American International University- Bangladesh

Project

Topic: Developing a Test Plan for Automated Ticket Issuing System for Dhaka Subway Systems

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Course Name: **SOFTWARE QUALITY AND TESTING**

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Test Plan Identifier

AIUB IT Solutions Inc. release 0.0.0.1 Software Test Plan.
Note, the structure of this document is primarily based on the IEEE 829-1998 Standard for Software Test Documentation. Additional reference standards include IEEE 1008 (Unit Testing), 1012 & 1059(Validation & Verification) and 1074 (Software Life Cycle process).

References

TEST PLAN OUTLINE (IEEE 829 FORMAT)

http://ece.uprm.edu/~icom5047/documents/OtherDocuments/TestPlan.pdf

The Functional Requirements for the following Project

- The software will support interface to touch screen monitors as well as keyboard interface.
- The software will support display of the list of incoming trains, their destinations and arrival and departure times, fare.
- The software will support multiple ticket purchase simultaneously.
- The software will support limiting the number of tickets purchased at the same time. This privilege control will be done by the administrator access only.
- The software will support ticket cancellation before final confirmation of the purchase.
- The software will support purchased ticket cancellation support by the administrator.
- The software will support credit transaction and validation.
- The software will support next and previous navigation during ticket purchase process.
- The software will support ticket availability information.
- The software will support information display via web.
- The software will use Oracle database server. Dhaka City Corporation will be responsible for the license fees of Oracle database server.

Introduction

This document is an overview defining our testing strategy for Automated Ticket Issuing System for Dhaka Subway Systems. This project's goal is provide automated ticket selling for public uses. This document will address the different standards that will apply to the unit, integration and system testing of the specified application. We will utilize testing criteria under the white box, black box, and system-testing paradigm. This paradigm will include, but is not limited to, the testing criteria, methods, and test cases of the overall design. Throughout the testing process we will be applying the test documentation specifications described in the IEEE Standard 829 for Software Test Documentation. Specifically, testing will now consist of the following phases (listed chronologically):

- **Unit and integration level** – adherence to coding standards and successful communication between units
- **Code Quality Assurance** - acceptance into system level testing by successfully repeating a small subset of the tests performed in the code and integration level
- **System level** – compatibility, performance, usability, functionality etc.
- **System Quality Assurance & Acceptance**
- **Post Implementation**

Test Items

The major items & functionalities of the system are given bellow:

- 24/7 service.
- Ticket availability information display.
- Train arrival and departure time display.
- Touch screen menu selection.
- Source and destination Selection.
- Multiple ticket issue in one transaction.
- Limit the number of ticket issue at the same time
- Cancellation of transactions any time during transaction.
- Credit/Debit card transaction.
- Coin/Taka recognition and acceptance.

Software risk issues

- Ticket availability information display function to be tested.
- Touch screen menu selection should be test because if it is not working properly then the whole process will be ruined.
- The Transaction Function should be tested it is more than important.
- Check of all Third party Delivery products.

- Checking the Most Complex Function.
- New version of product should be highly risked to match with older one.
- Poorly documented modules or change requests.

There are some inherent software risks such as complexity; these need to be identified.

- Whole Transaction Safety issue
- Real time Access of Client is big risk issue
- Government regulations and rules
- Another key area of risk is a misunderstanding of the original requirements.

These types of risk are frequently met with software process.

Features to be tested

This feature will must be tested that are follows:

- Touch Screen monitors and keyboard interface.
- Touch screen menu selection.
- Displayed trains arrival and departure time information, fare.
- Multiple ticket purchase support simultaneously.
- Limiting the number of tickets purchased at the same time by privilege control and the administrator access only.
- Ticket cancellation support before final confirmation of the purchase.
- Purchased ticket cancellation support by the administrator
- Ticket availability information.
- Credit/Debit card transaction.
- Coin/Taka recognition and acceptance.
- Displayed information via Website.
- Oracle database server support.

Features not to be tested

The features are not to be tested given bellow:

- 24/7 service.
- Ticket availability information display.
- Train arrival and departure time display.
- Touch screen menu selection.
- Source and destination Selection.
- Credit/Debit card acceptance.
- Coin/Taka recognition and acceptance.

Approach

The following represents the overall flow of the testing process approach:

- Identify the requirements to be tested. All test cases shall be derived using the current Program Specification.
- Identify which particular test(s) will be used to test each module
- Review the test data and test cases to ensure that the unit has been thoroughly verified and that the test data and test cases are adequate to verify proper operation of the unit.
- Identify the expected results for each test.
- Document the test case configuration, test data, and expected results.
- Perform the tests.
- Document the test data, test cases, and test configuration used during the testing process. This information shall be submitted via the Unit/System Test Report (STR).
- Successful unit testing is required before the unit is eligible for component integration/system testing.
- Unsuccessful testing requires a Bug Report Form to be generated. This document shall describe the test case, the problem encountered, its possible cause, and the sequence of events that led to the problem. It shall be used as a basis for later technical analysis.
- Test documents and reports shall be submitted. Any specifications to be reviewed, revised, or updated shall be handled immediately.

Item Pass/Fail criteria

This section specifies generic pass/fail criteria for the tests covered in this plan. They are supplemented by pass/fail criteria in the test design specification. Note that “fail” in the IEEE standard terminology means “successful test” in our terminology.

Component Pass/Fail criteria

Tests executed on components only pass when they satisfy the signatures, constraints, and interfaces dictated by the Object Design Specification for that component. This includes positive tests, negative and stress tests, and boundary tests.
If a test exhibits a product failure to meet the objectives of the object design specification, it will fail and a defect/issue will be reported in the defect tracking system for review by the triage team.

Integration Pass/Fail criteria

Tests executed on integrated components only pass when they satisfy the signatures, constraints, and interfaces dictated by both the object design specification and the system architecture

specification. This includes positive tests, negative and stress tests, boundary conditions, and tests that explicitly manipulate the interface environment (such as the physical connection to the database server).
If a test exhibits a product failure to meet the objectives of both the object design specification and the system architecture specification, it will fail and a defect/issue will be reported in the defect tracking system for review by the triage team.

➢ System Pass/Fail criteria

Tests executed against the system use the functional requirements, non-functional requirements, and use cases as the oracle to determine pass or fail.
If a test exhibits a product failure to meet the objectives of any of the functional requirements, non-functional requirements, or the use cases, it will fail and a defect/issue will be reported in the defect tracking system for review by the triage team.

Suspension Criteria and Resumption Requirements

This section specifies the criteria for suspending the testing on the test items associated with the plan. It also specifies the test activities that must be repeated when testing is resumed.

Automated Unit Test Suite

As components are being developed, unit tests will be developed to test the interfaces of the components and low-level unit tests will be developed to test the methods of the underlying classes in the components.
As a prerequisite to the BAT, the automated unit test suite will be run by the build server on a per-build basis.
When the unit-test suite reports failures, testing will not occur on that build until the failures have been analyzed and resolved. Testing will resume on a build that passes the automated unit test suite.

Build Acceptance Test (BAT)

When a build is deemed ready to test by development, a build acceptance test will be run on the build. The BAT will consist of a broad but shallow set of tests to determine the overall stability of the build and decide if it is worth testing.
If the BAT fails on a particular build, testing will suspend until another build is created with any BAT failure issues fixed, verified by running the BAT again. Testing will resume on a build that passes the BAT.
Different build acceptance tests will be developed and used for the different test phases. Component BATs will be small and localized for each of the components. Integration BATs will vary based on the level of integration testing being performed. The System Test BAT will contain a set of tests that will utilize each of the components of the system.

Regression Testing

On a build by build basis, major bug fixes or code changes will be reviewed to determine the effects they may have on the system. If the changes are deemed to cause a sufficient amount of risk, regression test sets of the appropriately judged size will be created and executed.
A system-wide regression will also be run on the release candidate build to ensure incremental changes to the system have not altered the results of the tests that were run early in the test cycle.

System Design Changes

If at any point in time issues are submitted that require a design change to the system, all testing will be suspended. After the changes to the requirements, system architecture, and object design are made, a review and updates will be performed of the test specifications to ensure they properly align with the revised system changes. After updates are made, testing will resume. Tests in the vicinity of the change must all be rerun. A 20% regression of other tests must also be performed to ensure the changes did not adversely affect other parts of the system.

Remaining test tasks

- 3rd party and off-The-Shelf components.
- Infrastructure components.
- Website and GPS device of software interaction.
- GUI response and directly database testing.
- Create Acceptance Test Plan
- Create System/Integration Test Plan
- Define Unit Test rules and Procedures
- Define Turnover procedures for each level
- Verify prototypes of Screens
- Verify prototypes of Reports

Environmental needs

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. The printers are also exclusively for use by the test network.

Hardware components required

- 1 Network Controller
- 6 Networked PC's *(See below)*
- 1 DAP Workstation
- 1 Motorola 6520
- 1 Oracle Server
- 1 Batch Waste Printer
- 1 HP LaserJet 4v Printer

PC Specifications

The 6 PC's required for the test environment will include the following:
1 x P100, 1 GB HD, and 16Mb RAM [Current Minimum Specification]
3 x P166, 1.5 GB HD, and 32 Mb RAM [Current Standard Specification]
1 x P333, 2.5 GB HD, and 64 Mb RAM [Current Maximum Specification]
These specifications are the various specifications currently in use in different branches. 1 x Pentium running Windows NT is also required as the Test center for controlling and executing the automated testing

Software

Test IMS environments

Test IMS region X will be required for System Testing. Additional or amended data will be populated where required.

Test Environment Software

System Test will be run on the following Software Versions:-
Custom Desktop Vers.97.0.1
Windows 7 Operating System
Visual Basic 5 Runtime Files
MS Office 2010
Novell Netware

Staffing and Training needs

This section outlines how to approach staffing and training the test roles for the project. Staffing is fixed for the duration of this project. It is likely most of the staff will assume some testing role that will be discussed in details in responsibilities section bellow.

Responsibilities

Project Leader – Zayed Bin Maleque

- Ensure Phase 1 is delivered to schedule, budget & quality
- Ensure Exit Criteria are achieved prior to System Test Signoff
- Regularly review Testing progress with Test Controller.
- Liaise with external Groups e.g. New Systems
- Raise and manage issues/risks relating to project or outside Test Teams control.
- Review & sign off Test approach, plans and schedule.

SQA Project Leader – Tazmira Akter

- Ensure Phase 1 is delivered to schedule, budget & quality
- Regularly review Testing progress
- Manage issues/risks relating to System Test Team
- Provide resources necessary for completing system test.

Test Planner / Controller – Mahbubur Rahman

- Ensure Phase 1 is delivered to schedule, budget & quality
- Produce High Level and Detailed Test Conditions
- Produce Expected Results
- Report progress at regular status reporting meetings
- Co-ordinate review & signoff of Test Conditions
- Manage individual test cycles & resolve tester queries/problems.
- Ensure test systems outages/problems are reported immediately and followed up.
- Ensure Entrance criteria are achieved prior to System Test start.
- Ensure Exit criteria are achieved prior to System Test signoff.

Testers

- Identify Test Data
- Execute Test Conditions and Mark off results
- Support IMS Regions
- Resolve Spooling Issues (if necessary)
- Bookkeeping Integration & Compliance (if necessary)
- Resolve queries arising from remote backup

Bookkeeping Support

- Provide Bookkeeping Technical support, if required.
- Resolve queries, if required.

Technical Support

- Provide support for hardware environment
- Provide support for Test software
- Promote Software to system test environment

Schedule

The section contains the overall project schedule. It discusses the phases and key milestones as they relate to quality assurance. It discusses the testing goals and standards that we'd like to achieve for each phase of testing that will be deployed, e.g., Usability Testing, Code Complete Acceptance, Beta Testing, Integration Testing, Regression Testing, and System Testing.
The key dates for overall Automation ticketing application development and Testing are outlined below. For details on the schedule, refer to the Automation ticketing application Project Schedule (this document). For details on general Engineering QA deliverables, refer to the test plan document.

Milestones	End Date	Notes	QA Deliverables/Roles
Planning Phase	01/20/2016	At this Milestone, the high level planning should be completed. Some of the deliverables are: Project Plan, Program function specifications.	High-level test planning activities, which include preliminary development of Master QA Plan (This document, QA schedule).
Code Complete - Infrastructure	02/04/2016	This milestone is when all infrastructure development and functions should be complete. The testing team should have performed unit & integration testing before checking the code into any build.	The Test Engineers should have completed or in the final stages of their preliminary Infrastructure Test Plan, test cases and other QA documents related to test execution for each feature or component such as test scenarios, expected results, data sets, test procedures, scripts and applicable testing tools.
Code Complete -Function	07/12/2016	This milestone includes unit testing and code review of each function component prior to checking the code into the test phase. The deliverables include system-Testing specification, Unit Testing specifications, Integration plan.	The Test Engineers should have provided Code Complete Assessment Test to Development Engineer one week prior to Code Complete Review date. The Test Engineers should also have completed or in the final stages of their preliminary White Box Test Plan, test cases and other QA

			documents related to test execution for each feature or component such as test scenarios, expected results, data sets, test procedures, scripts and applicable testing tools.
Feature Complete	03/24/2017	This phase allows for feature clean up to verify remaining bug fixes and regression testing around The bug fixes. This milestone indicates that the feature is ready for Beta regression.	All bugs verified and QA documentation is finalized. The test Engineers should assess that Automation ticketing application features are ready for Beta regression and have started their preliminary Test Summary Reports.
Regression Test	06/15/2017	This milestone represents that all Automation ticketing application code and GUI interface to the Automation ticketing application is ready for Regression Testing.	Complete regression test execution of complete system and update Test Summary Reports for regression.
Ship/Live	07/12/2017	Product is out.	Any unfinished Testing documents should be complete.

Planning Risks and Contingencies

Risk	Probability	Risk Type	Owner	Contingencies / Mitigation Approach
Unable to acquire the necessary number of skilled personnel as The components become ready to test.	30%	Personnel Schedule	Test Manager	Resources for components will be split between the existing resources. Schedule must be adjusted accordingly.
Unable to acquire Some of the necessary hardware and software required for integration and system testing	25%	Equipment	Program Manager Test Manager Developme nt Manager	Utilize existing acquired hardware. Split test execution into morning and evening shifts such that testing can occur for multiple teams in the same day using the limited hardware. This requires support of the development during both shifts.
Third party services utilized in the system become unavailable during testing	5%	Third party	Alliance Manager	Setup a communication channel to 3rd party to report and handle issues when they occur. Use the communication channel above to stay aware of planned outages and maintenance to help schedule test execution.
Components are not delivered on time	25%	Schedule	Developme nt Manager	Integration testing with those components must be delayed until the component is delivered. Overall integration test approach may be modified to do an appropriate amount of bottom-up as well as top-

				down or sandwich integration. Schedule must be adjusted accordingly.
Turnover	5%	Personnel	Test Manager	Testers will work in pairs on components. If a single member of the team decides to leave, a secondary testing with the knowledge of the component will still be able to train a new tester or finish the work. Schedule must be adjusted accordingly.

Approvals

Project Sponsor	S.M. ABDUR BHUIYAN ROUF
Development Management	Zayed Bin Maleque
EDI Project Manager	Tazmira Akter
RS Test Manager	Mahbubur Rahman
RS Development Team Manager	R.H.M. Reeshul Arefeen
Reassigned Sales	Tofazzol Hossain
Order Entry EDI Team Manager	Nasir Uddin