American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science &Technology (FST)

Spring 23 24

Section: A

Software Quality Assurance and Testing

FACULTY COURSE ALLOCATION

A Report submitted By

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Software Test Plan

for

<Faculty Course Allocation>

Version 4.0 approved

Prepared by <Abu Naser MD. Arman, MD Samiul Islam Sami, Nowrin Binte Rashid, Ishrakul Tahmid>

< American International University-Bangladesh (AIUB)>

<14 May,2024>

Checked By Industry Personnel

Name:

Designation:

Company:

Sign:

Date:

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Revision History

Revision	Date	Updated by	Update Comments
0.1	2024.05.01	Abu Naser MD. Arman	Version_1
0.2	2024.05.02	Ishrakul Tahmid	Version_2
0.3	2024.05.03	Nowrin Binte Rashid	Version_3
0.4	2024.05.04	MD Samiul Islam Sami	Version_4

1. TEST PLAN IDENTIFIER: FacultyCourseAllocation1.3

2. REFERENCES

Griffith, A. S., & Altinay, Z. (2020). A framework to assess higher education faculty workload in US universities. *Innovations in education and teaching international*, *57*(6), 691-700.

3. INTRODUCTION

3.1 Background to the Problem

In many educational institutions, the process of assigning courses to faculty members is often a complex and time-consuming task. This process involves considering various factors such as faculty expertise, course requirements, faculty preferences, and workload balance. Traditionally, this task has been performed manually by administrators, which can lead to errors, inconsistencies, and dissatisfaction among faculty members due to perceived unfairness in the allocation process. Moreover, the manual process is not scalable and becomes increasingly difficult to manage as the number of courses and faculty members increases. It also does not allow for easy adjustments in case of sudden changes such as faculty leaves or course cancellations. The "Faculty Course Allocation" project aims to address these issues by automating and simplifying the course assignment process. It provides an intuitive interface for administrators to assign courses. This project can tackle a significant problem faced by educational institutions and offers a solution that benefits administrators, faculty members, and ultimately, the students.

3.2 Solution to the Problem

The proposed solution is to develop a software system, the "Faculty Course Allocation" system, that automates the process of assigning courses to faculty members. This system will take into account various factors such as faculty preferences, and workload balance. This solution is particularly appropriate because it addresses the main issues identified in the problem, the time-consuming nature of manual allocation and the potential for errors and inconsistencies. By automating the process, the system can quickly generate optimal allocations, saving administrators valuable time. The system also allows faculty members to input their preferences, increasing satisfaction. There are existing software solutions that address similar problems, such as resource allocation and scheduling software. However, these solutions may not be specifically tailored to the unique requirements of course allocation in educational institutions. Our aim is to build a web-based application to

- Set Faculty's course preference and priority timing
- Automate the course allocation to the faculty.
- Make the tsf of faculty
- Set course section and timing

4. REQUEIREMNT SPECIFICATION

4.1 System Features

4.1.1 Admin Login

- Admin will log into the system with admin User ID and password.
- If login is successful, admin homepage will be shown. Otherwise, it will redirect to the admin login page with wrong credential massage.
- Priority Level: High
- Precondition: Admin must have valid User ID and password increase every bullet point shortly.

4.1.2 Allocate Course

- Admin allocate the course to the faculty according his priorities.
- Priority Level: High
- Precondition: in priority time there must have a open section.

4.1.3 Faculty TSF

- Admin search by the faculty name and can see his TSF.
- Priority Level: Medium
- Precondition: Faculty name should be valid

4.1.4 Add Course

- Admin can allocate new course.
- Priority Level: High
- Precondition: new course must have a valid credit.

4.1.5 Add Section

- Admin can allocate a new section.
- Priority Level: High.

- Precondition: available room and minimum number of students must have for allocating the section

4.1.7 Edit Section

- Admin can modify the section time or room number.
- Priority Level: High.
- Precondition: in the new time the allocated room must be available.

4.1.8 Add Faculty

- Admin add new faculty.
- Priority Level: High
- Precondition: new faculty must have a valid id.

4.1.9 Faculty Info

- Admin can modify the faculty information.
- Priority Level: Medium.
- Precondition: faculty must have valid ID.

4.1.10 Add Priority Course

- Admin set the priority course for the faculty
- Priority Level: Medium
- Precondition: priority time must be valid.

4.1.10 Set Priority Time

- Admin set the priority time for the faculty
- Priority Level: Low
- Precondition: priority time must be valid.

4.1.11 Admin Logout

- An admin will be able to log out of the system from his valid account.
- Logout will be successful if after pressing logout it redirects to the login page.
- Priority Level: High
- Precondition: Admin needs to successfully log in first.

4.2 System Quality Attributes

There are some software quality attributes as per ISO/ IEC 9126 that are very important to ensure the quality of software.

Functionality: Functionality ensures that only authenticated administrators ("valid Admins") can access all services and features after logging in. Anyone not recognized as a valid admin ("Invalid Admin") is denied access, enhancing system security and ensuring that only authorized personnel can operate within the administrative environment

Security: System security should be sufficient to prevent unauthorized access to the system operations. This involves implementing strong authentication protocols, encrypting data transmissions, and possibly using intrusion detection systems to ensure that only authorized users can interact with the system and that their actions are securely managed. This comprehensive security approach helps protect sensitive data and maintain the integrity of system operations.

Reliability: All features will work as intended across a range of working environments or devices. This implies thorough testing and optimization to handle different hardware configurations, operating systems, and network conditions, guaranteeing a stable and dependable user experience regardless of the platform used.

Usability: The Faculty-Course-Allocation system is a system that is easy to understand for everyone. This means the interface is intuitive, instructions are clear, and users can efficiently complete tasks without confusion or the need for extensive training.

Efficiency: Our system size is small and efficient so that it can be handled by any device. This ensures quick response times and minimal resource consumption, making the system accessible and practical for a wide range of users.

Maintainability: If a bug or problem is found in the system, it will be solved as soon as possible. The system remains reliable and performs well over time, with minimal disruption to users. It reflects a commitment to regular updates and effective problem-solving to enhance user experience and system stability.

Portability: Switching the host or environment can be done in a short time. Reinstallation of the software can be done easily as well. This flexibility allows for quick adaptations to new systems, facilitating seamless transitions with minimal setup time, which is ideal for maintaining operations across diverse platforms

Accessibility: As it is web-based software, it can be accessed from anywhere through Internet. Here users can reach and use the system conveniently, whether from home, work, or on the go, enhancing its usability and availability.

Installation: There won't be any time-consuming downloads or installations because it is web-based. It is based on web addresses. It is very easy for anyone to access.

4.3 System Interface

This is the system home user interface. All admins will first see this home page when then visit this Faculty-Course-Allocation Web application.

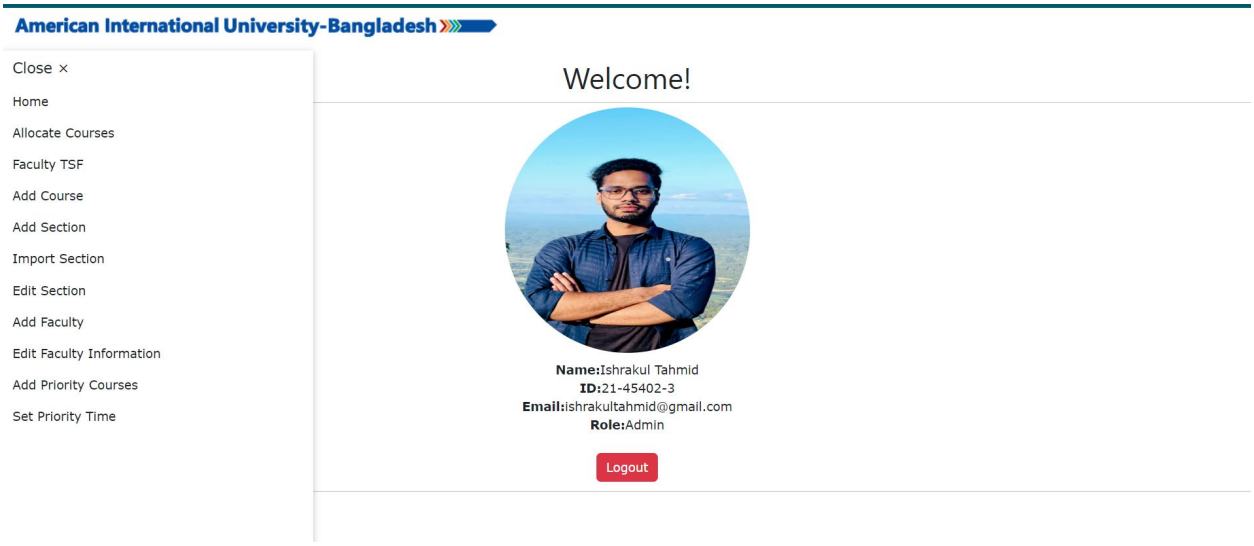


Fig 1: System Home Page

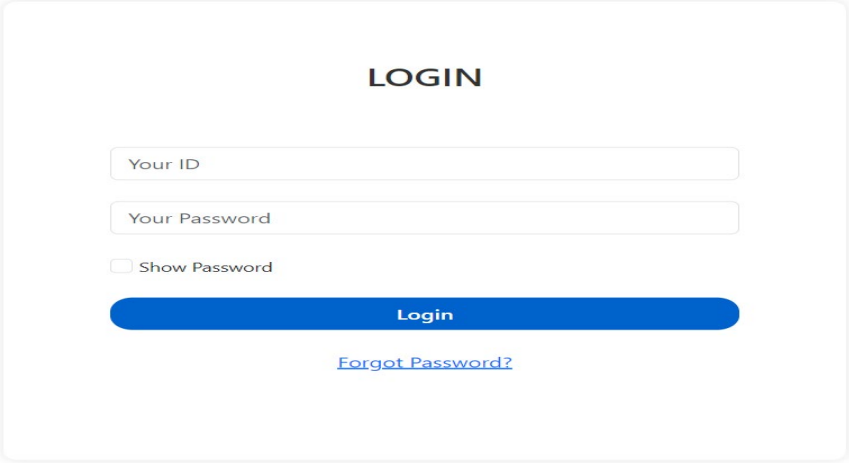


Fig 2: User Login Page

This page for allocate course.

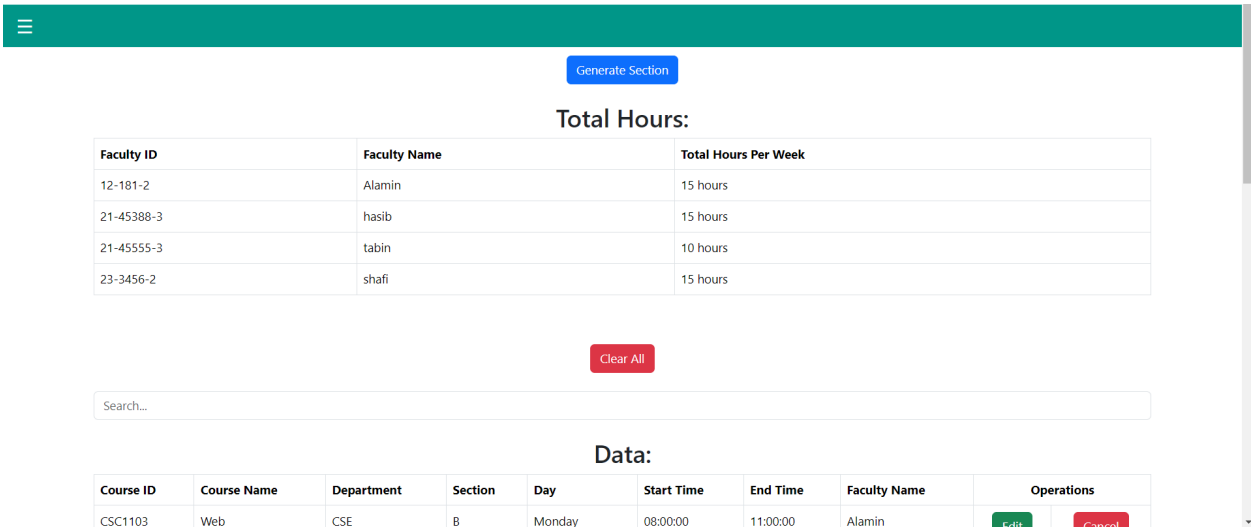


Fig 3: Allocate Course

This page for search TSF.

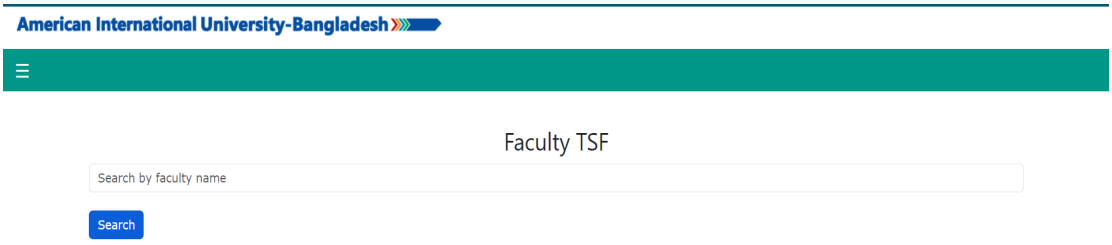


Fig 4.1: TSF Search

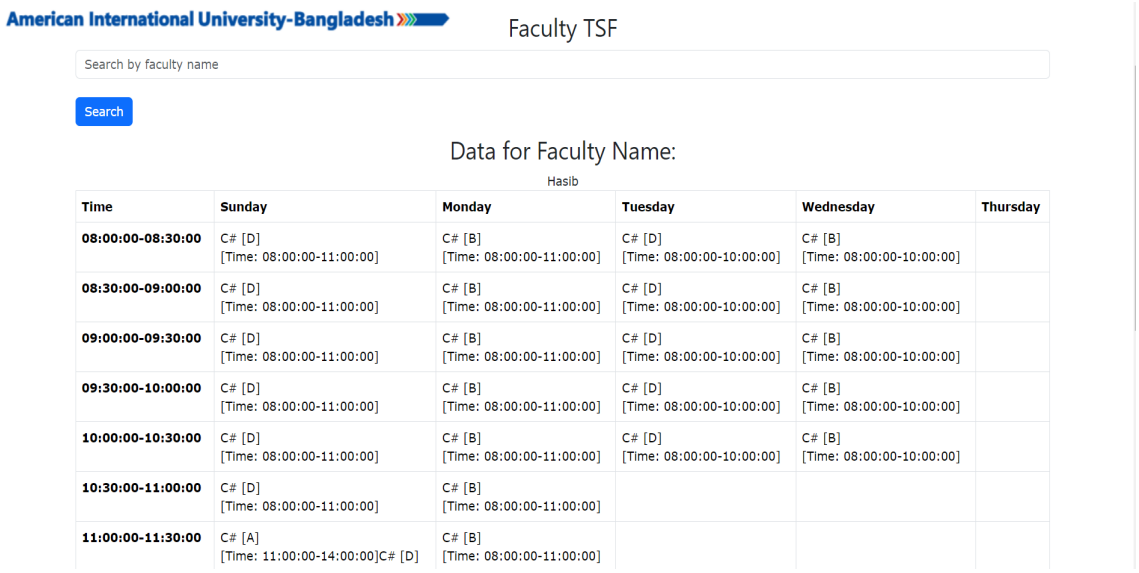


Fig 4.2: Faculty TSF

This page for add course.

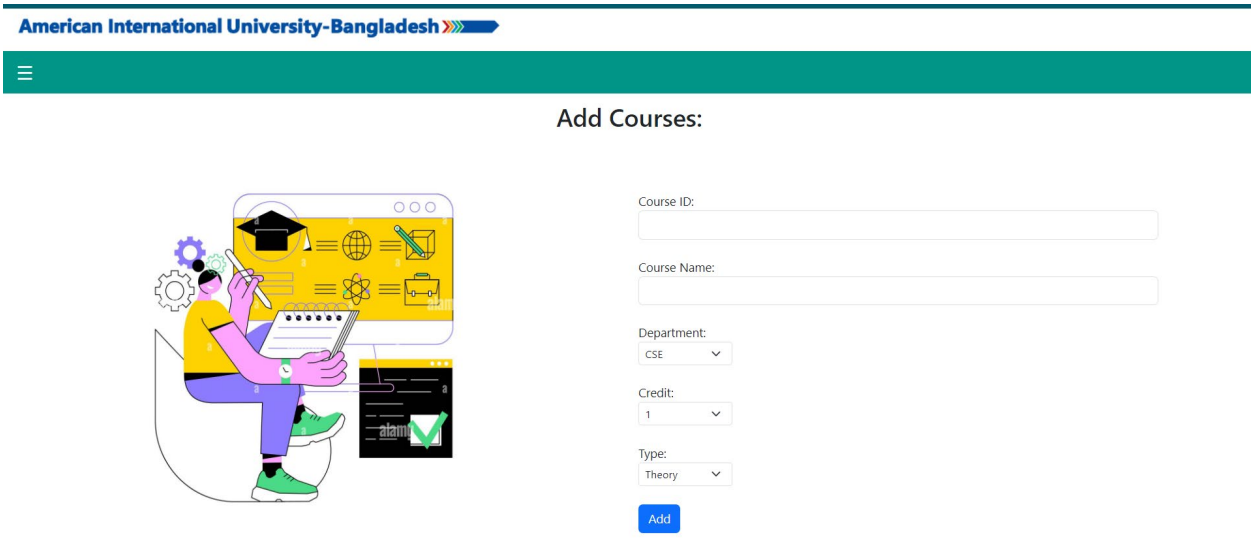


Fig 5: Add Course

This page for add section.

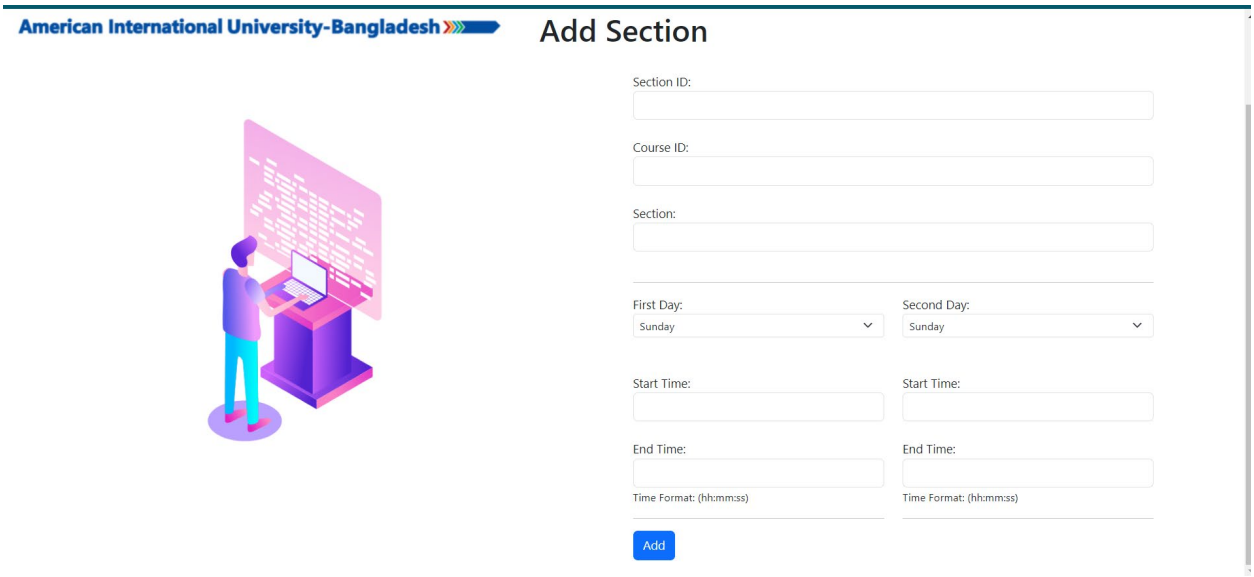


Fig 6: Add Section

This page for import section.

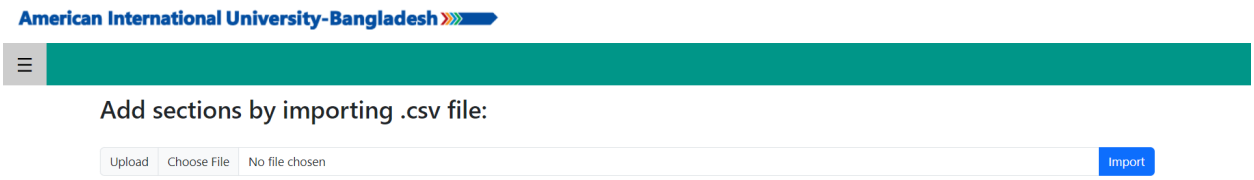


Fig 7: Import Section

This page for edit section

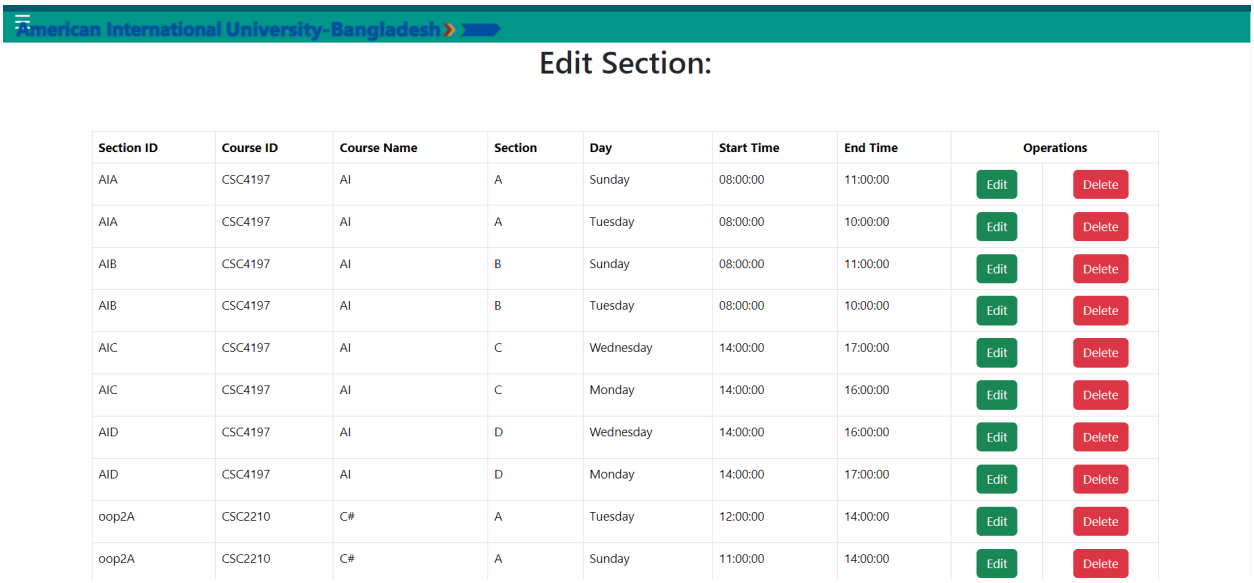


Fig 8: Edit Section

This page for add faculty

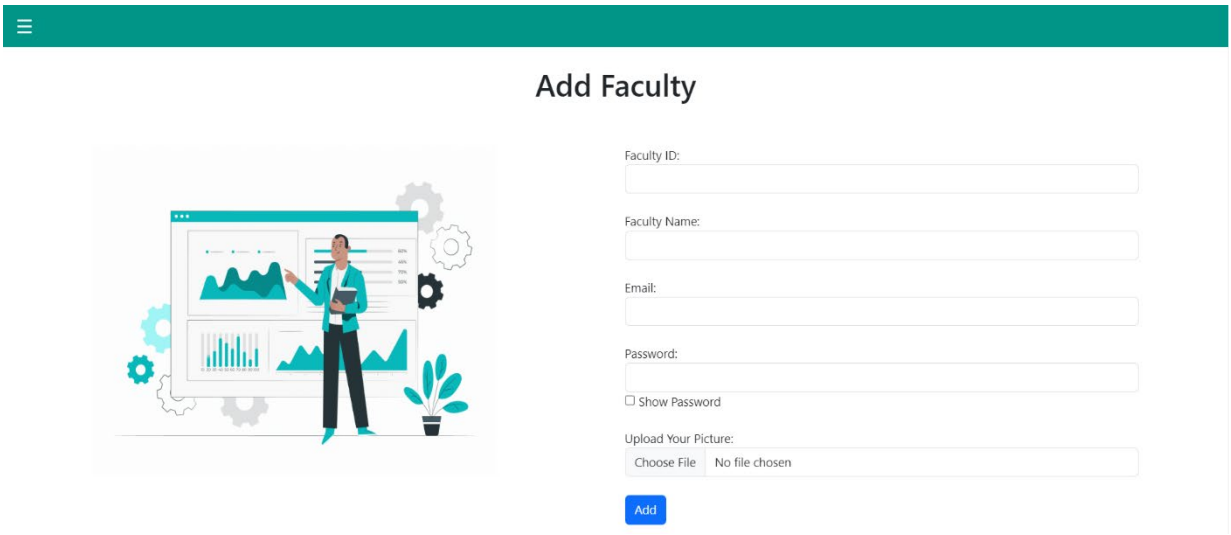


Fig 9: Add Faculty

This page for edit faculty information

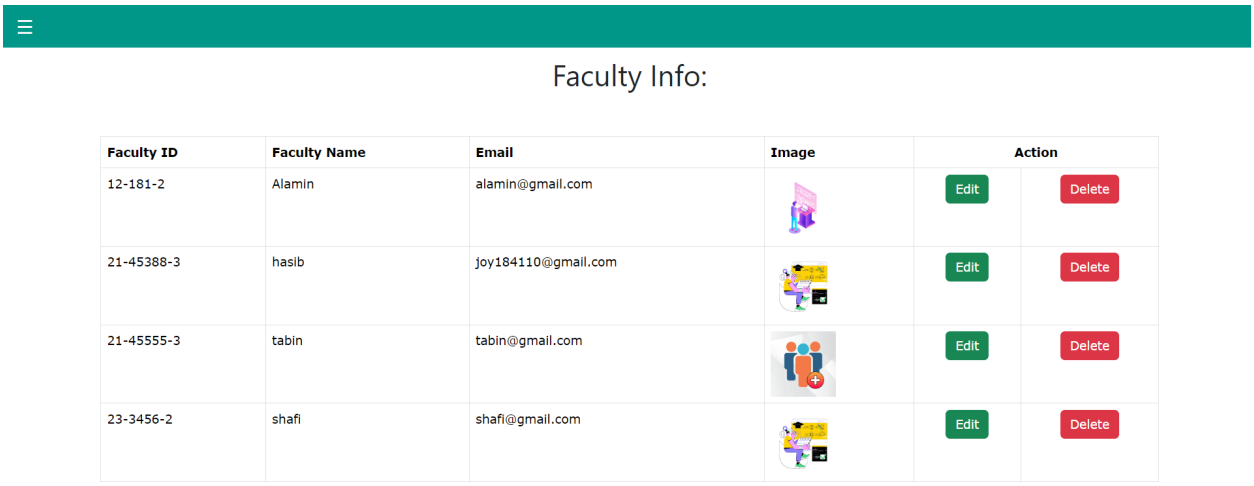


Fig 10: Edit Faculty

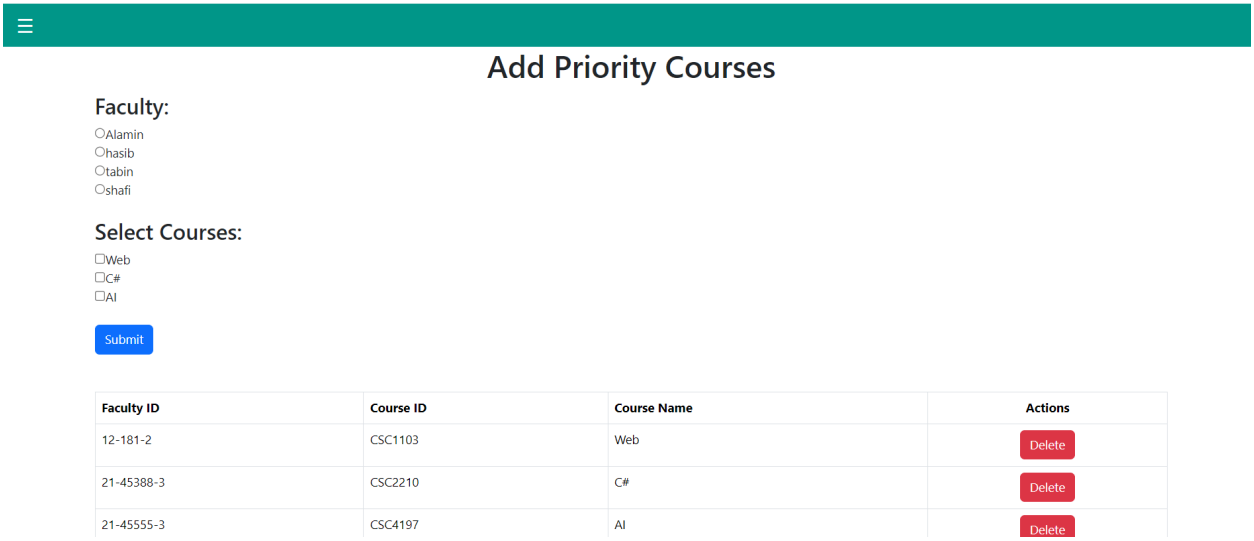


Fig 11: Course Priority

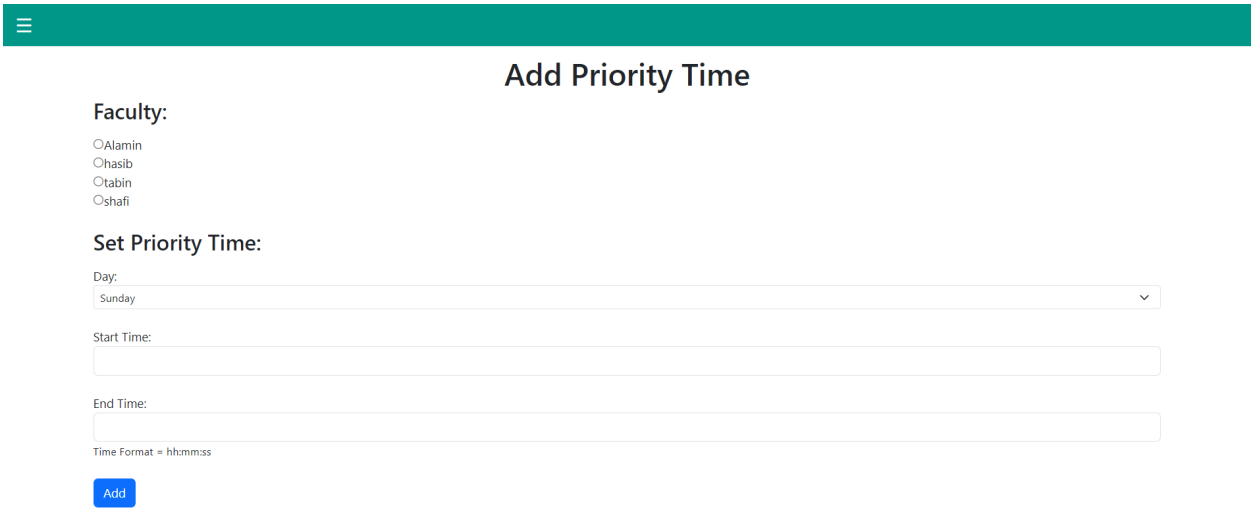


Fig 12: Priority time

4.4 Project Requirements

- Time: This web-based application may take about 1.5 months to complete
- Budget: 4,50,000 BDT
- Size: The final size of this web-based application will not be more than 500-600 MB.
- HTML, CSS, PHP, JavaScript, Bootstrap and Ajax will be used to build this web-based application.

5. FEATURES NOT TO BE TESTED

The project may boast several useful features, it is imperative to thoroughly test all functionalities to guarantee optimal performance and user satisfaction. Among these, load testing and performance testing stand out as indispensable components. Load testing is essential to assess how the system behaves under various levels of workload, ensuring it can handle the expected user traffic without crashing or slowing down. Similarly, performance testing evaluates the responsiveness, stability, and speed of the application under normal and peak conditions. By conducting comprehensive tests in these areas, we can identify potential bottlenecks, optimize resource utilization, and enhance the overall user experience. In essence, prioritizing the testing of load and performance features will fortify the reliability and scalability of the project, aligning it with our university's standards of excellence in technology and education.

6. TESTING APPROACH

There will be acceptance, system, integration, and unit test levels for this faculty course allocation. For system and integration testing, it is intended that at least one full-time independent tester will

be present. But given the timetable and financial restrictions, the test manager will conduct the majority of the testing with input from the development teams.

6.1 Testing Levels

Unit Testing:
The developer conducts unit testing, which is the initial stage of testing. When a small unit of the software is finished being coded, the developer tests the program to see if it is functioning as intended. The head of the development team will approve it. The test person receives a progress report for the unit testing so they can be informed of the software's present state.

Integration Testing
Unit testing is conducted first, and integration testing is carried out by a group of testers whose sole responsibility is testing. The smaller components will be put together as a whole. Additionally, the entire system will be examined to see if the new module seamlessly integrates with the current system after building a smaller component.

SYSTEM TESTING:
System testing ought to be carried out following integration testing to make sure that all of the software's modules function as a unit once it has been joined. The test is a black box. A test case is created based on the requirements and specifications in order to test the system holistically without having to understand the inner workings of any one module.

ACCEPTANCE TESTING:
Acceptance testing is the last phase of software testing. The real-time users of that specific software are the ones who carry it out. The program is made available in beta form to the public. After using the program, users give reviews based on their observations.
Problems are fixed as soon as they arise. Acceptance testing represents the overall quality of the program and confirms the work of the development and testing teams.

6.2 Test Tools

Selenium:

Selenium WebDriver is the only tool to be used for testing. An agile tester can create more complex test scenarios by using Selenium to automate repetitive test scripts for browser-based web applications.

6.3 Meetings

The test team will convene once a week to assess current progress and promptly detect error patterns and issues. Every two weeks, the project manager and development will also have a meeting with the leader of the test team. We'll set up these two meetings for different weeks. In the event of an emergency, more meetings may be called.

7. TEST CASES/TEST ITEMS

Test Case 1:

Project Name: Faculty Course Allocation			**Test Designed By: Arman**	
Test Case ID: FR1			Test Designed Date: 24-3-2024	
Test Priority: High			Test Executed By:T a k i	
Module name : Admin Login			Test Execution Date: 31-3-2024	
Test Title: Admin Login With valid Id and Password.				
Description: Check If Admin Login works perfectly with valid id and password.				
Precondition: Admin Must be registered into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Then Click Login 3. Put valid ID and Password 4. Click Login button	Id:21-45909-3 Password:123	Login must be successful	Login successful	Pass
Post Condition: Redirected to Admin home page				

Test Case 2:

Project Name: Faculty Course Allocation			**Test Designed By: Arman**	
Test Case ID: FR2			Test Designed Date: 24-3-2024	
Test Priority: High			Test Executed By:S a m i	
Module name : Faculty Login			Test Execution Date: 31-3-2024	
Test Title: Faculty Login With valid Id and Password.				
Description: Check If Faculty Login works perfectly with valid id and password.				
Precondition: Faculty Must be registered into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Then Click Login 3. Put valid ID and Password 4. Click Login button	Id:12-181-2 Password:123	Login must be successful	Login successful	Pass
Post Condition: Redirected to Faculty home page				

Test Case 3:

Project Name: Faculty Course Allocation			**Test Designed By: Arman**	
Test Case ID: FR3			Test Designed Date: 25-3-2024	
Test Priority: High			Test Executed By: N o w r i n	
Module name : Allocate Course			Test Execution Date: 31-3-2024	
Test Title: Automated Faculty Assign in the Course.				
Description: Check if the course is properly assigned to the faculty.				
Precondition: Admin Must be Logged into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Go to Admin Dashboard 3. Then Click 'Allocate Course' Button 4. Click 'Generate section' Button	N/A	Faculty Assign must be successful	Faculty Assign successful	Pass
Post Condition: Redirected to Generate Section page				

Test Case 4:

Project Name: Faculty Course Allocation			**Test Designed By: Sami**	
Test Case ID: FR4			Test Designed Date: 25-3-2024	
Test Priority: High			Test Executed By: A r m a n	
Module name : Add Faculty			Test Execution Date: 31-3-2024	
Test Title: Add Faculty into the system				
Description: Check If Add faculty works perfectly with valid information .				
Precondition: Admin Must be Logged into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Go to Admin Dashboard 3. Then Click 'Add faculty' Button 4. Then Click 'add' Button	Put valid Information and fill up all input level	Add Faculty must be successful	Add Faculty successful	Pass
Post Condition: Redirected to Add Faculty page				

Test Case 5:

Project Name: Faculty Course Allocation			**Test Designed By: Nowrin**	
Test Case ID: FR5			Test Designed Date: 25-3-2024	
Test Priority: High			Test Executed By: T a k i	
Module name : Add Priority Course			Test Execution Date: 31-3-2024	
Test Title: Add Priority Course of Faculty into the system				
Description: Check If Add priority course works perfectly .				
Precondition: Admin Must be Logged into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Go to Admin Dashboard 3. Then Click 'Add Priority' Button 4. Select faculty 5. Select Course 6. Then Click 'add' Button	N/A	Add priority course must be successful	Add priority Course successful	Pass
Post Condition: Redirected to Add Priority Course page				

Test Case 6:

Project Name: Faculty Course Allocation			**Test Designed By: Taki**	
Test Case ID: FR6			Test Designed Date: 26-3-2024	
Test Priority: High			Test Executed By: S a m i	
Module name : Set Priority Time			Test Execution Date: 01-04-2024	
Test Title: Set Priority Time of Faculty into the system				
Description: Check If Set priority course works perfectly .				
Precondition: Admin Must be Logged into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Go to Admin Dashboard 3. Then Click 'Set Priority Time' Button 4. Select faculty 5. Give Priority Time 6. Then Click 'add' Button	Day:Sunday Start Time : 08:00:00 End Time: 17:00:00	Set priority time must be successful	Set priority Time successful	Pass
Post Condition: Redirected to Add Priority Course page				

Test Case 7:

Project Name: Faculty Course Allocation			**Test Designed By: Taki**	
Test Case ID: FR7			Test Designed Date: 26-3-2024	
Test Priority: Medium			Test Executed By: N o w r i n	
Module name : Modification			Test Execution Date: 02-04-2024	
Test Title: Edit faculty Information				
Description: Check If Edit faculty Information works perfectly .				
Precondition: Admin Must be Logged into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Go to Admin Dashboard 3. Then Click 'Edit faculty Information' Button 4. Select faculty 5. Put data 6. Then Click 'submit' Button	Email:alamin@gmail.com	Edit Faculty Information must be successful	Edit Faculty Information successful	Pass
Post Condition: Redirected to faculty info page				

Test Case 8:

Project Name: Faculty Course Allocation			**Test Designed By: Sami**	
Test Case ID: FR8			Test Designed Date: 26-3-2024	
Test Priority: Medium			Test Executed By: A r m a n	
Module name : TSF			Test Execution Date: 02-04-2024	
Test Title: Check Faculty TSF				
Description: Check If faculty TSF works perfectly .				
Precondition: Admin Must be Logged into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Go to Admin Dashboard 3. Then Click ‘ Faculty TSF’ Button 4. Put data 5. Then Click ‘search’ Button	Faculty Name:Alamin	Show Faculty TSF must be successful	Show Faculty TSF successful	Pass
Post Condition: Redirected to Faculty TSF page				

Test Case 9:

Project Name: Faculty Course Allocation			**Test Designed By: Nowrin**	
Test Case ID: FR9			Test Designed Date: 27-3-2024	
Test Priority: High			Test Executed By: T a k i	
Module name : Import Section			Test Execution Date: 02-04-2024	
Test Title: Import Section by uploading csv file				
Description: Check If Import section works perfectly .				
Precondition: Admin Must be Logged into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Go to Admin Dashboard 3. Then Click ‘ Import Section’ Button 4. Upload data 5. Then Click ‘submit’ Button	Course.csv	Import section must be successful	Import section successful	Pass
Post Condition: Redirected to Import Section page				

Test Case 10:

Project Name: Faculty Course Allocation			**Test Designed By: Taki**	
Test Case ID: FR10			Test Designed Date: 28-3-2024	
Test Priority: Medium			Test Executed By: S a m i	
Module name : Logout			Test Execution Date: 02-04-2024	
Test Title: Faculty or Admin logout Test				
Description: Check If Faculty or admin can logout or not..				
Precondition: Faculty or Admin Must be Logged into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Then Click 'Logout' Button	N/A	Logout must be successful	Logout successful	Pass
Post Condition: Redirected to Home page				

Test Case 11:

Project Name: Faculty Course Allocation			**Test Designed By: Sami**	
Test Case ID: FR11			Test Designed Date: 24-3-2024	
Test Priority: High			Test Executed By:T a k i	
Module name : Admin Login			Test Execution Date: 29-03-2024	
Test Title: Admin Login With invalid Id and Password.				
Description: Testing the admin login functionality with invalid credentials verifies that the system accurately detects and handles login attempts with incorrect ID and password				
Precondition: Admin Must be registered into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Then Click Login 3. Put invalid ID and Password 4. Click Login button	Id:21-45909-3 Password:123456789	Login must not be successful	Login not successful	Pass
Post Condition: Redirected to Admin home page				

Test Case 12:

Project Name: Faculty Course Allocation			**Test Designed By: Nowrin**	
Test Case ID: FR12			Test Designed Date: 24-3-2024	
Test Priority: High			Test Executed By:A r m a n	
Module name : Faculty Login			Test Execution Date: 29-3-2024	
Test Title: Faculty Login With invalid Id and Password.				
Description: Testing the admin login functionality with invalid credentials verifies that the system accurately detects and handles login attempts with incorrect ID and password				
Precondition: Faculty Must be registered into the system				
Test Steps	Test Data	Expected Results	Actual Results	Status
1. Go to the website 2. Then Click Login 3. Put valid ID and Password 4. Click Login button	Id:12-181-2 Password:123	Login must be successful	Login successful	Pass
Post Condition: Redirected to Faculty home page				

8. ITEM PASS/FAIL CRITERIA

The main objective of this section is to describe the PASS/FAIL criteria for the tests that are a part of this project. Any system or unit receiving a score of less than 90% will be subject to the failure criteria, and any component, unit, system, or integrated test item receiving a score of 90% to 95% will be considered to meet the pass criterion

9. TEST DELIVERABLES

Documents known as test deliverables are distributed to the stakeholders during the software development process. It includes a list of records, instruments, and other supplies that need to be made, made available, and kept up to date in order to facilitate testing activities inside a project.

- Results and conclusions from unit testing shall be appropriately documented. A continuous progress report is necessary to stay on course.
- Acceptance test participants are carefully chosen because the wrong people can produce inaccurate input and findings. It resembles an agreement for software delivery and release from the development team.
- New modules are included into the system during the integration testing phase. It was also necessary to preserve these records for future verification.
- A detailed report with the test findings will be provided whenever each testing phase is finished.

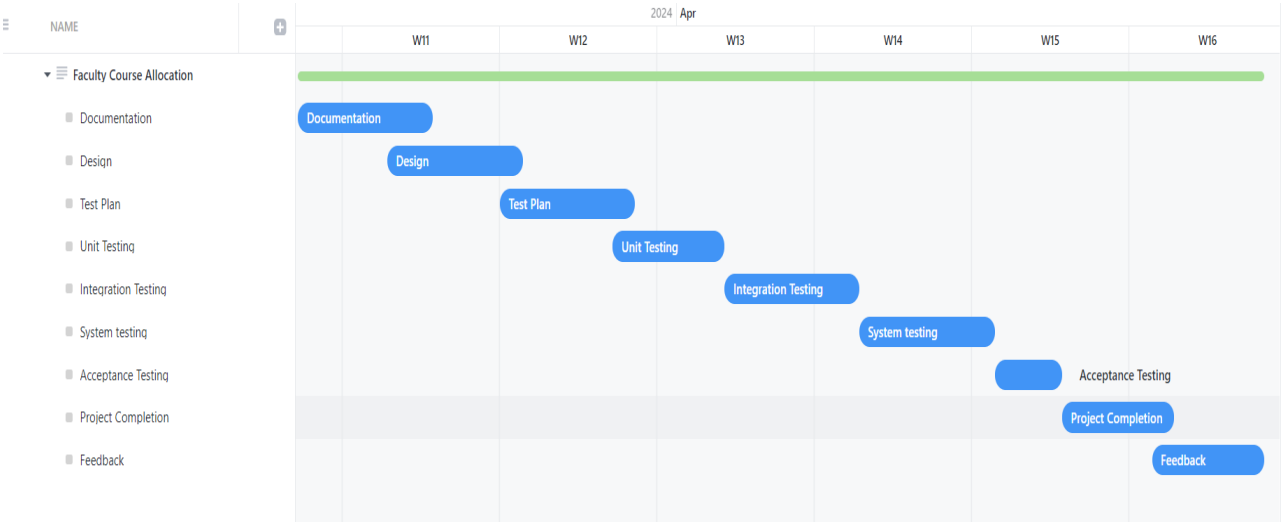
10. STAFFING AND TRAINING NEEDS

The purpose of this staffing approach is to increase the probability that the project will be assigned to enough qualified individuals to guarantee its effective completion. Employees must have the right staffing and training to foster creativity and boost productivity for the creation of products. Throughout the project's acceptance and system/integration testing stages, we require at least one full-time tester. For the first four months, a devoted tester will work on the project full-time. The test manager fills in when there isn't enough time for a specialized tester. Basic training on our project's user interface will be required for developers and testers. Before the project is approved, operations personnel must also complete extensive training in this project communication protocol. We must bring all the tools required to help the testing team because we will be using Selenium, and if necessary, training must also be given.

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	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



13. PLANNING RISKS AND CONTINGENCIES

A project's ability to manage risk and handle emergencies well is critical to its success. It is used in a project to control the exception risk. The created product cannot accomplish its own objective if it is not in line with the service areas, ethics, and etiquette. In order to help the organization, deal with unforeseen circumstances, there are also some norms and regulations. This kind of system must exist, and it must be properly maintained.

14. APROVALS

Project Sponsor	
Development Management	
EDI Project Manager	
RS Test Manager	
RS Development Team Manager	
Reassigned Sales	
Order Entity EDI Team Manager	