



American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

Summer 21 22

Section: D

Software Quality Assurance and Testing

AIUB PARKING MANAGEMENT SYSTEM

A Report submitted By

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Software Test Plan

for

<AIUB Parking Management System>

Version 1.0 approved

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<20 August, 2022>

Checked By Industry Personnel

Name:

Designation:

Company:

Sign:

Date:

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Revision History

Revision	Date	Updated by	Update Comments
0.1	2022.08.17	Mir, Hafiz	First Draft
0.2	2022.08.18	Momu, Sharmin Akter	Second Draft
0.3	2022.08.19	Swapnil,Abdur Rahman	Third Draft
0.4	2022.08.19	Mir, Hafiz	Fourth Draft

1. TEST PLAN IDENTIFIER: AIUB Parking RS-MTP01.3

2. REFERENCES

- <https://www.izix.eu/parking-management-everything-you-need-to-know>

3. INTRODUCTION

Background to the Problem

- AIUB is a reputed university in Bangladesh. It has been need a unique and smart parking space management system. We think, if we maintain the vehicles in a proper way, we can reduce traffic jam in the Kuratoli road and also in front of our campus. So, we need a proper management system to maintain the vehicles. There are fifteen thousand students and around five hundred faculty members and employees in our university. There are around seven hundred vehicles passing in the campus. And AIUB has its own vehicles also. So, every day we are facing traffic jam problem in front of our main gate and also Kuratoli road.

Solution to the Problem

- The objective of this project is to build a Parking management system that enables the time management and control of vehicles using number plate recognition. The system that will track the entry and exit of cars, maintain a listing of cars within the parking slot and determine if the parking slot is full or not.
- Every day we are facing traffic jam problem to go to our campus in Kuratoli road. We think, if we maintain the vehicles in a proper way, we can reduce traffic jam in the Kuratoli road and also in front of our campus so that, students, faculties and employees can get free parking and it can also reduce traffic jam in Kuratoli road. Besides students, faculties, employees and university authority can be benefited in this such way:
 - Maintain records in short time of period
 - Determines the parking area is full or not.
- Our proposed solution will be based on some functionalities. There have been database system where stores all information of the students, faculties, employees. There have admin panel. We all the group members are discussing about it for better solution also better option for this system. We will work for better functionalities, modern technologies, also useful for our university.

4. REQUIREMENT SPECIFICATION

4.1 System Features

1. Software Login

Functional Requirements

- 1.1 The user login into the software with their username and password.
- 1.2 If the login successful the main home page in this software will be displayed.
- 1.3 If the user forget the username and password so they can be reset password using their valid email address and phone number.
- 1.4 If the user input 3 times wrong password, the system will block the user account login for half one hour

Priority level: High

Precondition: User have valid username and password.

Cross-references: None

2. User Information Management

Functional Requirements

- 2.1 We will create users account according to the users vehicle information.
- 2.2 We will give each user a user parking ID card that includes all user information.
- 2.3 When users pass main gate with the vehicle, they will scan their parking ID card into the machine.
- 2.4 In this time the software will store all the information about the users in the database.

Priority level: High

Precondition: User need to bring their parking ID card.

Cross-references: 5.1, 5.2, 5.3

3. Vehicle Parking Details (Secondary Gate)

Functional Requirements

- 3.1 There will be separate parking slot for each type of vehicles.
- 3.2 It will ensure that how many vehicles available at a time.
- 3.3 There will be different parking slot for students, teachers, authorities and guests. If user valid for specific slot then “Park” otherwise “Try another slot”.

Priority level: Medium

Precondition: The vehicles must be registered according to the vehicles and user’s information.

Cross-references: None

4. Admin

Functional Requirements

- 4.1 Monitoring user information by maintaining accurate database of all parking and access card for tracking and reporting.
- 4.2 If the user is valid based on his/her information then “activate” card otherwise “reject” and report to the user.
- 4.3 If the card is activated by admin then user can park.
- 4.4 Admin will able to see the payment status. If paid then allow to park otherwise report to the user for payment. After reporting 2 times if user doesn’t pay then admin can deactivate the user card.

Priority level: High

Precondition: Admin must have the rights to access the whole system.

Cross-references: 1.1, 1.2, 2.1, 6.1

5. Security Management (Primary Gate)

Functional Requirements

- 5.1 The security guard also checks the user’s parking ID Card.
- 5.2 After checking user’s parking ID card, the security guard will check the free available space.
- 5.3 If the space is free for parking, the guard will scan the car and give access for the parking.

Priority level: High

Precondition: The security will must verified the registered vehicles.

Cross-references: 2.1, 3.2, 3.3

6. Payment System

Functional Requirements

- 6.1 The payment transaction will be done using user’s parking ID card.
- 6.2 The payment slip can be get from the account department using user’s parking ID card.
- 6.3 Then the payment will be received in the bank in our campus.

Priority level: Medium

Precondition: Payment system must be pay using user Parking ID card.

Cross-references: 2.1

4.2 System Quality Attributes

There are some quality attributes that are very important to ensure the quality of a software.

Usability: Any skilled user should be able to register and login to the system.

Efficiency: Each and every functional need must be fulfilled.

Portability: This will be capable of running properly on all the devices.

Maintainability: If any issue locates or detect in the system then it will be possible to fix it.

Correctness: Mentioned all features will be completed according to the preferences of the patients.

Functionality: Will display available slot list, their details and it will also show if they are parking or not.

Accessibility: It's a web-based software so it will be accessible from anywhere on the Internet.

Readability: It's critical to rely on appointment software to properly and containing accurate scheduling demands. It is so important to check to see if the system is durable enough to sustain any situation. So, regular counting on parking slot.

Reliability: All features will perform in various working environments or devices.

Flexibility: Will flexible enough to modify in terms of any needs.

Integrity/Security: System integrity or security should be sufficient to prevent unauthorized access to system functions, information loss, and virus infection of software, as well as to protect the privacy of data entered into the system. Actually, Integrity comes with security.

Installation: There will definitely be no lengthy downloads or installations. So easy to download and install for any user.

Customer Support: This is a critical requirement, given the importance of proper parking system. The service provider should provide live email and phone assistance.

4.3 System Interface



AIUB Parking Management System- Payment

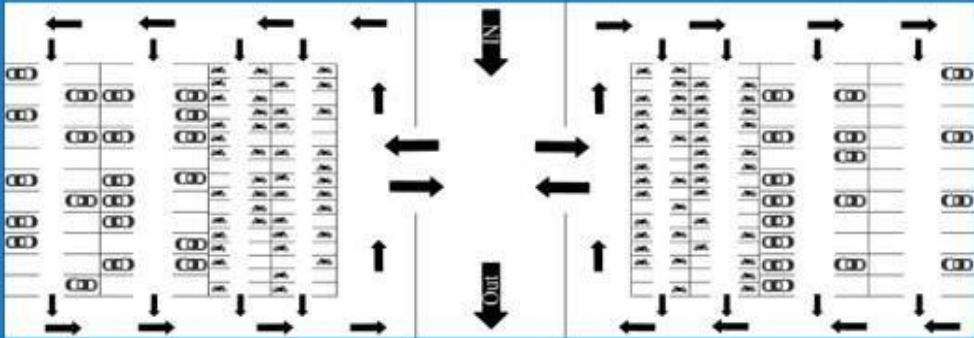
User ID	<input type="text" value="User ID"/>
Amount	<input type="text" value="BDT"/>
Date	<input type="text" value="DD/MM/YYYY"/>
Received by	<input type="text"/>

AIUB Parking Management System- Parking Slot

<input type="button" value="Officer"/>	<input type="button" value="Faculty"/>
<input type="button" value="Guest"/>	<input type="button" value="Students"/>

AIUB Parking Management System- Student

Capacity-	<input type="text" value="1000"/>	Available-	<input type="text" value="350"/>
Bike Slot Available-	<input type="text" value="200"/>	Car Slot Available-	<input type="text" value="150"/>



4.4 Project Requirements

- Time: Around 4 months (120 days) can be needed to complete this application.
- Budget: 5,00,000 BDT
- The total size of our final application should not be more than 500-600 MB.
- There will be only one application for the University Parking System. So, it is only for the University Authority.
- The application will be written in C# (.NET) programming language, because C# is object-oriented.

5. FEATURES NOT TO BE TESTED

The following is a list of fields that will not be specifically addressed. All test efforts in this area will be indirect as a result of other test efforts. For example:

- ❖ In PC-based spreadsheet analysis systems, reassigned sales data is used. Because these apps are completely under the control of the system users and are not included in the scope of this project. Student, teacher, staff will be provided with the necessary database format information in order to extract data.
- ❖ External functionality over the program is not supported by this system. As a result, application to server testing should be avoided.
- ❖ Student's, teacher's, staff's personal information.
- ❖ Networks.
- ❖ Hardware.

6. TESTING APPROACH

6.1 Testing Levels

UNIT TESTING: It is a sort of software testing that examines individual software units or components. The goal is to ensure that each unit of software code works as intended. Unit testing is carried out by developers during the development of an application. Unit tests are used to isolate a part of code and ensure that it is accurate. A singular function, method, process, module, or object might be considered a unit. The developer will complete this task, which will be authorized by the development team leader. All tests are conducted online using a software package that may be downloaded from the official website. Unit tests give a fundamental overview of the unit API for developers who want to discover what functionality a unit provides and how to utilize it. We can test portions of the project without having to wait for others to finish due to the modular structure of unit testing.

SYSTEM/INTEGRATION TESTING: System Integration Testing (SIT) is the overall testing of a system that is made up of several subsystems. SIT's major goal is to make sure that all software module dependencies are working properly and that data integrity is maintained between different modules in the system. The test manager and development team leader will be in charge of this, with assistance from individual developers as needed.

ACCEPTANCE TESTING: User Acceptance Testing (UAT) is a sort of testing in which the end user or customer verifies and accepts the software system before it is moved to the production environment. With the help of the test manager and development team leader, this will be done by the real end users. The acceptance test will run concurrently with the existing beta testing user community for a month after the System/Integration test procedure is completed prior to project launch. In this project The primary goal of UAT is to verify the end-to-end business process. It is not concerned with visual flaws, misspellings, or system testing. User Acceptance Testing is performed in a separate testing environment with data that is similar to that used in production. Two or more end-users will be participating in this type of black box testing.

6.2 TEST TOOLS

The testing tool that will be mainly used for the project is discussed below:

Selenium: Selenium is an open-source automated testing framework for validating web applications across multiple browsers and platforms. Selenium Test Scripts may be written in a variety of computer languages, including Java, C#, Python, and others. Selenium Testing is the term for testing done using the Selenium testing tool. Selenium Software is more than just a single tool; it's a collection of tools, each of which caters to a certain organization's Selenium QA testing requirements. The following is a list of tools.

- Automated testing is faster than manual execution, so automated testing improves test coverage.
- It supports execution of repeated test costs.
- Automated testing reduces test reliability
- It helps to enable parallel execution.
- Its development process and delivery system are very fast
- It saves time and money.
- Users can get immediate feedback by using Automation Testing.
- With a view to increasing productivity rate, Automation Testing is very much helpful.

6.3 MEETINGS

Every two weeks, our test team meets to discuss new advancements and suggestions for improving functionality, as well as to become aware of error characteristics and concerns as soon as feasible. As soon as every two weeks, our test team's crew chief will meet with improvement and the mission supervisor. These two conferences will take place on different weeks. Additional meetings may be called as needed in emergency situations. Employees may participate in live chat sessions from home to discuss new advancements and recommendations for improving functionality before any planned meetings.

7. TEST CASES/TEST ITEMS

Project Name: AIUB Parking Management System		Test Designed by: Momu,Sharmin Akter		
Test Case ID: FR_1		Test Designed date: 10/08/2022		
Test Priority (Low, Medium, High): High		Test Executed by: Momu,Sharmin Akter		
Module Name: Software login		Test Execution date: 15/08/2022		
Test Title: Verify login with valid username and password				
Description: Test website login page				
Precondition (If any): User have valid username and password				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to website 2. Enter username Input 3. Enter password 4. Click submit	UserName: AiubParkingManagement Password: AIUB1994	User should login into the system.	Login	Pass
Post Condition: User is validated with database and successfully login to account. The account session details are logged in the database.				

Project Name: AIUB Parking Management System		Test Designed by: Mir, Hafiz		
Test Case ID: FR_2		Test Designed date: 10/08/2022		
Test Priority (Low, Medium, High): High		Test Executed by: Mir, Hafiz		
Module Name: User Information management		Test Execution date:13/08/2022		

Test Title: Verify user parking ID card with software database				
Description: Test parking ID card				
Precondition (If any): User need to bring their parking ID card				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go the software 2. Login with valid username and password 3. Check parking id card when user scan their id card into the machine	UserName: AiubParkingManagement Password: AIUB1994	Software user should login into the system and verify users parking ID card.	Verify Parking Card	Pass
Post Condition: The user entry details are stored in the database.				

Project Name: AIUB Parking Management System		Test Designed by: Mir, Hafiz		
Test Case ID: FR_3		Test Designed date: 11/08/2022		
Test Priority (Low, Medium, High): High		Test Executed by: Mir, Hafiz		
Module Name: Vehicle Parking Details (Secondary Gate)		Test Execution date: 14/08/2022		
Test Title: Verify vehicle parking system				
Description: After login Security guard can see how many vehicles slot available that time. Seeing the available Parking slot security guard ensure the parking slot to user. After ensuring user can park that selected parking place.				
Precondition (if any): The vehicles must be registered according to the vehicles and user’s information				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)

1.Login to the software 2.Enter parking slot 3.Select available slot 4.Click Confirm	Username: AiubParkingManagement Password: AIUB1994	Booking parking slot	Verify vehicle parking	Pass
Post Condition: Valid user park their vehicle on selected slot if parking available.				

Project Name: AIUB Parking Management System		Test Designed by: Momu,Sharmin Akter		
Test Case ID: FR_4		Test Designed date: 11/08/2022		
Test Priority (Low, Medium, High): High		Test Executed by: Momu,Sharmin Akter		
Module Name: Admin		Test Execution date: 15/08/2022		
Test Title: Verify Admin with valid ID and password.				
Description: Test whether Admin can log into the system and the Admin information is valid based on the database.				
Precondition (if any): Admin must have the rights to access the whole system.				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Enter ID 3. Enter password 4. Click submit	Username: AiubParkingManagement Password: AIUB1994	Admin should login into the application	Verify Admin login	Pass
Post Condition: Admin is validated based on the database information and successfully login to this system.				

Project Name: AIUB Parking Management System	Test Designed by: Swapnil,Abdur Rahman
Test Case ID: FR_5	Test Designed date: 14/08/2022

Test Priority (Low, Medium, High): High		Test Executed by: Swapnil,Abdur Rahman			
Module Name: Security Management		Test Execution date: 16/08/2022			
Test Title: Checks the user parking ID card.					
Description: the security guard will check user ID card.					
Precondition (if any): The security will must verify the registered vehicles.					
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Security Login 2. Click User Info 3. Input User ID number 4. Confirm User validation		Security Name: Abul Kashem Password: abul1992 User ID: 1425	Security guard will check user ID card and also validation	Check user ID card	Pass
Post Condition: after verification, the guard will scan the car and give access for the parking.					

Project Name: AIUB Parking Management System		Test Designed by: Swapnil,Abdur Rahman		
Test Case ID: FR_6		Test Designed date: 12/08/2022		
Test Priority (Low, Medium, High): High		Test Executed by: Swapnil,Abdur Rahman		
Module Name: Payment System		Test Execution date: 14/08/2022		
Test Title: Checks the user payment issue.				
Description: The payment transaction will be done using user’s parking ID card and payment slip can be get from the account department using user’s parking ID card. Then the payment will be received in the bank in our campus.				
Precondition (if any): Payment system must be pay using user Parking ID card.				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)

1. Login 2. Click User Account Details 3. Input User ID number 4. Confirm payment slip	Name: admin Password: admin	Payment slip will be generated.	Payment Option works	Pass
Post Condition: after payment, the vehicle will be able parking for next semester.				

8. ITEM PASS/FAIL CRITERIA

The main objective of this section is to specifies the PASS/FAIL criteria for the tests covered in this project. If a component or unit, a system or any integrated test item has 80% to 95%, then it will be considered as pass criteria and if any system of any unit has below 80%, then it will be considered as fail criteria. In our project we have follow this measurement for identify that our project is how much reliable and how much it satisfies for the user.

9. TEST DELIVERABLES

The technical and directorial processes required for the development and delivery of the system are defined in the Software Quality and Testing Plan.

- First of all, the acceptance test plan is like a contract for our project and the developers of the project to be released.
- Then, we need a system integration plan. Because System integration is defined as the process, by using this process we can connect individual computer systems or software applications to a single, larger system so that each solution can work together functionally.
- In the unit test plan section, first of all, we have to analyze the product which going to be tested.
- Then design the test approaches and define objectives.
- If we want to track progress, then we have to run test plans and track progress with project management tools.
- There are some documents that makeup screen prototypes. That one prototype is a Rapid Application Development that has been revised. The code-related data will be presented in the form of output including each team's code.

- Design goals, high-level decomposition of the system, concurrency identification, hardware and software platforms, acceptance test plan, system integration plan, screen prototypes, software control implementation, report mock ups are described here.
- Incident reports are important for keeping employees safe and establishing best practices in the workplace. Proper documentation of incidents helps to make a successful project. In our project we made report and full summary of our project.
- A test manual outlining the unit and system tests carried out on the system prior to delivery, as well as the expected outcomes.
- The test log contains a historical record of events that occurred during a test run or scheduled run, as well as the status of each checkpoint. In our project, we revised every checkpoint and recorded data on our activities and different approaches.
- An employee turnover report is the overall report of the number of terminated employees among the active employee in an organization. It is the monthly analysis report and is prepared monthly and the average is calculated for the year. So, it is very much important for our projects and plays a significant role.

So, we made an overall summary and turnover report.

10. STAFFING AND TRAINING NEEDS

The goal of the staffing technique is to guarantee that the project has enough people with the necessary skills and expertise to complete it successfully. The following is a detailed overview of the duties required to complete the project. It details the project's roles, their responsibilities, the number of people needed to complete each position.

- It is clearly notified that, there will be minimum one or two project manager who are expert in organizing, planning, and executing projects while working within constraints such as budgets and schedules.
- In our project we need at least one full-time tester assigned to the system / integration and acceptance testing phase of the project. Approximately four months after the start of the project, (full-time tester) will be assigned. If there is no tester, the test manager will assume this role. To ensure a complete and proper exam, we need to address some areas related to training.
- In our project, we hired lead programmers. Lead programmers are software engineers who oversee several projects. At the technical level, he is responsible for overseeing projects, technical decisions, and developer work. At the management level, he is responsible for achieving goals and meeting deadlines.
- Developers and testers need to be trained in the basic features of the EDI interface. Operations staff must also be well trained in the EDI communication process before the project is finally approved.
- As our project is car parking system, design, develop, and test our system or application according to our specifications is also needed.
- Analyze project requirements, determine how to translate a designer's vision into a plan that developers can implement. By involving a requirement analyst in our project, we can do these types of works.

- Testing strategy and objectives in our project, we identified the purpose of our testing. Also observed what a successful completion of a testing cycle looks.
- Monitoring and controlling mechanism plays a vital role of project objectives. If some discussions have been done about project, then monitoring system will be helpful.
- If the project is well budgeted and all perspectives of the project are running, the project will work properly. We should notice about these things.
- If needed, training and other activities must be added to our project.
- The developer will observe project progress and if needed they will modify the project.
- Development management and user management are closer. The user administrator decides where to go, taking into account changes in the control process. So, in our project (Parking system) when the development management system needed help to improve the project, they can discuss with the user management team.

So, finally, we can say that Staffing and proper training (if needed), is very important. If we want to make a successful project staffing and training plays a significant role.

11. RESPONSIBILITIES

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

12. TESTING SCHEDULE

Task	Duration (Days)	04.08.22 to 06.08.22	08.08.22 to 11.08.22	11.08.22 to 16.08.22	18.08.22 to 20.08.22	20.08.22 to 26.08.22	26.08.22 to 28.08.22	29.08.22 to 01.09.22	02.09.22 to 05.09.22
Initial Study	3								
Feasibility Study	4								
Analysis/Project Requirements	6								
Planning Phase	3								
Designing & Modeling	6								
System Testing	3								
System Testing	4								
User Acceptance Test & Training	4								

13. PLANNING RISKS AND CONTINGENCIES

Planning risk and contingencies are a very important for getting a good outcome from a project. Main in a project, it is used for risk management for exceptional cases. On the other hand, Contingency plans are made by governments other business organizations. Every company has some rules and regulations and they have to follow in the event of disaster. The plan may also include policies to mitigate a disaster. So, it is very important to follow those rules and make everything for organization's benefit.

14. APPROVALS

Project Sponsor	AIUB Management
Development Management	Cefalo BD
EDI Project Manager	Mir,Hafiz
RS Test Manager	Momu,Sharmin Akter
RS Development Team Manager	Mir,Hafiz
Reassigned Sales	Swapnil,Abdur Rahman
Order Entry EDI Team Manager	Siam Ashrafi