American International University-Bangladesh (AIUB)
Department of Computer Science
Faculty of Science &Technology (FST)
Spring 22-23

Section: G

Software Quality Assurance and Testing

PROJECT TITLE

Metro e-Service

Submitted By

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Software Test Plan

for

<Metro e-Service>

Version 1.1 approved

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<14 April, 2023>

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Date: 29th April, 2023

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Revision History

Revision	Date	Updated by	Update Comments
0.1	9-04-2023	Shamim	Version_1.0
0.2	14-04-2023	Shanto	Version_1.1

1. **TEST PLAN IDENTIFIER**: Metro e-Service-MTP01.3

2. REFERENCES

- Requirement Specification (SRS) Document

3. INTRODUCTION

Background to the Problem

The project is focused on addressing the challenges of effectively managing the metro rail service. With many people using the service every day, the ticket system and train schedule become major problems that can cause inconvenience and consume valuable time for office employees and students. The need to wait in line to purchase tickets at the station and the lack of real-time information on train schedules can cause significant delays and increase the risk of missing important appointments.

The root cause of the problem is the lack of an efficient ticketing system and real-time train schedule information. With a significant number of passengers using the metro rail service, the current system can cause long waiting times and delays that can have serious consequences for commuters. The importance of addressing this problem lies in the potential to increase convenience and reduce the risk of missed appointments or other important commitments for passengers.

Solution to the Problem

The project aims to address the challenges of managing the metro rail system and make it more convenient for daily commuters. The ticketing process and train timetable become significant issues as more people use the service daily, which can result in severe delays and raise the possibility of missing important appointments. To overcome these challenges, the project proposes solutions such as a QR code-based ticketing system and a live tracking system for train schedules. These solutions are particularly appropriate as they reduce the need for standing in line to buy tickets and provide real-time information on train locations. The software being specified is a metro rail management system that will benefit commuters by providing more efficient and convenient service.

4. REQUIREMENT SPECIFICATION

4.1 System Features

4.1.1 User Registration

- The software shall allow new users to create an account by providing personal information such as full name, phone number, email, username and password.
- The software shall verify that the provided information is valid and not already in use.
- The software shall confirm successful registration with a pop-up message and redirect the user to the login page.
- The software shall limit account validity to a certain period and notify the user of the expiration date.

Priority Level: High

Precondition: User must have valid and unique personal information to create an account.

4.1.2 User Login

- The software shall allow users to enter their username and password to access the system.
- If the username and/or password is incorrect, an error message will be displayed, and the user will be prompted to try again.
- If the user has forgotten their password, they can request a password reset by providing their registered email address.

Priority Level: High

Precondition: User must have a valid username and password or a registered email address for password reset.

4.1.3 NID Verification after Registration:

- The software shall allow users to verify their National ID (NID) after registration to complete the account setup process.
- If the NID provided by the user is incorrect or invalid, an error message will be displayed, and the user will be prompted to provide a valid NID.
- The verification process will be done through a third-party API that validates the NID information provided by the user.

Priority Level: High

Precondition: User must have completed the registration process and provided their NID information for verification.

4.1.4 Manage Users Profile

- The software shall allow the Admin to view profiles of all users.
- The software shall allow the Admin to adjust user roles, e.g. make admin/user/checker.
- The software shall allow the Admin to delete existing users.
- The software shall display daily revenue for the Admin to monitor.
- The software shall allow the Admin to access transaction history.
- The software shall allow the Admin to access all ticket details.

Priority Level: High

Precondition: The user must have admin privileges and be logged in to access this feature.

4.1.5 Ticket Purchase

- The software shall allow the user to purchase a ticket by selecting the desired origin and destination stations, date, and payment method.
- The system shall validate the payment information entered by the user and confirm the successful transaction with a payment receipt.
- The user shall be able to view the purchased ticket and receipt in their transaction history.

Priority Level: High

Precondition: User must be logged in and have valid payment information.

4.1.6 Purchased Ticket Details

- The software shall allow users to view their ticket details including ticket type, origin and destination stations, fare, and date and time of travel.
- The users shall be able to access the ticket details for their past and future travels.

Priority Level: Medium

Precondition: User must have purchased a ticket and be logged in to their account.

4.1.7 Transaction History

- The software shall allow the admin to view the transaction history of all users.
- Admin can filter the transaction history based on date, time, user, and transaction type.
- The transaction history shall display details such as transaction ID, user ID, ticket type, amount, date, and time.

Priority level: High

Precondition: Admin must have valid login credentials.

4.1.8 Live Location Tracking

- The software shall allow users to view the current location of the train in real-time on a map.
- The software shall display the last station left time and estimated arrival time at the destination station.
- The software shall update the train's location and arrival time information periodically to provide accurate information to the user.

Priority Level: High

Precondition: The train must be equipped with GPS technology to track its location in real-time.

4.1.9 User Logout

- The software shall allow the user to log out from the system.
- Upon logging out, the user shall be redirected to the login page.

Priority Level: Medium

Precondition: The user is logged into the system.

4.1.10 Edit Profile

- The software shall allow users to edit their personal information such as name, email, and phone number.
- The software shall verify the input data and ensure that it is valid before saving the changes.
- If the user attempts to save invalid data, the software shall provide appropriate error messages.

Priority Level: Medium

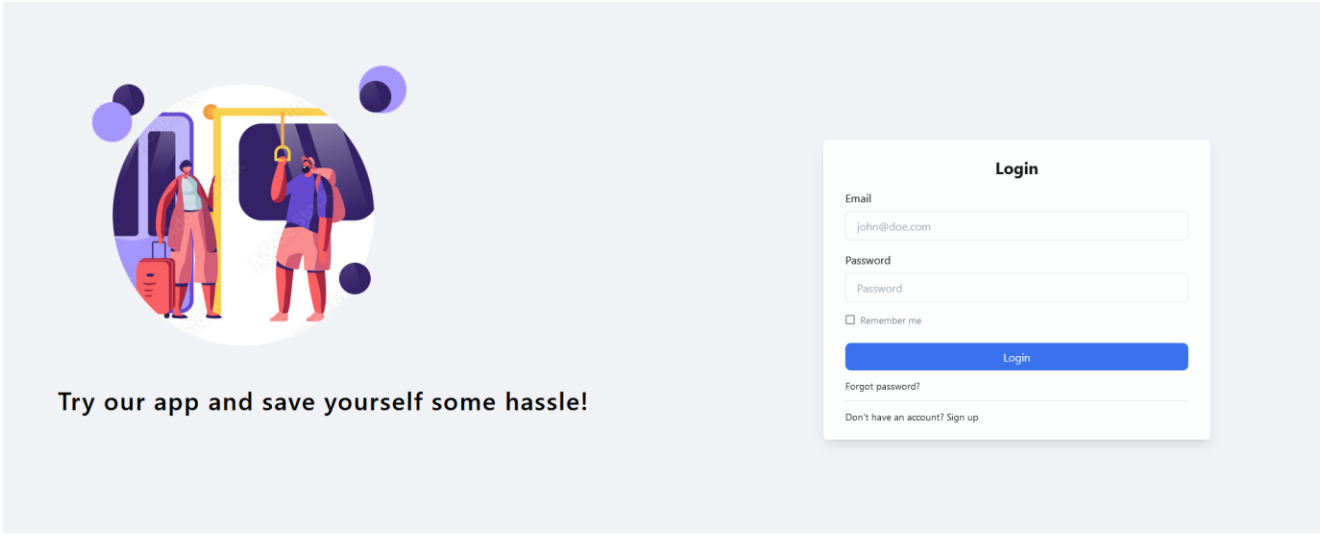
Precondition: user must be logged in.

4.2 System Quality Attributes

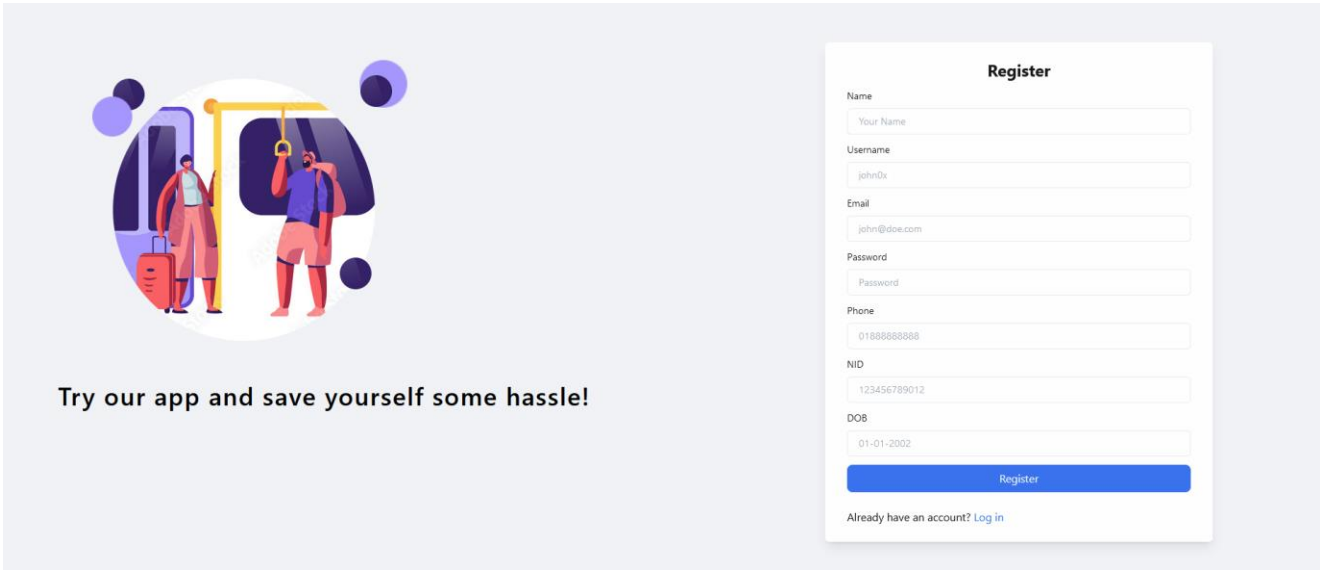
- Reliability: The system should be able to handle a large volume of users and transactions with minimal downtime, ensuring that users can rely on the system for their daily transportation needs.
- Scalability: The system should be able to handle an increasing number of users and transactions as the Metro Rail service grows in popularity.
- Security: The system should have robust security measures in place to protect sensitive user information and financial transactions.
- Usability: The system should be user-friendly, making it easy for users to purchase tickets, access train schedules, and track their transactions.
- Performance: The system should be able to process transactions quickly and efficiently, minimizing wait times for users.
- Maintainability: The system should be easy to maintain and update, allowing for quick bug fixes and software updates as needed.
- Availability: The system should be available for use at all times, with minimal downtime for maintenance or updates.

4.3 System Interface

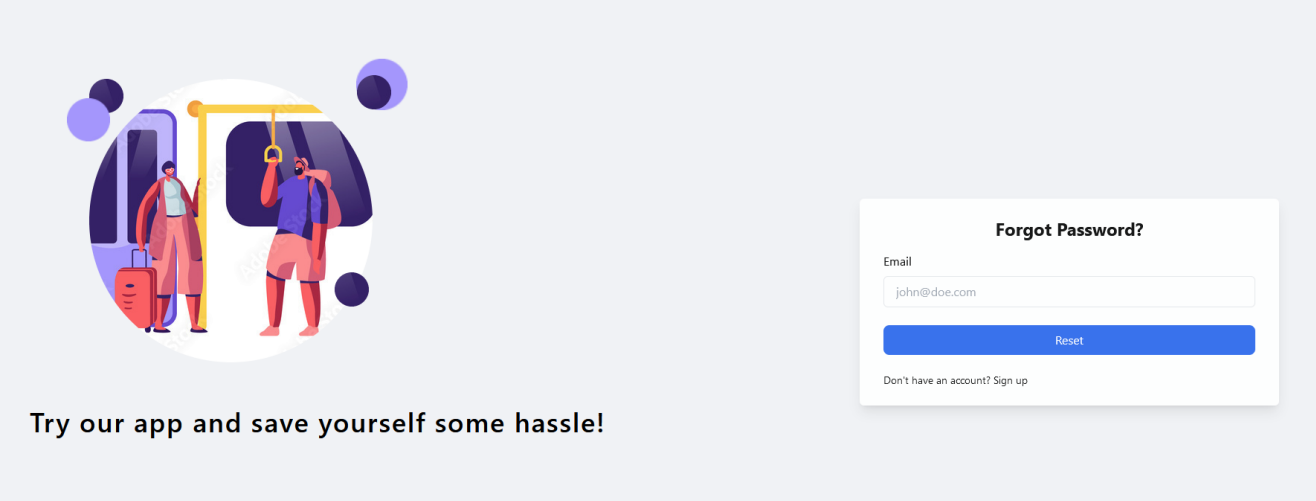
Login Page:



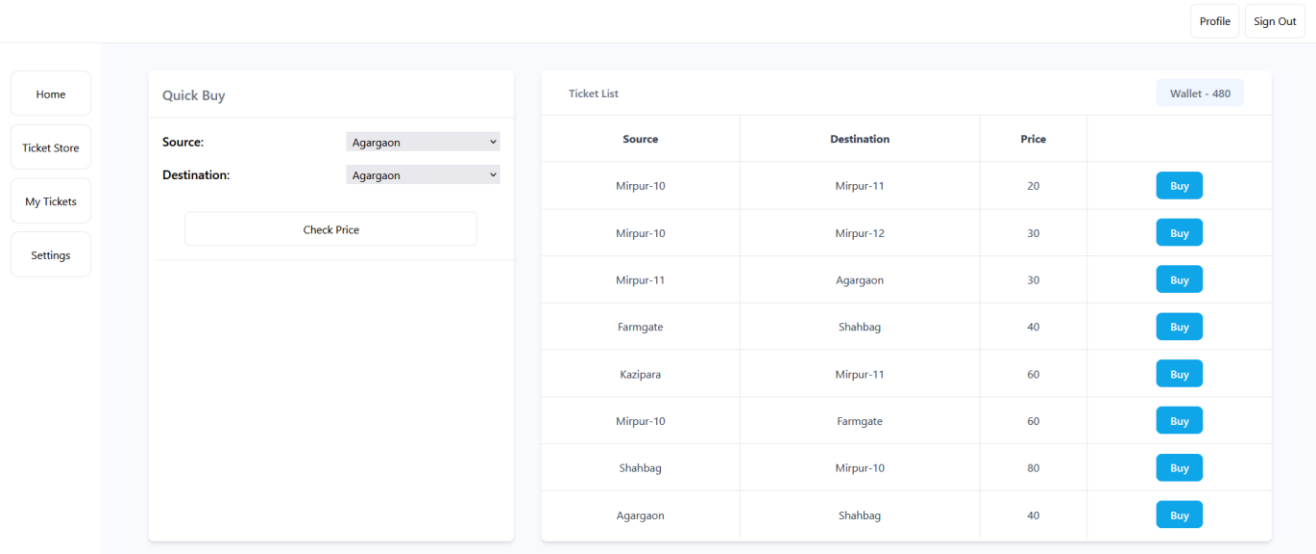
Registration Page:



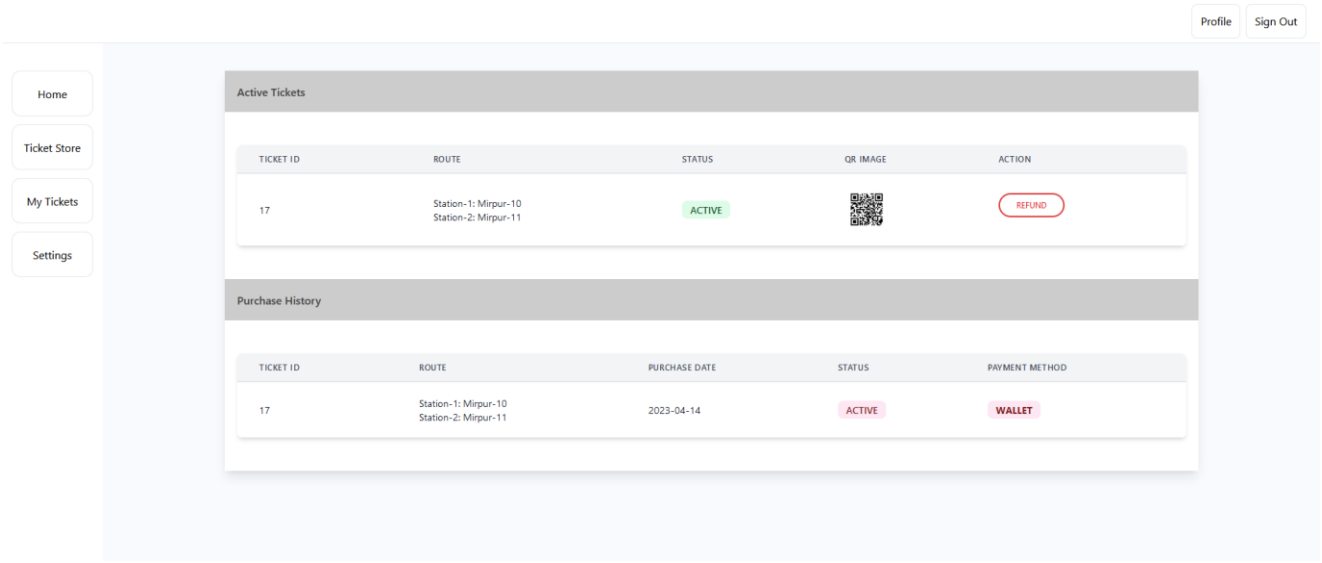
Password Reset Page:



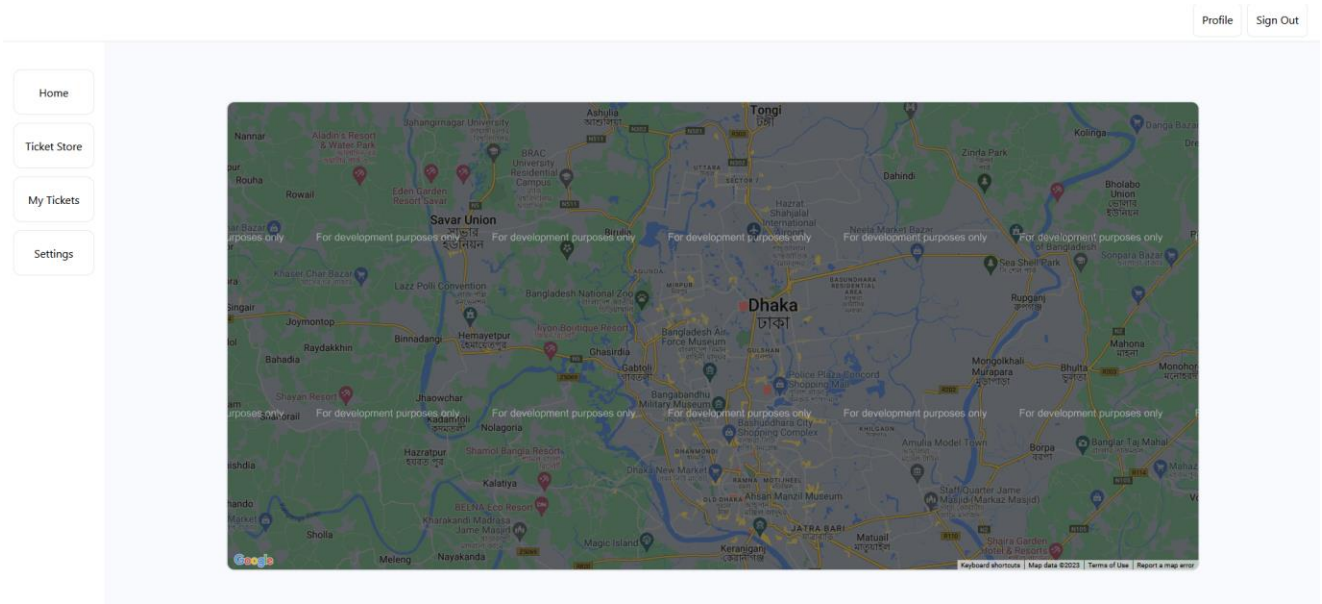
Ticket Purchase:



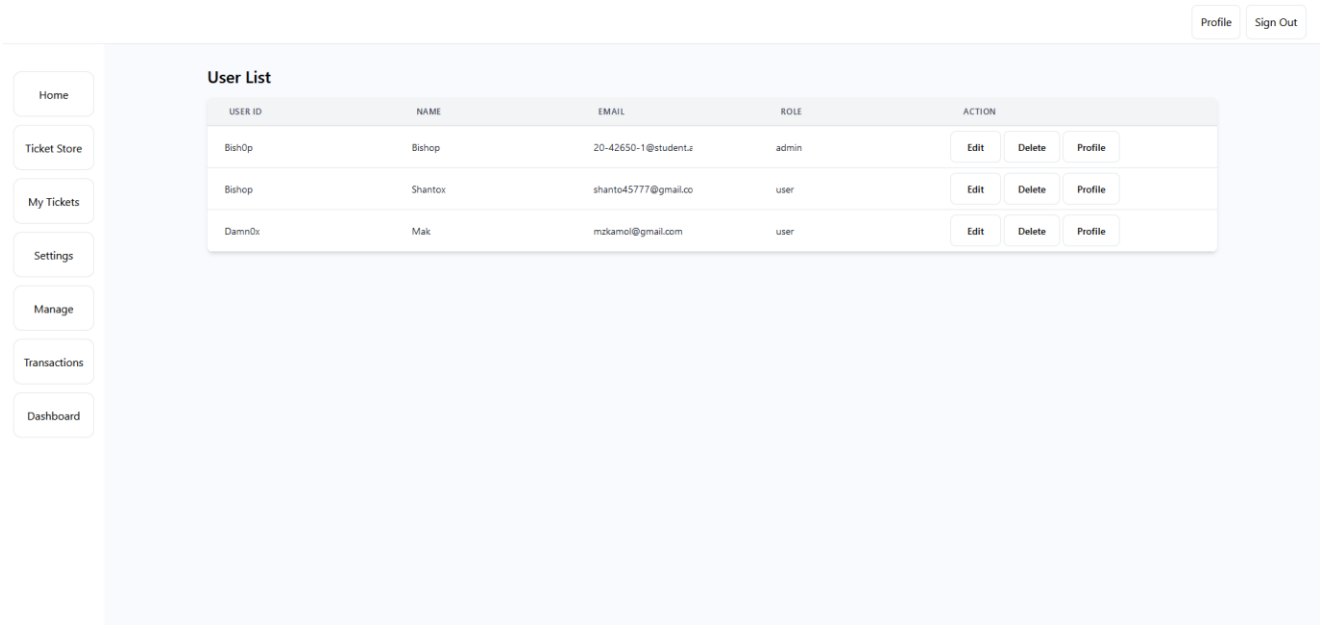
Ticket Purchase History:



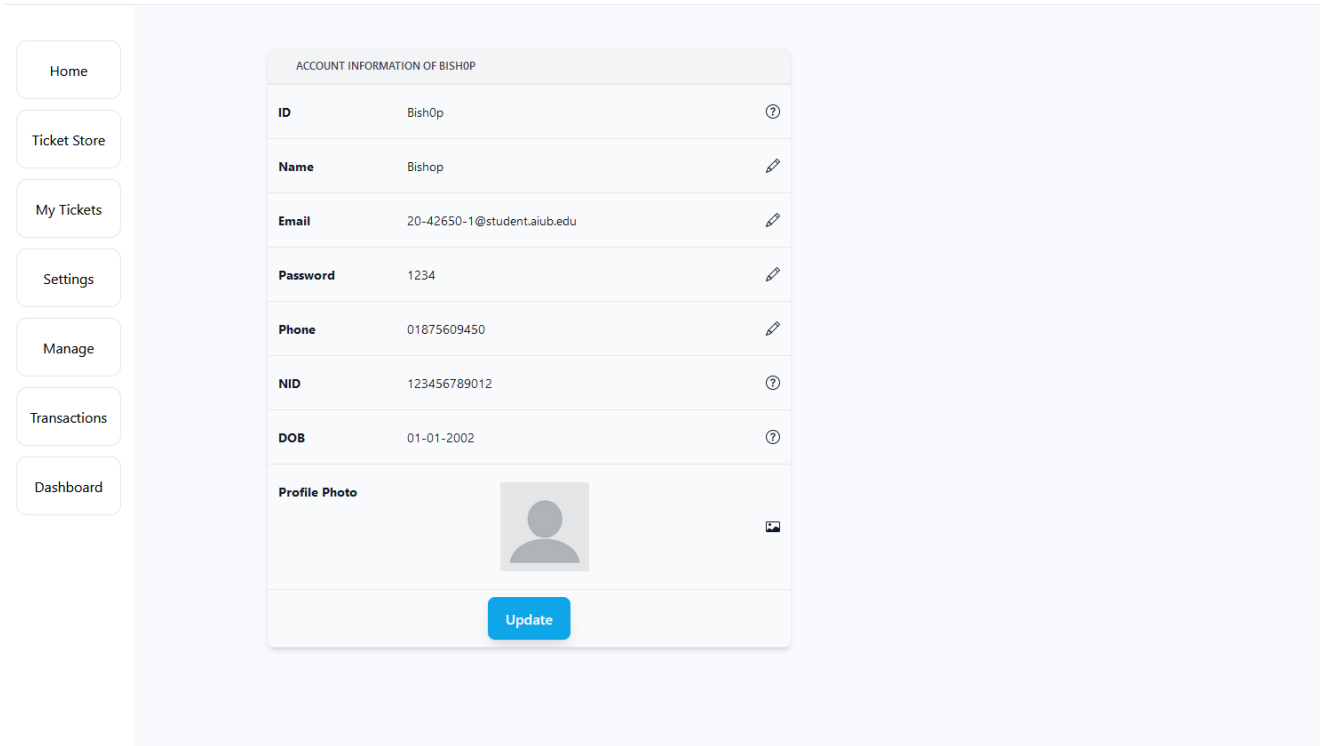
Live Location:



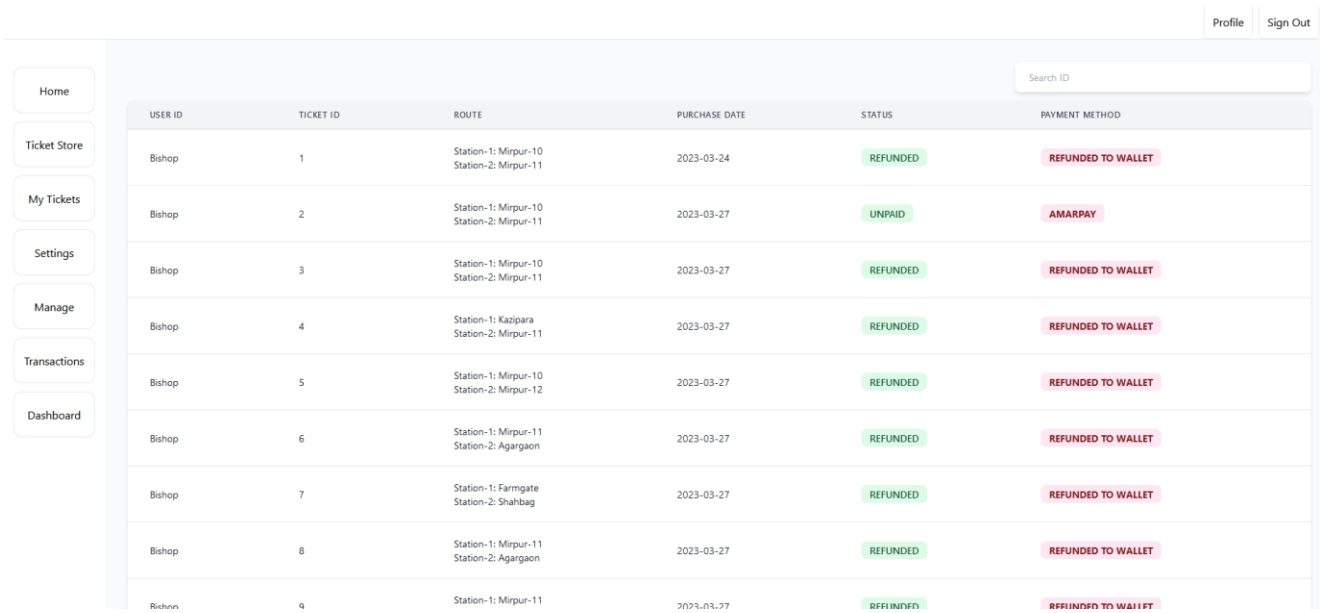
Manage Users (Admin):



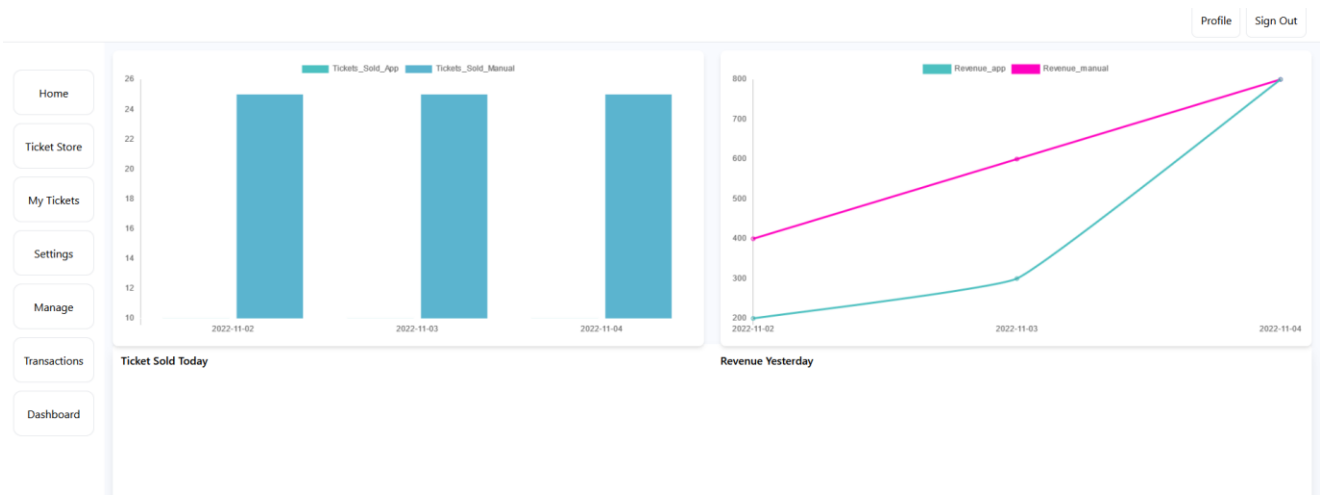
Edit Profile:



All User Transactions (Admin):



Statistics (Admin):



4.4 Project Requirements

- The source code must be in Laravel framework
- For software databases, shall use mysql database server, but other databases are also acceptable.
- For android version, shall use Android studio.
- For testing, shall use Selenium Automation.
- The android app size is maximum 50MB.

5. FEATURES NOT TO BE TESTED

The following is a list of the areas that will not be specifically addressed. All testing in these areas will be indirect as a result of other testing efforts.

- Hardware compatibility: Although it won't be formally addressed, testing the software on various hardware setups will be done indirectly through functional testing.
- Performance under high load: Performance testing will be used to test stress testing indirectly rather than directly.
- Security testing that goes beyond the basics: The system won't undergo in-depth security testing that goes beyond the basics. Only the most fundamental security controls will be checked on the system.
- Network circumstances: No testing will be done under various network conditions, such as low bandwidth or high latency. The system will only be evaluated in typical network circumstances.

6. TESTING APPROACH

6.1 Testing Levels

1. **Unit testing**: To make sure the little pieces of code are functioning properly; the developer runs unit tests throughout the software development process. The testing team receives a report once the team leader approves the testing progress.
2. **Integration Testing**: Following unit testing, a group of testers does integration testing by putting together smaller units to see if the new module is flawlessly linked with the current system.
3. **System testing**: After integration testing, the entire system is tested in a black-box fashion to make sure all modules function properly with one another.
4. **Acceptance Testing**: Acceptance testing is the last step of testing, during which beta users of the product use it in real-time and provide comments. Any defects are fixed by the testing team, demonstrating the high caliber of the product as a whole.

6.2 Test Tools

The test tools to be used for this project:
Popular open-source software called Selenium WebDriver is used to automate web application testing. It enables programmers to replicate user behaviors on web browsers by writing code in a variety of computer languages (such as Python, Java, C#, and Ruby). Testers can run automated functional and regression tests on web applications using Selenium WebDriver to make sure they are operating as intended.

Unit tests are simple to create and execute with the help of Pytest, a testing framework for Python. In order to improve the effectiveness and efficiency of testing, Pytest can offer a thorough and automated testing solution for web applications when used with Selenium WebDriver.

6.3 Meetings

The test team will meet once in every week to evaluate progress to date and to identify error trends and problems as early as possible. The test team leader will meet with development and the project manager once every two weeks as well. These two meetings will be scheduled on different weeks. Additional meetings can be called as required for emergency situations.

7. TEST CASES/TEST ITEMS

Project Name: Metro E-Service	Test Designed by: Monaem
Test Case ID: FR_1	Test Designed date: 12th April, 2023
Test Priority (Low, Medium, High): High	Test Executed by: Monaem
Module Name: Signup Session	Test Execution date: 17th April, 2023
Test Title: verify registration with valid information	
Description: Test website registration page	

Precondition (If any): User must have valid and authorized information

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to Signup 3. Enter Valid information's 4. Click submit	Username: Sayeth Password: 87654321 Email: mzkamol@gmail.com Phone: 01878958985 NID: 345 129 4260 DOB: 13th December, 2002	User should be able to sign up for the website and become a valid user	Registration Successful	Pass

Post Condition: User information is stand in the database and now the user can use the username and password to login. The user must activate their account by verifying their NID.

Project Name: Metro E-Service	Test Designed by: Shamim
Test Case ID: FR_2	Test Designed date: 12th April, 2023
Test Priority (Low, Medium, High): High	Test Executed by: Shamim
Module Name: Login Session	Test Execution date: 17th April, 2023
Test Title: verify login with valid username and password	
Description: Test website login page	

Precondition (If any): User must have valid username and password

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Enter username 3. Enter password 4. Click submit	Username: Sayeth Password: 87654321	User should login into the application	Login Successful	Pass

Post Condition: User is validated with database and successfully login to account. The account session details are logged in the database.

Project Name: Metro E-Service			Test Designed by: Monaem	
Test Case ID: FR_3			Test Designed date: 13th April, 2023	
Test Priority (Low, Medium, High): Medium			Test Executed by: Monaem	
Module Name: Admin login			Test Execution date: 17th April, 2023	
Test Title: verify admin login with valid information				
Description: Check If admin login works perfectly with valid Username and password				
Precondition (If any): Admin must have valid username and password				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to Login 3. Enter Valid admin username and password 4. Click submit	Username: admin Password: admin	Admin should be able to logged in	Login Successful	Pass
Post Condition: Redirect to admin dashboard				

Project Name: Metro E-Service			Test Designed by: Akash	
Test Case ID: FR_4			Test Designed date: 13th April, 2023	
Test Priority (Low, Medium, High): Medium			Test Executed by: Akash	
Module Name: Manage user			Test Execution date: 17th April, 2023	
Test Title: Manage user profiles				
Description: To check If user can manage user profile details				
Precondition (If any): User must be logged in				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to user profile dashboard 3. Put new data/ edit previous data 4. Click update button	New phone: 01878956565	Data update must be successful	Updated Successfully	Pass
Post Condition: Redirect to user profile dashboard				

Project Name: Metro E-Service			Test Designed by: Shamim	
Test Case ID: FR_5			Test Designed date: 13th April, 2023	
Test Priority (Low, Medium, High): Medium			Test Executed by: Shamim	
Module Name: User modification			Test Execution date: 17th April, 2023	
Test Title: Delete user				
Description: Check If admin can delete a user from the system				
Precondition (If any): Admin must be logged in into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to user profile dashboard 3. Select user to delete 4. Click delete button	N/A	Delete action must be successful	Deleted Successfully	Pass
Post Condition: Redirect to user profile dashboard				

Project Name: Metro E-Service			Test Designed by: Inty	
Test Case ID: FR_6			Test Designed date: 13th April, 2023	
Test Priority (Low, Medium, High): Medium			Test Executed by: Inty	
Module Name: Ticket purchase			Test Execution date: 17th April, 2023	
Test Title: Buy tickets online				
Description: Check If user can buy a ticket via online and pay for it				
Precondition (If any): User must be logged in				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to ticket store 3. Select preferred ticket 4. Click buy ticket button	N/A	Ticket purchase must be successful	Purchased Successfully	Pass
Post Condition: Redirect to my ticket's dashboard				

Project Name: Metro E-Service			Test Designed by: Monaem	
Test Case ID: FR_7			Test Designed date: 13th April, 2023	
Test Priority (Low, Medium, High): Medium			Test Executed by: Monaem	
Module Name: Refund			Test Execution date: 17th April, 2023	
Test Title: Ask for refund of a ticket				
Description: Check If user can get refund from one of his purchased tickets				
Precondition (If any): User must be logged in				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to my ticket's dashboard 3. Select a ticket 4. Click refund button	N/A	Ticket refund must be successful	Refunded Successfully	Pass
Post Condition: Redirect to my ticket's dashboard				

Project Name: Metro E-Service			Test Designed by: Shamim	
Test Case ID: FR_8			Test Designed date: 13th April, 2023	
Test Priority (Low, Medium, High): Low			Test Executed by: Shamim	
Module Name: Tracking			Test Execution date: 17th April, 2023	
Test Title: Track the location of metro rail				
Description: Check If user can get the current location through GPS tracking				
Precondition (If any): User must be logged in				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to live location	N/A	The current location of the metro rail must be shown	Location showing accurately	Pass
Post Condition: The location must update with real time				

Project Name: Metro E-Service			Test Designed by: Inty	
Test Case ID: FR_9			Test Designed date: 13th April, 2023	
Test Priority (Low, Medium, High): Low			Test Executed by: Inty	
Module Name: Transaction History			Test Execution date: 17th April, 2023	
Test Title: Access all the transactions made by users				
Description: Check If user can access all the transaction history				
Precondition (If any): User must be logged in				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to my ticket's dashboard 3. Select transaction history	N/A	All the transaction history must be shown	Transactions are accessible	Pass
Post Condition: Redirect to my ticket's dashboard				

Project Name: Metro E-Service			Test Designed by: Akash	
Test Case ID: FR_10			Test Designed date: 13th April, 2023	
Test Priority (Low, Medium, High): High			Test Executed by: Akash	
Module Name: Logout Session			Test Execution date:17th April, 2023	
Test Title: to check if user/admin can log out from the system				
Description: Test website logout feature				
Precondition (If any): User must be logged in				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Click logout button	N/A	User should be logged out from the application	Logout Successful	Pass
Post Condition: Redirect to login page				

8. ITEM PASS/FAIL CRITERIA

The entrance criteria for each step of testing must be met before proceeding to the subsequent phase. The criteria for passing and failing are listed below.

1. In accordance with the stated scenario, the expected outcome must occur for the design to be deemed successful; otherwise, this criterion must be failed.
2. If an item is tested ten times and functions correctly nine times, but fails once, it will be called a failure case.
3. Crashing of the system will be deemed a failure scenario.
4. After submitting a query to the system, if the desired page does not show, it will be considered a failure.

9. TEST DELIVERABLES

The documentation and resources made available to stakeholders during the software development process to assist testing activities are referred to as test deliverables. This lists the papers, gadgets, and instruments that are required.

- To keep on schedule, proper documenting of unit testing findings and results is crucial, along with ongoing progress reporting.
- For acceptance tests, choosing the right audience is essential to preventing inaccurate results and comments. This is comparable to a contract for the software supply and release from the development team.
- It is advisable to keep track of the system's integration of new modules for future verification.
- To keep track of progress reports, project management systems like Jira and Trello can be used.
- A thorough report with test findings will be provided when each testing phase is finished.

10. STAFFING AND TRAINING NEEDS

This part covers personnel and test job preparation. At least one full-time tester is recommended for system/integration and acceptance testing. Most employees will embrace challenging tasks. Job descriptions follow:

1) Project Manager: Responsible for the overall project execution. This includes drafting requirements and managing the testing cycle, among other tasks. Therefore, project managers need training in these areas.

2) Test Manager: Responsible for creating expert test strategies, evaluating test deliverables, managing test cycles, and recommending testing completion. Test managers must be qualified to evaluate professional standard test designs.

3) Test Engineer: Responsible for designing tests, creating test methods, generating test data, executing tests, constructing automated test strategies, and providing the test administrator with measurement information. Test engineers should therefore be able to plan and execute any test case using automated technologies.

11. RESPONSIBILITIES

	TM	PM	Dev Team	Test Team	Client
Acceptance test documentation & execution	X	X		X	X
System/Integration test documentation & execution	X	X		X	
Unit test documentation & execution	X	X		X	
System Design Reviews		X	X		X
Detail Design Reviews		X	X		X
Test procedures and rules	X			X	
Screen & Report prototype reviews		X	X		X
Change Control and regression testing	X		X	X	

12. TESTING SCHEDULE

Task/Weeks	April 1-2	April 3-4	April 5-6	April 7-8	April 9-10	April 11-12	April 13-14	April 15-16	April 17-18	April 19-20
Documentation										
Test Planning										
Unit Testing										
Integration and System Testing										
Acceptance Testing										
Project Completion										
Feedback										

13. PLANNING RISKS AND CONTINGENCIES

Effective risk and emergency planning is crucial to the accomplishment of a project. In a project, it is used to control the risk of exceptions. The planned product must be in line with the service areas, ethics, and manners in order to succeed; otherwise, it will fall short of expectations. There are also certain guidelines and norms to help the organization deal with ambiguous circumstances. The existence of such a system and proper maintenance of it are crucial.

14. APPROVALS

Project Sponsor	N/A
Development Management	Takitazwar Parthib
EDI Project Manager	Asif Sharif Akash
RS Test Manager	Md Shamim Siddiky
RS Development Team Manager	Al-Monaem Khan
Reassigned Sales	Sadiya Afrin Inty