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## **E-School – School Management System**

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## **Abstract**

E-School (SMS) is a web enabled application developed in PHP and powerful MYSQL database backend. To implement E-School, schools do not require expensive hardware and software, all schools need is internet connection and desktops. Our system works as a centralized database and application that schools can easily access the system from anywhere based on the login credentials. E-School is a platform independent system that virtually any user can access from anywhere through a standard internet accessible system. We can also customize E-School for individual school needs.

**Administrators:** School Management System helps administrators get the most accurate information to make more effective decisions. Teachers and administrators gain time saving administrative tools, parents gain immediate access to their children's grades and students can track their own progress. School Management System equipped features makes it possible to generate schedules and reports in minutes and to retrieve attendance records, grade checks, report cards, transcripts, and form letters in just a few clicks. **Teachers:** School Management Systems helps Teachers to complete grade book, track students attendance, input class notes, create lesson plans and detailed reports. Communicate with other staff members, students, and parents all via e-mail. **Students:** School Management Systems helps Students to access assignments and tests. View attendance records, grades, report cards, and progress reports all online. Students also can communicate through mail and forums with teachers and students online.

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## **List of Abbreviations and Glossaries**

<b>SSI's</b>	Server Side Includes
<b>HTML</b>	Hyper Text Markup Language
<b>PHP</b>	PHP: Hypertext Preprocessor
<b>SQL</b>	Structured Query Language
<b>SDLC</b>	Software Development Life Cycle
<b>SMS</b>	School Management System



# **Chapter 1**

# **INTRODUCTION**

## **1.1 Background**

When you ask the school to enter the electronic world in which he asked to electronic advantages make you processions electronic era which has become all the world is in it and that makes you continuously with students and teachers quickly Here you require a Website so that this site covers the needs of teachers and students at one time so that it is Students special site where watching the monthly marks obtained at the school and also can request permission in the case not to go to school and that teacher who can put signs and writes reports on each student activity, duties and violin can be to the director of the school that is watching all the students and teachers in terms of absence and attendance and also can see that all the observations and monitors all complaints and reports and so in a short time and quickly. Hence we can say that this site facilitates all administrative tasks within and outside the school with ease.

Web pages will often require more screen space than is available for a particular display resolution. Most modern browsers will place a scrollbar (a sliding tool at the side of the screen that allows the user to move the page up or down, or side-to-side) in the window to allow the user to see all content. Scrolling horizontally is less prevalent than vertical scrolling, not only because such pages often do not print properly, but because it inconveniences the user more so than vertical scrolling would (because lines are horizontal; scrolling back and forth for every line is much more inconvenient than scrolling after reading a whole screen; also most computer keyboards have page up and down keys, and many computer mice have vertical scroll wheels, but the horizontal scrolling equivalents are rare). When web pages are stored in a common directory of a web server, they become a website.

A website will typically contain a group of web pages that are linked together, or have some other coherent method of navigation. The most important web page to have on a website is the index page. Depending on the web server settings, this index page can have many different names, but the most common is index.html. When a browser visits the homepage for a website, or any URL pointing to a directory rather than a specific file, the web server will serve the index page to the requesting browser. If no index page is defined in the configuration, or no such file exists on the server, either an error or directory listing will be served to the browser. A web page can either be a single HTML file, or made up of several HTML files using frames or Server Side Includes (SSIs).

Frames have been known to cause problems with web accessibility, copyright, navigation, printing and search engine rankings, and are now less often used than they were in the 1990s. Both frames and SSIs allow certain content which appears on many pages, such as page navigation or page headers, to be repeated without duplicating the HTML in many files. Frames and the W3C recommended alternative of 2000, the <object> tag, also allow some content to remain in one place while other content can be scrolled using conventional scrollbars. Modern CSS and JavaScript client-side techniques can also achieve all of these goals and more.

When creating a web page, it is important to ensure it conforms to the World Wide Web Consortium (W3C) standards for HTML, CSS and other standards. The W3C standards are in place to ensure all browsers which conform to their standards can display identical content without any special consideration for proprietary rendering techniques. A properly coded web page is going to be accessible to many different browsers old and new alike, display resolutions, as well as those users with audio or visual impairments.

Usually, Web pages today have become more dynamic. Web pages are dynamic, which is generated from the server-side when asked to do so, and then serve the end user. These types of web pages usually do not have a fixed link, or a fixed address, associated. Today, it can be seen in many popular forums, and online shopping, even on Wikipedia. This practice is designed to reduce the amount of static pages instead of storage with associated information in the database pages. Some search engines may have difficulty in indexing web pages and dynamic web pages, so it can offer static pages in those cases

## 1.2 Problem Statement

The problem currently facing many schools is the management of courses. Here, the teacher does not properly handle their workload, and sometimes the courses are not offered on time. The number of students who must study the course is not followed. The main problem is to managing the teachers work and courses scheduling.

Also, in the school the student cannot know the marks that the student get it on the exam, but when the student goes to school and also, the teacher cannot be assured that the student has a sign seen by the parent and guardian also cannot, to know his son's performance in school, but he must go to school and ask for it.

## 1.3 Objectives

### Main Objective:

- Build a web site that support mobile working to manage the different school activities.

### Sub Objective:

- Track student schedules.
- Hold records of the student's attendance.
- Managing student health records.
- Enrolling new students.
- Help parents to follow up to his son's performance in school.
- Help the teacher to facilitate access to parents and introduce them to the extent of deficiencies at the student process.

## **1.4 Importance of the Project**

The school as institution to provide students, children and young person's to science and education, and is a building where students learn reading, writing, mathematics, science and various other studies, what are the features of the school and its goals and where are the various teaching centers? What are the facilities and equipment that requires availability in the school

We must therefore provide students with the electronic knowledge, because the world is with electronic features and became dependent on technology dramatically and through the presence of the Web site of the school makes it easier for students to deal with websites and opens a large field of learning and enter this world full of information and useful things that make it benefit significantly and it also helps to understand the field of development through research and discovery of new information in the materials that can also cultures through the discovery of new methods of learning and teaching methods

In Gaza, the student must have a knowledge of technology and science, which has become the easy way to reach the outside world in order to raise the educational level of the student and also to send a message to all the world that the Palestinian student can keep up with the electronic world quickly despite the wars that are exposed and that he could be scientifically advanced in the world.

## **1.5 Scope and Limitation of the Project**

The Website Design School, to provide an easy way to get the student grades. On the website was chosen PHP programming language in order to be available to him from the ease and durability in this language.

This project is based on any operating system where the programming language is open source which helps to make changes to what it is compatible with any school

This project will be applicable in Gaza strip, then it will involve all Palestine's schools. We will make the testing process in Kamal Edwan School.

## **Chapter 2**

# **LITERATURE REVIEW**

## **2.1 Introduction**

This chapter review and identify concepts and related work about E-School.

## **2.2 E-School, School Management System Strategy**

E-School is a complete school information management solution. Today's schools need to manage more information than ever before. Without a solid internal infrastructure for teachers, administrators and departments to share data, critical school and student information can be lost, or worse leading to a host of problems that can effect of a school's image and endurance. To remain competitive, school needs a simple solution that can run individual function, connect their entire operation, use the web as a key communication tool and simplify day to day operational responsibilities, giving staff more time with students.

E-School automates various scheduling activities of school and optimizes the use of premium resources. Concerned authorities can now easily and seamlessly use the system to create timetables, otherwise a time consuming and tedious task.

### **2.2.1 E-School for Management**

- Single points school management software
- Manage multiple campuses.
- Enable internet front-end for the school.
- Connect with Parents and other stakeholders effectively
- Build and Manage community of parents, teachers and students
- Manages all administrative records with zero redundancy
- Achieve best possible resource optimization
- Automate all operational functions like fees, Attendance, Exam Management.
- Automatic generation and regeneration of timetable with dynamic substitute management.

### **2.2.2 E-School for Teacher**

- Complete attendance automation.
- Complete marks/grade management
- Publish articles for others.
- Interact with parents efficiently and effectively.
- View analytical reports
- Email and Internal messaging system.
- Participate in forum and share knowledge with others.
- View own attendance.
- View Timetable in advance.

### **2.2.3 E-School for Student**

- Real time exposure for better learning.
- Publish article to share knowledge, experience and views.
- Participate in forums.
- View online marks and timetable for exams.
- Interaction with other students, teachers and parents.
- Access library Transaction.
- View own attendance.
- View Timetable in advance.
- View current events and holidays at school.

### **2.2.4 E-School for Parent**

- Get latest updates about school through image Gallery, News etc..
- Share knowledge and views with other parents and school through various features like article and forums.
- Get connected with schools effectively and easily
- Interact with teachers through internal messaging system.
- know status about her child through attendance, marks, fees etc ...

## **2.3 Technologies used on E-School**

**HTML:** is the standard markup language used to create web pages. Web browsers can read HTML files and render them into visible or audible web pages. HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items.

**CSS:** is a Web page derived from multiple sources with a defined order of precedence where the definitions of any style element conflict. The Cascading Style Sheet, level 1 recommendation from the World Wide Web Consortium (W3C), which is implemented in the latest versions of the Netscape and Microsoft Web browsers, specifies the possible style sheets or statements that may determine how a given element is presented in a Web page. And describes how HTML elements are to be displayed on screen, paper, or in other media.

**PHP:** is an open source server-side language which is used for creating dynamic web pages. It can be embedded into HTML. PHP is usually used in conjunction with a MySQL database on Linux/UNIX web servers. It is probably the most popular scripting language. And it is a widely-used general-purpose scripting language and interpreter that is freely available. A full explanation of all the PHP tags.

**MySQL database:** MySQL is the world's most popular open source database. With its proven performance, reliability and ease-of-use, MySQL has become the leading database choice for web-based applications, used by high profile web properties including Facebook, Twitter, YouTube, Yahoo! and many more.

## **2.4 Related Work**

### **2.4.1 FeKara**

FeKara, just like School Time, is an all-around school admin powerhouse, so long as you are running an operation with 50 students or less.

#### **Advantages:**

FeKara is a clean and modern school administration and management software option which covers everything from exams and assignments to budgeting and internal messaging for all staff. FeKara even includes a mobile app which can work on all tablets and smartphones for convenient on-the-go use.

#### **Disadvantages:**

Similar to School Time, FeKara is limited by the amount of students, bandwidth, and storage which can be managed on the free version of its software. A \$10 per month upgrade to premium gives you further options, including per student pricing model, increased bandwidth, and additional data storage with all of the previously mentioned features.

### **2.4.2 School Time**

If you are a smaller school, such as a private elementary or preschool with 50 students or less, the free version of School Time may be just what you are looking for.

#### **Advantages:**

No financial obligations or credit cards are required for the free version of the program and it never expires. Features include board management, grading systems, library databases, exam management, transportation, attendance, and even dormitory management.

### **Disadvantages:**

The most obvious disadvantage would have to be the limit on the amount of students that can be accounted for in the free version of School Time. Of course this issue can be solved by upgrading to the not-so-free versions of School Time, but doing so would negate the “free and open source” solution you were looking for. So, as long as your school falls at or below 50 students, School Time can be a fit for you.

### **2.4.3 Fedena**

Is an open-source school administration software that largely focuses on handling records.

#### **Advantages:**

Fedena offers unlimited administration and student logins to use their system, along with unlimited courses and batches. The system was developed using Ruby on Rails, so schools can easily customize the code to their school’s needs. The system includes human resources, a calendar, financial management, examination management, and student/parent logins.

#### **Disadvantages:**

Fedena is the free version of another school administration software of the same name. When comparing the free version to the paid version, it becomes clear that the open-source version is lacking in a number of features, including inventory, custom reports, registration, and discipline.

#### **2.4.4 Ascend SMS**

Ascend SMS is an entirely free full-program school administration software made for Catholic and Independent schools. Ascend SMS proudly notes, Ascend SMS does not believe schools should have to pay exorbitant prices for something they fundamentally need to make their school work.

##### **Advantages:**

Ascend SMS offers a complete package. From offering a health management system for the school nurse to a mobile app for parents to a simple discipline reporting system, Ascend SMS offers more than many paid school administration software options. Administrators will be particularly attracted to their heavy reporting feature, which quickly provides information on ACR, school vitality, student performance, and more.

##### **Disadvantages:**

Ascend SMS is *only* free to Catholic and Independent schools. Ascend SMS also limits the number of schools that it adds to its system each year.

## **2.4.5 SchoolTool**

SchoolTool is a cloud-based open-source school administration software made for schools in the developing world.

### **Advantages:**

SchoolTool has a ton of features that largely appeal to teachers. It provides educators with what they need to run their classrooms (gradebooks, skill assessment documents, class attendance sheets, and daily participation journals), strong organization features (including a calendar that plugs in with popular calendar applications like Google Calendar), and a great report card generator. SchoolTool was made with Python, is largely secure, and is run on Linux Ubuntu.

### **Disadvantages:**

SchoolTool is a great starting software for smaller schools, but it isn't an all-inclusive piece of software. For example, schools will have to find other applications to do human resources, reporting, and financial management. SchoolTool is far more a tool for teachers than it is for administrators.

Features	E-School	Fekara	School Time	Fedena	Ascend SMS	School Tool
<b>Support Large System</b>	√	X	X	√	X	X
<b>Support Mobile working</b>	√	√	√	X	√	√
<b>Cover Every thing</b>	√	√	X	X	X	√
<b>Free Version</b>	√	√	√	√	√	X

Table1: Comparison between related Works.

As shown in (Table 1), the e-school system will be free and it will support mobile working by using bootstrap framework that make the website responsive with all devices that will help the users to access to the website from anywhere and anytime, and it will have a free version to try all features that the e-school are provided.

# **Chapter 3**

# **METHODOLOGY**

### **3.1 Introduction**

The third chapter states the methodology used to reach the objectives of the project. The framework in which software is designed, developed, and maintained is known as the Software Development Life Cycle (SDLC). It shows the steps, phases, milestones, and evolution of the software development process. There are many types of models used in software design and development. Among them are the spiral models, rapid development model, Evolutionary model, waterfall model, prototyping model, etc.

### **3.2 Methodology**

Prototyping Model has been used to develop this application. The Prototyping model is a technique for quickly building a function but incomplete model of the information system. There are several kinds of prototypes but they all intend to reduce risk by building a quick and dirty replica or mockup of the intended system. It can be used to demonstrate technical feasibility when the technical risk is high. It can also be used to better understand and elicit user requirements. In either case, the goal is to reduce risk and limit costs by increasing understanding of proposed solutions before committing more resources, as shown in figure 1.

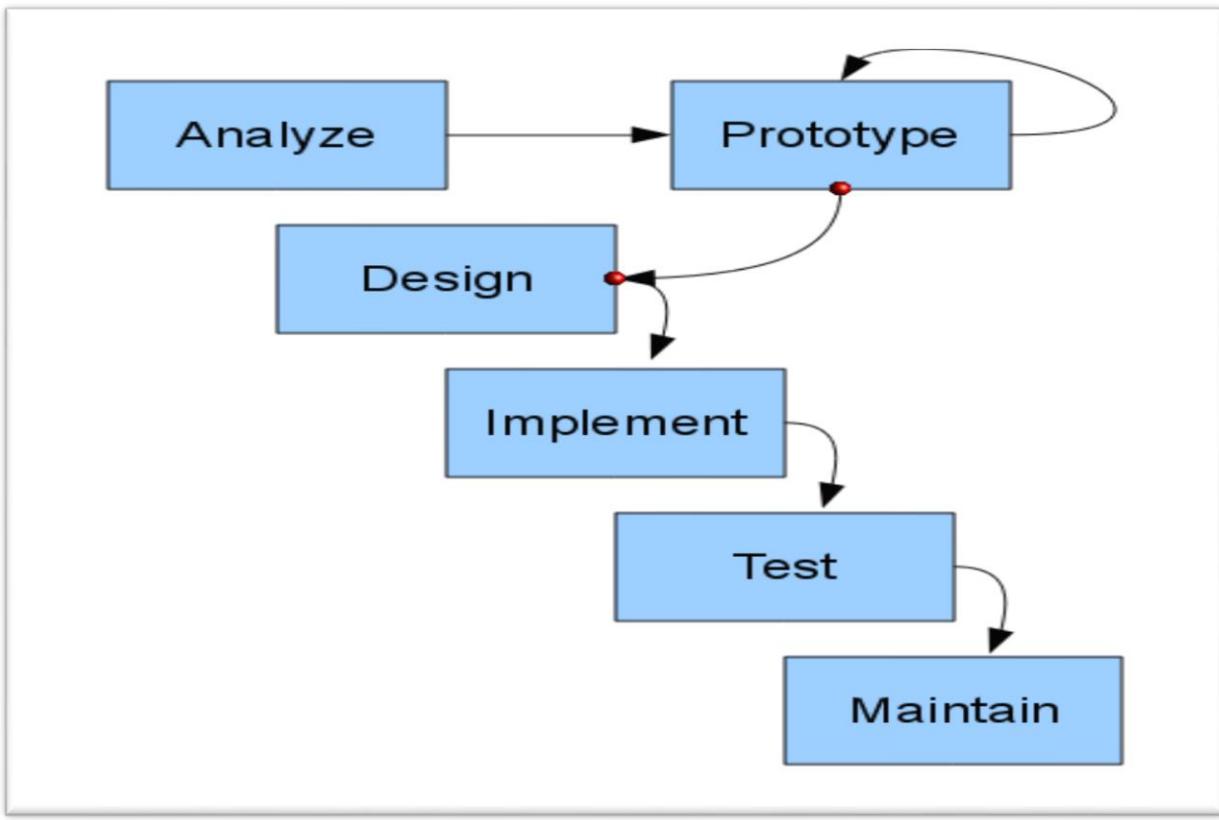


Figure 1 : Prototype Model Process.

### 3.3 Prototype Model

#### 3.3.1 Advantages of Prototyping

- Reduces development time.
- Reduces development costs.
- Requires user involvement.
- Developers receive quantifiable user feedback.
- Facilitate system implementation since users know what to expect.
- Results in higher user satisfaction.
- Exposes developers to potential future system enhancements.

### 3.3.2 The Process of Prototyping

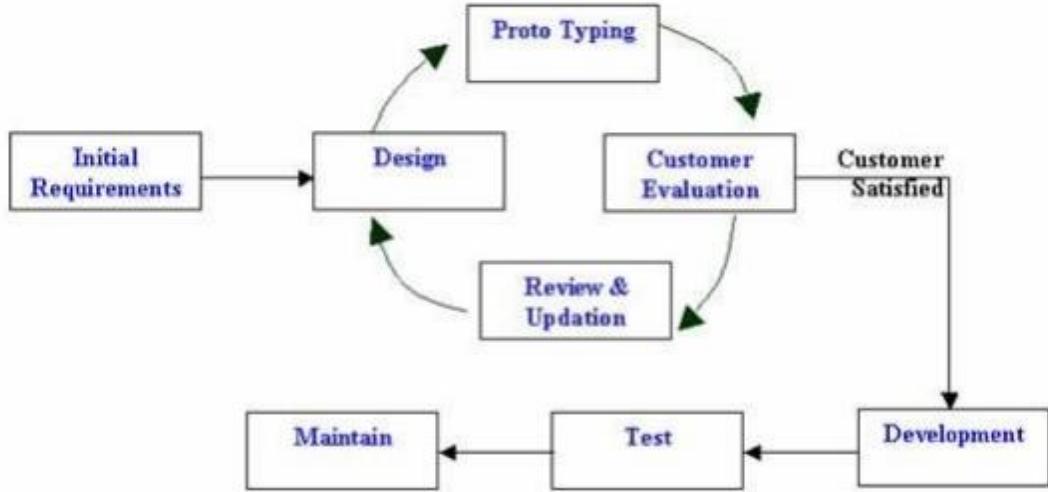
- **Identify basic requirement:** Determine basic requirements including the input and output information desired. Details, such as security, can typically be ignored.
- **Develop initial prototype:** The initial prototype is developed that includes only user interfaces.
- **Review:** The customers, end-users, examine the prototype and provide feedback on additions or changes.
- **Revise and enhancing the prototype:** Using the feedback, both the specifications and the prototype can be improved.

This method involves a series of iterations and refinement until the prototype product is a fully working system, and the user is satisfied.

### 3.4 Reason of using Prototype Model

1. Users are actively involved in the development
2. Since in this methodology a working model of the system is provided, the users get a better understanding of the system being developed.
3. Errors can be detected much earlier.
4. Quicker user feedback is available leading to better solutions.
5. Missing functionality can be identified easily
6. Confusing or difficult functions can be identified Requirements validation, Quick implementation of, incomplete, but functional, application.

### **3.5 Phases in prototype Model**



**Figure 2 : Prototype Model Phases.**

**Phase 1: Identify some requirements to begin with:** Get lists of some major requirements which define the need for the new system including the main input output information.

**Phase 2: Develop initial prototype:** Develop a basic initial prototype which only has UI screens.

**Phase 3: Review the prototype:** End users and SME's work and examine the prototype and provide feedback for improvements/enhancements.

**Phase 4: Revise and enhance the prototype:** Scope is changed based on feedback from end users and the prototype is enhanced and refined to accommodate user feedback.

# **Chapter 4 Requirement Analysis**

## **4.1 Introduction**

This chapter will provide a full description of the system and its users. Then it depicts the functional and non-functional requirements that have been collected using several methods from brainstorming, interview and e-surveys. After determining the most important requirements, requirement analysis was adopted using several tools such as use-case diagram, sequence diagram and activity diagram.

## **4.2 System description**

E-school (SMS) It is a system serving the student and the teacher and parents This electronically where it will be the work of a Web application, The idea of this system to enable the student to enter the site and get a midterm marks and final exams given by the school and also the work of electronic tests through which to test himself and make himself ready for the exams at school and also keep pace with all that is happening again in the school in general

It also operates a system for parents who can follow their children through this system in terms of teacher's supervisor's names on their students' grades and monthly, as well as teacher observations own sons and students can also follow the administration of the website

And also seeing the school quota schedule for the student as well as attendance rates and absenteeism from school, Where parents can see them for the student And also the daily absences for the school system, with the possibility of determining the cause of absences for each student, also for teachers and staff, And also can through the site to be communication between teachers and parents in order to follow the activities of the students inside the school.

### **There is a special system of expenditure and income you can get**

- Full accounts for the school system, budget and profit, then cash in exchange, special permission Automotive Exchange cash, Then a special cash disbursement books, special permission cash disbursement activities, then the supply of cash in, then the supply of cash and special transportation, special permission monetary supply written permission special cash supply activities, Also for the exams can teacher

- Add a student for the exam and Add the name for exams and Bank of questions for each material and Determine the duration of the exam and Determine the number of questions for the exam and the number of questions randomly selected from a bank of questions for each material and emergence of the result after the end of the exam period or and screen insert and modify data results and estimates of Control and the possibility of querying the outcome for students and Organize organizing committees sit down and figure system and exam Online: In other words, for example, in 1000 the introduction of the question and are divided randomly to students at the exam. If there were 10 students questions be different for each student

And Add student certificate (Arabic Name - English Name - the name of the exam - appreciation - period - grade - grade), and certificate design And Linking certification classes

There is a special part of the reports and those are the students on a regular basis where they are through

User data Students (Name - Address - Telephone - Mobile - date of birth)

- User school transport (driver data - Supervisor - car number - student data - route)
- lists of attendance for students -
- Report the number of students each row at any time
- Report the number of students each itinerary of the car at any time
- User data detailed student (Name - Address - Telephone - Mobile - Birthday - the name of the Father - Father - Father qualified work - Telephone - Mother's Name - mother worked - qualified mother - Telephone - the classroom - the type of study)
- User to withdraw students from school files, and why
- screen insert and modify data results and estimates
- querying result

There is a special part of workers and that all those who work in the school and have a special section where all can know how their salaries and then following form

- personnel data (Arabic Name - English Name - Address - Telephone - portable - Position - Salary - Bonus - discount - total salary)
- Vacations data Bagger
- Data unpaid vacations
- Statement delays
- A statement permissions
- A statement by sanctions
- A statement bonuses

### **4.3 User description**

There are four main users for the proposed system; these are Admin, student, teacher and the parent. Each user can perform several different functions during the use of the system. These functions were determined according to the design of the proposed system and a user-friendly functions to make the system more effective and efficient. Figure 4-1 summarizes the functions performed by each user.

#### 4.3.1 Admin

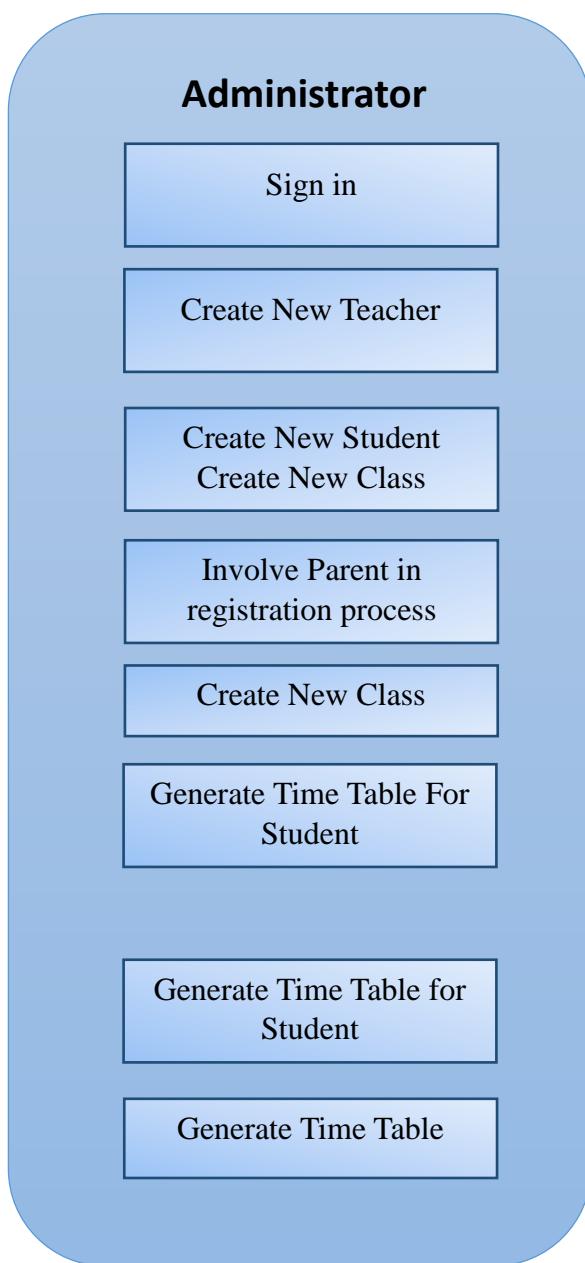


Figure 3: Admin Rules

As shown, the admin can Create New Teacher and Create New Student and Involve Parent in registration process and Create New Class and Generate Time Table for Student and Generate Time Table for Teacher.

#### 4.3.2 Student

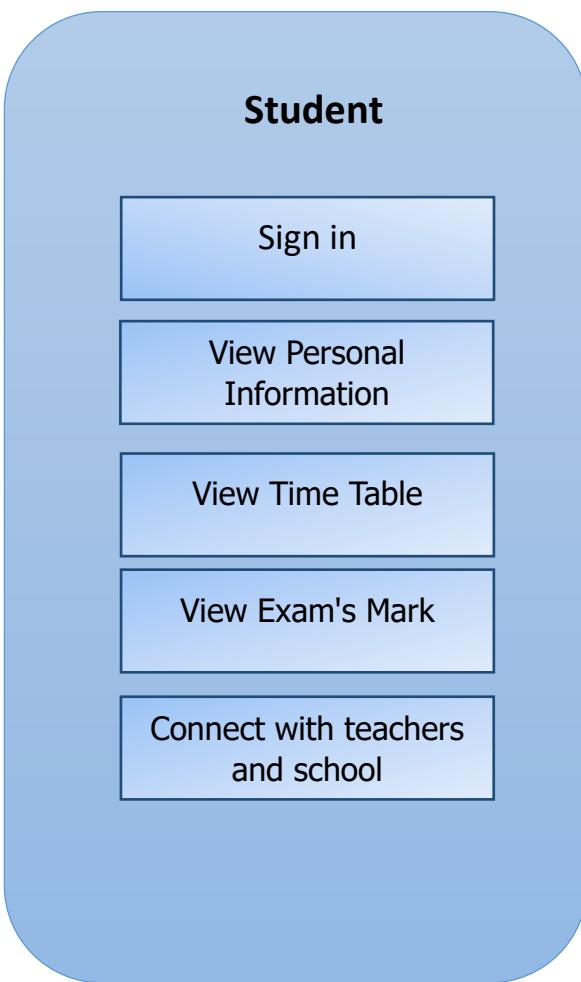


Figure 4: Student Rules

As shown, the student can View Personal Information and View Time Table and View Exam's Mark and Connect with teachers and school management System

#### 4.3.3 Teacher

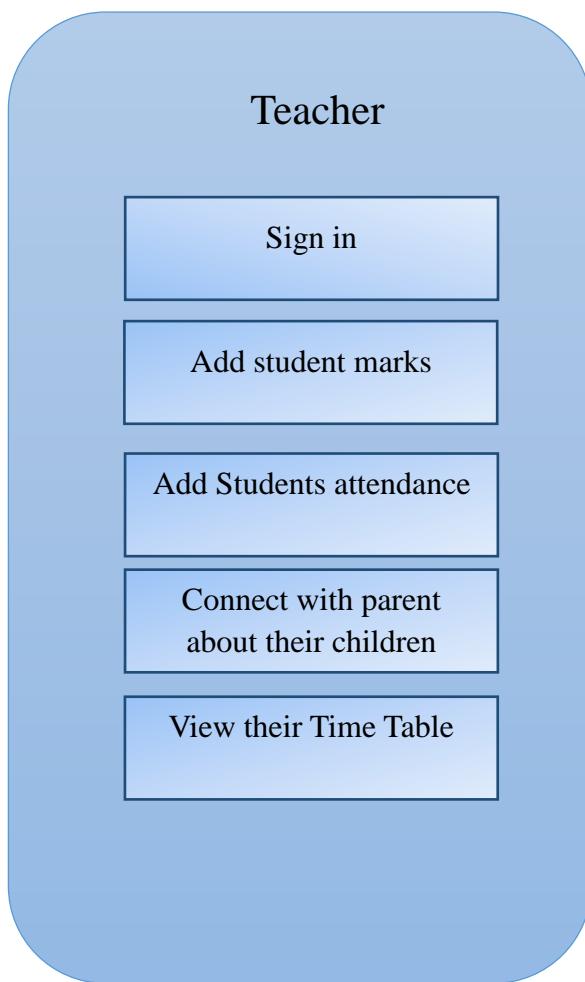


Figure 5 : Teacher Rules

As shown, The Teacher can add student marks And Add Students attendance And Connect with parent about their children And View their Time Table.

#### 4.3.4 Parent

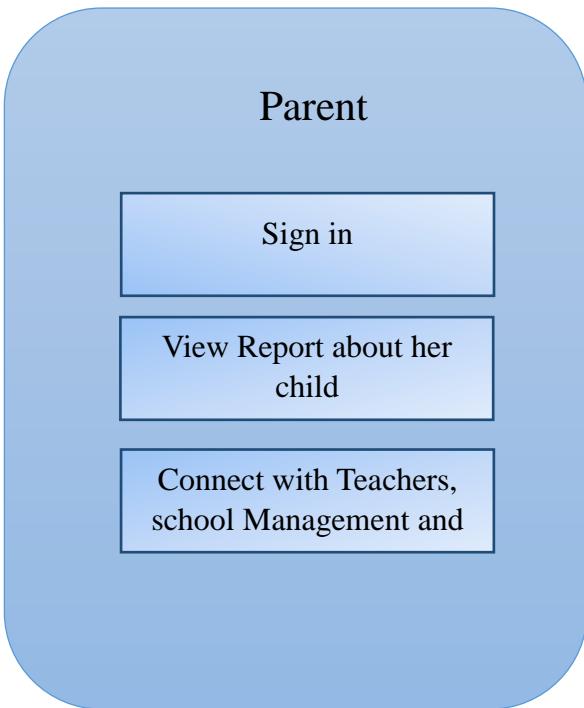


Figure 6 : Parent Rules

As Shown, The Parent can sign in And View Report about her child And Connect with Teachers, school Management and other parent.

## **4.4 System Requirement**

Before creating any website or a mobile App, it is necessary to visualize the layout, design and all features intended to be incorporated. In addition, how users will interact with each page and icon and how the website/App should perform (behavior, load time etc.). Requirements are the necessary attributes in the system, a statement that identifies a capability, characteristic or quality factor of the system in order to have value and utility to the users. Once the requirements are set, developers can initiate the other technical work including system design, development, testing, implementation, and operation.

For any system, there are functional and non-functional requirements to be considered while determining the requirements of the //system. The functional requirements are user “visible” features that are typically initiated by stakeholders of the system, such as generate report, login, and signup. On the other hand, nonfunctional requirements are requirements that describe how the system will do what it is supposed to do, for example, security, reliability and maintainability.

### **4.4.1 Functional Requirement**

#### **4.4.1.1 Admin**

- Create, edit and delete student account.
- Create, edit and delete teacher account.
- Create, edit and delete parent account.
- Publish news for users (Teacher, Student, and Parent).
- Store, edit, delete, calculate and print student's grade.
- Add Classes and Subject to the teachers.
- Change user information.
- Search student's grade per name and per ID.
- Create, edit, delete and print timetable.

#### **4.4.1.2 Teacher**

- Add Student's marks per Subject.
- Add Student's attendance per Subject.
- Connect with student and parent.

- Publish news for users (Admin, Student, and Parent).
- Add Questions to Questions Bank.
- Add Activity To another Teacher.
- Add Activity To The Admin.

#### **4.4.1.3 Student**

- View their marks per subject.
- Ask their teacher and the admin
- View Question Bank per subject.
- Publish news for users (teacher, parent and admin)
- Change their account's information.

#### **4.4.1.4 Parent**

- View the marks of their children.
- View the attendance of their children.
- Publish news for users (Student, Teacher, and Admin).
- Change their account's information.

### **4.4.2 Non-Functional Requirement**

#### **4.4.2.1 Security**

The system have accounts for its users and only authorized users can access the system with username and password. The passwords are encrypted using a PHP function sha1 () .



Figure 7: user login interface

#### **4.4.2.2 Performance**

Easy tracking of records and updating can be done.

#### **4.4.2.3 Availability**

The system are available to users anytime, anywhere, just need a PC and Internet Connection. Also the system work in multiple web browsers like (Chrome, Mozilla, Opera, and Internet Explorer).

#### **4.4.2.4 User Friendly**

The system have a friendly user interface and the system very interactive.

### **4.5 System Analysis**

This part contains the analysis of the functional and non-functional requirements using use-case diagrams, and use-cases details. In addition, the interactive behavior of the activities is analyzed using sequence diagrams and activity diagrams.

#### **4.5.1 Use case Diagram**

This part contains the analysis of the functional and non-functional requirements using use-case diagrams, and use-cases details.

##### **1. Admin**

The Admin can do After Login process the following function as shown in figure7:

- Add Teacher include (Modify/Delete).
- Add Student include (Modify/Delete).
- Add Parent include (Modify/Delete).
- Add Class include (Modify/Delete).

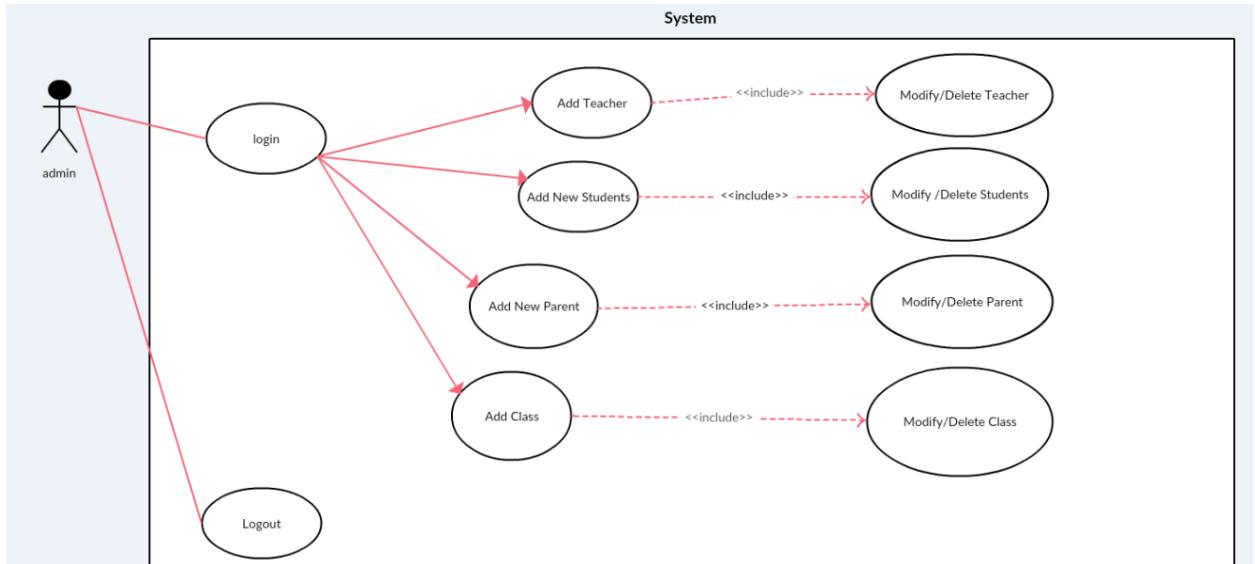


Figure 8: Admin use case Diagram

## 2. Student

The student can do After Login process the following function as shown in figure8:

- View Personal Information.
- View Timetable.
- View Courses Marks.
- View Personal Details.

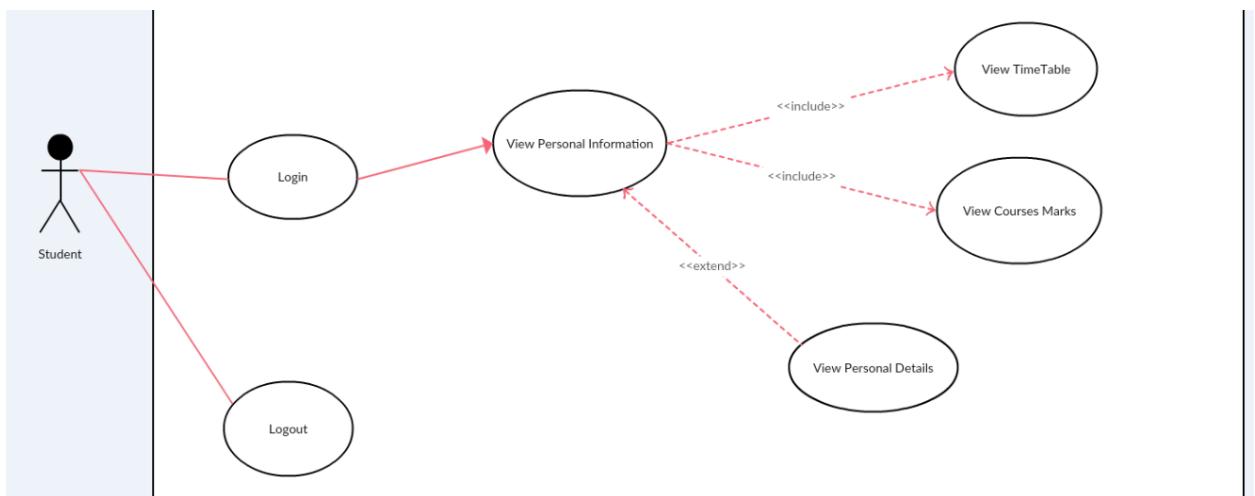


Figure 9: Student use case Diagram

### 3. Teacher

The Teacher can do After Login process the following function as shown in figure9:

- Add Attendance include (their Marks).
- Student's Marks.
- Modify or delete mark.

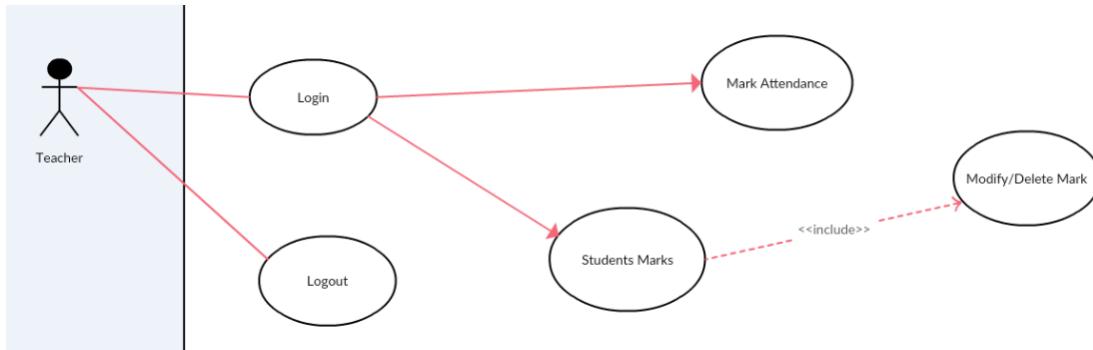


Figure 10 : Teacher use case Diagram

### 4. Parent

The Parent can do After Login process the following function as shown in figure10:

- Generate Report.
- Show their child attendance.
- Show their child marks.

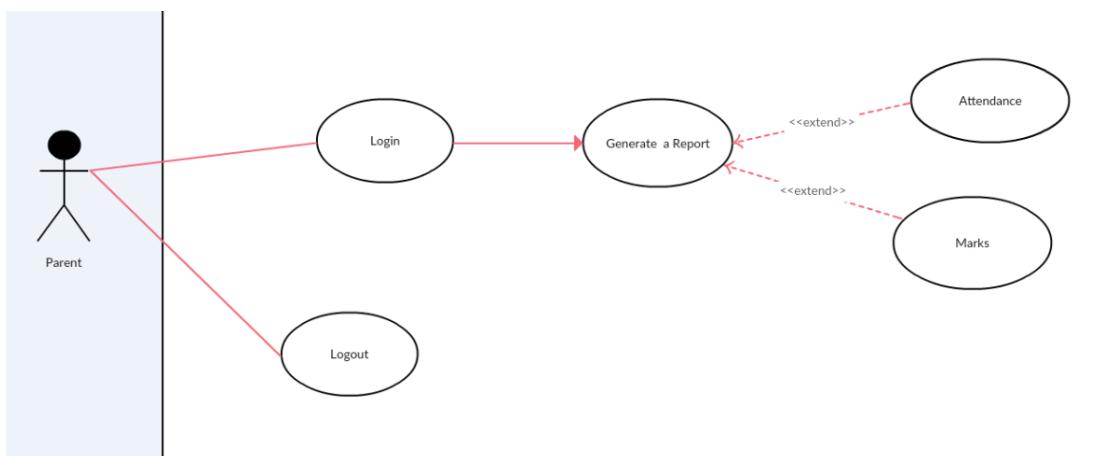


Figure 11: Parent use case Diagram

#### 4.5.2 Sequence Diagram

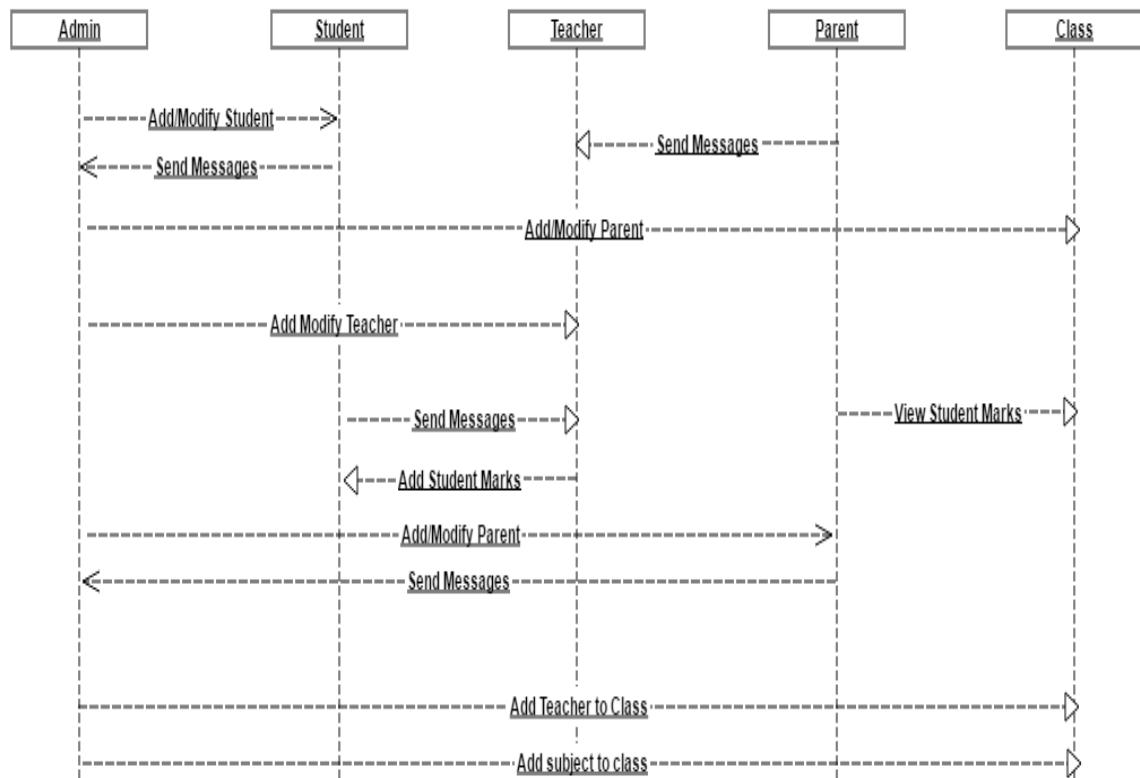


Figure 12: Sequence Diagram

#### 4.5.3 Activity Diagram

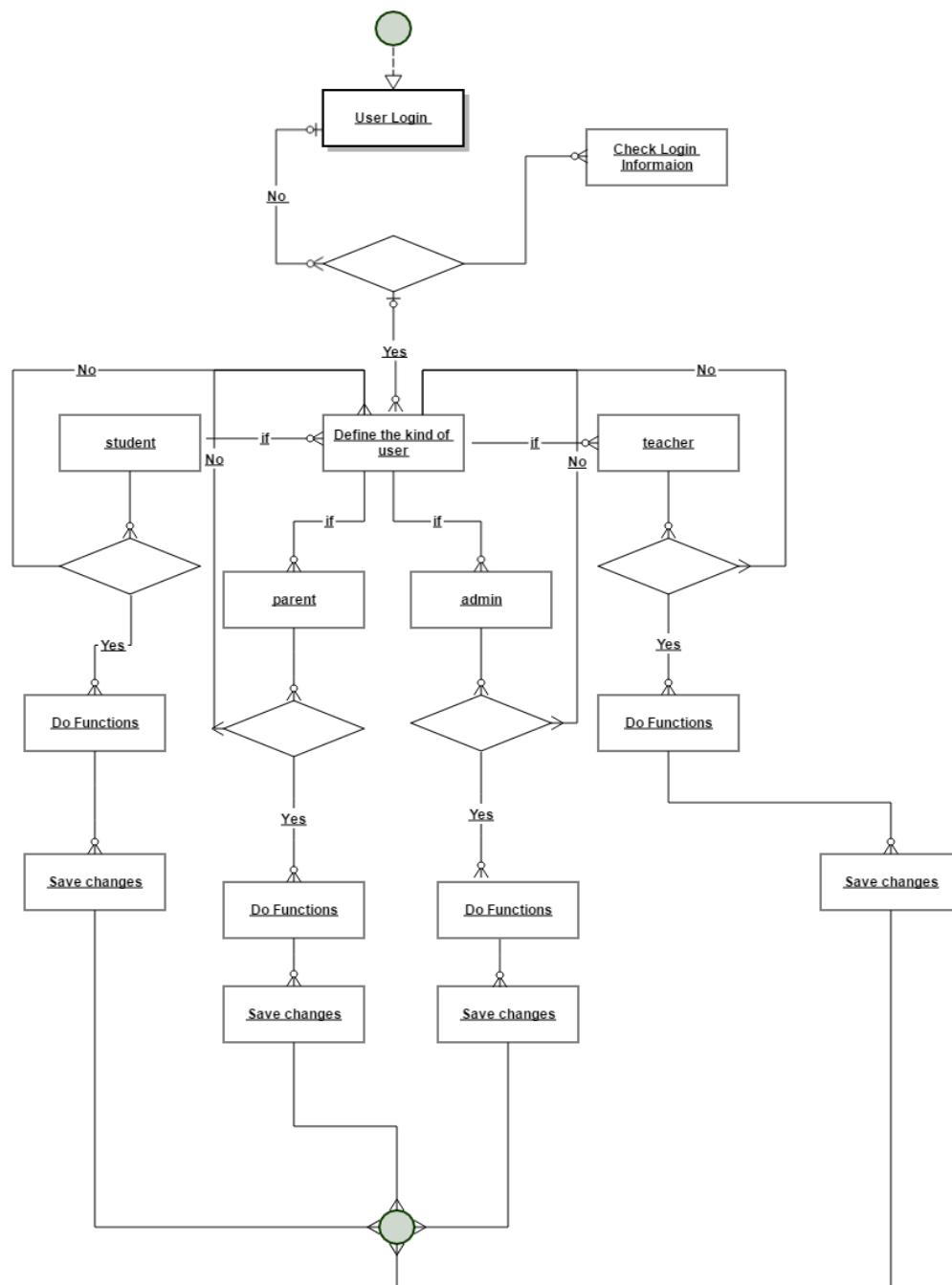


Figure 13Activity Diagram

# **Chapter 5 Design and Implementation**

This chapter explains the design and implementation phases of the system. It depicts the class diagram, ER diagram and database schema the System. Moreover, the implementation phase combines the requirements, design phase outputs, and process them using the appropriate technologies.

## **5.1 Analyze Phase**

During the analyze phase, we determine the requirement of the project and get in touch how we can improve the school's performance, also we determine how implement the school's need's to help them to get professional work.

## **5.2 Build A Prototype.**

In this phase, the tools used in developing the prototype and the developed system are described:

### **5.2.1 Programming Tool**

The system are developed using web development techniques (HTML5, CSS3, JavaScript, JQuery) that let us design the system layout such as login form, tables, panels and colors, then implement UI/UX element's such as :

- Make the system ease to use.
- Make the system ease to learn.
- Choose the website color's carefully to enhance user interfaces

Then, make the system dynamic using programming tools (PHP v7, MYSQL DBMS) it's let us store the user's information in the database and view it in the webpages using PHP v7.

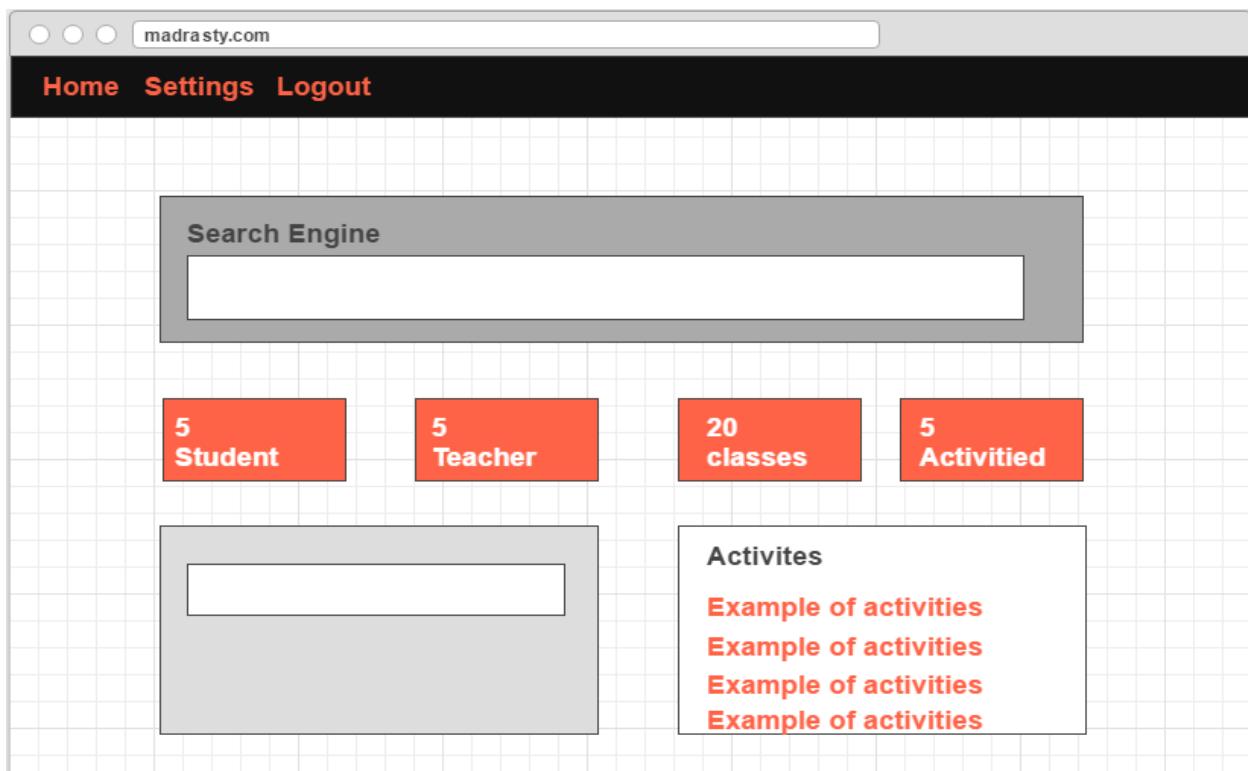


Figure 14 : Prototype Control Panel

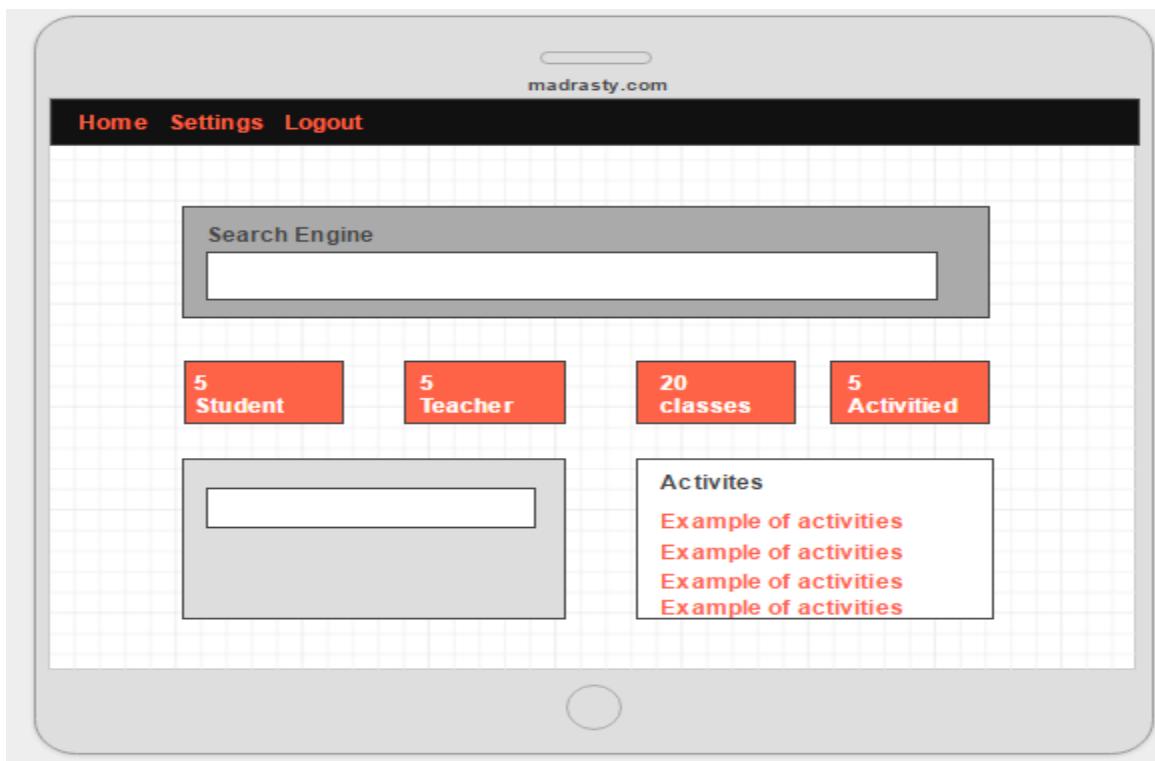


Figure 15 : Prototype Mobile Working

## **5.3 Design Phase**

During the design phase, the relationships between classes was designed and analyzed using the class diagram. After that, the database schema was developed to illustrate the mapping of the data. Finally, the

### **5.3.1 Class Diagram**

To illustrate the relationships and source code dependencies among classes, class diagram was developed. In this context, the class defines the methods and variables in an object, which is a specific entity in a program or the unit of code representing that entity.

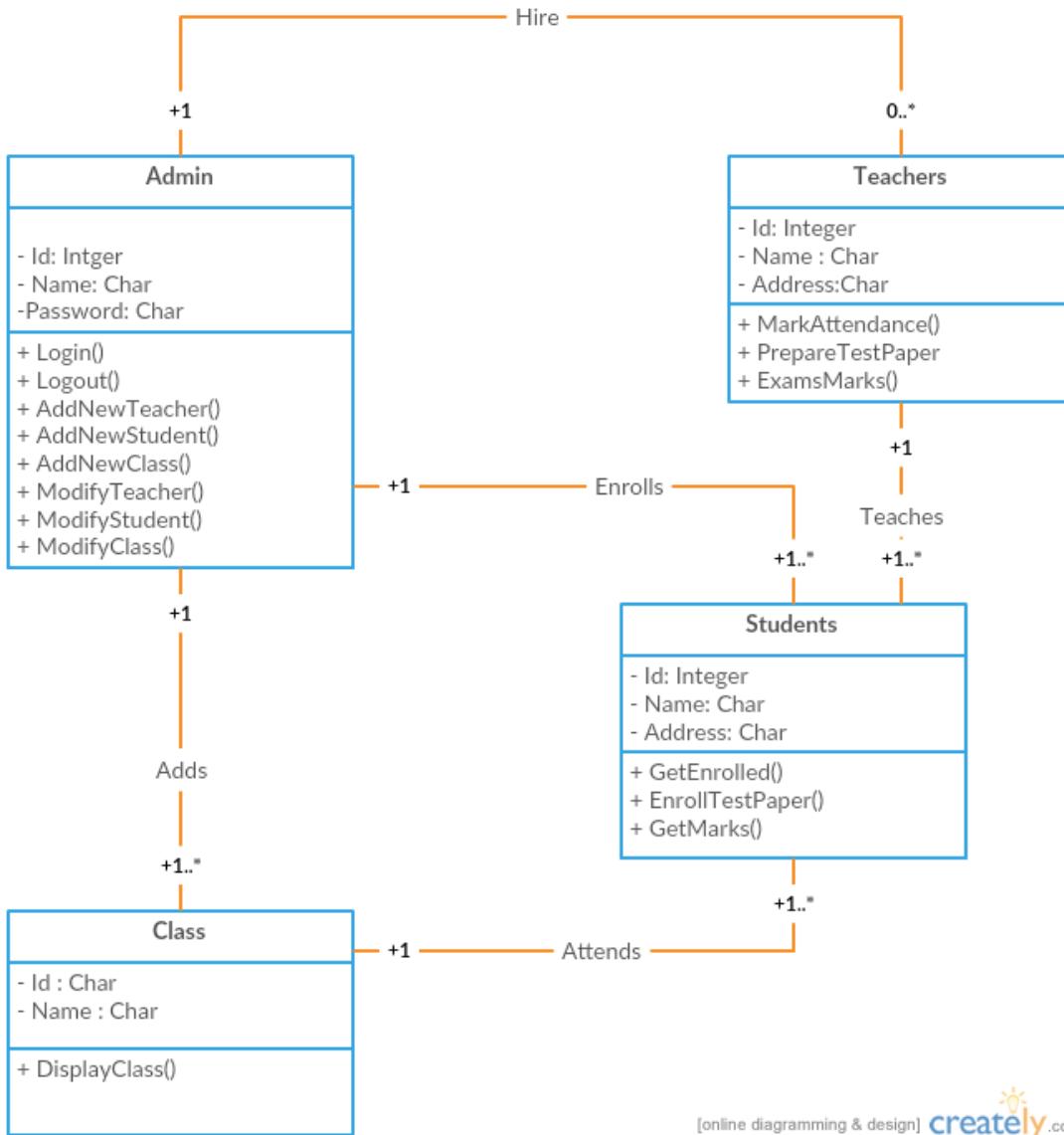


Figure 16 : class diagram

### 5.3.2 Database Schema

A database schema is the skeleton structure that represents the logical view of the entire database. It defines how the data is organized and how the relations among them are associated. It formulates all the constraints that are to be applied on the data.

The system has five database tables as shown in Figure 13. Each table contains an ID and several different attributes related to different functions in the system.

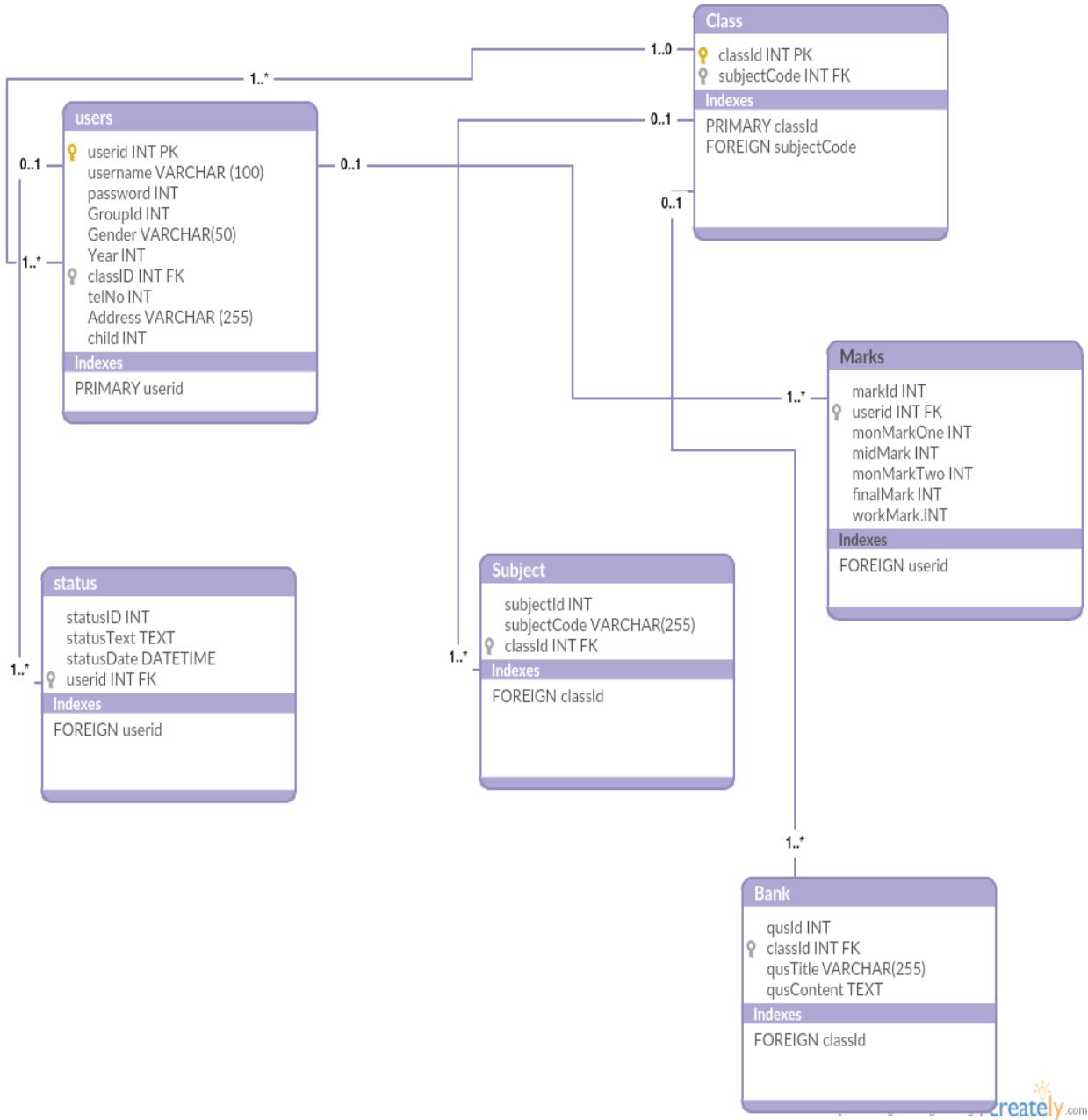


Figure 17 : Database Scheme

## 5.4 Implementation Phase

After developing the databases of the system, the implementation phase emerges and through this phase, several activities and techniques were used to develop the website and mobile App, as shown in below. The development of the website starts with designing the website structure using HTML5, then the style of the website was designed using CSS3. After that, enhanced user interfaces and dynamic website were developed using JavaScript and JQuery. Later on, the website contents and databases were managed through the use of PHP7. Finally, the panorama was incorporated in the website.

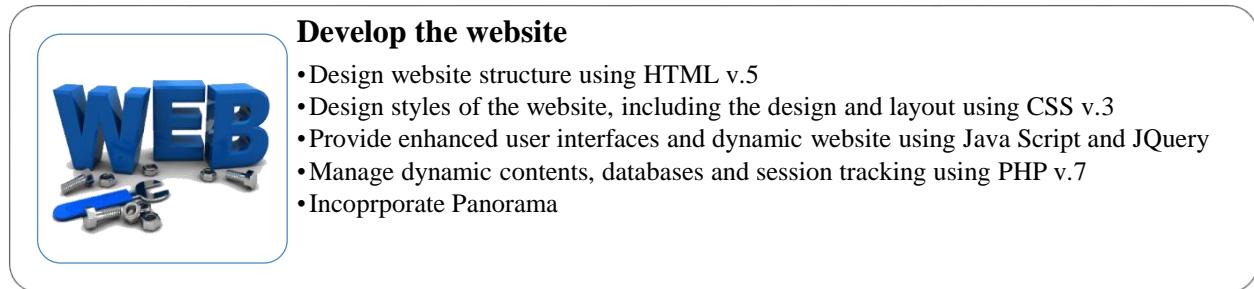


Figure 18: The Implemintation Phase Activities.

## 5.4.1 User Interfaces

### 5.4.1.1 Admin Interface

The screenshot displays the Admin User Interface with the following key elements:

- Header:** Includes navigation links for "الصفحة الرئيسية" (Home Page), "المعلمون" (Teachers), "الطلاب" (Students), "أولياء الأمور" (Parents), and "الصفحة الرئيسية" again.
- Top Bar:** Shows the date "2017 - 2016" and user information "مدير المدرسة" (School Manager) and "نوجة التدكيم" (Evaluation Guide).
- Search Bar:** A search field with placeholder text "ابحث عن أي مستخدم بإستخدام الاسم أو الرقم العدريسي أو سنة الالتحاق أو العنوان."
- Statistics:** Two sections showing counts:
  - Left: 12 مقصول (Mafsool) and 2 طلاب (Students)
  - Right: 4 معلمين (Teachers) and 6 مهام (Tasks)
- Messages:** A list of messages from users:
  - Message from "رسالة من طالب" (Message from Student) on 2016-05-03: "لدي اثنان ان ابني مدين بالاموال المطالبة بدفعها تجاه المعلم المعنوي المقصول".
  - Message from "رسالة من طالب" (Message from Student) on 2016-05-03: "لدي اثنان ان ابني مدين بالاموال المطالبة بدفعها تجاه المعلم المعنوي المقصول".
  - Message from "رسالة من طالب" (Message from Student) on 2016-05-03: "لدي اثنان ان ابني مدين بالاموال المطالبة بدفعها تجاه المعلم المعنوي المقصول".
  - Message from "رسالة من طالب" (Message from Student) on 2016-05-03: "لدي اثنان ان ابني مدين بالاموال المطالبة بدفعها تجاه المعلم المعنوي المقصول".
  - Message from "رسالة من طالب" (Message from Student) on 2016-05-03: "لدي اثنان ان ابني مدين بالاموال المطالبة بدفعها تجاه المعلم المعنوي المقصول".
  - Message from "رسالة من طالب" (Message from Student) on 2016-05-03: "لدي اثنان ان ابني مدين بالاموال المطالبة بدفعها تجاه المعلم المعنوي المقصول".
- Footer:** Copyright notice "جميع الحقوق محفوظة © لـ مدرستي"

Figure 19 : Admin User Inteface

### 5.4.1.2 Teacher Interface

The screenshot displays the Teacher User Interface (UI) of a school management system. At the top, there is a navigation bar with links for 'الصفحة الرئيسية' (Home Page), 'الطلاب', 'المعلمات', and 'مدربتي'. Below the navigation bar, the user's name 'عز الدين الغربز' is shown along with their ID '220160014' and gender '♀'. A blue button labeled 'مدربتي' is also present.

The main content area is divided into several sections:

- المهام (Tasks):** This section contains a message from the school administration: 'أمر هام نرجو من ادارة المدرسة الرد' (Important Order, we request a response from the school administration). It also includes a signature placeholder 'بسم الله الرحمن الرحيم' and a note: 'استاذ عز ، الردء الرد امر هام'.
- آخر التحديثات (Latest Updates):** This section lists five recent updates, each with a timestamp '2016-05-03', the author 'مدرب المدرسة' (School Trainer), and the subject 'الادارة' (Administration). Each update is a link to a detailed view: 'بسم الله الرحمن الرحيم اعزائنا الطيبة يرجي العلم ان يوم غد إجازة رسمية بمناسبة " عبد العمال العالم 'المزيد' (More) »'. The 'نشر' (Share) button is located at the top right of this section.
- Footnote:** A black footer bar at the bottom contains the text 'جميع الحقوق محفوظة © لـ مدربتي' (All rights reserved © by مدربتي).

Figure 20 : Teacher User Interface

### 5.4.1.3 Student Interface

The screenshot displays the student interface of an application. At the top, there is a dark header bar with the following elements from left to right: a dropdown menu labeled "الصفحة الرئيسية" (Home Page), a user icon labeled "الطلاب" (Students), a search bar with the placeholder "الصف الثاني عشر" (Grade 12), a user ID "رقم الطالب : 120160074", and a user name "فيصل حماد حجازي". Below the header is a large white content area. At the top of this area, there is a dark navigation bar with the text "آخر التحديثات" (Latest Updates) and a "نشر" (Publish) button. The main content area contains five identical notification cards, each with the following details: a timestamp "2016-05-03" followed by "مدير المدرسة" (School Manager) and "الادارة" (Administration); a message in Arabic: "بسم الله الرحمن الرحيم اعزائنا الطالبة يرجى العلم ان يوم غد إجازة رسمية بمناسبة "عبد العمال العالم المزید" (More)", and a small "x" icon to close the card. At the bottom of the page, there is a black footer bar with the text "جميع الحقوق محفوظة © لـ مدرستي" (All rights reserved © by Mدرستي).

Figure 21: Student User Interface

#### 5.4.1.4 Parent Interface

The screenshot displays the Parent User Interface with the following components:

- Header:** Includes "الصفحة الرئيسية" (Home Page) on the left, "مدربتي" (My Coach) on the right, and a search bar.
- Notifications:** A list titled "آخر التحديثات" (Latest Updates) showing multiple notifications from "مدير المدرسة" (School Manager) dated "2016-05-03". Each notification states: "بسم الله الرحمن الرحيم أعزتنا الطالبة برجي العلم ان يوم غد إجازة رسمية بمناسبة "عيد العمال العالمي" المزيد".
- Message Center:** A section titled "عرض موضوع" (View Topic) for "لرسال الشكاوى و المقترفات للدارة / الكادر الأكاديمي برجي تعزينا النموذج بالأسفل". It includes input fields for "الجهة المراد ماسترها" (Recipient), "عنوان الموضوع" (Subject), and a large text area for "الموضوع" (Topic). A blue "إرسال" (Send) button is at the bottom.
- Student Grades:** A section titled "علامات الطالب" (Student Grades) for "طلبات الطالب فيصل محمد جباري". It shows a table of grades across various subjects:

المادة	النحو	الكلمات	نحواني	أفعال الفصل	الكل
تربية اسلامية	١٠٠	٢٠	٤٠	١٠	٢٠
تاريخ	٥٦	١٠	٢٥	١٠	٨
لغة انجليزية	١٠٠	٢٠	٤٠	١٠	٢٠
ادباء	٤٠	٧	٨	٨	٧
قدراتي معاصرة	١٠٠	٢٠	٤٠	١٠	٢٠
لغة انجليزية	٥٦	١٠	١٠	١٠	١٩

- Footer:** "جميع الحقوق محفوظة © لمدرستي"

Figure 22 : Parent User Interface.

# **Chapter 6 Testing and Evaluation**

This chapter illustrates the last two phase of the project the testing and evaluation phases. In the testing phase, the performance testing and functionality testing performed. In addition, the evaluation was performed through this steps School Manager, Teacher, Student, and Parent.

## 6.1 Testing

Two types of testing was performed to test the website and how it support mobile working. These tests were mainly performance testing and functionality testing.

### 6.1.1 Performance Testing

The website was tested on Firefox browser using an online tool called **GTMetrix**, which analyzes web pages according to different rules by giving each rule a weigh, and then evaluate the score of each rule for the website. The rules tested by this tool is indicated in Table blew.

<b>1.</b> Make fewer HTTP requests	<b>2.</b> Remove duplicate JavaScript and CSS
<b>3.</b> Use a CDN	<b>4.</b> Configure ETags
<b>5.</b> Avoid empty src or href	<b>6.</b> Make AJAX cacheable
<b>7.</b> Add Expires headers	<b>8.</b> Use GET for AJAX requests
<b>9.</b> Compress components with GZip	<b>10.</b> Reduce the number of DOM elements
<b>11.</b> Put CSS at top	<b>12.</b> Avoid HTTP 404 (Not Found) error
<b>13.</b> Put JavaScript at bottom	<b>14.</b> Reduce cookie size
<b>15.</b> Avoid CSS expressions	<b>16.</b> Use cookie-free domains
<b>17.</b> Make JavaScript and CSS external	<b>18.</b> Avoid AlphalmageLoader filter
<b>19.</b> Reduce DNS lookups	<b>20.</b> Do not scale images in HTML
<b>21.</b> Minify JavaScript and CSS	<b>22.</b> Make favicon small and cacheable
<b>23.</b> Avoid URL redirects	

Table 1: Rules used during the test of the website

The system's website was tested using this tool, and the results showed that the system belongs to grade A, which is the first grade with an overall performance score of 90%, as shown in below.

**Latest Performance Report for:**  
http://media.tecpt.com/

Report generated: Tue, May 3, 2016, 7:12 PM -0700  
Test Server Region: Canada Vancouver, Canada  
Using: Firefox (Desktop) 45.0.2, PageSpeed 1.12.16, YSlow 3.1.8

Performance Scores	Page Details
PageSpeed Score <b>B (86%)</b>	YSlow Score <b>A (93%)</b>
Page Load Time <b>1.3s</b>	Total Page Size <b>212KB</b>
Requests <b>18</b>	

**What do my scores mean?**  
Rules are sorted in order of impact upon score  
Optimizing rules at the top of the list can greatly improve your overall score.  
Not every recommendation will apply to your page  
The recommendations are meant to be generic, best practices; some things will be out of your control (eg. external resources) or may not apply to your page.

**Need optimization help?**  
Gossamer Threads can handle all of your speed optimization requirements.  
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Figure 23 : GTmetrix Online Performance Testing of the website.

## **6.1.2 Functionality Testing**

All functions in the application, database connection, forms used to enter data for submission, editing, getting or deleting information from users were tested. Developers performed the test of the website. Some functionality requirements were tested during the test:

### **6.1.2.1 Security Testing**

Security was tested by pasting internal URL directly into browser address bar without login. SQL injection SQL MAP tool was used to test all pages in website. Also when the user (Admin, Teacher) need to edit marks or information to other user if he edit the id in URL the system will redirect to logout page or home page.

Ex: (student.php?userid=120110220) if the user try edit the id number to access to other user information or other hacking.

### **6.1.2.2 Database Testing.**

Data consistency is very important. Data integrity and errors while editing, deleting, modifying the forms or do any DB related functionality were checked. Moreover, the entire database queries were checked to be executed correctly, data is retrieved correctly and even updated correctly.

## **6.2 Evaluation**

Since the system has four users whose opinion about the system is very important, a sample of student, teacher, parent, and school manager were consulted to evaluate the website.

### **6.2.1 Usability Evaluation**

To evaluate the system based on the users (student, teacher, parent, admin),

## 6.2.2 End-Users' Evaluation

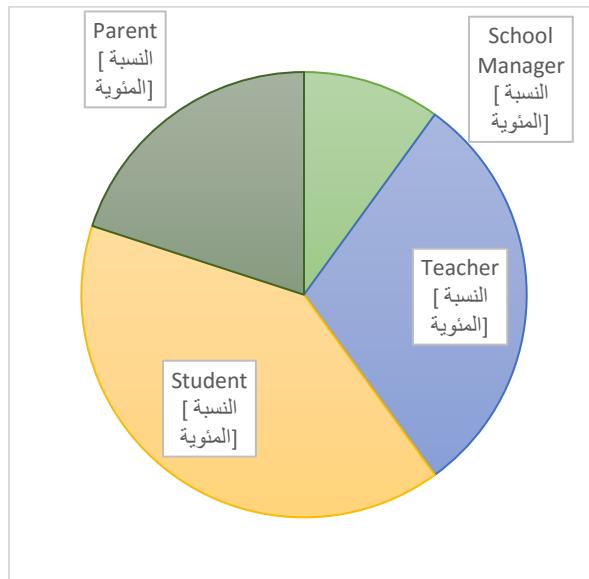


Figure 24: Distribution of the users kind

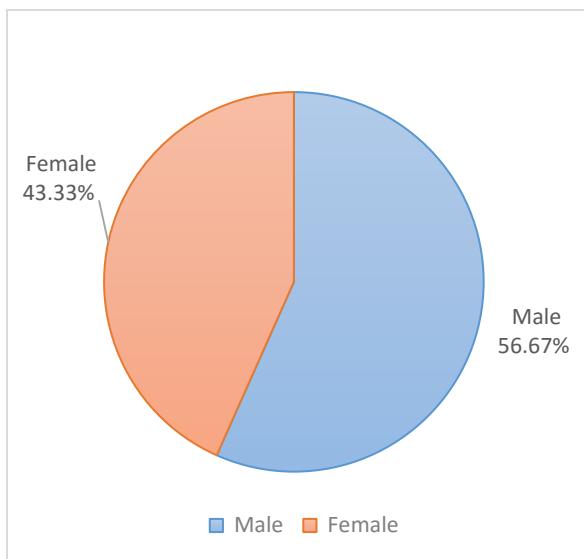


Figure 25: Distribution of the users

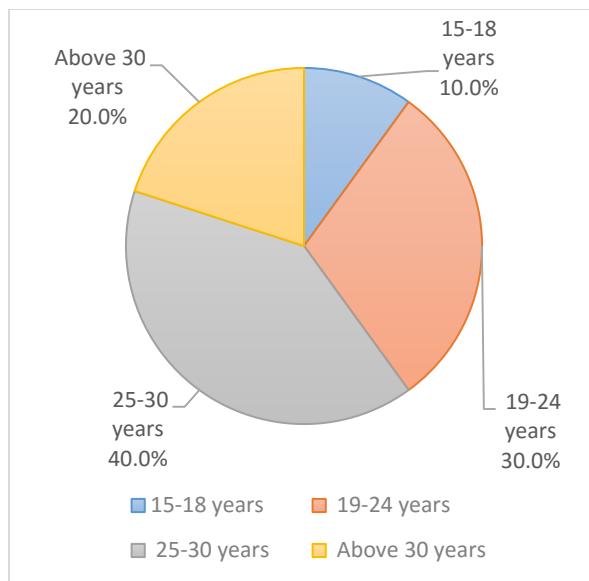


Figure 26: Distribution of the users age

### 6.2.3 Users Evaluation

In this evaluation process, we go to the school in the 'Nuserat' and distribute thirty questionnaires and we get just 20 from it as shown below (9 student, 6 teacher, 3 teacher, 2 admin).

	Strongly agree	agree	Neutral	Disagree	Strongly Disagree
Easy to use	5	2	5	3	5
Easy access to the functions of the system	4	8	4	8	1
Age completion	8	2	5	1	4
Help me tracking the student	2	2	8	5	1
Help us to concatenation within the school	10	5	2	2	1

Figure 27: Distribution of the users evaluation

# **Chapter 7 Conclusion and Future Work**

## **7.1 Conclusion**

In recent years, with the pace of technological development, people have become more and more demanding in terms of quality of life, and the schools managers in recent years look to improve a performance in their schools to get the highest rate of knowledge and experience in their student.

## **7.2 Future Work**

Some ideas and features can be considered as a future work for this project. These features can be summarized in the following points:

- Let the student take a testing exams Online.
- Let the student take an online certification.
- Bank of question per subject.
- Let teacher add a question to the bank of question.
- Let parent concatenation with other parents.
- Let admin add new classes.