

**Student Management System for
National Vocational Training Institute
(Niyagama)**

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Student Management System for National Vocational Training Institute (Niyagama)

**A dissertation submitted for the Degree of Master
of Information Technology**

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University of Colombo School of Computing

2017



Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

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This is to certify that this thesis is based on the work of

~~Mr.~~/Ms. I.S. Karunanayake

under my supervision. The thesis has been prepared according to the format stipulated and is of acceptable standard.

Certified by:

Supervisor Name: Mr. G.K.A.Dias

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Date:

Abstract

National Vocational Training Institute (Niyagama) according to present situation, many of student's activities done by manually. All information is not recorded in ordered manner. Some student records are not available for several months, also they can be lost or missed place. Currently it is very hard to handle students' daily attendance and calculating 80% attendance for each course manually. Also hard to collect instalment basis payments according to correct time period for each course. Student's records are not available in one central location, update information of students may not correctly get into students records. Arise duplication records and time wasting when finding a record or information related to particular student.

In this project I mainly applied customer major requirements to do best for my customer. As a result of that using this project NVTI- Niyagama staff can add, delete view and update student information, course details, payment details and attendance. Also can do students registration and generate reports registration details course vice. Furthermore they can do students payments and generate reports course vice student payment details. Not only that this facilitate to show overdue payments. Easy to insert student daily attendance to the system. Download and upload course teaching aids for students.

To develop this system I use XAMPP v 3.2.2 (PHP, MySQL and Apache). All three software applications are free to use and download so customer not need to pay for software requirements also it is added advantage to upgrade system software very easily. I use sql commands for backend activities. This system established using Software engineering techniques. System shelters all the functional and nonfunctional requirements of the client. They are operational suitably and user friendly, conduct web based through internet. System is provide help page for customer. Otherwise system be able to help through e-mail by contacting them.

Using this student management system NVTI- Niyagama staff can do their student activities very easily. All the information are stored in central location. As a result of that up to date update information can capture very easily, furthermore easy to find data using searching in digital media. Using this student management system avoid data redundancy and time saving.

Real time they test the system with real data and they achieve more advantage from this system.

Acknowledgement

I thank Mr. G.K.A.Dias who advised me and supervised my project from the beginning to the end. He gave me some points to improve my project and gave me full of confidence as a supervisor. His guidance helped me to complete the project successfully and effectively, which met the requirements of the web based Student Management System for National Vocational Training Institute.

Personally I would thank my friends who gave me support to do this project successfully, by supplying all the reference materials & gave us helpful advice in difficulties.

Also I would like to thank University of Colombo School of Computing for introducing this Msc post graduate degree programme. All my lectures and staff of University of Colombo School of Computing support to complete this Msc post graduate degree program.

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List of Abbreviations

ER	Entity Relationship Diagram
NVTI	National Vocational Training Institute
NF	Normal Form
NIC	Network Interface Card
NVQ	National Vocational Qualification
SMS	Student Management System
SW	Software
VTA	Vocational Training Authority

Chapter 1- Introduction

Chapter 1- Introduction

1.0. Overview

National Vocational Training Institute (NVTI) Niyagama is providing vocational education to rural youth generation who wants vocational qualifications for their career paths. Also this institute conducting twelve courses in several schemes. And providing NVQ level 3, 4, and 5 qualifications.

For Student Management System I use student based activities. Those activities as follows:

- Students can register with the online web based system. After that they can edit entered their registration details before dead line of student registration.
- The project will provide online web based access for management assistance to add, delete view and update student details such as personal information, course details, payment details and attendance.
- Management Assistance can do students registration and generate reports registration details course vice.
- Can do students payments and generate reports course vice student payment details.
- If there is overdue payments in instalment payments can generates reports and send mails to students as payment notifications.
- Management Assistance can insert daily student attendance and generate reports monthly course vice.
- If student attendance less than 80% generate mail to student by asking explanations.
- Separate login accounts for staff members (Instructors, Management Assistance, Senior Instructor, Training Officer, Assistance Director and system administrator)
- Student can send online application forms for course registration
- Can list down course vice on job training qualified list.
- Can upload student results and teaching slides to students.

1.1. Why the Student Management System (SMS)

Presently NVTI – Niyagama institute handling manual system to handle student registration. By doing manual works difficult to find student records.

Those activities are not like smooth flow, and some activities are isolated. by doing manual system get more time to prepare reports of student registration course by course.

Difficult to do student payments according correct time period. Sending notification may delay when doing manually. Therefore institute profits may loss.

Analyzing student attendance may take long time, getting explanations may late.

1.2. Problem specification

In present situation, Student's information is entered into cardboard files. All information is not recorded in ordered manner. NVTI- Niyagama handles all students' activities in manually. New students applications are collected from normal mail system therefore those records are not available for several months, also they can be lost or missed place. New joiners doesn't know any enough knowledge about course which conducted by NVTI – Niyagama.

To conduct exams 80% of student attendance is mandatory, currently it is very hard to handle students' daily attendance for each course manually. Management assistance needs to prepare separate student attendances reports for each course.

Hard to collect instalment basis payments according to correct time period, Account clerk need to prepare separate student payments reports for each course.

If some administrative staff member is going to get information about a student, he/she will refer many hard copies in several places. So he/she will face another problem, students records are not available in one central location. Changing of existing student record is not easy. If there is update information of students may not correctly get into students records, if there is computer system which is very easy to done within small time.

Percentage attendance for each student will be calculated later. But students request to see their attendance percentage daily rather than after completing lecture series of a course unit.

1.3. Aim of the SMS

The aim of Student Management System is to store student information and their academic activities in a center location. They can access the system in any location of the institute. The system allows to student update their registration information. Also it facilitates to get useful information such as percentage attendance, semester exam result. Accuracy and robustness system was given to students. Another aim was reduced paper work in the institute. And students were practiced to do their academic activities with the system.

1.4. Objectives of the SMS

The main objective of Student Management System was built a central location (different student academic activities are put in one place) for student information and their academic activities. They can access the system in any location of the institute. The system allows to student update their personal information. Also it facilitates to get useful information such as percentage attendance, semester exam result. Accuracy and robustness system was given to students. Another aim was reduced paper work in the institute. And students were practiced to do their academic activities with the system.

To provide ease of access to the staff to manage student details (payment details attendance details, applications and on job training details, etc.) To reduce data redundancy, misleading information of student process, etc. Minimize time and paperwork in controlling student activities. The student details will be digitized so that the details could be used for future reference easily. Increasing accuracy about student attendance. Minimizing delays of student activities. Facilitating staff members to do their student related activities efficient way. Reducing paper based activities.

1.5. Scope of the project

The project will provide online web based access for management assistance to add, delete view and update student details such as personal information, course details, payment details and attendance.

Management Assistance can do students registration and generate reports registration details course vice.

Can do students payments and generate reports course vice student payment details.

If there is overdue payments in instalment payments can generates reports and send mails to students as payment notifications. Management Assistance can insert daily student attendance and generate course vice reports monthly. If student attendance less than 80% generate mail to student by asking explanations.

Separate login accounts for staff members (Instructors, Management Assistance, Senior Instructor, Training Officer, Assistance Director and system administrator) and students.

Student can send online application forms for course registration. Staff can list down course vice on job training qualified list also they can upload student results and teaching slides to students.

1.6. Brief overview of this chapter

In this chapter I mention about Overview of the project, problem of the existing system, objectives of the existing system and scope of the new system.

Chapter 2 – Background / Literature Review

Chapter 2 – Background / Literature Review

2.1 Introduction

This chapter will deliberate literature review, background information of the SMS, existing functional and non-functional requirements of the system. Which was assembled according to academic staff, non-academic staff and student requirements.

2.2 Literature review:

Student Management System for NVTI – Niyagama is an information system.

SchoolTool is an open source web based student information system which had been intended for developing countries schools. That tool is compatible with Ubuntu Linux operating system. Students, teachers and parents can collaborate by the tool. User groups are managed by the tool. Attendance and grades can be tracked each student. [1]

Sri Lanka vocational training authority has LMS called VSO. It is used to handle assignment details and module syllabus of ICT 5 students. [2]

Contents of Information technology infra-structure chapter of the book defines project planning which was helped to plan my Student Management System. Building and managing systems chapter were also helped to implement my system.

Management Information Systems is one more book which had been written for business information systems by Effy Oz. The book describes diverse services which are provided by an information system. We decided which services should be provided by my system. This book was helped to select suitable database model for our project.

2.3. Existing system

Existing system based on the manual recording system. We used to receive student applications. They were either received by post or by visiting office. Verification of information has not possible all the time.

It is very hard to find some specific student document. Also repeating same action, occur unnecessary delay and missing importance are common problems in manual system.

2.4. Brief overview of this chapter

In this chapter I explain background of the system. Based on literature survey the chapter will discuss existing systems which relate with the Student Management System. And how this system is differ from them.

Chapter 3 – Analysis and Design / Methodology

Chapter 3 – Analysis and design / methodology

3.1 Introduction

In this chapter will deliberate techniques which were used to gather user requirements. Then analyse phase, those requirements were represented by diagrams such as use cases, class diagrams, sequence diagrams, etc. Conceptual model of the system was designed by using those diagrams. Also goals and relation within the conceptual model was discussed. Database was designed for the system. After that suitable methodology was selected.

3.2 Requirement gathering

Requirement gathering is a very significant and critical task, because whole project development is based on correct requirement gathering. To do this several type of requirement gathering technique were used.

Observation in working environment was one of requirement gathering technique which was used for our project. Students, academic and non-academic staff behaviors with academic and student activities were observed.

There were two kinds of documents hard copies and soft copies. Under hard copies student registration files, examination result files, attendance files were referenced. Under soft copies excel files which contained attendance, exam eligibility list, result and access files which contained student information database were referenced.

Though requirements were taken from observation and document referencing, some requirements, activities and relations were not captured well. This trouble was overcome by interviews. Those interviews were conducted informal way rather than formal because users could communicate with us without any stress and they were encouraged to tell true and real activities rather than talking about pre-defined stories. Administrative staff members, instructors, managing representations, program officers and randomly selected students from each level were interviewed.

(Refer Appendix A)

3.2.1 Requirements

3.2.1 a. Functional requirements

- The project will provide online web based access for management assistance to add, delete view and update student details such as personal information, course details, payment details and attendance.
- Management Assistance can do students registration and generate reports registration details course vice.
- Can do students payments and generate reports student payment details course vice.
- If there is overdue payments in instalment payments can generates reports and send mails to students as payment notifications.
- Management Assistance can insert daily student attendance and generate reports monthly course vice.
- If student attendance less than 80% generate mail to student by asking explanations.
- Separate login accounts for staff members (Instructors, Management Assistance, Senior Instructor, Training Officer, Assistance Director and system administrator)
- Student can send online application forms for course registration
- Can list down course vice on job training qualified list.
- Can upload student results and teaching slides to students.

3.2.1 b. Nonfunctional requirements

User can access the system any time within the institute or any location.

System should work 24 hours without break down. So server computer should run under regular and stable power supply. Also other network equipment such as switches and routers should work properly.

Number of users can access the system simultaneously.

System should be able to handle multiple user login at a time. Any user will not wait to login with the Student Management System during many users are accessing the system.

Respond time (within 5 seconds) of the system should be minimum.

Student Management System should responds user request as far as possible. After requesting some result by user, the result will be set by the system soon. It does not take long time to give the result.

User friendly interfaces.

It should be simple. Any user can understand tasks are done by each link in his/her first touching.

Interfaces should be simple content based and simple graphical based.

The system should not enclose too much graphic items and animations. It will pointer to take long time for loading a web page of the system. Sometime user cannot find mandatory information though it is available in a page because of more graphics.

Backup of the system should be taken.

Backup of web root and database should be taken after some time period. To recover hardware failures (hard disk crash) a backup server should be continued.

Size of interfaces should be normal (Not too small or too large).

User interfaces should be shown in normal size. Users will face reading problems because of too small interfaces. User should scroll a window vertical and horizontal direction because of too large interfaces.

3.3 System users

Users who will use the system will be discussed with their privileges.

Administrative users

Assistant Director, Training Officer, Senior Instructors, Instructors, Program Officers and Management Representatives. They can view student information, view / edit course, approve / disapprove student registration, check student attendance, check student payments and on job training.

Senior Instructors / Instructors

Senior Instructors, probationary Instructors and temporary Instructors are in this group. They can find their course, student attendance for their course units and find semester exam result for their course.

Management representatives

Student attendance entering process is handled by them. They can generate attendance sheet, enter / edit student attendance.

Students

Students can do different activities with the system. Student can view / change profile, select course units for current year, check attendance percentage for registered course units and apply for another course.

3.4 Design of the system

This section will deliberate methodology which was used to develop the system, architecture design, component design and data design.

3.4.1 System development methodology

Rational Unified Process (RUP) is the methodological approach which will be used in the proposed system. It is an iterative software development framework created by Rational Software Cooperation. Consists of 4 phases. Namely,

1. Inception – Identify the system scope by gathering the user requirements correctly. Business case is established. Should be concerned about the cost/schedule estimate, risk assessment etc.
2. Elaboration – Mitigate the key risks identified from the previous stage. Develop an overall project plan. Complete the use case diagrams up to 80%.
3. Construction – Main focus is on the development of the codes.
4. Transition - End user training and acceptance testing is carried out here.[3]

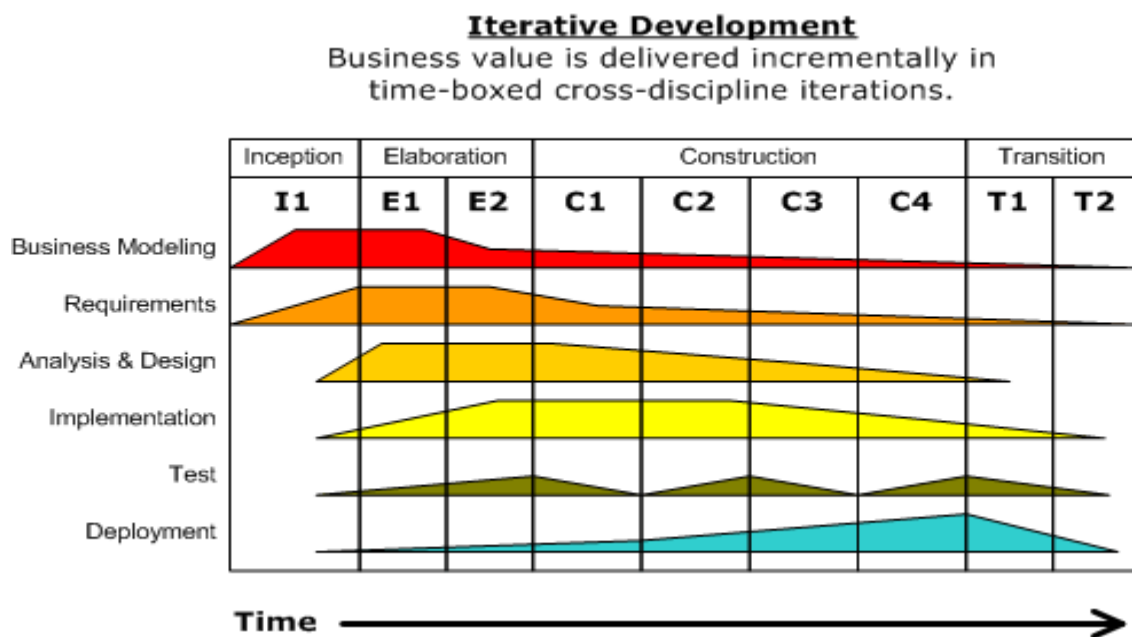


Figure 3:1 : RUP phases and disciplines

In contrast there are alternative design methodologies which can be used.

Waterfall Model - In the waterfall model, the developers should follow the order of the steps and one step should be completely finished to proceed to the next step. Back tracking is not possible. Steps can be state as,

- Requirement Analysis
- Design
- Implementation
- Verification
- Maintenance

To a project like this waterfall model is not suitable, since the requirements are not 100% clear at the beginning and stages may overlap while developing the software. [4]

Strengths:

- The orderly sequence of development steps and strict controls for ensuring the adequacy of documentation and design reviews helps ensure the quality, reliability, and maintainability of the developed software.
- Progress of system development is measurable.
- Conserves resources.

Weaknesses:

- Inflexible, slow, costly and weighty due to significant structure and tight controls.
- Project progresses forward, with only slight movement backward.
- Depends upon early identification and specification of requirements, yet users may not be able to clearly define what they need early in the project.
- Requirements inconsistencies, missing system components, and unexpected development needs are often discovered during design and coding.
- Problems are often not discovered until system testing.
- System performance cannot be tested until the system is almost fully coded, and under-capacity may be difficult to correct.
- Difficult to respond to changes. Changes that occur later in the life cycle are more costly and are thus discouraged.
- Produces excessive documentation and keeping it updated as the project progresses is time-consuming.
- Written specifications are often difficult for users to read and thoroughly appreciate.

- Promotes the gap between users and developers with clear division of responsibility.
[5]

3.4.2 Architecture design

The system is deployed in central location. User can access the system far away from the central location. Also the system can be accessed multiple users. Client server model is suitable architecture according to above requirements. Below diagram shows our system according to client server architecture.

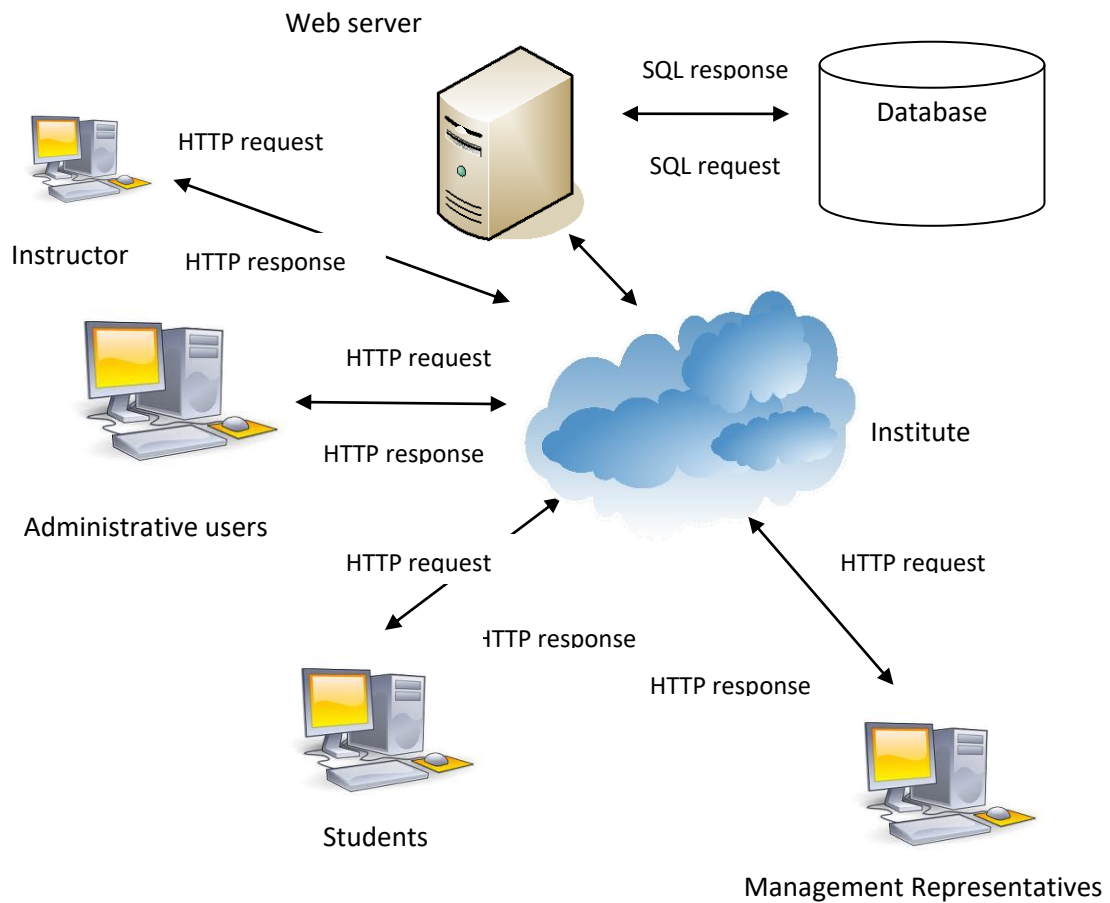


Figure 3:2 – System Architecture

3.4.3 Flow chart

A flowchart is a diagrammatic representation that shows the sequence of operations to be performed to get the solution of a problem. Notation that is often used throughout the design stage of the software life cycle for quick and easy understanding of a programs flow.

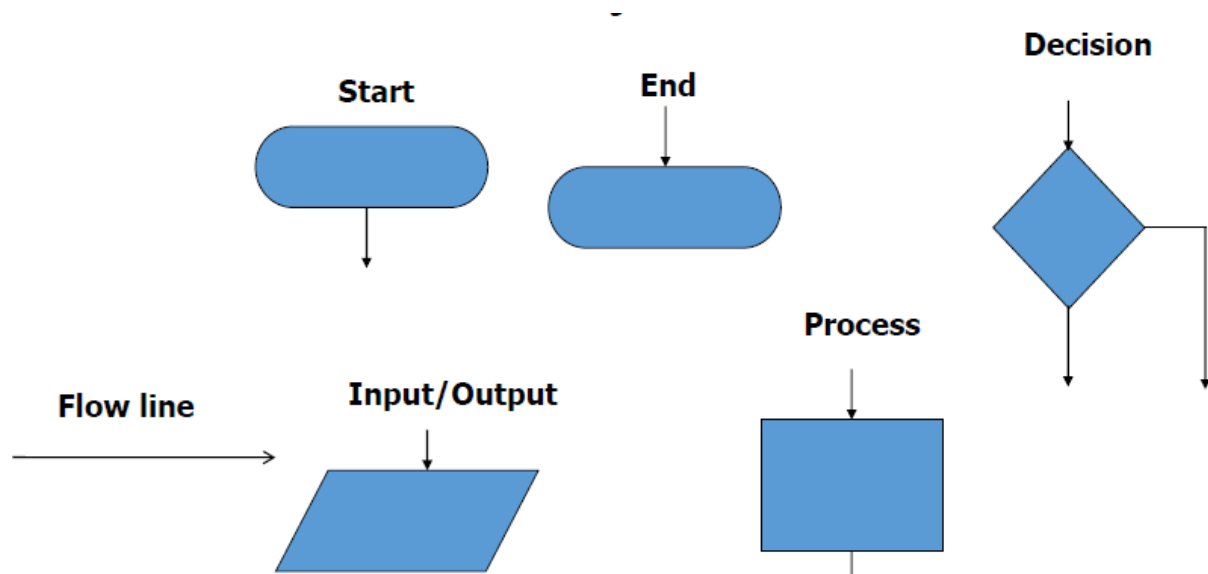


Figure 3:3 – Notations of Flow Chart

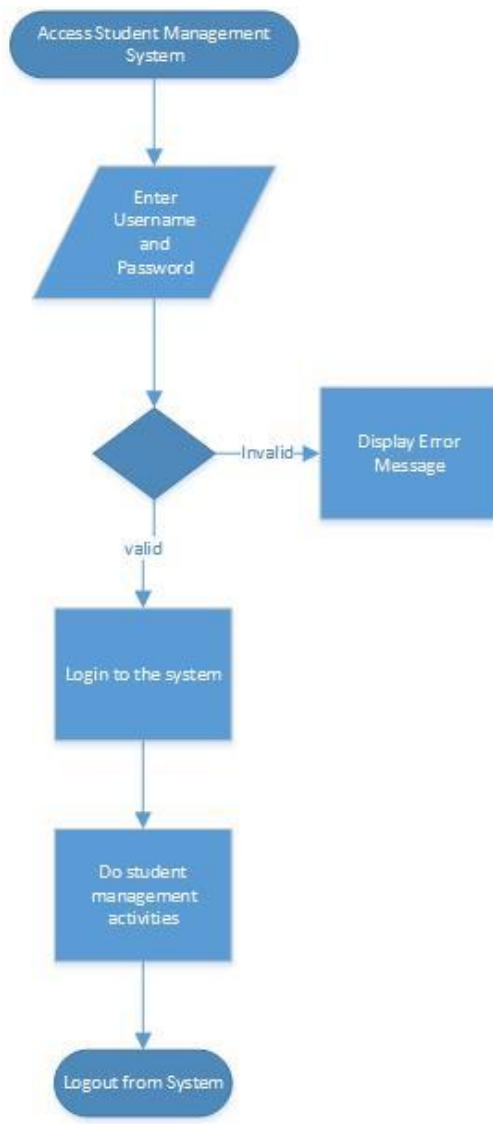


Figure 3:4 – Flow Chart Diagram for Student Management System

3.4.4 Pseudocode

A Pseudocode is an English like representation that shows the sequence of operations to be performed to get the solution of a problem.

```
Main program  
  
User variables  
  
Loginop, stact, sfact OF TYPE character  
  
Username, pass OF TYE String  
  
n1, n2, anw  
  
DISPLAY "Please login to the SYSTEM"  
  
DISPLAY "1 for Student Login"  
  
DISPLAY "2 for Staff Login"  
  
ACCEPT Loginop  
  
IF Loginop == 1 THEN  
  
DISPLAY "1 for Add, view and update personal details"  
  
DISPLAY "2 for Send online applications"  
  
DISPLAY "3 for Download slides"  
  
ACCEPT stact  
  
ELSE IF Loginop == 2 THEN  
  
DISPLAY " 1 for Add, delete, view and update student details"  
  
DISPLAY " 2 for Generate reports of student registration"  
  
DISPLAY " 3 for Add student payments and generate reports"  
  
DISPLAY " 4 for Insert student attendance"  
  
DISPLAY " 5 for upload teaching slides"  
  
ACCEPT sfact  
  
ENDIF  
  
DISPLAY "Invalid User"  
  
End program
```

Figure 3:5 – Pseudocode for Student Management System

3.4.5.1 Use case diagram

System users and their activities are represented. It was helped to identify goals of each user. A user may be a physical user or a computer system. This type of diagram use for describing a set of user scenarios. Mainly used for capturing user requirements of the system.

Components of use case diagram:

Actors: A role that a user plays with respect to the system, including human users and other systems. e.g Student, Administrator, Instructor, Training Officer); an external system that needs some information from the current system. e.g “tally system” for student payments

Use case: A set of scenarios that describing an interaction between a user and a system, including alternatives. E.g Create student account

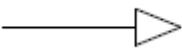
System boundary: Rectangle diagram representing the boundary between the actors and the system.

Relationships of use case diagram:

Association: Communication between an actor and a use case; Signified by a solid line.



Generalization: Relationship between one general use case and a special use case (used for defining special alternatives) Signified by a line with a triangular arrow head toward the parent use case.

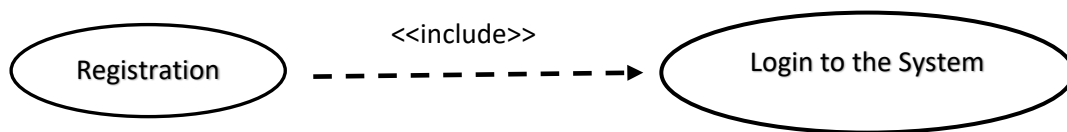


The child/sub use case inherits the behavior and meaning of the parent/super use case. The child may add to or override the behavior of its parent.

<<extend>> relationship:

As the name implies it extends the base use case and adds more functionality to the system. The extending use case is usually optional and can be triggered conditionally. An arrow toward the base case. The extending use case may add behavior to the base use case. The base class declares “extension points”.

<<include>> relationship: The base use case is incomplete without the included use case. The included use case is mandatory and not optional. Beginning at base use case and ending with an arrows pointing to the include use case.



Use case narratives

This section will describe more details about main use cases.

3.4.5.1.1 Use case narrative for student registration

Use case narrative	
Name	Create student account
Number	0.0.1
Author	I.S.Karunanayake
Last update	20/07/2016
Assumption	Student who going to study in NVTI-Niyagama
Pre-condition	Student has not registered with the institute.
Use case description	Creating an account for student by storing student information.
Actors	Student, Management Representative
Use case initialization	This use case starts when new comer student will request to resister in the institute.

Use case dialog	<p>Student records are entered.</p> <p>Student records are double checked.</p> <p>If all records are correct, student information is confirmed and student is given user name and password, otherwise student records are reentered.</p>
Use case termination	<p>This use case ends when:</p> <ol style="list-style-type: none"> 1. Student is provided user name and password. 2. Management Representative cancels student account creation. 3. System displays a message that user account already exists.
Post-condition	<p>Upon success full completion:</p> <p>User account is updated.</p> <p>Upon cancel registration, system returns to initial state.</p> <p>Upon user already exist message, system gives new interface to provide new user name and password.</p>

3.4.5.1.2 Use case narrative for course registration by student

Use case narrative	
Name	Register for course
Number	0.1.0
Author	I.S. Karunanayake
Last update	20/07/2016
Assumption	User has valid account with user name and password.
Pre-condition	Time period should be earlier of a dead line.
Use case description	Student selects and requests to register valid course for a particular semester Management Representative confirms or not that course unit registration.
Actors	Management Representative, student
Use case initialization	This use case is started by student.
Use case dialog	<p>Student logins to the system.</p> <p>If login is correct proceed otherwise student is asked to re enter login details.</p> <p>Course available for semester will be displayed based on student's level.</p> <p>Student selects appropriate course.</p> <p>Course selection is confirmed by student.</p> <p>If student confirms without selecting any course, system will display error message and terminate process.</p> <p>Management Representative logins to system.</p>

	<p>If login is correct proceed otherwise Management Representative is asked to re enter login details.</p> <p>Management Representative opens student course unit registration interface.</p> <p>Course registration is confirmed or not. If a course registration is confirmed, sends confirmation message.</p>
Use case termination	<ol style="list-style-type: none"> 1. Course unit registration is confirmed. 2. Student does not select course. 3. Student cancels course registration. 4. Management Representative is unable to find any course unit registration record.
Post-condition	<p>Upon successful completion of the course registration:</p> <ol style="list-style-type: none"> 1. Course registration is updated 2. Sends confirmation message. <p>Upon student not selects course, course unit selection interface is reloaded.</p> <p>Upon student cancels course registration, course selection interface is closed.</p> <p>Upon Management Representative is unable to find any course registration record, course registration confirmation page is not loaded.</p>

3.4.5.1.3 Use case narrative for attendance sheet creation

Use case narrative	
Name	Create attendance sheet
Number	0.3.0
Author	I.S.Karunanayake
Last update	20/07/2016
Assumption	<ol style="list-style-type: none"> 1. Students have registered for a particular course. 2. Instructor was conducted.
Pre-condition	Students have registered for a particular course.
Use case description	Attendance sheet for a particular course by using its conducting date. The course may be a theory or practical.
Actors	Management Representative
Use case initialization	This use case starts after conducting a lecture.
Use case dialog	<p>Management Representative logs in to the system.</p> <p>If login success, proceed otherwise Management Representative is asked to reenter login information.</p> <p>Course, date and number of hours are selected by Management Representative.</p> <p>Management Representative is selected whether course unit is a theory or practical.</p> <p>Attendance sheet is generated.</p>
Use case termination	<ol style="list-style-type: none"> 1. Attendance sheet is successful generated. 2. Attendance sheet for particular course unit and date has been already generated.

	<p>3. Connection failure with the system while attendance sheet is being generated.</p>
<p>Post-condition</p>	<p>Up on generating attendance sheet, Management Representative is allowed to enter attendance.</p> <p>Up on attendance sheet already exists, error message is displayed.</p> <p>Up on connection failure with the system while generating attendance sheet, system returns to its initial state.</p>


3.4.5.2 Class diagram


The system can be represented as set of classes. A class has three major units. There are class name, attributes and methods. Class name is used to recognize a class. Properties of a class are defined by attributes. Behavior of a class is defined by methods.


A class diagram defines the types of objects in the system and the various kinds of static relationships that exist among them. A graphical illustration of a static view on declarative static elements. A central modeling technique that runs through closely all object-oriented methods. The richest notation in UML.

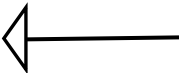
Elements of class diagram:

- Class
- Attributes
- Methods
- Relationships

Associations - A structural relationship, specifying that objects of one class are connected to objects of a second (possibly the same) class. 

Aggregations - A special form of association that models a whole-part relationship between an aggregate (the whole) and its parts. 

Composition - A strong form of aggregation. The part classes used to make up the entire class cannot exist on their own. Multiplicity on the whole side must be zero or one. The life time of the part is dependent upon the entire. The destruction of the whole class means destruction of the part classes. 

Generalizations - Specifies that objects of the specialized class (subclass) are substitutable for objects of the generalized class (super-class). "is kind of" relationship. 


Dependency - A dependency specifies a semantic relation between two or more classes in which a modification in one may force changes in the other although there is no explicit association between them. 



Figure 3:6 – Structure of a Class

Multiplicity occurs in class diagram: The number of instances of the class, next to which the multiplicity expression seems, that are referenced by a single instance of the class that is at the other end of the association lane.

Exactly one	1
Zero or more (unlimited)	0..*
One or more	1..*
Zero or one (optional association)	0..1
Specified range	2..4
Multiple, disjoint ranges	2, 4..6, 8

Figure 3:7 – Multiplicity

(Refer Appendix B – Class diagram for Student Management System)

3.4.5.3 Data design

Data which is handle in the system will be described in a structure. Data design part reflects data base management system of the system. Relational database concept was used to design database in the system. The database was modeled by consuming Entity Relationship (ER) diagram. Also ER diagram is used to signify structure of the database.

According to the ER diagram student, instructor, course, attendance, and management representatives are entities. Each entity is defined by using their attributes. There may be multi valued attributes also. ER diagram is a conceptual model of a database, to deploy the physical data base ER diagram should be mapped into schema diagram.

(Refer Appendix C)

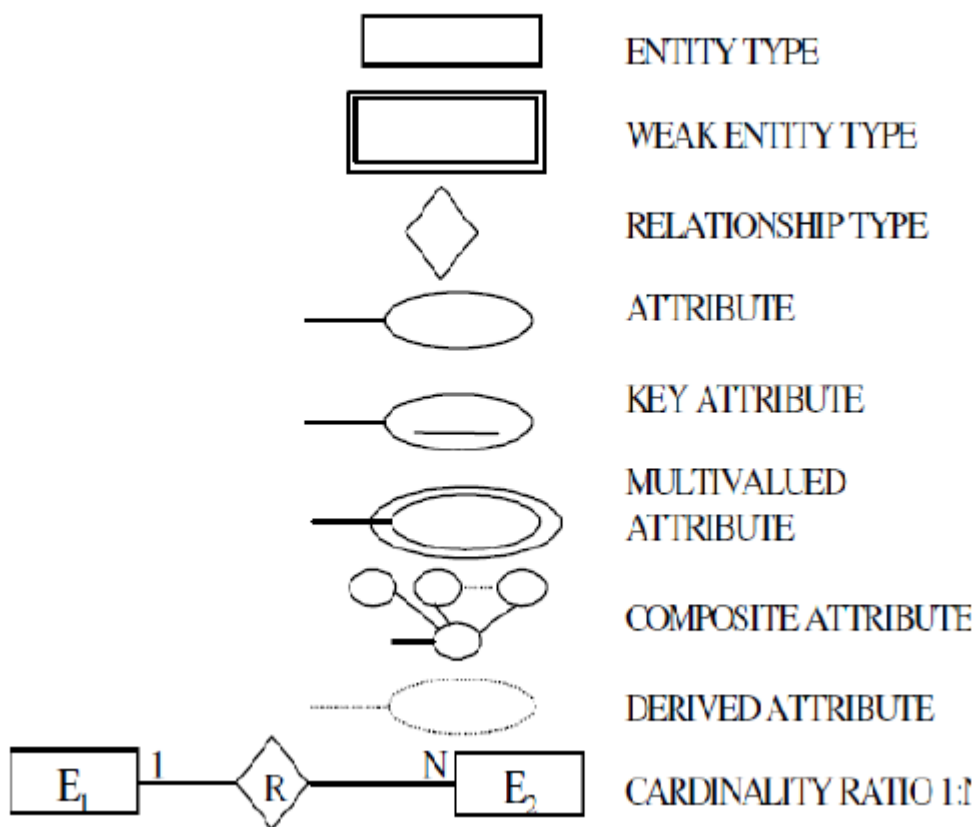


Figure 3:8 – ER diagram Notation

3.4.5.4 Activity diagram

An activity diagram shows dynamic aspects of Student Management system. Serves the same function as a flowchart. Is composed of a sequence of activities, possibly concurrent.

Each activity generates actions. Actions are atomic computations that result in a change of state or the return of a value. Is commonly used to show the activities involved in carrying out a particular use-case, a package or to the implementation of an operation.

An activity diagram consists of a starting point (singular), a set of states, contains activity states, action states, a set of transitions and the event associated with the transition. And an end point.

Action states are atomic and cannot be decomposed. Transition shows the path between activity and action states. Is graphically represented as a directed line. Activity diagram initial state represent by solid ball. End state represent by solid ball inside the circle.

A branch specifies alternate paths taken based on some Boolean expression. A branch may have one incoming transition and two or more outgoing transition. Represented by diamond.

Use a synchronization bar to specify the forking and joining of parallel flows of control. A synchronization bar is rendered as a thick horizontal or vertical line.

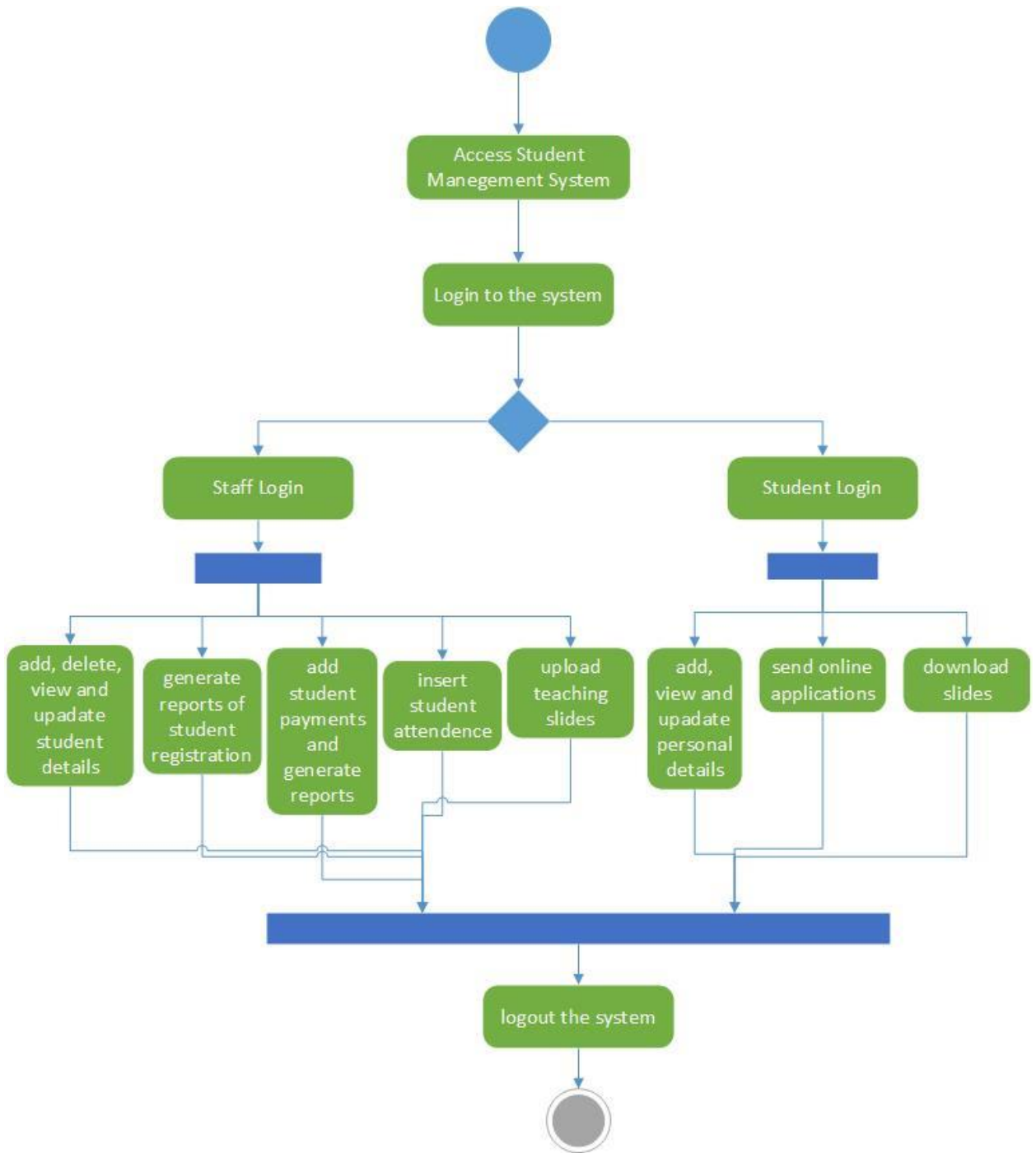


Figure 3:9 – Activity Diagram for Student Management System

3.4.5.5 Sequence diagrams

A sequence diagram gives view of dynamic behavior of system. Illustrations all the messages that flow between the objects to realize the functionality of a use-case scenario. The sequence diagram defines the flow of messages being passed from object to object. Unlike the class diagram, the sequence diagram signifies dynamic message passing between instances of classes rather than just a static structure of classes.

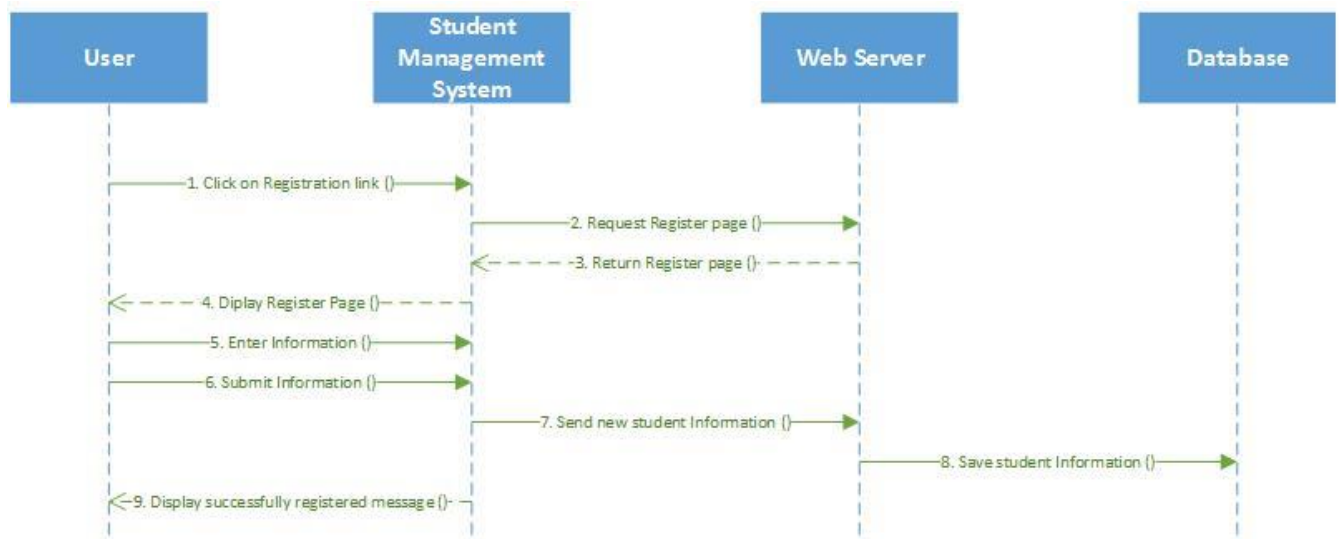


Figure 3:10 – User Registration (Sequence)

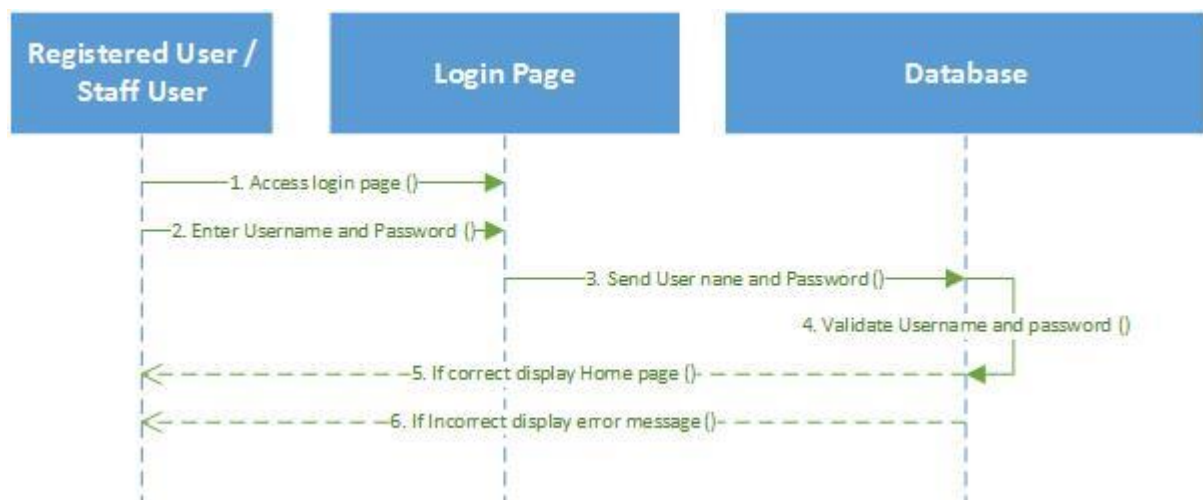


Figure 3:11 – User Login (Sequence)

3.4.5.6 State chart diagram

State chart diagram shows behavior of an individual object. It is a dynamic model of a system.

A state is a condition or situation through the life of an object in which it satisfies some condition, performs some activity, or waits for some event. A state may include Name, Entry/exit actions, internal transitions, Activities, Sub states and deferred events (infrequently used)

Special categories of states

Initial state - specifies the initial starting state for the state or a sub state.

Final state - indicates the state execution has completed.

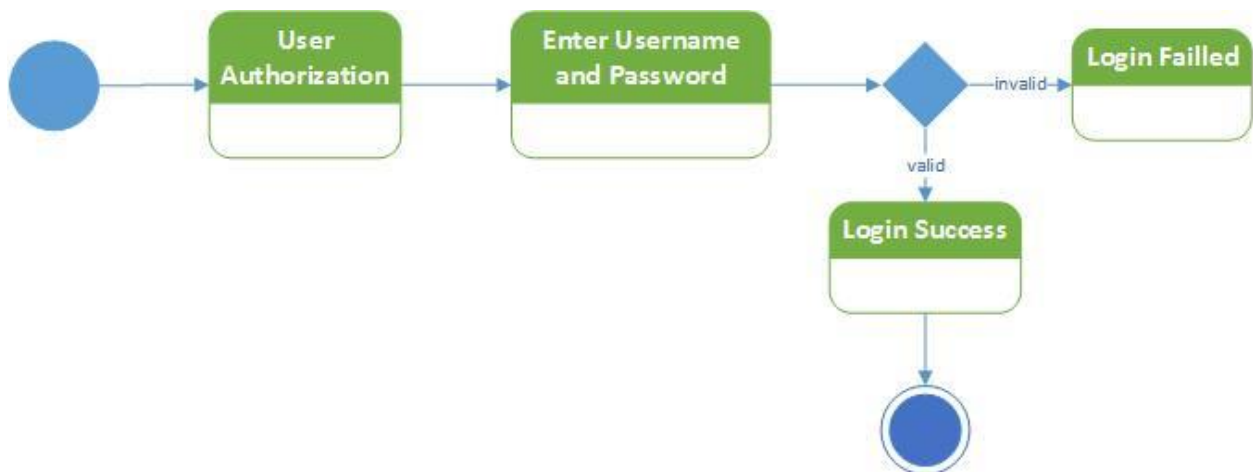


Figure 3:12– User Login (State Chart)

3.4.5.8 Collaboration diagram

Dynamic behavior of objects can, in addition to sequence diagrams, also be signified by collaboration diagrams. The transformation from a sequence diagram into a collaboration diagram is a bi-directional function. The difference between sequence diagrams and collaboration diagrams is that collaboration diagrams emphasize more the structure than the sequence of connections.

Within sequence diagrams the order of interactions is established by vertical positioning whereas in collaboration diagrams the sequence is given by numbering the connections.

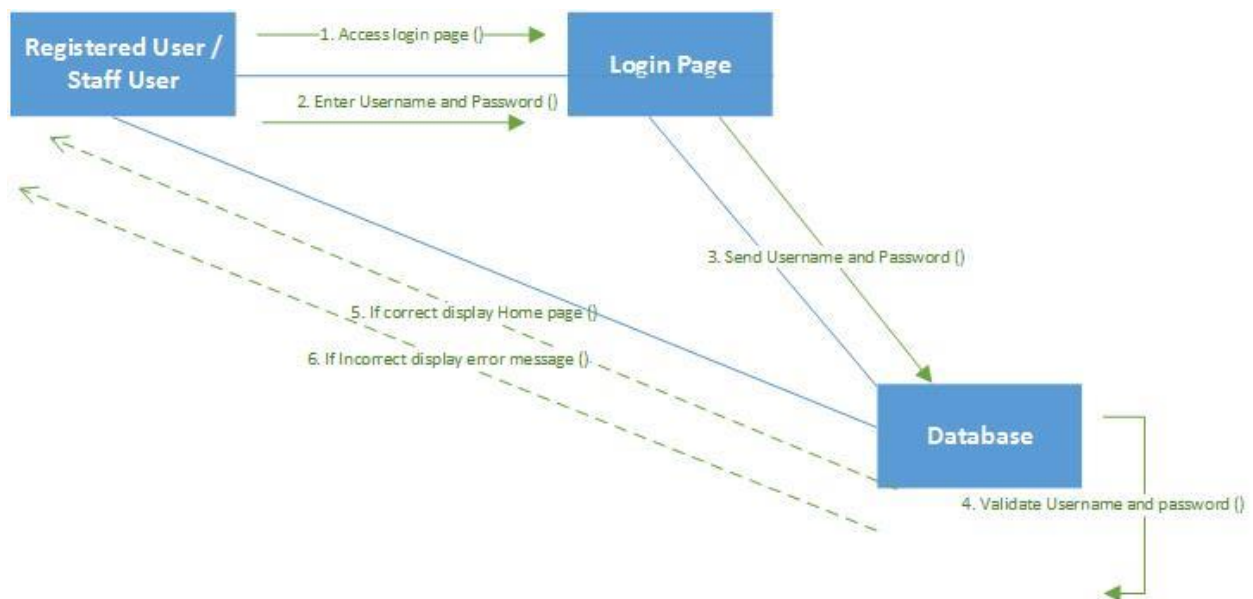


Figure 3:13– User Login (Collaboration)

3.5 UI design

User interface design (UI) is the design of user interfaces for any software applications, such as computers, home appliances, mobile devices, and other electronic devices, with the attention on maximizing usability and the user experience. The goal of user interface design is to make the user's contact as simple and efficient as possible, in terms of achieving user goals.

Worthy user interface design facilitates finishing the task at hand without drawing unnecessary attention to itself. Graphic design and design are utilized to support its usability, influencing how the user performs certain interactions and improving the aesthetic appeal of the design.

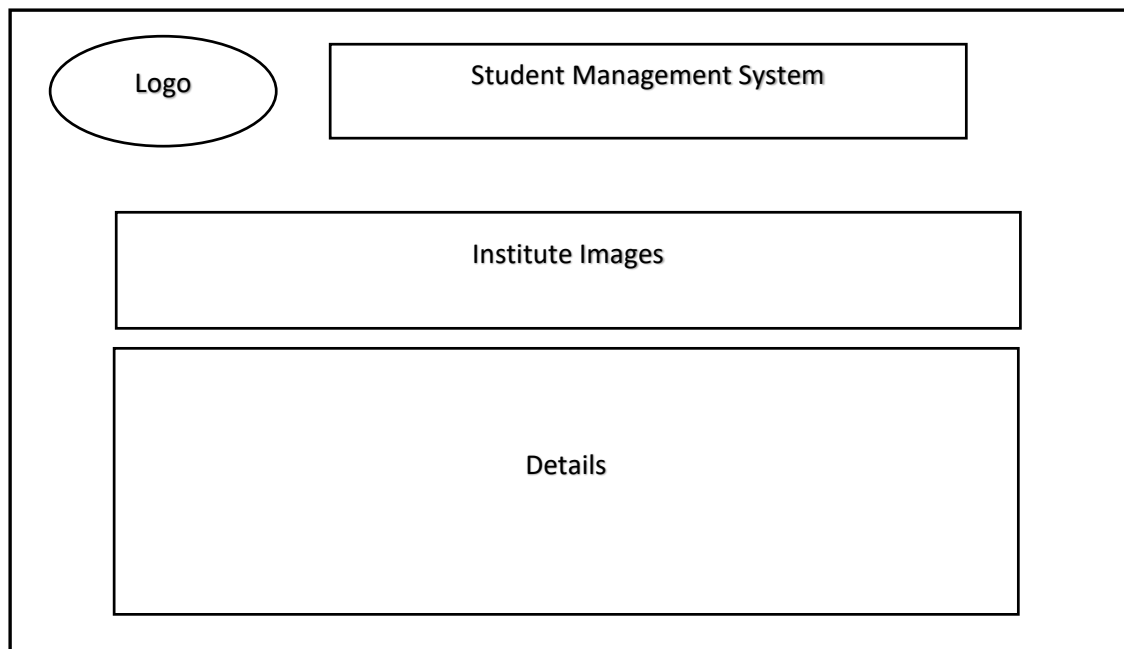


Figure 3:14– UI Design

3.6 Brief overview of this chapter

Methodology was used to design the system, requirement analysis techniques was used to gather requirements, different diagrams which explained system in different view ports will be discussed in this chapter.

Chapter 4 – Implementation

Chapter 4 – Implementation

Progress to date and project plan

This chapter will discuss flow of the project, mile stones of the project as well as difficulties we have faced up to now. Next part will discuss time line for rest of the project.

4.1. Project direction

Proposed project is unchanged. The Student Management System is being developed according to the project proposal. There is no customer requirements change after project proposal. Further users did not request new requirements. So project is gone proposed direction.

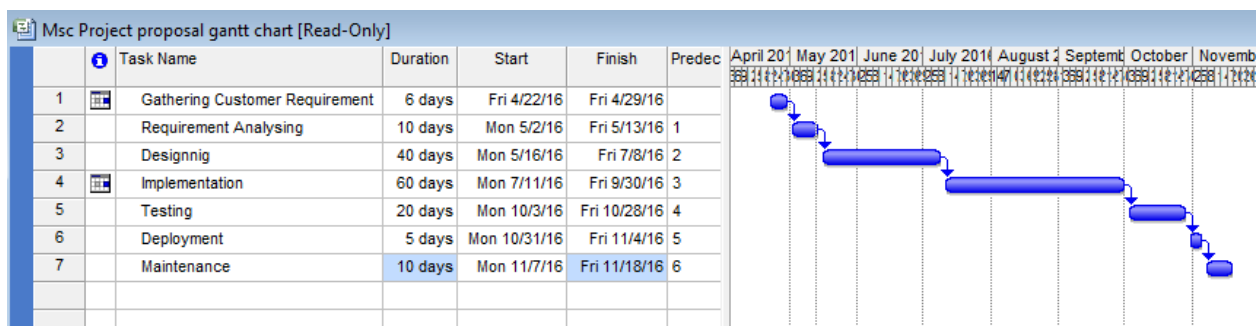
4.2. Difficulties

From stating date to now we faced some difficulties against our project. Gathering requirements was very difficult task. Explanations of some users were not clear about existing manual system. I spent more time to get clear ideas about those explanations. Observation and Interviews were used for above task.

Selecting suitable methodology for developing the project another difficult task. However our requirements were not changed users are waiting short period (nearly 9 months) for working system with minimum functions. We selected incremental prototyping method.

4.3. Time plan

We prepared our time plan by considering load of work in each stage. So prepared time plan is realistic. Flow of the project is being gone smoothly according to time plan. There are not any conflict with time plan and flow of the project.



4.4. Scope of the project

Scope of our project is reasonable because given time period is enough to complete the project. So scope of the project is not too large or too small.

4.5. Time allocation for dissertation writing

In my project time allocation for last part was considered duration of dissertation writing. Also dissertation writing is being continued parallel with entire project. There will not be a time allocation for dissertation writing.

4.6. Software technologies used to develop this system

I used PHP 5.5.12 to develop server side system application. MySQL 5.6.17 to develop my backend applications. Use Apache 2.4.9 as my web server. They are open source group of software programs. They are freely available, cross platform and “technology-natural”, they must not restrict other software’s and they embrace diversity. HTML used develop client side system applications.

PHP: Hypertext Processor is Open Source general-purpose scripting language support for object oriented programming & improved support for XML. This is especially suited for Web development and can be embedded into HTML. PHP programs are run on a server- specially a web server.

Apache act as web server and parse any file requested by browser and display the result accurately.

MySQL enables PHP and Apache to work together. It is a structured query language designed for process complex queries. This allows many different tables to join together. It helps to gain maximum efficiency and speed.

4.7. Tools & techniques used to develop this system

I used XAMPP 3.2.2 Server to develop this system. It is very easy to handle me PHP 5.5.12, MySQL 5.6.17 and Apache 2.4.9. It is a combination of them. No need separate configurations.

I used Dreamweaver CC. By using Dreamweaver I can quickly create web pages without writing a line of code. Dreamweaver also provides tools that make it easy to add Flash assets to web pages. In addition to drag-and-drop features that help me to build web pages. Dreamweaver also let to build dynamic, database-driven web applications using server technologies such as CFML, ASP.NET, ASP, JSP, and PHP. Dreamweaver is fully customizable.

I used Microsoft Visio to illustrate UML diagrams. This enhance feature to Drag-and-drop features that help me to illustrate UML diagrams very easily.

Bootstrap is a free collection of tools for creating websites and web applications. It contains HTML and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions.

I used Joomla as implementation tool. Joomla is a free and open-source content management system (CMS) for publishing web content. It is constructed on a model–view–controller web application framework that can be used independently of the CMS.

Joomla is written in PHP, uses object-oriented programming (OOP) techniques (since version 1.5) and software design patterns, stores data in a MySQL, MS SQL (since version 2.5) database, and includes features such as page caching, RSS feeds, printable versions of pages, news flashes, blogs, polls, search, and support for language internationalization.

4.8. Screenshot

User interfaces of the system have been designed in a user friendly manner so it will help users to learn the system fast and use it efficiently.

The screenshot displays the homepage of the Student Management System for Vocational Training Authority - Niyagama. The website features a blue header with navigation links: Home, Staff Login, Student Login, Courses, Contact us, and Online Application. Below the header is a large banner image of a school building. The main content area includes a 'Welcome to our Website' section with a group of students and text describing the Vocational Training Authority and NV11 - Niyagama. There are also sections for Vision, Mission, and NVQ, each with an icon and a 'Learn more' link. The footer contains 'About Us', 'Location' (with a map), and 'Contact Information' (with a form).

Home Staff Login Student Login Courses Contact us Online Application

Student Management System for Vocational Training Authority - Niyagama

Welcome to our Website

Vocational Training Authority.

Vocational Training Authority of Sri Lanka was established under the provisions of the Vocational Training Authority of Sri Lanka Act No. 12 of 1995, consisting of 8 National Vocational Training Institutes, 24 District Vocational Training Centers and 245 Vocational Training centers. This Institute operating under the Ministry of Youth Affairs and Skills Development is providing the skills training for rural youth, while implementing the skills development programs under various fields, with the participation of employees in the field of vocational training exposing the rural youth to information technology and training them for entrepreneurship development.

NV11 - Niyagama

NV11 - Niyagama also known as Sri Lanka-Korea National Technical College NV11 - Niyagama is an invaluable asset to strengthen the future of the sons and daughters of Niyagama divisional secretariat division.

[Learn more](#)

Vision

To be Leader Leader of providing technical, vocational and training to the nation.

[Learn more](#)

Mission

To function as an Organization that produced skilled personnel to the level of national and international skill standards.

[Learn more](#)

NVQ

Tertiary and Vocational Education Commission has taken steps to introduce a National Vocational Qualification System (NVQ) consisted with / Lanka in collaboration with all Government Technical Education and Vocational Training Institutes and Skills Development Project presently as TEDI* under the guidance of Ministry of Vocational and Technical Training.

[Learn more](#)

About Us

Contact Us.

Address: National Vocational Training Authority, Niyagama, Niyagama.

Website: www.nvtasri.lk

Phone: 011-2239445

Location

Map Satellite Pigeon

Niyagama

Contact Information

Name:

Email:

4.9. System structure

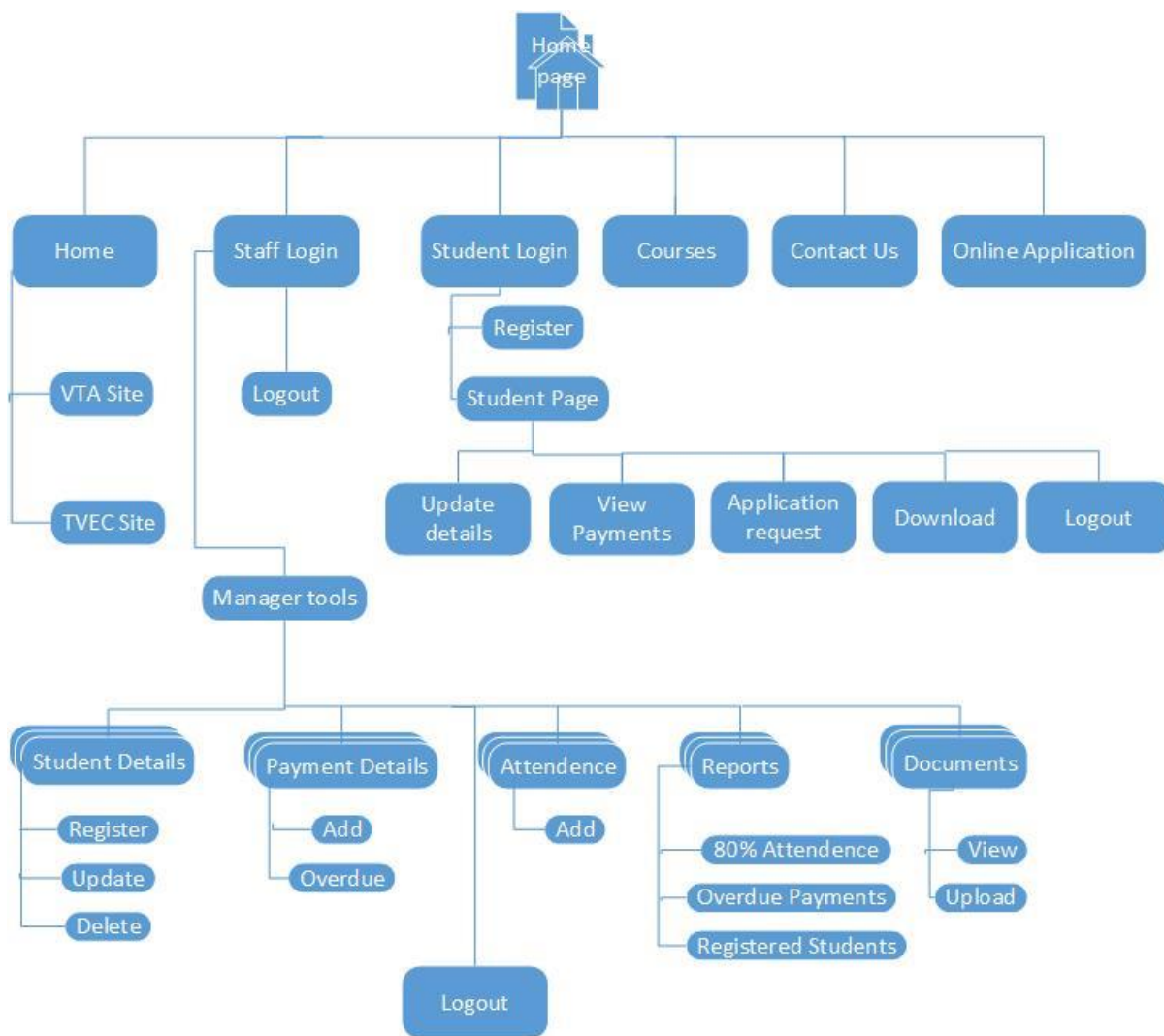


Figure 4:1– Structure of the Student Management System

4.10. Brief overview of this chapter

Current project status, difficulties which were met up to now, scope against time line will be discussed. Also time line for rest of the project will be discussed.

Chapter 5

User Evaluation and Testing

Chapter 5: User evaluation and testing

5.0 Testing

Testing is the Process of Executing programs to find out errors.

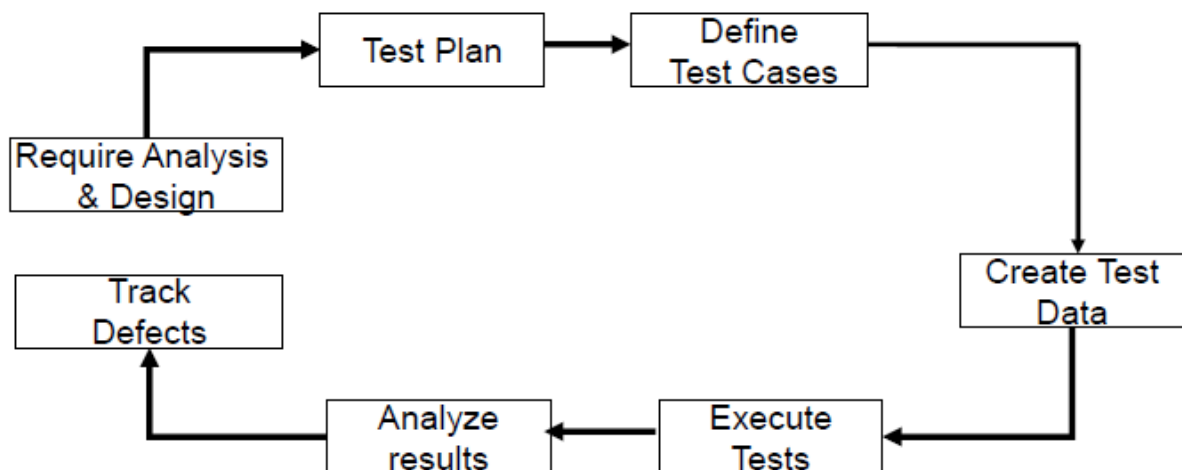


Figure 5:1– Testing life cycle

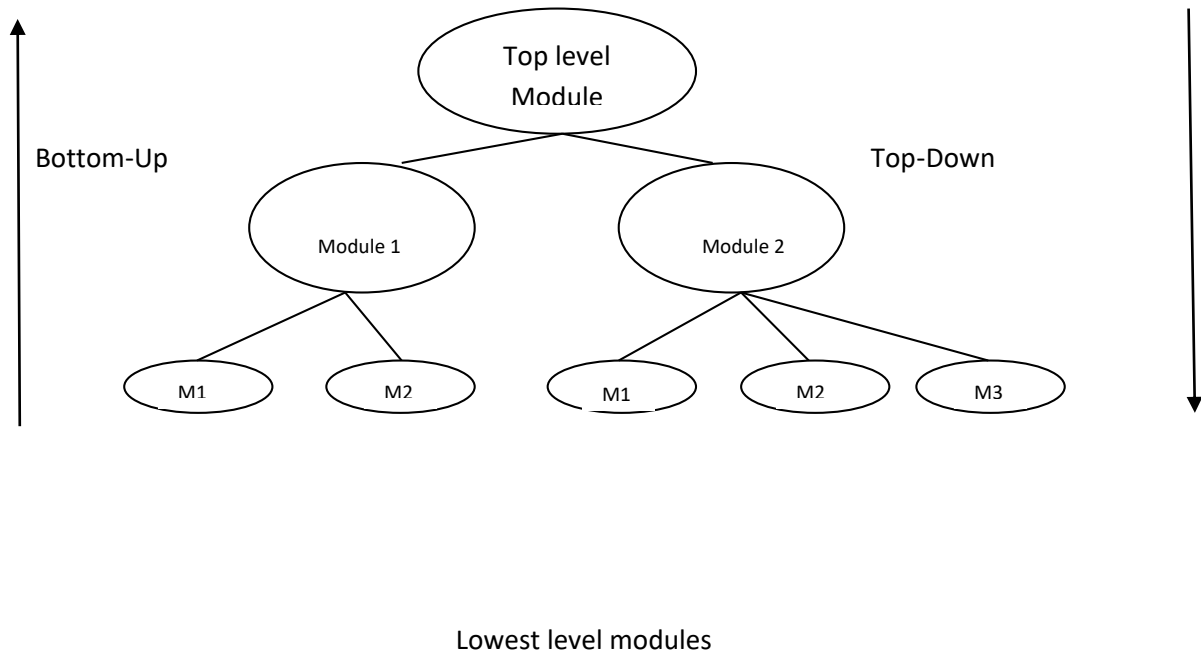
5.1 Important of testing

Software system is a complex system. It's Intangible. Can easily made error by programmers.

Requirements can be change when developing software. Testing is helpful to know whether the system is correctly working according to user requirements.

5.2 Top down & bottom up testing strategies

Top- down testing tests of the high levels of a system before testing its detailed components. And add modules from the levels immediate below. The program is represented as a single abstract component with sub components represented by stubs.



Bottom-up testing begins with the lowest level modules and adds new modules from successively higher levels.

5.3 Testing techniques

I used several type of testing techniques in this stage. Except for small programs, systems should not be tested as a single, monolithic unit. Large systems are built out of sub-systems which are built out of modules which are composed of procedures and functions.

5.3.1 Unit testing

This involves testing each module of a program in isolation.

Black box testing

Mainly consider outside view of the program module. This concern with input value and output values and check whether the module is satisfied its specifications.

(E.g. If user give wrong username & password then system generating error massage saying Invalid username & password)



White Box testing (open box testing, glass box, structural and clear box testing)

This consider about internal operations of a program module.

(E.g. If user give correct data to the system then he/she can visit next page)

```
if ( )  
{  
_____
```

5.3.2 Integration testing

This tests that the linkages between each tested module work properly. Integration testing tests integration or interfaces between components, interactions to different parts of the system such as an operating system, file system and hardware or interfaces between systems.

5.3.3 System testing

This tests the system as a whole system to ensure that the components fit together properly. It confirm whether all the system elements have been integrated & perform the allocated functions.

Once all the components are integrated, the application as a complete is tested rigorously to see that it meets Quality Standards.

5.3.4 Acceptance testing

Final testing is to determine if the software is satisfactory to a customer. User acceptance testing is a main feature of project implementation.

5.3.5 Installation testing

This is the testing of the system as a whole as it goes live on the customer's hardware and in the customer's environment.

5.4 Test plan

During the testing process the black box and the white box testing methods was applied. As unit testing, mainly the testing was carried out parallel to the development. A validation testing is carried out for testing the fulfilment of requirements. With the participation of all the levels of users the system testing is carried out. A test plan contains testing strategies, testing objectives, test cases and test schedules. Test plan documentation formats can be varied product to product or organization to organization which it apply. A test plan contains the following need to determine scope of the project, determine risks on the project, Identify the objectives of testing, determine the test approach, test techniques, test items, and coverage, determine the resources required (people, infrastructure, test environment, implement test strategy, schedule, test analysis and designs tasks, implementation, execution and evaluation, and determine exit criteria to test, testing procedures, test data and expected result.

5.5 Test cases

This consists of set of input values (test data) and expected output values.

Eg: Test screen – Student service screen

No	Test Case Description	Test Data	Priority	Expected Output	Actual Output
1	Click on Register with our system	Not Applicant	high	Load Register page	
2	Click on Login	Not Applicant	high	Load student login page	

5.6 Validation and verifications (V & V)

Verification means “Did we build the right System”. The process to make sure the product achieved the conditions imposed at the beginning of the implementing phase. Validation mean “Did we build the system right?” The process to get confirm the product satisfy the requirements given by the clients at the end of the implementation on the executable system. V model is very much useful to do testing activating within every development phases. V-Model links early development activities to their corresponding future testing activities.



Figure 5:2 – V model

5.7 Testing framework

A testing framework or more exactly a testing automation framework is an execution environment for automated tests. It is the overall system in which the tests will be automated.

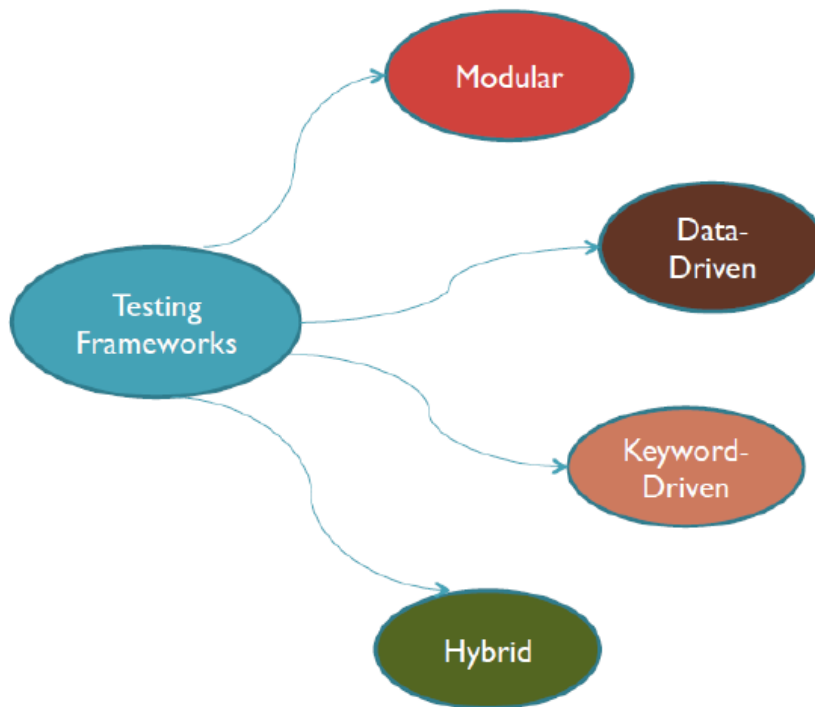


Figure 5:3 – Types of testing frame work

Here I use data driven testing framework. Data driven testing is where the test input and the expected output results are kept in a separate data file (normally in a tabular format) so that a single driver script can execute all the test cases with multiple sets of data.

The driver script holds navigation through the program, reading of the data files and logging of the test status information.

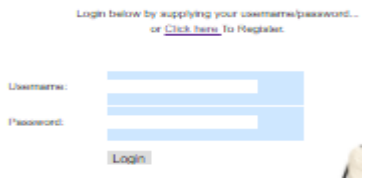
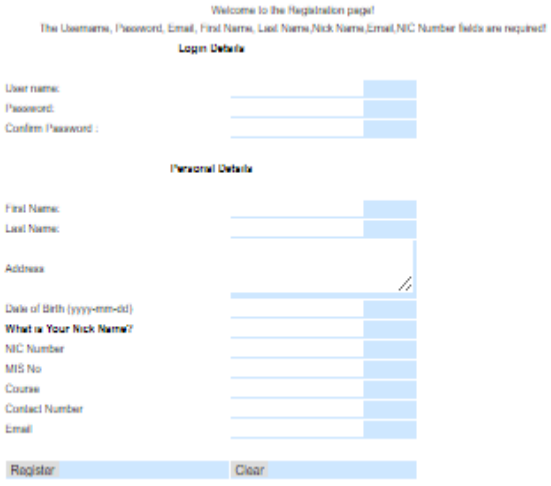
This framework reduces the number of overall test scripts needed to establish all the test cases. Less amount of code is necessary to generate all the test cases. Offers better flexibility when it comes to maintenance and fixing of bugs. The test data can be generated before test implementation is ready or even before the system to be tested is ready.

5.8 Test data and test results

Considering the data captured form sample documents which grabbed during the analysis stage, can create needed test data to run tests. For the every test cases, have to choose test

data based on specific requirements for check the accuracy/correctness of the software and to check the software is capable to validate and produce error messages when validate goes wrong.

Eg: Test screen – Student service screen

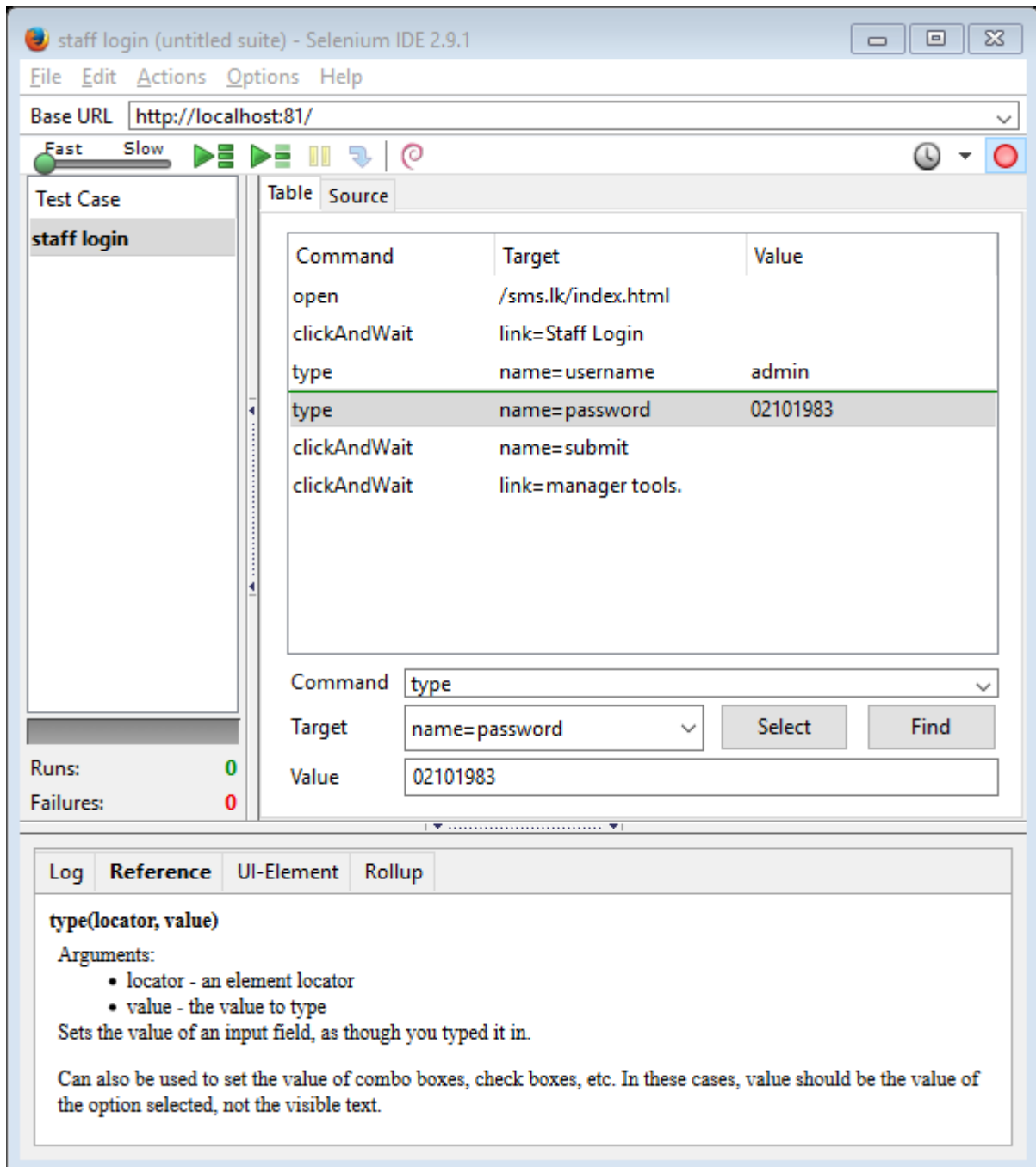
No	Test Case Description	Test Data	Priority	Expected Output	Actual Output
1	Click on Register with our system	Not Applicant	high	Load Register page	Same 
2	Click on Login	Not Applicant	high	Load student login page	Same 

(Refer Appendix D)

5.9 Test automation (Selenium IDE)

I use selenium IDE to execute some automation testing in my SMS. Selenium IDE is free open source testing tool to test functionalities web applications and also can use as a Mozilla Firefox plugging.

Eg: Automation test case for staff login



The screenshot displays the Selenium IDE 2.9.1 interface. The title bar reads "staff login (untitled suite) - Selenium IDE 2.9.1". The menu bar includes "File", "Edit", "Actions", "Options", and "Help". The "Base URL" is set to "http://localhost:81/". The interface features a "Test Case" sidebar on the left with "staff login" selected. The main area shows a table of test steps:

Command	Target	Value
open	/sms.lk/index.html	
clickAndWait	link=Staff Login	
type	name=username	admin
type	name=password	02101983
clickAndWait	name=submit	
clickAndWait	link=manager tools.	

Below the table, the "Command" dropdown is set to "type", the "Target" dropdown is "name=password", and the "Value" field contains "02101983". There are "Select" and "Find" buttons next to the target dropdown. At the bottom, the "Log" tab is active, showing the command signature **type(locator, value)** and its arguments: "locator - an element locator" and "value - the value to type". It also includes a description: "Sets the value of an input field, as though you typed it in." and a note: "Can also be used to set the value of combo boxes, check boxes, etc. In these cases, value should be the value of the option selected, not the visible text."

5.10 User evaluation of the system.

Acceptance testing of the software helps to do evaluation process. Mainly in the evaluation process focus on usability, sustainability and maintainability of the software.

Usability

Usability means the quality of user experience when users interact with software. The concept of usability has been defined in multiple ways. [6]

Semantics	Usability is equated to terms such as 'ease of use' or 'user-friendliness without formal definition of the properties of the construct
Features	Usability is equated to the presence or absence of certain features in the user interface such as Windows, Icons, Menus or Pointing devices.
Operations	In terms of performance and affective levels manifest by users for certain task and environmental scenarios.

Usability is combination of factors they are,

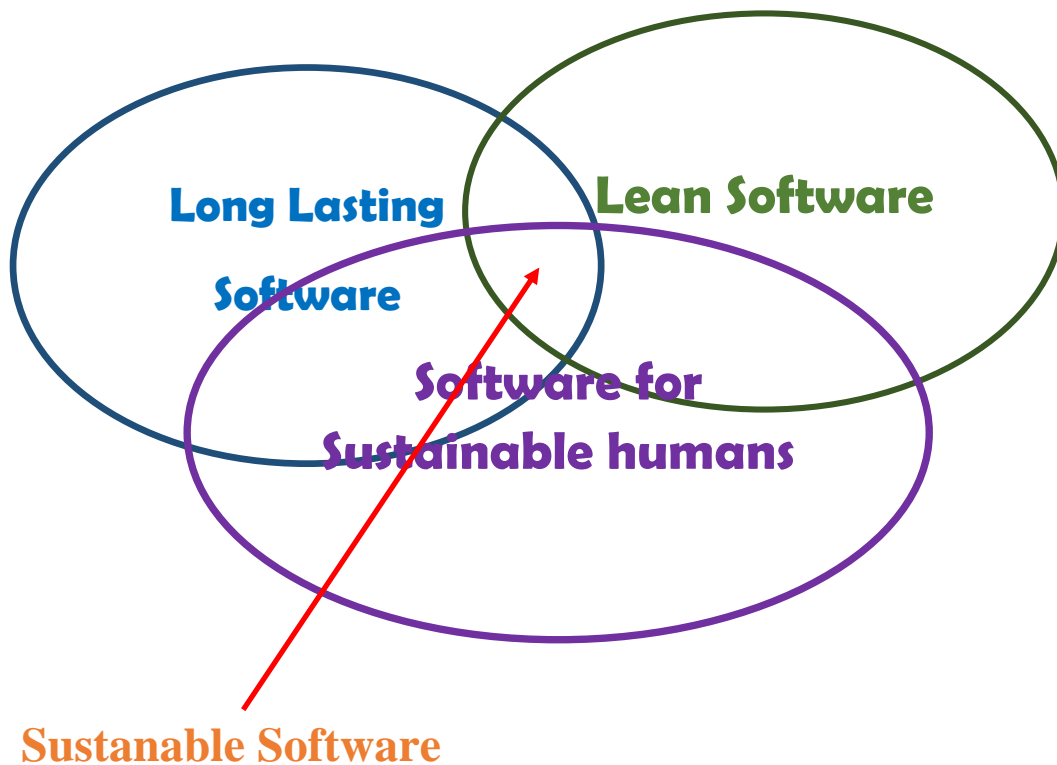
- **Easy to learn** - How fast users can learn when users see the interface before accomplish the tasks.
- **Efficiency of use** - How quickly an experienced user can complete tasks
- **Memorability** - After user hands on a system, whenever user accessing in future, how much user can remember enough to use it effectively.
- **Intuitive design** - Effortless understanding of the architecture and navigation on system.
- **Error frequency and severity** - How user recover from the errors, how critical the errors are, how often user makes errors when using software
- **Subjective satisfaction** - User likeness of the software

Sustainability

Generally sustainability can be define as capacity to endure that is measured by time. To be a sustainable software, it need to achieve following three major features,

- **Long Lasting Software** – “the goal is to build "long lasting" software. This in turn relates to qualities such as reliability, (self-)adaptability, maintainability or context-awareness of software, as well as to development paradigms such as Agile” [6]

- **Lean Software** – “software is one that requires few hardware capacity and reduces its own power consumption” [6]
- **Software for sustainable humans** – “In this sense a sustainable software is one that induces sustainable human behaviors. There are an infinity of examples, as software has invaded all our activities, in daily life or business, and most have an impact on the way we behave. Consequently, any piece of software should be designed in the awareness of its impacts on human sustainability. We may cite e-bay, which fosters reuse of physical goods, or paper virtualization platforms, which reduce the use of paper in offices, or google maps' ability to show you public transportation routes towards your destination” [6]



Maintainability

Ability to modify to correct faults, improve performance, or other attributes, or adapt to a changed environment on the software system or component.

Evaluating methods

➤ User-base

Testing software with sample of the intended users performing a set of tasks. Goal of this is to examine software supports the intended users in their work.

➤ Expert-base

Usability expert makes an assessment of software.

➤ Model-base

Expert uses formal methods to predict one or more criteria of user performance.

Evaluating software with sample of users performing tasks is considered to yield the most reliable and valid estimate of a software usability.

To evaluate this student management system I use following evaluation criteria.

1. User-friendliness of our software's interface
2. Speed of the application
3. Is that warning & error message displayed at the right places and it is helpful
4. Accuracy of system provided information.
5. Is that software freeze or crash?
6. Support of daily activities.
7. Colour matching.
8. Performance of software.
9. Compatibility with other application software.
10. Reliability of software

Generated report by the system

Refer Appendix E - Report – less than 80% attendance.

User manual to handle system functionalities.

Refer Appendix F - User manual

This system is student management system for student activities that involve in National Vocational Training Institute Niyagama. This system developed using Software engineering techniques. System covers all the functional and nonfunctional requirements of the client. They are working properly and user friendly.

This system is handle web based through internet. System is provided help page for customer. Otherwise system be able to help through e-mail by contacting them.

Chapter 6

Conclusion and Future Work

Chapter 6: Conclusion and future work

6.1 Introduction.

This chapter will explain the reflection of author on this software including a critical appraisal on the success.

6.2 Purpose of this SMS.

Following are the main aims to develop this system.

- Provide web base environment to access from anywhere for the NVT- Niyagama staff and students.
- To avoid issues in existing manual system.

6.3 Difficulties encountered.

At the start of this implementation, there are few difficulties to face while collecting requirements. Some user prospects were not clear. So I had to expend more time with them to get clear idea about their expectation. But the time spent those clarifications did not waste time and time plan did not exceeded. And also there were problem with meeting top management because of their busy schedules.

While implementing, program modules need to do modification according to requirement changed. Anyhow it can be reached the scheduled time of the project. Some of task get more time compare with project plan. But overall time plan is realistic. Flow of the project is been to beginning smoothly with the time plan.

6.4 Lessons I learned.

Gained a good knowledge in requirement gathering, analyzing requirement and design.

How to deal with top management people and manage their day today matters with office works.

Time management when implementing system according time plan.

To do implementation I gained more knowledge of about PHP, MySQL & Apache. I paid special attention to gather complete knowledge about the advanced features of the DBMS as MySQL was used as the backend.

How to configure Apache, MYSQL & PHP applications.

How to get existing data to SMS.

6.5 Future enhancement to do.

Top management may ability to do graphical representation (pie charts, bar charts & line charts) for payment & overdue cost.

Add feature to allow to user to upload their photograph. This help to institute to easily recognize that student.

Add feature to quickly popup message to the institute web site, if a send sends request/enquiry about a course.

Institute may have facility to reminding payments to students automatically.

Implement daily update monitoring system.

Improve validation error messages on the system.

Monitoring student complaints.

6.6. Brief overview of this chapter

This chapter accomplishes the report, which had five chapters up to this. Difficulties encountered and the benefits gained by the author are also included within this chapter. This also concise the future works of the project.

Reference:

[1]"SchoolTool: the Global Student Information System", *Schooltool.org*, 2016. [Online]. Available: <http://schooltool.org/>. [Accessed: 07- Sep- 2016].

[2]"VOLAP - VTA Online Learning Advancement Portal", *222.165.180.196*, 2016. [Online]. Available: <http://222.165.180.196/lms/>. [Accessed: 07- Sep- 2016].

[3]"Rational Unified Process", Wikipedia, 2016. [Online]. Available: https://en.wikipedia.org/wiki/Rational_Unified_Process. [Accessed: 07- Sep- 2016].

[4]"Waterfall model", Wikipedia, 2016. [Online]. Available: https://en.wikipedia.org/wiki/Waterfall_model. [Accessed: 07- Sep- 2016].

[5]2016. [Online]. Available: <https://www.cms.gov/research-statistics-data-and-systems/cms-information-technology/xlc/downloads/selectingdevelopmentapproach.pdf>. [Accessed: 07- Sep- 2016].

[6]Andrew Dillon. Usability is a measure of interface quality that refers to the effectiveness, efficiency and satisfaction with which users can perform tasks with a tool [Online] Available at:<https://www.ischool.utexas.edu/~adillon/BookChapters/Dillonevaluation%20of%20software%20usab.htm> [Accessed: 10- Dec- 2016].

Appendices

Appendix A

Fact finding techniques that I used

i. Interviews

Interview with Assistant Director of vocational training institute.(on 23 June 2016, at 10.00am)

Q: Can you explain about your existing system? What do you expect from this proposed system?

A: Currently we have a manual system for our student activities. In exists manual system, student requesting/enquiring about course through telephone calls and visiting our institute. Then telephone operator makes note and give these details to program officer. Finally they send information to them through posting mails. We simply record these details in our paper based documents.

Q: What are the drawbacks in existing system?

A: In current system cannot get correct details from student, because it is telephone conversation between student and telephone operator there can be mistakes of hearings (Especially in student address).

There can be misplace of notes about student request that make by telephone operator. Can be error in telephone lines (e.g line is busy).

Lots of paper based activities to do. There can be many duplicate records.

Q: What do you expect from this proposed system?

A: The proposed system, Web based student management System for national vocational training institute, is allow to students to give details of their course through online. When a student, gives details about a course then website may quickly popup that message then we (institute) can quickly and easily recognize that details. We can give our service to our customers. Finally student can do online payments. Database should be store records about our students and their payments & other details. This helps us to know about our students, pending works, finished works, due payments & our profits.

Appendix – B

Use case Diagrams

i. Student Registration

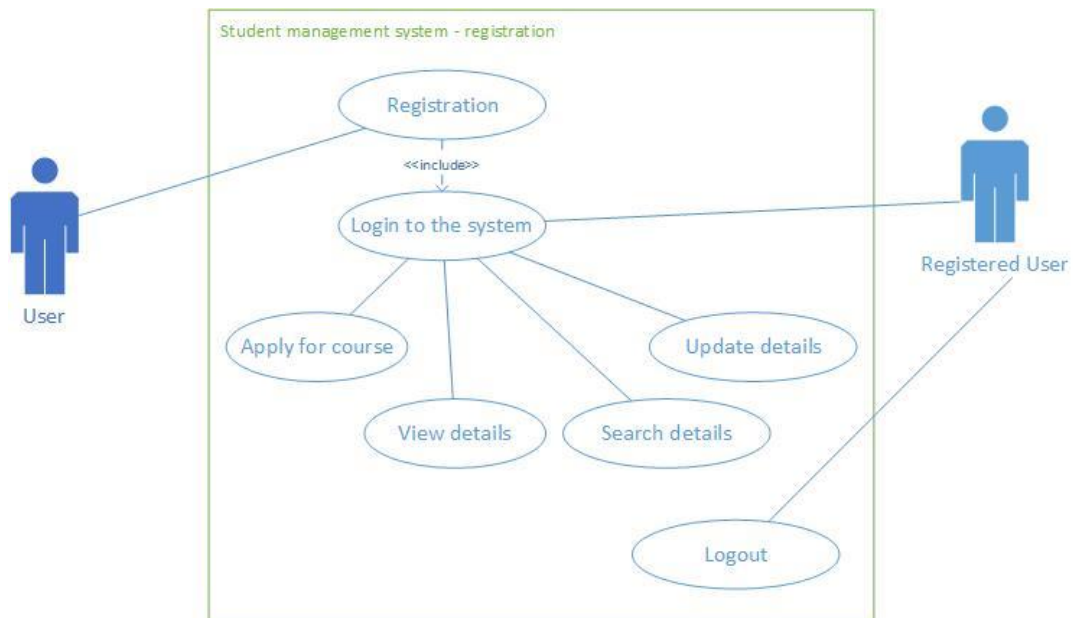


Figure A.1 Use case diagram: Student Registration

ii. Student Management Activities.

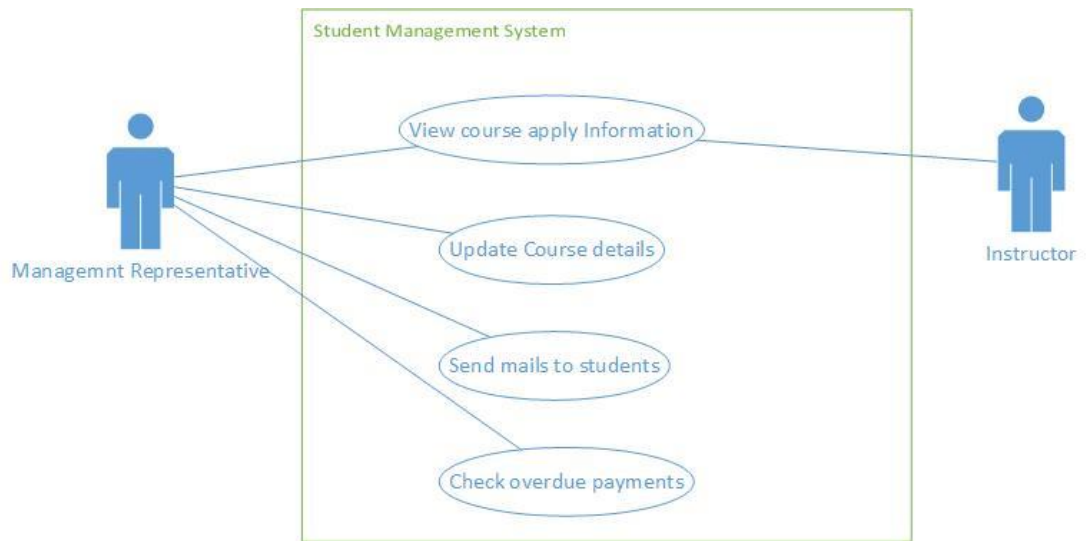


Figure A.2 Use case diagram: Student Management Activities

Class Diagrams

I Student Management Package.

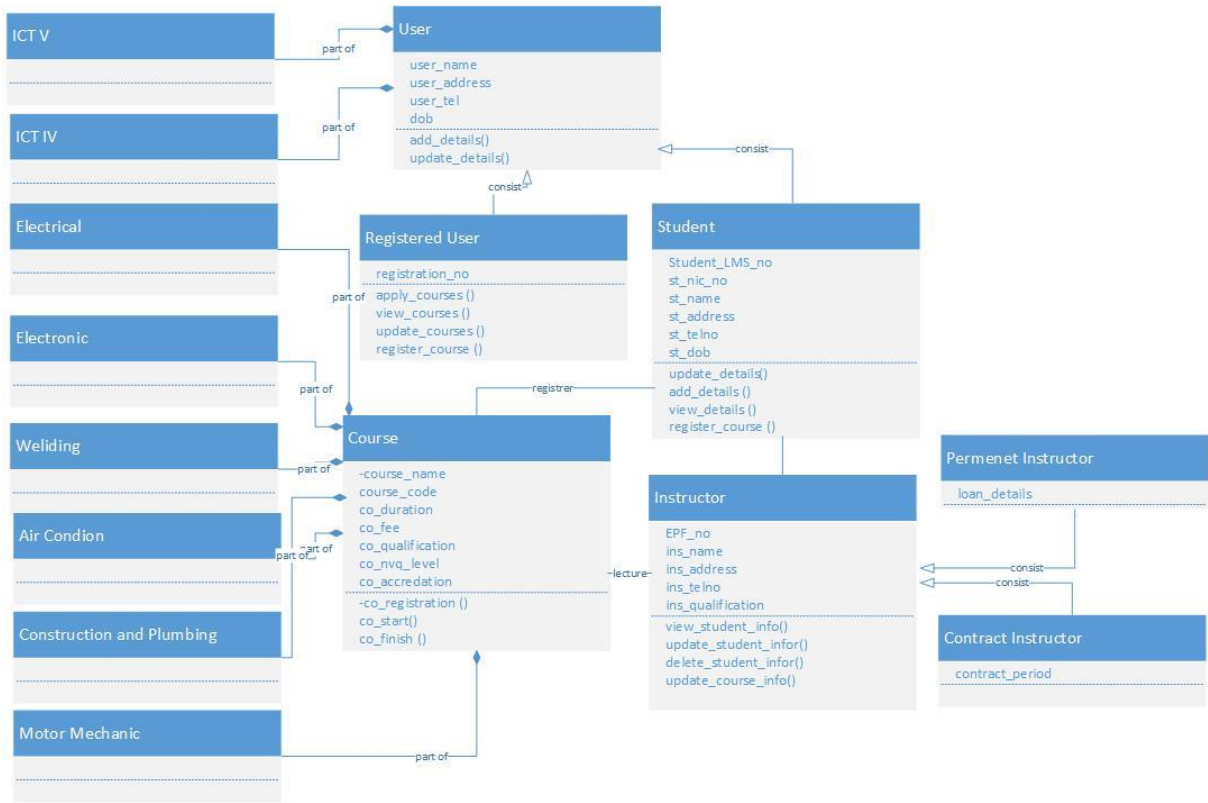


Figure A.3: Class Diagram: Student Management Package

Appendix C

Entity Relationship diagram

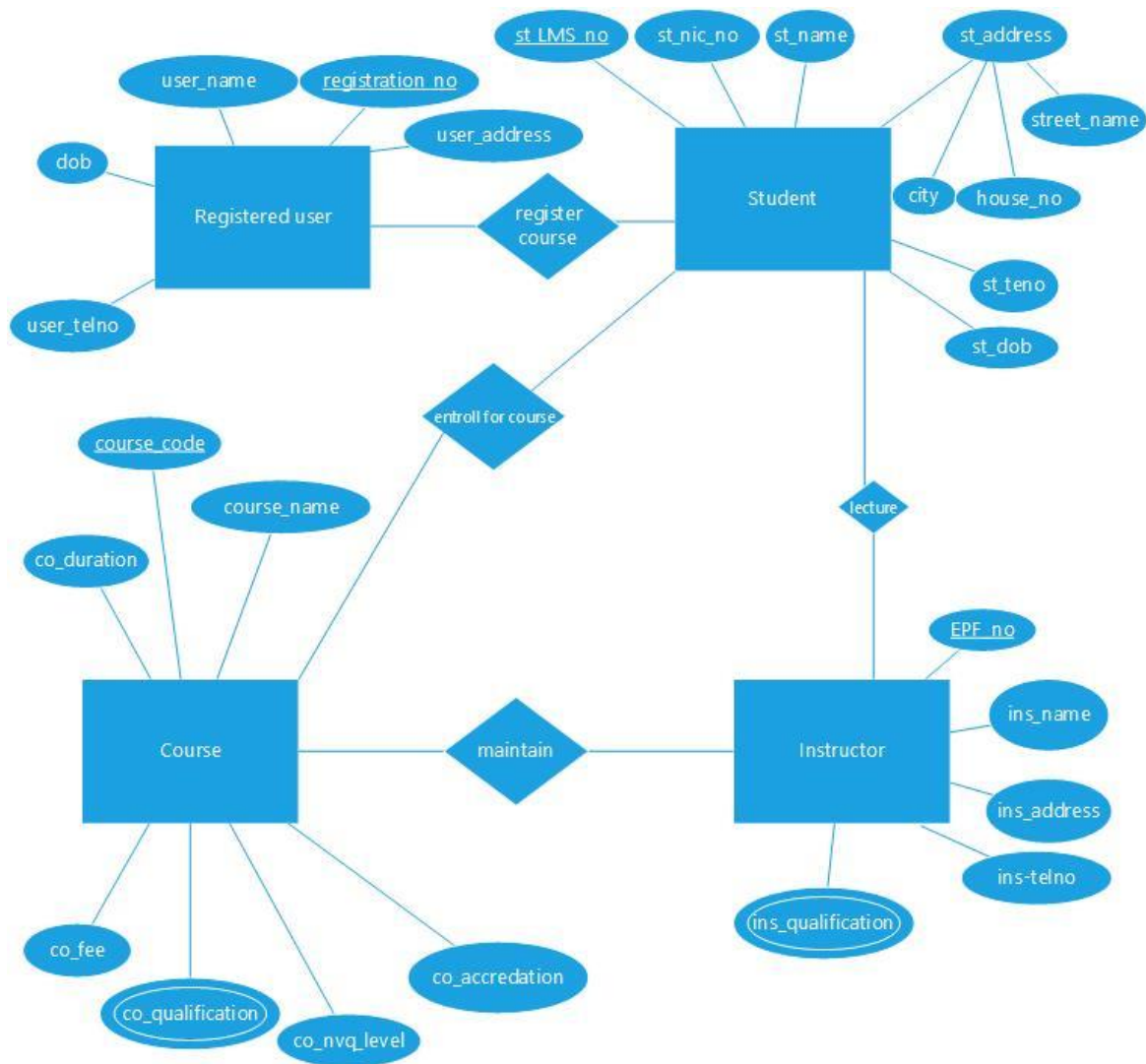

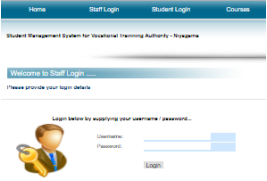




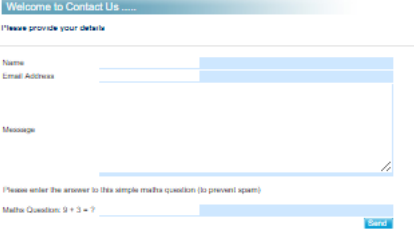
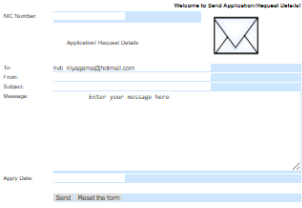
Figure A.4: ER diagram

Appendix D

Test data and test results

Test screen – home screen

No	Test Case Description	Priority	Expected Output	Actual Output																				
1	Click on home hyperlink	High	Load home page	Same 																				
2	Click on staff login hyperlink	High	Load staff login page	Same 																				
3	Click on student login hyperlink	High	Load student login page	Same 																				
6	Click on courses hyperlink	High	Load courses page	Same  <table border="1"> <thead> <tr> <th>Course Name</th> <th>NVD Level</th> <th>Course Duration</th> <th>Course Fee</th> </tr> </thead> <tbody> <tr> <td>Information Communication Technology</td> <td>Level 5</td> <td>1 Year</td> <td>40500.00</td> </tr> <tr> <td>Information Communication Technology</td> <td>Level 4</td> <td>6 Months</td> <td>8500.00</td> </tr> <tr> <td>Construction and Plumbing</td> <td>Level 4</td> <td>1 1/2 Year</td> <td>3000.00</td> </tr> <tr> <td>Radio and Television</td> <td>Level 4</td> <td>1 1/2 Year</td> <td>7050.00</td> </tr> </tbody> </table>	Course Name	NVD Level	Course Duration	Course Fee	Information Communication Technology	Level 5	1 Year	40500.00	Information Communication Technology	Level 4	6 Months	8500.00	Construction and Plumbing	Level 4	1 1/2 Year	3000.00	Radio and Television	Level 4	1 1/2 Year	7050.00
Course Name	NVD Level	Course Duration	Course Fee																					
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Information Communication Technology	Level 4	6 Months	8500.00																					
Construction and Plumbing	Level 4	1 1/2 Year	3000.00																					
Radio and Television	Level 4	1 1/2 Year	7050.00																					

7	Click on contact us hyperlink	High	Load contact us page	Same	
8	Click on online application hyperlink	High	Load online application page	Same	


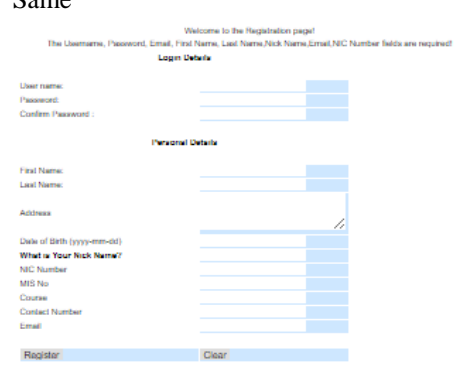
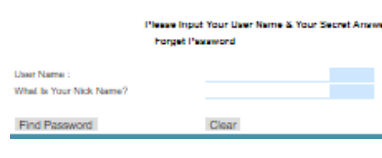
Test screen – student service screen

No	Test Case Description	Test Data	Priority	Expected Output	Actual Output
1	Click on Register with our system	Not Applicant	high	Load Register page	Same
2	Click on Login	Not Applicant	high	Load student login page	Same

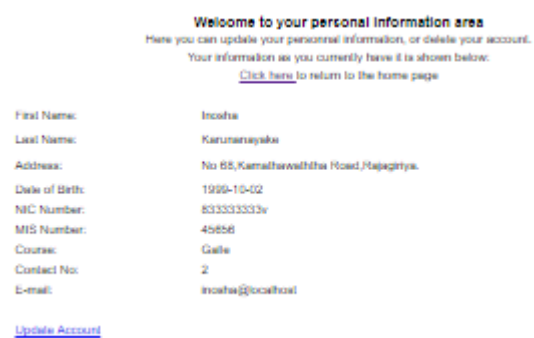

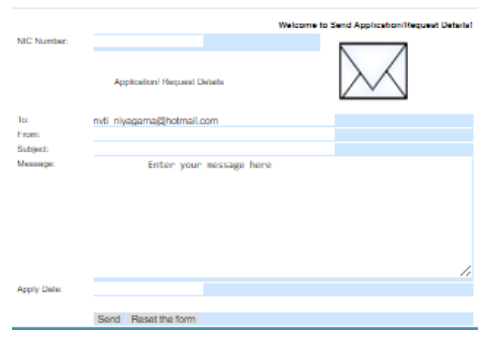



Test Screen – Contact Us Screen

No	Test Case Description	Priority	Expected Output	Actual Output
1	Click on nvti_niyagama@vtasl.com	High	Load outlook express mail	Same


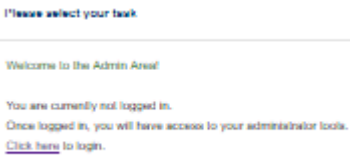
Test Screen – Student Login Screen

No	Test Case Description	Priority	Expected Output	Actual Output
1	Click on Login, by inserting valid username and password	High	Load student home page	<p>Same</p> 
2	Click on Register	High	Load register page	<p>Same</p> 
3	Click on Forget Password	High	Load forget password page	<p>Same</p> 

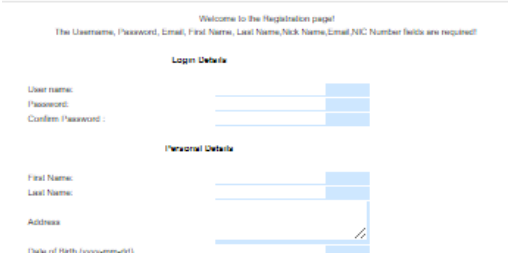

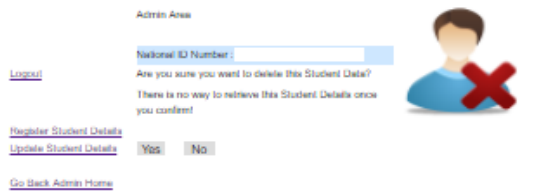
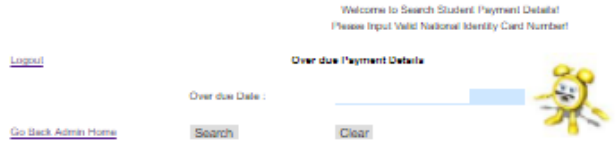
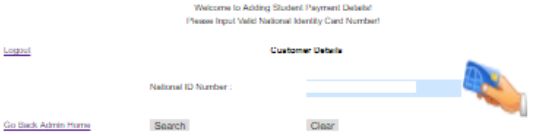
Test screen – student home screen

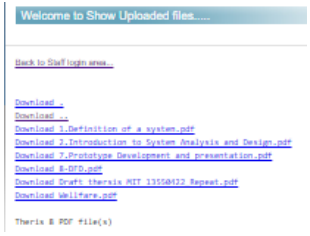
No	Test Case Description	Priority	Expected Output	Actual Output
1	Click on 'To update my personnel information' hyperlink	High	Load update personnel information page	<p>Same</p>  <p>Welcome to your personal information area Here you can update your personal information, or delete your account. Your information as you currently have it is shown below: Click here to return to the home page</p> <p>First Name: Incotia Last Name: Karunaratna Address: No 88, Kamathawaththa Road, Rajagiriya. Date of Birth: 1999-10-02 NIC Number: 833333332v MHS Number: 45555 Contact: Galle Contact No: 2 E-mail: incotia@icccol.ac.lk</p> <p>Update Account</p>
2	Click on 'To view my payments details' hyperlink	High	Load customer payments details page	<p>Same</p>  <p>Customer Home Update Information View Payment Details</p> <p>NIC Number: 833333332v First Name: Incotia Last Name: Karunaratna Address: No 88, Kamathawaththa Road, Rajagiriya. E-mail: incotia@icccol.ac.lk Contact Number: 2</p>
3	Click on 'To do an enquiry/request' hyperlink	High	Load enquiry/request page	<p>Same</p>  <p>Welcome to Send Application/Request Details</p> <p>NIC Number: <input type="text"/></p> <p>Application/ Request Details </p> <p>To: nvl_niyagama@hotmail.com From: <input type="text"/> Subject: <input type="text"/> Message: <input type="text"/></p> <p>Apply Date: <input type="text"/></p> <p><input type="button" value="Send"/> <input type="button" value="Reset the form"/></p>
4	Click on 'logout' hyperlink	High	Load student home page	<p>Same</p>  <p>Welcome to the Student Page ! You are currently logged into our system. Once logged in, you will have access to our personal area, along with other user information. If you have already registered, Click here to login, or if would like to create an account, Click here to register.</p> 



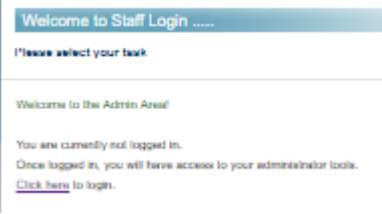
Test Screen – Admin Logged Screen

No	Test Case Description	Priority	Expected Output	Actual Output
1	Click on 'manager tools' hyperlink	High	Load manger area page	<p>Same</p> 
2	Click on 'Logout' hyperlink	High	Load Logout page	<p>Same</p> 

Test Screen – Admin Area Screen

No	Test Case Description	Priority	Expected Output	Actual Output
1	Click on register student details hyperlink	High	Load register student details page	Same 
2	Click on update student details hyperlink	High	Load Update student details page	Same 
3	Click on delete student details hyperlink	High	Load delete student details page	Same 
4	Click on overdue payments hyperlink	High	Load Overdue payments page	Same 
5	Click on add payments hyperlink	High	Load add payments page	Same 

6	Click on View User Enquiries/Request	High	Load View User Enquiries/Request page	Same	 <p>Admin Area - admin Below is a list of users and your available administrator privileges.</p> <p>22222222v Show Enquiry Delete Enquiry 83/762901v Show Enquiry Delete Enquiry 8123/4356v Show Enquiry Delete Enquiry 83/762901V Show Enquiry Delete Enquiry 83/762901v Show Enquiry Delete Enquiry</p> <p>Go Back Admin Home</p>																																
7	Click on add student attendance hyperlink	High	Load add student attendance page	Same	 <p>Welcome to Adding Student Attendance Details! Please Input Valid National Identity Card Number!</p> <p>Logout</p> <p>Student Details</p> <p>National ID Number: <input type="text"/></p> <p>Go Back Admin Home <input type="button" value="Search"/> <input type="button" value="Clear"/></p>																																
8	Click on upload files hyperlink	High	Load on upload files page	Same	 <p>!Please upload slides</p> <p>Back to Staff login area...</p> <p>Select slide to upload: <input type="button" value="Choose File"/> No file chosen <input type="button" value="upload"/></p>																																
9	Click on show upload files hyperlink	High	Load show upload files page	Same	 <p>Welcome to Show Uploaded files.....</p> <p>Back to Staff login area...</p> <p>Download ... Download ... Download 1.Definition of a system.pdf Download 2.Introduction to System Analysis and Design.pdf Download 3.Prototype Development and presentation.pdf Download 4.OTD.pdf Download Draft_therix RIT 13558432_Report.pdf Download 5011946.pdf</p> <p>Therix & PDF file(s)</p>																																
10	Click full report of registered student hyperlink	High	Load report of registered student page	Same	 <p>Welcome to Staff Login</p> <p>Registered Student Details</p> <p>Back to Staff login area...</p> <table border="1"> <thead> <tr> <th>First Name</th> <th>Last Name</th> <th>Address</th> <th>NIC Number</th> <th>Course</th> <th>Contact Number</th> <th>Email</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>Daksh</td> <td>Simeena</td> <td>No 12, Mapugala, Galia</td> <td>837574535V</td> <td>Galia</td> <td>724559484</td> <td>dak@localhost</td> <td>0000-00-00</td> </tr> <tr> <td>Darsuha</td> <td>Karunamayaka</td> <td>250, Madara Road, Galia.</td> <td>792584888V</td> <td>Galia</td> <td>774552568</td> <td>darsuha@localhost</td> <td>0000-00-00</td> </tr> <tr> <td></td> <td></td> <td>No</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	First Name	Last Name	Address	NIC Number	Course	Contact Number	Email	Date	Daksh	Simeena	No 12, Mapugala, Galia	837574535V	Galia	724559484	dak@localhost	0000-00-00	Darsuha	Karunamayaka	250, Madara Road, Galia.	792584888V	Galia	774552568	darsuha@localhost	0000-00-00			No					
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Darsuha	Karunamayaka	250, Madara Road, Galia.	792584888V	Galia	774552568	darsuha@localhost	0000-00-00																														
		No																																			

11	Click full report of overdue payment hyperlink	High	Load report of overdue payment page	<p>Same</p> 
12	Click full report of less than 80% attendance hyperlink	High	Load report of less than 80% attendance page	<p>Same</p> 
13	Click logout hyperlink	High	Load admin area page	<p>Same</p> 

Appendix E

Report – less than 80% attendance

80% Attendance Report

[Back to Staff login area...](#)

NIC Number	Year	Month	Total Attendance	Percentage of Attendance
837762902v	2015	ocober	1	3
837762902v	2016	january	6	20

Appendix F

User manual

Type url as <http://www/sms.lk/index.html> your web browser. Then you see student management system for Vocational Training Authority – Niyagama.

The screenshot shows the homepage of the Student Management System for Vocational Training Authority - Niyagama. The website has a blue header with navigation links: Home, Staff Login, Student Login, Courses, Contact us, and Online Application. Below the header is a banner image of a smiling female student giving a thumbs up, with books on a desk in front of her. The main content area is divided into several sections:

- Welcome to our Website:** A large image of a diverse group of students. Text to the right describes the Vocational Training Authority of Sri Lanka, established in 1995, and its role in providing skills training and entrepreneurship development. It also mentions NVTI - Niyagama, also known as Sri Lanka-Korea National Technical College (NVTI - Niyagama).
- Vision:** To be Leader Leader of providing technical, vocation and training to the nation. Includes a "Learn more" link.
- Mission:** To Function as an Organization that produced skilled personal to the level of national and international skill standard. Includes a "Learn more" link.
- NVQ:** National Vocational Qualification System. Text describes the introduction of the NVQ system in collaboration with the Government Technical Education and Vocational Training Institute and Skills Development Project, presently as TROP under the guidance of Ministry of Vocational and Technical Training. Includes a "Learn more" link.

The footer contains three columns:

- About Us:** Contact Us information including address (National Vocational Training Authority, Niyagama, Trincomalee), email (nvti@vta.lk), and phone number (011-2226445).
- Location:** A Google Map showing the location of Niyagama, with labels for Piliyala, Niyagama, and Nagoda.
- Contact Information:** A form with fields for Name, Email, and a large text area, followed by a "Send" button.

At the bottom, there is a copyright notice: "Copyright©2017. Designed by IS Karunanayake" and social media icons for Facebook, Twitter, YouTube, and LinkedIn.

Home

Under “Home” tab you can see some organizational information about NVTI – Niyagama, vision and mission. Also you can click on “learn more” hyperlink to visit <http://www.vtasl.gov.lk/index.html>



NVQ qualification details also listed in this system and by clicking “learn more” hyperlink you can visit <http://www.tvec.gov.lk/> for get more details.



තෘතීයික හා වෘත්තීය අධ්‍යාපන කොමිෂන් සභාව
முன்றாம் நிலைக்கல்வி, தொழிற்கல்வி ஆணைக்குழு
Tertiary and Vocational Education Commission



ශ්‍රී ලංකාවේ කාර්මික හා වෘත්තීය අධ්‍යාපන පුහුණු ක්ෂේත්‍රයේ ප්‍රමුඛ ආයතනය ලෙස රටේ සමාජ ආර්ථික අරමුණු හා වෙනත් වන ඉම වෙළෙඳුමට අවශ්‍යතාවලට අනුකූල කාර්යක්ෂම හා ඵලදායී කාර්මික අධ්‍යාපන හා වෘත්තීය පුහුණු පද්ධතියක් ස්ථාපිත කිරීම.

தொழில்நுட்ப, வாழ்க்கைத் தொழில் கல்வி மற்றும் பயிற்சித் (TVET) துறையின் அதியுயர் அமைப்பாகிய நாங்கள், சமூக மற்றும் பொருளாதார இலக்குகள் மற்றும் மாற்றப்படுகின்ற சந்தைத் தேவைகளுடன் தொடர்புபட்ட, பயனுறுதியும் விளைத்திறனும் வாய்க்கப்பெற்ற TVET முறைமையைத் தாபித்தலும் அதனைப் பேணுதலுமாகும்.

As the apex body in the TVET sector, we are committed to establish and maintain an efficient and effective technical education and vocational training system which is relevant to socio-economic goals and changing market needs

සිංහල **தமிழ்** **English**

"சிவனா பியச" 354/2, எலிவிடிகல மாவத்தை, கொழும்பு 05
நிபுளதா பியச, 354/2, எஸ்விடிகல மாவத்தை, கொழும்பு 05
Nipunatha Piyasa, 354/2, Elvitigala Mawatha, Colombo 05, Sri Lanka

* [Click here to get Sinhala & Tamil Uni Code](#)

Staff Login

Under this section you can logging to manager area by providing correct username and password.

Welcome to Staff Login

Please provide your login details

Login below by supplying your username / password...



Username:

Password:

Login

After login to system you can see manager area. Here you can select manager tools (to perform management task) or logout (logout from the system) hyperlinks.

Welcome to Staff Login

Please select your task

Welcome to the Manager Area!

[Logout](#)

You are Successfully logged in to our System

Now you can access your [manager tools](#).







Within manager area you can perform following tasks







01



[Register Student Details](#)

Can add Students details to the system.
(you have to provide login details and personal data of each student)

02	 Update Student Details	<p>Can update student personal details by searching particular student NIC number. Also this provides navigation to logout, update student details and go back to manager area.</p>
03	 Delete Student Details	<p>Can delete student details by searching particular student NIC number. Also this provides navigation to logout, update student details, register student details and go back to manager area.</p>
04	 Add Payment Details	<p>Can add payment details (1st installment, 2nd installment and 3rd installment) those who registered with the system by searching particular student NIC number. Also this provides navigation to logout and go back to manager area.</p>
05	 Over Due Payments	<p>Can see students those who has overdue payment by giving relevant overdue date. Also this provides navigation to logout and go back to manager area.</p>
06	 Add Student Attendance	<p>Can add student attendance daily or monthly by providing student NIC number. Also this provides navigation to logout and go back to manager area.</p>
07	 View Application/ Request Details	<p>Can see application request/enquiry also you can delete those request/enquiry. Also this provides navigation to logout and go back to manager area.</p>

08	 Upload Files	<p>This facilitates to upload teaching slides or any other important document that related to students. Can navigate to go back to manager area.</p>
09	 Show Uploaded Files	<p>This facilitates to see uploaded files. Can navigate to go back to manager area.</p>
10	 Full Report of Registered Students	<p>Can generate full report of registered students. Can navigate to go back to manager area.</p>
11	 Full Report of Over due Payment	<p>Can generate full report of students those who has overdue payments. Can navigate to go back to manager area.</p>
12	 Full Report of less than Attendance Requirements	<p>Can generate full report of students those who has less 80% attendance. Can navigate to go back to manager area.</p>
13	 Logout	<p>Logout from admin login</p>

Student Login

Under this section students can logging to student area by providing correct username and password or otherwise you can register with the system.

Welcome to the Student Page !




You are currently logged into our system.

Once logged in, you will have access to our personal area, along with other user information.

If you have already registered, [Click here](#) to login, or if would like to c reate an account, [Click here](#) to register.



Within student area you can perform following tasks

01	 To Update My Personnel Information	Registered student can update address, contact number and email address. Can navigate to go back to student area and logout.
02	 To View My Payment Details	Registered students can see their payments installment wise and display total payment and balance payments. Can navigate to go back to student area and logout.
03	 To do an Application / Request	Registered students can send request. Can navigate to go back to student area and logout.

04



[Download Slides](#)

Registered students can download lecture notes. Can navigate to go back to student area and logout.

05



[Logout](#)

Logout from student login

Courses

Under this section you can see ongoing course details NVTI – Niyagama. Including course name, NVQ level, course duration and course fee.

Welcome to Courses

Ongoing Course Details of NVTI - Niyagama

Course Name	NVQ Level	Course Duration	Course Fee
Information Communication Technology	Level 5	1 Year	40500.00
Information Communication Technology	Level 4	6 Months	8500.00

Contact us

Under this section anyone who access site can send message to NVTI – Niyagama.

Welcome to Contact Us

Please provide your details

Name

Email Address

Message

Please enter the answer to this simple maths question (to prevent spam)

Maths Question: $9 + 3 = ?$

Send


Online Application

Under this section anyone who access site can send online application to NVTI – Niyagama.

Please provide your details

Welcome to Send Application/Request Details!

NIC Number:

Application/ Request Details 

To:

From:

Subject:

Message:

Apply Date: