



American International University-Bangladesh (AIUB)

Department of Computer Science
Faculty of Science & Technology (FST)

Public Transport Optimization

A Software Engineering Project Submitted
By

Semester: Fall (24 – 25)		Section: F	Group Number: 5	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
01	SAZID – AL – ABEDIN	22-45999-1		
02	MD. SAIDUZZAMAN SOHAG	22-46006-1		
03	MD. SADMAN HOSSAIN	22-46061-1		
04	NOUROZE TARANNUM ANANNYA	22-46062-1		
05	SEEMANTA TORAFDAR	21-45968-3		

The project will be Evaluated for the following Course Outcomes

CO3: <i>Select</i> appropriate software engineering models, project management roles and their associated skills for the complex software engineering project and evaluate the sustainability of developed software, taking into consideration the societal and environmental aspects	Total Marks	
Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]	
Evidence of Argumentation regarding process model selection	[5Marks]	
Analysis the impact of societal, health, safety, legal and cultural issues	[5Marks]	
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	[5Marks]	
CO4: <i>Develop</i> project management plan to manage software engineering projects following the principles of engineering management and economic decision process	Total Marks	
Develop the project plan, its components of the proposed software products	[5Marks]	

Identify all the activities/tasks related to project management and categorize them within the WBS structure. Perform detailed effort estimation correspond with the WBS and schedule the activities with resources	[5Marks]	
Identify all the potential risks in your project and prioritize them to overcome these risk factors.	[5Marks]	

Description of Student's Contribution in the Project work

<p>Student Name: SAZID – AL – ABEDIN</p> <p>Student ID: 22-45999-1</p> <p>Contribution in Percentage (%):</p> <p><u>Contribution in the Project:</u></p> <p><input type="checkbox"/> Contribution Description 1</p> <p><input type="checkbox"/> Contribution Description 2</p> <p>_____ Signature of the Student</p>
<p>Student Name: MD. SAIDUZZAMAN SOHAG</p> <p>Student ID: 22-46006-1</p> <p>Contribution in Percentage (%):</p> <p><u>Contribution in the Project:</u></p> <p><input type="checkbox"/> Contribution Description 1</p> <p><input type="checkbox"/> Contribution Description 2</p> <p>_____ Signature of the Student</p>
<p>Student Name: MD. SADMAN HOSSAIN</p> <p>Student ID: 22-46061-1</p> <p>Contribution in Percentage (%):</p> <p><u>Contribution in the Project:</u></p> <p><input type="checkbox"/> Contribution Description 1</p> <p><input type="checkbox"/> Contribution Description 2</p> <p>_____ Signature of the Student</p>

Student Name: NOUROZE TARANNUM ANANNYA

Student ID: 22-46062-1

Contribution in Percentage (%):

Contribution in the Project:

☐ Contribution Description 1

☐ Contribution Description 2

Signature of the Student

Student Name: SEEMANTA TORAFDAR

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Contribution in Percentage (%):

Contribution in the Project:

☐ Contribution Description 1

☐ Contribution Description 2

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1. PROJECT PROPOSAL

1.1 Background to the Problem

To address the challenges faced by public transport systems in densely populated cities in Bangladesh, this project aims to develop a digital platform to enhance the accessibility, convenience and efficiency of public transport. Currently, passengers encounter significant difficulties due to a lack of real-time information, poor route management, and inefficient ticketing processes. These issues result in overcrowded buses and trains, long wait times, and reduced reliability, which discourages the use of public transport and increases reliance on private vehicles.

The root cause of this problem lies in the absence of real-time data and streamlined ticketing solutions, leading to passenger frustration and overall system inefficiency. Addressing these issues is essential for creating a more sustainable urban transport system that meets the demands of a growing population while promoting public transport usage. By providing real-time tracking, route planning, ticketing, and availability updates, this app seeks to make public transportation a more reliable, accessible and attractive option for daily passengers, contributing to better urban mobility and environmental sustainability.

1.2 Solution to the Problem

The primary objective of this project is to develop a mobile application that enhances the public transportation experience by addressing common issues faced by passengers in urban areas. This app will integrate route searches, live tracking, suggestions, and a secure QR-code ticketing system to offer a convenient, reliable alternative to current transportation options. This solution aims to solve problems related to the lack of real-time information, overcrowding, and inefficient ticketing, making public transport a more attractive choice.

The proposed solution involves a GPS-integrated public transport app with features like route planning, real-time tracking, and cashless secure ticketing. The solution is feasible and scalable to meet business objectives since it supports widely-used mobile and GPS technology, requiring minimal additional infrastructure investment while increasing passenger satisfaction and potentially boosting public transport usage.

Key Functionalities of the Proposed Solution:

- **Route Search:** Provides an intuitive “From - To” search feature that recommends bus routes and options.
- **Bus Suggestion:** It will show available buses on that selected route.
- **Bus Information:** Tapping on a bus option provides details, including Estimated Time Arrival (ETA) and occupancy status, using GPS data.
- **Map with Route Suggestions:** A visual interface that offers route suggestions and relevant information.
- **Ticket Purchase and Validation:** Secure in-app ticketing system with one-hour pre-scan validity, reducing cash transactions.
- **Live Tracking:** Real-time bus tracking, updating users with accurate ETAs and traffic conditions.

Target User Groups: The primary users include daily commuters, students, and professionals in urban areas who depend on public transport. Secondary users are transport operators and government agencies that oversee public transit systems. Commuters benefit through:

- Live tracking will reduced wait times.
- Access to real-time updates that enhance efficiency.
- Cashless transactions that streamline the ticketing process.

Comparison and Extensions in the Proposed Study:

Building on existing solutions, our study addresses key gaps in urban public transport management to better serve densely populated areas like Bangladesh.

1. **User-Centric Mobile Application:** Unlike previous web-based approaches, such as the low-cost GPS model for mobile tracking presented in [1] and [2], our app focuses on a mobile platform for both users and drivers, centralizing route suggestions, live tracking, and digital ticketing.

2. **Integrated Ticketing:** While the reviewed studies focus on bus tracking, our solution extends functionality by integrating QR-based cashless ticketing, enhancing convenience and security for commuters.
3. **Advanced Route Planning:** Beyond real-time tracking, our app includes route planning with estimated arrival times and occupancy data, helping users reduce wait times and overcrowding.
4. **Enhanced Sustainability:** Our project encourages public transport usage by improving convenience, supporting goals like reduced congestion and emissions, aligning with urban sustainability efforts.

References:

- [1] "Cost-Effective Bus Tracking Using Driver GPS," *IEEE Xplore*, [Online]. Available: <https://ieeexplore.ieee.org/document/10544750>.
- [2] "Smart City Bus Tracking for Improved Urban Mobility," *IEEE Xplore*, [Online]. Available: <https://ieeexplore.ieee.org/document/10346218>.

Existing studies in the problem area and solution: Various software platforms, such as Uber and Pathao, offer real-time location tracking and navigation but focus on ridesharing on the other hand public transportation doesn't provide this. Studies on smart cities and transportation highlight that good public transport apps should include real-time data, tools to predict arrival times, and an easy-to-use interface. These studies highlight the importance of digital integration, which our project addresses by combining tracking, routing, and ticketing.