



Web based office Automation System
For
Provincial Education office - Sabaragamuwa

J.M.A.K. Jayakody

Registration Number : R110379

Index Number : 1103792

Client : Provincial Education Office – Sabaragamuwa

Name of the Supervisor : Mr. H.M.D.S. Herath

2017



This dissertation is submitted in partial fulfillment of the requirement of the
Degree of Bachelor of Information Technology (external) of the
University of Colombo School of Computing.

Declaration

Declaration

I certify that this dissertation does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any university and to the best of my knowledge and belief, it does not contain any material previously published or written by another person or myself except where due reference is made in the text. I also hereby give consent for my dissertation, if accepted, to be made available for photocopying and for interlibrary loans, and for the title and abstract to be made available to outside organizations.



Date: 31/10/2017.

J.M.A.K. Jayakody.

Countersigned by:



Date: 31/10/2017.

H.M.D.S. Herath.

Abstract

Sabaragamuwa Provincial education office is one of the Provincial education office in Sri Lanka. It has 7 zonal education office, 120 Directors, 200 ISA, 1500 Schools and in them there are 24000 teachers. Provincial education office handling almost all the administrative operations of the schools in Provincial such as managing information of schools and their academic and non-academic staff, analyzing result of province, Teachers transfer management, held exams, distribute text books, generate reports for administrative decisions, etc. even though the office is responsible for numerous complicated tasks, until the very recent times they have relied on a conventional manual file based system which was figured out to be inefficient and time consuming by the operational management. Not only the inefficiency and lack of robustness, but also redundancy of data and unavailability of timely information has been a major problem for the day to day operations of the office.

Considering all these the institute has come across a solution to upgrade the current manual system to a computerized system in order to obtain fullest benefit of modern computer technology for day to day operations. The corresponding solution, the office Administration System for the Provincial education office, has to cover almost all the processes of the office.

The requirement analysis, design and the development of this system is decided to be achieved through object oriented techniques and UML diagrams have been used to analyze the requirements and to draw the design. The architecture used for the system is MVC architecture, which stands for 'model, view and controller'. To develop the system while MySql is used to handle the database, XAMPP server is using to develop the system.

By using the developed system, users will be able to overcome the problems of the current manual system and will be able to perform their tasks efficiently and effectively.

As a solution, the director of IT Department in PEO decided bring in the Information Technology in place of the and thereby enhance the management functions related to the teachers and the other supportive functions.

Acknowledgement

I make this an opportunity to express my heartfelt gratitude to all those who have helped me and guided me in various ways to complete this project successfully. I would like to thank the University of Colombo School of Computing and its staff for offering this course unit and guiding us from the beginning.

My sincere thanks to my supervisor Mr. H.M.D.S. Herath Senior Lecture from Esoft Metro campus for his ideas and suggestions an especially for the guidance throughout the difficulties encountered during the course of the project.

Further special thanks to Mr. Sepala Kuruppuarachchi, Director of education to give me opportunity to do a project in the Province, and I would like to thanks all the staff those who gave me an unending support throughout the whole project with providing necessary information and guidance.

Table of content

Declaration.....	ii
Abstract.....	iii
Acknowledgement	iv
Table of content	v
List of Figures.....	viii
List of Tables	x
List of Acronyms	xi
01.Introduction.....	1
1.1 Introduction to the Sabaragamuwa Provincial Education office.....	1
1.2 The Office Automation System for Sabaragamuwa Provincial education office.....	1
1.3 Motivation for the Project	2
1.4 Objectives of the Project	2
1.5 Scope of the Project	3
1.6 Structure of the Dissertation.....	3
1.6.1 chapter 2 – analysis	3
1.6.2 chapter 3 – design.....	3
1.6.3 chapter 4 – Implementation.....	4
1.6.4 chapter 5 – Evaluation.....	4
1.6.5 chapter 6 – Conclusion	4
02. Analysis	5
2.1 Introduction.....	5
2.2 Fact Gathering Techniques.....	5
2.3 Existing System.....	5
2.4 Functional Requirements.....	7
2.4.1 School Management.....	7
2.4.2 Teacher Management	7
2.4.3 Text Books Management.....	7
2.4.4 Result Management.....	7
2.4.5 Exam Management.....	7
2.4.6 Report Management	7

2.5 Non – Functional Requirements	8
2.6 Existing similar System.....	8
2.6.1 Teacher Management System of Wayamba Education Network	9
2.6.2 Self Service Teacher Portal – Ministry of Education	10
2.6.3 Provincial Department of Education – Weston Province	10
03. Design	11
3.1 Design Techniques	11
3.2 The Design Architecture	12
3.3 Reasons for selecting web based System.....	12
3.3.1 A Collection of Software.....	13
3.3.2 Develop a standalone system.....	13
3.3.3 Use off- the shelf Software.....	13
3.4 Selected solution	13
3.5 Use case diagram for the system	14
3.6 Database Design.....	15
3.7 User interface design.....	16
3.8 Main Interfaces	16
04. Implementation	19
4.1 Introduction.....	19
4.2 Implementation environment	19
4.3 Reused modules	20
4.4 Major code segments.....	22
4.4.1 Database connection.....	22
4.4.2 Login Module.....	22
4.4.3 Logout module	23
4.4.4 School module.....	23
4.4.5 Result module	24
4.5 Security	24
05. Evaluation	25
5.1 Introduction.....	25
5.2 Importance Evaluation	25
5.3 Testing Strategies	25

5.3.1 Unit Testing.....	25
5.3.2 Integration Testing	25
5.3.3 Regression Testing	26
5.3.4 System Testing	26
5.3.5 User Acceptance Testing.....	26
5.4 Evaluation Methodologies.....	26
5.5 Evaluation Criteria	26
5.6 Results Evaluation.....	27
5.7 Test Cases	27
5.8 Test results	29
5.9 Test data and test results.....	30
5.10 User Evaluation.....	30
06. Conclusion	31
6.1 Introduction.....	31
6.2 Critical evaluation of the project development.....	31
6.3 Problem encountered during the project.....	33
6.4 lessons learnt from the project.....	33
6.5 Future enhancement	33
References.....	34
Appendix A – System documentation.....	35
Appendix B – Design documentation	39
Appendix C – User documentation	44
Appendix D – Management Reports.....	48
Appendix E – Test results.....	50
Appendix F – Code listings.....	58
Appendix G – Client Certificate.....	62
Glossary	63

List of Figures

Figure 2.1 web site of North western Province	9
Figure 2.2 Login page in Wayamba Education Network	9
Figure 2.3 Home page in Ministry of education.	10
Figure 2.4 Home page in Provincial Department of education western province.	10
Figure 3.1 RUP	11
Figure 3.2 MVC Architecture	12
Figure 3.3 use case diagram of the system	14
Figure 3.4 Normalization forms	15
Figure 3.5 Login Interface.....	17
Figure 3.6 School Dashboard.....	17
Figure 3.7 Add teacher form	18
Figure 3.8 Add result form.....	18
Figure 4.1 Connect Database	20
Figure 4.2 Session handling	21
Figure 4.3 Generate chart.....	21
Figure 4.4 Print	21
Figure 4.5 Database connection	22
Figure 4.6 Login module.....	22
Figure 4.7 Logout module.....	23
Figure 4.8 School module	23
Figure 4.9 Result module	24
Figure 5.1 User evaluation.	30
Figure A.1 Installing XAMPP.....	38
Figure B.1 High level use case diagram.	39
Figure B.2 Use case diagram for login.	40
Figure B.3 Use case diagram for school management.	41
Figure B.4 Sequence diagram for report generation.	42
Figure B.5 Sequence diagram for school registration.	43
Figure C.1 Login interface.	44
Figure C.2 School dashboard.	45
Figure C.3 Dashboard navigational sidebar.	45

Figure C.4 User Management.	46
Figure C.5 Add User page.	46
Figure C.6 teacher Management.	47
Figure C.7 Add teacher.	47
Figure D.1 School Details	48
Figure D.2 Teacher Details	48
Figure D.3 G.C.E (O/L) Result (Subject vise)	49
Figure D.4 G.C.E (O/L) Result (Year vise).....	49
Figure E.1 User evaluation form(Director).	53
Figure E.1 User Evaluation form(Principals)	55
Figure E.1 User Evaluation form(ISA)	57
Figure F.1 User Validation.....	60
Figure F.2 Login Validation.....	61

List of Tables

Table 4.1 Hardware configuration.....	19
Table 5.1 Test Cases	28
Table 5.2 Testing for non functional requirements	29
Table 5.3 test results for login.	29
Table A.1 Hardware requirements.	35
Table A.2 Software requirements.....	36
Table B.1 Use case description for login.....	40
Table B.2 Use case description for Mange school.....	41
Table B.2 Use case description for Result Management	42
Table E.1 Test result for login.....	50

List of Acronyms

PEO - Provincial Education Office

UML - Unified Modeling Language

MVC - Model View Controller

01.Introduction

1.1 Introduction to the Sabaragamuwa Provincial Education office

Provincial Education office is a government institute which manage all the schools in the Sabaragamuwa Province. Currently under the supervision of the Director of the Province Mr. Sepala Kuruppuarachchi and an outshining performance of a dedicated staff, the educational service of the province is reaching an outstanding level where every single shortcoming is replaced with satisfactory, reliable service. The PEO consists of five departments with assistant directors. Each department comes under deputy director and assistant directors.

1.2 The Office Automation System for Sabaragamuwa Provincial Education office

Provincial education office is currently use their operation on a manual file system which was identified to be highly inefficient and time consuming where every single minute has a priceless value in providing a fruitful service. Furthermore, the staff is also demotivated since the environment is also non-appealing with a large pile of document files and non-modified surroundings through decades. The frequency of generating errors is also at a high rate in relation to above factors. Analyzing the current manual system and difficulties the staff face with, the following short comings of the current system could be discovered.

- ❖ Difficulty of retrieving information of a teacher at a given time
- ❖ Data redundancy and inconsistency of data
- ❖ Misplacement of documents which are in a format of a hard copy.
- ❖ Lack of ability / difficulty to view data / generate reports from different databases created according to different criterions.
- ❖ Lack of possibility to view historical data on demand.
- ❖ Manipulations can be erroneous at times.
- ❖ Dissatisfaction of the staff due to the lack of use of modern technology.

In order to overcome above problems, the proposed system was developed. This would help the office in upgrading the quality of the service as well as managing time, monetary and other resources, elevating the job satisfaction of the staff and etc. And the proposed system would solve the above mentioned problems of the current system using reliable technological solutions.

1.3 Motivation for the Project

Proper handling of day-to-day tasks of an education institute is never been an easy task. It involves a great deal of collecting, storing, sharing of information, which is time consuming and error-prone when done manually.

Number of education institutes have gained benefits of web based system, which effectively bind information technology and management of the institute, and improves the collaboration between the Institute , schools and teachers

Sabaragamuwa Provincial education office which is specialized in Sri lanka. They interested in development of a system that helps to archive their objectives efficiently by automating various functions. Furthermore, this will be a great opportunity to use the knowledge, which I gained through following the BIT degree program.

1.4 Objectives of the Project

The aim of this project is to build a web-based system that can improve the efficiency of most of the tasks carried out by Provincial education Office. The objectives of the project are as follows.

- ❖ To handle data of all the schools in Sabaragamuwa Province.
- ❖ To provide the manual effort needed in scheduling seminars and avoid schedule conflicts.
- ❖ To provide a system which will facilitate managing all the aspects of transfers and the availability of that information for stakeholders.
- ❖ Cater for different needs of information a cross the provincial office to make timely and informed decision making possible and to support the day-to-day office administration smoothly.

1.5 Scope of the Project

The scope of the project was carefully chosen to fulfill the needs of the Institute within limited time and resource constraints. The scope of project can be summarized as follows.

- ❖ School Management
- ❖ Teacher Management
- ❖ Result Management
- ❖ Exam Management
- ❖ Text books Management
- ❖ Notification Management
- ❖ Report Management
- ❖ Backup Management

1.6 Structure of the Dissertation

The dissertation will provide an overall idea about the process used to develop the Office Automation System for Provincial education office. The dissertation has divided into six main chapters.

1.6.1 chapter 2 – analysis

In this chapter discusses “what to build”. It includes a clear description about the problems which were encountered and identified solutions for those problems. Furthermore, the high level requirements are analyzed and specifically identified and ready to be designed in this phase. Use case diagrams and more figures make the proposed system understand easily.

1.6.2 chapter 3 – design

This chapter includes descriptions of both the logical and physical stages of the design process. The use case diagrams of the current system which are used for the logical

design stage are included in this chapter. The latter stage of the chapter describes the mapping of the logical design to the physical design.

1.6.3 chapter 4 – Implementation

The development process of the coding of the project is described, in this chapter. In addition, the major coding parts are also presented here.

1.6.4 chapter 5 – Evaluation

This chapter describes how the system was tested and how the various test cases are used to test various modules. And this includes a critical discussion on the achievement of the functional and non-functional requirements.

1.6.5 chapter 6 – Conclusion

This chapter provides a critical evaluation of the project. And this gives a piece of information of the lessons learnt during the project, the problems encountered during the development process and the possible enhancements in the future.

02. Analysis

2.1 Introduction

System analysis is a very important phase in the software development life cycle which is performed to define system's functions, constraints and goals with the help of system users. The goal of system analysis is to determine where the problem is in an attempt to fix it. This step involves breaking down the system in to several parts in order to analyze the situation, analyze project goals, what needs to be created and attempting to engage users so that definite requirements can be defined.

2.2 Fact Gathering Techniques

The techniques that are used in system analysis to identify and understand system requirements are referred to as fact-finding techniques. The success of any project is depended on the accuracy of requirements identified. Several common fact finding techniques were employed to identify system requirements clearly.

- **Sampling of existing Documentation** – Since there is an existing manual system this was very useful to develop a good feel about the current system.
- **Observation** – in this method, the analyst himself visit the organization and tries to understand the existing system.
- **Questionnaire** – It is a technique used to extract information from a number of people. This technique was adapted because it is suitable to collect unbiased responses, especially from students.
- **Interview** – This method was used to clarify and confirm the identified requirements.

2.3 Existing System

In order to gain knowledge about the domain of the system we are supposed to acquire a surrounding knowledge of the current system and its process. Through the analysis of the processes of the current system, we will be then move on to the proposed system.

- **Managing personal details of the teachers and details of school of the Province**

This is one of the major processes done by The Provincial Educational Office. Recording personal details of employees and school details within the province, and updating relevant details on time should be directed to maintain requirements such as accuracy and reliability. All these records and the updates are handled using a manual file based system.

- **Managing changes in the career life**

This includes managing promotions, transfers and recruitments, placements, retirements which cause a change in the employee career life. In addition to that foreign leaves of the employees are also handled.

- **Analyzing results and measuring the educational progress of the Province**

This is done to take managerial decisions to take proper actions for increasing the results of the province. Usually this survey is done after competitive exams such as Grade five scholarship exams, O/L exams and A/L exams. Through analyzing and comparing these results with each zonal and of previous years, directors of the zonal will take immediate decisions on the subject. the zonal of the province that should be improved.

- **Generating reports**

Generating reports is compulsory for making decisions in the office as well as in every institute or in company. Here, reports are prepared for various activities like analyzing results and the facilities which should develop according to censuses.

2.4 Functional Requirements

A list of functional requirements was identified during the fact-finding process. For defining identified requirements clearly, they have been categorized into modules according to their dependencies.

2.4.1 School Management

- Manage school details of the Province.
- Search school details by school sensors number
- Update, Delete records where necessary.

2.4.2 Teacher Management

- Manage teachers details of the Province
- Search teachers details by ID and the School.
- Update, Delete records where necessary.

2.4.3 Text Books Management

- Manage text book details.
- Distribute text books in the Provincial

2.4.4 Result Management

- Analyzing and compare results of zonal of the province and recent past years.

2.4.5 Exam Management

- Manage exam calendar and prepare papers.

2.4.6 Report Management

- Generate reports on analyzing results.
- Generate reports on school details.

2.5 Non – Functional Requirements

Here are the non-functional requirements that system should have in order to achieve the outcomes expected by the Province.

Accessibility – the system should be accessible by using all major web browsers.

Availability – Most of the time the system should be in functioning condition.

Backup – The System should allow making copies of data, which may be used to restore the original after a database.

Recoverability – The ability of restoring the system after a failure has been occurred.

Extensibility – The system should be extensible for future improvements.

Privacy – Appropriate measures have to be taken to protect personnel details from unauthorized access.

Reliability – The system should be trustworthy to its users.

Robustness – The system should have the ability to copy with errors arising while it is in production environment.

Response time – The system should work fast enough for its users.

Usability – The system should be easy to use and learn for its target user community.

2.6 Existing similar Systems

There are systems on the internet somewhat similar to this system. Some of them are not web based. Among those web based systems, most are proprietary software and few are free and open source software. But none of them are exactly similar to this project. Only web based similar systems are describe below.

2.6.1 Teacher Management System of Wayamba Education Network [9]

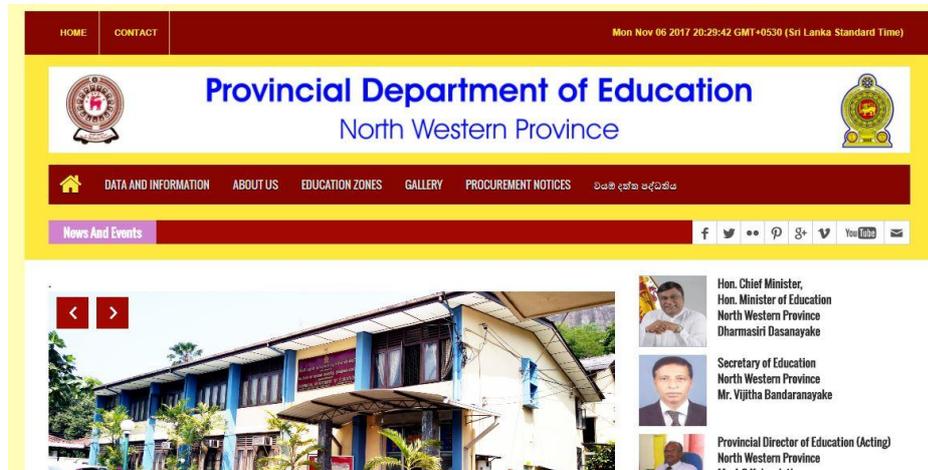


Figure 2.1 web site of North western Province

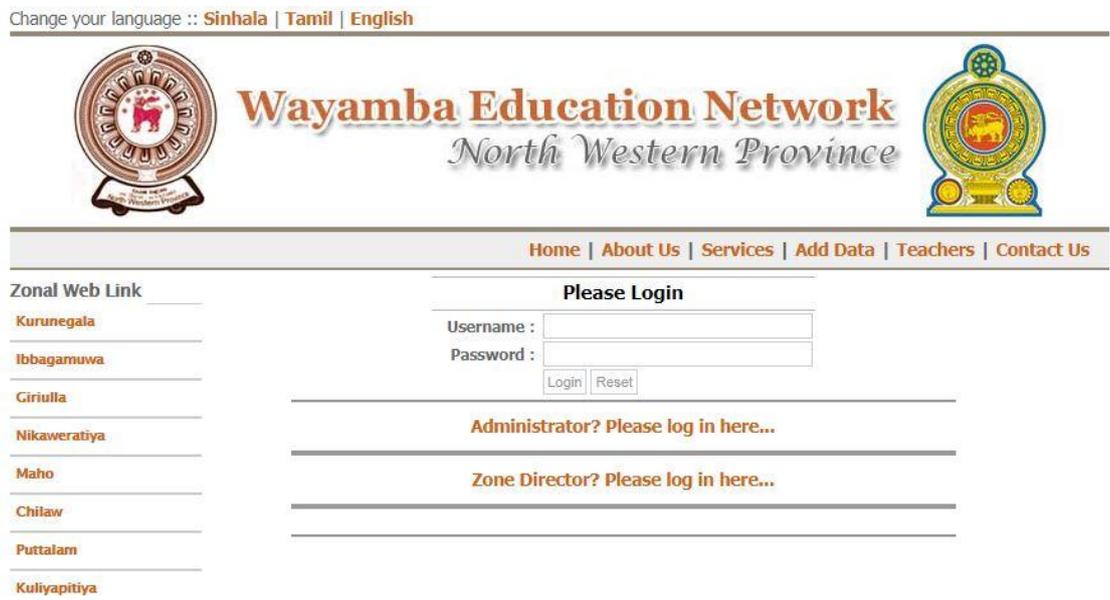


Figure 2.2 Login page in Wayamba Education Network

2.6.2 Self Service Teacher Portal – Ministry of Education [10]



Figure 2.3 Home page in Ministry of education.

2.6.3 Provincial Department of Education – Weston Province [11]



Figure 2.4 Home page in Provincial Department of education western province.

03. Design

3.1 Design Techniques

The design phase of a system is quite important prior to the implementation phase, since developing a system without a design is most likely to make the project a failure.

The two main design techniques are structured approach and the object oriented approach. Structured approach mainly follows the phases in the software development life cycle as it is, and focuses on the processes. Since the object oriented approach promotes component based development, use iterations and increments and taken into consideration of the factors such as abstraction, inheritance, modularity, reusability, encapsulation and message passing it is used as the design approach for the project.

The next main decision was choosing a suitable process model for the project. The process models taken into consideration were waterfall model, rapid application development, prototyping, iterative and incremental development and rational unified process model. [1]

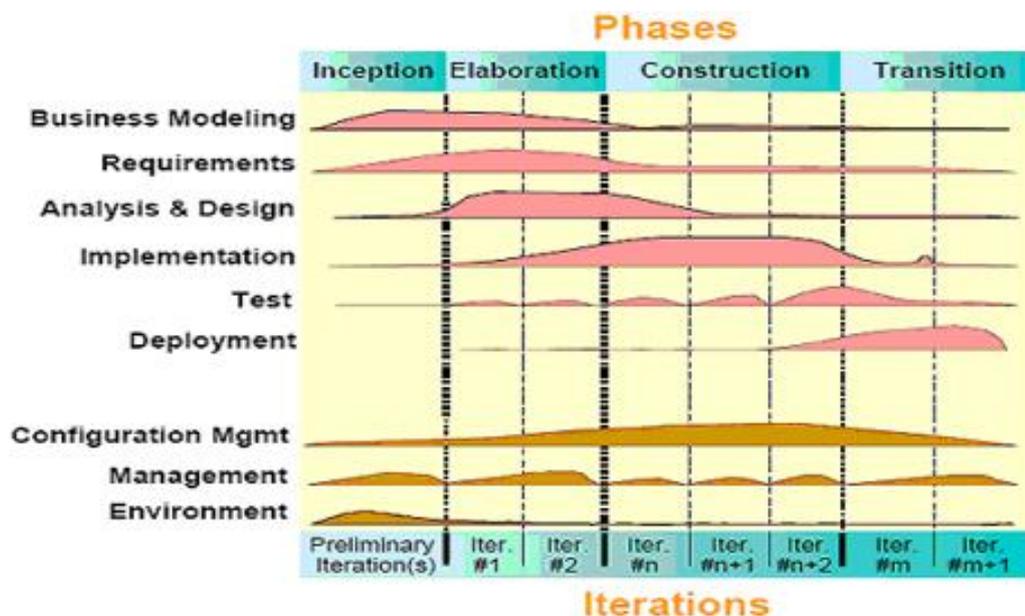


Figure 3.1 RUP

RUP model was decided to be used in this project, which allows developing software iteratively, managing requirements, using component-based architectures, visually model software, verifying software quality and controlling changes to software. RUP consists of four phases Inception, Elaboration, Construction and Transition. Figure 3.1 depicts the RUP model.

3.2 The Design Architecture

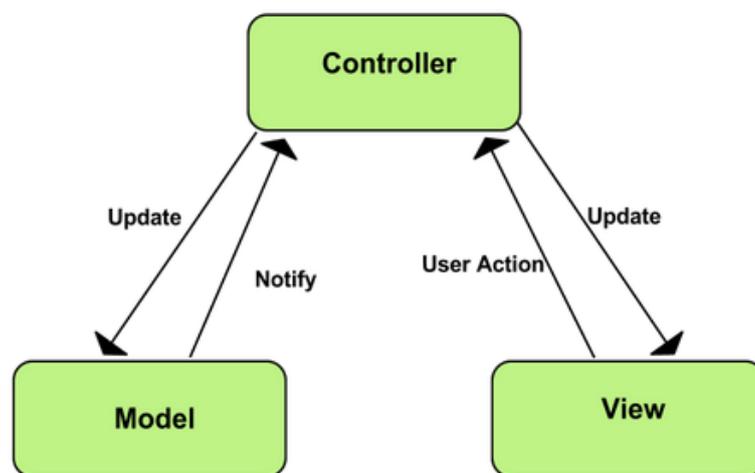


Figure 3.2 MVC Architecture

The architecture used for the system is MVC architecture in representing ‘model, view, and controller’. The interface pages are located in the view and the interaction with the database is done through the model. The controller receives the web request and updates the presentation at the view and update data through model.

3.3 Reasons for selecting web based System

This section illustrates the type of the system selected and alternate system types that are replaceable the proposed system type.

3.3.1 A Collection of Software

If the office wishes to go for a collection of software, it would be a crucial decision as the office has to pay for a number of functions which will not be used. For more, these commercial software are developed mostly for business purposes and generic purposes, the customized functions needed for the activities in the office are not included in the commercial software.

A software collection would consist of,

- An Accounting software for handling payroll system.
- A Loan Management Software for managing loans.
- A HRM System.
- A Report Generating software for generating various reports.

3.3.2 Develop a standalone system

Developing a standalone system an alternative solution for the web based system. It operates independently and need high maintenance cost also difficult to add extension. Client also specifically requested for a web based system and the system should be accessible from anywhere, because Schools, Zonal office are situated in all around the Sabaragamuwa province.

3.3.3 Use off- the shelf Software

Software developed for mass market, using may be an alternative but with many features which the client may not need and some of the requirements that are specifically wanted were unavailable.

3.4 Selected solution

Because of the following reasons it was decided to develop the office automation system as a web based system.

- Sabaragamuwa provincial education office is connected with school net server, so it was decided to use PHP as the server side language.
- Client particularly requested for a web based system.
- The system should be accessible from anywhere.
- Interoperability and Extensibility of web based system.
- The system should be platform independent.
- Easy installation and maintenance.
- Lower security risks compared to standalone system.
- Lower cost.

3.5 Use case diagram for the system

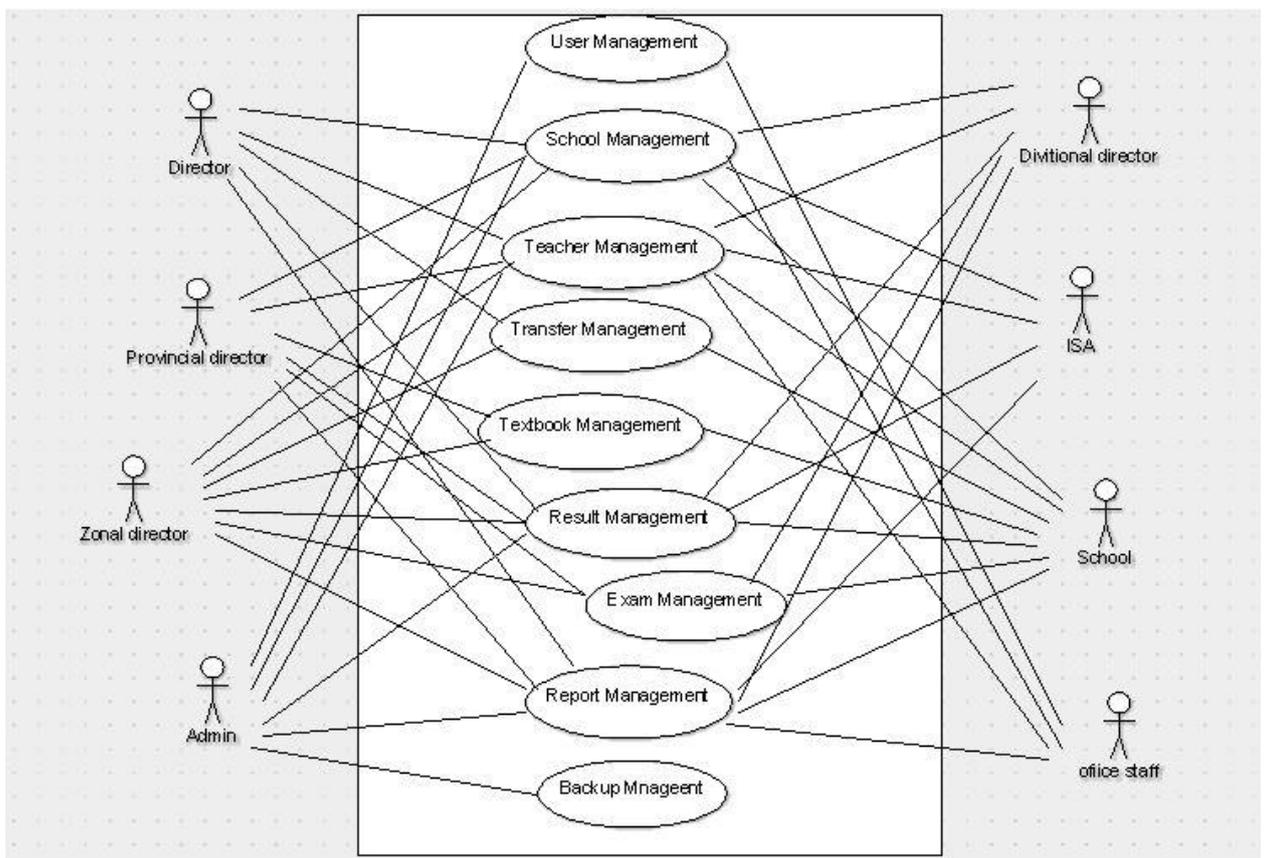


Figure 3.3 use case diagram of the system

3.6 Database Design

The tables in the Database Management System for The Office Automation System of The PEO have been normalized up to the third normalization in order to remove anomalies from the database. Improving the logical design of the system is accomplished here. The process to convert the complex data structures into simple and stable data structures is called normalization. Initially normalization consists of three normal forms.

First Normal Form (1NF) - Eliminate duplicate groups from relations and build separate tables with related data.

Second Normal Form (2NF) – Duplicate columns are further removed here. Removing partial functional dependencies are done in the 2nd normal form.

Third Normal Form (3NF) – Transitive dependencies are removed here. In simple, columns which are not depended on the primary key are removed in this form.

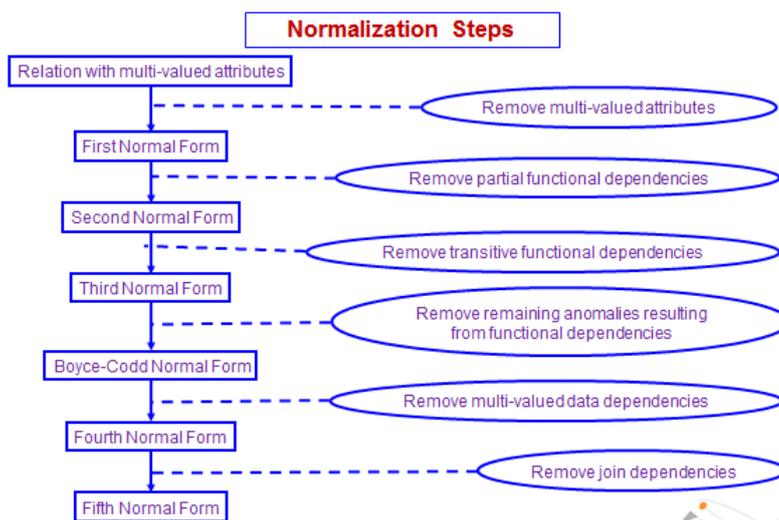


Figure 3.4 Normalization forms

3.7 User interface design

A user interface can be defined as the communication method between the user and the system. Shifting from command driven programming to GUI based programming, the demand for the software industry is being increasing in thousands and thousands. As the User Interface is the only human interactive method in a system, in designing a good interface for an end user the developer should be aware of some principals. The same principals were followed here, in The Office Automation System, to give the user an easy availability to the functions within his role. Some of used principals are mentioned here.

- User friendly interface with easy navigations for required functions.
- Using the most appropriate headings, labels and buttons to identify the functions easily.
- Grouping similar functions, data inquiries together and separate dissimilar functions for related groups.
- Using user-already-known icons and controls for the related functions, so the user may react promptly.
- Using a precise and unambiguous language for instructions, error messages and other messages the user should be informed about.
- Providing feedback about the processes.
- Using colours, fonts and sizes (text, icons) which appeal t the user.

3.8 Main Interfaces

In this section, some of the selected user interfaces of the proposed system are provided, in order to have a gross idea of the way the system looks like. Figure 3.5 shows the interface of the login form which appears to the user in the first point.

This will help user to access the functions which are assigned to each other's role.



Figure 3.5 Login Interface

The figure 3.6 below presents the schools dashboard of the system. After logged in the school is able to select their tasks.

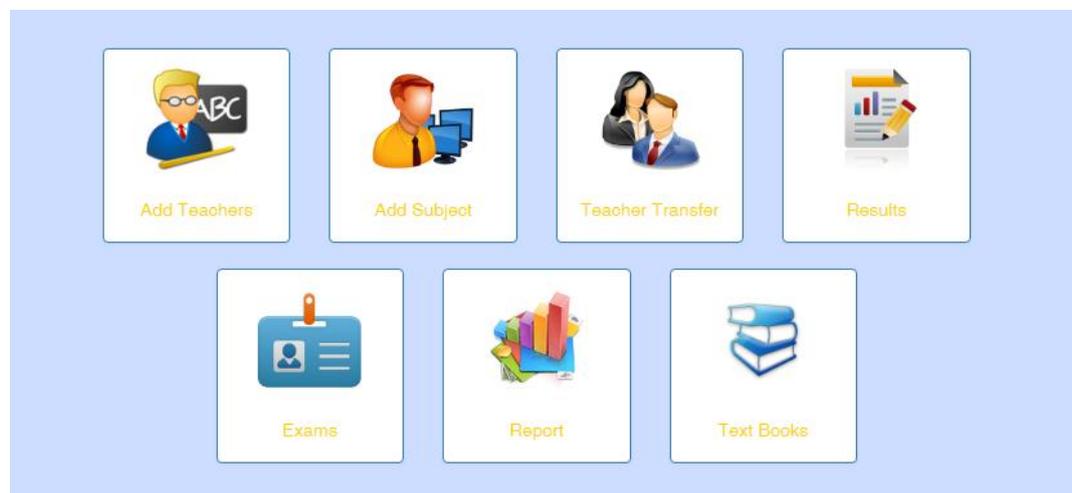


Figure 3.6 School Dashboard

Dashboard / Teacher Management / Add Teacher

Adding a Teacher

School ID :-	<input type="text" value="23005"/>	Appointed Date :-	<input type="text" value="mm/dd/yyyy"/>
Full Name :-	<input type="text" value="Full Name"/>	DoB :-	<input type="text" value="mm/dd/yyyy"/>
Main Subject :-	<input type="text" value="Please select a Subject"/>	Other Subjects :-	<input type="text" value="PTS,Helth"/>
NIC :-	<input type="text" value="NIC"/>	Tel No :-	<input type="text" value="Telephone Number"/>
Address :-	<input type="text"/>	Gender :-	<input type="radio"/> Male <input type="radio"/> Female
No. of Period (per week) :-	<input type="text" value="38"/>	Other School (if any) :-	<input type="text" value="P/Anura M.V"/>

Figure 3.7 Add teacher form

Home / Result Management / Add O/L Result

Exam Information

School Id	<input type="text" value="23005"/>	Exam Type	<input type="text" value="O/L"/>	Year	<input type="text" value="select a year"/>
Subject	<input type="text" value="Please select a Subject"/>	No. of Students	<input type="text"/>		

Add Result

A	<input type="text"/>	B	<input type="text"/>
C	<input type="text"/>	S	<input type="text"/>
W	<input type="text"/>		

Subject	No. of Students	A Passes	B passes	C Passes	S Passes	w Passes
---------	-----------------	----------	----------	----------	----------	----------

Figure 3.8 Add result form

04. Implementation

4.1 Introduction

Implementation is the phase of software development process where the coding is done for the project. The system has been implemented according to the requirements gathered at the Analysis phase and design technologies suggested at the Design phase.

Suitable tools and environment were used in this phase. Comments are added to code segments in order to clearly understand the processes. These will help the software to be flexible for any changes done in the future.

Programming of the system started using different languages such as C#.net, Vb net, C, C++ and so on. It is necessary to choose the correct language in order to fulfill the identified requirements.

4.2 Implementation environment

The system was developed on a machine with the following hardware and software configuration respectively.

Hardware configuration

Server	client
<ul style="list-style-type: none">➤ Intel core i3➤ 4GB RAM➤ 500 GB Hard disk	<ul style="list-style-type: none">➤ Pentium iv processor or above➤ 512 MB RAM or above➤ 40 GB Hard disk or above

Table 4.1 Hardware configuration

Software configuration

The system has used the following language and tools to develop the system

- Windows 7 Operating system.
- PHP 5.2.0.
- HTML.
- CSS.
- JQuery.
- XAMPP version 3.2.1.
- Apache server.
- MySQL 5.6.16.
- phpMyAdmin.

4.3 Reused modules

Various modules were used while developing the system. They are listed below

To connect Database

```
1  <?php
2  class dbconnection{
3      function connection(){
4          $hostname="localhost";
5          $un="root";
6          $ps="";
7          $db="sabara";
8          $con=new mysqli($hostname,$un,$ps,$db); //connection string
9          //Sql query
10         return $con;
11     }
12 }
13 ?>
```

Figure 4.1 Connect Database

Session handling

```
<?php
error_reporting(E_ERROR | E_WARNING | E_PARSE);
if(count($_SESSION['userinfo'])==0 && (count($_SESSION['schoolinfo'])==0)&&(count($_SESSION['isainfo'])==0)){
    $msg="Please Login";
    header("Location:../../login/view/index.php?msg=$msg");
    exit;
}
?>
```

Figure 4.2 Session handling

Generate Chart

```
<script type="text/javascript">
google.charts.load('current', {'packages':['bar']});
google.charts.setOnLoadCallback(drawChart);

function drawChart() {
    var data = google.visualization.arrayToDataTable([
        ['Year', 'Number Of students','A', 'B', 'C','S','W' ],

        <?php while ($row1=$result1->fetch_assoc()){ ?>
        ["<?php echo $row1['year']; ?>", <?php echo $row1['n_of_stu']; ?>,<?php echo $row1['a']; ?>,
        <?php echo $row1['b']; ?>, <?php echo $row1['c']; ?>, <?php echo $row1['s']; ?>,<?php echo $row1['w']; ?>],

        <?php } ?>

    ]);

    var options = {
        chart: {
            title: 'School Result',
            subtitle: '<?php echo $sub_id ?>',
        }
    };

    var chart = new google.charts.Bar(document.getElementById('columnchart_material'));

    chart.draw(data, google.charts.Bar.convertOptions(options));
}
</script>
```

Figure 4.3 Generate chart

Print

```
<script>
function printDiv(divID) {
    var prtContent = document.getElementById(divID);
    var WinPrint = window.open('', '', 'left=0,top=0,width=800,height=600,toolbar=0,scrollbars=0,status=0');
    WinPrint.document.write(prtContent.innerHTML);
    WinPrint.document.close();
    WinPrint.focus();
    WinPrint.print();
    WinPrint.close();
}
</script>
```

Figure 4.4 Print

4.4 Major code segments

4.4.1 Database connection

```
1  <?php
2  class dbconnection{
3      function connection(){
4          $hostname="localhost";
5          $un="root";
6          $ps="";
7          $db="sabara";
8          $con=new mysqli($hostname,$un,$ps,$db);
9          //Sql query
10         return $con;
11     }
12 }
13 ?>
```

Figure 4.5 Database connection

4.4.2 Login Module

```
class login{
    function loginvalidate1($uname, $pass, $role_id){ //not same name
        include '../common/dbconnection.php';
        $obj=new dbconnection();
        $con=$obj->connection();
        $sql="SELECT * FROM login l,user u,role r WHERE l.username='$uname' AND l.password='$pass'
            . " AND l.user_id=u.user_id AND u.role_id=r.role_id";
        $result=$con->query($sql); //to execute the query
        return $result;
    }
    function loginvalidate2($uname, $pass, $role_id){ //not same name
        include '../common/dbconnection.php';
        $obj=new dbconnection();
        $con=$obj->connection();
        $sql="SELECT * FROM schools WHERE uname='$uname' AND password='$pass'";
        $result=$con->query($sql); //to execute the query
        return $result;
    }
    function loginvalidate3($uname, $pass, $role_id){ //not same name
        include '../common/dbconnection.php';
        $obj=new dbconnection();
        $con=$obj->connection();
        $sql="SELECT * FROM isa WHERE uname='$uname' AND password='$pass'";
        $result=$con->query($sql); //to execute the query
        return $result;
    }
}
```

Figure 4.6 Login module

4.4.5 Result module

```
<?php
include '../common/dbconnection.php';
$obj=new dbconnection();
$con=$obj->connection();
$GLOBALS['con']=$con; //Globalize the value

class result{

    //Add job details
    function address($school_id,$session_id,$year,$type,$subject,$n_of_student,$a,$b,$c,$s,$w){
        $con=$GLOBALS['con'];
        $sql="INSERT INTO olresult VALUES('','$school_id','$session_id','$year','$type','$subject','$n_of_student','$a','$b','$c','$s','$w')";
        $result=$con->query($sql);
        return $result;
    }

    function addressal($school_id,$session_id,$year,$type,$subject,$n_of_student,$a,$b,$c,$s,$w){
        $con=$GLOBALS['con'];
        $sql="INSERT INTO alresult VALUES('','$school_id','$session_id','$year','$type','$subject','$n_of_student','$a','$b','$c','$s','$w')";
        $result=$con->query($sql);
        return $result;
    }

    function addressa2($school_id,$year,$type,$n_of_student,$a,$b,$c,$s,$w,$session_id){
        $con=$GLOBALS['con'];
        $sql="INSERT INTO scoll VALUES('','$school_id','$year','$type','$n_of_student','$a','$b','$c','$s','$w','$session_id')";
        $result=$con->query($sql);
        return $result;
    }

    function viewresult($session_id){
        $con=$GLOBALS['con'];
        $sql="SELECT * FROM olresult WHERE session_id='$session_id'";
        $result=$con->query($sql);
        return $result;
    }

    function viewresult2($session_id){
        $con=$GLOBALS['con'];
        $sql="SELECT * FROM alresult WHERE session_id='$session_id'";
        $result=$con->query($sql);
        return $result;
    }

}

?>
```

Figure 4.9 Result module

4.5 Security

Since the system deals with user logins and many user sensitive data regarding teachers data, School data the system should maintain powerful security methods. The passwords of users are encrypted before saving it to the database using SHA-1 [6] algorithm. The purpose of using SHA-1 over other hashing algorithms like MD5 [7] was basically because SHA-1 could produce a 160 bit hash value where MD5 could produce only a 128 bit value. In other words, SHA-1 is more secure than MD5. And also each user has been grouped according to their roles and given a certain privileges when accessing the system.

05. Evaluation

5.1 Introduction

Prior to commencement of the actual work of the project, the objectives of the proposed system clearly defined. They were to develop reliable, low cost software architecture and product that could be readily adopts to implement OAS.

When developing functional and nonfunctional requirements of the system, high standards imposed on the software product to reach its performance requirements.

5.2 Importance Evaluation

The primary objective of evaluation is to identify whether the objectives, which were defined, at the early stages of the project are satisfied at the end of the process. Hence evaluation is the means of clearly outlining whether the predefined requirements are met at the completion of the project. Therefore the evaluation results could be considered as a key indicator of the level of success achieved in the project.

5.3 Testing Strategies

Several testing strategies will be discussed under this topic.

5.3.1 Unit Testing

This ensures that the individual components are working properly.

5.3.2 Integration Testing

The primary objective of this is to test the module interfaces. The different modules are integrated using an integration plan. After each integration step the partially integrated system is tested. Integration testing can be done in any of the following approaches.

- Big Bang integration Testing.
- Bottom-up integration Testing.
- Top- down integration Testing.
- Mixed integration Testing.

5.3.3 Regression Testing

The integration of the regression testing is to identifying whether a change to the system introduce any new error. A change to a one part of the system should not affect another part of the system. This kind of issues tried to archive through regression testing.

5.3.4 System Testing

The fully developed system is validated to assure that its requirements have met. This is done against the Requirement Specification.

5.3.5 User Acceptance Testing

Acceptance testing is done by the users to ensure that the outcome of the system meets the requirements and works as the customer expected.

5.4 Evaluation Methodologies

Before carrying out an evaluation, a suitable evaluation plan should be formulated. After having considered several methods used for evaluation, it has been decided to use a collection of methods, because one method alone will not be sufficient to act as a measuring tool, which will provide both quantitative and qualitative information.

The evaluators were first given hands on exposure to the system and after they were familiar with the system functionality, a short interview was conducted to capture the Provincial Directors, Zonal Directors, ISA and Principals reaction on the first impressions of the system. The comments were noted down separately. This will allow the capturing of information with regard to the users point of view.

5.5 Evaluation Criteria

This section will identify a set of criteria, which will be used to evaluate different aspects of the system.

- **Problem** : Reviewing the problem will allow to determine the significance of the solution devised.

- **Approach** : Reviewing the devised approach in addressing the problem and suitability of the adapted technologies is crucial in determining the feasibility of the system.
- **System** : The final system requires reviewing the success of the solution implemented by considering level of design, user interface, functionalities and level of application. Further the system should be evaluated on the benefit it provides as to gain a competitive edge.

Having identified the evaluation criteria it is important to identify group who will evaluate the application. The target evaluators of the system will be the Provincial Directors, zonal directors, ISA, and Principal in the province. The feedback from the evaluators was analyzed as the next step in the evaluation process.

5.6 Results Evaluation

The evaluation of the final system is several criteria,

1. Against Functional requirements.
2. Against Non-functional requirements.

5.7 Test Cases

Testing all aspects of the final system is very difficult but to provide the integrity of the system it is compulsory to test the system in all possible ways.

ID	Test Description	Testing procedure	Expected results
Common Functionalities.			
1	Login to the system (negative)	Enter an invalid username and password	Display error message.
2	Login to the System with empty fields.	Click login button without entering username and password.	Display error message.

3	Login to the system(positive)	Enter valid username and password.	User will redirect to the Dashboard.
4	Logout from the System.	Click logout from User option menu	User will be redirect to the index page.
5	Accessing the system without logging in	Enter the URL of a page without login.	User will be redirect to the login page
6	Closing the browser window	Closing the browser window without logout of the system.	Open browser again and user will be redirect to the login page.
Teacher management			
7	Add new teacher details (Negative)	Trying to enter details of an teacher who already exists.	Display error message
8	Add new teacher details (positive)	Click continue button of the form wizard.	Success message is shown.
9	Search teachers by schools.	Select the school from the menu.	A list of teachers in that school appears.
Result Management			
10	Add results (positive)	Try to add results with selecting correct tab.	Add result form open with correct census ID.
11	Attempt to view results. (Positive)	Search results, after approval process is completed.	View Results Modal opens with approved details.
School Management			
12	Edit School Details (Positive)	User enters required fields and click on save	Allow Saving
13	Edit School Details (Negative)	User left the blanks for required field and click save	Display error message

Table 5.1 Test Cases

Non functional requirements testing

No	Non functional requirements	Criticality
1	Reliability	High
2	Human Computer Interface Issues	High
3	Portability	Medium
4	Supportability	Medium
5	security	High

Table 5.2 Testing for non functional requirements

5.8 Test results

Appendix E describe all the tested functionalities in more details.

Test result for login.

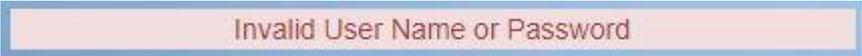
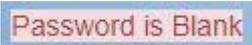
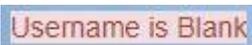
Test ID	Test results	Status
1	Enter Invalid User name or password 	Pass
2	User enters valid username and left password blank 	Pass
3	User enters valid password and left username blank 	Pass
5	Role name Blanks 	Pass

Table 5.3 test results for login.

5.9 Test data and test results

Dummy test data values were used for the purpose of testing at the early stages of implementation and later past data records were taken. Suitable error messages were given at various functionalities. Common error message were reused for similar functionalities.

5.10 User Evaluation

A Survey was conducted to gather user feedback about OAS. In this survey Provincial director of education has taken Officers role of the system and Assistant director of education, Divisional director of education, ISA, principals are Tested other roles. More details in Appendix E.

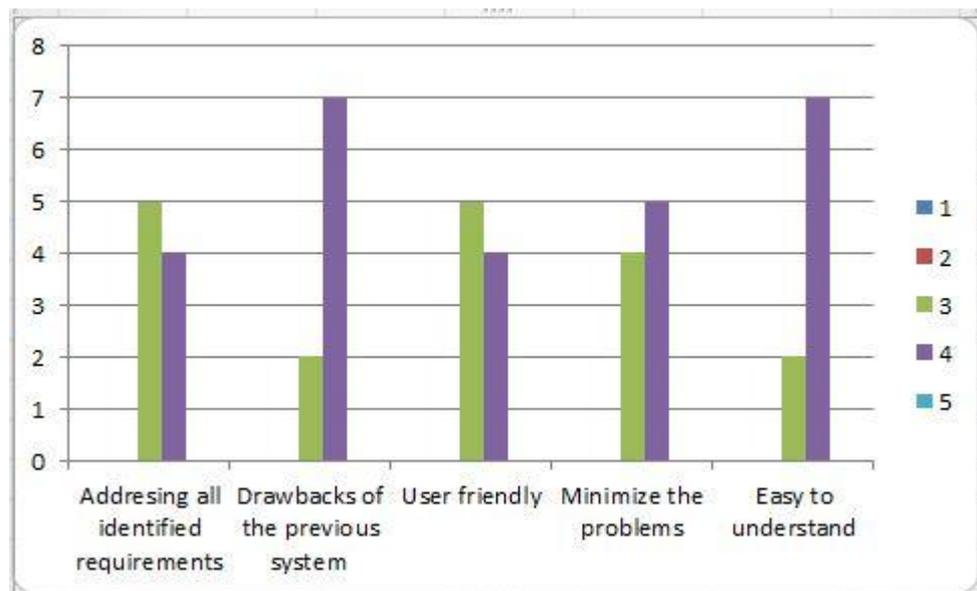


Figure 5.1 User evaluation.

06. Conclusion

6.1 Introduction

As the final chapter of the dissertation, the summary of the system and also the critical evaluation of the system are concluded. Future development suggestions, problems encountered and lesson learnt during the project work are also discussed in the chapter.

6.2 Critical evaluation of the project development

By assessing the project development success or pitfalls can be evaluated and it will open up new avenue for further developments.

Project development was started with requirement gathering and analyzing the problem domain. Due to the unfamiliarity of the problem domain this stage needed long period of time in the project life cycle. Requirements of the client were vague and procedures of the OAS were bureaucratic. In order to develop the system to fulfill different types of user requirements critical requirement evaluation was carried out.

Increase the efficiency and effectiveness of the performance was the primary objective. To achieve the goal different new functionalities were introduced after discussing with client. Provide space for new activity suggestions and news articles and report writing facilities can be explained as examples for above mentioned fact.

As the development model Rational Unified Model was considered and Unified Modeling Language (UML) diagrams were used to analyze the system. Several Usecase diagrams, Sequence diagrams, Activity diagrams were designed in order to increase the clarity. Database was normalized according to the requirements and interfaces were designs according to user preference.

Several designing and development technologies were taken in to consideration finally open source XAMPP solution was selected as the best method for the system development.

Testing was done to ensure the reliability of the functions. The testing was done throughout the coding as unit base and system base using the test cases developed during the design stage by using test data. Finally test result were compared with the expected data to verify the system performance.

Current manual system handles all the data of schools and offices in the province manually. It involves a great deal of collecting, storing, sharing of information which is time consuming and error-prone when it's done manually. But, through this web based system, the efficiency of most of the tasks carried out by provincial education office, has improved by effectively binding information technology and management of the institute and improving the collaboration between the institute, schools and teachers.

Some existing similar systems on the internet are not web based. Some systems are proprietary software and few are free and open source software. But none of them are exactly similar to this project.

In user evaluation stage, nine system users have given their opinions. The percentage of user satisfaction is as below,

- While 44.4% of the clients have evaluated “Addressing all identified requirements” as good, 55.6% of the clients have evaluated “Addressing all identified requirements” as average.
- For criteria two (Drawbacks of the previous system), 22.2% have evaluated as good and 77.8% have evaluated as average.
- For criteria three (User friendly), 55.6% have evaluated as good and 44.4% have evaluated as average.
- For criteria four (Minimize the problems), 44.4% have evaluated as good and 55.6% have evaluated as average.
- While 22.2% of the clients have evaluated “Easy to understand” as good, 77.8% of the clients have evaluated “Easy to understand” as average.

Finally all functional and non-functional requirements which were gathered in the initial stage were compared with outcome of the system.

By evaluating the project, successful achievement is experienced and ultimate goal is achieved however some minor changes had been appeared.

6.3 Problem encountered during the project

During the project life cycle several problems were encountered.

- Gathering information from different types of users was very time consuming.
- Extracting useful information from the gathered requirements to design the system was very critical.
- Unfamiliarity of jargons used by the clients lead to mislead the requirement understanding.
- Time is the main constraint during the project life cycle.
- lack of knowledge in programming with PHP and MySQL lead to incur more time for coding and testing.
- During the development some major functions had been changed.

6.4 lessons learnt from the project

By undertaking the project.

- Obtain knowledge in programming with PHP and MySQL.
- Experience the project management cycle and the most of knowledge areas relevant to the project development.
- Obtained knowledge how to manage the scope, time, resource constraints.
- Gained opportunity to apply the knowledge gained in the previous subject lessons practically.

6.5 Future enhancement

Proposed system was completed by achieving the functional requirements defined by the users within the limited time and resource constraints. Some of the future enhancements can be made as with the future requirement changes.

- Introduce VLE for system.
- Enable to log teachers for the system.
- Introduce more qualitative report generation.
- Introduce chat room or forum discussion using system.
- View the logged in users.

References

- ❖ [1] Rational Unified Process - Wikipedia, the free encyclopedia,[Online]. Available at : https://en.wikipedia.org/wiki/Rational_Unified_Process [Accessed 08April.2017].
- ❖ [2] Software Engineering. 6th Edition: Ian Sommerville, 2000.
- ❖ [3] System Analysis and Design Methods, 5th Edition : Jeffrey L.Whitten, Lonnie D, Bentley, Kevin C.Dittman, 2004
- ❖ [4] Virtual Learning Environment for the BIT Students, [Online]. Available at : <http://vle.bit.lk/project>
- ❖ [5] Object Management Group, [Online]. Available at : https://en.wikipedia.org/wiki/Unified_Modeling_Language [Accessed 05May.2017]
- ❖ [6] Wikipedia, the free encyclopedia, [Online]. Available at : <https://en.wikipedia.org/wiki/SHA-1>[Accessed: 15June.2017].
- ❖ [7] Wikipedia, the free encyclopedia, [Online]. Available at : <https://en.wikipedia.org/wiki/MD5> [Accessed: 15June.2017].
- ❖ [8] Bootstrap, [Online]. Available at : <http://getbootstrap.com/getting-started/#download> [Accessed: 20June.2017]
- ❖ [9] Wayamba Education Network, [Online]. Available at : <http://www.nwpedu.lk/> [Accessed: 2July.2017]
- ❖ [10] Self Service Teacher Portal – Ministry of Education [Online]. Available at : <http://moe.gov.lk/> [Accessed: 2July.2017]
- ❖ [11]Provincial Department of Education – Western Province [Online]. Available at: <http://moe.wp.gov.lk/sin/> [Accessed: 2July.2017]

Appendix A – System documentation

Title:

Web based office automation system for provincial education office – sabaragamuwa..

Date: 6th November 2017

Version: 1.0

System: Web application

System Documentation provide sufficient information to install and configure the system technical perspective. System Administrator or authorized developers are the targeted group for this section. This documentation is providing guidelines in order to continue with further enhancements for this project or to fix errors.

Recommended hardware and software installation is demonstrated below.

Hardware Requirements

Hardware	Minimum Requirements
processor	Pentium IV, 1GHz Processor or greater
Memory	1GB RAM or higher
Hard Disk space	1 GB or higher
Display	1024x768 or higher
Internet	Minimum 300Mbps
Printer	Any printer

Table A.1 Hardware requirements.

Software Requirements

Software	Minimum Requirements
Operating system	Windows XP/ Windows 7/ Windows vista/ Ubuntu
XAMPP server	Version 3.2.1/Apache /MySQL / PHP
Web Browser	Google Chrome
Code Editor	netbeans

Table A.2 Software requirements.

Installation and configuration server

On server side implementation a web server should be configured first, XAMPP should be installed firstly.

NOTE: ALL the paths in the documentation will refer to Disk Volume “C://”

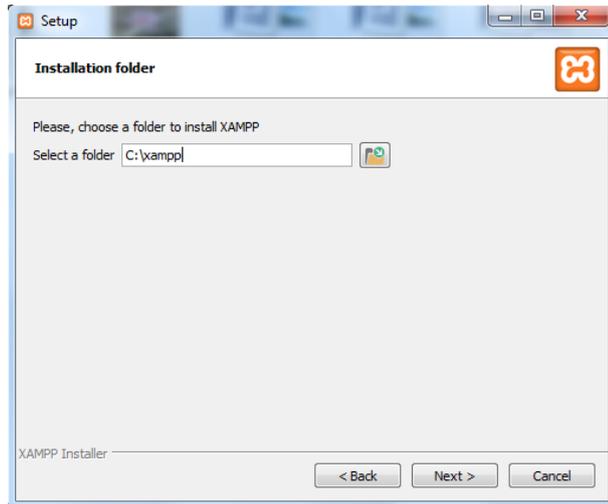
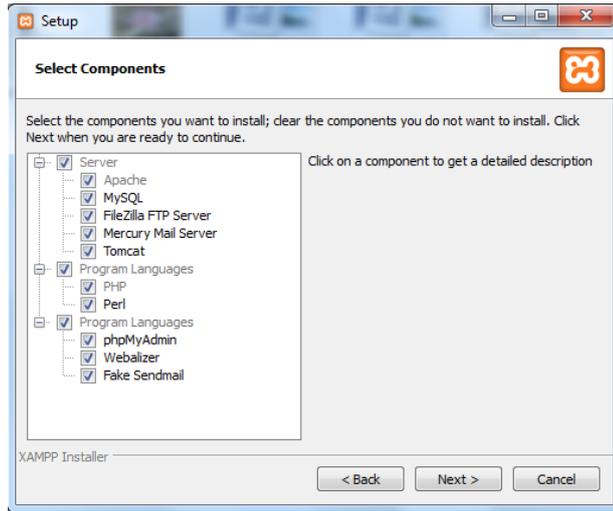
Apache web server installation

XAMPP can be downloaded from <https://www.apachefriends.org/download.html>

Installing XAMPP

Double click on the downloaded file. Everything is automatic. The XAMPP Server package is delivered with the latest releases of Apache, MySQL and PHP Once XAMPP Server is installed, Each release of Apache, MySQL and PHP has its own settings and its own files(data for MySQL).





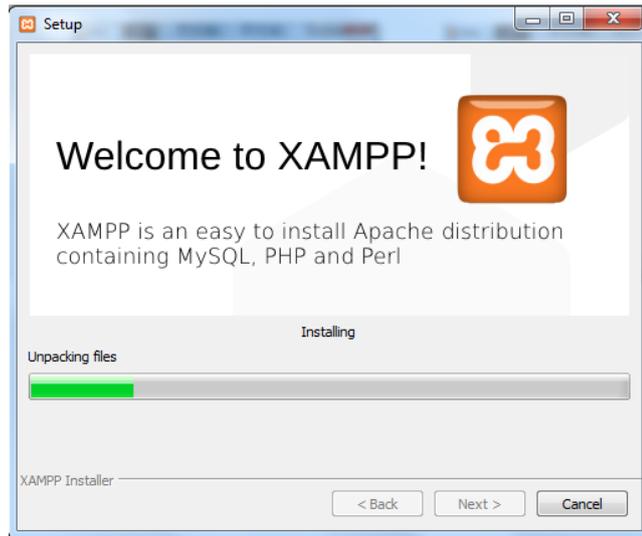


Figure A.1 Installing XAMPP.

Appendix B – Design documentation

High level Use case diagram for the Office automation system.

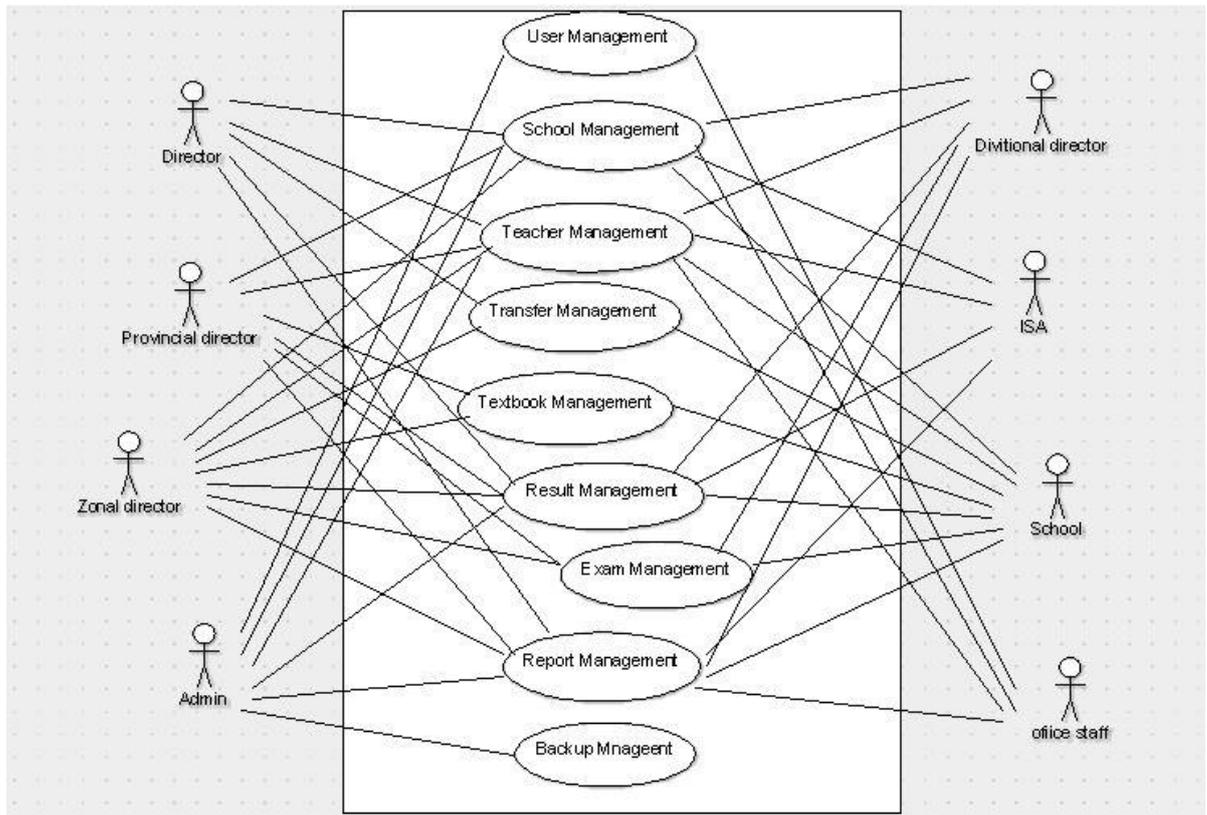


Figure B.1 High level use case diagram.

Detailed Use Case Narrative for the each module

Through the use case description/narrative further knowledge is provided which is summarized in the use diagram. Use case narratives for the some of the main functions are presented here to get a further knowledge of the system design structure and system procedure.

Login Module

Use case diagram for login

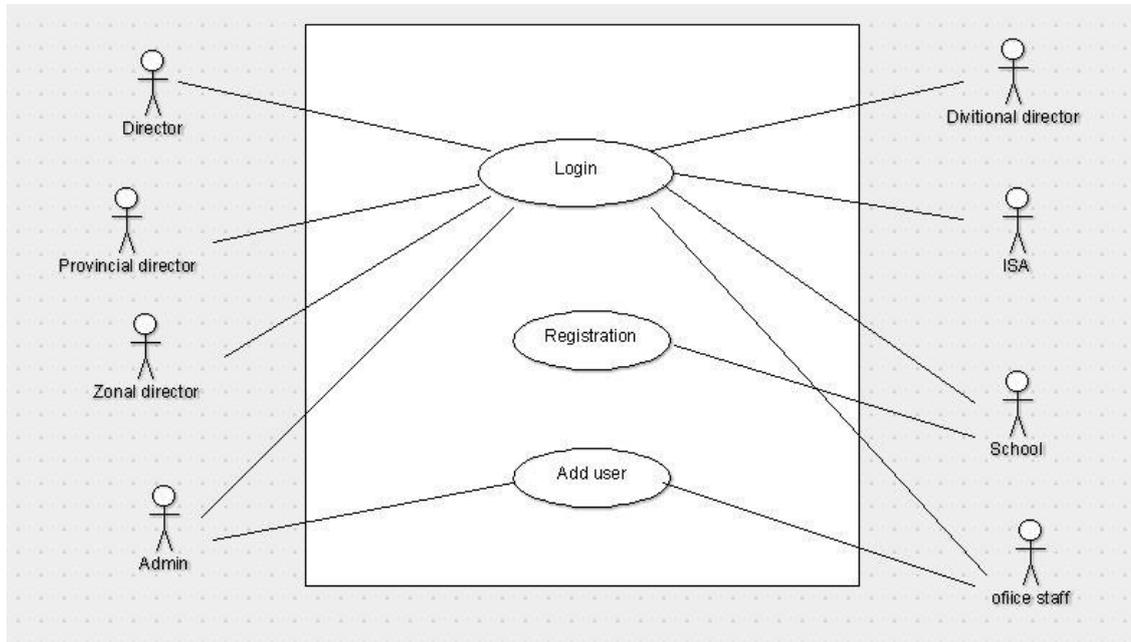


Figure B.2 Use case diagram for login.

Use case description for login

Use Case	Login
Actors	Admin, Directors, ISA, Schools, Staff
Overview	Users may login to the system with their username and passwords
Preconditions	The users must have user privileges to enter the system.
Flow of events	<ol style="list-style-type: none"> 1. Provide authentication details(username, password) 2. Verify details. 3. Access the system.
Post conditions	Use the system functions using the account privileges.

Table B.1 Use case description for login.

School Management Module

Use case diagram for school management

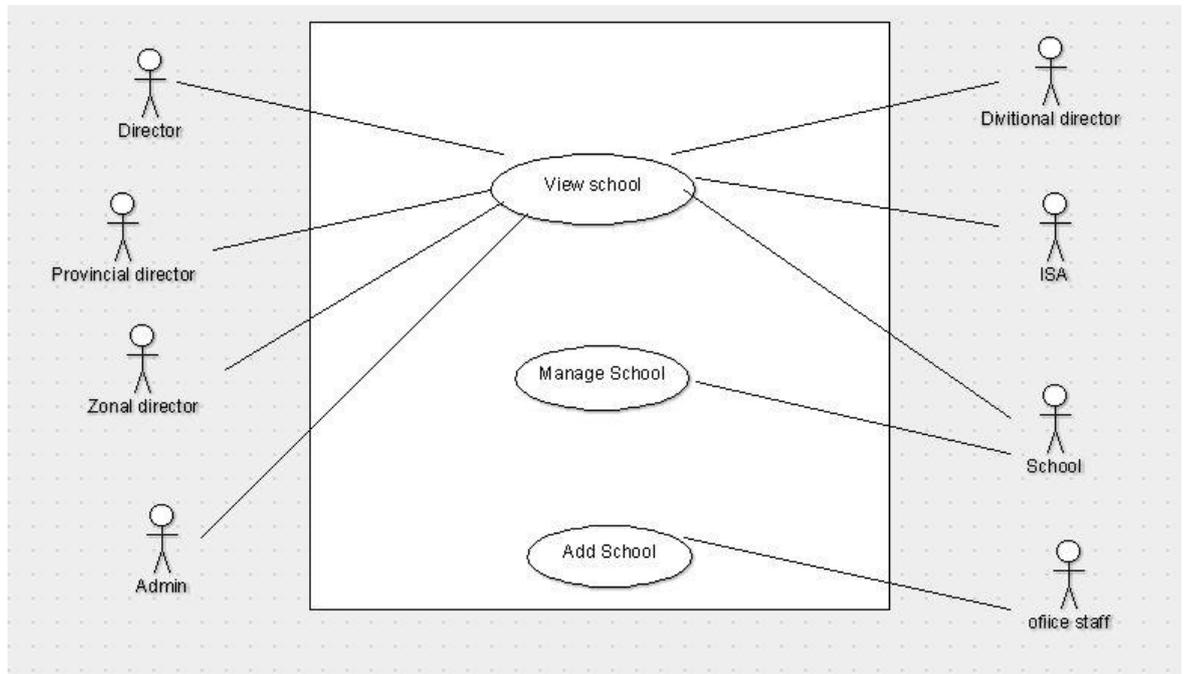


Figure B.3 Use case diagram for school management.

Manage school details

Use Case	Manage School Details
Actors	Admin, Schools, Directors, ISA, Staff
Overview	Add, delete, search and update new/existing school details
Preconditions	Enter valid data.
Flow of events	<ol style="list-style-type: none"> 1. Enter valid information for the 2. Save details properly. 3. Search a school in order to delete or update.
Post conditions	The confirmation messages will be displayed after a task.

Table B.2 Use case description for Mange school.

Result Management Module

Result analyzing of the public examinations

Use Case	Results Analyzing
Actors	Admin, Schools, Directors, ISA
Overview	The results for the relevant examination are collected and analyzed.
Preconditions	The accurate results are collected properly.
Flow of events	<ol style="list-style-type: none"> 1. The results are saved properly according to the desired criteria. 2. Management reports for the current plight and more details are generated.
Post conditions	The reports are generated and printed properly.

Table B.2 Use case description for Result Management

Sequence Diagram for Report Generation.

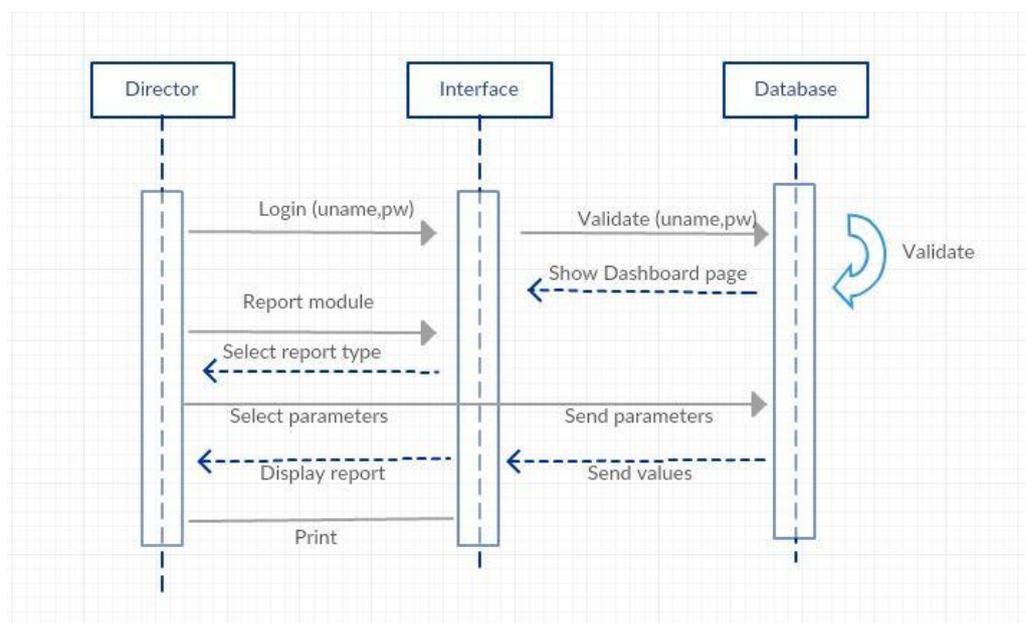


Figure B.4 Sequence diagram for report generation.

Sequence Diagram for School Registration

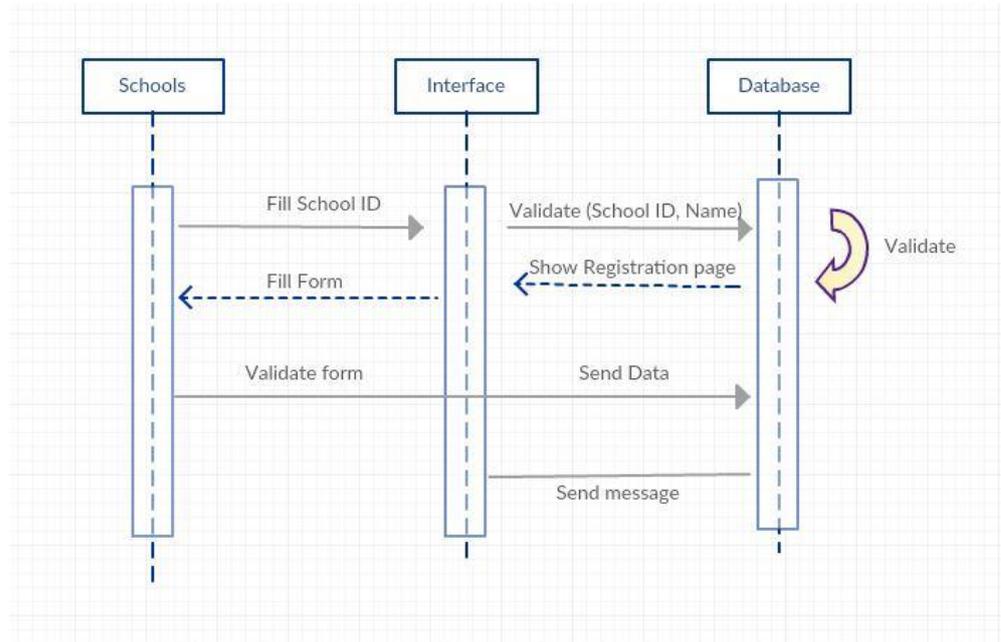


Figure B.5 Sequence diagram for school registration.

Appendix C – User documentation

This documentation is for the users who will access the OAS in order to get to know about the functionalities of the system and how to use them effectively. There are seven roles defined in the system namely, System Admin, Provincial Director, Zonal Director, Director, ISA and Schools and staff.

Login

Once the user logs in to the system with valid username and password, the system will identify the type of role and display appropriate links to other pages. User logs in to the system the dashboard page will appear.

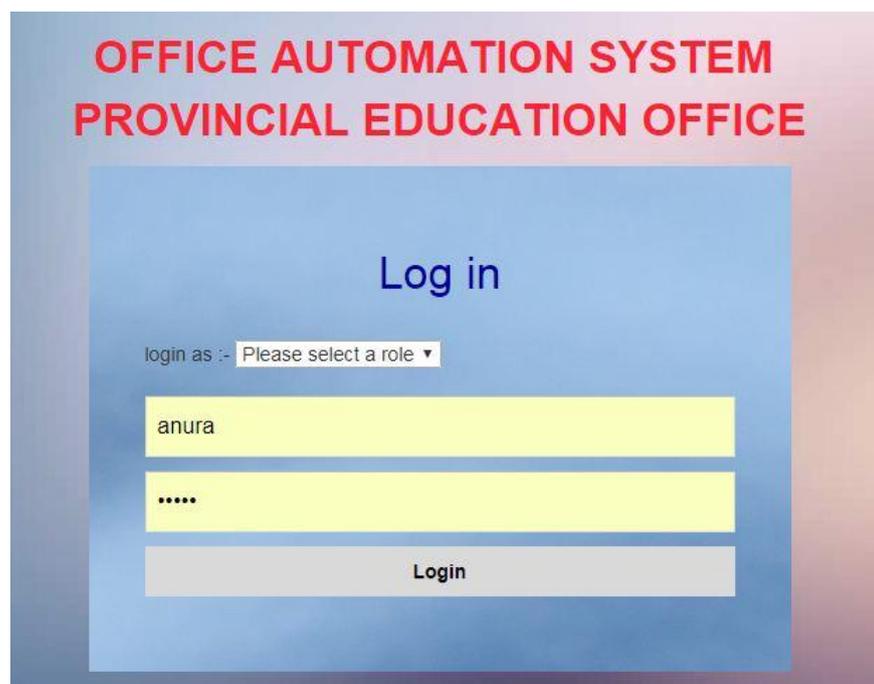


Figure C.1 Login interface.

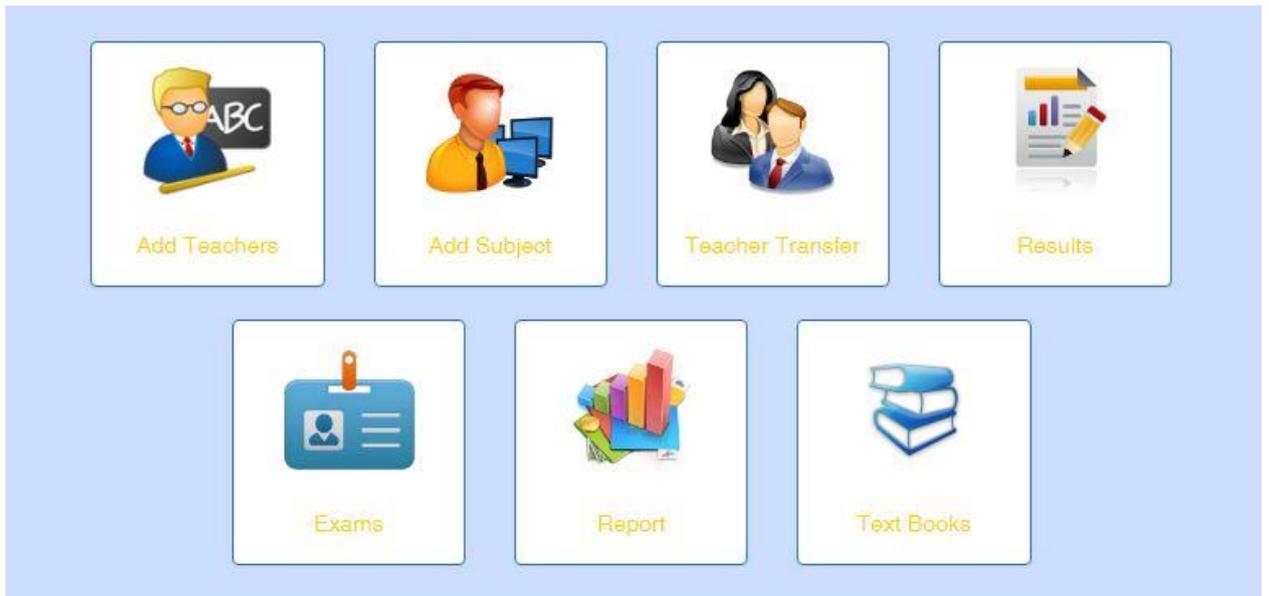


Figure C.2 School dashboard.

The dashboard page gives the access to other modules. Through the side bar the user can select the desired module

General guidelines to do a Add new user

Click on the User Management in the dashboard navigational sidebar.

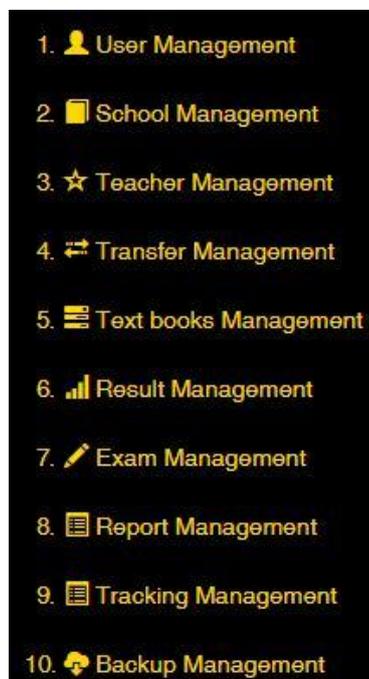


Figure C.3 Dashboard navigational sidebar.

This will direct to the User management page.

User Management

Show 10 entries Search:

User Image	Name	Email	Role	
	kapila	kgh@yahh.hgc	Zonal Director	Deactivate
	Ajith	preajith55555@gmail.com	Province Directors	Deactivate
	Edirisooriya	jkdsd@dggf.ss	Staff	Deactivate
	Asitha	asitha.nanayakkara@yahoo.com	System Admin	
	Anushka	kaushalyajkd@gmail.com	System Admin	Deactivate

Showing 1 to 5 of 5 entries

First Previous **1** Next
Last

Figure C.4 User Management.

Click add button and direct to the adduser page.

Adding a User

First Name :- Last Name :-

E - Mail :- User Name :-

DoB :- NIC :-

Tel No :- Gender :- Male Female

Address :-

Role :- Uploading an Image :- No file chosen

Zonal :-

Figure C.5 Add User page.

Fill the form and click continue button to add new user.

General guidelines to do a Add Teacher

Log in as a school and direct school dashboard page. Click on the teacher Management in the dashboard navigational sidebar.



Figure C.6 teacher Management.

Then click Add teacher and direct add teacher page

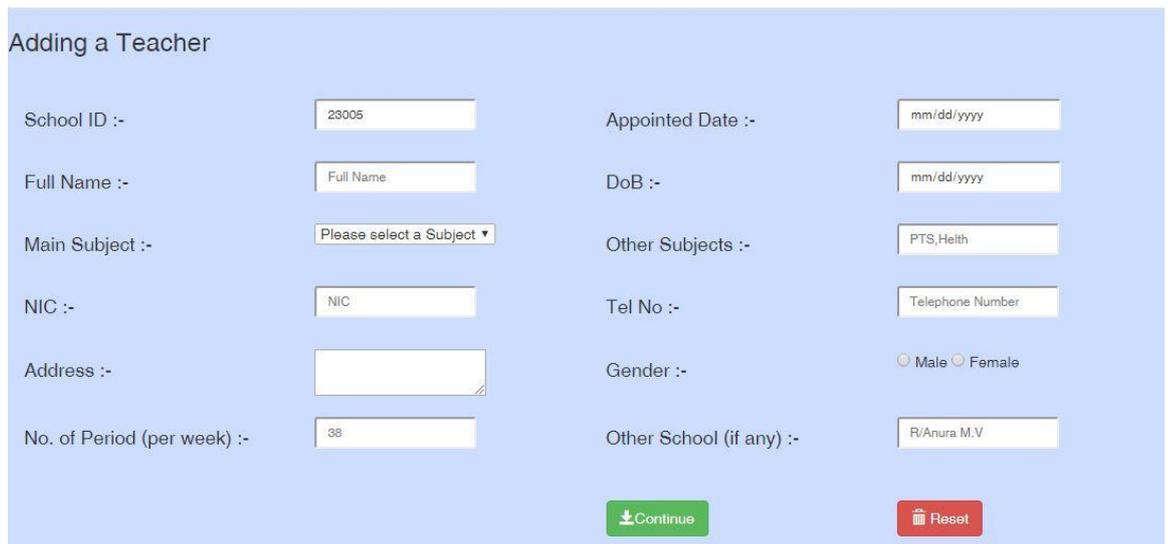
The image shows a form titled "Adding a Teacher" on a light blue background. It has two columns of input fields. The left column includes: School ID (23005), Full Name (Full Name), Main Subject (Please select a Subject), NIC (NIC), Address (empty), and No. of Period (per week) (38). The right column includes: Appointed Date (mm/dd/yyyy), DoB (mm/dd/yyyy), Other Subjects (PTS,Health), Tel No (Telephone Number), Gender (radio buttons for Male and Female), and Other School (if any) (R/Anura M.V). At the bottom right, there are "Continue" and "Reset" buttons.

Figure C.7 Add teacher.

Fill the form and click continue button.

Appendix D – Management Reports.

The system allows the directors to generate useful reports that will help to view and track the progress of the province.

D.1. School Details (Hole Province)

School Management

Show 10 entries Search:

School Name	Divition	Zonal	Principal's Name	Contact
E/Embilipitiya Maha Vidyalaya				0
K/Swarna Jayanthi Vidyalaya	9	3	Mr. Wimaladasa	458725487
R/Fergosun Girls College				0
R/kuruwita M.M.V	2	1	kkkkk	235874569
K/Panakawa Maha Vidyalaya	9	3	Mrs. Wimalasena	254875456
R/Thalawitiya Saman Vidyalaya	2	1	Mr. BA. Wijerathna	366548956
R/Erathna M.V	2	1	fdvc	2147483647
R/Seewali Central College	3	1	Mr. Abenayaka	365487872
R/Udumaththa Mihindu Vidyalaya		1	Mr. Upasen withanage	362589654
R/Pohorabawa Vidyalaya				0

Showing 1 to 10 of 13 entries

Figure D.1 School Details

D.2. Teacher Details (Hole Province)

Teacher Management

Show 10 entries Search:

No.	School Name	Teacher Name	Main Subject	Contact	Appointed date
1	R/Thalawitiya Saman Vidyalaya	Ananda	Science	0	2010-04-08
2	R/Thalawitiya Saman Vidyalaya	wagis	Sinhala	715454875	2010-05-08
3	R/Anura Maha Vidyalaya	aaaaaaaaaaaaaaaaaaaa	Histry	2147483647	2000-05-06
4	R/Thalawitiya Saman Vidyalaya	ffffff	Sinhala	2147483647	2010-05-05
5	R/Udumaththa Mihindu Vidyalaya	Wimaladasa	Science	28714566	1999-06-09
6	R/Anura Maha Vidyalaya	jmakjyakody	ICT	779740084	2012-07-02
8	R/Anura Maha Vidyalaya	jmakjyakody	ICT	0	2012-07-02

Showing 1 to 7 of 7 entries

Figure D.2 Teacher Details

D.3. G.C.E.(ordinary Level) Result analysis (Subject wise)

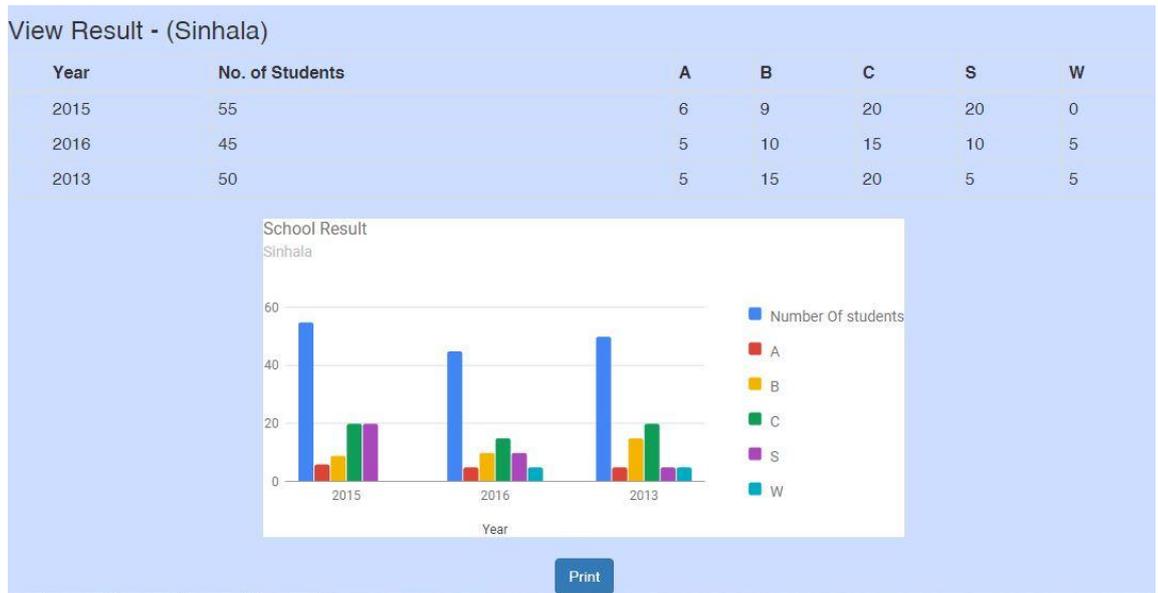


Figure D.3 G.C.E (O/L) Result (Subject wise)

D.4. G.C.E.(ordinary Level) Result analysis (Year wise)

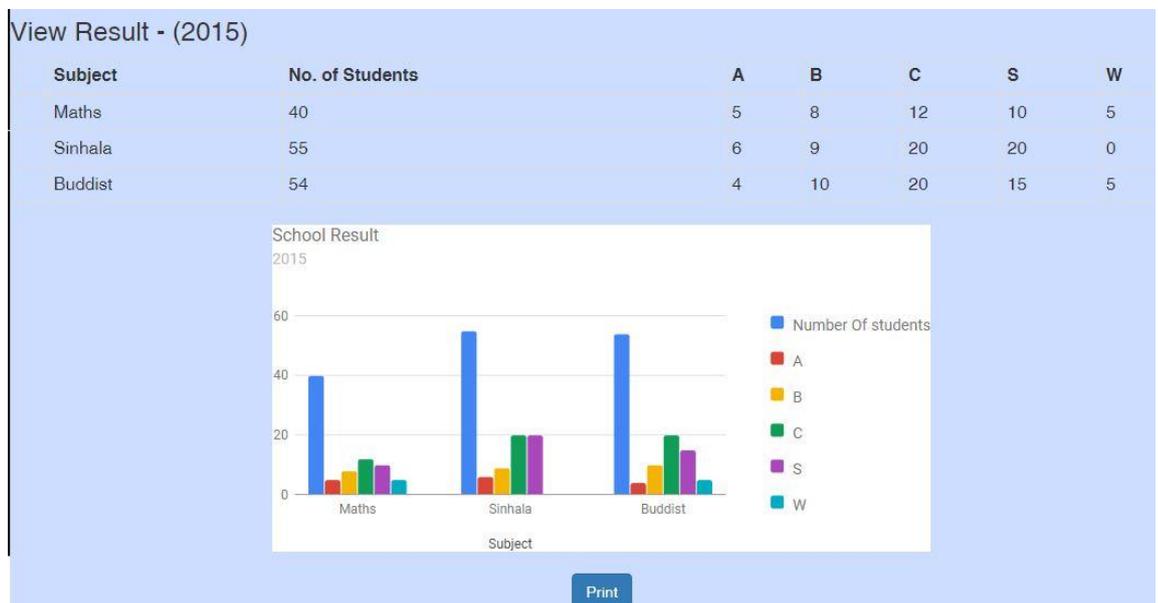


Figure D.4 G.C.E (O/L) Result (Year wise)

Appendix E – Test results.

The user interactive messages which are used by several modules are only used once to avoid the inefficiency. For the ease of understanding screen shots are provided where necessary.

Test Result for Login

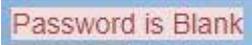
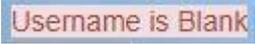
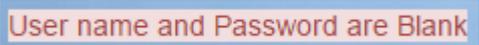
Test ID	Test Result	Status
1	Enter Invalid User name or password 	Pass
2	User enters valid username and left password blank 	Pass
3	User enters valid password and left username blank 	Pass
4	User name and password are blanks 	Pass

Table E.1 Test result for login.

User Evaluation

User Evaluation Form

Name of the user : S. Kuruppuarachchi

Designation : Sabaragamuwa Provincial Director of Education

Role name: Director

Tested Module

User Management	<input checked="" type="checkbox"/>	School Management	<input checked="" type="checkbox"/>
Teacher Management	<input checked="" type="checkbox"/>	Result Management	<input checked="" type="checkbox"/>
Report Management	<input checked="" type="checkbox"/>	Exam Management	<input checked="" type="checkbox"/>

User satisfaction on system

Grading:- 5 – Very Good 4 – Good 3 – Average 2 - Poor 1 – Very Poor

Evaluation Criteria	1	2	3	4	5
The module is addressing all the identified requirements			✓		
The new system module helped to overcome the drawbacks of the previous system				✓	
The new system module is user friendly				✓	
The module helped to minimize the problems				✓	
The module help document is easy to understand				✓	

User Comments

This system is very efficient and user friendly. After installation, it was very easy to work with it. It organised all of the data accordingly.

Date : 07.11.2017

Signature : _____

S. KURUPPU ARACHCHI
Sabaragamuwa Provincial Director of Education
Getangama - Ratnapura

User Evaluation Form

Name of the user : R. M. G. K. Ranasingha

Designation : * ADE

Role name: Zonal Director

Tested Module

User Management <input type="checkbox"/>	School Management <input checked="" type="checkbox"/>
Teacher Management <input checked="" type="checkbox"/>	Result Management <input checked="" type="checkbox"/>
Report Management <input checked="" type="checkbox"/>	Exam Management <input checked="" type="checkbox"/>

User satisfaction on system

Grading:- 5 – Very Good 4 – Good 3 – Average 2 - Poor 1 – Very Poor

Evaluation Criteria	1	2	3	4	5
The module is addressing all the identified requirements			✓		
The new system module helped to overcome the drawbacks of the previous system				✓	
The new system module is user friendly			✓		
The module helped to minimize the problems			✓		
The module help document is easy to understand				✓	

User Comments

The software created by Mrs J.M.A.K Jayakody who is the teacher in charge of Information Communication Technology of R/Anura M.V is worthwhile and valuable for educational & administrative purposes of the Sabaragamuwa province. It enables me to retrieve all the required informations of all the principals and teachers of the province at any place of the world.

Date : 2017.11.07

Signature :

ආර්. එම්. ජී. කේ. රණසිංහ
සහකාර අධ්‍යාපන අධ්‍යක්ෂ
කලාප අධ්‍යාපන අධ්‍යක්ෂ වෙනුවට
රත්නපුර

User Evaluation Form

Name of the user : S.M.A.K. Anuruddika

Designation : Divisional Director of Education

Role name: Director

Tested Module

- | | |
|--|---|
| User Management <input type="checkbox"/> | School Management <input checked="" type="checkbox"/> |
| Teacher Management <input checked="" type="checkbox"/> | Result Management <input checked="" type="checkbox"/> |
| Report Management <input checked="" type="checkbox"/> | Exam Management <input checked="" type="checkbox"/> |

User satisfaction on system

Grading:- 5 – Very Good 4 – Good 3 – Average 2 - Poor 1 – Very Poor

Evaluation Criteria	1	2	3	4	5
The module is addressing all the identified requirements			✓		
The new system module helped to overcome the drawbacks of the previous system			✓		
The new system module is user friendly				✓	
The module helped to minimize the problems				✓	
The module help document is easy to understand			✓		

User Comments

This is a time saving method and it helps to keep the information of all the schools efficiently.

Date : 2017. 11. 06.

Signature : *(Handwritten Signature)*

එස්.එම්.ඒ.කේ. අනුරුද්ධිකා
 කොට්ඨාශ අධ්‍යාපන අධ්‍යක්ෂ
 කොට්ඨාශ අධ්‍යාපන කාර්යාලය
 කුරුමිට

Figure E.1 User evaluation form(Director).

User Evaluation Form

Name of the user : B. A. Wijerathna

Designation : Principal

Role name : Principal (school)

Tested Module

- | | | | |
|--------------------|-------------------------------------|-------------------|-------------------------------------|
| User Management | <input type="checkbox"/> | School Management | <input checked="" type="checkbox"/> |
| Teacher Management | <input checked="" type="checkbox"/> | Result Management | <input checked="" type="checkbox"/> |
| Report Management | <input checked="" type="checkbox"/> | Exam Management | <input type="checkbox"/> |

User satisfaction on system

Grading:- 5 – Very Good 4 – Good 3 – Average 2 - Poor 1 – Very Poor

Evaluation Criteria	1	2	3	4	5
The module is addressing all the identified requirements			✓		
The new system module helped to overcome the drawbacks of the previous system				✓	
The new system module is user friendly			✓		
The module helped to minimize the problems			✓		
The module help document is easy to understand			✓		

User Comments

The project created userfriendly pleasant environment and it saves lot of time. It fulfilled our major requirements.

Date : 2017.11.05

Signature : B. A. Wijerathna

ඩී.ටී. විජේරත්න
 විදුහල්පති
 ර/ කලාවිටිය සිරිසමන් විද්‍යාල
 දිකොනොද, ඇතැල්ලොලො

User Evaluation Form

Name of the user : D. D. Sarath Alawathura

Designation : Principal

Role name: Principal (school)

Tested Module

User Management <input type="checkbox"/>	School Management <input checked="" type="checkbox"/>
Teacher Management <input checked="" type="checkbox"/>	Result Management <input checked="" type="checkbox"/>
Report Management <input checked="" type="checkbox"/>	Exam Management <input type="checkbox"/>

User satisfaction on system

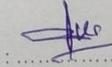
Grading:- 5 – Very Good 4 – Good 3 – Average 2 - Poor 1 – Very Poor

Evaluation Criteria	1	2	3	4	5
The module is addressing all the identified requirements				✓	
The new system module helped to overcome the drawbacks of the previous system				✓	
The new system module is user friendly			✓		
The module helped to minimize the problems			✓		
The module help document is easy to understand				✓	

User Comments

This project is very helpful to the schools as it helps to maintain all the data systematically.

Date : 05.11.2017

Signature : 

D. D. Sarath Alawathura
Principal (S. L. P. S.)
R / Anura Maha Vidyalaya
Getaheththa.

Figure E.1 User Evaluation form(Principals)

User Evaluation Form

Name of the user : K. P. S. Hemantha

Designation : I. S. A. (Maths)

Role name: I SA

Tested Module

- | | |
|--|---|
| User Management <input type="checkbox"/> | School Management <input checked="" type="checkbox"/> |
| Teacher Management <input checked="" type="checkbox"/> | Result Management <input checked="" type="checkbox"/> |
| Report Management <input checked="" type="checkbox"/> | Exam Management <input checked="" type="checkbox"/> |

User satisfaction on system

Grading:- 5 – Very Good 4 – Good 3 – Average 2 - Poor 1 – Very Poor

Evaluation Criteria	1	2	3	4	5
The module is addressing all the identified requirements				✓	
The new system module helped to overcome the drawbacks of the previous system				✓	
The new system module is user friendly				✓	
The module helped to minimize the problems				✓	
The module help document is easy to understand				✓	

User Comments

..... This programme guided us to touch all administrative document in details by one mouse click.....

Date : 2017 / 11 / 06

Signature :

User Evaluation Form

Name of the user : K. K. S. Praveyanthu
 Designation : ISA (science)
 Role name: ISA

Tested Module

User Management <input type="checkbox"/>	School Management <input checked="" type="checkbox"/>
Teacher Management <input checked="" type="checkbox"/>	Result Management <input checked="" type="checkbox"/>
Report Management <input checked="" type="checkbox"/>	Exam Management <input checked="" type="checkbox"/>

User satisfaction on system

Grading:- 5 – Very Good 4 – Good 3 – Average 2 - Poor 1 – Very Poor

Evaluation Criteria	1	2	3	4	5
The module is addressing all the identified requirements		4		✓	
The new system module helped to overcome the drawbacks of the previous system			✓		
The new system module is user friendly				✓	
The module helped to minimize the problems				✓	
The module help document is easy to understand				✓	

User Comments

It is user friendly software. It is very useful for my works and managing them.

Date : 2013/10/5

Signature :

Figure E.1 User Evaluation form(ISA)

Appendix F – Code listings.

This section contains an overview of the codes used for the development of the system.

User validation

```
$(document).ready(function(){
    $("#form").submit(function(event){
        var fname=$("#fname").val(); // to grt the first name
        var pat1=/^[a-zA-Z]+$/; // regular expression

        var lname=$("#lname").val();
        var pat2=/^[a-zA-Z]+$/;

        var email=$("#email").val();
        var pate=/^([a-zA-Z0-9_\.\\-])+\@(([a-zA-Z0-9\\-])+\.)+([a-zA-Z]{2,6})+$/; // email regular expression
        //Check fname value is empty

        var uname=$("#uname").val();
        var pat3=/^[a-zA-Z]+$/;

        var nic=$("#nic").val();
        var patNIC=/^[0-9]{9}[VX]+$/;

        var tel=$("#tel").val();
        var pattel=/^[0-9]{10}$/;

        //fname validation
        if(fname==""){
            $("#show").text('Blank First Name'); // to display an error massege
            document.getElementById('fname').focus();
            // if so default value must be prevented.....
            // default value is true
            event.preventDefault();
            return false;
        }

        if(!fname.match(pat1)){ // pattern is no there then
            $("#show").text('Invalid First Name'); // to display an error
            document.getElementById('fname').focus(); //focus fname
            // if so default value must be prevented.....
            // default value is true
            event.preventDefault();
            return false;
        }

        //Last Name validation
        if(lname==""){
            $("#show").text('Blank last Name'); // to display an error massege
            document.getElementById('lname').focus();
            // if so default value must be prevented.....
            // default value is true
            event.preventDefault();
            return false;
        }

        if(!lname.match(pat2)){ // pattern is no there then
            $("#show").text('Invalid last Name'); // to display an error
            document.getElementById('lname').focus(); //focus fname
            // if so default value must be prevented.....
            // default value is true
            event.preventDefault();
            return false;
        }
    }
}
```

```

//email validation
if(email==""){
    $("#show").text('Blank Email'); // to display an error message
    document.getElementById('email').focus();
    // if so default value must be prevented.....
    // default value is true
event.preventDefault();
return false;
}
if(!email.match(pate)){ // pattern is no there then
    $("#show").text('Invalid Email Address'); // to display an error
    document.getElementById('email').focus();
    // if so default value must be prevented.....
    // default value is true
    event.preventDefault();
    return false;
}

//User Name
if(uname==""){
    $("#show").text('Blank User Name'); // to display an error message
    document.getElementById('uname').focus();
    // if so default value must be prevented.....
    // default value is true
event.preventDefault();
return false;
}

if(!uname.match(pat3)){ // pattern is no there then
    $("#show").text('Invalid User Name'); // to display an error
    document.getElementById('uname').focus();
    // if so default value must be prevented.....
    // default value is true
    event.preventDefault();
    return false;
}

//current date
var today=new Date();
var year=today.getFullYear();
var month=today.getMonth();
var date=today.getDate();

//dob validation
var dob=$("#dob").val();
var bday=new Date(dob);
var byear= bday.getFullYear();
var bmonth=bday.getMonth();
var bdate=bday.getDate();

age=year-byear;
m=month-bmonth;
d=date-bdate;
if(m<0 || (m==0 && d<0)){
    age--;
}
}

```

```

if(!nic.match(patNIC)){ // pattern is no there then
    $("#show").text('Invalid NIC'); // to display an error
    document.getElementById('nic').focus(); //focus fname
        // if so default value must be prevented.....
        // default value is true
    event.preventDefault();
    return false;
}

//tel validation
if(tel==""){
    $("#show").text('Blank tel'); // to display an error massege
    document.getElementById('tel').focus();
        // if so default value must be prevented.....
        // default value is true
    event.preventDefault();
    return false;
}

if(!tel.match(pattel)){ // pattern is no there then
    $("#show").text('Invalid tel'); // to display an error
    document.getElementById('tel').focus(); //focus fname
        // if so default value must be prevented.....
        // default value is true
    event.preventDefault();
    return false;
}

if(!($("#male").is(':checked')) && !($("#female").is(':checked'))){
}

if(age<18){
    $("#show").text('Underage'); // to display an error
    document.getElementById('dob').focus();
        // if so default value must be prevented.....
        // default value is true
    event.preventDefault();
    return false;
}

if(age>60){
    $("#show").text('OverAge'); // to display an error
    document.getElementById('dob').focus();
        // if so default value must be prevented.....
        // default value is true
    event.preventDefault();
    return false;
}

//NIC validation
if(nic==""){
    $("#show").text('Blank NIC'); // to display an error massege
    document.getElementById('nic').focus();
        // if so default value must be prevented.....
        // default value is true
    event.preventDefault();
    return false;
}
}

```

Figure F.1 User Validation

Login validation

```
$(document).ready(function(){
    $("#form").submit(function (event){
        if($('#uname').val()=="" && $('#pass').val()=="" && $('#role_id').val()==""){
            $('#msg').text("User name, Password and Role Id are Blank");
            event.preventDefault();
            return false;
        }
        else if($('#uname').val()==""){
            $('#msg').text("Username is Blank");
            event.preventDefault();
            return false;
        }
        else if($('#pass').val()==""){
            $('#msg').text("Password is Blank");
            event.preventDefault();
            return false;
        }
        else if($('#role_id').val()==""){
            $('#msg').text("role id is Blank");
            event.preventDefault();
            return false;
        }
    });
});
```

Figure F.2 Login Validation

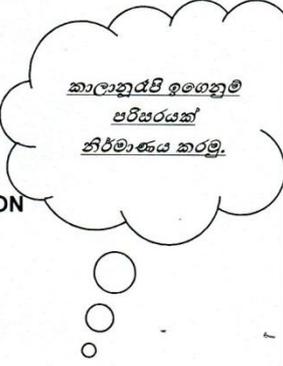
Appendix G – Client Certificate

දුරකථනය தொலைபேசி Telephone	අධ්‍යක්ෂ பணிப்பாளர் Director කාර්යාලය அலுவலகம் Office ෆැක්ස් பெக்ஸ் Fax	045 - 2222403 045 - 2222184 045 - 2222403		ඔබගේ අංකය உமது இல Your No දිනය திகதி Date	SG/ED/DEV/12 2017.11.07
----------------------------------	---	---	---	--	----------------------------

සබරගමුව පළාත් අධ්‍යාපන දෙපාර්තමේන්තුව
 ගැටන්ගම - රත්නපුර

சபரகமுவ மாகாண கல்வித் திணைக்களம்
 கெற்றன்கம - இரத்தினபுரி

SABARAGAMUWA PROVINCIAL DEPARTMENT OF EDUCATION
 GETANGAMA – RATNAPURA

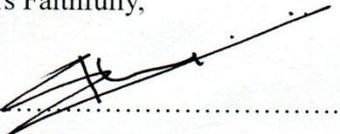


Project Examination Board,
 University of Colombo School of Computing,
 No. 17, Swarna Road,
 Colombo 06.
 Dear Sir/Madam,

Letter of Certification

This is to certify Mrs. J.M.A.K. Jayakody (R110379) has successfully developed a working system for the Provincial Education Office, Sabaragamuwa. The corresponding system was carried out as a partial requirement of Bachelor of Information Technology degree program. We strongly believe this system will help the office to carry out its day-to-day operations efficiently and effectively.

Thank You,
 Yours Faithfully,



The Provincial Director of Education
 The Provincial Department of Education,
 Sabaragamuwa Province.

S. KURUPPU ARACHCHI
 Sabaragamuwa Provincial Director of Education
 Getangama - Ratnapura

Glossary

Term	Description
School Registration	A School registering to Office Automation System
Teacher Registration	A Teacher registering to Office Automation System
Use Case Diagram	Diagram which shows the overall picture
Class Diagram	Class diagram shows the relationship between system classes
Sequence Diagram	A sequence diagram shows object interactions arranged in time sequence.
Activity Diagram	An activity diagram shows the overall flow of control
Rational Unified Process	Iterative software development process