

**Online School Exam Results
Analysis System
(OSERAS)
for
Ave Maria Convent Negombo**

P. A. I. M. Perera

2020



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Analysis System
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Ave Maria Convent Negombo**

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

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University of Colombo School of Computing

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Abstract

Ave Maria Convent - Negombo also known as AMC is a semi government catholic private school in Sri Lanka. AMC has nearly 2850 students and 137 teachers as at year 2020. The teaching profession is very much challenged today due to various reasons like, high competition in the field of education, increasing the content of the subjects' matter, demands from the job market, technological development, and demand for efficiency, quality and effectiveness in teaching. These challenges have become the talk of the town, among the teachers. The school teachers spend more time to enter the marks on mark sheets and to prepare students' result sheets. This effort consumes much time than the time they spend on marking exam papers. On the other hand, school administration demands to categories the students' results into various categories that are needed for the records and evaluations which provide them a platform to evaluate the teaching learning process and improve their efforts and decisions.

This is a web system which is accessible by the teachers and admin staff to calculate and make reports. Benefits of the system to minimize the paperwork, improve efficiency, effectiveness, less of human errors, and save time.

The implemented system consists of many features, which include adding subject teachers, subjects, add marks of each subject and generate report. This web-based application is easy to handle and automates the process of the evaluation process of school. The supporting system is developed with PHP, MYSQL, Bootstrap, Java script libraries. System can use in any web browser like Internet Explorer, Mozilla Firefox and Google Chrome.

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

Ms. P. A. I. M. Perera

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

Certified by:

Supervisor Name : Mr. K P M K Silva

Signature:

Date:

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List of Abbreviations

OSERAS	-	Online School Exam Results Analysis Systems
ER Diagram	-	Entity Relationship Diagram
IE	-	Internet Explorer
My SQL	-	My Structured Query Language
PHP	-	Hypertext Pre-Processor
RAM	-	Random Access Memory
SDLC	-	Software Development Life Cycle
UML	-	Unified Modeling Language
URL	-	Uniform Resource Locator
WWW	-	World Wide Web
XAMPP	-	Cross Platform, Apache, MariaDB, PHP, and Perl

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I belong to a school-family where I work as a Teacher. Therefore I very especially thank my school Principal Rev. Sr. Shermila Jayawardena, Vice Principal Mrs. Nilanthi Perera for the splendid support given at all times from the initial stages of data gathering. I too wish to remember all my colleges and administrative staff members who contributed enormously making available all the relevant information for data analysis.

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CHAPTER 1 - INTRODUCTION

The teaching profession is very much challenged today due to various reasons like, high competition in the field of education, increasing the content of the subjects' matter, demands from the job market, influence of the parents, technological development, demand for efficiency, quality and effectiveness in teaching etc. These challenges have become the talk of the town, among the teachers.

When reflecting on this, that the school teachers spend more time to enter the marks on mark sheets and to prepare students' result sheets. This effort consumes much time than the time they spend on marking exam papers. On the other hand, school administration demands to categories the students' results into various categories that are needed for the records and evaluations which provide them a platform to evaluate the teaching learning process and improve their efforts and decisions. This is a must work for the teachers and clerical staffs of the schools and it is challenging and time consuming. The teachers who are having a better knowledge of IT, use the software, such as the Microsoft Excel to fulfil this task but nearly 85% of the tutorial staff use the calculator, to calculate the total and find the average of one student and repeat the same method for all the other students in the class. Therefore, these teachers have to spend more time on this with much stress and pressure.

Not only the teachers but also the clerical staff of school office faces this challenge at the end of every term and at the end of the academic year, when analyzing the result sheets prepared by the teachers. They are requested to analyze the scores of the students according to various evaluation methods; under various categories for various purposes in the school administration; Ex- for annual prize giving ceremony. Therefore, it has become more strenuous to the clerical staff too.

The developed system is a web-based system; "Online School Exam Results Analysis System" (OSERAS) is the solution to face this challenge with much effect. Here considered the poor IT knowledge that many teachers and members of the clerical staff have. This system should be easy to learn and operate and customer friendly, otherwise, it will become a failure. With this online system, teachers can easily prepare the mark sheets and do the evaluations with less time, without much stress and focus more on the other duties of the teaching learning processes. This online student exam result analysis system is not only a solution but also benefits the teachers and the clerical staff of the school office. This system will minimize the human error in

preparing the score sheets and doing the evaluations. Thus the students have no longer to worry about wrong or inaccurate results, since there is no chance for errors in this system.

According to this system, the teachers have to enter the marks into the system according to subjects and the results analysis system will generate the student's Total, Average and Class Positions automatically. This system can help the clerical staff to find out Best Students and it can provide the prize winners' list that is needed for the annual prize giving ceremony.

1.2 Aims and Objectives

- The fundamental target of the project is to provide an online system for the teachers and for the clerical/administrative staff to analyze students' marks and help them to view final report online with the results analysis (through computer, Laptop, Tab or even from mobile phone).
- The most crucial objective of the system is to automate the manual results analysis process.
- Using automated system administrative staff can view the report analysis not only at the end of the year but also at the end of every term
- manage the results of the students and to maintain a data base of results of the students throughout the year(s)
- can enter examination marks of each student and can automate and generate of the school report cards
- generate reports, charts along with allocated grades based on grade calculation easily
- print reports for each student, Grade wise, Class wise and subject wise on the simple web interface.
- Without using manual calculations, calculators or spreadsheet applications system deliver the information based on requirement using web browser.
- Educate the teachers and to overcome the "Digital Divide" among teachers by conducting the training sessions.

1.3 Scope of the Project

OSERAS consist of two major modules, teachers process and Administrative process. In teachers' process can insert, update, delete and calculate final grading according to given subject marks and generate reports. In administrative process the system can view, update and edit

details. Principal, Teacher and Admin staff need to register to the system before entering marks. The system is intended for the teachers. Moreover, the privileges that are provided to teachers are to enter students result by providing user name and password for secure login and in case. And the guests has the privilege only to read. All users will be able to generate reports, view reports and print reports. Reports can be facilitated as in PDF. In addition, admin gives the privileges to the Teacher and the college administrative staff.

Assumptions:

- Teachers enter/input the correct marks to the system
- Calculations done according to the government criteria. (Average get by dividing the known subjects) if its change make sure to inform to the administrator to change the criteria.
- Internet connection is working properly at everywhere
- All class teachers and subject's teachers have the knowledge to use computer and the use of Internet.

1.4 Structure of the Dissertation

The following is a brief description of the topics that are covered in the rest of this dissertation.

Chapter 2: Background

This chapter studies background of the manual system, crucial review of available existing methods and technologies and related applications.

Chapter 3: Analysis

This chapter explains the requirements gathering techniques that have been used to identify the requirements of the school class teachers.

Chapter 4: Design

Provide a description of ER diagram, UML diagrams and the methodological approach that applied in the program design.

Chapter 5: Implementation

During the implementation phase, it describes the development of the system. This deals with the coding and execution apparatuses and methods to build up the entire system.

Chapter 6: Evaluation

The built system is tested by using sample data and its result will be discussed. Actual data from the teacher's environment is used. The chapter also includes aspects such as test plan, test cases, use of test automation tools and testing frameworks.

Chapter 7: Conclusion

This chapter summarizes the work, discusses its findings and contributions, points out limitations of the current work.

CHAPTER 2 - REVIEW OF SIMILAR SYSTEMS AND TECHNOLOGIES

2.1 Introduction

The background analysis will primarily focus on various systems which are already available, followed by an evaluation of those solutions to find if there is already a suitable and applicable solution. All teachers face difficulties when calculating final grades. Deep diving into the problem, the most predominant factor which leads towards to all these problems is calculations being manually managed without a proper system. There are some systems which help to manage this but some are more complex for teachers who are still not moving with technology.

2.2 Review of similar systems

Subsequent to doing a web review, it was discovered some comparable systems as portrayed beneath.

2.2.1 Fedena [1]

“Modern grade book management system to meet pedagogical goals” is an article published on 23 October, 2017. It makes reference to that with the beginning of advanced innovation, the life span of the records has been waxed to reach out past the lifetime. With cautious thought and keeping these issues in center, Fedena as of late dispatched the beta form of Gradebook through which the staff can undoubtedly oversee and make different sorts of assessments and keep the records on the merged stage.

2.2.2 Lolite [2]

A School is an association having a lot of information assets spread up every which way in type of representatives, teachers, students, staff, etc and needs to give best of the offices to its understudies productively and in a best way. "lolite" is another School Management System that gives the best answers for all the school requires. lolite School Management System is created by Shah Net Technologies Pvt. Ltd. This is an organization which has been doing programming advancement occupations longer than 10 years and fulfilling the clients over the globe since long. lolite School Management System is particularly intended for the Schools,

planning to make the working of school organization and the board work of an establishment, easy and simple which is completed consistently.

2.2.3 DSRMSP [3]

According to the “D.S.R.M.S.P. REPORT” which is available on online the proposed system, they have the provision for adding the details of the students by themselves. So the overhead of the school authorities and the teachers become less. Another preferred position of the framework is that it is anything but difficult to alter the subtleties of the understudies and erase an understudy when it is discovered pointless. The primary target of building up this Student Management System is to assess the term progress of understudy. The task is to give and make effective programming to overseeing understudies in take a shot at the most recent test result the executives framework. All the manual difficulties in managing the student details in a school have been rectified by implementing computerization.

2.2.4 ERMS [4]

Exam & Result Management System (ERMS) is an online application that automates and digitizes a lot of processes which involve student result processing. These processes range from students’ registration, examination, papers marking, approval of results, producing of students result reports, summary and charts, result notification and publishing, transcript processing as well as customized result analysis to produce a performance analysis of courses, students, lecturers, departments or even faculties. ERMS makes little yet compelling Profile information for both Student and Teacher. It includes brilliant rundown report inside the Dashboard or Homepage. It effectively allocates Department, Subject, Teacher and Semester in Registration measure. It is user friendly and supports integrated multiple User accounts with Authorized Panel and Front-end Admin authentication. In addition, ERMS encompasses a secure and monitored system that tracks and logs all the activities on the system.

2.2.5 LK-Exam [5]

Online question papers and results analysis system. In this system, the admin uploaded MCQ question papers and the users enroll them self and can follow the exams. After finishing the exam user can submit and the user can see the correct answers for all questions. In Dash board user can see the overall results for all the papers done.

2.3 A comparison of the above systems

This section describes specific features of the above mentioned similar systems and comparison of those features in a tabular format. Also below table 2.1 shows the comparison of alternative systems.

Features	Modern Grade Book...	Lolite	ERMS	OSERAS (Proposed System)
Easy use	No	Yes	yes	Yes
Easy to enter subject Marks	Yes	Yes	Yes	Yes
Quick Loading in all browsers	Yes	No	Yes	Yes
Simple to understand the system	Yes	No	No	Yes
Teachers who have only much knowledge can use	No	No	Yes	Yes
Free access to all features	No	No	No	Yes

Table 2-1 - A comparison of the alternative systems

According to the table 2.1 existing systems do not offer above some features in their systems. There are no free and open source systems which provide all the requested features, therefore, proposed system (OSERAS) should be developed to fulfill the requirements of the school. The proposed project joined every one of these highlights together to fulfill client prerequisites. Therefore, users can get maximum benefits.

2.4 Summery

Over the last few decades, many different forecasting techniques have been developed in number of different application areas. Proposed Online school exam results analysis systems for Ave Maria Convent – Negombo (OSERAS) is developed for a school which handling huge number of students' marks. End user understandable report also generated through the system. System use latest technologies and tools for developments.

CHAPTER 3 – PROBLEM ANALYSIS

3.1 Introduction

Analysis is focus on requirement gathering, fact finding and identifying the functional and non-functional requirements of the system. After the analysis stage, the project can continue to the design stage. In the design stage software architecture design and Entity Relationship Diagrams, UML diagrams are drawn.

3.2 Requirements Gathering

Requirement gathering or requirement eliciting is a challenging task, it is the process of identifying the needs and conditions of the any sort of system. A significant amount of time should allocate this process. To make requirement gathering phase successful it is very important to gather all type of data. The success of any project is depended upon the accuracy of available data. If failed to analyze the requirement. incorrectly analyzed requirements leads the entire project failure. Therefore, it is very important to identify and gather requirements correctly. There are many fact gathering techniques available for analysis, such as Sampling, Questioners, Interviews, and Observations

3.2.1 Interviews

Both open ended and close ended interviews were conducted for prompt existing and also to identify new problems. Interviews done to gather the data from teachers and the admin staff. (Interview questionnaire is attached in Appendix C – QT 01). This method also helps gap the areas of misunderstandings and help to discuss the future problems.

3.2.2 Observations

Relevant documents and current system were analyzed and studied through a sampling observation methodology. Observed the process that manually handle the calculation process by teachers. They have add marks using calculators and mark total, average and later find the position using the average marks obtained. Again enter the marks to mark book at college office.

3.2.3 Questionnaires

Provide questionnaires to the staff who involved with calculation processes. (Questionnaire is attached in Appendix C – QT 2)

3.3 Requirements for the new system

3.3.1 Functional Requirements

1. Class Teachers' and Administrative Staff Authentication
Class Teachers/Admin Staff ought to be earlier registered. Every teacher/admin staff ought to be given a user name and a password to utilize the web administration
2. Provide access to the previous entered Marks
Subject teachers' handover marks in different times. So system should allow teachers to enter, view and edit marks which was entered previous.
3. Single click calculations
When teachers/ admin staff click on buttons system should provide the calculated marks.
4. Allow teachers to add subjects and student names.
System should allow teachers to add new students' names and subjects.

3.3.2 Non Functional Requirements

1. Performance Requirements:
The proposed system that going to develop will be used as the main system for providing help to the school in managing the results database of the student studying in the Ave Mari a Convent. Therefore, it is expected that the database would perform functionally all the requirements that are specified.
2. Safety Requirements:
The database may get crashed at any certain time due to virus or internet failure. Therefore, it is required to take the database backup.

3. Security Requirements:

Going to develop a secured database. There are different categories of users namely Administrator, Teacher, Admin Staff who will be viewing either all or some specific information form the database. Depending upon the category of user the access rights are decided. It means if the user is an administrator or Teacher then he/she can be able to modify the data, append etc. All other users only have the rights to retrieve the information about database.

3.3.3 Hardware and software requirements

Minimum Hardware Requirement and software Requirement categories as follows.

Implementation side requirements can be deployed as in table 3.1 for the system OSERAS.

Hardware Requirement	Software Requirement
Processor : Intel 2GHz or Higher	Operating System : Windows/Mac/Ubuntu
RAM : 512 MB/ 1GB or Higher	Web Server : Apache web server
Hard Disk : 20 GB or more Disk Space	PHP
Internet Connection : Broadband Connection	Database : My SQL
Resolution : Minimum 1024x768	Web Browser : IE, Firefox, Google Chrome, etc.

Table 3-1 - Hardware and Software Requirements

CHAPTER 4 – DESIGN

4.1 Entity Relationship Diagram (ER Diagram)

The ER Diagram is a graphical representation of entities and their relationship to each other typically used in computing regarding the organization of data within database or information systems. Entity is a piece of data, object or concept which describe which data should store. Relationship is how data is shared between entities. The ER diagram for the system is shown in figure 4.1

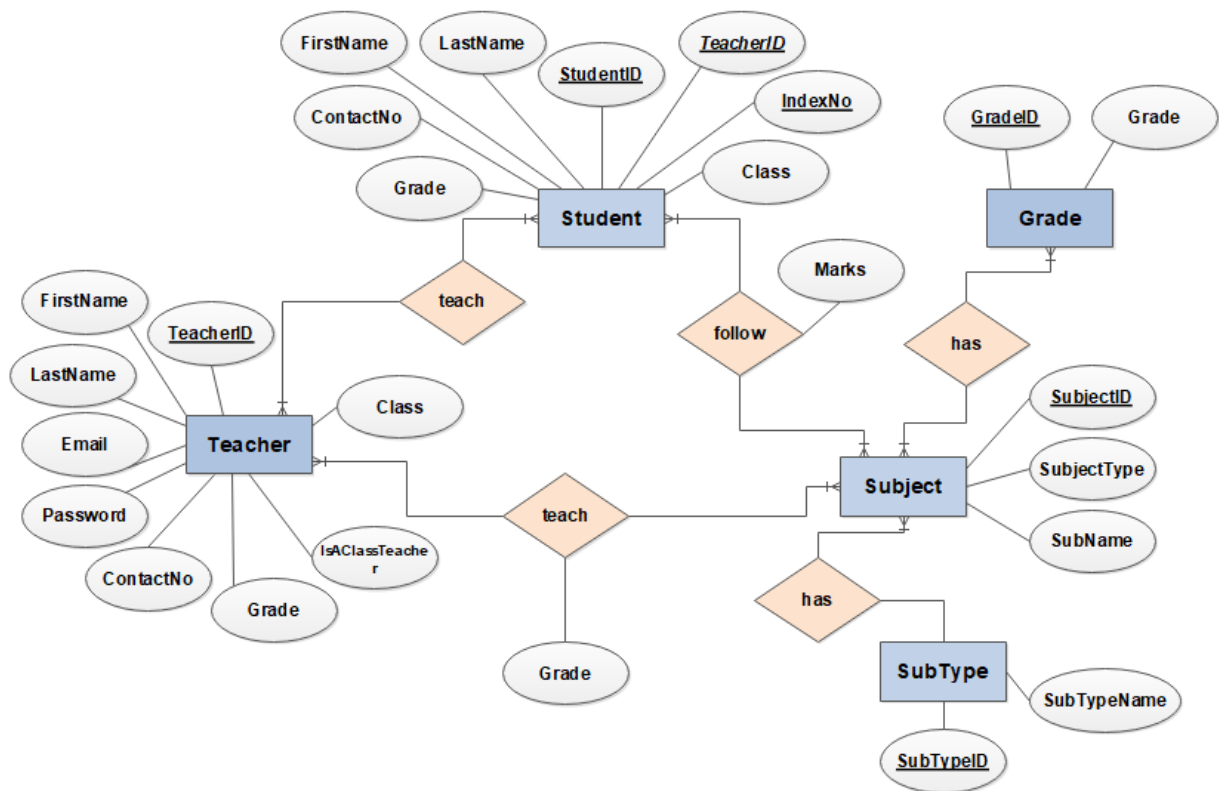


Figure 4.1 - ER Diagram of OSERAS

4.2 Use Case Diagram and Narratives.

In this use case diagram provide brief description about Three main actors in the system such as Super Admin, Admin Staff, and Teacher. System is gotten to over the web through internet browsers or cell phones. Use case diagram for the system is shown in figure 4.2.

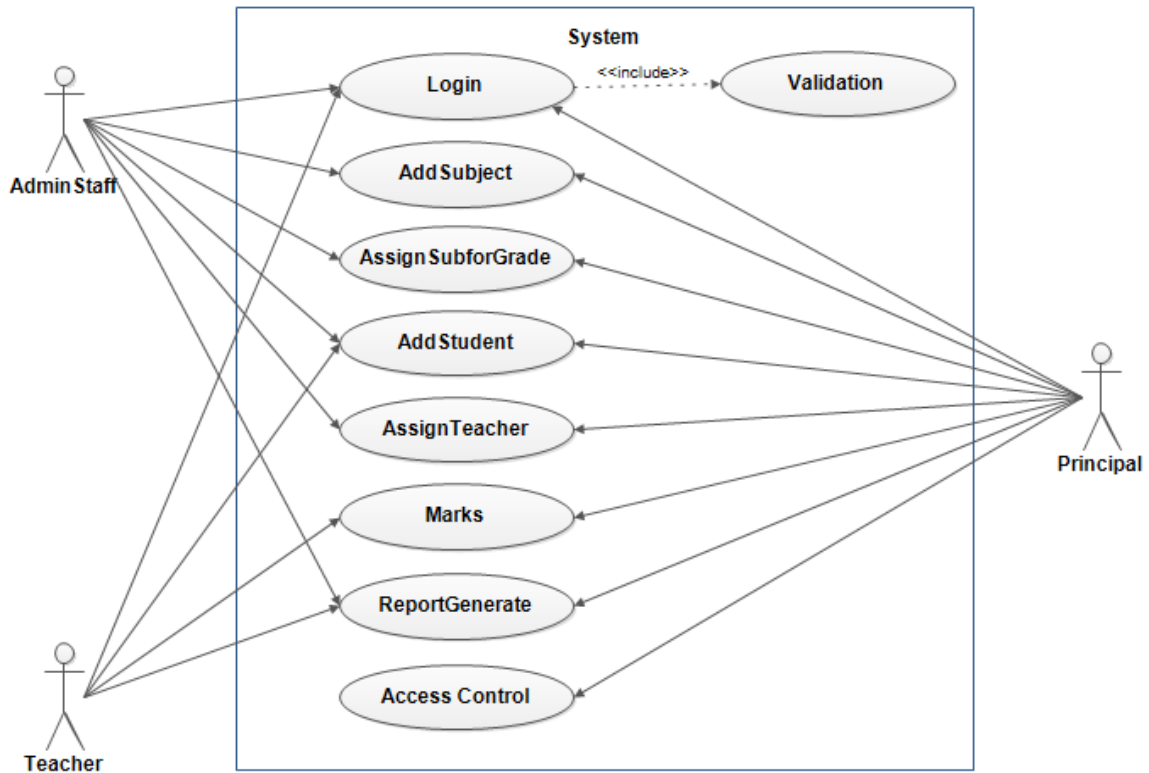


Figure 4.2 - Use Case Diagram

4.2.1 Use Case Narratives

Use case narrative is a textual description of the event and how the user will interact with the system to accomplish the task. Use case Narratives for the developed system is shown in below tables 4.1, 4.2, 4.3, 4.4 and 4.5. .

Use Case	User Registration
Description	User should enroll to the system for get to the access
Primary Actor	Teacher, Admin Staff
Secondary Actor	None
Pre-Conditions	
	1. Need to have an email address
Flow of event	
	1. User must furnish starting details to enroll with the system
	2. Users must give password and affirm it.
Post- Condition	
	1. Once user registered user belongs to one category. It may be teacher or Admin Staff

Table 4.1 - User Registration – use case description

Use Case	User Login
Description	To access the system functions user ought to login to the system
Primary Actor	Teacher, Admin Staff, Principal
Secondary Actor	None
Pre-Conditions	
	<ol style="list-style-type: none"> 1. The Administrator(Principal) must enabled the particular teacher/AdminStaff onto the website in order for this use case to begin. 2. User should be a registered user to access the system 3. User name & secret word should match
Flow of event	
	<ol style="list-style-type: none"> 1. The Website prompts the user for the user name and password. 2. The user enters the user name and password. 3. The Website verifies the password and sets the user's authorization. 4. The User is given access to the Website to perform his tasks. 5. The user enters invalid username and password then he will not be allowed to enter the website.
Post- Condition	
	<ol style="list-style-type: none"> 1. To access next page

Table 4.2 - user login - use case description

Use Case	Add Subject/Assign subjects for Grade/Add Students/Assign Teacher for subject
Description	Before add marks user should add students, subject details and teacher details
Primary Actor	Admin Staff
Secondary Actor	Teacher
Pre-Conditions	
	<ol style="list-style-type: none"> 1. User must correctly log on to the system
Flow of event	
	<ol style="list-style-type: none"> 1. User Add subjects by mentioning whether it's a Main subject or an Optional Subject 2. User should assign subjects for grades. 3. Add students with students' details such as Index Number, Name, contact no.etc... 4. Assign teachers according to the subjects they teach
Post- Condition	
	<ol style="list-style-type: none"> 5. Should save

Table 4.3 - Adding details - use case description

Use Case	Add Marks to the system
Description	After marking papers manually teachers should add marks to OSERAS
Primary Actor	Teacher/Principal
Secondary Actor	None
Pre-Conditions	
	<ol style="list-style-type: none"> 1. Before enter marks; subjects, students details must in the system
Flow of event	
	<ol style="list-style-type: none"> 2. User need to select subject, grade and class 3. Then add marks to each students.
Post- Condition	

Table 4.4 - Add Marks to system – use case description

Use Case	Generate Report
Description	After Adding marks to the system teachers can generate reports and also admin staff can view summary of subjects and students
Primary Actor	Teacher/Admin Staff
Secondary Actor	None
Pre-Conditions	
	1. To generate reports, every subject marks ought to submitted to the OSERAS
Flow of event	
	2. User need to select the category of the report
	3. Select the grade and class
Post- Condition	
	Can get PDF or view

Table 4.5 - Generate Reports – use case description

4.3 Activity Diagram

4.3.1 Login Process

Activity diagram for Login Process is shown in figure 4.3

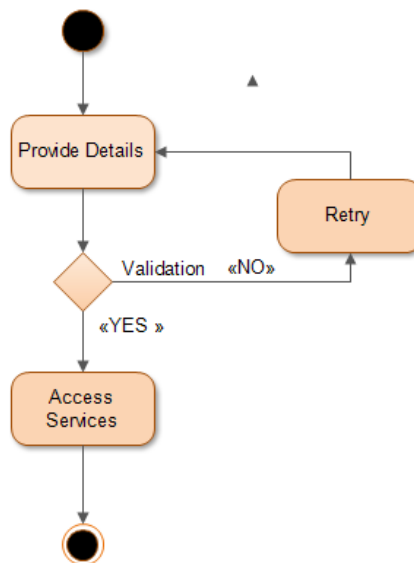


Figure 4.3 - Login Process

4.3.2 User Activation and Deactivation Status Process.

Activity diagram for User Activation and Deactivation Status Process is shown in figure 4.4

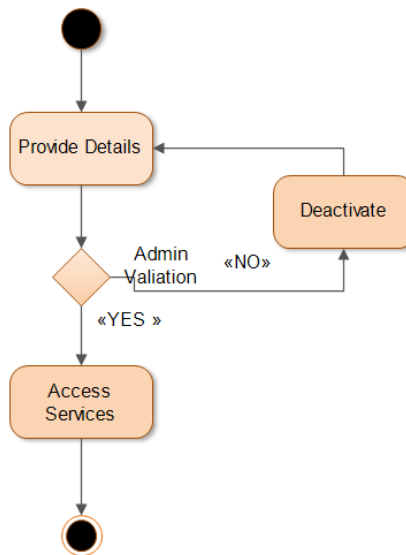


Figure 4.4 - User Activation and Deactivation Status Process

4.3.3 Administrator and Principal Process

Activity diagram for Administrator and Principal Process is shown in figure 4.5

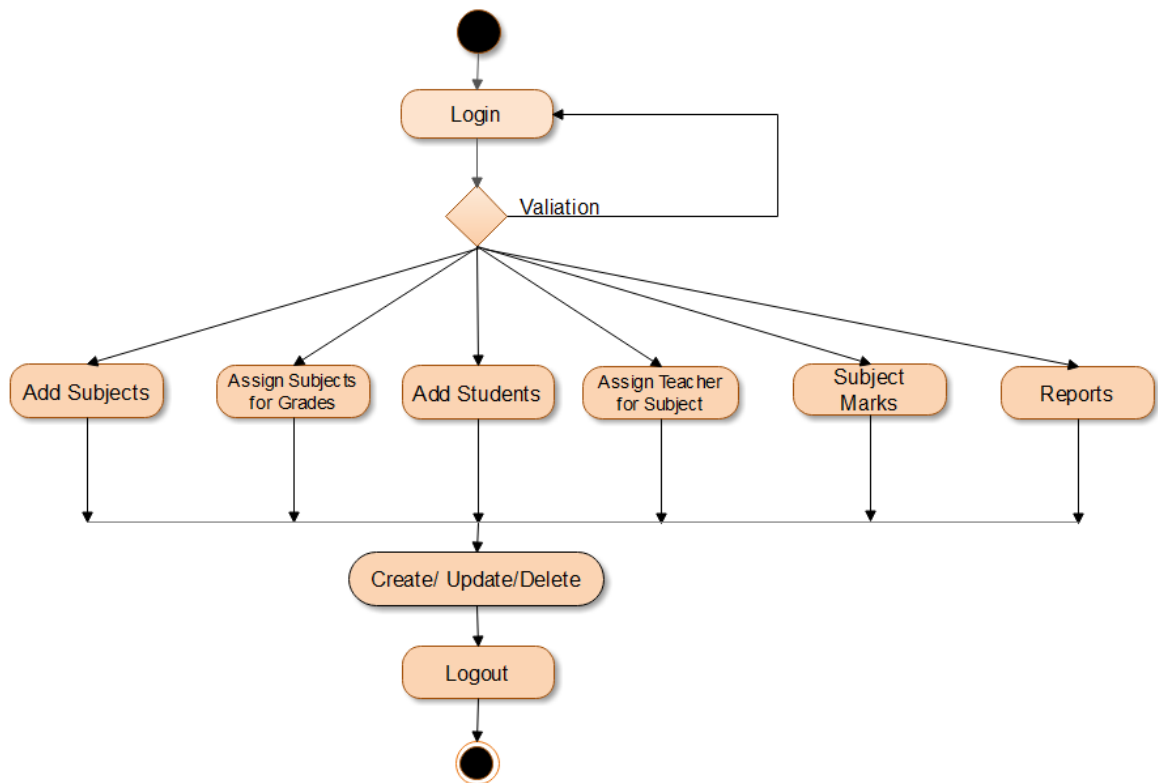


Figure 4.5 - Administrator and Principal Process

4.3.4 Admin Staff Process

Activity diagram for Admin Staff Process is shown in figure 4.6

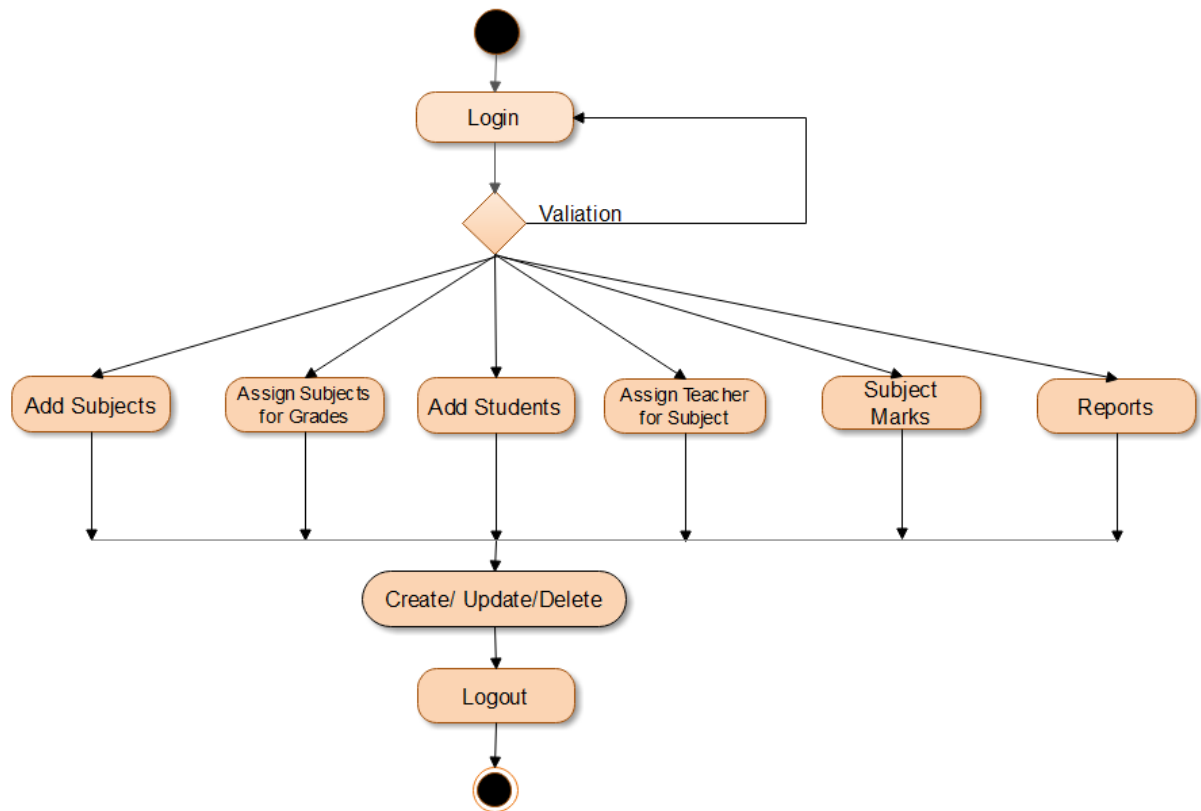


Figure 4.6 - Admin Staff Process

4.3.5 Teacher Process

Activity diagram for Teacher Process is shown in figure 4.7

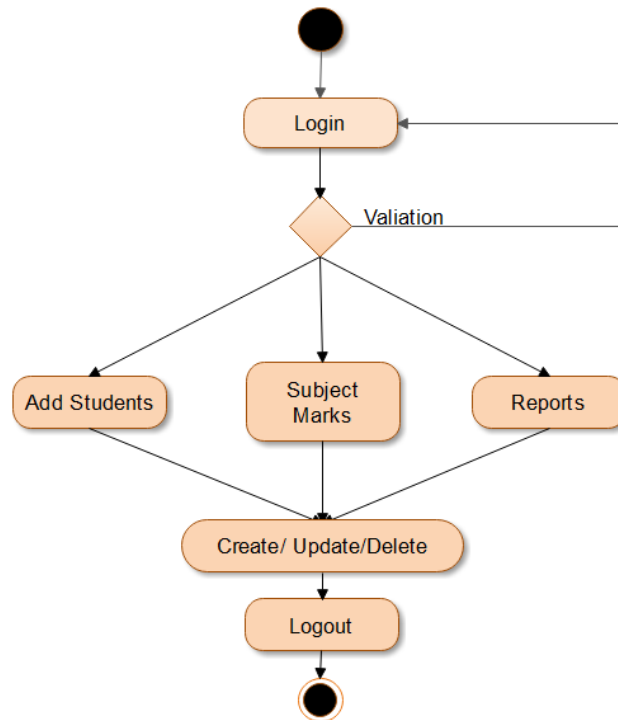


Figure 4.7 - Teacher Process

4.4 Sequence Diagram

Sequence diagram for the OSERAS is shown in figure 4.8

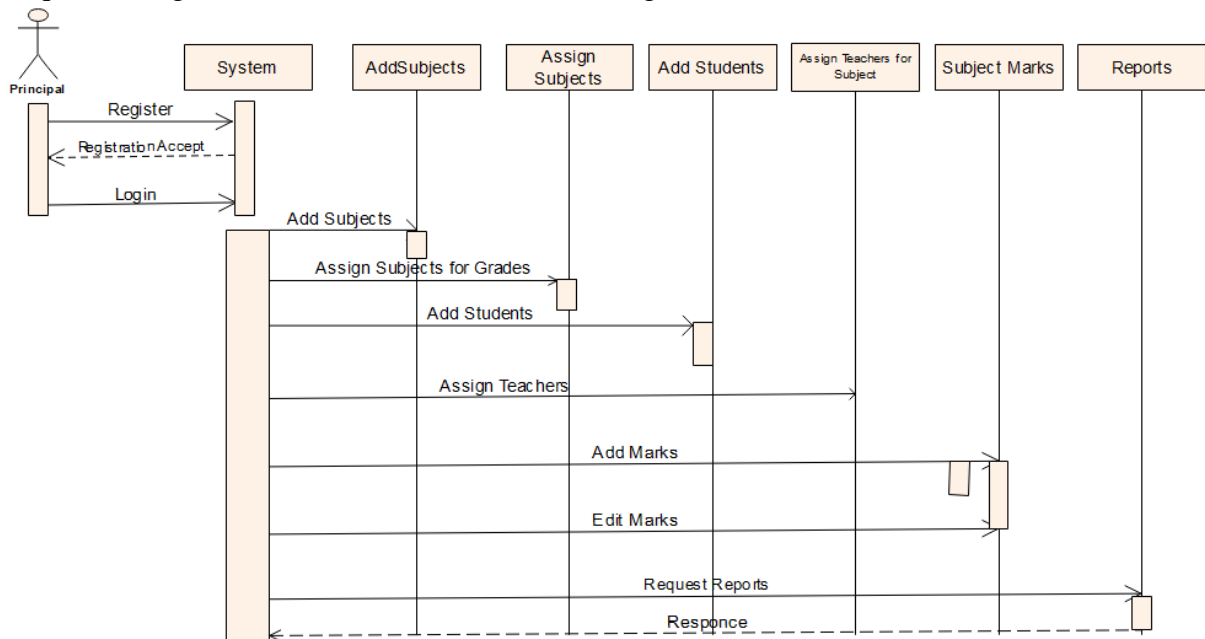


Figure 4.8 - Sequence Diagram

CHAPTER 5 – IMPLEMENTATION

5.1 Introduction

Online School Exam Results Analysis Systems for Ave Maria Convent – Negombo (OSERAS) is implemented using server side scripting PHP Framework with help of the XAMPP version 3.2.4, MySQL database and with many JavaScript libraries, Bootstrap, CSS, Ajax and JQuery. The Implemented system can deploy and run on any of windows or Unix operating systems. There are Four system user roles: Administrator, Principal, Teacher and Admin Staff. Admin Staff is responsible for Add Subjects, Assign Subjects for Grades, Add Students, Assign Teacher for Subject and Generate Report. Update and Delete process. Teacher is responsible for Add Students, Update Marks of subjects and view reports. Administrator is responsible for grant permission for the roles of users weather a Teacher or and Admin Staff member. Principal have the full access to the system.

5.2 Technology Aspects

XAMPP [6]

XAMPP is freely available open source cross-platform web solution package which was developed by Apache Friends. It contains Apache HTTP Server, MariaDB database, PHP and Perl. XAMPP works equally well on Windows, Mac and Linux operating system. To create databases utilized MYSQL which was worked in XAMPP bundle.

Bootstrap [7]

System interfaces were developed by using Bootstrap. It also free and open source toolkit which contains HTML, CSS and JS. Bootstrap is frontend development library. Bootstrap contains HTML and CSS based plan layouts for buttons, navigation, forms and date grids . This software helps to develop colourful and responsive graphical user interfaces.

PHP [8]

Hypertext Preprocessor (PHP) is an open source server-side scripting language created by Rasmus Lerdorf. In here used PHP as development language.

5.3 Hardware and Software configurations

Development Environment

Hardware Configuration

- Processor - Intel® Core™ i5
- RAM - 4GB
- 64-Bit OS
- 250GB HDD
- Monitor 1440 X 900

Software Configuration

- XAMPP
- Bootstrap
- Notepad ++ , Sublime text
- Adobe Photoshop

Client Environment

- Javascript enable web browser
- Internet connected computer/mobile

5.4 System Overview

In this section provides few user interfaces. The homepage of the OSERAS website lets users to access the main areas of the site.

Registration and Login Page

Teachers and Admin Staff should register to the system before they log into the system. Also a new Principal should register when a new principal is assign to the school. Username should be the email address of the user. Screenshot of the registration and login page is shown in figure 5.1 and 5.2

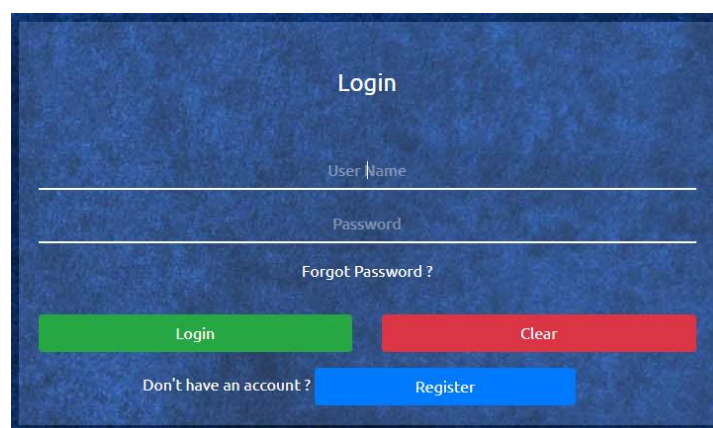


Figure 5.1 - User Login

Figure 5.2 - User Registration

First Page after successfully Login

Administrator, Principal, Teacher or Admin Staff can access this page after successful login. This First Page is not similar for all users. It vary according to the login role. Screenshot of the First Page after successfully Login for different users is shown in below figure 5.3, 5.4 and 5.5.

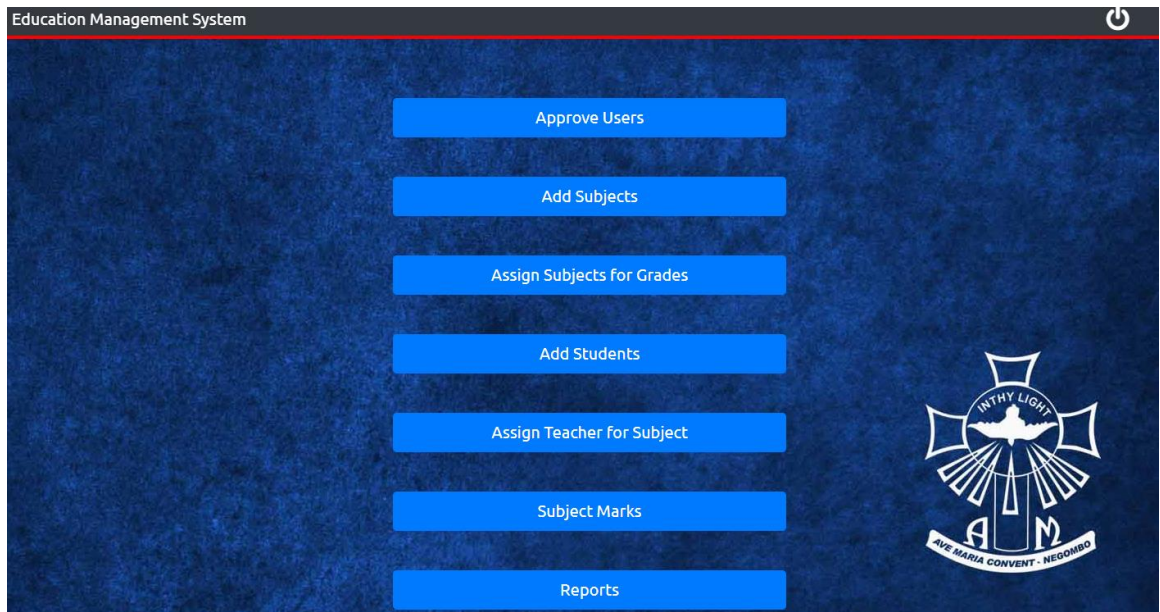


Figure 5.3 - Administrator/Principal view (with "Approve Users")

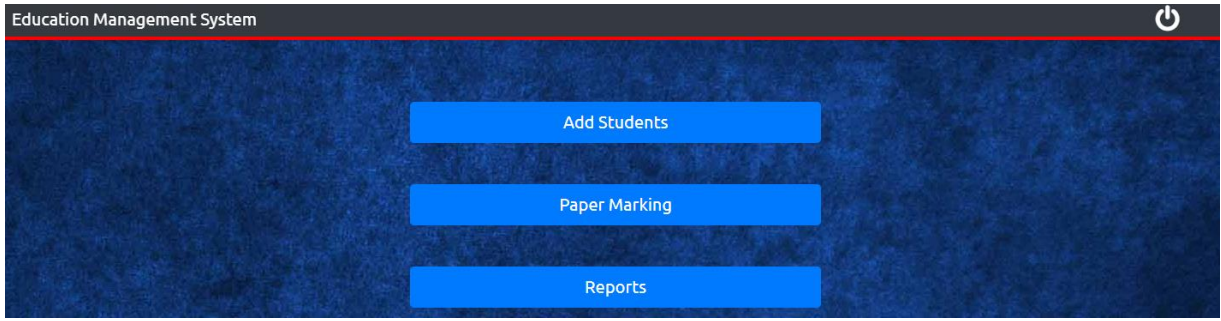


Figure 5.4 - Teacher/ClassTeacher View

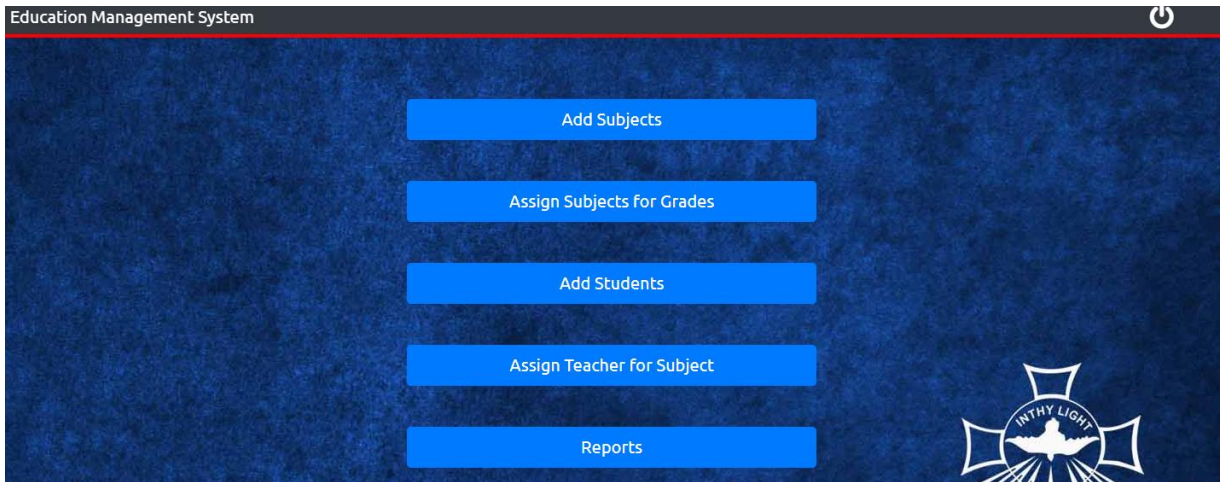


Figure 5.5 - Admin Staff View

Approve Users

This page only appear to Administrator of the system. Administrator can Activate the users or Deactivate users from here. Screenshot of the Page of Approve users is shown in below figure 5.6.

User Access					
Id	Name	Privilege type	User name	Class teacher	Action
14	Principal	Principal	pricipal@gmail.com	No	Activate
13	AdminStaff	Staff	staff@gmail.com	No	Activate
12	ClassTeacher	Teacher	classteacher@gmail.com	Yes (12-A)	Deactivate
11	Teacher	Teacher	teacher@gmail.com	No	Activate

Figure 5.6 - User Access Permission View

Add Subject

This page appear only to Administrator, principal and AdminStaff of the system. User can Type the Subject Name and Mention weather it is “Main” subject or “Optional”. If its optional user can type the subjects of that optional subject Category..(Eg: In Grade 11- Category III optional subjects are - ICT, Health science). All data will appear below Figure 5.7.

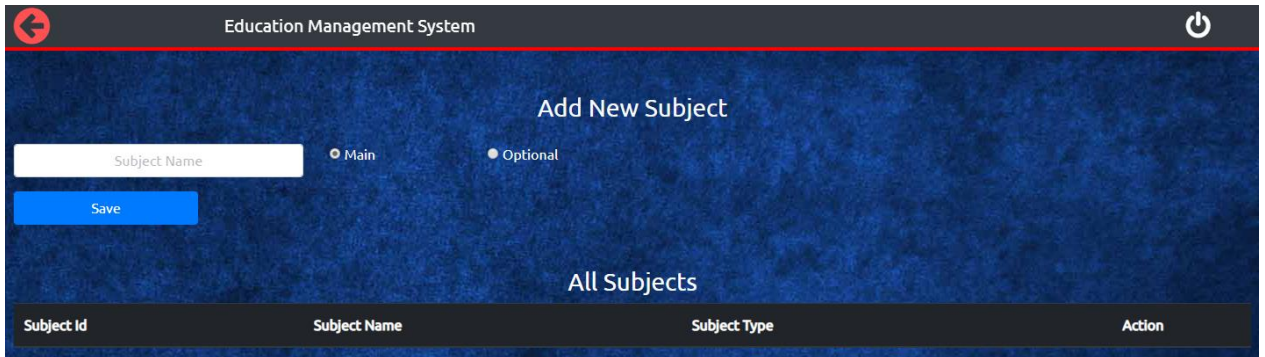


Figure 5.7 - View of Add Subjects for the system

Assign Subjects for Grade

This page appear only to Administrator, principal and AdminStaff of the system. User can select the grade from the dropdown list and can assign subjects for each grade by using check box selection. Screenshot of the assign subjects for grade page is shown in below figure 5.8.

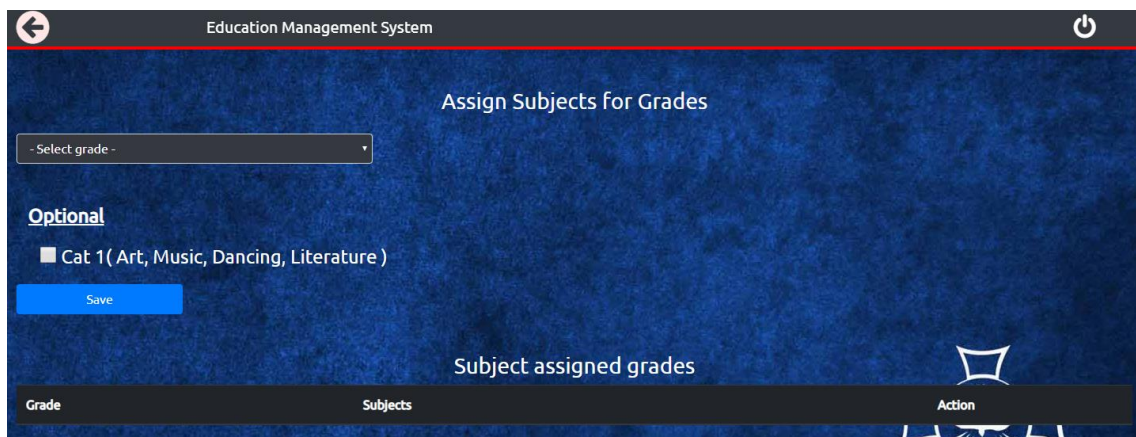


Figure 5.8 - View of Assign Subjects for each Grades

Add Student

This page appear to all users of the system. User can Type Index Number, First Name, Last Name, Contact No (optional), select the class teacher, grade, class from the 3 dropdown lists and then save. Screenshot of the add student page is shown in below figure 5.9.

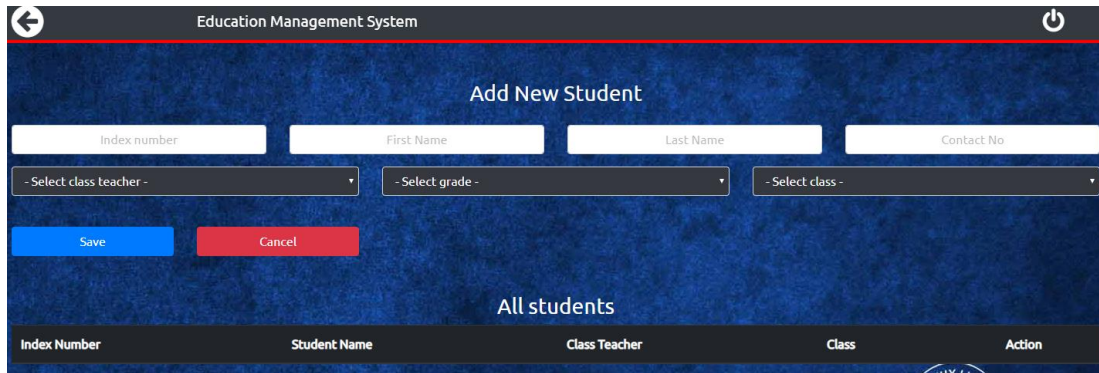


Figure 5.9 - View of Add Students to the system

Assign Teacher for Subject

This page appear only to Administrator, principal and AdminStaff of the system. User can select the class teacher, grade, class and Subject from the four dropdown lists and then save. Screenshot of the assign teacher for subject page is shown in below figure 5.10.

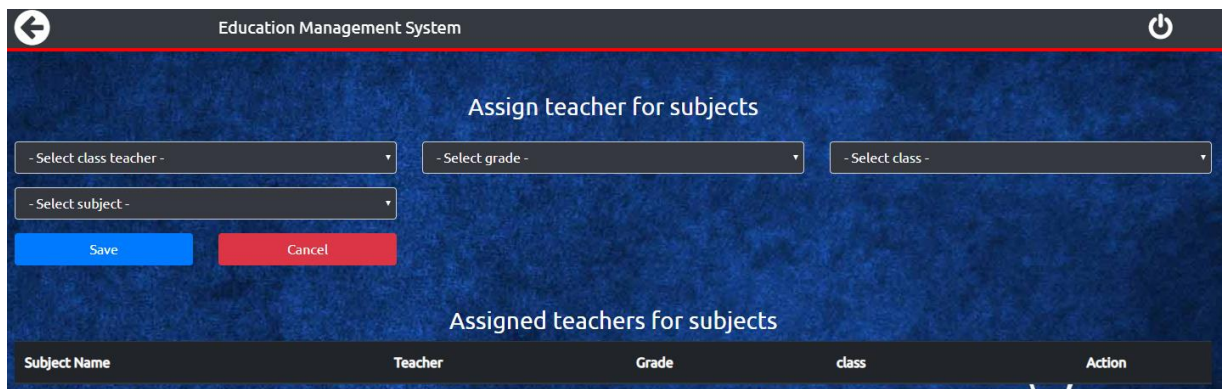


Figure 5.10 - View of Assign Teacher for Subject

Subject Marks

This page appear only to Administrator, principal and Teacher of the system. User can select the Subject, grade, class when press search all students who doing each subject for the selected class will appear. Then teacher can add marks and then click on ✓ mark to save. Screenshot of the subject marks page is shown in below figure 5.11.

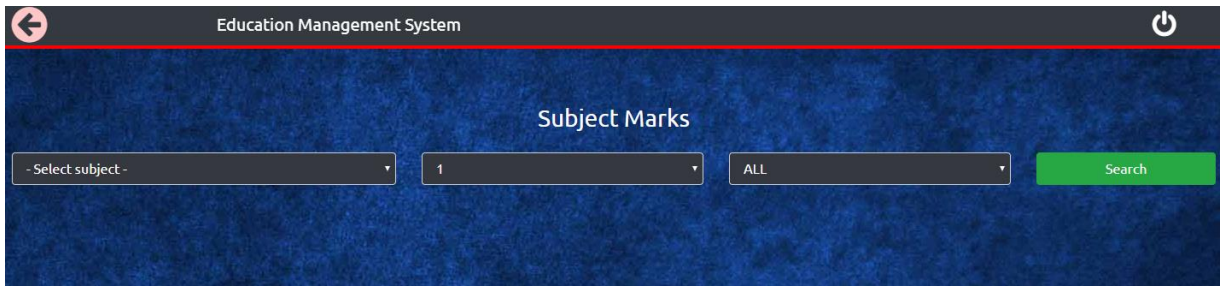


Figure 5.11 - View of Subject Marks adding page

Reports

This page appear to all the users . There have two report types. Namely “Reports for Subjects” and “Reports for Students” . Screenshot of the reports page is shown in below figure 5.12.

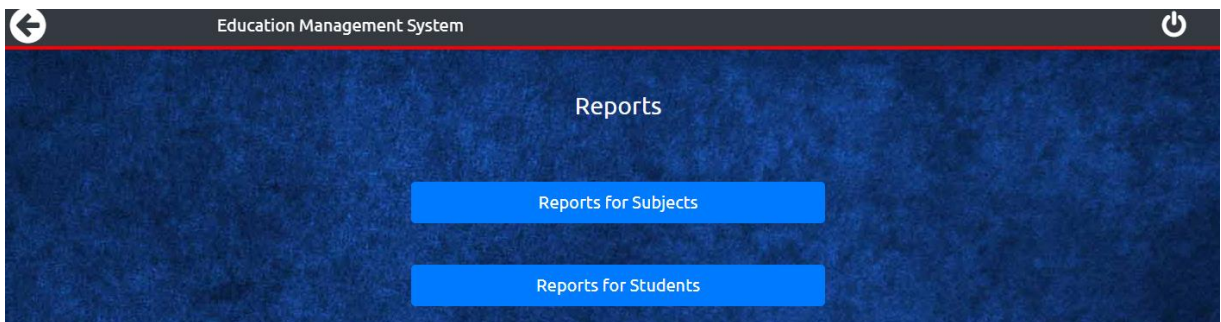


Figure 5.12 - View of Reports Page

(i) Reports for Subject

When your select “Reports for subject” following will appear. When select Subject, Grade and class (or all) it list down the marks according to the subjects in sorted order. This is useful for the admin staff member to find the best students. Screenshot of the Reports for subject page is shown in below figure 5.13.

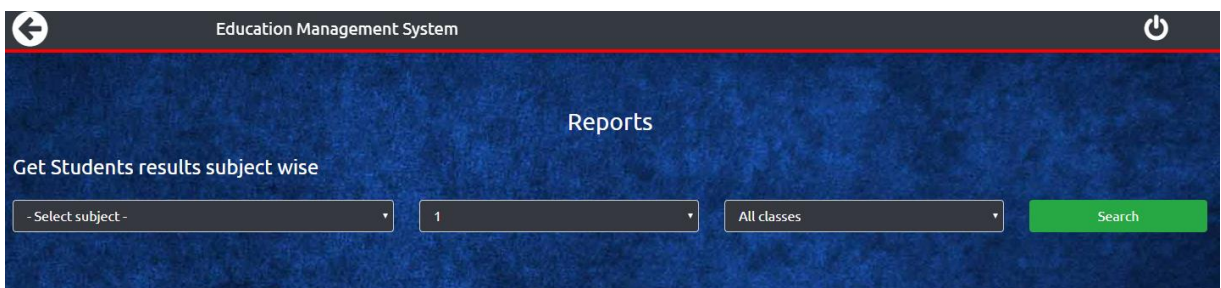


Figure 5.13 - View of Reports for Subject

(ii) Reports for Students

When you select “Reports for students” the following will appear. When you select Grade and class, it lists down all the names of students in the class. When you click on each student, the viewer can see the report card generated and also can get the PDF of it. Screenshot of the reports for students page is shown in below figure 5.14.

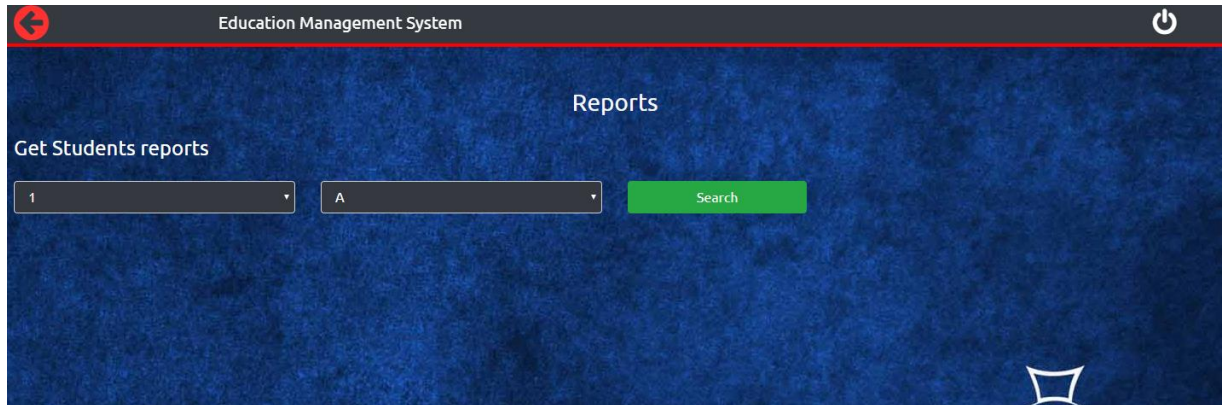


Figure 5.14 - View of Reports for Students

CHAPTER 6 – EVALUATION AND TESTING

6.1 Introduction

This chapter portrays how the system was tested. User interface test, code tests, finding bugs and the solutions to fix the identified bugs. Further describes the test plan and test process, also the expected output and behavior from the test plan.

To evaluate the final system throughout system development life-cycle, better evaluation techniques required. System testing used to check whether system functioning appropriately and to confirm requirements were satisfied to not.

Software testing is a process of executing a program or system for finding errors. It involves some activity that determining system meets its required results. Software bugs will almost always exist in any software application.

6.2 Unit Testing

Unit testing is a method by which the source code of the different units is tested to determine if they are fit for use. When each sub systems were completed, unit testing done by the developer. After completion of each module of the system, unit testing was done to each module to identify the bugs before integrate it as whole. Unit testing is done while implementing the system.

Eg: *Test Logon Module*

- Username and password provided to log into the system
- Inserted username and password miss matched or wrong username and password provided error message displayed.

6.3 System Testing

Purpose of system testing is to prove that the software meets the specific user requirements and works in the target environment. This covers both functional and non-functional requirements.

6.4 Regression Testing

After fixed the recently happened errors new errors can be happen. Therefore, it is required to test the repeating a subset of previous tests to ensure that any change has not introduce any new errors.

6.5 Acceptance Testing

This is a process where system test for acceptability. The purpose of this test is to evaluate the system's compliance with the business requirements and assess whether it is acceptable for delivery.

6.6 Test Plan

User Registration and Login

User enrollment process is significant procedure in this system. All users should enter a valid email address and can register with the system. Various test cases had been used to test the procedure and a generalized test plan is shown below table 6.1, 6.2 and 6.3.

No	Test case data	Purpose	Output	Success
01	Click "Login" button without inserting any field.	To validate empty filed in login page	Show error message "Invalid User name / password"	Yes
02	Insert password value and skip user name value and click submit.	To test login without user name	Show error message "Invalid User name / password"	Yes
03	Insert user name value and skip password value and click submit.	To test login without password	Show error message "Invalid User name / password"	Yes
04	Insert correct user name and incorrect password value and click submit.	To test log in with invalid password	Show error message "Invalid User name / password"	Yes
05	Insert incorrect user name and correct password value and click submit.	To test log-in with invalid user name	Show error message "Invalid User name / password"	Yes

06	Before Admin or Principal activate the user. User try to login using the registered details	To check whether system able to prevent unauthorized access	Show “Educational Management” page (teacherHome.php)	Yes
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Table 6.1 - Test Case for User Registration and Login function

Add subjects

No	Test case data	Expected Results	Success
01	Click Add Subject	Directed to the Add New Subject Page	Yes
02	Type Subject Name, Select Main and click save	“Subject Successfully Added” or “Subject is Already Exist”	Yes
03	Type Subject Name, Select Optional, Then add subjects and click on Save	“Subject Successfully Added” or “Subject Already Exist”	Yes

Table 6.2 - Test Plan for “Add Subjects” to the system

Add Students

No	Test case data	Expected Results	Success
01	Type Index, First Name, Last Name, Contact No	IF not assigned subjects “Please assign subjects for this grade”	Yes
02	Type Index, First Name, Last Name, Contact No	If subjects assigned already “Student Added Successfully”	Yes
03	Type Contact number wrong	“Wrong Contact pattern ”	Yes

Table 6.3 - Test Plan for Add Students for the system

6.7 User Evaluation

User acceptance testing (UAT) is the most essential to get right. If the system implemented correctly it reduces time and cost while increasing user satisfaction. It is pointless if the developed system does not perform according to the end user expects.

To test the user acceptance provides facility to use the system for the Principal, Teacher and Admin Staff who are interested with the Online School Exam Results Analysis System for Ave Maria Convent – Negombo (OSERAS). Then provide following questionnaire (Figure 6.1) to get end user expects.

<p>Online School Exam Results Analysis System for Ave Maria Convent – Negombo (OSERAS)</p> <p style="text-align: center;"><u>User Evaluation Form</u></p> <p>Name :(not compulsory)</p> <p>Designation:</p> <p><i>In the Scale of 1 – 5, Please tick the best option for the following questions. (5=Excellent, 4=Good, 3=Average, 2=Poor, 1=Very Poor)</i></p> <p>1. Do you agree the developed web based system would beneficial your evaluation process? <input type="checkbox"/> Very Poor <input type="checkbox"/> Poor <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent</p> <p>2. Do you agree that Developed system is user-friendly? <input type="checkbox"/> Very Poor <input type="checkbox"/> Poor <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent</p> <p>3. Is there consistency in the theme used on this system? <input type="checkbox"/> Very Poor <input type="checkbox"/> Poor <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent</p> <p>4. Has the system satisfied your requirements of school environment? <input type="checkbox"/> Very Poor <input type="checkbox"/> Poor <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent</p> <p>5. Do you think this new OSERAS system is superior to existing manual technique you currently use? <input type="checkbox"/> Very Poor <input type="checkbox"/> Poor <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent</p> <p>6. Do you think that system can learn quickly? <input type="checkbox"/> Very Poor <input type="checkbox"/> Poor <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent</p> <p>7. Do you experience any difficulty while utilizing the system? <input type="checkbox"/> Very Poor <input type="checkbox"/> Poor <input type="checkbox"/> Good <input type="checkbox"/> Very Good <input type="checkbox"/> Excellent</p> <p>8. Kindly recommended any improvement(s) for this system</p> <div style="border: 1px solid black; height: 60px; width: 100%; margin-top: 10px;"></div>

Figure 6.1 - User Evaluation Form

User answers evaluation shows an overview of how client is happy with the system. As per the above survey every user mentioned their feedback. The poll has given to 1 Principal 20 teachers and 3 Admin Staff Members. From the statistics of the questionnaire following figure 6.2 was created.

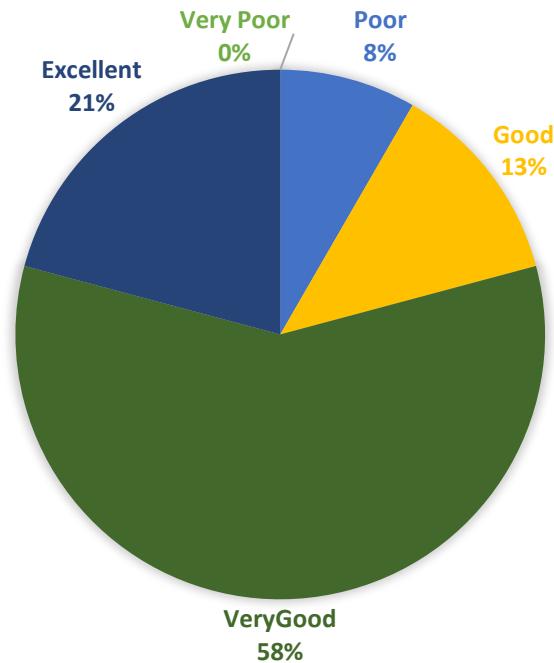


Figure 6.2 - User Satisfaction towards the system OSERAS

58% percent of the users commented that the created system is very acceptable, 13% of them said that the system is good and 21% of them said system is excellent. All though 92% of users satisfied with the developed system, 8% of them were not satisfied with the system. The behind reason was 8% of them do not like to go for the new system, they are preferred to work on the manual process.

Analyzed responses for above questions is in Appendix D.

6.8 Conclusion

According to the user evaluation following favourable circumstances and weaknesses of the OSERAS system has identified.

Favourable circumstances of OSERAS:

- Simple access and easy to follow.
- Easy to use
- User Interfaces are basic.
- User can easily enter data and generate reports easily.

Weaknesses of OSERAS:

- Information backup and re-establish is not available.
- Need more reports.
- No function to upgrade classes of students every year starts.

CHAPTER 7 – CONCLUSION AND FUTURE WORK

7.1 Introduction

This last chapter discuss about the objectives archived and the future encasements of the developed system. The project is to provide an online system for the teachers and for the clerical/administrative staff to analyze students' marks and help them to view final report online with the results analysis. The system was built using these following technologies HTML, CSS, PHP and JavaScript.

7.2 Problems Encountered

From the earliest starting point catching the right prerequisites was troublesome as a result of the lack of IT information on certain teachers. There are progressively unique subject classes in Advanced Level Section in this manner the system examination and configuration was postponed. So time expected to relegate for investigation grow than planed time.

Some major requirements were changed while developing the system and also database structure was changed according to changed requirements. Hence required to re modify code segments of those specific parts which consumed lot of time.

Other serious issue which experienced during the advancement procedure is the lack of knowledge regarding the developing software tools and languages. Online tutorial exercises and books were utilized to catch the fundamental degree of information.

7.3 Lessons Learned

Gained knowledge and got great experience while building up the system. From the need assembling stage to the end, everything learned was very useful to work up a successful system. Applying theory to practice is hard sometimes. Gained knowledge about how to utilize new programming dialects (PHP, HTML, CSS, and JavaScript), structure designs, to utilize a system, and how to use bootstrap layouts to create User Interfaces.

Learnt how to documentation a thesis also really an important thing. Therefore, lots of self-learning was carried out throughout this process.

Manage time according to the project schedule and according to the guidelines was really crucial. With the lack of web developing language knowledge had to learn new techniques within the given time frame. It was a challenge to complete the system development with this kind of situation. Therefore, author had to put extra effort into developed system successfully.

7.4 Conclusion

Developed OSERAS system is easy to use and user friendly system which any new person can easily understand. Achieved objectives are:

- Website for adding students details, grades, subjects and marks.
- All the registered and permission granted users can login using website.
- Teachers/Admin staff can generate report easily.

Future enhancements

There are some functions can be introducing to the system to enrich the system functionalities, such as,

- Add effective charts in report generation module to support Administration in decision making.
- Module to view previous grades term marks and reports.
- Module for parents to view their children results by login to system.
- New feature to add Assignments marks for each term because assignments marks is an essential part in G.C.E.(o/l) and (a/l) examinations.
- RFID or Barcode system to add students details to the system
- Connects library and fees office functions together as students records already added to this OSERAS.

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- [8] "PHP," [Online]. Available: <https://www.php.net/>. [Accessed 8 May 2020].

Appendix A – System Documentation

Title : Online School Exam Results Analysis System for Ave Maria Convent – Negombo(OSERAS)

Date : 15.05.2020

Version : 1.0

System : Open source Web Application

This documentation contains technical information to configure the system and support system administrators, Teachers or Admin Staff who involve in further system.

Hardware Configuration

- Intel Core i5 Processor
- 4GB RAM
- 64-Bit Operating System
- 250GB Hard Disk Drive
- Monitor 1366 X 768

Software Configuration

- XAMPP (Apache, PHP, MySQL)
- IE6+ or any other web browser

Configuration

XAMPP is open source freely available software bundle which contains Apache, MySQL, PHP. Using XAMPP can configure the system locally with web server and database. XAMPP can install on Windows, Linux or Mac Operating system.

Steps to configure the system

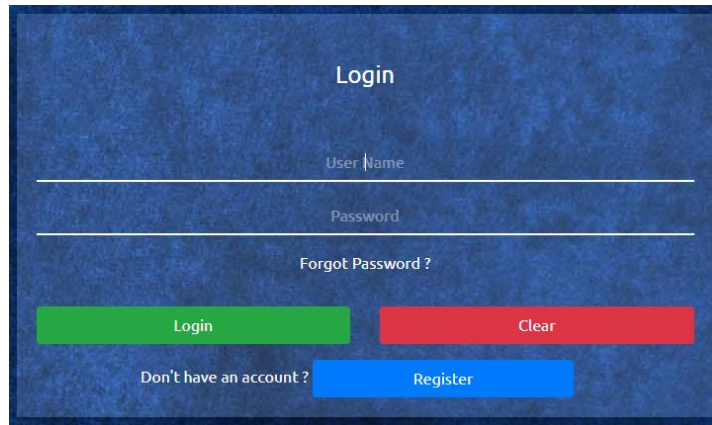
1. Download and install XAMPP software
2. Start the XAMPP server
3. Copy all the project files into XAMPP Server host folder located in C:/xampp/htdocs
4. Go to the web browser and type “localhost/phpmyadmin” and import the database file to restore database.
5. Type following URL on web browser to view the OSERAS website

<http://localhost/amc>

Appendix B – User Documentation

Administrator can log into the system and grant permissions to other users on the website.

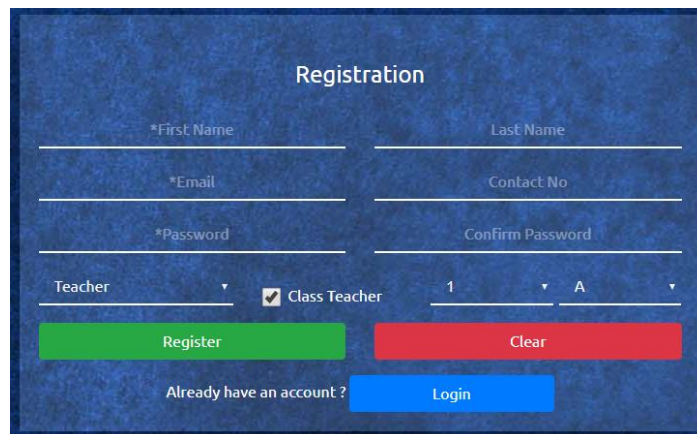
First View of the OSERAS. Every user must register first to log into the system



The screenshot shows a login form titled "Login" on a dark blue background. It features two input fields: "User Name" and "Password". Below the password field is a link for "Forgot Password?". At the bottom, there are three buttons: a green "Login" button, a red "Clear" button, and a blue "Register" button. A link "Don't have an account?" is positioned to the left of the "Register" button.

Figure B 1 - Login View

When registering user must enter first name, email address and Password. Last name and contact number is optional. Then select weather the user is a Principal, Teacher or Admin Staff from the drop down list. If the user is a class teacher of the school user must select the check box and select the grade and class he/she assigned to. Then click on Register Button to Register.



The screenshot shows a registration form titled "Registration" on a dark blue background. It includes several input fields: "*First Name", "Last Name", "*Email", "Contact No", "*Password", and "Confirm Password". Below these fields are dropdown menus for "Teacher" (with a value of "1") and "A". There is a checked checkbox for "Class Teacher". At the bottom, there are three buttons: a green "Register" button, a red "Clear" button, and a blue "Login" button. A link "Already have an account?" is positioned to the left of the "Login" button.

Figure B 2 - Registration View

Even though the user registered users cannot log into the system until the Administrator Activate (Grant Permission) the accounts.

Education Management System					
User Access					
Id	Name	Privilege type	User name	Class teacher	Action
14	Principal	Principal	pricipal@gmail.com	No	Activate
13	AdminStaff	Staff	staff@gmail.com	No	Activate
12	ClassTeacher	Teacher	classteacher@gmail.com	Yes (12-A)	Deactivate
11	Teacher	Teacher	teacher@gmail.com	No	Activate

Figure B 3 - Permission Grant View

Before granting permission if someone who already registered try to log into the system the system shows the following.

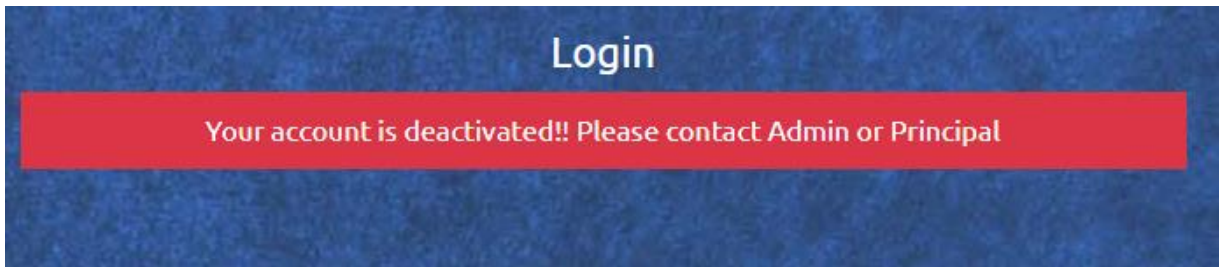


Figure B 4- Error Message

First Page after logging in for Administrator and Principal. Principal also should activate by administrator before using this page.

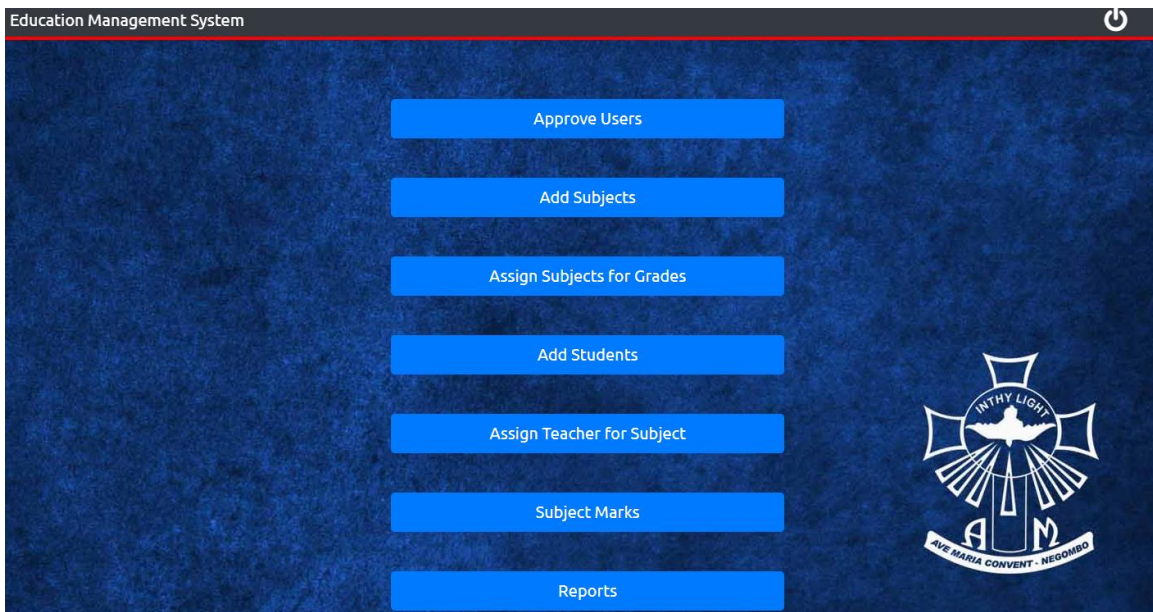


Figure B 5 - Administrator and Principal View

First Page after logging in for Admin Staff

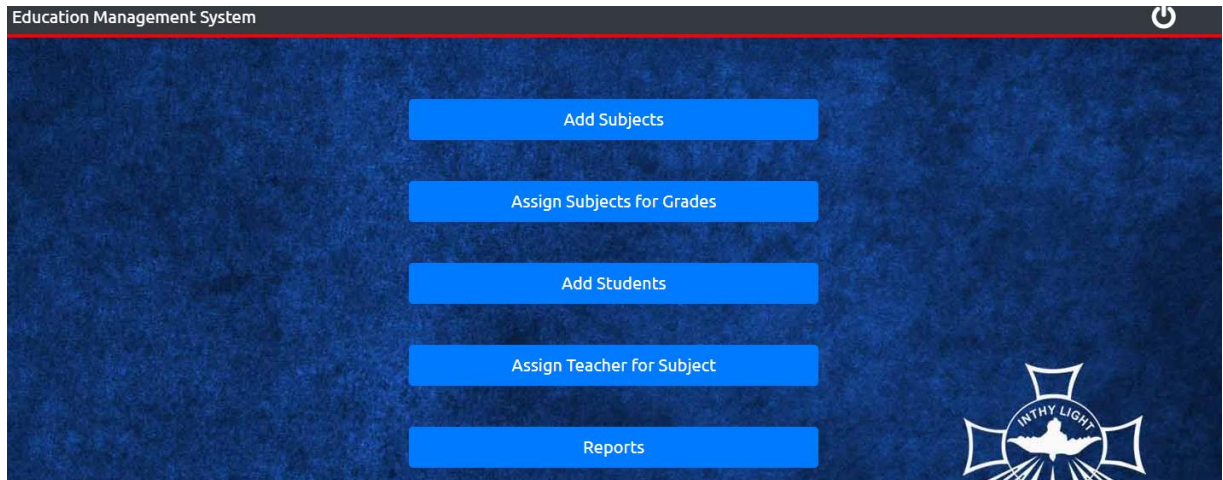


Figure B 6 - View of First Page after logging in for Admin Staff

First Page after logging in for Teachers

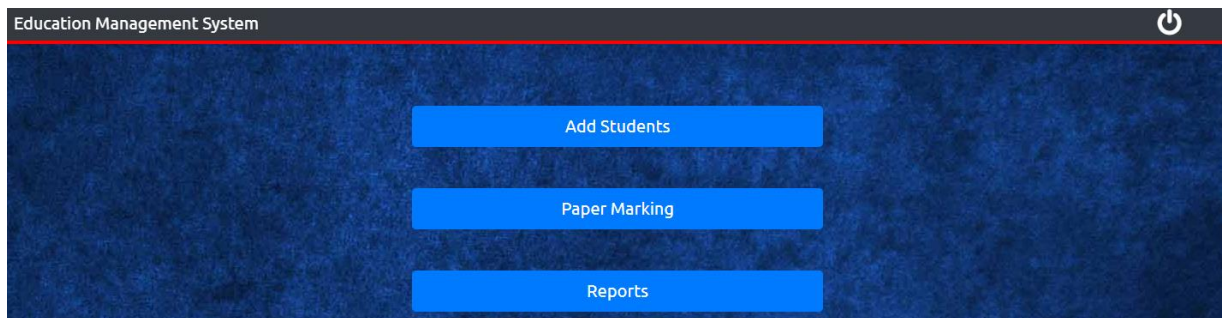


Figure B 7 - View of First Page after logging in for Teachers

First Admin Staff should Add Subjects to the system. Type the subject Name and select whether it is a main subject or optional. If it's a Main subject should select Main option button. But if its category subject under "subject name" Type the Category (eg:Cat 1) and then type subjects at the right side after selecting optional option button. There are more subjects than two click on Add button to add another subject name. Then click on Save.

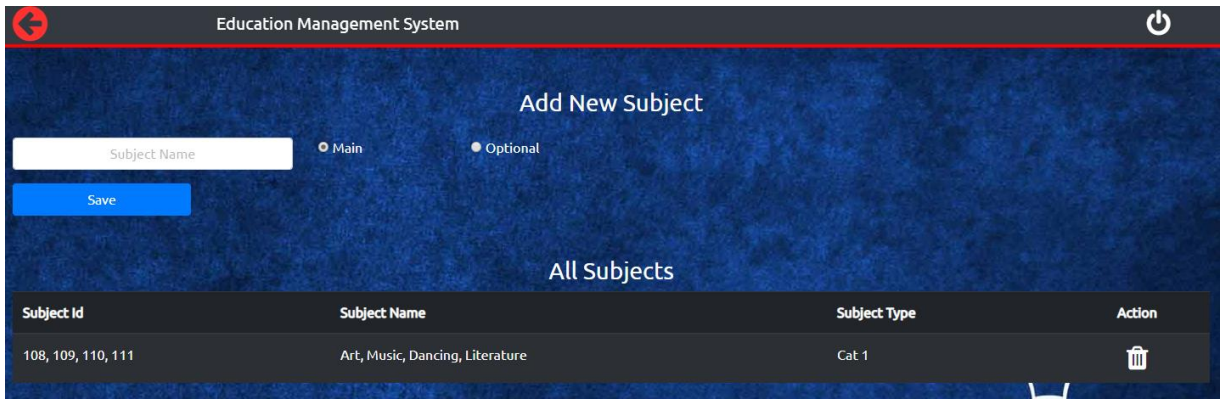


Figure B 8 - View of Add New Subject (Main)

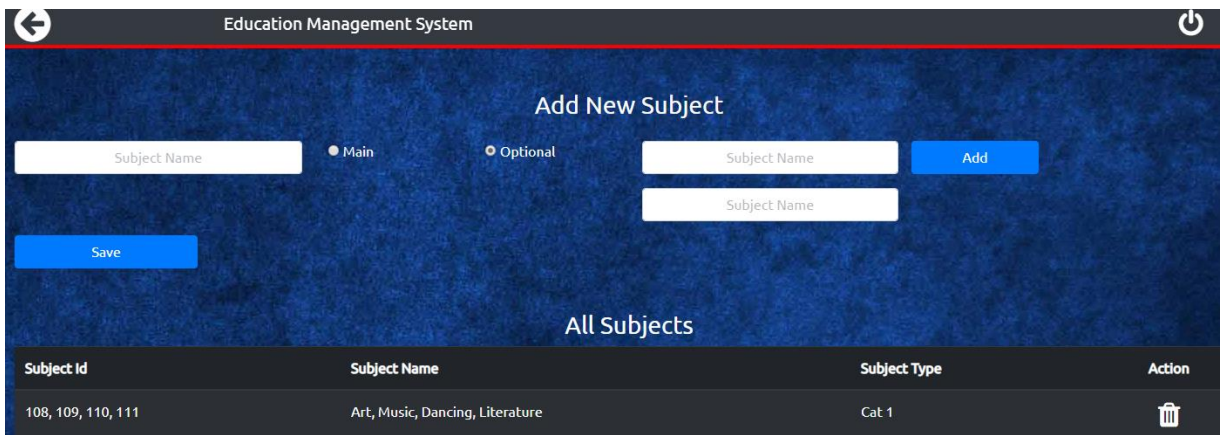


Figure B 9 - View of Add New Subject (Optional)

After adding subjects. Admin Staff should assign subjects for each grades according to the government curriculum.

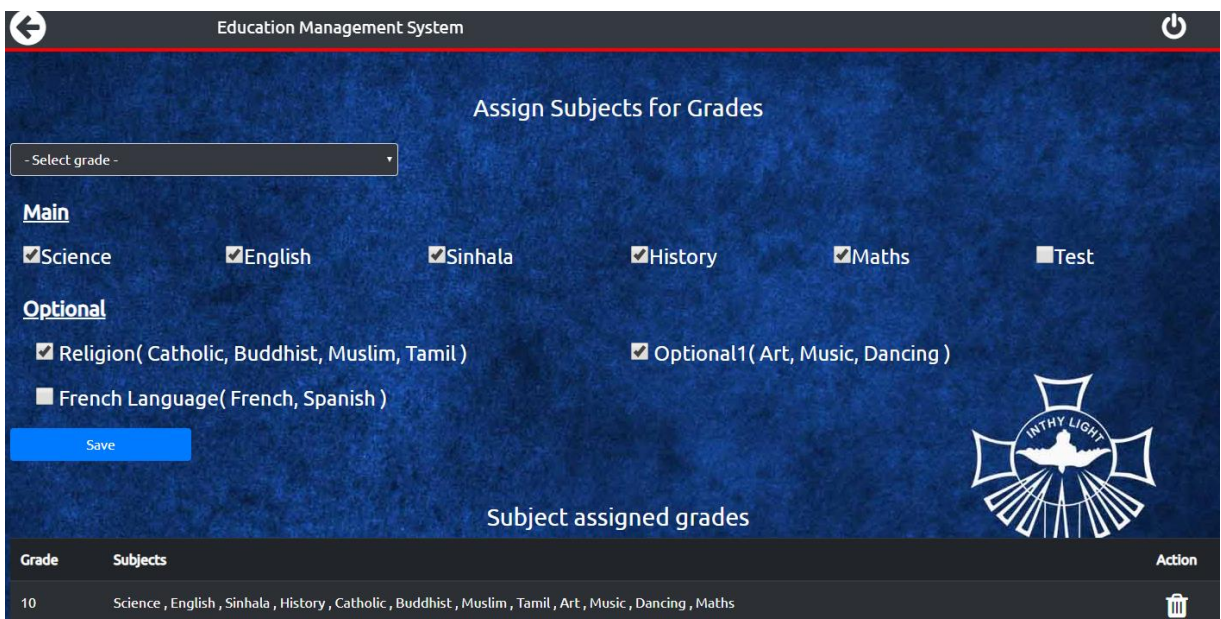


Figure B 10 - View of Add Subject for Grade

Adding Students to system. All the registered users can add students to the system. Type index Number, FirstName, Last Name, Contact Number. Then Select Class Teacher from the drop down list. Then Select the class of the student and class letter from next two dialog boxes. When select grade it shows the relevant subjects assigned for each Grades. Select main subjects and select optional subjects the students should follow. Then click Save button.

Index Number	Student Name	Class Teacher	Class	Action
5430	Thenishi Ekanayake	class Teacher	11 - E	

Figure B 11 - View of Add New Students

Then Admin Staff should assign teachers for relevant subjects. For each grades and classes

Subject Name	Teacher	Grade	class	Action
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Figure B 12 - View of Assign Teacher for Subject

Principal and Teachers can add subject marks from the use of “Subject Marks”. Select Subject, Grade and class then click search. Then all the students who belongs to that class who is doing the selected subject will appear. User should enter marks and click on tick mark to save.

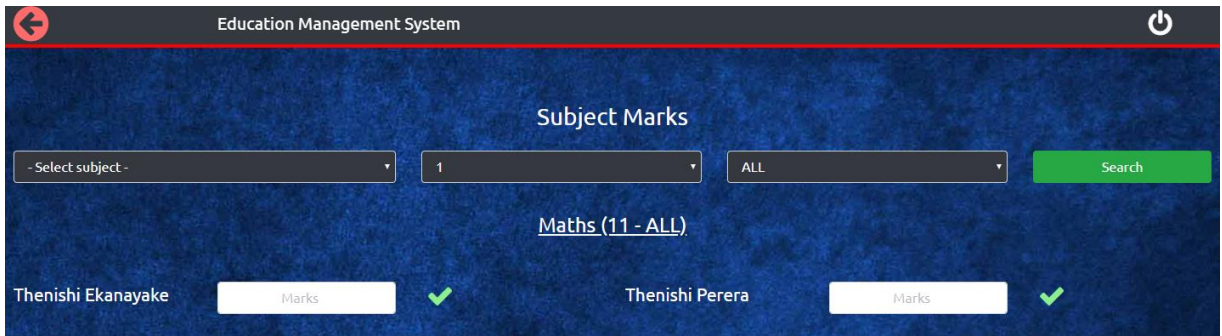


Figure B 13 - View of Add Marks

In reports. “Reports for Students” is to get the report card and position list of each class. For that user must select the Grade and class and press Search button.

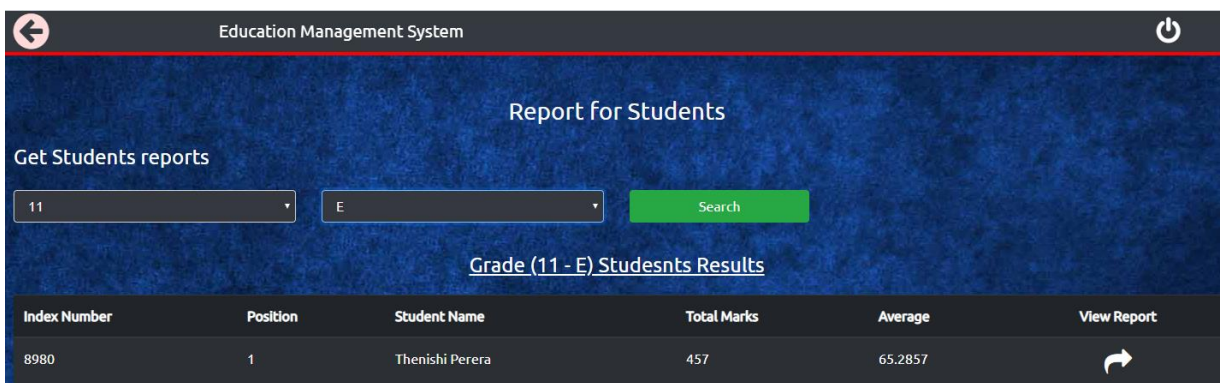


Figure B 14 - View of Report (for Student)

If need to view each students report click on the right arrow under “view Report” there user can create PDF file for selected student.

Education Management System

Results Details

Index Number : 8980
 Student Name : Thenishi Perera
 Class Teacher Name : class Teacher
 Class : 11 - E
 Position : 1
 Total of Marks : 457
 Average : 65.2857
 Subject Results >>

Subject Name	Result
Science	45
English	23
Sinhala	78
History	56
Catholic	90
Art	87
Maths	78

Create PDF

Figure B 15 - View of each students' report

In reports. “Report for subjects” is to get the Subject marks for all students in each grades or each classes. This report will help to the Admin Staff to find the highest marks holders in each grades. For this user should select the subject, Grade and class(or all) and then click search button.

Education Management System

Report for subjects

Get Students results subject wise

Maths 11 All classes Search

[Maths \(11 - ALL\)](#)

Index Number	Position	Student Name	Marks	Class
8980	1	Thenishi Perera	78	11 - E
5430	2	Thenishi Ekanayake	56	11 - E

Figure B 16 View of report (for Subjects - Helpful for Admin Staff)

Appendix C – Questionnaire

QT 01 : Interview Questionnaire on Online School Exam Results Analysis System for Ave Maria Convent – Negombo (OSERAS)

(The data gathered through this interview would be used exclusively for the purpose of academic research only)

For Teachers

1. How long will it take to complete entire school reports making process at the end of each term?
2. What is the method you use to calculate totals, averages (eg: calculator)?
3. Will you get help from students to the report making process?
4. What are the advantages of the manual process you use now?
5. What are the drawbacks of the manual process you use now?
6. Do you use any extra technology to the process of making report cards?
7. Do you wish to use a new system for the report making process?

For Admin Staff

1. How long will it take to find the best achievers for each grades and for each subjects?
2. What is the method you use to find the highest marks achieved by children in a particular Grade?
3. How do you get confirmation of the correctness of each selected students for Annual Prize giving?
4. Will you get help from students to the process of finding the best achievers for each year?
5. What are the advantages of the manual process you use now?
6. What are the drawbacks of the manual process you use now?
7. Do you use any extra technology to the process of finding the best students?
8. Do you wish to use a new system for the process of selecting best achievers?

QT 02 : Questionnaire on Online School Exam Results Analysis System for Ave Maria Convent – Negombo (OSERAS)

(The data gathered through this interview would be used exclusively for the purpose of academic research only)

Please put a tick on the given boxes

1. What is your roll in school?

- Principal
- Vice Principal
- Class Teacher
- Only Subject Teacher
- Admin Staff

2. When do you complete the process of making report cards/finding best achievers?

- In school teaching Time
- Free periods
- Interval
- After school
- At home

3. Do you use any system to handle the process of making report cards/finding best achievers??

- Yes
- No

4. How do you collect the subject marks for the grading process?

- From each subject teacher
- From subjects papers with the help of a student
- Verbally (by a call)
- Ask from children
- Marks Book

5. If there is any mistakes of marks of any subject how you correct it?

- Do the process manually again
- Use excel sheet or any other software
- Not correct it
- Change again the all workings and give new printouts
- Only correct the mark book

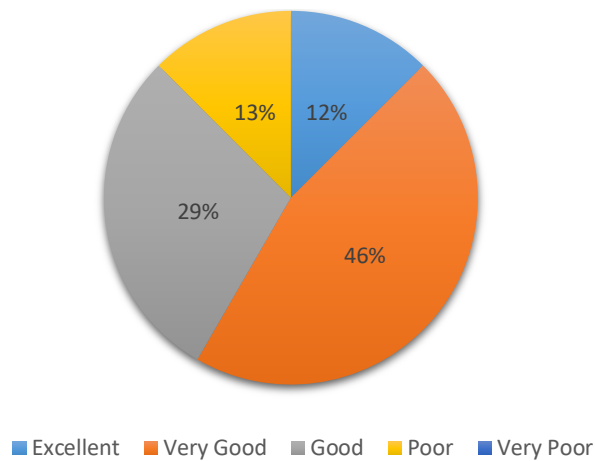
Appendix D – User Evaluation

Once analyzed the given answers of each question, identified the following results.

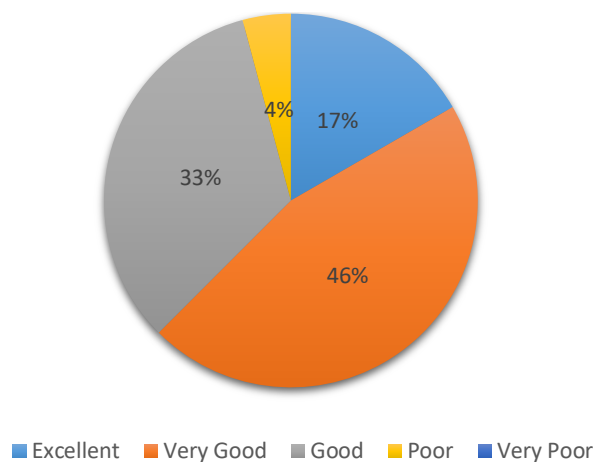
	<i>Question 1</i>	<i>Question 2</i>	<i>Question 3</i>	<i>Question 4</i>	<i>Question 5</i>	<i>Question 6</i>	<i>Question 7</i>
Excellent	3	4	2	6	3	2	2
Very Good	11	11	9	9	7	3	7
Good	7	8	10	7	9	7	8
Poor	3	1	3	2	5	2	6
Very Poor	0	0	0	0	0	0	1

Table D-1 User Feedback

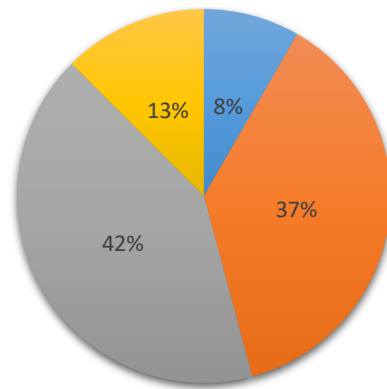
1. Do you agree the developed web based system would beneficial your evaluation process?



2. Do you agree that Developed system is user-friendly?

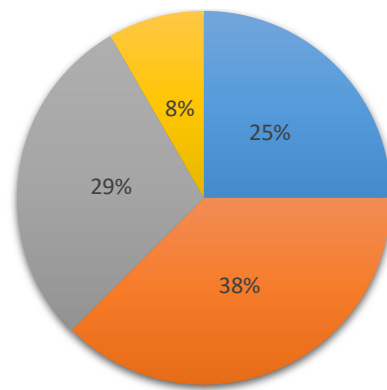


3. Is there consistency in the theme used on this system?



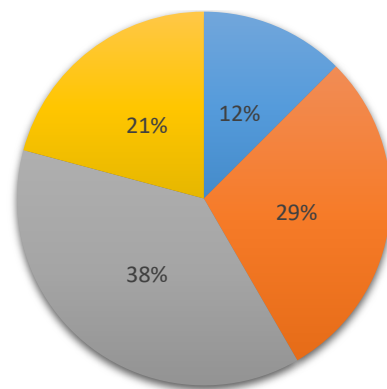
■ Excellent ■ Very Good ■ Good ■ Poor ■ Very Poor

4. Has the system satisfied your requirements of school environment?



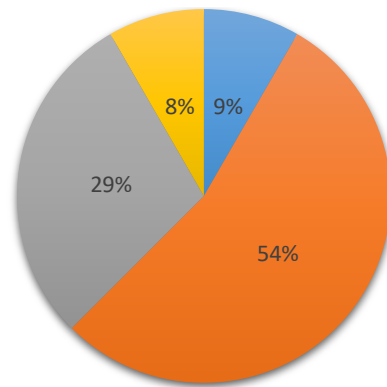
■ Excellent ■ Very Good ■ Good ■ Poor ■ Very Poor

5. Do you think this system is better than existing manual method?



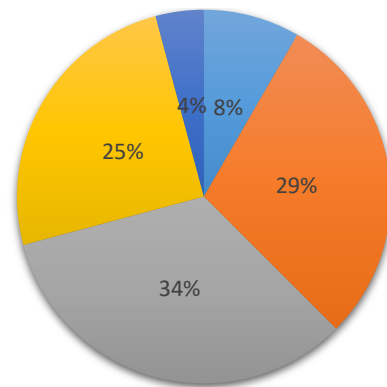
■ Excellent ■ Very Good ■ Good ■ Poor ■ Very Poor

6. Do you think that system can learn quickly?



■ Excellent ■ Very Good ■ Good ■ Poor ■ Very Poor

7. Do you encounter any difficulty while using the system?



■ Excellent ■ Very Good ■ Good ■ Poor ■ Very Poor