

American International University-Bangladesh (AIUB)  
**Department of Computer Science  
Faculty of Science & Technology (FST)**

**Public Transport Optimization**

A Software Engineering Project Submitted

By

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| --- | --- | --- | --- | --- |
| **Semester: Summer\_21\_22** | | **Section:** | **Group Number:** | |
| 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

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| --- | --- | --- |
| **CO3:** *Select* 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:** *Develop* 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

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| --- |
| Student Name: SAZID – AL – ABEDIN  Student ID: 22-45999-1  Contribution in Percentage (%):  Contribution in the Project:   * Contribution Description 1 * Contribution Description 2   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Signature of the Student |
| Student Name: MD. SAIDUZZAMAN SOHAG  Student ID: 22-46006-1  Contribution in Percentage (%):  Contribution in the Project:   * Contribution Description 1 * Contribution Description 2   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Signature of the Student |
| Student Name: MD. SADMAN HOSSAIN  Student ID: 22-46061-1  Contribution in Percentage (%):  Contribution in the Project:   * Contribution Description 1 * Contribution Description 2   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Signature of the Student |
| 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  Student ID: 21-45968-3  Contribution in Percentage (%):  Contribution in the Project:   * Contribution Description 1 * Contribution Description 2   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Signature of the Student |

# PROJECT PROPOSAL

## Background to the Problem

* Write the background description that helps putting your project into the right context of a problem domain and gives everyone involved a common view of the project.

**Ans:** Public transport systems in densely populated cities in Bangladesh often face challenges in meeting the demands of passengers efficiently. Issues such as lack of real-time information, poor route management, and difficulty in accessing accurate bus and train schedules lead to overcrowded buses and trains, long wait times, and overall inefficiencies. This app aims to address these issues by providing a digital platform where users can find routes, check bus and train availability, purchase tickets, and access real-time tracking. By using technology, the app seeks to streamline the public transport experience for both passengers and operators, making public transport a more reliable and convenient choice.

* What is the root cause of this problem? Why this problem is so important to consider?

**Ans:** The core issue lies in the lack of real-time information and efficient ticketing solutions within the existing public transport system. As a result, passengers face difficulties in planning their journeys, leading to overcrowding, delays, and frequent confusion about schedules and availability. This inefficiency not only affects passengers satisfaction but also discourages the use of public transport, pushing more people towards private vehicles. Addressing this problem is critical for creating a more sustainable and efficient urban transport system that can better serve the needs of a growing population, reduce traffic and contribute to an overall improvement in urban mobility and environmental sustainability.

## Solution to the Problem

* Describe what is your project/thesis objective? What solutions are you going to provide to solve the above-mentioned problems?

**Ans:** The objective of this project is to develop a user-friendly mobile application to improve public transport experience. This app will integrate features like route search, suggestions, live tracking, and a secure ticketing system with QR code-based ticket validation. This solution will solve the common issues faced by passengers, such as lack of real-time information, overcrowded vehicles, and inefficient ticketing, thus making public transport a more convenient and preferred choice.

* What are the solutions you are going to propose to deal with the problem? why is this solution is particularly appropriate to solve the problem? Is the solution feasible to the meet the business objective?

**Ans**: The solution involves creating a real-time, GPS-integrated public transport app that addresses the primary issues of route planning, vehicle availability, ticketing, and tracking. This approach is ideal because it consolidates essential information and functionality into one digital platform. 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.

* Describe the basic functionalities of your proposed solution that makes the best use of state‐of‐art technology and produced a significant result that is likely to have a major impact on societal, health, safety, legal and cultural issues. Provide a deep insight that demonstrate and preset a creative solution to the real‐life problem.

**Ans:** The core functionalities of the proposed solution include:

* **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.
* Describe the target group of users of your solution? And how they will be benefited by your proposed solution to the problem?

**Ans:** 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.
* Describe the contribution of your project to the development of scientific results that is identified and well documented.

**Ans:**

* Provide a literature review on what are the other studies that have discussed the same topic of yours in the literature and explain how your study has utilized and extended the problems of existing studies.
* Provide a description of all the existing studies presented in the problem area. What are the existing software solutions (for project) are available to solve the aforementioned problems?

**Ans:** 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.

* What are the existing software solutions are available to solve the aforementioned problem? And how your proposed solution is going to extend them in providing more benefits to the users?

# SOFTWARE DEVELOPMENT LIFE CYCLE

## Process Model

* Provide an analysis regarding the nature and environment of the software that you are going to develop and select the best suitable method(s) to develop the software.
* Present your arguments based on your analysis about why your selected method(s) is the best choice among all other methods to develop your proposed software.
* Presents sufficient amount of evidence to support argument for your model selection in developing your proposed solution.

## Project Role Identification and Responsibilities

* Identify all the roles/stakeholder in the software/project management activities in software development.
* Describes the responsibilities of the role in the software development.

**Text Format:**

* Style: Times New Roman
* Size: 12
* Space: 1.0
* Alignment: Justify
* Length: Maximum 6 pages (including cover page)

## Rubric for Project Assessment (CO3)

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| Criteria | Marks distribution (Max 3X5= 15) | | | | Acquired  Marks |
| **Inadequate (1-2)** | **Satisfactory (3)** | **Good (4)** | **Excellent (5)** |
| Selection of Software Engineering Models | Does not articulate a position or argument of choosing appropriate model. Does not present any evidence to support the arguments for the choice of the model | Articulates a position or argument for choosing models that is unfocused or ambiguous. Presents incomplete/vague evidence to support argument for model choice | Articulates a position or argument of choosing models that is limited in scope. Does not present enough evidence to support the argument for the choice of the model | Clearly articulates a position or argument for the choosing software engineering models. Presents sufficient amount of evidence to support argument for the model selection |  |
| Role identification and Responsibility Allocation | The project has poor project management plans for identifying roles and assigning the responsibilities | Identify few roles in the project management where some of the roles are left alone with any project responsibilities | Identify most of the roles in the project management and assign their responsibilities | Well planned project with proper role identification and responsibility allocation in the project management activities |  |
| Impact identification |  |  |  |  |  |
| Formatting and Submission | Project report is not complete and Several errors in spelling and grammar. Present a Confusing organization of concepts, supporting  arguments, and  real-life example.  Sentences rambling, and details are repeated. | Some errors in spelling and grammar. Some problems  of organizing the answer in a logical order of defining,  elaborating, and providing real-life examples. | Few errors in spelling and grammar. Presents most of the details in a logical flow of  organization in  definition,  details, and  example. | Project report is complete and No errors in spelling and grammar. Consistently  presents a logical  and effective  organization of definition,  details, and real-life example of  the topic. |  |
| Acquired marks: | | | | |  |
| CO Pass / Fail: | | | | |  |

## Rubric for Project Assessment (CO4)

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| Marking Criteria | Marks Distribution (Maximum 3X5=15) | | | | Acquired Marks |
| **Inadequate (1-2)** | **Satisfactory (3)** | **Good (4)** | **Excellent (5)** |
|  |  |  |  |  |  |
| Project Planning | No background information regarding the project is  given; project goals and benefits are  missing. | Insufficient background information is given; project goals and benefits are  poorly stated | Sufficient background information is given; the purpose and goals of the project are explained. | Thorough and relevant background information  is given; project goals are clear and easy to identify. |  |
| Effort Estimation and Scheduling | Student vaguely discuss the impact of societal, health, safety, legal and cultural issues in their project | Student provided with partial relevance to the impact of societal, health, safety, legal and cultural issues in their project | Student fairly provided the analysis to the impact of societal, health, safety, legal and cultural issues in their project | Student comprehensively provided the analysis to the impact of societal, health, safety, legal and cultural issues in their project |  |
| Risk Management | Ambiguous representative example. | Partially identify / indicate towards real-life example. | Real-life example is fairly connected towards the definition. | Comprehensively defend with real life example. |  |
| Acquired Marks: | | | | |  |
| CO Pass / Fail: | | | | |  |