A TEST PLAN FOR STUDENTS REGISTRATION SYSTEM FOR A UNIVERSITY

The objective of this project is to develop a test plan based on the requirements and functionalities of the system.

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American International University- Bangladesh (AIUB)
Department of Computer Science
Software Quality and Testing
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1. Test Plan Identifier:

Student Registration System Portal for AIUB -V1.001.

Author: *Akther Hamid Saymon [16-32203-2], Fariha Rowshan Huda [16-31209-1], Ahmed Shahriar Sakib [16-32170-2] A.B.M. Nashrif [16-31259-1].*

2. References:

- Student Registration System Documents
- Requirements Specifications
- Design Details
- Methodology Guidelines

3. Introduction:

3.1. Test Plan Overview:

For American International University Bangladesh, a solid online course registration scheme will be introduced. We will create a test plan for it based on the demands and functionalities and design a scheme that can meet all the demands. The project will have three testing stages, Unit, System / Integration and Acceptance. The details for each stage are dealt with in

3.2. Test Plan Purpose:

The objective of Student Registration System Portal is to permit the students to do the registration for the courses and the system will track the information about every course such as (course title, schedule, course teachers name, capacity etc.). Every course can have many sections any particular year also indifferent semester. Students must have to complete the pre-requisite otherwise he/she will not able to register for the course.
Moreover, every section belongs to a specific course. Every section of the courses is defined for maximum number of slots for the registered students as well as have a classroom and time span assigned to it.

System will keep all the records of the students:

1. First Name
2. Last Name
3. Student ID
4. Gender
5. Address
6. Department
7. Phone number
8. Email

System also store the information of the faculties such as their

1. First Name
2. Last Name
3. Faculty ID
4. Gender
5. Address
6. Department
7. Phone number
8. Email
9. Research Interests
10. Degrees obtained and the corresponding University details

So, the main purpose is to store all the information of faculties and students and help the students to register online.

3.3. Scope:

The scope of the project is:

Registered module: This will help the students to register from anywhere through internet.
Login module: Students who have the valid id and password only they can log in to the system.

4. Test Items

1. Login Module, Version 1.001
2. Students Information Module, Version 1.001
3. Registration Module, Version 1.001
4. Course Management Module, Version 1.001

5. Software Risk Issues:

1. **Critical Areas:**
   1. Interruption of a third-party Software.
   2. Errors while registration time.
   3. Multiple Users.
   4. Session timeout.

2. **Complexities:**
   1. Safety.
   2. Multiple interfaces.
   3. Impacts on Students.
   4. University regulations and rules.

6. Features to be tested

The following is a list of the areas to be focused on during testing of application.

a. 24/7 service.(L)
b. Login to the portal (Both administrator and student).(L)
c. Editing profile information by students.(L)
d. Displaying the previous semester courses, results and Faculty to a student.(M)
e. Semester registration done by students (Maintaining all the security features for registration).(M)
f. Semester registration done by advisor for complicated cases.(H)
g. Course and section management done by administrator.(M)
h. Changing password for all type of users.(L)
i. Displaying the schedule for any student.(L)
j. Displaying all the details for a section.(L)
k. Allowing the users to identify the number of students in each section of a course.(L)
l. Implementation of some security features.(H)

Feature a, b, c, h, i, j and k are at Low Risk because they are less critical areas which are more understandable to a user. But as of for feature d(Medium Risk), there can be poorly documented modules or change requests There might be some inherent software risks such as complexity. Feature e and g are at Medium Risk as they might have multiple interfaces and security issues.

Feature f is at High Risk because it is a feature which is being changed for complicated purposes which the software might have lacking at. Lastly, feature l is also at High Risk because of safety and security issues. (H=HIGH RISK, M=MEDIUM RISK, L=LOW RISK).

7 FEATURES NOT TO BE TESTED

i. Network Issues

Network related issues will not be tested in this case.

ii. Power Related Issues

Issues that usually occur from sudden power failure will not be tested.

iii. Database management

Database related issues will not be tested.

8 APPROACH (STRATEGY)

8.1 Testing Levels

The testing for a robust web-based system for online course registration will consist of Unit, System/Integration (combined) and Acceptance test levels. It is hoped that there will be at least one full time independent test person for system/integration testing. However, with the budget constraints and time line established number of testers involved in different kinds of testing may vary.

Unit Testing will be done by the developer and will be approved by the development team leader. Proof of unit testing (test case list, sample output, data printouts, and defect information) must be provided by the programmer to the team leader before unit testing will be accepted and passed on to the test person. All unit test information will also be provided to the test person.

Since it's a web-based system, load testing is very important for this system. Load Testing is type of performance testing to check system with constantly increasing the load on the system until the time load is reaches to its threshold value. Here Increasing load means increasing number of concurrent users, transactions & check the behavior of application under test. It is normally carried out underneath controlled environment in order to distinguish between two different systems. It is a type of performance testing.

System/Integration Testing will be performed by the test manager and development team leader with assistance from the individual developers as required. No specific test tools are available for this project. The system will enter into System/Integration test after all critical defects have been corrected.

Acceptance Testing will be performed by the actual end users with the assistance of the test manager and development team leader. The acceptance test will be done for a period of 15 days after completion of the System/Integration test process.

The system will enter into Acceptance test after all critical and major defects have been
corrected. Prior to final completion of acceptance testing all open critical and major defects must be corrected and verified by the student test representative.

8.2 Test Tools

- Microsoft Excel will be used to write test cases.
- JIRA Testing & QA Tool will be used to manage test cases and reporting.

8.3 Meetings

The test team will meet once every one 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 one week as well. Additional meetings can be called as required for emergency situations.

8.4 Measures and Metrics

The following information will be collected by the Development team and will be provided to the test team on a continuous basis during the all testing process.

- Defects by modules and severity.
- Origin of the defects.
- Time needed to investigate and solving the defects.
- Number of times the system is submitted to the testing team to test.
- Unusual defects found in different levels of testing.

9 ITEM PASS/FAIL CRITERIA

The test process will be completed once it is ensured all the features are correctly implemented, working perfectly and providing accurate results, accepted by the users and they are satisfied with the performance.

10 SUSPENSION CRITERIA AND RESUMPTION REQUIREMENTS

10.1 Suspension Criteria

- Unavailability of different resources needed for testing.
- If there is a defect found that cannot allow any further testing.
- Problem regarding the contract.
- Specifications and requirements achieved.
- Software reliability achieved.

10.2 Resumption Requirement

- When the resources become available again.
- Defect is fixed.
- Contract renegotiation.

11 TEST DELIVERABLES

- Test cases
- Test plans for different kind of testing
- Problem reports and corrective actions
- Error logs and execution logs.
- Detailed test plan document
- Test design specifications.
- Simulators
- Tools and their outputs
- Problem reports and corrective actions
- Statistical documents

12 REMAINING TEST TASKS

- Third party and off-The-Shelf components.
- Infrastructure components.
- GUI responsiveness.
- Define Unit Test rules and Procedures
- Define Turnover procedures for each level
- Verify prototypes of Screens
- Verify prototypes of Reports
- Create regression testing plan upon change of requirements

13 ENVIRONMENTAL NEEDS

Phases:

1. Offline Environment
2. Online Environment

One separate, controlled system will be required for the initial phase of testing, setup as per one standard, complete office environment. In order to maintain the integrity of the test environment his network will not be accessible to anybody outside this project.

If the testing process in offline environment results in success then the system will be ready for online testing process.

Testing tools:

- Automated testing tools: JIRA, Selenium, Appium.
- Test management tools:TET,TETware
- Bug tracking tools: BugZilla, Trac, Redmine.
- Requirement tracking tools: Microsoft word and Microsoft Excel
- Load testing tools: Apache JMeter, The Grinder

Testing environment:

Hardware components required:

- 5 Networked PC's
- 1 DAP Workstation

- 1 oracle server
- 1 cisco 900 series router
- 5 mobile phones

Software required:

- Operating system:
  - For PC : Windows 8 or above(both x64 and x86) , Linux (Ubuntu ,Kali ,)
  - Android (Lollipop and higher) , iOS (7 and above)
- Internet Browser: chrome ,safari ,Mozilla Firefox ,opera , Edge ,
- Emulator : iPad Peek , Responsivepx , Genymotion , MobiOne Studios
- Api testing tools : Postman

14 STAFFING AND TRAINING NEEDS

It is preferred that there will be at least one (1) full time tester assigned to the project for the system/integration and acceptance testing phases of the project. This will require assignment of a person part time at the beginning of the project to participate in reviews etc... and approximately four months into the project they would be assigned full time. If a separate test person is not available the project manager/test manager will assume this role. In order to provide complete and proper testing the following areas need to be addressed in terms of training:

- The developers and tester(s) will need to be trained on the basic operations of the JIRA interface.
- The administration staff will require training on the new screens and reports.
- At least one developer and operations staff member needs to be trained on the installation and control of the project package. The distributors personnel will also have to be trained on the operational characteristics.

15 RESPONSIBILITIES

	PM	TM	Development Team	Testing Team (Students)	Client (AIUB CIO)
Testing criteria and directives.		✓	✓		
Test scheduling		✓			
Assigning test cases/modules		✓			
Supervising testing process	✓	✓			
Selection of system features to be tested first	✓	✓			✓
Testing training		✓			
Defect fixing		✓	✓		
Gathering testing resources(staff/tools)	✓	✓			
Test planning	✓	✓	✓		
Regression testing			✓	✓	✓
System testing				✓	✓
Unit testing			✓		
Integration testing			✓	✓	
Functional testing				✓	✓
Validation of product				✓	✓

Requirements gathering	✓				
Project planning	✓				
System detail design	✓	✓	✓	✓	✓

16 SCHEDULE

The project must be completed within the deadline. Thus, the last two months are considered and reserved for testing purposes. Moreover, along with development, developers are said to check functionalities- sort of validation of modules. The Project manager (PM) is the major planner who thereby handles task collaborations, team managements, makes decision and lastly monitors testing necessities.

The project therefore tends to maintain deadline specified for each module or partitioned jobs in order to avoid time slippage or wastage of time.

Following are the testing activities that are grouped together and is supposed to take place during the project testing phases: -

i)Requirements specification is clearly understood by the testing team in order to visualize the project's objectives. A minor testing team (not the students) can be hired for knowledge based testing to ensure quality.

ii)Testing team manager develops a testing plan and approximate time is allocated that includes a minimum of two sets of reviews.

iii)Development of the mentioned test plans and testing criterions such as System testing/Integration testing or Acceptance testing by the individuals who are held responsible for (the above section deals with the responsibilities).

iv)Review of the System Detail and Design Detail view that includes the client's perceptions.

v)Developers in the meantime continues with the unit testing to make sure functionalities actually provides desired outcomes.

vi)Once all the test cases are performed, defects are figured out and resolved successfully. The process is repeated to look for further defects as theirs is no end of testing/ nothing said as complete testing.

17 PLANNING RISKS AND CONTINGENCIES

i)Uncertain political issues- The state might be in troublesome situation due to political conflicts that hampers daily life. As a result, developers or testing team members may be unable to work or attend properly which affects the project.

-Hire an apartment to get jobs done throughout the unstable situation to get work going.

-Use clients as testers to ensure their satisfaction.

ii)Non-favourable weather conditions- This is another uncertainty that might slow down the testing process and as a result the project is delayed or certain features remain untested.

-Hire an apartment to get jobs done throughout the unstable situation to get work going.

iii)Change in requirements of clients- Clients sometimes tend to change requirements out of nowhere. This is a huge problem and results in increase of development jobs as well as testing jobs.

- Extend the project deadline.

iv)Budget issues- Due to lack of resources or time, resources were hired that increases cost. The planning did not work as it was supposed to do. Third party involvement increases cost as a result overall budget increase.

-Manage client about increase in payment. In case of system testing, use clients and get the works done.

v)Inappropriate requirements understanding of the testing team lead- As a result the objection is totally blur.

-Manage two or three testing team members while discussing about the requirements specifications. Sometimes testing team also cannot be able to understand as they are students so

development team might cooperate.

vi)Staff Shortage-Incomplete works that results in delay of submission.

-Use clients for testing wherever it is possible to ensure their satisfaction is met or not.

-Hire resources (students) based on the project's progress.

vii)Lack of testing tools- Advanced testing tools makes testing easier, less time consumption.

-Talk with PM to arrange testing tools to make testing more efficient. Also, students cannot be able to use testing tools effectively so they need to be trained or a minor testing team is required for such purpose.

18 APPROVALS

The project has to be approved by the listed individuals in order to ensure success.

The AIUB CIO is the main client over here and the other users are categorized for approval. Following are the list of individuals: -

- Project Manager
- Faculty members as client
- Students as testing team
- Administrative officials as client
- Testing team(if required with development team)
- Development team
- University authority as accounts

19 GLOSSARY

Item Name	Description
SOFTWARE TESTING:	Software testing is a process, to evaluate the functionality of a software application with an intent to find whether the developed software met the specified requirements or not and to identify the defects to ensure that the product is defect free in order to produce the quality product.
UNIT TESTING:	UNIT TESTING is a level of software testing where individual units/ components of a software are tested. The purpose is to validate that each unit of the software performs as designed. A unit is the smallest testable part of any software. It usually has one or a few inputs and usually a single output
INTEGRATION TESTING:	INTEGRATION TESTING is a level of software testing where individual units are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units. Test drivers and teststubs are used to assist in Integration Testing
SYSTEM TESTING:	SYSTEM TESTING is a level of software testing where a complete and integrated software is tested. The purpose of this test is to evaluate the system's compliance with the specified requirements.
ACCEPTANCE TESTING:	ACCEPTANCE TESTING is a level of software testingwhere a system is tested for acceptability. The purpose of this test is to evaluate the system's compliance with the business requirements and assess whether it is acceptable for delivery.
DEFECT:	A programmer while designing and building the software can make mistakes or error. These mistakes or errors mean that there are flaws in the software. These are called defects. When actual result deviates from the expected result while testing a software application or product then it results into a defect.
TET	Test Environment Toolkit (Test management tools)
Off the shelf components	An adjective that describes software or hardware products that are

	ready-made and available for sale to the general public. For example, Microsoft Office is a COTS product that is a packaged software solution for businesses.
REGRESSION TESTING	Structured retesting of a software component or application to verify that any modifications made have not caused unintended effects and that the software still complies with its specified requirements.
TEST PLAN	A document that defines the preparations, test items, test data, and test cases for the series of tests to be performed on an application.
TEST ITEM	A software component that is the object of a test case.
TESTING STAGE	Also often referred to as the test and acceptance stage. A stage in the software development lifecycle where the components of a software product are executed under specified conditions, the results are observed and recorded, and an evaluation is made to determine whether or not the requirements have been met.
VALIDATION	1. The process of determining whether a value in a table's data cell its within the allowable range or is a member of a set of acceptable values. 2. The process of evaluating software to ensure compliance with established requirements and design criteria.
VERIFICATION	The process of evaluating an application to determine whether or not the work products of a stage of a software development lifecycle fulfill the requirements established during the previous stage.
SOFTWARE METRICS	Objective assessments (in the form of quantified measurements) of a software application or component.