Test Plan on "IIT Official Web Site"

Software Testing and Quality Assurance
SE 605

Project Name

IIT Official Web Site

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Letter of Transmittal

We declare that this design Test Plan on "**IIT Official Web Site**" submitted to Institute of Information Technology, University of Dhaka to fulfill the requirements for the Bachelor of Information Technology (BSSE) in 6th Semester. This documentation work has done under the guidance of **Mohammad Ashik Elahi**. Though this project is mainly developed for Institute of Information Technology, this is certified that we did this documentation under SE- 605, Software Testing and Quality Assurance Course and it has not been submitted elsewhere for the requirement of any degree or for any other purposes.

Members of the Project Signature and Date

1. Shanto Rahman _____
2. Md. Mostafijur Rahman _____

ABSTRACT

This document is aimed to cover the complete Test Plan of the **"IIT Official Web Site"**. This Test Plan is designed to prescribe the scope, approach, resources, and schedule of all testing activities. The project will have three levels of testing, Unit, System/Integration and Acceptance. The details for each level are addressed in the approach section and will be further defined in the level specific plans. Finally, we can say that the document is thought to be fulfilled and all the adequate steps are done carefully which is described in minutiae through this whole document. We believe that this documentation can play a vital role in **"IIT Official Web Site"** testing process.

Revision History

Date	Version	Description	Author
5th December,2013	1.0	Test Plan Version 1.0	Shanto Rahman Md. Mostafijur Rahman

Contents

1.0 Introduction

This is the Test Plan for the **"IIT Official Web Site"**. This Test Plan is designed to prescribe the scope, approach, resources, and schedule of all testing activities.

The project will have three levels of testing, Unit, System/Integration and Acceptance. The details for each level are addressed in the approach section and will be further defined in the level specific plans.

The estimated time line for this project is very aggressive (six (6) months), as such, any delays in the development process or in the installation and verification of the third party software could have significant effects on the test plan. The acceptance testing is expected to take one (1) month from the date of application delivery from system test and is to be done in parallel with the current application process.

1.1 Description of this Document

This document is a Test Plan for the "**IIT Official Web Site**". It describes the testing strategy and approach to testing QA will use to validate the quality of this product prior to release. It also contains various resources required for the successful completion of this project.

The focus of the "**IIT Official Web Site**" is to support those new features that will allow easier development, deployment and maintenance of solutions built upon the "**IIT Official Web Site**". Those features include:

- Provide the users with directions & error messages to direct him/her on the various options.
- Events and news of IIT
- Achievement Pictures
- Noticeboard
- Educational archive
- FAQ
- Dashboard
- Courses in the semester-Assignment and Books

- Attendance
- Program management
- Exam management
- Accounts and Admission Management
- Upload and Download Documents

1.2 Test Plan Objectives

This document describes the plan for testing the "**IIT Official Web Site**". This Test Plan documents supports the following objectives:

- Identify existing project information and the software components that should be tested.
- List the recommended test requirements (high level).
- Recommend and describe the testing strategies to be employed.
- Identify the required resources and provide an estimate of the test efforts.
- List the deliverable elements of the test activities.
- Identify various Dependencies and Risks.

1.3 Testing Strategy

The main considerations for the test strategy are the techniques to be used and the criterion for knowing when the testing is completed. In addition to the considerations provided for each test below, testing should only be executed using known, controlled databases, in secured environments.

1.4 Scope of Test Plan

This Test Plan applies to the integration and system tests that will be conducted on the "**IIT Official Web Site**" Release 1.0.

It is assumed that unit testing already provided thorough black box testing through extensive coverage of source code and testing of all module interfaces.

This Test Plan applies to testing all requirements of the "**IIT Official Web Site**" as defined in the Project Plan Document [1], Use Case Specifications [2], and Software Requirements Specification [3], Database Schema and E-R Diagram Specification [4], Software Architecture Document [5], Interface Design Document [6], Software Development Plan for the "**IIT Official Web Site**" [7].

1.5 Reference Material

Applicable reference materials are:

1. Project Plan Document, Version 1.0, BSSE
2. Use Case Specifications, Version 1.0, BSSE
3. Software Requirements Specification, Version 1.0, BSSE
4. Database Schema and E-R Diagram Specification, Version 1.0, BSSE
5. Software Architecture Document, Version 1.0, BSSE
6. Interface Design Document, Version 1.0, BSSE
7. Software Development Plan for the "**IIT Official Web Site**", Version 1.0, BSSE

2.0 Test Items

The following is a list, by version and release, of the items to be tested:

- IIT Official Web Site, Version 1.0
  - A detailed listing of programs, databases, screens and reports will be provided in the system and detailed design documents.
- IIT Official Web Site **User Interface**, Version 1.0
- IIT Official Web Site **System requirements documents**, Version 3.1
- IIT Official Web Site **System Design Document**, Version 3.1
- IIT Official Web Site **Detail Design Document**, Version 3.2
- IIT Official Web Site **Operations.**
  - Functions of different modules and items of the system.

3.0 Features to be tested

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

- User interface.
- Interface to the Attendance Control system and data bases.
- Computation of different statistical/Numerical data
- Accessibility
- Performance
- Scalability
- Usability
- Coding standards
- Functional

4.0 Features not to be tested

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

- Business analysis functions which is used for accounts and fees purpose.
- Network Security
- Reliability
- Availability
- Installability
- Failover / Recovery Testing
- Configuration Testing

5.0 Approaches

We have followed some technique and some approaches for testing the software. The project will have three levels of testing, Unit, System/Integration and Acceptance. The details for each level are addressed in below.

5.1 Unit Testing

Equivalence class partitioning of Login:

Input / Output	Valid Class	Invalid Class
User Name	v1-- a-z(small letter) v2-- A-Z (capital letter) v3-- 1-9(numeric digit) v4-- .(period) _(underscore) @ v5-- Exactly one @	I1-- more than one @ I2-- First alphabet @ I3-- Empty I4-- space in 1st place of email address I5-- Other Special Char
Password	V6--a-z(small latter) V7-- A-Z (capital letter) V8-- 1-9(numeric digit) V9-- any special character V9-- length >=6	I6-- length <=5 I7-- Empty

Fig1.0: Equivalence class partitioning of Login

ECP Test Cases for Login:

ECP Test	User Name	Password	Expected Result
1	V1^V4^V5	V6 ^V9	Pass
2	V2^V4^V5	V7^V9	Pass
3	V3^ V4^V5	V6 U V7 U V8 U V9	Pass
4	V1^V5^I1	V6 U V7 U V8 U V9	Fail
5	I1	V6 U V7 U V8 U V9	Fail
6	I2	V6 U V7 U V8 U V9	Fail
7	I3	V6 U V7 U V8 U V9	Fail
8	I4	V6 U V7 U V8 U V9	Fail
9	I5	V6 U V7 U V8 U V9	Fail
10	V1^V5^I2	V7	Fail
11	V1^V4^V5^I3	V6	Fail
12	V1^V4^V5^I1	V9	Fail
13	V1^V4^V5	I6	Fail

14	V1^V4^V2^V3^V5	V6 U V7 U V8 U V9	Pass
15	V1^V4^V5^V2^V3	I7	Fail

Fig1.1: ECP Test Case

Boundary Value Analysis for Login

Test	**User Name**	**Password**	**Expected result**
1	[Space]shanto@gmail.com	abcdef	Invalid
2	@shantogmail.com	As45***	Invalid
3	shanto@fff@yahoo.com	Jhuu&&k	Invalid
4		hhjdfjjjj	Invalid
5	_shanto.iitduqqqq.com	asdfsss	Invalid
6	…….@qqqsqqq	KKK((HHH	Invalid
7	shanto.iitdu@yahoo.com	aaakkkk	Valid
8	bit0321@iit.du.ac.bd	ffyyyss	Valid
9	bit0321@iit.du.ac.bd	asdft	Invalid
10	shanto.iitdu@yahoo.com		Invalid
11	shanto.iitdu@yahoo.com	Asd&h_	Valid
12	bit0312@iit.du.ac.bd	P***rts	Valid

Fig1.2: Boundary Value Analysis for Login

Equivalence class partitioning of Contacts:

Input / Output	Valid Class	Invalid Class
Email	v1-- a-z(small letter) v2-- A-Z (capital letter) v3-- 1-9(numeric digit) v4-- .(period) _(underscore) @ v5-- Exactly one @	I1-- more than one @ I2-- First alphabet @ I3:Empty I4:space in 1st place of email address I5-- Other Special Char
Message body	V6--a-z(small latter) V7-- A-Z (capital letter) V8-- 1-9(numeric digit) V9-- any special character	I6:Empty

Fig2.0: Equivalence class partitioning of Contacts

ECP Test Cases for contacts:

ECP Test	Email	Message body	Expected Result
1	V1^V4^V5	V6	Email Send
2	V2^V4^V5	V7	Email Send
3	V3^ V4^V5	V6 U V7 U V8 U V9	Email Send
4	V1^V5^I1	V6 U V7 U V8 U V9	Not Send
5	V1^V5^I2	V7	Not Send
6	V1^V4^V5^I3	V6	Not Send
7	V1^V4^V5	I6	Not Send
8	V1^V4^V2^V3^V5	V6 U V7 U V8 U V9	Email Send
9	V1^V4^V5^V2^V3	I6	Not Send

Fig2.1: ECP Test Cases for contacts

Equivalence Class Partitioning of Attendance (Date, student _name):

Input / Output	Valid	Invalid Class
Month	v1– 30-day months V2– 31-day months V3-- February	I1-- >=13 I2-- <=0 I3– any non integer I4-- empty I5-- >= 3 integers
Day	V4– 1-30 V5– 1-31 V6– 1-28 V7– 1-29	I6-- >=32 I7-- <=0 I8– any non integer I9-- empty I10-- >= 3 integers
Year	V8– Start from 2013 V9– non-leap year V10– leap year(29) V11– century non-leap year V12– century leap year(29)	I11 --Before 2013 I11– any non integer I12-- empty I13-- >= 5 integers
Student name	V12-alpha numeric	I14 -- empty

Fig3.0: Equivalence Class Partitioning of Attendance (Date, student _name)

ECP Test Cases:

ECP Test	Month	Day	Year	Student Name	Expected Result
1	V1 U V2 U V3	V6	V8	V13	Successful
2	V1	V4	V8^V9	V13	Successful
3	V2	V5	V8^V9	V13	Successful
4	V3	V6	V8^V11	V13	Successful
5	V3	V7	V8 ^ V10	V13	Successful
6	V1 U V2 U V3	V4	V8^ V9	V13	Successful
7	V1 U V2 U V3	V5	V8U V9 U V11	V13	Successful
8	V1	I6	V8	V13	Error
9	V1 U V2 U V3	I10	V8	V13	Error
10	I2	V4	V8	V13	Error
11	I3	V4	V8	V13	Error
12	I4	V4	V8	V13	Error
13	I5	V4	V8	V13	Error
14	V1	V4	I11	V13	Error
15	V3	V6	V8	I14	Error

Fig3.1: ECP Test Cases for Attendance

Boundary Value analysis of Month:

Test	Month	Day	Year	Expected result
1	0	1-28	Start from 2013	Error
2	1	1-28	Start from 2013	Attendance taken successful
3	2	1-28	Start from 2013	Attendance taken successful
4	11	1-28	Start from 2013	Attendance taken successful
5	12	1-28	Start from 2013	Attendance taken successful
6	13	1-28	Start from 2013	Error
7	1-12	0	Start from 2013	Error
8	1-12	1	Start from 2013	Attendance taken successful
9	1-12	2	Start from 2013	Attendance taken successful
10	1-12	30	Start from 2013	Attendance taken successful
11	1-12	31	Start from 2013	Attendance taken successful
12	1-12	32	Start from 2013	Error
13	1-12	1-28	2012	Error
14	1-12	1-28	2013	Attendance taken successful
15	1-12	1-28	2014	Attendance taken successful
16	1-12	1-28	Start from 2013	Attendance taken successful

Fig3.2: Boundary Value analysis of Month

All Pair testing for Program management:

For pair testing on program management, we have considered four kinds of programs in IIT. One is BSSE. Others are MSE, PGDIT and last one is MIT. IN BSSE program has eight semesters. PGDIT has three semesters. Other programs have two semesters.

Test Case	BSSE	PGDIT	MSE	MIT
Tc1	BSSE-1st	PGDIT-1st	MSE-1st	MIT-1st
Tc2	BSSE-1st	PGDIT-2nd	MSE-2nd	MIT-2nd
Tc3	BSSE-1st	PGDIT-3rd	MSE-1st	MIT-1st
Tc4	BSSE-2nd	PGDIT-1st	MSE-2nd	MIT-2nd
Tc5	BSSE-2nd	PGDIT-2nd	MSE-1st	MIT-1st
Tc6	BSSE-2nd	PGDIT-3rd	MSE-2nd	MIT-2nd
Tc7	BSSE-3rd	PGDIT-1st	MSE-1st	MIT-1st
Tc8	BSSE-3rd	PGDIT-2nd	MSE-2nd	MIT-2nd
Tc9	BSSE-3rd	PGDIT-3rd	MSE-1st	MIT-1st
Tc10	BSSE-4th	PGDIT-1st	MSE-2nd	MIT-2nd
Tc11	BSSE-4th	PGDIT-2nd	MSE-1st	MIT-1st
Tc12	BSSE-4th	PGDIT-3rd	MSE-2nd	MIT-2nd
Tc13	BSSE-5th	PGDIT-1st	MSE-1st	MIT-1st
Tc14	BSSE-5th	PGDIT-2nd	MSE-2nd	MIT-2nd
Tc15	BSSE-5th	PGDIT-3rd	MSE-1st	MIT-1st
Tc16	BSSE-6th	PGDIT-1st	MSE-2nd	MIT-2nd
Tc17	BSSE-6th	PGDIT-2nd	MSE-1st	MIT-1st
Tc18	BSSE-6th	PGDIT-3rd	MSE-2nd	MIT-2nd
Tc19	BSSE-7th	PGDIT-1st	MSE-1st	MIT-1st
Tc20	BSSE-7th	PGDIT-2nd	MSE-2nd	MIT-2nd
Tc21	BSSE-7th	PGDIT-3rd	MSE-1st	MIT-1st
Tc22	BSSE-8th	PGDIT-1st	MSE-2nd	MIT-2nd
Tc23	BSSE-8th	PGDIT-2nd	MSE-1st	MIT-1st
Tc24	BSSE-8th	PGDIT-3rd	MSE-2nd	MIT-2nd

Fig4.0: All Pair testing for Program management

All Pair testing for Modify Program:

For modifying program status we also consider Modify Programs Module where program status can be changed. For doing this we will do pair test for modify program. Here four types are programmed are available and status are two types.

Test case	Program	Status
Tc1	BSSE	Active
Tc2	BSSE	Deactive
Tc3	MSE	Active
Tc4	MSE	Deactive
Tc5	MIT	Active
Tc6	MIT	Deactive
Tc7	PGDIT	Active
Tc8	PGDIT	Deactive

Fig5.0: All Pair testing for Modify Program

All Pair testing for Attendance:

For pair testing on Attendance, we have considered 6 courses for a student. For example, in 6th semester course codes are CSE 601, BUS 602, GE 603, CSE 604, SE 605, SE 606. In attendance status two value yes or no.

Test Case	Semester	Course	Status
Tc1	BSSE-1st	Course 1	YES
Tc2	BSSE-1st	Course 2	NO
Tc3	BSSE-1st	Course 3	YES
Tc4	BSSE- 1st	Course 4	NO
Tc5	BSSE- 1st	Course 5	YES
Tc6	BSSE- 1st	Course 6	NO
Tc7	BSSE- 2nd	Course 1	YES
Tc8	BSSE- 2nd	Course 2	NO
Tc9	BSSE- 2nd	Course 3	YES

Tc10	BSSE-2nd	Course 4	NO
Tc11	BSSE-2nd	Course 5	YES
Tc12	BSSE-2nd	Course 6	NO
Tc13	BSSE- 3rd	Course 1	YES
Tc14	BSSE- 3rd	Course 2	NO
Tc15	BSSE- 3rd	Course 3	YES
Tc16	BSSE-3rd	Course 4	NO
Tc17	BSSE-3rd	Course 5	YES
Tc18	BSSE-3rd	Course 6	NO
Tc19	BSSE-4th	Course 1	YES
Tc20	BSSE-4th	Course 2	NO
Tc21	BSSE-4th	Course 3	YES
Tc22	BSSE-4th	Course 4	NO
Tc23	BSSE-4th	Course 5	YES
Tc24	BSSE-4th	Course 6	NO
Tc25	BSSE-5th	Course 1	YES
Tc26	BSSE-5th	Course 2	NO
Tc27	BSSE-5th	Course 3	YES
Tc28	BSSE-5th	Course 4	NO
Tc29	BSSE-5th	Course 5	YES
Tc30	BSSE-5th	Course 6	NO
Tc31	BSSE-6th	Course 1	YES
Tc32	BSSE-6th	Course 2	NO
Tc33	BSSE-6th	Course 3	YES
Tc34	BSSE-6th	Course 4	NO
Tc35	BSSE-6th	Course 5	YES
Tc36	BSSE-6th	Course 6	NO
Tc37	BSSE-7th	Course 1	YES
Tc38	BSSE-7th	Course 2	NO

Tc39	BSSE-7th	Course 3	YES
Tc40	BSSE-7th	Course 4	NO
Tc41	BSSE-7th	Course 5	YES
Tc42	BSSE-7th	Course 6	NO
Tc43	BSSE-8th	Course 1	YES
Tc44	BSSE-8th	Course 2	NO
Tc45	BSSE-8th	Course 3	YES
Tc46	BSSE-8th	Course 4	NO
Tc47	BSSE-8th	Course 5	YES
Tc48	BSSE-8th	Course 6	NO

Fig6.0: All Pair testing for Attendance

State Transition Test Design:

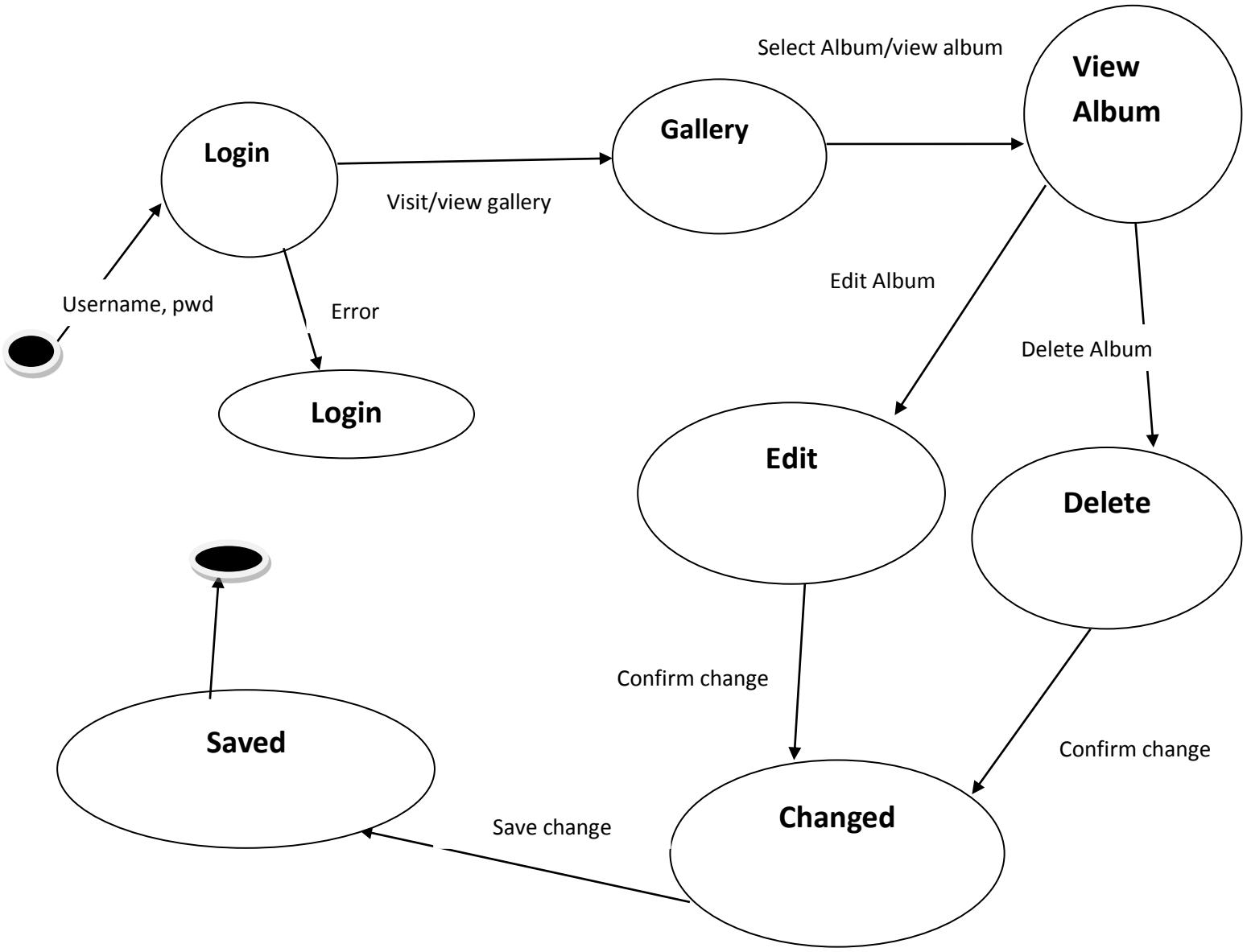


Fig7.0: Modify Admin

Test case1:

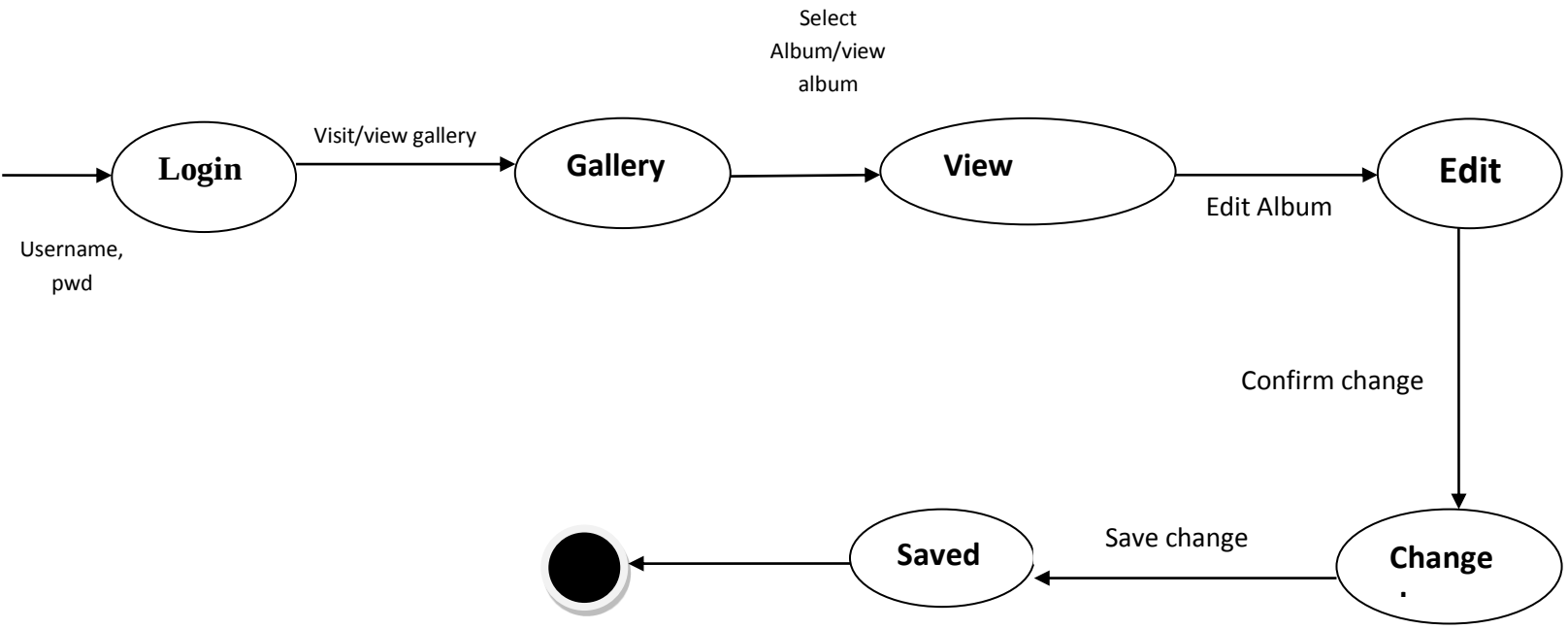


Fig7.1: Test case1

Test case2:

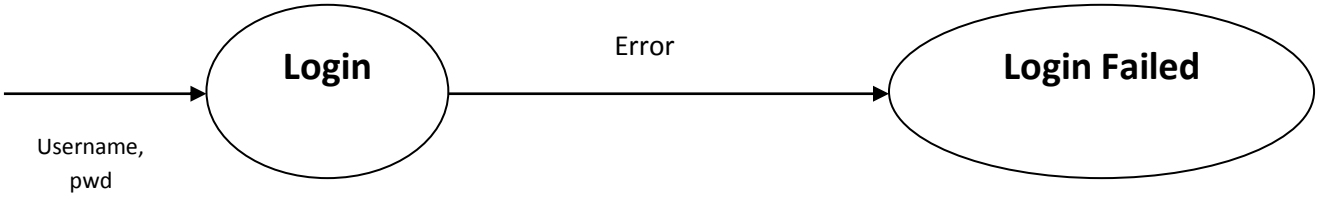


Fig7. 2: Test case2

Test Case3:

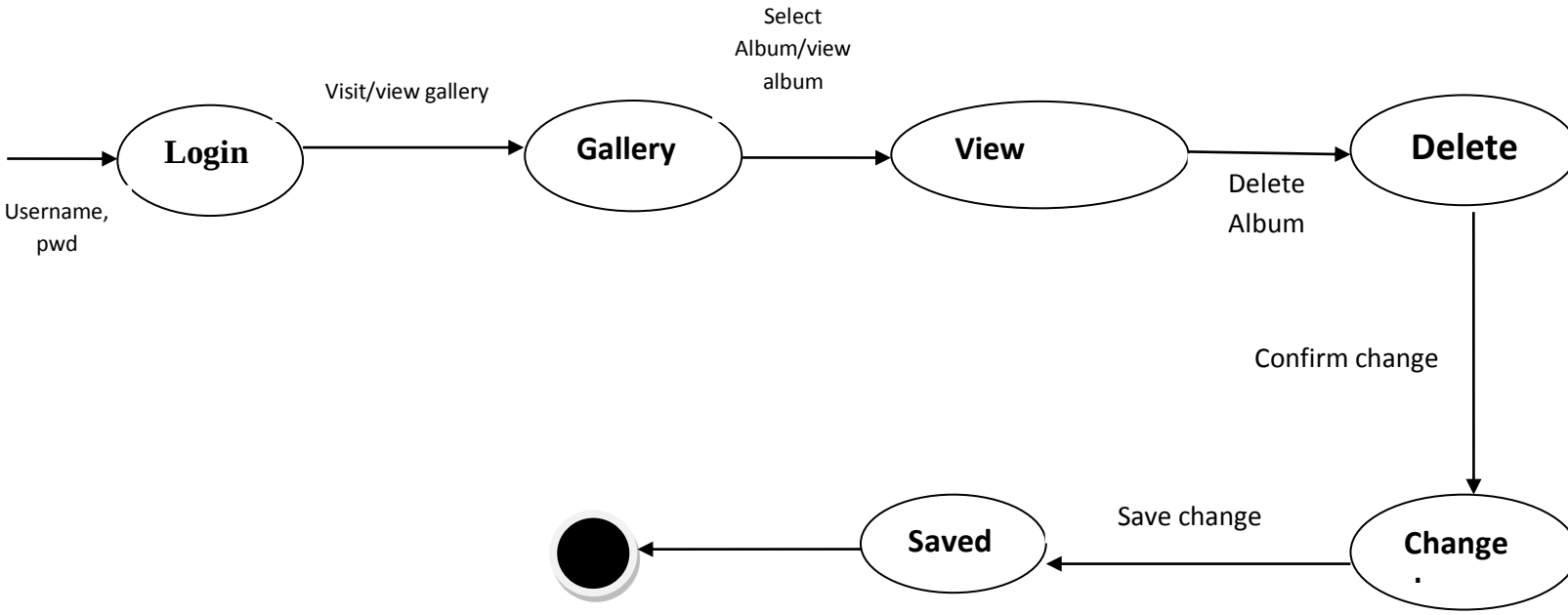


Fig7. 3: Test case3

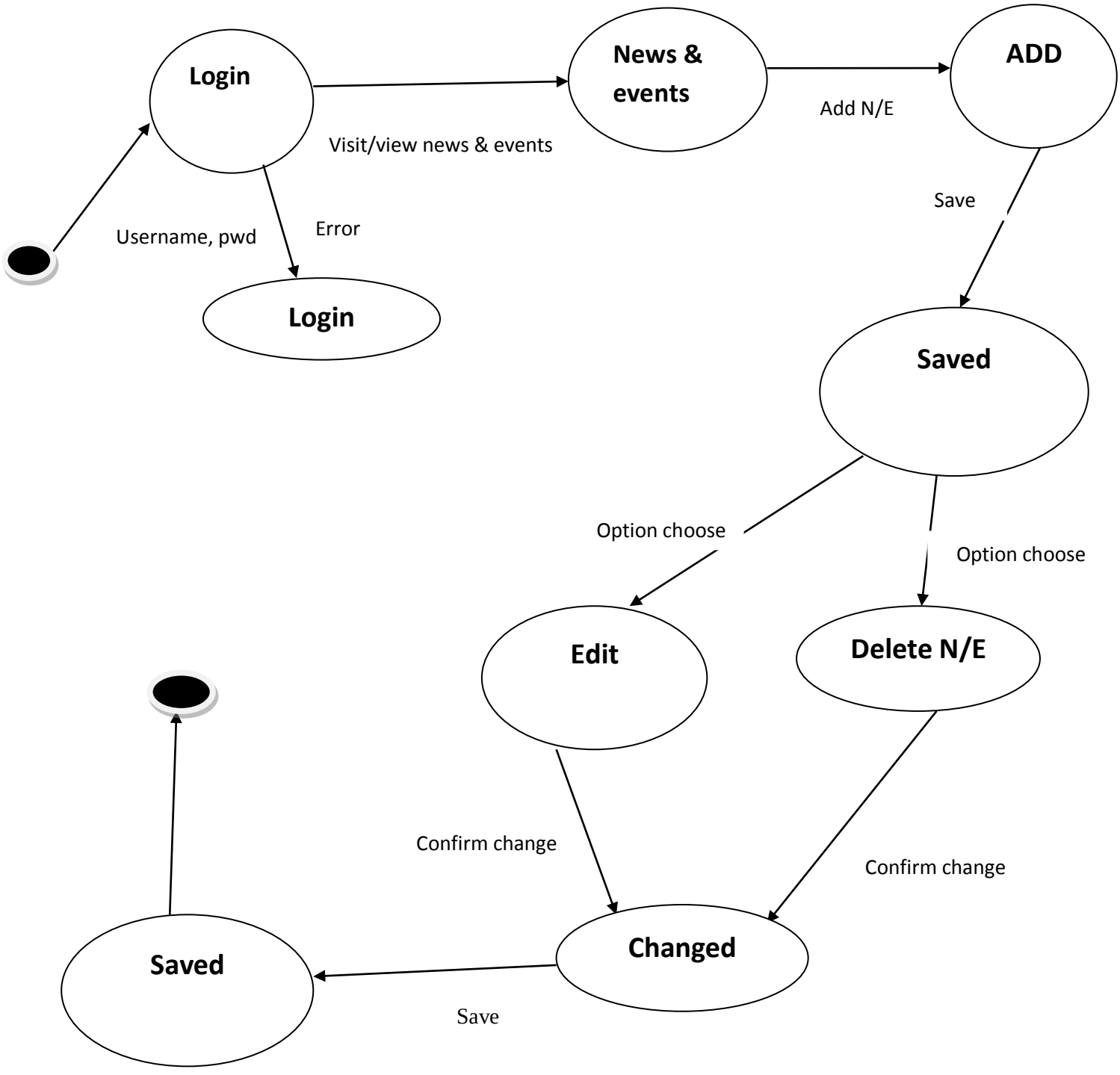


Fig8.0: News and events

Test Case1:

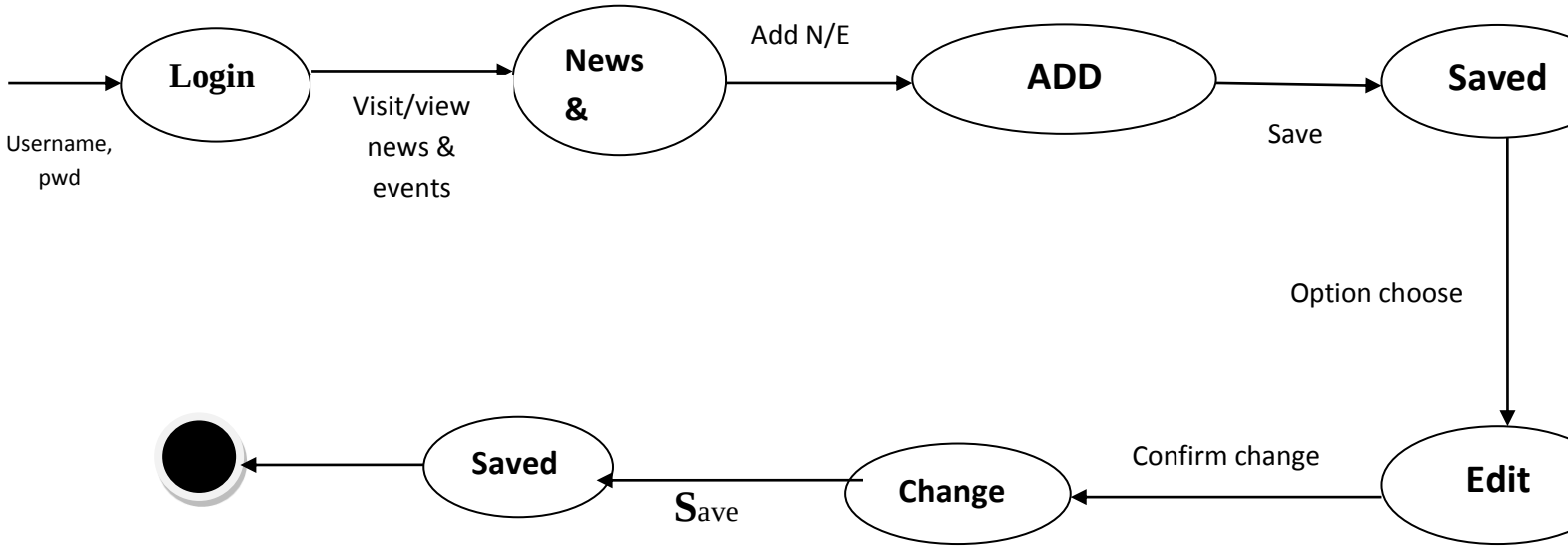


Fig8. 1: Test case1

Test case2:

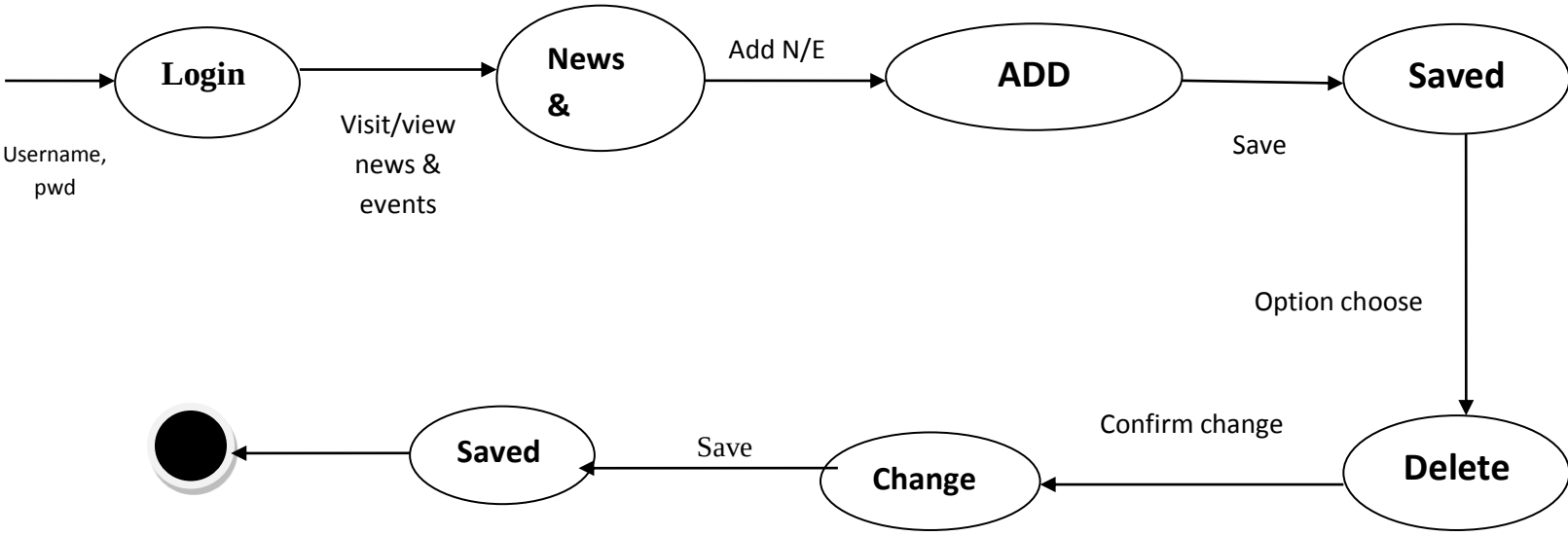


Fig8. 2: Test case2

Test case3:

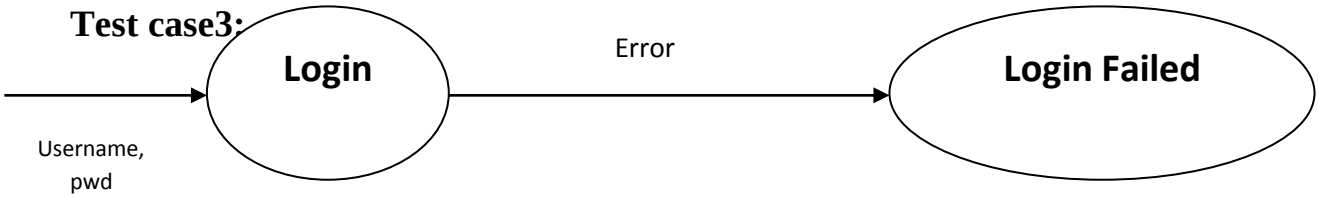


Fig8. 3: Test case3

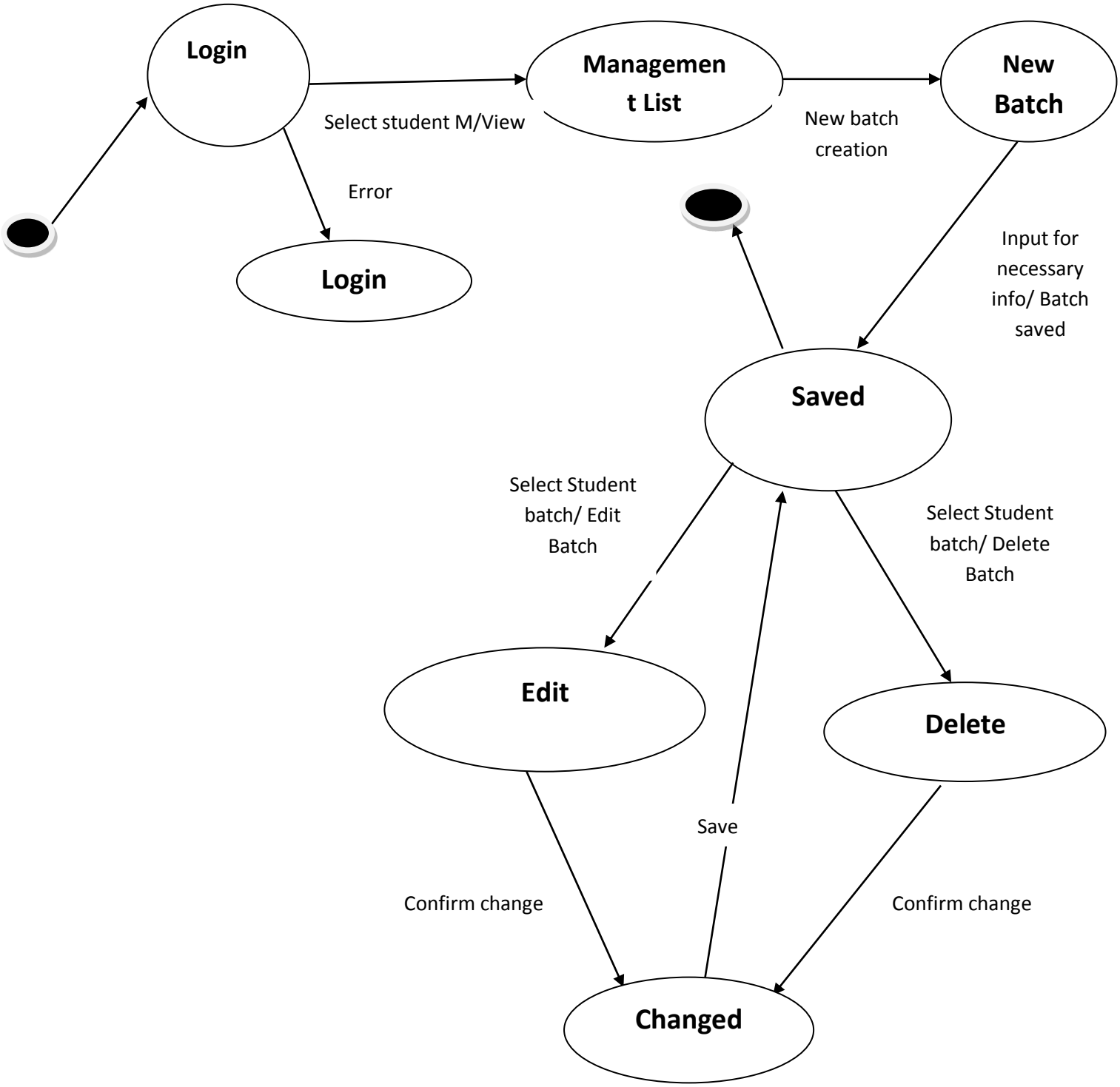


Fig9.0: Manage Batch

Test Case1:

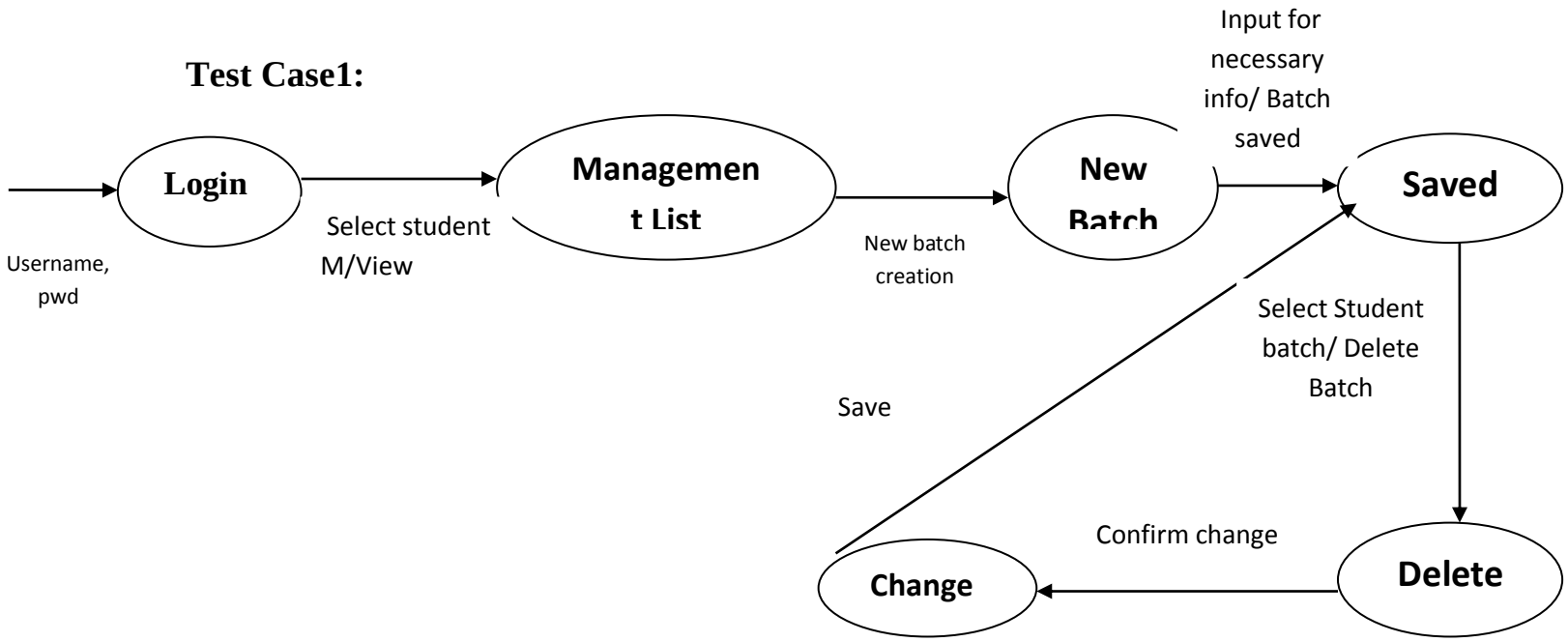


Fig9.1: Test case1

Test Case2:

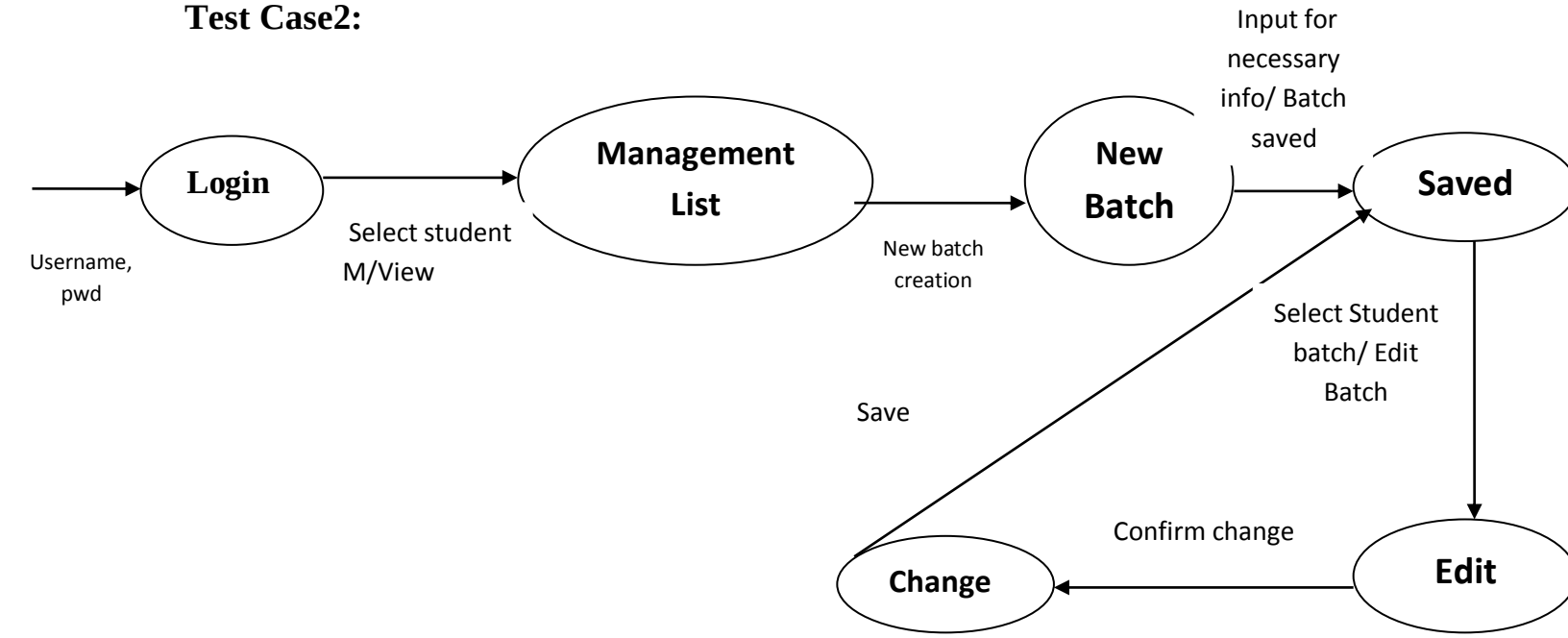


Fig9.2: Test case2

Test Case3:

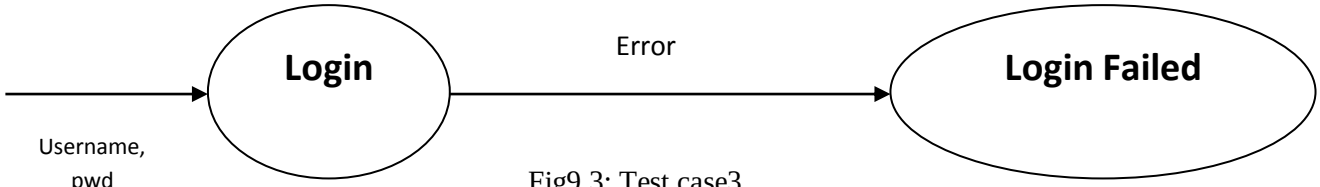


Fig9.3: Test case3

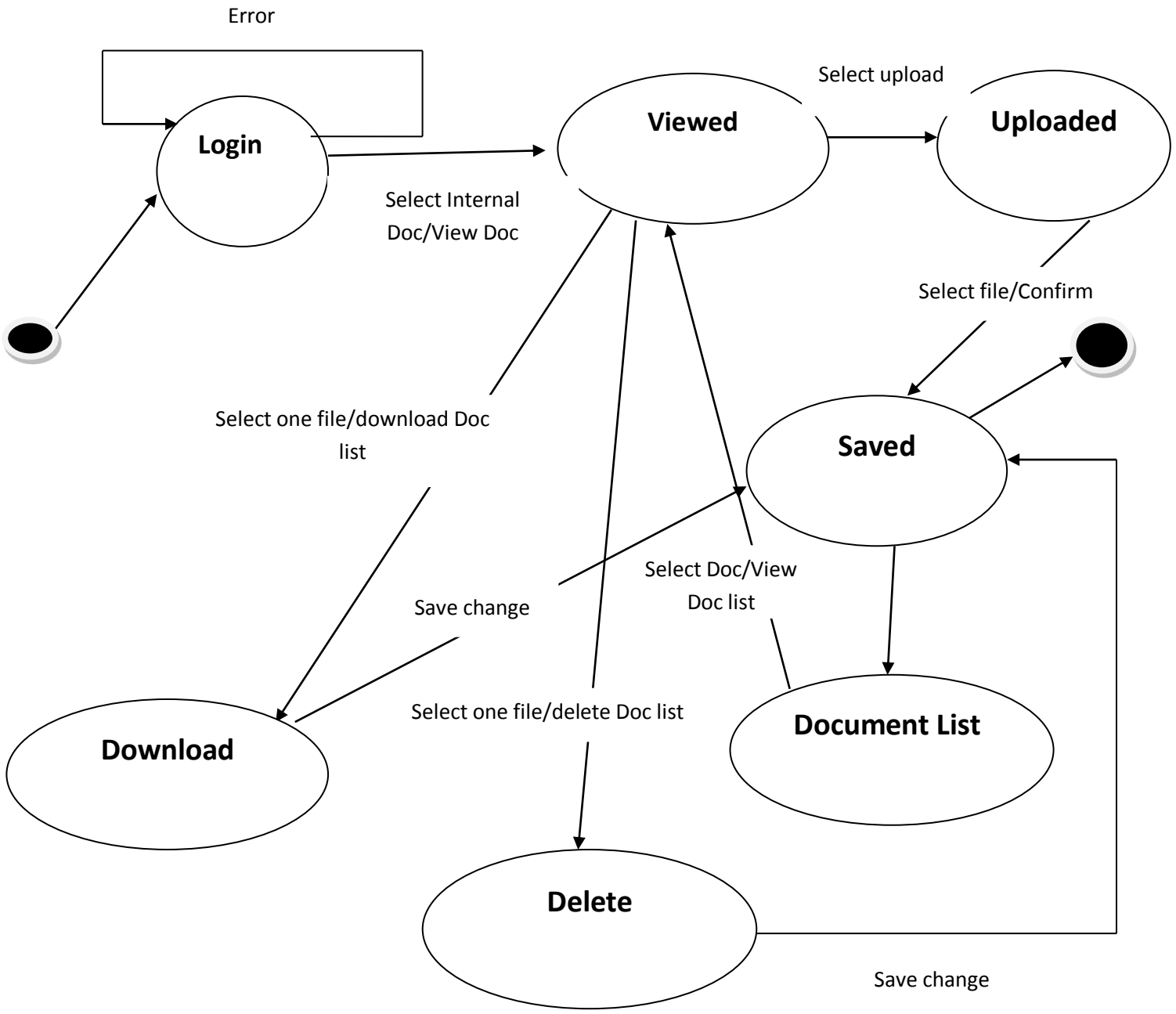


Fig10.0: Documents

Test Case1:

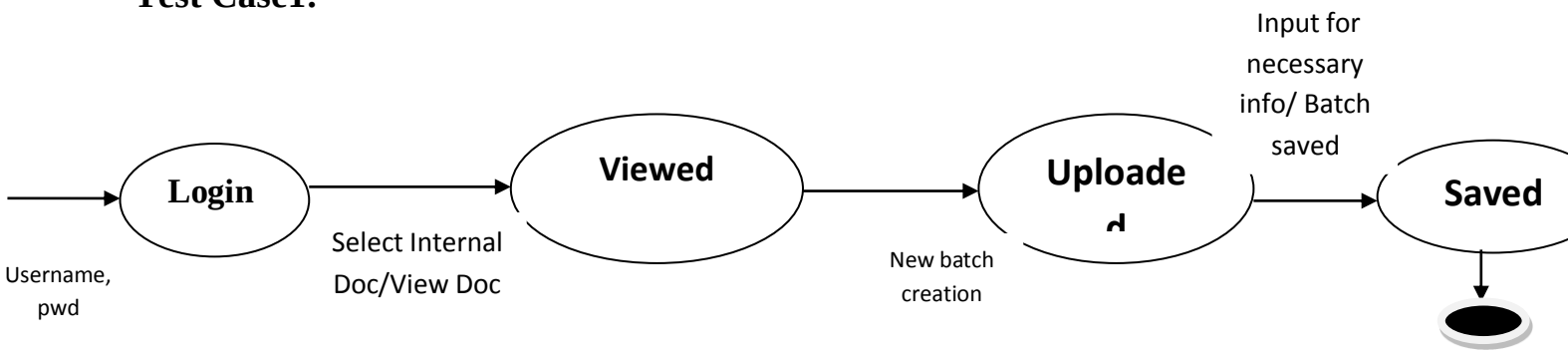


Fig10.1: Test case1

Test Case2:

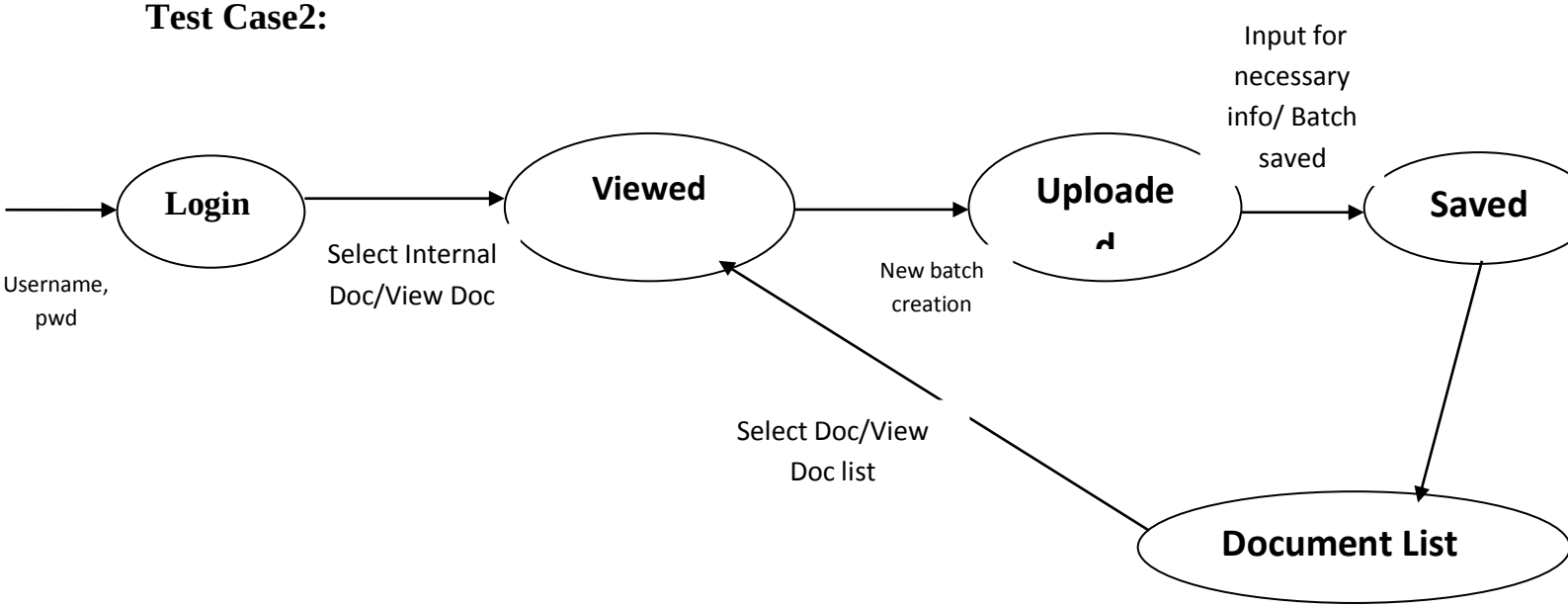


Fig10.2: Test case2

Test Case3:

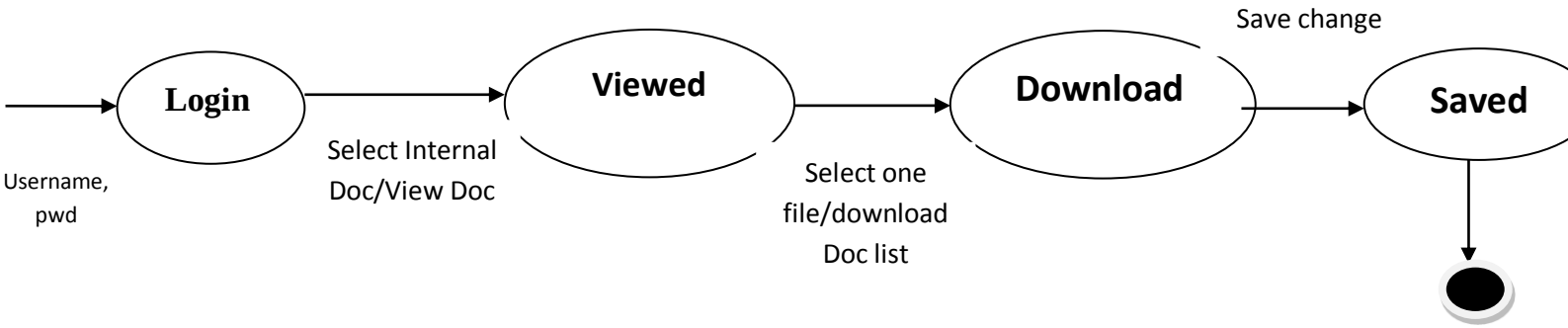


Fig10.3: Test case3

Test Case4:

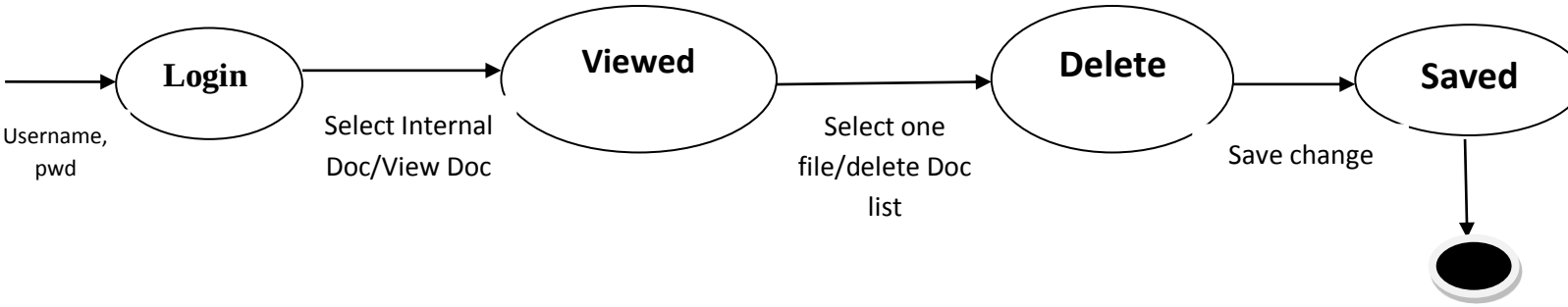


Fig10.4: Test case4

5.2 User Interface Testing

User Interface testing verifies a user's interaction with the software. The goal of UI Testing is to ensure that the User Interface provides the user with the appropriate access and navigation through the functions of the applications. In addition, UI Testing ensures that the objects within the UI function as expected and conform to corporate or industry standards.

Test Objective:	Verify the following: • Navigation through the application properly reflects business functions and requirements, including window to window, field to field, and use of access methods (tab keys, mouse movements, accelerator keys) • Window objects and characteristics, such as menus, size, position, state, and focus conform to standards.
Technique:	• Create / modify tests for each window to verify proper navigation and object states for each application window and objects.
Completion Criteria:	Each window successfully verified to remain consistent with benchmark version or within acceptable standard
Special Considerations:	• Not all properties for custom and third party objects can be accessed.

5.3 Security and Access Control Testing

Security and Access Control Testing focus on two key areas of security:

i. Application security, including access to the Data or Business Functions, and
ii. System Security, including logging into / remote access to the system.

Application security ensures that, based upon the desired security, users are restricted to specific functions or are limited in the data that is available to them. For example, everyone may be permitted to enter data and create new accounts, but only managers can delete them. If there is security at the data level, testing ensures that user "type" one can see all customer information, including financial data, however, user two only sees the demographic data for the same client.

System security ensures that only those users granted access to the system are capable of accessing the applications and only through the appropriate gateways.

Test Objective:	Function / Data Security: Verify that user can access only those functions / data for which their user type is provided permissions. System Security: Verify that only those users with access to the system and application(s) are permitted to access them.
Technique:	• Function / Data Security: Identify and list each user type and the functions / data each type has permissions for. • Create tests for each user type and verify permission by creating transactions specific to

each user type.

- Modify user type and re-run tests for same users. In each case verify those additional functions / data are correctly available or denied.
- System Access (see special considerations below)

Completion Criteria: For each known user type the appropriate function / data are available and all transactions function as expected and run in prior Application Function tests

Special Considerations:

- Access to the system must be reviewed / discussed with the appropriate network or systems administrator. This testing may not be required as it may be a function of network or systems administration.

5.4 System Testing

Testing of the application should focus on any target requirements that can be traced directly to use cases (or business functions), and business rules. The goals of these tests are to verify proper data acceptance, processing, and retrieval, and the appropriate implementation of the business rules. This type of testing is based upon black box techniques, that is, verifying the application (and its internal processes) by interacting with the application via the GUI and analyzing the output (results). Steps Identified below is an outline of the testing recommended for each application:

Test Objective:	Ensure proper application navigation, data entry, processing, and retrieval.
Technique:	• Execute each use case, use case flow, or function, using valid and invalid data, to verify the following: • The expected results occur when valid data is used. • The appropriate error / warning messages are displayed when invalid data is used. • Each business rule is properly applied.
Completion Criteria:	• All planned tests have been executed. • All identified defects have been addressed.

5.5 Data and Database Integrity Testing

The databases and the database processes should be tested as separate systems. These systems should be tested without the applications (as the interface to the data). Additional research into the DBMS needs to be performed to identify the tools / techniques that may exist to support the testing identified below.

Test Objective:	Ensure Database access methods and processes function properly and without data corruption.
Technique:	• Invoke each database access method and process, seeding each with valid and invalid data (or requests for data). • Inspect the database to ensure the data has been populated as intended, all database events occurred properly, or review the returned data to ensure that the correct data was retrieved (for the correct reasons)
Completion Criteria:	All database access methods and processes function as designed and without any data corruption.
Special Considerations:	• Testing may require a DBMS development environment or drivers to enter or modify data directly in the databases. • Processes should be invoked manually. • Small or minimally sized databases (limited number of records) should be used to increase the visibility of any non-acceptable events.

5.6 Performance Testing

Performance testing measures response times, transaction rates, and other time sensitive requirements. The goal of Performance testing is to verify and validate the performance requirements have been achieved. Performance testing is usually executed several times, each using a different "background load" on the system. The initial test should be performed with a "nominal" load, similar to the normal load experienced (or anticipated) on the target system. A second performance test is run using a peak load.

Additionally, Performance tests can be used to profile and tune a system's performance as a function of conditions such as workload or hardware configurations.

Test Objective:	Validate System Response time for designated transactions or business functions under a the following two conditions: ✓ Normal anticipated volume ✓ Anticipated worse case volume
Technique:	• Use Test Scripts developed for Business Model Testing (System Testing). • Modify data files (to increase the number of transactions) or modify scripts to increase the number of iterations each transaction occurs. • Scripts should be run on one machine (best case to benchmark single user, single transaction) and be repeated with multiple clients (virtual or actual, *see special considerations below).*
Completion Criteria:	• Single Transaction / single user: Successful completion of the test scripts without any failures

and within the expected / required time allocation (per transaction)

- Multiple transactions / multiple users: Successful completion of the test scripts without any failures and within acceptable time allocation.

Special Considerations:

- Comprehensive performance testing includes having a "background" load on the server. There are several methods that can be used to perform this, including:
    - "Drive transactions" directly to the server, usually in the form of SQL calls.
    - Create "virtual" user load to simulate many (usually several hundred) clients. Remote Terminal Emulation tools are used to accomplish this load. This technique can also be used to load the network with "traffic."
    - Use multiple physical clients, each running test scripts to place a load on the system.
- Performance testing should be performed on a dedicated machine or at a dedicated time. This permits full control and accurate measurement.
- The databases used for Performance testing should be either actual size, or scaled equally.

5.7 Load Testing

Load testing measures subjects the system-under-test to varying workloads to evaluate the system's ability to continue to function properly under these different workloads. The goal of load testing is to determine and ensure that the system functions properly beyond the expected maximum workload. Additionally, load testing evaluates the performance characteristics (response times, transaction rates, and other time sensitive issues).

Test Objective:	Verify System Response time for designated transactions or business cases under varying workload conditions.
Technique:	• Use tests developed for Business Cycle Testing. • Modify data files (to increase the number of transactions) or the tests to increase the number of times each transaction occurs.
Completion Criteria:	• Multiple transactions / multiple users: Successful completion of the tests without any failures and within acceptable time allocation.
Special Considerations:	• Load testing should be performed on a dedicated machine or at a dedicated time. This permits full control and accurate measurement. • The databases used for load testing should be either actual size, or scaled equally.

5.8 Stress Testing

Stress testing is intended to find errors due to low resources or competition for resources. Low memory or disk space may reveal defects in the software that aren't apparent under normal conditions. Other defects might results from competition for shared resource like database locks or network bandwidth. Stress testing identifies the peak load the system can handle.

Test Objective:	Verify that the system and software function properly and without error under the following stress conditions: • little or no memory available on the server (RAM) • maximum (actual or physically capable) number of clients connected (or simulated) • multiple users performing the same transactions against the same data / accounts • worst case transaction volume / mix (see performance testing above).
Technique:	• Use tests developed for Performance Testing. • To test limited resources, tests should be run on single machine, RAM on server should be reduced (or limited). • For remaining stress tests, multiple clients should be used, either running the same tests or complementary tests to produce the worst case transaction volume / mix.
Completion Criteria:	All planned tests are executed and specified system limits are reached / exceeded without the software or

	software failing (or conditions under which system failure occurs is outside of the specified conditions).
Special Considerations:	• Stressing the network may require network tools to load the network with messages / packets. • The DASD used for the system should temporarily be reduced to restrict the available space for the database to grow. • Synchronization of the simultaneous clients accessing of the same records / data accounts.

5.9 Acceptance Testing

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 in parallel with the existing manual process for a period of one month after completion of the System/Integration test process.

Programs will enter into Acceptance test after all critical and major defects have been corrected. A program may have one major defect as long as it does not impede testing of the program. Prior to final completion of acceptance testing all open critical and major defects MUST be corrected and verified by the Customer test representative.

The purpose of this phase of testing is three fold: first, as a means of ensuring the quality of the system testing process (i.e. are the team members responsible for performing the system testing following the guidelines specified in the system testing test plan) and secondly, as a means of ensuring that the next release of the application has been sufficiently tested at the system level and thereby is "fit enough" to be placed into production. Lastly, the project sponsor will be given a final opportunity to use the system and determine whether or not the application will adequately meet IIT's Official needs.

The strategy employed for this phase can be summarized as follows:

- A risk assessment will be made of the Web site/application

- The test cases designed to detect/mitigate any of the “high” risk features or attributes of the Web site/application will be re-tested
- Since the QA department is relatively small and does not have the resources to conduct all the these tasks, the QA department will “borrow” staff and resources from the development and testing teams, these individuals will temporarily report to the head of QA and will not be assigned any portion of the system that they have previously been connected with
- Once the original set of “high” risk system tests have been validated (via the random re-testing),a decision will be made as to whether the discrepancies (if any) between the original results and the re-test results, indicate a failure in the system testing process. If the head of QA determines that the system process is operating in a less than optimal manner, then the head of QA will call a meeting of the project review board to discuss what actions should be taken to improve the situation
- The second assessment that the QA manager will make, based of the results of the original system testing and the re-test results, is as to whether or not this release meets or exceeds the previously agreed upon release criteria for placing this release of the application into production. In the event that this release does not meet those requirements, the QA manager will call a meeting of the project review board to discuss what actions should be taken as a result of this discovery
- Finally, the project sponsor (or representative of) will conduct ad-hoc testing to ensure that the application has realized the vision that the sponsor had wanted implemented. If the sponsor deems that this vision has not been met, then the sponsor will call a meeting of the project review board to discuss what actions should be taken as a result of this assessment.

5.10 Browser Compatibility Testing

Our product has been completed and so we also test browser compatibility. Here, we consider four browsers such as Mozilla Firefox, Google Chrome, IE 8, 9.0, 10.0, Safari. When we load IIT website into four browsers, IE7 reveal some different appearance.

Issue ID	Issue Title	Date	S & Brows	Issue Description	ubmitted B	Assigns	Severity	Priority
Column1	Column2	Column3	Column4	Column5	Column6	Column	Column	Column9
1	Site map menu Item has also shown in all page at first	4.12.13	Windows 7 & IE8	What actually come after clicking site map has merged with home page content, when any external menu	Shanto Rahman	PM	2	4
2	After clicking a menu item student, all divs alignment are not	4.12.13	Windows 7 & IE8	After clicking student menu item many divs are coming and Alignment of those divs are different	Shanto Rahman	PM	1	2
3	Each and every lines seems as	4.12.13	Windows 7 & Safari	When mouse hover over each div it appear like each line is a link	Shanto Rahman	PM	1	1
4	Button can not be loaded	4.12.13	Windows 7 & Safari & IE8	After clicking any divs such as BSSE, under all batch BSSE has appeared. Each Batch is within a button but IE8 & Safari can't load this button	Shanto Rahman	PM	1	2
5	Hover doesn't works in IE8	4.12.13	Windows 7	In news & event module, after appearing the images, when mouse has hovered on the image, it becomes large. But in IE8 no image has	Shanto Rahman	PM	2	1

6	Images not appeared	4.12.13	Windows 7 & IE8 & Safari, Google Chrome	When club menu item has clicked, each club item is stayed into a buton, but that button has not come, above each div only a cross sign has appeared.	Shanto Rah	PM	1	1
7	Images are not shown	4.12.13	Windows 7 & IE 8 & Safari, Mozilla Firefox	In contact page, bellow industrial Attachment different images of different industries has included. But images are not shown correctly in all browser.	Shanto Rah	PM	3	3
8	Icons are not correct	4.12.13	Windows 7 & IE8	In internal module, for all menu icons are not correctly loaded in IE8. They just appeared a rectangle shape or with two vertical line.	Shanto Rahman	PM	1	1
9	Ckeditor button correctly not shown	4.12.13	Windows 7 & IE8	In Ckeditor different types of buttons are existed with their shortcut name. But in IE8 no name of any button appeared. It just comes as a rectangle	Shanto Rahman	PM	2	2

10	Picture upload impossible	4.12.13	Windows 7	Through Edit profile item no picture can be uploaded.	Shanto Rahman	PM	3	3
11	Dates alignment	4.12.13	Windows 7 & IE8 & Google Chrome & Safari	All dates are not appeared in one row rather multiple rows	Shanto Rahman	PM	2	2
12	Create New Post Button in Group	04.12.13	Windows 7 & Firefox, Chrome, IE9.0,10.0,Safari	Button Extra large and not well positioned	Mostafijur Rahman Raju	PM	3	2
13	Post button not present in Group	04.12.13	Windows 7 & Firefox, Chrome, IE9.0,10.0,Safari	There should be a button to post in group but button not present	Mostafijur Rahman Raju	PM	2	3
14	Post and comments div missing in Group	04.12.13	Windows 7 & Firefox	comment div present in chrome, safari,IE but not in Firefox	Mostafijur Rahman Raju	PM	3	2
15	Add new book button in Books	04.12.13	Windows 7 & IE 10.0, Firefox	button's text left align in IE and Firefox but middle in Chrome,Safari	Mostafijur Rahman Raju	PM	1	5
16	Combobox of Select Course in Books	04.12.13	Windows 7 & IE 10.0	not appear appropriately in IE 10.0 but others appear correctly	Mostafijur Rahman Raju	PM	2	4

17	Add New Assignment button in Assignments	04.12.13	Windows 7 & IE 10.0, Firefox	Add New Assignment button's text left align in IE and Firefox but middle in Chrome,Safari	Mostafijur Rahman Raju	PM	2	5
18	Combobox of Select Course in Assignments	04.12.13	Windows 7 & IE 10.0	Combobox does not appear appropriately in IE 10.0 but others appear correctly	Mostafijur Rahman Raju	PM	2	4
19	Combobox of Status in Modify Project Popup	04.12.13	Windows 7 & IE 10.0	Combobox does not appear appropriately in IE 10.0 but others appear correctly	Mostafijur	PM	2	4
20	Combobox of Status in Modify Thesis Popup	04.12.13	Windows 7 & IE 10.0	Combobox does not appear appropriately in IE 10.0 but others appear correctly	Mostafijur Rahman Raju	PM	2	4
21	Download File Button does not work in Own Drive	04.12.13	Windows 7 & Firefox, Chrome, IE9.0,10.0,Safari	When you click on download button it does not hold appropriate action in any browser	Mostafijur Rahman Raju	PM	2	1

Fig11.0: Browser Compatibility Testing

Performance Testing:

We record different operation in website to test the performance of the website. We divide whole system into two part- External and Internal. All the test procedure and result is given below.

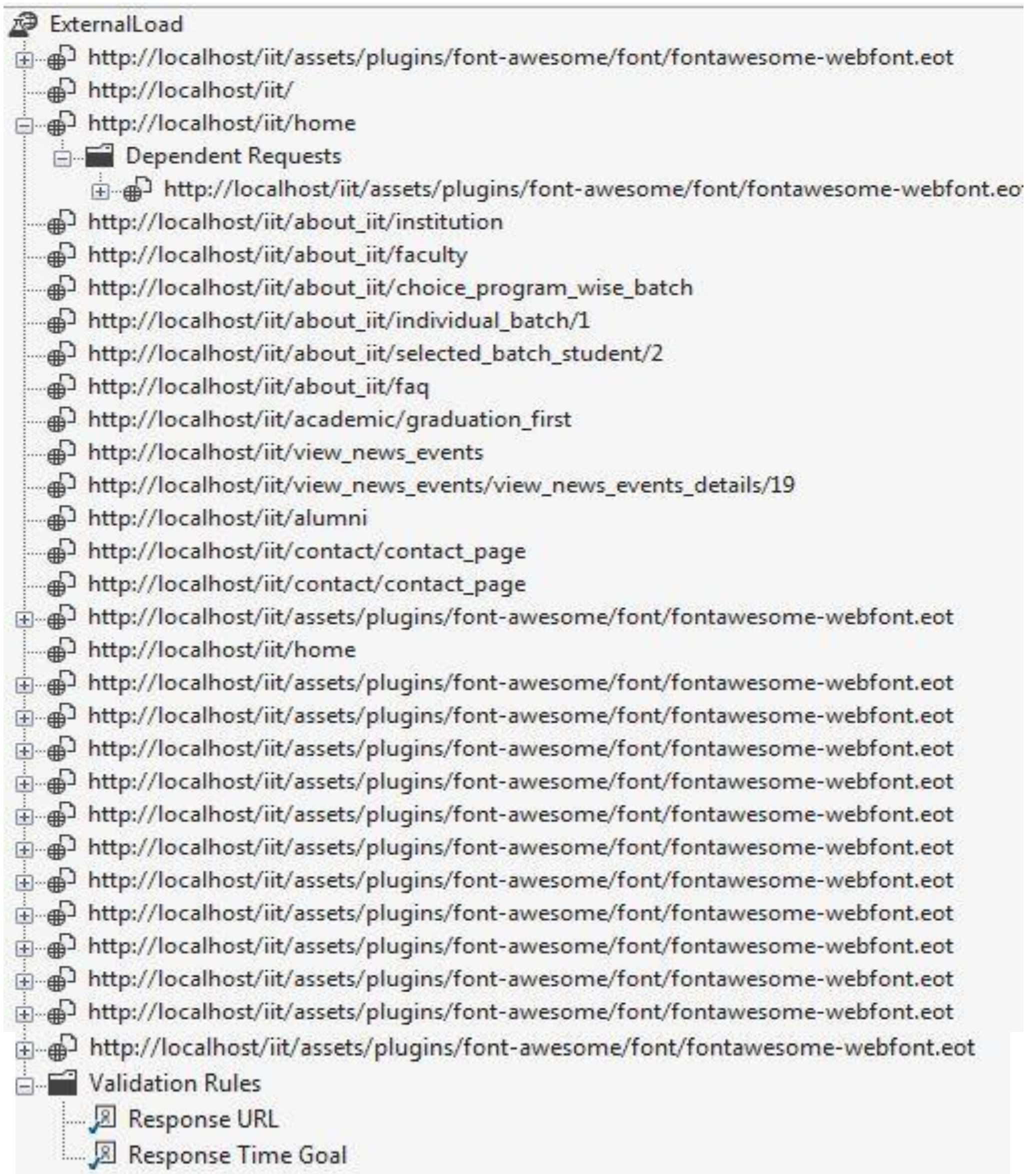


Fig12.0: Recordings of External

Request	Status	Total Time	Request Time	Request Bytes	Response Bytes
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	1.013 sec	1.013 sec	0	27,879
http://localhost/iit/	200 OK	1.151 sec	0.094 sec	0	5,433,996
http://localhost/iit/home	200 OK	0.336 sec	0.070 sec	0	5,461,875
http://localhost/iit/about_iit/institution	200 OK	0.291 sec	0.112 sec	0	2,910,809
http://localhost/iit/about_iit/faculty	200 OK	0.146 sec	0.074 sec	0	969,872
http://localhost/iit/about_iit/choice_program_wise_batch	200 OK	0.115 sec	0.066 sec	0	647,005
http://localhost/iit/about_iit/individual_batch/1	200 OK	0.173 sec	0.064 sec	0	646,890
http://localhost/iit/about_iit/selected_batch_student/2	200 OK	0.123 sec	0.062 sec	0	641,754
http://localhost/iit/about_iit/faq	200 OK	0.160 sec	0.081 sec	0	652,736
http://localhost/iit/academic/graduation_first	200 OK	0.119 sec	0.076 sec	0	642,984
http://localhost/iit/view_news_events	200 OK	0.397 sec	0.123 sec	0	755,137
http://localhost/iit/view_news_events/view_news_events_details/19	200 OK	0.133 sec	0.077 sec	0	756,316
http://localhost/iit/alumni	200 OK	0.115 sec	0.073 sec	0	642,366
http://localhost/iit/contact/contact_page	200 OK	12.327 sec	0.070 sec	0	677,912
http://localhost/iit/contact/contact_page	200 OK	12.333 sec	0.100 sec	0	677,912
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.004 sec	0.004 sec	0	27,879
http://localhost/iit/home	200 OK	0.285 sec	0.092 sec	0	5,433,996
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.002 sec	0.002 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879

Fig12.1: Performance Result of External System

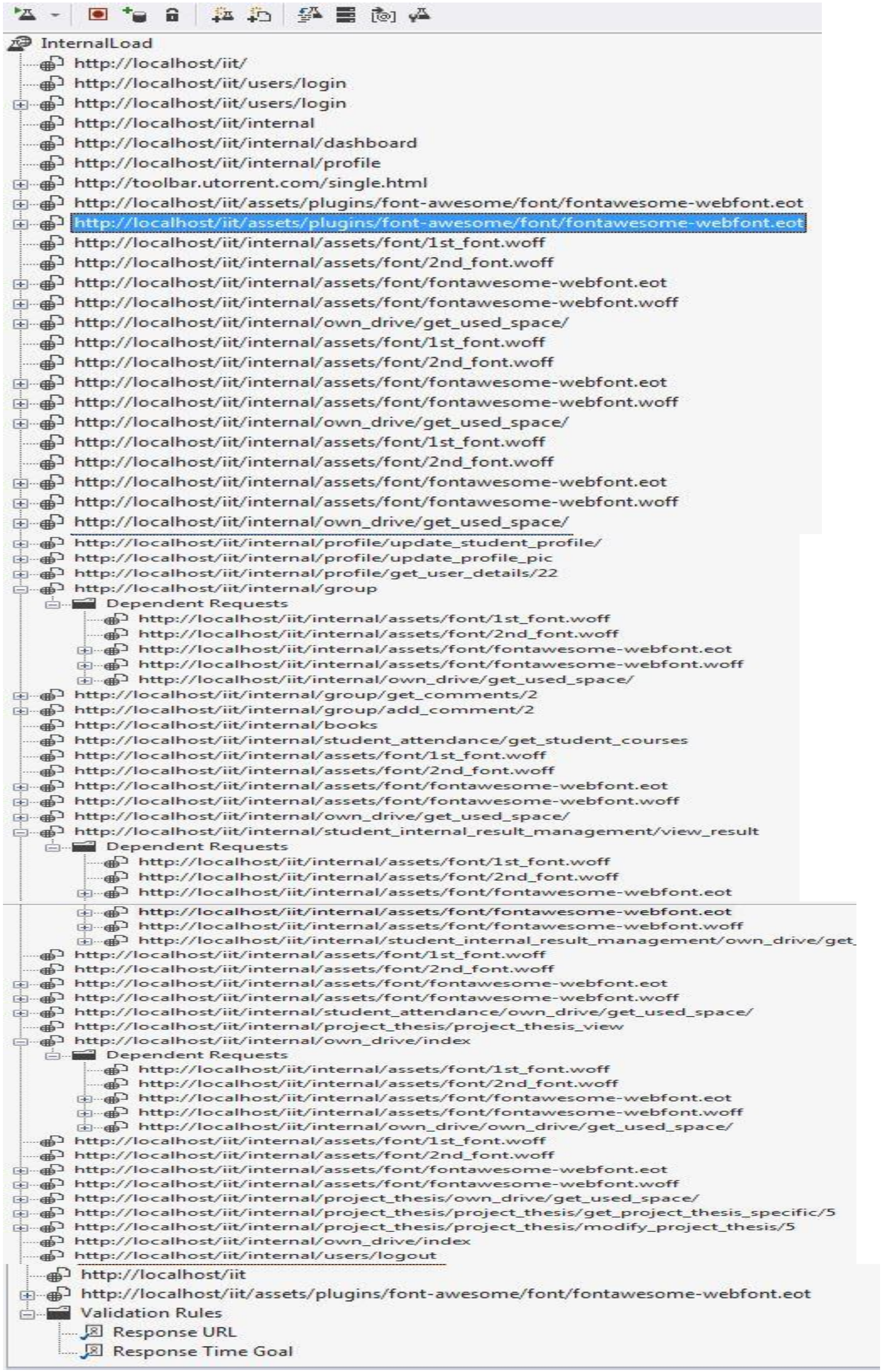
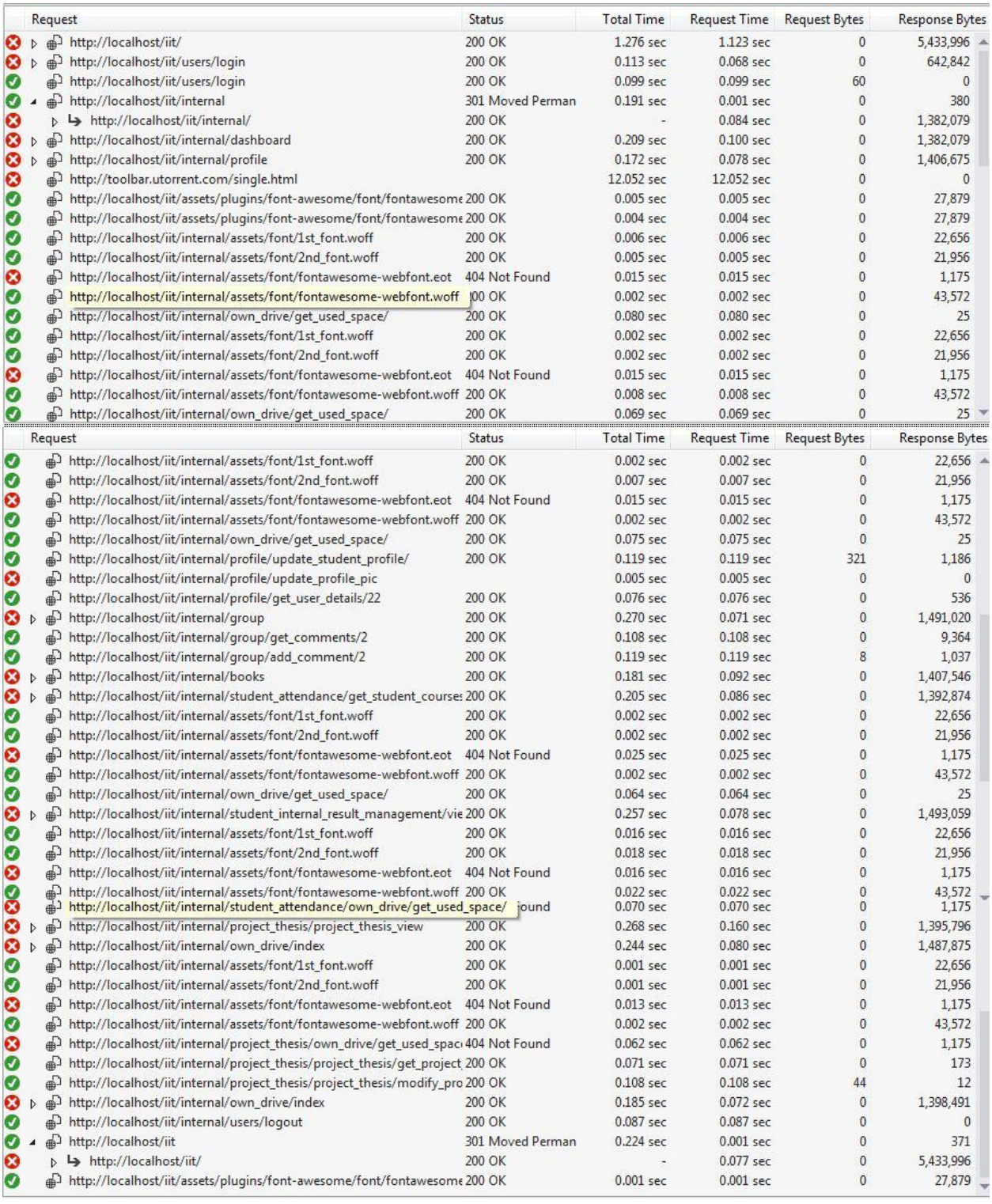


Fig12.2: Internal System



Request	Status	Total Time	Request Time	Request Bytes	Response Bytes
http://localhost/iit/	200 OK	1.276 sec	1.123 sec	0	5,433,996
http://localhost/iit/users/login	200 OK	0.113 sec	0.068 sec	0	642,842
http://localhost/iit/users/login	200 OK	0.099 sec	0.099 sec	60	0
http://localhost/iit/internal	301 Moved Perman	0.191 sec	0.001 sec	0	380
http://localhost/iit/internal/	200 OK	-	0.084 sec	0	1,382,079
http://localhost/iit/internal/dashboard	200 OK	0.209 sec	0.100 sec	0	1,382,079
http://localhost/iit/internal/profile	200 OK	0.172 sec	0.078 sec	0	1,406,675
http://toolbar.utorrent.com/single.html		12.052 sec	12.052 sec	0	0
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.005 sec	0.005 sec	0	27,879
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.004 sec	0.004 sec	0	27,879
http://localhost/iit/internal/assets/font/1st_font.woff	200 OK	0.006 sec	0.006 sec	0	22,656
http://localhost/iit/internal/assets/font/2nd_font.woff	200 OK	0.005 sec	0.005 sec	0	21,956
http://localhost/iit/internal/assets/font/fontawesome-webfont.eot	404 Not Found	0.015 sec	0.015 sec	0	1,175
http://localhost/iit/internal/assets/font/fontawesome-webfont.woff	200 OK	0.002 sec	0.002 sec	0	43,572
http://localhost/iit/internal/own_drive/get_used_space/	200 OK	0.080 sec	0.080 sec	0	25
http://localhost/iit/internal/assets/font/1st_font.woff	200 OK	0.002 sec	0.002 sec	0	22,656
http://localhost/iit/internal/assets/font/2nd_font.woff	200 OK	0.002 sec	0.002 sec	0	21,956
http://localhost/iit/internal/assets/font/fontawesome-webfont.eot	404 Not Found	0.015 sec	0.015 sec	0	1,175
http://localhost/iit/internal/assets/font/fontawesome-webfont.woff	200 OK	0.008 sec	0.008 sec	0	43,572
http://localhost/iit/internal/own_drive/get_used_space/	200 OK	0.069 sec	0.069 sec	0	25

Request	Status	Total Time	Request Time	Request Bytes	Response Bytes
http://localhost/iit/internal/assets/font/1st_font.woff	200 OK	0.002 sec	0.002 sec	0	22,656
http://localhost/iit/internal/assets/font/2nd_font.woff	200 OK	0.007 sec	0.007 sec	0	21,956
http://localhost/iit/internal/assets/font/fontawesome-webfont.eot	404 Not Found	0.015 sec	0.015 sec	0	1,175
http://localhost/iit/internal/assets/font/fontawesome-webfont.woff	200 OK	0.002 sec	0.002 sec	0	43,572
http://localhost/iit/internal/own_drive/get_used_space/	200 OK	0.075 sec	0.075 sec	0	25
http://localhost/iit/internal/profile/update_student_profile/	200 OK	0.119 sec	0.119 sec	321	1,186
http://localhost/iit/internal/profile/update_profile_pic		0.005 sec	0.005 sec	0	0
http://localhost/iit/internal/profile/get_user_details/22	200 OK	0.076 sec	0.076 sec	0	536
http://localhost/iit/internal/group	200 OK	0.270 sec	0.071 sec	0	1,491,020
http://localhost/iit/internal/group/get_comments/2	200 OK	0.108 sec	0.108 sec	0	9,364
http://localhost/iit/internal/group/add_comment/2	200 OK	0.119 sec	0.119 sec	8	1,037
http://localhost/iit/internal/books	200 OK	0.181 sec	0.092 sec	0	1,407,546
http://localhost/iit/internal/student_attendance/get_student_course	200 OK	0.205 sec	0.086 sec	0	1,392,874
http://localhost/iit/internal/assets/font/1st_font.woff	200 OK	0.002 sec	0.002 sec	0	22,656
http://localhost/iit/internal/assets/font/2nd_font.woff	200 OK	0.002 sec	0.002 sec	0	21,956
http://localhost/iit/internal/assets/font/fontawesome-webfont.eot	404 Not Found	0.025 sec	0.025 sec	0	1,175
http://localhost/iit/internal/assets/font/fontawesome-webfont.woff	200 OK	0.002 sec	0.002 sec	0	43,572
http://localhost/iit/internal/own_drive/get_used_space/	200 OK	0.064 sec	0.064 sec	0	25
http://localhost/iit/internal/student_internal_result_management/vie	200 OK	0.257 sec	0.078 sec	0	1,493,059
http://localhost/iit/internal/assets/font/1st_font.woff	200 OK	0.016 sec	0.016 sec	0	22,656
http://localhost/iit/internal/assets/font/2nd_font.woff	200 OK	0.018 sec	0.018 sec	0	21,956
http://localhost/iit/internal/assets/font/fontawesome-webfont.eot	404 Not Found	0.016 sec	0.016 sec	0	1,175
http://localhost/iit/internal/assets/font/fontawesome-webfont.woff	200 OK	0.022 sec	0.022 sec	0	43,572
http://localhost/iit/internal/student_attendance/own_drive/get_used_space/	ound	0.070 sec	0.070 sec	0	1,175
http://localhost/iit/internal/project_thesis/project_thesis_view	200 OK	0.268 sec	0.160 sec	0	1,395,796
http://localhost/iit/internal/own_drive/index	200 OK	0.244 sec	0.080 sec	0	1,487,875
http://localhost/iit/internal/assets/font/1st_font.woff	200 OK	0.001 sec	0.001 sec	0	22,656
http://localhost/iit/internal/assets/font/2nd_font.woff	200 OK	0.001 sec	0.001 sec	0	21,956
http://localhost/iit/internal/assets/font/fontawesome-webfont.eot	404 Not Found	0.013 sec	0.013 sec	0	1,175
http://localhost/iit/internal/assets/font/fontawesome-webfont.woff	200 OK	0.002 sec	0.002 sec	0	43,572
http://localhost/iit/internal/project_thesis/own_drive/get_used_spac	404 Not Found	0.062 sec	0.062 sec	0	1,175
http://localhost/iit/internal/project_thesis/project_thesis/get_project	200 OK	0.071 sec	0.071 sec	0	173
http://localhost/iit/internal/project_thesis/project_thesis/modify_pro	200 OK	0.108 sec	0.108 sec	44	12
http://localhost/iit/internal/own_drive/index	200 OK	0.185 sec	0.072 sec	0	1,398,491
http://localhost/iit/internal/users/logout	200 OK	0.087 sec	0.087 sec	0	0
http://localhost/iit	301 Moved Perman	0.224 sec	0.001 sec	0	371
http://localhost/iit/	200 OK	-	0.077 sec	0	5,433,996
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome	200 OK	0.001 sec	0.001 sec	0	27,879

Fig12.3: Internal System Performance

Load Test:

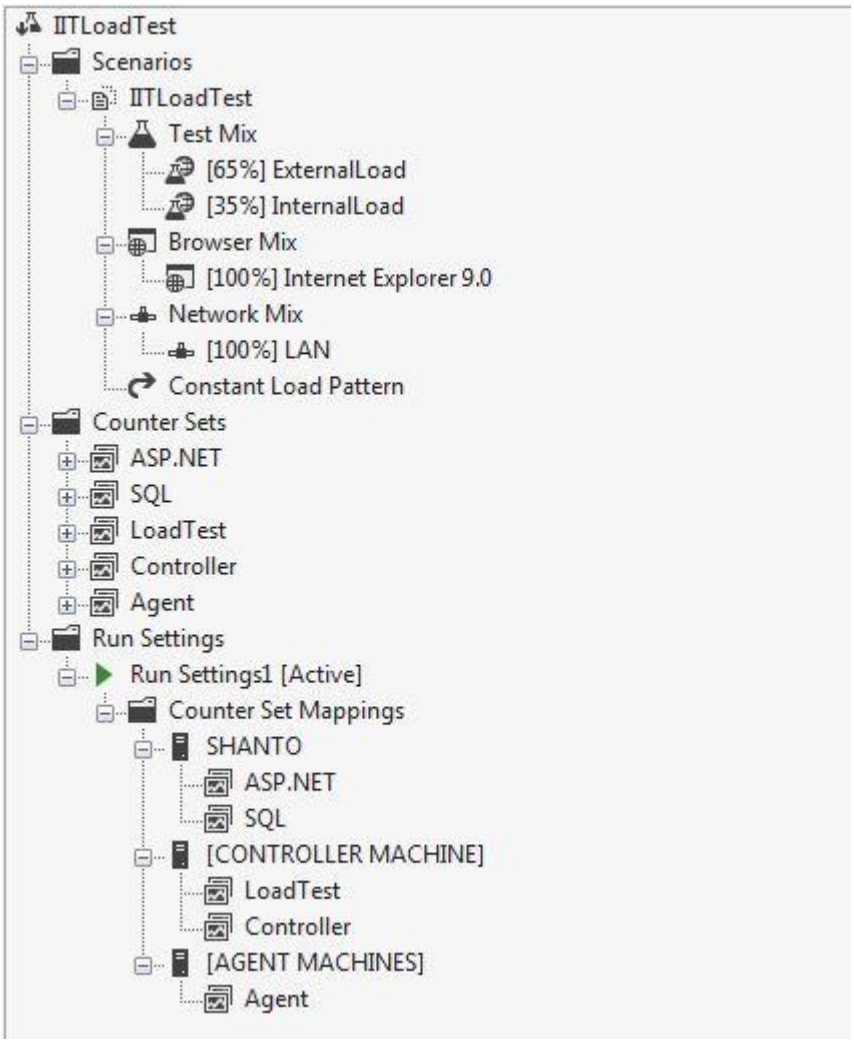


Fig13.0: Load Test

Load Test Result:

Test Run Information

Load test name	IITLoadTest
Description	
Start time	12/3/2013 12:21:28 PM
End time	12/3/2013 12:22:28 PM
Warm-up duration	00:00:00
Duration	00:01:00
Controller	Local run
Number of agents	1
Run settings used	Run Settings1

Fig13.1: Load Test Result

Key Statistic: Top 5 Slowest Pages

URL (Link to More Details)	95% Page Time (sec)
http://localhost/iit/contact/contact_pag...	12.5
http://toolbar.utorrent.com/single.html	12.0
http://localhost/iit/	4.46
http://localhost/iit/assets/plugins/font...	3.20
http://localhost/iit/internal/profile	1.25

Key Statistic: Top 5 Slowest Tests

Name	Avg. Test Time (sec)
InternalLoad	0
ExternalLoad	0

Overall Results

Max User Load	10
Tests/Sec	0
Tests Failed	0
Avg. Test Time (sec)	0
Transactions/Sec	0
Avg. Transaction Time (sec)	0
Pages/Sec	3.12
Avg. Page Time (sec)	0.73
Requests/Sec	78.9
Requests Failed	319
Requests Cached Percentage	39.1
Avg. Response Time (sec)	0.048
Avg. Content Length (bytes)	15,153

Fig13.2: Load Test

Test Results

Name	Scenario	Total Tests	Failed Tests (% of total)	Avg. Test Time (sec)
InternalLoad	IITLoadTest	0	0 (0)	0
ExternalLoad	IITLoadTest	0	0 (0)	0

Fig13.3: Load Test

▾ **Page Results**

URL (Link to More Details)	Scenario	Test	Avg. Page Time (sec)	Count
http://localhost/iit/contact/contact_page {GET}	IITLoadTest	ExternalLoad	12.4	2
http://toolbar.utorrent.com/single.html	IITLoadTest	InternalLoad	12.0	5
http://localhost/iit/	IITLoadTest	InternalLoad	3.74	5
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome-webfont.eot	IITLoadTest	ExternalLoad	1.55	5
http://localhost/iit/internal/dashboard	IITLoadTest	InternalLoad	0.79	5
http://localhost/iit/internal	IITLoadTest	InternalLoad	0.78	5
http://localhost/iit/internal/profile	IITLoadTest	InternalLoad	0.70	5
http://localhost/iit/	IITLoadTest	ExternalLoad	0.33	5
http://localhost/iit/users/login {GET}	IITLoadTest	InternalLoad	0.27	5
http://localhost/iit/users/login {POST}	IITLoadTest	InternalLoad	0.23	5
http://localhost/iit/home	IITLoadTest	ExternalLoad	0.19	5
http://localhost/iit/about_iit/individual_batch/1	IITLoadTest	ExternalLoad	0.19	5
http://localhost/iit/view_news_events	IITLoadTest	ExternalLoad	0.18	5
http://localhost/iit/about_iit/institution	IITLoadTest	ExternalLoad	0.14	5
http://localhost/iit/about_iit/faq	IITLoadTest	ExternalLoad	0.14	5
http://localhost/iit/view_news_events/view_news_events_details/19	IITLoadTest	ExternalLoad	0.14	5
http://localhost/iit/academic/graduation_first	IITLoadTest	ExternalLoad	0.13	5
http://localhost/iit/about_iit/selected_batch_student/2	IITLoadTest	ExternalLoad	0.11	5
http://localhost/iit/alumni	IITLoadTest	ExternalLoad	0.11	5
http://localhost/iit/about_iit/choice_program_wise_batch	IITLoadTest	ExternalLoad	0.11	5
http://localhost/iit/about_iit/faculty	IITLoadTest	ExternalLoad	0.11	5
http://localhost/iit/internal/own_drive/get_used_space/	IITLoadTest	InternalLoad	0.081	15
http://localhost/iit/internal/assets/font/fontawesome-webfont.eot	IITLoadTest	InternalLoad	0.019	15
http://localhost/iit/internal/assets/font/1st_font.woff	IITLoadTest	InternalLoad	0.0079	15
http://localhost/iit/assets/plugins/font-awesome/font/fontawesome-webfont.eot	IITLoadTest	InternalLoad	0.0031	10
http://localhost/iit/internal/assets/font/fontawesome-webfont.woff	IITLoadTest	InternalLoad	0.0026	15
http://localhost/iit/internal/assets/font/2nd_font.woff	IITLoadTest	InternalLoad	0.0023	15

Fig13.4: Load Test

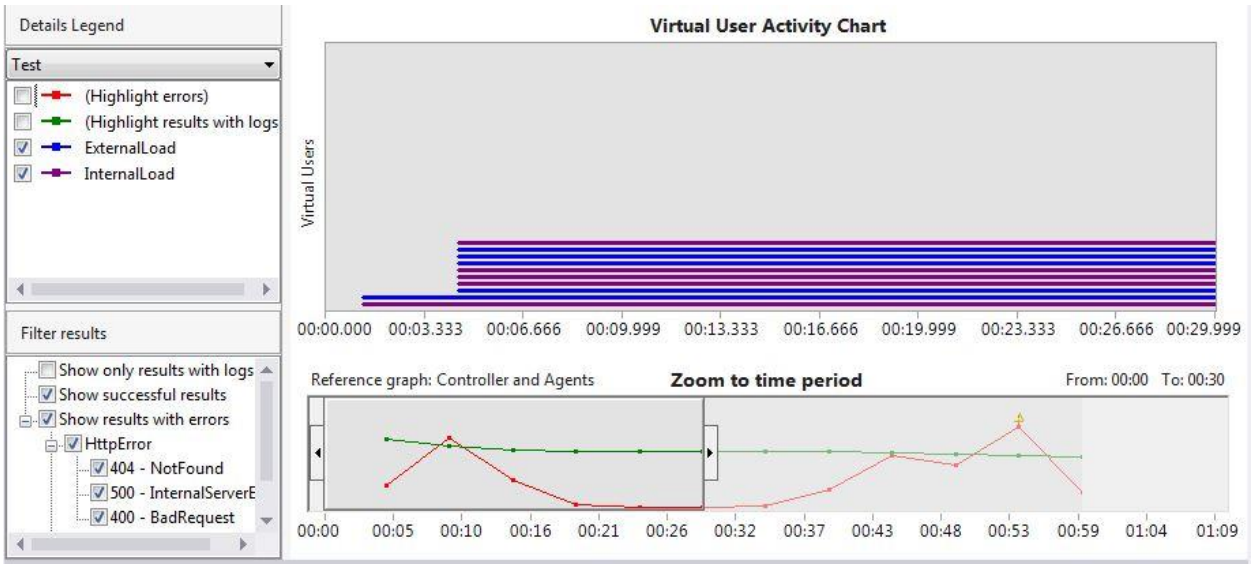
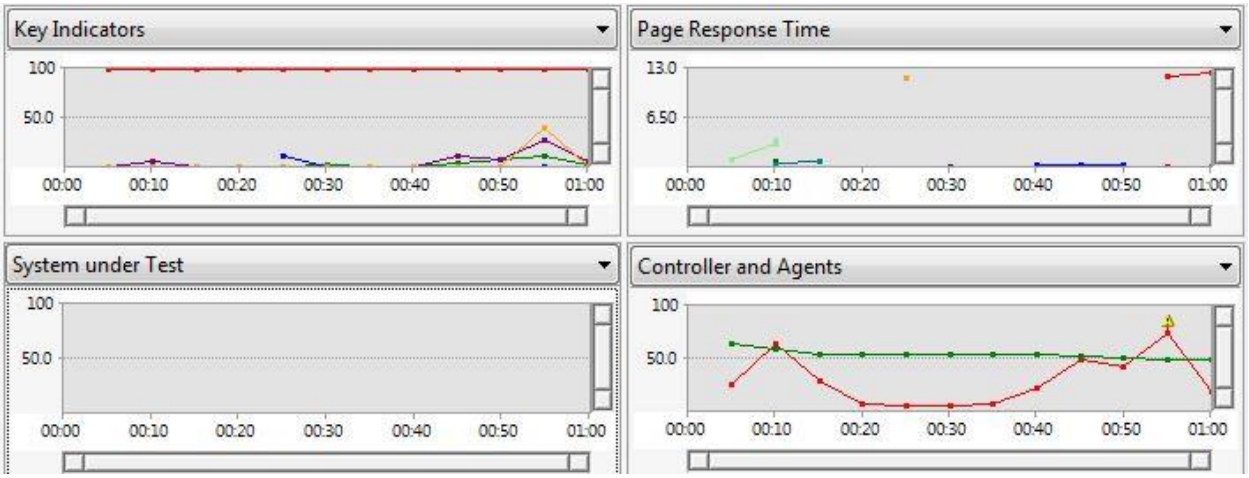
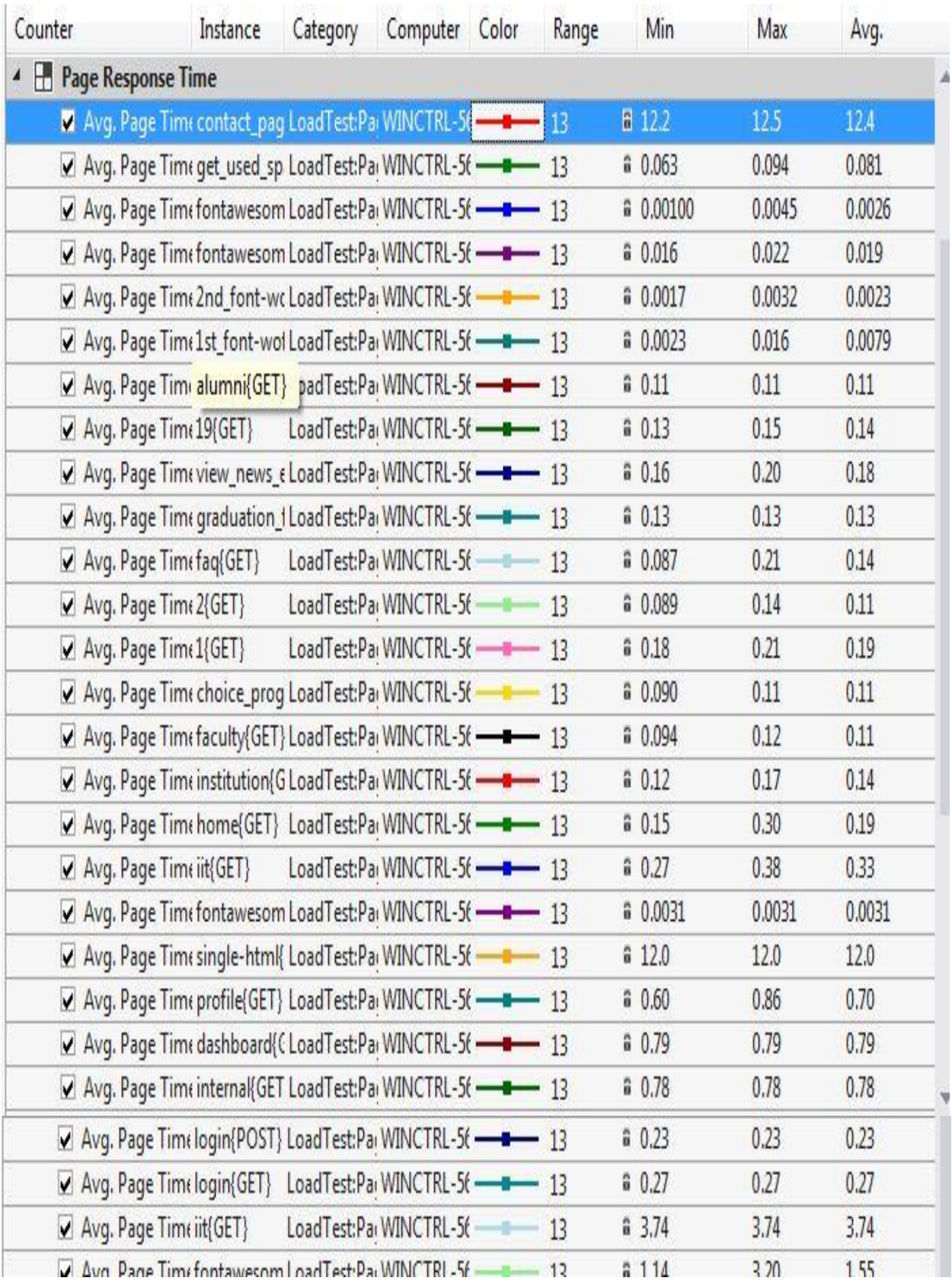


Fig13.5: Load Test

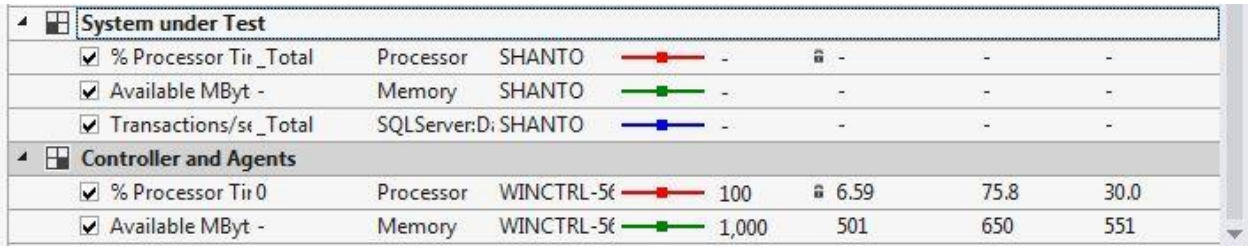


Counter	Instance	Category	Computer	Color	Range	Min	Max	Avg.
Key Indicators								
User Load	_Total	LoadTest:Sc	WINCTRL-5(		10	10	10	10
Pages/Sec	_Total	LoadTest:Pa	WINCTRL-5(		100	0	11.0	3.12
Avg. Page Time	_Total	LoadTest:Pa	WINCTRL-5(		100	0.0031	12.0	0.73
Errors/Sec	_Total	LoadTest:Err	WINCTRL-5(		100	0	28.2	5.32
Threshold Viola	_Total	LoadTest:Err	WINCTRL-5(		1	0	0.40	0.033

Fig13.6: Load Test



Counter	Instance	Category	Computer	Color	Range	Min	Max	Avg.
Page Response Time								
Avg. Page Time	contact_pag	LoadTest:Pa	WINCTRL-5(		13	12.2	12.5	12.4
Avg. Page Time	get_used_sp	LoadTest:Pa	WINCTRL-5(		13	0.063	0.094	0.081
Avg. Page Time	fontawesom	LoadTest:Pa	WINCTRL-5(		13	0.00100	0.0045	0.0026
Avg. Page Time	fontawesom	LoadTest:Pa	WINCTRL-5(		13	0.016	0.022	0.019
Avg. Page Time	2nd_font-wc	LoadTest:Pa	WINCTRL-5(		13	0.0017	0.0032	0.0023
Avg. Page Time	1st_font-wo	LoadTest:Pa	WINCTRL-5(		13	0.0023	0.016	0.0079
Avg. Page Time	alumni{GET}	padTest:Pa	WINCTRL-5(		13	0.11	0.11	0.11
Avg. Page Time	19{GET}	LoadTest:Pa	WINCTRL-5(		13	0.13	0.15	0.14
Avg. Page Time	view_news_	LoadTest:Pa	WINCTRL-5(		13	0.16	0.20	0.18
Avg. Page Time	graduation_	LoadTest:Pa	WINCTRL-5(		13	0.13	0.13	0.13
Avg. Page Time	faq{GET}	LoadTest:Pa	WINCTRL-5(		13	0.087	0.21	0.14
Avg. Page Time	2{GET}	LoadTest:Pa	WINCTRL-5(		13	0.089	0.14	0.11
Avg. Page Time	1{GET}	LoadTest:Pa	WINCTRL-5(		13	0.18	0.21	0.19
Avg. Page Time	choice_prog	LoadTest:Pa	WINCTRL-5(		13	0.090	0.11	0.11
Avg. Page Time	faculty{GET}	LoadTest:Pa	WINCTRL-5(		13	0.094	0.12	0.11
Avg. Page Time	institution{G	LoadTest:Pa	WINCTRL-5(		13	0.12	0.17	0.14
Avg. Page Time	home{GET}	LoadTest:Pa	WINCTRL-5(		13	0.15	0.30	0.19
Avg. Page Time	iit{GET}	LoadTest:Pa	WINCTRL-5(		13	0.27	0.38	0.33
Avg. Page Time	fontawesom	LoadTest:Pa	WINCTRL-5(		13	0.0031	0.0031	0.0031
Avg. Page Time	single-html{	LoadTest:Pa	WINCTRL-5(		13	12.0	12.0	12.0
Avg. Page Time	profile{GET}	LoadTest:Pa	WINCTRL-5(		13	0.60	0.86	0.70
Avg. Page Time	dashboard{(	LoadTest:Pa	WINCTRL-5(		13	0.79	0.79	0.79
Avg. Page Time	internal{GET	LoadTest:Pa	WINCTRL-5(		13	0.78	0.78	0.78
Avg. Page Time	login{POST}	LoadTest:Pa	WINCTRL-5(		13	0.23	0.23	0.23
Avg. Page Time	login{GET}	LoadTest:Pa	WINCTRL-5(		13	0.27	0.27	0.27
Avg. Page Time	iit{GET}	LoadTest:Pa	WINCTRL-5(		13	3.74	3.74	3.74
Avg. Page Time	fontawesom	LoadTest:Pa	WINCTRL-5(		13	1.14	3.20	1.55



System under Test							
% Processor Ti _Total	Processor	SHANTO	-	-	-	-	
Available MByt -	Memory	SHANTO	-	-	-	-	
Transactions/s _Total	SQLServer:D	SHANTO	-	-	-	-	
Controller and Agents							
% Processor Ti 0	Processor	WINCTRL-5	100	6.59	75.8	30.0	
Available MByt -	Memory	WINCTRL-5	1,000	501	650	551	

Fig13.7: Load Test

Security Tests:

- Security is not good. Because without authentication, if any one copies a url then he/she can enter that page and are able to perform any kinds of operation.
- SQL Injection is possible because all queries are directly affected to the database.

5.11 Mind Map Representation

Some test results are presented in mind map. IIT WebSite.mm

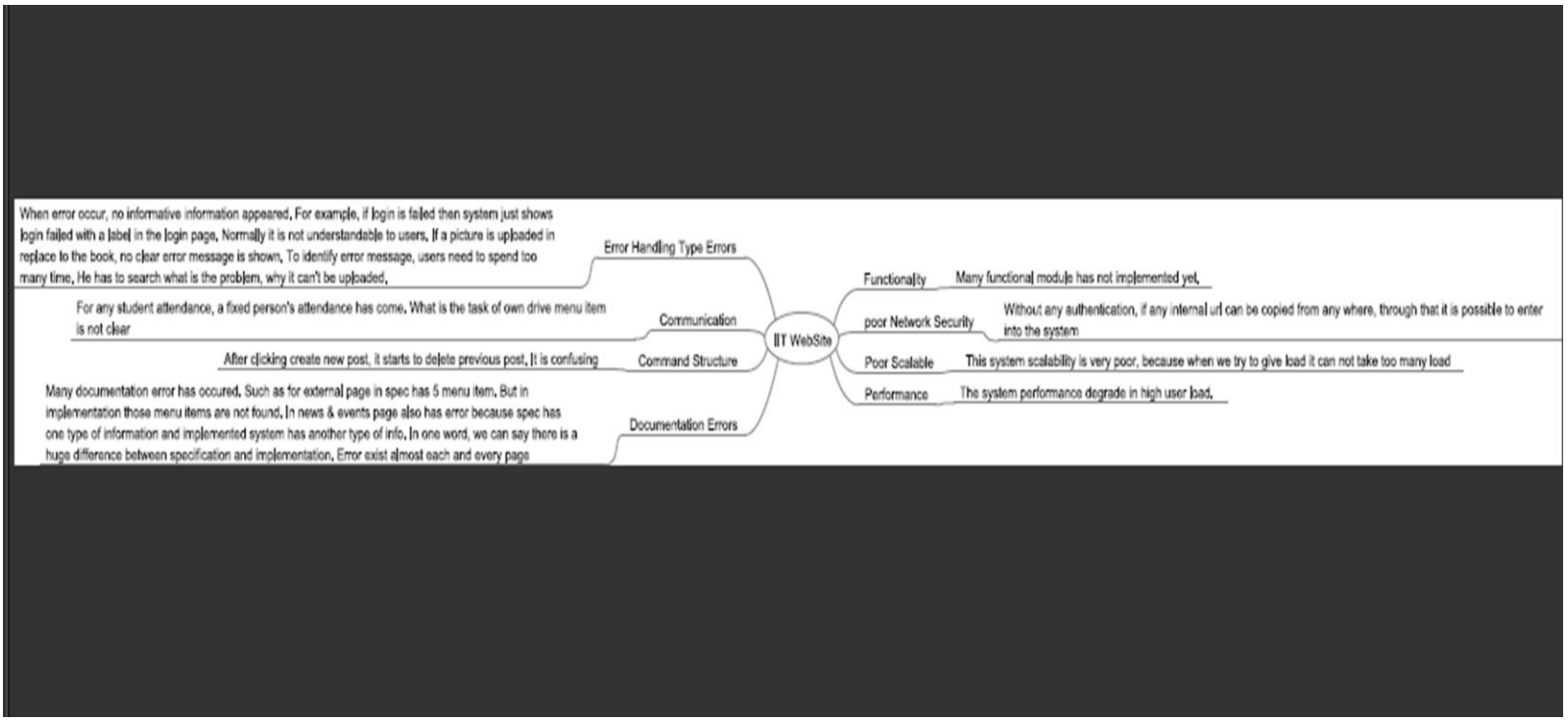


Fig14.0: Testing in mind map

6.0 Pass/ Fail Criteria

The test process will be completed once the initial set of distributors have successfully sent in different modules of IIT Official Web-Site for a period of one month and the new form data with the old manual data received in parallel. When the sales administration staff is satisfied that the data is correct the initial set of distributors will be set to active and all parallel stopped for those accounts.

At this point the next set of distributors will begin the parallel process, if not already doing so.

Only the initial set of distributors must pass the data comparison test to complete the testing, at that point the application is considered live. All additional activations will be on an as ready basis. When a distributor is ready, and their data is verified, they will then also be activated.

7.0 Suspension Criteria and Resumption Requirements

Suspension criteria specify the criteria to be used to suspend all or a portion of the testing activities while resumption criteria specify when testing can resume after it has been suspended.

7.1 Suspension Criteria

The Association Services are a prerequisite to the operation of all of the Services Classes and must operate successfully in order for testing of any of the Service Classes to proceed. Should any of the Association Services primitives not perform as predicted, then the tests for interconnectivity shall be suspended.

The CT Storage Services Class will be tested. Should the testing within the Service Class not perform as predicted, then the testing shall be suspended.

- No Distributors are ready for testing at pilot initiation.
  - The pilot project will be delayed until at least three Distributors are ready to initiate the pilot process.
  - No additional elements will be added to the Reassigned Sales project during this delay.

7.2 Resumption Requirements

Testing of the Association will resume from the beginning when the reasons for suspension of testing have been determined, have been corrected, and new versions of the Application Entities have been submitted to the testing group.

Testing within the Service Class will resume from the beginning of testing for that Service Class when the reasons for suspension of testing have been determined and new versions of the Application Entity in question have been submitted to the testing group.

8.0 Test Deliverables

The deliverables of the test activities as defined in this Test Plan are outlined in the table below.

Note that some of these deliverables are produced multiple times; once for each test cycle or iteration. Other deliverables, such as the Test Plan, are updated each development iteration.

Deliverables	Owner	Review / Distribution	Due Date
Test Plan	IIT, DU	Senior Project Management Team	
Test Environment	IIT, DU	-	
Test Suite	IIT, DU	Internal Peer Review	
Test Data Sets	IIT, DU	Internal Peer Review	
Test Scripts	IIT, DU	Internal Peer Review	
Test Defect Reports	IIT, DU	Senior Project Management Team	
Test Results	IIT, DU	Test Manager	
Test Evaluation Report	IIT, DU	Senior Project Management Team	

Fig15.0: Test Deliverable

9.0 Remaining Test Tasks

Task	Assigned To	Status
Create Acceptance Test Plan	TM, PM, Client	
Create System/Integration Test Plan	TM, PM, Dev.	
Verify prototypes of Screens	Dev., Client, TM	
Verify prototypes of Reports	Dev., Client, TM	

Fig16.0: Remaining Tasks

10.0 Staffing and Training needs

Test designs assume a thorough and complete knowledge of the operation of both systems under test as well as knowledge of the primary service tools and their appropriate operation.

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 User interface. Prior to final acceptance of the project the operations staff will also require complete training on the communications process.
- 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 PC based use interface. The distributors personnel will also have to be trained on the PC based package and its operational characteristics.

11.0 Environmental Needs

Testing environment is a setup of software and hardware on which testing team is going to perform the testing of the newly built software product. This setup may consist of the physical setup which includes hardware and logical setup that includes Server Operating System, client operating system, database server, browser required to run this software product.

11.1 Hardware and Software

The following represent the essential hardware and software needs for testing the IIT Official Website:

Resources	Name/Type/Serial No
IITDU Server	Serial No: IIT01
Database Server	Version Id: IITDB-16
Mail Server	<TBD>
IIT Official Website	Version Id: IITOWS-02
Client Test PC's	

15 Remote PCs (with internet access)	Serial No: L40612 Serial No: L40618 Serial No: L40621 <7 TBD>
5 Local PCs (connected via LAN)	Serial No: L40267 Serial No: L40624(IT Lab) Serial No: L40640(IT Lab) Serial No: L20344 (Faculty Office) 1 <TBD>
Test Repository	
IITDU Server	Serial No: IIT01
Test Development PC's - 5	Serial No: L40621 4 <TBD>
Load Simulator	Serial No: IIT-123

Fig17.0: Test Deliverables

- At least Pentium IV processor and TCP/IP network.
- Each test site must be equipped with a telephone.

External web server was utilized for testing after normal working hours. The server was connected via 10Base5 coaxial cable to a Cabletron Mini-MMAC configured as a bridge. The Cabletron unit was connected via multi-mode optical fiber to a port on a Cisco router. This router is part of the campus backbone of the Institute of Information Technology, University of Dhaka. The network connecting the devices under test experienced representative of the university network traffic during the testing period.

11.2 Testing Tools

The following tools will be employed for testing of the system:

Tools	Version
Selenium	<TBD>
Free Mind	<TBD>
Browsers	
Google Chrome	<TBD>
Mozilla Firefox	<TBD>
IE	Version: 10.0, 9.0, 8.0, 7.0
IETester	<TBD>
Testlink	Version 1.8
Mantis	<TBD>
Visual Studio	Version 2012
SQL Server	Version 2008 R2
Microsoft Office	Version 2010
MySQL Server	<TBD>

Fig18.0: Testing Tools

12.0 Responsibilities

Task	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

Fig19.0: Responsibilities

- The development team leader will be responsible for the verification and acceptance of all unit test plans and documentation.
- The project manager/test manager is responsible for all test plans and documentation.
- The entire project team will participate in the review of the system and detail designs as well as review of any change requests that are generated by the user or as a result of defects discovered during development and testing.
- The sales administration staff is also required to participate in the initial high-level system review.
- The sales administration staff will provide a person, as required, throughout the project to verify test results and answer questions as they arise. This person will also be responsible for participating in the execution of the acceptance test plan.

13.0 Schedules

Milestone Task	Effort (pd)	Start Date	End Date
Iteration C1: Beta Release Test Planning Test Design Test Development Test Execution Test Evaluation	TBD	10th November	5th December
Iteration C2: R1.0 Release Test Planning Test Design Test Development Test Execution Test Evaluation	TBD	6th December	31st December

Fig20: Table- Testing Schedule

Time has been allocated within the project plan for the following testing activities.

- Review of Requirements document by test team personnel (with other team members) and initial creation of Inventory classes, sub-classes and objectives.
- Development of test plan by test manager and test with time allocated for at least two reviews of the plan.
- Review of the System design document by test team personnel. This will provide the team with a clearer understanding of the application structure and will further define the Inventory classes, sub-classes and objectives.

- Development of System/Integration and Acceptance test plans by test manager and other essential personnel with time allocated for at least two reviews of the plans.
- Review of the Detail design document(s) by test team personnel as required. This will provide the team with a clearer understanding of the individual program structure and will further define the Inventory classes, sub-classes and objectives.
- Unit test time within the development process.
- Time allocated for both System/Integration and Acceptance test processes.

14.0 Software Risk Analysis

Risks are future uncertain events with a probability of occurrence and a potential for loss. Risk identification and management are the main concerns in every software project. Effective analysis of software risks will help to effective planning and assignments of work. Software risk is that which threatens to meet our daily need. For analyzing risk, we have performed some steps which we mention bellow. We have formed a brainstorming team which team basically tries to gather as much information as possible.

14.1 Cyclometic Complexity, Halstead Metrics and LOC

Bellow we have considered a code which is taken on project_thesis_view module:

```
<?php
                    $project_counter=0;
if (count($project_thesis) == 0) {
echo '<li><span class="blue">No Data Found</span></li>';
}
foreach ($project_thesis as $row1) {
if ($row1->type == 'project' && $row1->user_id == '22') {
                        $project_counter++;
echo '    <a href="#" class="dropdown-toggle">';
echo $row1->title;
echo $row1->status;
```

```
echo '                  <button name="project_thesis_view_project_thesis_details" class="btnbtn-small btn-warning"  id="' . $row1->project_thesis_id . '">View Details </button>';

echo '            <button name="project_thesis_modify_project_thesis" class="btnbtn-small btn-warning"  id="' . $row1->project_thesis_id . '">

                Modify Project

</button>';

echo '        <b class="arrow icon-angle-down"></b>';

echo '    </a>';

echo '        <ul class="submenu">';

foreach ($project_thesis_files as $row2) {

if ($row1->project_thesis_id == $row2->project_thesis_id) {

echo '<li>';

<i class="icon-download-alt"></i>Download

echo '<b class="arrow icon-angle-down"></b>';

echo '</a>';

echo '</li>'

        }

     }

echo '</ul>';

echo '</li>';

       }

   }

if ($project_counter == 0) {

echo '<li><span class="blue">No Project Found</span></li>';

   } ?>
```

Fig21.0: Source code of project thesis

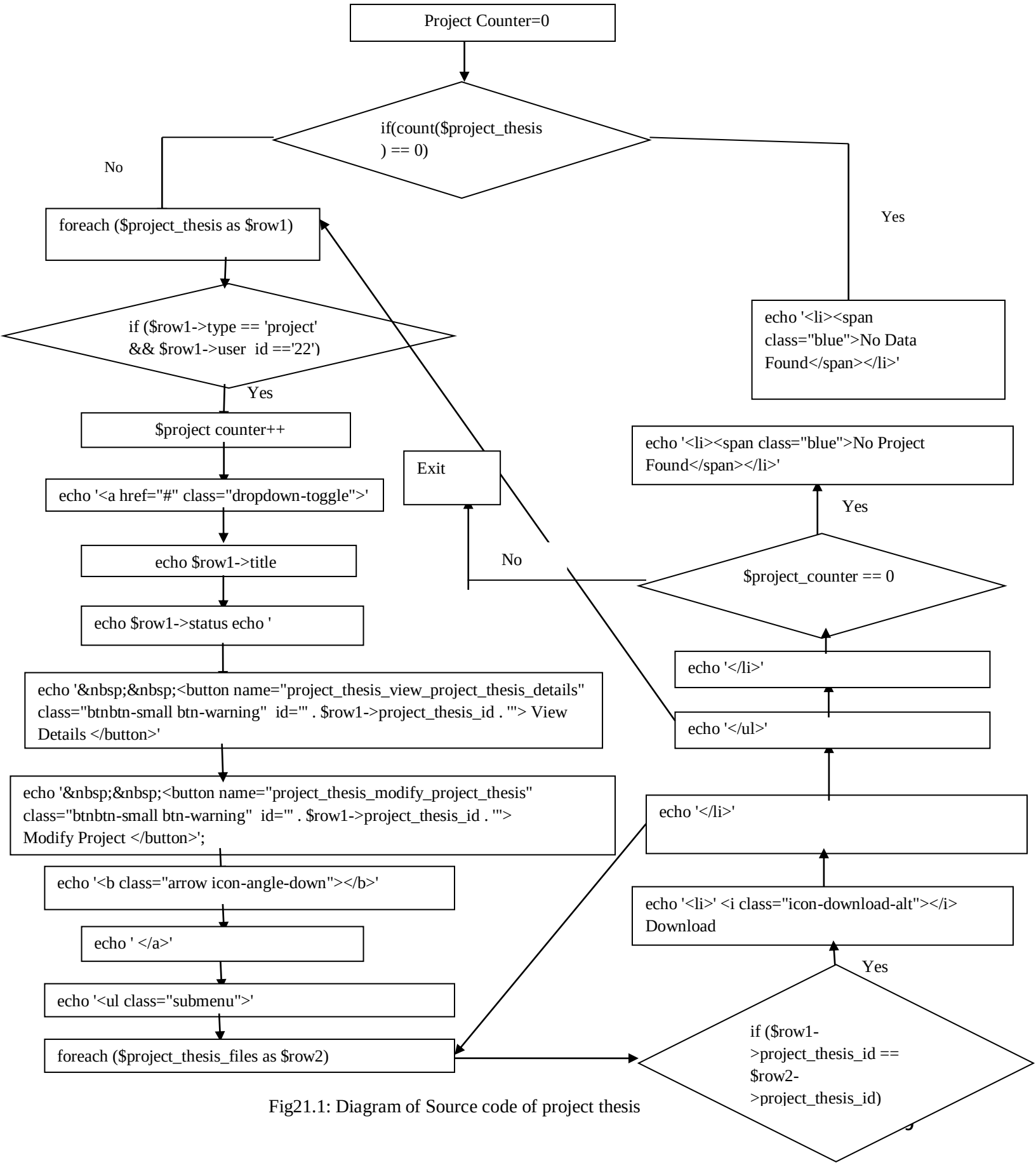


Fig21.1: Diagram of Source code of project thesis

Now we will calculate the Cyclometic Complexity of above diagram.

Number of Node=22

Number of Edges=24

As we know, Cyclometic Complexity=Edges-Nodes+2=24-22+2=4

Halstead Metrics:

	unique operators	Count	unique operands	Count
1	=	3	0	3
2	==	5	$project_thesis	3
3	&&	1	$row1	8
4	++	1	type	1
5	->	8	'Project'	1
6			user_id	1
7			22	1
8			$project_counter	3
9			title	1
10			status	1
11			id	2
12			project_thesis_id	4
13			$project_thesis_files	1
14			$row2	2
Total	**5(n1)**	**18(N1)**	**13(n2)**	**22(N2)**

Fig21.2: Halstead Metrics

Length: (N1+N2) =18+22=40

Difficulty: (n1/2)*(N2/n2) =(5/2)*(22/13)=4. 231

Lines of Code:

Lines of Code= 43

Function name	Cyclometric Complexity	Halstead Metrics	Lines of Code
Project thesis view	4	4	43

Fig21.3: complexity metrics

So, from above statistics we can draw a calculation that the complexity of the function of project thesis view module is Medium that means not so good or not so bad.

Now we will also consider another php code for white box testing. The portion of code which we consider is given bellow.

```
<?php
            $no_data=0;
              $no_yes=0;
              $no_no=0;
          foreach ($students_attendance_of_courses as $attendances) {
if ($attendances->course_id == $courses->course_id) {
                  $no_data++;
                                          if($attendances->attendance_status=='yes'){
                                          $no_yes++;
                                                                          }
                  else if($attendances->attendance_status=='no'){
                                          $no_no++;
                                                                  }                ?>
<tr><td><?php echo $attendances->attendance_date?></td>
<td><?php echo $attendances->attendance_status?></td></tr>
<?php
              }
}
```

Fig22.0: Source code of attendance

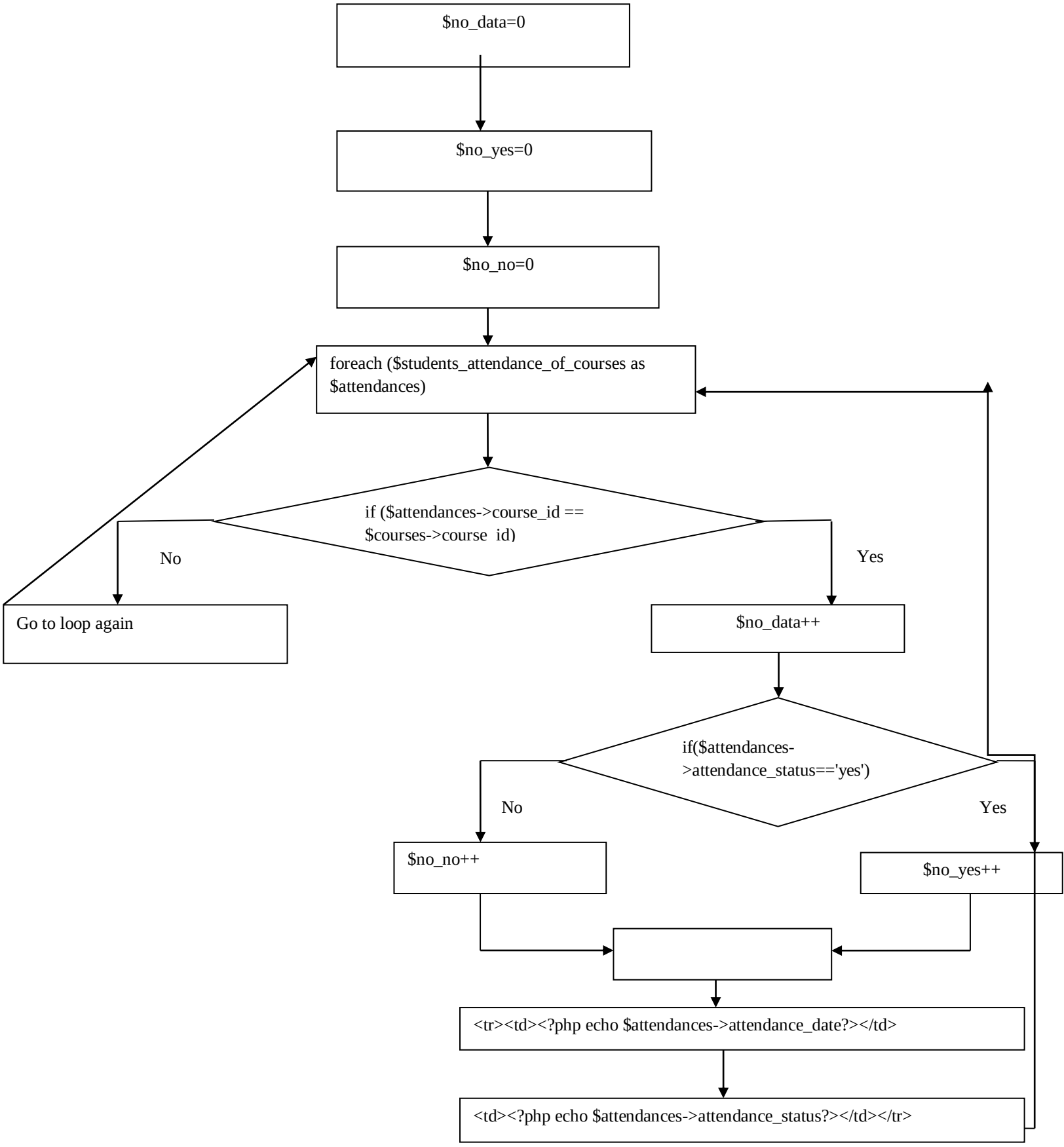


Fig22.1: Diagram on Source code of attendance

Now we will calculate the Cyclometic Complexity of above diagram.

Number of Node=13

Number of Edges=15

As we know, Cyclometic Complexity=Edges-Nodes+2 = 15-13+2=4

Halstead Metrics:

	unique operators	**Count**	**unique operands**	**Count**
1	=	3	$no_data	2
2	==	3	$no_yes	2
3	++	3	$no_no	2
4	->	6	$students_attendance_of_courses	1
5			$attendances	5
6			course_id	2
7			$courses	1
8			attendance_status	3
9			yes	1
10			no	1
11			0	3
12			attendance_date	1
13				
14				
Total	**4(n1)**	**15(N1)**	**12 (n2)**	**24(N2)**

Fig22. 2: Halstead Metrics of Attendance

Length: (N1+N2) =15+24=39

Difficulty: (n1/2)*(N2/n2) =(4/2)*(24/12)=2*2=4

Lines of Code:

Lines of Code= 17

Function name	Cyclometic Complexity	Halstead Metrics	Lines of Code
Attendance student view	4	4	17

Fig22. 3: Total complexity of Attendance

From this we can summarize that the complexity is Medium. Because we discuss only a sub - portion of our attendance module code.

Software Risk Analysis:

Software risk is that which threatens to meet our daily need. For analyzing risk, we have performed some steps which we mention bellow.

We have formed a brainstorming team which team basically tries to gather as much information as possible.

From that information we compile the requirements that mean we reduce some unnecessary thing. Next, we calculate/ determining the likelihood and impact of the features and attributes. This process is illustrated in Fig23.0.

IIT official website			
Features	Attributes	Likelihood	Impact
Events and news of IIT		Medium	High
Insert Achievements & show		Medium	Low
Noticeboard		Medium	High
Educational archive		Low	Medium
FAQ		Medium	High
Programs		High	High
Authentication		High	High
Dashboard		Medium	Medium
Profile		Medium	Medium
groups		Medium	Medium
Assignment		High	Medium
Faculty Management		Medium	High
Exam management		High	High
Result		High	High
Fees		High	High
Attendance		Medium	High
Admission Management		High	High
	Accessibility	Medium	High
	Usability	Medium	High
	Performance	Low	Medium
	Security	High	High

Fig23.0: Determining the Likelihood and Impact

Computing the Risk Priority:

After assigning a numeric value, in this step we will calculate the risk priority. This process is illustrated in

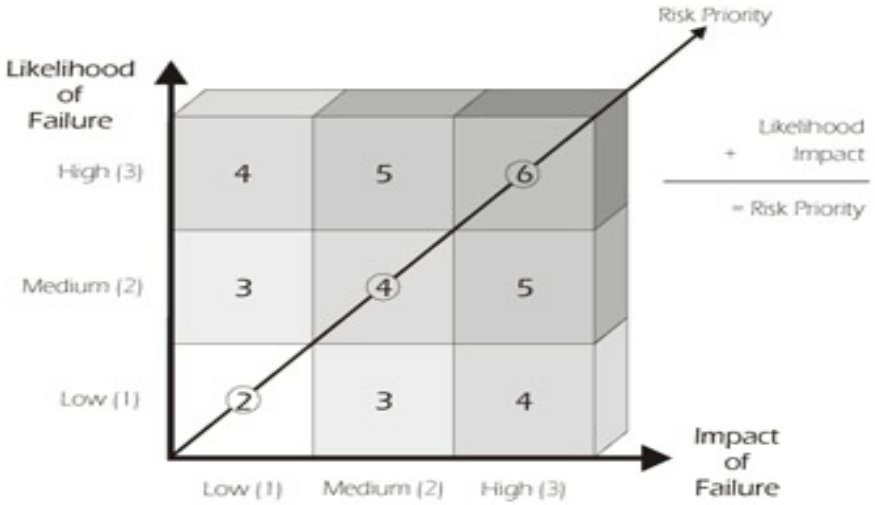


Fig23.1: Computing the Risk Priority

Computing the Risk Priority and Prioritize the Features

IIT official website				
Features	Attributes	Likelihood	Impact	Priority
Events and news of IIT		Medium	High	5
Insert Achievements & show		Medium	Low	3
Noticeboard		Medium	High	5
Educational archive		Low	Medium	3
FAQ		Medium	High	5
Programs		High	High	6
Authentication		High	High	6
Dashboard		Medium	Medium	4
Profile		Medium	Medium	4
groups		Medium	Medium	4
Assignment		High	Medium	5
Faculty Management		Medium	High	5
Exam management		High	High	6
Result		High	High	6
Fees		High	High	6
Attendance		Medium	High	5
Admission Management		High	High	6
	Accessibility	Medium	High	5
	Usability	Medium	High	5
	Performance	Low	Medium	3
	Security	High	High	6

Fig23.2: Computing the Risk Priority and Prioritize the Features

Mitigation:

What process will help us to mitigate the risk, we consider that issue here. This process also described in Fig23.3.

IIT official website					
Features	Attributes	Likelihood	Impact	Priority	Mitigation
Events and news of IIT		Medium	High	5	Code inspection
Insert Achievements & show		Medium	Low	3	Database inspection
Noticeboard		Medium	High	5	Database inspection
Educational archive		Low	Medium	3	
FAQ		Medium	High	5	Early prototype
Programs		High	High	6	Code inspection
Authentication		High	High	6	Code inspection
Dashboard		Medium	Medium	4	User interface inspection
Profile		Medium	Medium	4	Code inspection
groups		Medium	Medium	4	Early user feedback
Assignment		High	Medium	5	Early user feedback
Faculty Management		Medium	High	5	Early user feedback
Exam management		High	High	6	Code inspection
Result		High	High	6	Code inspection
Fees		High	High	6	Code inspection
Attendance		Medium	High	5	Code inspection
Admission Management		High	High	6	Code inspection
	Accessibility	Medium	High	5	
	Usability	Medium	High	5	
	Performance	Low	Medium	3	
	Security	High	High	6	

Fig23.3: Mitigation

15.0 Planning Risks and Contingencies

The following seeks to identify some of the more likely project risks and propose possible contingencies:

- Web site becomes unavailable
  - Testing will be delayed until this situation is rectified.
  - May need to recruit more staff to do the testing or reduce the number of test cases.
- Web testing software is not available/does not work (e.g. Web site uses cookies and tool cannot handle cookies)
  - This will delay the introduction of automated testing and result in more manual testing.
  - May need to recruit more staff to do the testing or reduce the number of test cases.
- Testing staff shortages/unavailability,
  - Many of the test staff are part-time and have other higher priorities. In addition no slack time is allocated for illness or vacation.
  - May need to recruit more staff to do the testing or reduce the number of test cases.
- A large number of defects/incidents makes it functionally impossible to run all of the test cases
- Not enough time to complete all test cases.
  - If time cannot be extended, individual test cases will be skipped, starting with the lowest priority.

16.0 APPROVALS

Name	Signature
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Mohammad Ashik Elahi	