on 23rd February, 2023
is, hereby, accepted as the partial fulfillment of the requirements for the award of their Bachelor Degrees.

Head of the Dept.	**Chairman, Exam. Committee**	**Supervisor**
Rumel M. S. Rahman Pir	Shafkat Kibria	Prithwiraj Bhattacharjee
Associate Professor Head & Head	Assistant Professor	Lecturer
Department of Computer	Department of Computer	Department of Computer
Science and Engineering	Science and Engineering	Science and Engineering

Abstract

LU Bus Tracker is a real-time bus-tracking app designed for the students and staff of Leading University. The app lets users track the university's buses in real time, providing updates on their location, estimated arrival times, and any unexpected delays. The app is user-friendly and easy to navigate, providing a convenient and efficient way for students and staff to plan their commutes. The primary purpose of LU Bus Tracker is to help users stay informed about their bus schedule and ensure they arrive on time for their classes, meetings, and events. With this app, users can say goodbye to the stress of waiting for buses, and hello to a more organized and stress-free transportation experience.

Acknowledgements

Expressing our gratitude towards the Almighty will never be enough for giving us this opportunity to accomplish our project. We have successfully done this project. Also, we would like to mention our dearest parents, without whom itâs far beyond imagination to be at this stage of our life, in the state of education we are now. This is all because of their love, sacrifice, and prayers for us. As this was our third-year project work, we were in trouble with it at the beginning. But This did not last for long because of the honorable teachers of our department. They helped us to learn and keep working on every single aspect in such a way that we now feel we could not get better than this. We convey our deepest gratitude towards them. Especially our honorable supervisor Prithwiraj Bhattacharjee Sir for his great supervision. Without his help, support, and guidance, we could not have completed this project. Last but not least, we are thankful to our friends and everyone who helped us with the required information and knowledge regarding this project.

Dedication

We would like to dedicate our work to our parents, relatives and friends.

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Chapter 1

Introduction

1.1 Background

The title of our project is LU Bus Tracker, which is intended to track the busses. One of the most common problem student faces is taking the bus on time, as there is no bus tracking system in our university. Our university previously had an app named "LU Birds" that allowed users to track the university's buses, but the app had its limitations and was unable to provide a comprehensive solution to the university's transportation needs. LU Bus Tracker is a state-of-the-art app that tracks the university's shuttle buses in real-time and provides a range of additional features that make it a comprehensive transportation solution. For example, the app includes passenger count, allowing users to know how many seats are available on the bus, as well as notice and announcement features to keep users informed about important transportation updates and information. The app is designed to make life easier for students and staff of the Leading University, allowing them to plan their commutes more efficiently and effectively. With LU Bus Tracker, users will never have to worry about missing a bus or waiting for a shuttle, as they will always have real-time updates at their fingertips. Whether you're a student, staff member, or visitor to the campus, LU Bus Tracker is the perfect transportation companion.

1.2 Motivation

The most common problem we face as students are taking the bus on time and finding its location. Often we miss our bus just because we do not know the exact location of the bus. On top of that, there is no proper way for finding bus-related notices. Moreover, to find the routine or bus schedule, we have to look it in the gallery or media directory. To overcome these problems, we have built an application that provides features that help a student with this. We thought that most students currently rely on apps and that if the applications meet all of their demands at once in a user-friendly approach, it would be simpler to interact. We understand that the dependability of user-friendly and informative apps has become one of the most important aspects of our motivation and objective. So we decided to make an app that can solve all these problems.

Chapter 2

Background Study

We discovered several fascinating tools for background research and also assisted one other in learning about tools. A good background study is essential for a successful project. Because it is a tracking app, we first considered the working process. User research, UX design, branding, Wireframing, Ui design, and development are just a few examples. We conducted user research on our students who would need to utilize this, and then we began the UX process. For the UX Process, we concentrate on our strategy and then come up with some actual ideas that will have a significant influence on our products. Following that, we moved on to the branding phase, where we created a logo, a colour scheme, and font concepts, among other things. Finally, the development process came and we decided to go with flutter as it was the best fit for our project. We also learned dirt, Node js, and Express for this project.

2.1 Review Previous Work

The previous work on the bus tracking app for Leading University was a Java-based app developed by a group with limited features. This app was not published formally by our university, but it is still available in the app store. But it is not in working condition. However, our team has built upon this previous effort by using Flutter to create a more comprehensive version of the app. The app now includes important new features such as passenger counting, notices, bus departure time, and much more, which make it a more useful and user-friendly tool for students and staff. These added features greatly enhance the overall functionality and utility of the app, making it a

valuable resource for those who rely on university transportation.

Chapter 3

Methodology

Before starting the app's creation, we had to study and research other tracking apps. Though we have a future plan to publish it, we had to maintain a proper procedure for the production of the Mobile app. We studied Native android and Flutter to make things crystal clear. Flutter is a less code framework and a multi-platform-supported framework. So we decided to study it and manage everything related to our project. But First of all, we gather the google map API for it. We were successful in this. Then we started planning the Activity of our application. Then we design the whole app, which makes the development much easier. Started using VCS to control our flow of work and make traces on our track. We started discussing topics with our supervisor. He helped us a lot to make some features much more efficient. After that, we started on Android Studio to code our ideas. We used some special procedures to build the app. We followed the MVVM structure to make the app more functional using less code. We used Provider for data compatibility, Firebase and Node JS for the backend. Our app uses continuous data transmission for a real-time experience.

3.1 System Requirement

- Microsoft Windows / Mac OS / Linux
- 8 GB Ram.
- 20 GB Disk Space

- A faster processor
- Android Studio
- Flutter
- Firebase
- Dart
- Adobe Photoshop

3.2 Features

- Real-time bus tracking.
- Available seat count.
- Bus routes.
- Assigned Busses.
- G suite verification.
- Notice.
- Bus and class schedule.
- User profile.

Chapter 4

Structural Design

4.1 Class Diagram

Insert the class diagram here 4.1

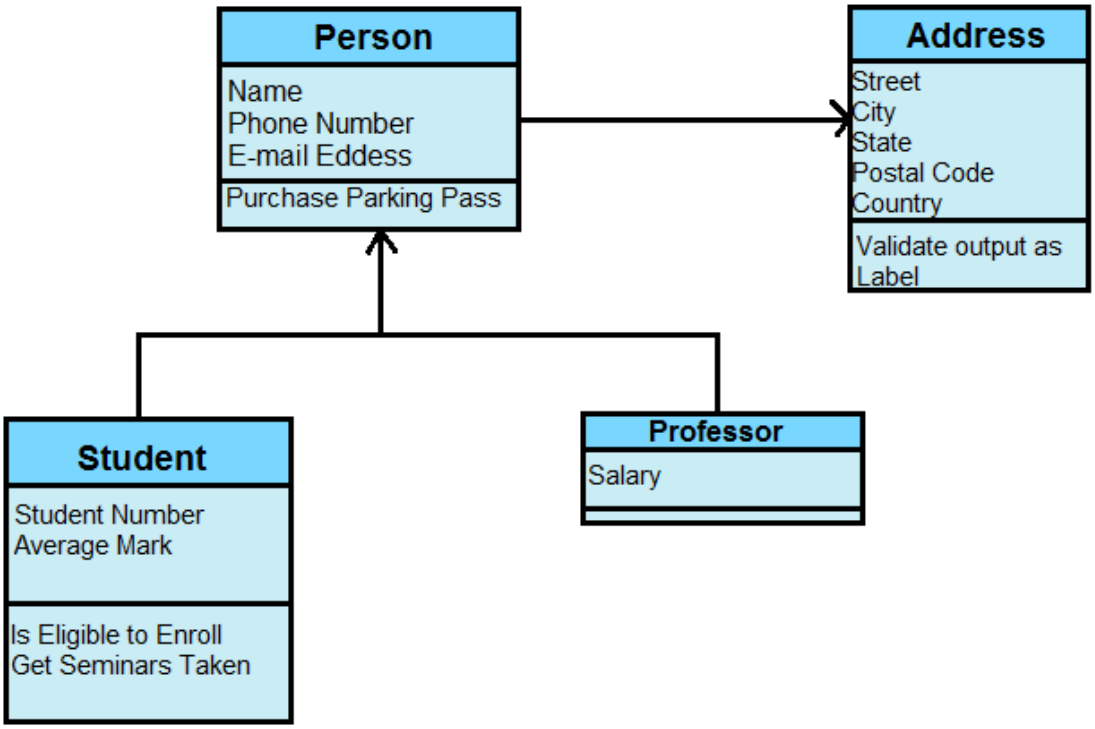

Figure 4.1: Class Diagram

4.2 E-R Diagram

Insert the E-R diagram here 4.2

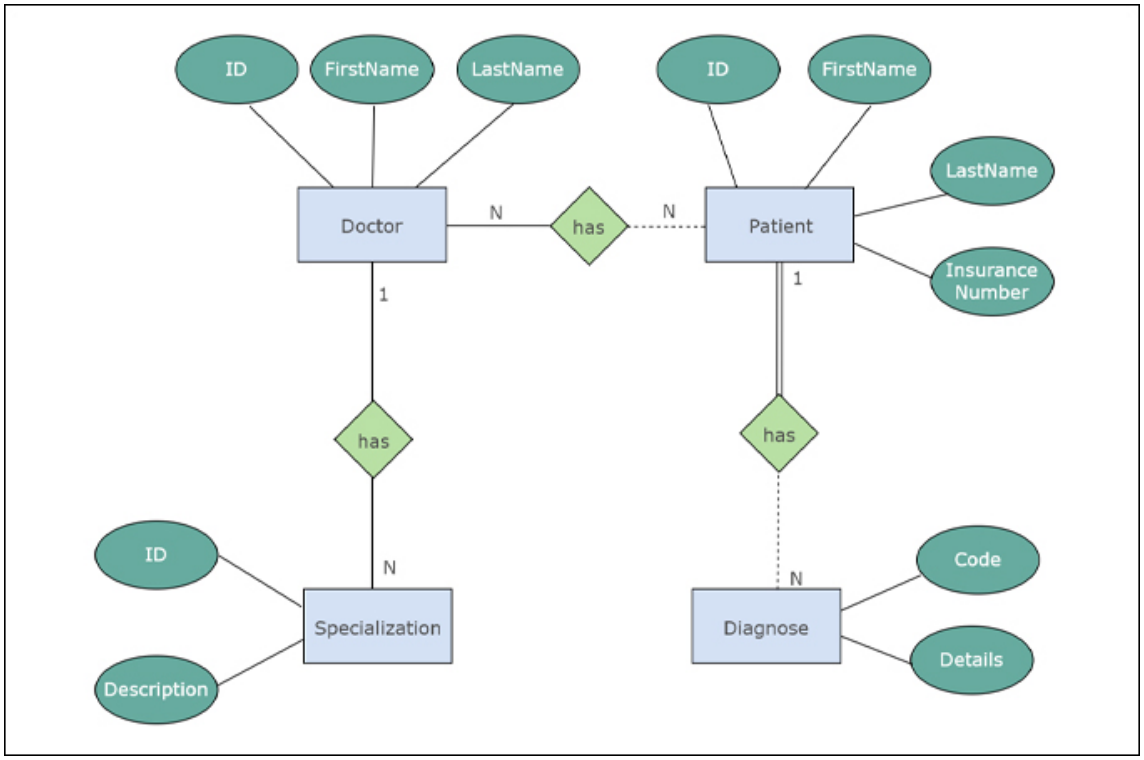

Figure 4.2: E-R Diagram

Figure 4.2 shows the ER-diagram.

4.3 Use Case Diagram

Insert the Use case diagram here 4.3

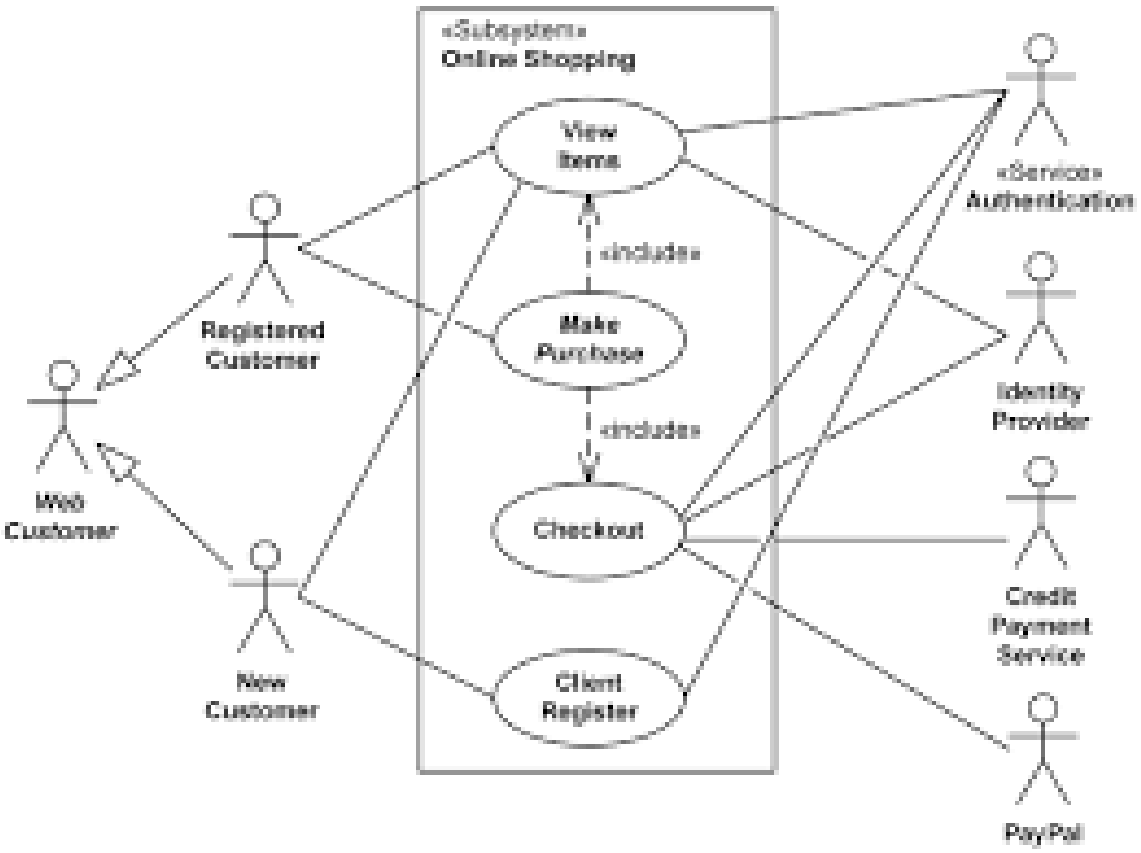

Figure 4.3: Use Case Diagram

4.4 Data Flow Diagram

Insert the data flow diagram here 4.4

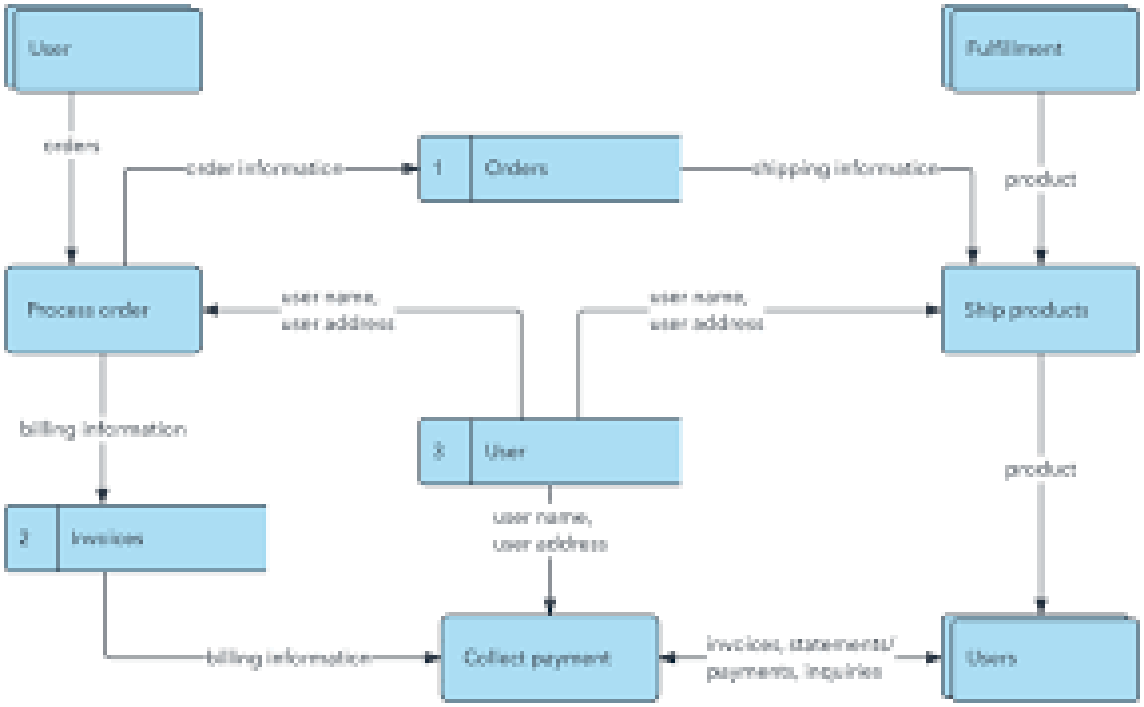

Figure 4.4: Data Flow Diagram

Chapter 5

Limitations and Future Work

5.1 Limitations

We give our best to make our app as functional as possible. But still, there are some limitations in our app. Firstly, The accuracy of the bus tracking information depends on the quality of GPS signals, which can be affected by various factors such as weather conditions, buildings and other physical obstructions. Secondly, The app relies on real-time data from the buses, which can sometimes be delayed or unavailable due to network issues or technical malfunctions. Finally, the admin can not add routes using the app, and there is no notification for notice.

5.2 Future Work

There are several future works that could be done to enhance the LU Bus Tracking App for Leading University. The app could be further optimized to provide a more user-friendly and intuitive experience, with features such as personalized notifications, route adding, and real-time traffic updates. The app could incorporate advanced analytics capabilities to provide insights into transportation usage patterns, bus utilization rates, and other key metrics. The app could be translated into multiple languages to better serve a diverse user base. The app could be designed with accessibility in mind, with features such as voice commands and alternative text for visually impaired users. The tracker can be shrunk down to a portable level for use on any bus.

Chapter 6

Conclusion

The LU Bus Tracking App for Leading University represents a significant advance in transportation technology, providing students, staff, and other users with real-time information about bus locations and estimated arrival times. This app has the potential to greatly improve the efficiency and convenience of university transportation, and its future development holds even more promise. The addition of new features, such as passenger counting and improved analytics, will further enhance the value of this app and make it an indispensable tool for all members of the university community. Ultimately, the LU Bus Tracking App has the potential to revolutionize the way that universities manage and utilize transportation resources, making it a key component of a more sustainable and efficient future.

References