

American International University-Bangladesh (AIUB)

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

**Mero Rail Dhaka App**

A Software Engineering Project Submitted By

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| --- | --- | --- | --- | --- |
| **Semester: Spring\_22\_23** | | **Section: E** | **Group Number: 5** | |
| SN | Student Name | Student ID | Contribution (CO1+CO3) | Individual Marks |
| 1 | MD MOSTOFA HASIB | 21-44938-2 | 25% |  |
| 2 | ALIF HOSSAIN TALHA | 21-44923-2 | 25% |  |
| 3 | IRTIZA AHSAN ABIR | 21-45009-2 | 25% |  |
| 4 | SHAILA SHARMIN | 21-45223-2 | 25% |  |

The project will be Evaluated for the following Course Outcomes

|  |  |  |
| --- | --- | --- |
| CO1: *Analyze* the impact of software engineering models over various context of software development to assess societal, health, safety, legal and cultural issues. | Total Marks | |
|  | |
| Project Background Analysis and feasibility (needs, goal, benefits, etc.) | [5 Marks] |  |
| Analysis the impact of societal, health, safety, legal and cultural issues | [5Marks] |  |
| Review of existing Studies and Relevant Example | [5Marks] |  |
| CO3: *Select* appropriate software engineering models, project management roles and their skills in the context of professional engineering practice and solutions to complex engineering problems in a software development environment | Total Marks | |
|  | |
| Appropriate Process Model Selection and Argumentation with Evidence | [5Marks] |  |
| Evidence of Argumentation regarding process model selection | [5Marks] |  |
| Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report | [5Marks] |  |

Description of Student’s Contribution in the Project work

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| --- |
| Student Name: MD MOSTOFA HASIB Student ID: 21-44938-2  Contribution in Percentage (%): 25 Contribution in the Project:   * Proposed Dhaka Metro Rail App idea and compiled project work. * Designed UI, Use case Diagram, developed Risk analysis and Test Automation.   A close up of a paper  Description automatically generated  Signature of the Student |
| Student Name: ALIF HOSSAIN TALHA  Student ID: 21-44923-2  Contribution in Percentage (%): 25 Contribution in the Project:   * Designed Sequence diagram * Calculated effort estimation and resource allocation     Signature of the Student |
| Student Name: IRTIZA AHSAN ABIR Student ID: 21-45009-2  Contribution in Percentage (%): 25 Contribution in the Project:   * Resources and information gathering * Designed Class diagram     Signature of the Student |
| Student Name: SHAILA SHARMIN  Student ID: 21-45223-2  Contribution in Percentage (%): 25 Contribution in the Project:   * Designed Activity diagram and contributed to risk analysis and payment method with UI   A close up of a signature  Description automatically generated  Signature of the Student |

# PROJECT PROPOSAL

* 1. **Background to the Problem**

Dhaka, Bangladesh's busy capital, is home to a population of more than 18 million people, making effective and convenient transportation services an urgent necessity. The metro rail system has grown as an important means of transportation, providing an accessible and economical alternative to driving. Nonetheless, present metro train services are heavily criticized for a lack of real-time information and inefficient ticket purchasing alternatives. As a result, taking the metro can be a frustrating experience, with long lines, ambiguous schedules, and ticketing difficulties. Such impediments not only add to the stress of daily commuters, but they also result in lost time and the possibility of missing appointments or deadlines. Furthermore, the metro's complexity may befuddle tourists and visitors, creating a poor impression and potentially discouraging much-needed tourism money. As a result, a comprehensive and user-friendly solution to address these challenges and improve the entire experience of using metro train services in Dhaka city is urgently required.

# Solution to the Problem

The Metro Rail App's goal is to improve the overall experience of travelling via metro rail services in Dhaka city to provide a better solution to the difficulties.

# Objectives:

* + To develop a user-friendly platform for Dhaka Metro Rail riders.
  + Login and sign-up features for the system.
  + To provide real-time updates on railway timetables and delays.
  + To make the ticket purchasing procedure easier.
  + To improve commuters' overall experience when using metro rail.
  + To improve the efficiency and convenience of their journeys.

# Proposed solutions:

* Using the.NET framework, create a full Metro Rail App that is compatible with a wide range of devices and platforms.
* Use agile approaches and focus on user-centered design before launching to provide a high-quality user experience.
* Integrate with other modes of transportation, such as bike-sharing and ride-hailing, to provide a unified experience for city travelers.
* Work closely with Dhaka metro train authorities to ensure that all information provided via the app is correct and up to date.

# Functionality:

# Real-time train schedules and updates.

# Dhaka-specific route maps and fare information.

# Simple and secure ticket purchasing choices.

# The option to remember regularly used routes and payment methods.

# Push notifications for any delays or schedule changes.

# Integration with other modes of transportation, such as bike-sharing and ride-hailing.

# Target Audience:

* + The Metro Rail App is intended for commuters who use metro rail services in Dhaka, as well as tourists and visitors who are unfamiliar with the metro rail system.
  + The app aims to improve the whole experience of commuting via metro rail services and reduce frustration among Dhaka commuters.
  + By using the app, commuters can save time, money, and lessen stress associated with navigating the metro rail system.

Our project contributes to the advancement of scientific discoveries by utilizing cutting-edge technology and design techniques to give a user-centered design and extensive testing before launch to assure a high-quality user experience. There are other studies in literature that cover subjects comparable to ours. However, our study used and extended the problems of previous studies by giving a holistic solution that combines with other transportation providers to provide customers with a smooth experience. The Metro train App would supplement existing solutions by providing a more comprehensive and user-friendly platform that links with other transportation services, decreasing the stress and frustration associated with navigating Dhaka's metro train system.

# SOFTWARE DEVELOPMENT LIFE CYCLE

* 1. **Process Model**

We studied the nature and environment of the program before selecting the most appropriate way to construct the Dhaka Metro Rail App. We adopted the Incremental model as our SDLC process model after thorough evaluation. The **Incremental model** was chosen for the following reasons:

* + - **Iterative development:** The Incremental model is excellent for the Metro Rail App project since it allows for iterative development. It entails numerous features and functionalities that can be created in stages, making management, and tracking development easier.
    - **Smaller sub-projects**: The project can be broken into smaller sub-projects, each with its own set of deliverables. This makes it easy to monitor and track progress while ensuring that the project stays on schedule and accomplishes its objectives.
    - **Early delivery of essential features**: The Incremental model enables the user to receive critical features sooner. These features can be evaluated and refined before the final product is delivered, ensuring that it satisfies the needs of the user.
    - **Frequent feedback**: The Incremental model places a premium on receiving frequent feedback from stakeholders, especially users. This feedback is critical in ensuring that the finished product satisfies the needs of the intended audience.
    - **Flexibility**: The Incremental model allows for the introduction of additional requirements or changes during the development process, giving the project the flexibility to adapt to changing needs.
    - **Regular reviews:** The project's progress can be assessed on a regular basis and altered as needed to ensure that it continues track and accomplishes its objectives.

Based on the foregoing, we believe that the Incremental model is the ideal option for developing the Dhaka Metro Rail App. It offers a flexible, iterative development strategy that guarantees the final product fits the needs of the target audience while allowing for alterations and revisions as needed. We have provided adequate data to support our case for using the Incremental model as the best SDLC process model for the Dhaka Metro Rail App project.

# Project Role Identification and Responsibilities

The following roles and stakeholders, along with their respective duties, have been identified during the software development process for the Dhaka Metro Rail App::

1. **Project Manager:** Overall project planning, budgeting, scheduling, and resource allocation are all your responsibility. In addition, the project manager will be in charge of conveying project progress to stakeholders and managing project risks.
2. **Business Analyst:** In charge of collecting and analyzing requirements from stakeholders, creating use cases, and drafting a document outlining both functional and non-functional needs for the Dhaka Metro Rail App.
3. **UX Designer:** Responsible for creating the Dhaka Metro Rail App's user interface, ensuring that it is user-friendly, aesthetically pleasing, and meets the project's criteria.
4. **Software Developer:** The Dhaka Metro Rail App's features and capabilities must be coded and implemented, and it is my responsibility to make sure the code is high quality, maintainable, and scalable.
5. **Quality Assurance (QA) Analyst:** In charge of testing the Dhaka Metro Rail App to make sure it complies with project specifications, is error-free, and is user-friendly. Any flaws or problems discovered during testing must be documented and reported by the QA analyst.
6. **Deployment and Support Team:** In charge of setting up the Dhaka Metro Rail App in the production environment, maintaining user support, and making sure the app is functional and safe.

Each of these jobs has particular duties to fulfill during the software development process, and they will work closely together to produce a high-quality, project-specific Dhaka Metro Rail App.

**Rubric for Project Assessment (CO1)**

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

**Rubric for Project Assessment (CO3)**

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