Kingdom of Saudi Arabia
Majmaah University
Ministry of Education
College of Science in Zolfi
Dept. of Computer Science

المملكة العربية السعودية
جامعة المجمعة
وزارة التعليم
كلية العلوم في الزلفي
قسم علوم الحاسب والمعلومات

MAJMAAH UNIVERSITY
COLLEGE OF SCIENCE & COMPUTER SCIENCE

Smart School Application

BY

Samer Saad Faleh Alotaibi

Supervised by

Ms. Mutasim Mohamed El kear Mansour

A REPORT SUBMITTED TO
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Abstract

Amidst this momentum of global changes, and with the world needing many applications, especially those that discuss distance learning processes

It has been necessary to invent many applications that discuss the idea of distance learning and do not call for the need for the student to go to school in order to receive education or continuous communication between the family and the school through electronic platforms instead of going to school and wasting time and effort while this great time can be shortened Through an electronic application

Also the expense payments according to the 2030 vision and interest in such initiatives that call for a huge technological renaissance through expanding the work of these applications.

Smart School is an application that contains many personalities, namely the student, teacher, manager, accountant and guardian

In which the student can receive lessons through an online education platform, and also the teacher can download the lessons and the guardian can pay the expenses and follow his children through the application

The results that we came out of this project are that in order for this system to succeed, it must actually be applied in any of the scientific institutions and it is based on a specialized support and development authority.

One of the most important recommendations for whoever undertakes this project is to develop the direct education process in line with modern technologies and not rely on the recorded lessons

[6]

Acknowledgement

Thanks for all, thanks for all staff in college, special thanks for our supervisor. When we need help always we find the person standing by our side, and give us all information and guidance to achieve this project, this person is our supervisor.

MAJAMAAH UNIVERSITY

COLLEGE OF SCIENCE AL ZULFI

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION

(CERTIFICATE BY STUDENT)

This is to certify that the project titled "Title of the project" submitted by me (Name of the student, Student ID) under the supervision of Dr. Name for award of Bachelor degree of the Majmaah University carried out during the Semester 1, 2020-2021 embodies my original work.

Signature in full: Samer Saad Faleh Alotaibi

Name in block letters: Smart School Application

Date:4/3/2020

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1. CHAPTER 1

1.1. Introduction

In a world that is progressing step by step in terms of scientific and technological progress, and everything is done online, due to the exacerbation of diseases that lead to limiting clusters, the urgent need for the existence of distance education and its systems and the development of means and means for it has become one of the most important requirements of our time.

Therefore, there is an increasing need for many multiple applications that distribute distance education, especially via mobile phone, in order to reduce the largest possible number of human gatherings, especially among children.

In light of the global repercussions and the changing circumstances around the world, the urgent need for smart applications especially in the field of distance education as a result of the many challenges facing people now especially children and adolescents and also the result of a large expansion in the use of the Internet has become the need for a lot of distance education applications that It connects the teacher with the student through the virtual class platform or through direct video communication, as well as the need for smart applications in its various sections and types. Many call for development and innovation of many ideas that facilitate the lives of people and make A more comfortable

The smart applications are based on the idea of using the mobile phone, the TV or the smart watch to provide a specific application in which the user enters the application interface and through him the developer provides a set of services that the user needs

Also in the smart school system there will be the administrative side of facilitating the process of payment of expenses and communication between the guardian and the administration, as well as the process of accounts for the school itself.

In this project, we use questionnaire way to collect data from student and other persons, and we get these results:

- There are exist much application but not cover the needs of the learning online.
- Student and school manager need this application strongly.
- The parents prefer to make an payment and ask teachers online

❖ **Statistics**

Analysis of the questionnaire

1. **Is the idea actionable or not?**
   Yes 81% No 1,28%.
2. **By how much you will filter the application for use by your friends**

10%	9.26%
50%	16.67%
70%	29.63%
90%	44.44%

3. **Is the application similar to the rest of the existing applications?**

Yes

16.98%

No

39.62%

I don,t know

43.40%

4. **How much do you expect the student to use the application to expect**

High	46.30%
Medium	46.30%
Weak	7.41%

5. **Do you prefer to follow your children by visiting the school directly or through the application?**

Go to School	11.11%

online	66.67%
anyone	22.22%

6. Is the app suitable for children under 12 years of age?

yes	46.30%
no	24.07%
I don't know	29.63%

7. Does the application save time and effort?

yes	79.63%
no	9.26%
I don't know	11.11%

1.2.Problem Statement

The main problem is that the school needs a smart management system and also a distance education system that allows the school to practice its educational activities in the event of a catastrophe and in conjunction with what is happening in the world of epidemics, diseases and wars that almost eliminate the entire educational process.

Therefore, the most important problems that call for a smart school system are the following:

- Lack of a strong electronic archiving system inside the school.
- Reliance in general on the paper archive to save the files of former and current students, which complicates the research process for any student.
- The inability to follow the student throughout his consecutive years of study is the lack of information system.
- The absence of an electronic system for communication between students and the school administration.
- The lost time that the guardian wastes to follow his son's educational situation by forcing him to go to school and following his son's case himself.

1.3.Motivation

Smart School Android App is a simple and intuitive application focused on student/parent can access their school information on mobile. The aim is to not only enhance learning experience of the students, but also enrich the lives of parents so they can monitor their child academic activities.

The smart school application is in line with the 2030 vision for the Kingdom of Saudi Arabia.

The smart school application is based on connecting the student and the parent with the school administration

1. Make all accounts for the school, organize the library, and follow up on student activities through the application.
2. Transforming the educational situation into a digital tool by converting all transactions inside the school to the application

1.4.Research Objectives

1. Facilitating the educational process and converting all office and paper matters into digital tools.
2. The ability of the guardian to view the student's reports and follow his scientific progress.
3. Complete the payment process through the application and pay the academic expenses with ease.
4. Make all accounts for the school, organize the library, and follow up on student activities through the application.

1.5.Methodology

One of the basic notions of the software development process is SDLC models, which stands for Software Development Life Cycle models. The most used, popular and important SDLC models are given below: [1] [2]

1- Waterfall model
   The linear nature of this method makes it easy to understand and manage. Projects with clear objectives and stable requirements can best use the waterfall method.
2- Iterative model
   It attempt to minimize risk when adding new functionality by developing the software in iterations that are mini-increments of the new functionality
3- Spiral model
   The Spiral methodology extends the Waterfall model by adding rapid prototyping in an effort to combine advantages of top-down and bottom-up concepts
4- Agile model
   Focused on improving time, lowering the failure rate of new releases, shortening the lead-time between fixed reliability.

1.5.1. Comparative between methodologies

Table 1 Comparative between methodologies

	Waterfall	Iterative	Spiral	Agile
Time Consuming	Little	Many	Many	Many
widely understood	Yes	No	Yes	No
complexity	No	Yes	Yes	Yes
Project size	Small, medium	medium	medium, Large	medium

The methodology used is Waterfall model

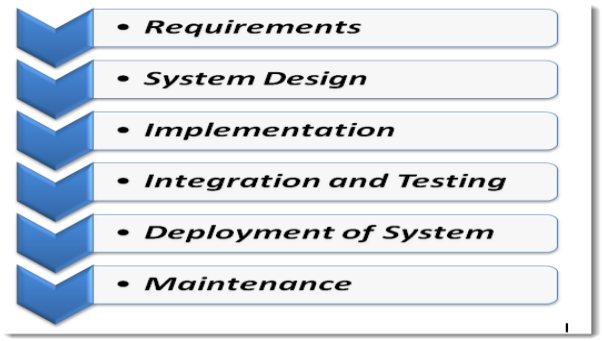


Figure 1-1 Waterfall model

We will use this model because:

- In the waterfall model, all phases are completed separately not overlapped because these phases are executed one by one.
- Waterfall model is successful mainly for the small-scale projects, where all the requirements are very clear to the team.
- This is very simple and easy to control because of the inflexibility of this model.

2. CHAPTER 2

Related studies

2.1. Previous Studies

2.1.1. My Smart School

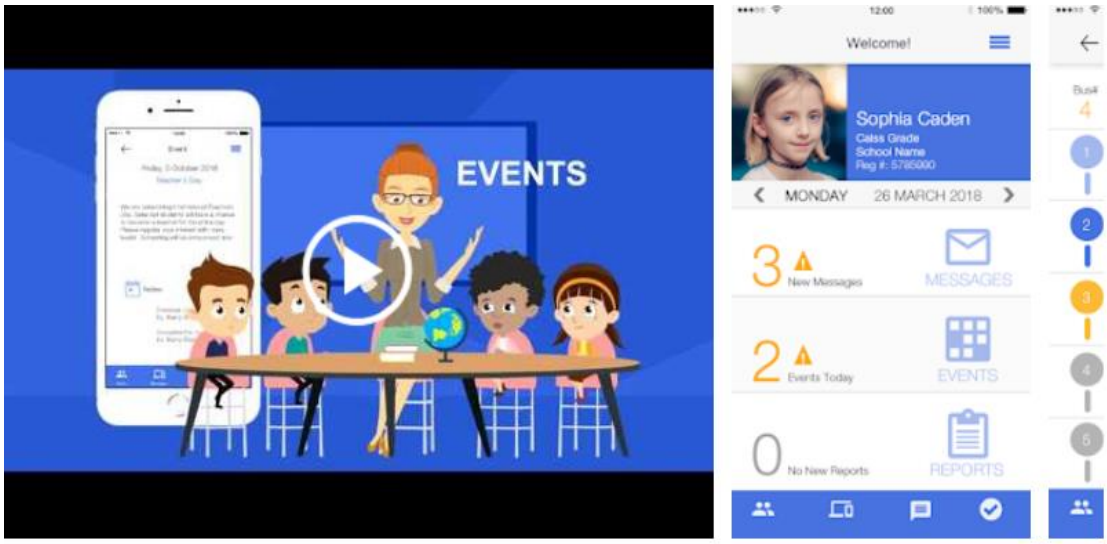


Figure 2-1

A customized school management app that connects all core areas of the institution.

My Smart School is a system to manage school better, improve the academic standards, gain the loyalty of parents, increase the efficiency of teachers and ensure the safety of students.

Schools can register for this service at our website.

Features:

• Messaging with advanced tagging

• Tasks and events

• Easy scheduling

• Fully featured time table

- Auto absent alert
- Real-time reports
- Classroom managing
- Daily activities planner
- Home works and doubt clearing
- Complete school calendar
- Direct circulars and memos
- Transportation alerts
- Transportation managing
- Real-time tracking
- Teacher managing.

2.1.2. Smart School Mobile App

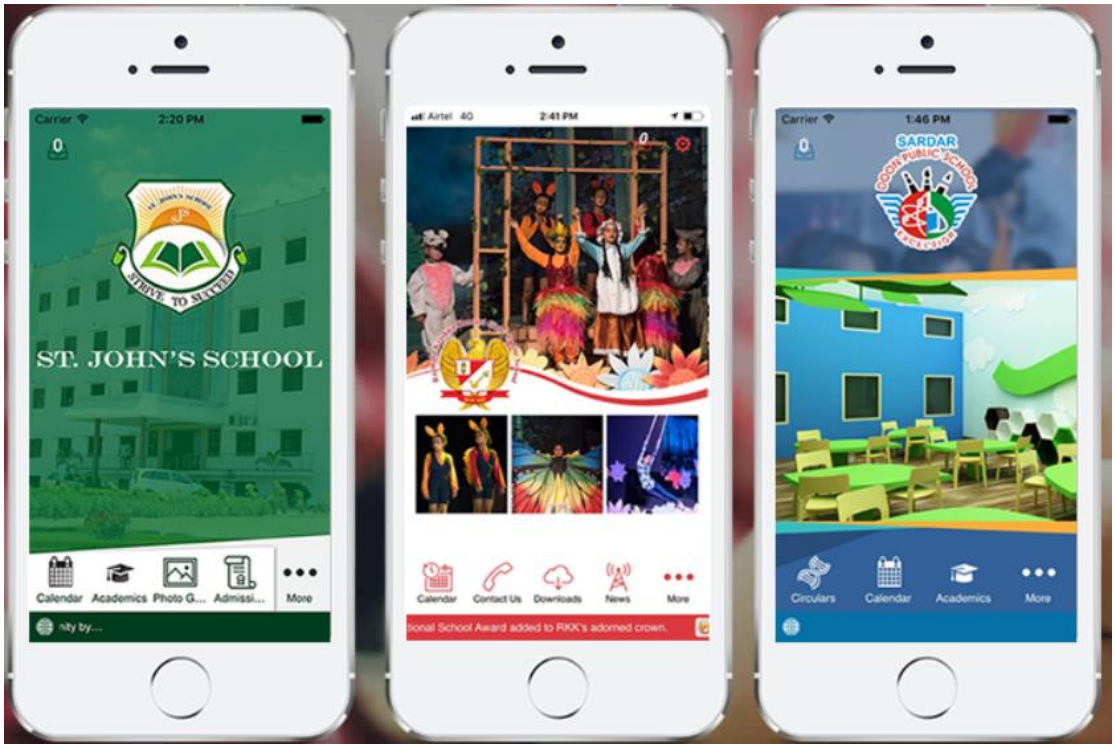


Figure 2-2

The clear and timely sharing of information between schools and their families is vital for efficient and cohesive education. By improving school to parent communication, mobile apps (School Apps) have a host of benefits for both parties.

For Schools

Removes the financial and environmental cost of paper newsletters.

Notes are communicated securely by school staff to the parent via mobile app, removing frustrations of notes being returned late or not at all.

Frees up the time of school staff by reducing phone calls with repetitive and often unnecessary questions.

Helps support and sustain a harmonious relationship with parents.

For Parents

Provides parents with an easy way to know what is going on.

Ensures parents always receive notes.

Reduces ‘bad parent days’ by reminding busy parents about upcoming school events.

Informs parents when events are rained out, avoiding frustration.

2.1.3. School voice

Simplifying communication between schools and parents

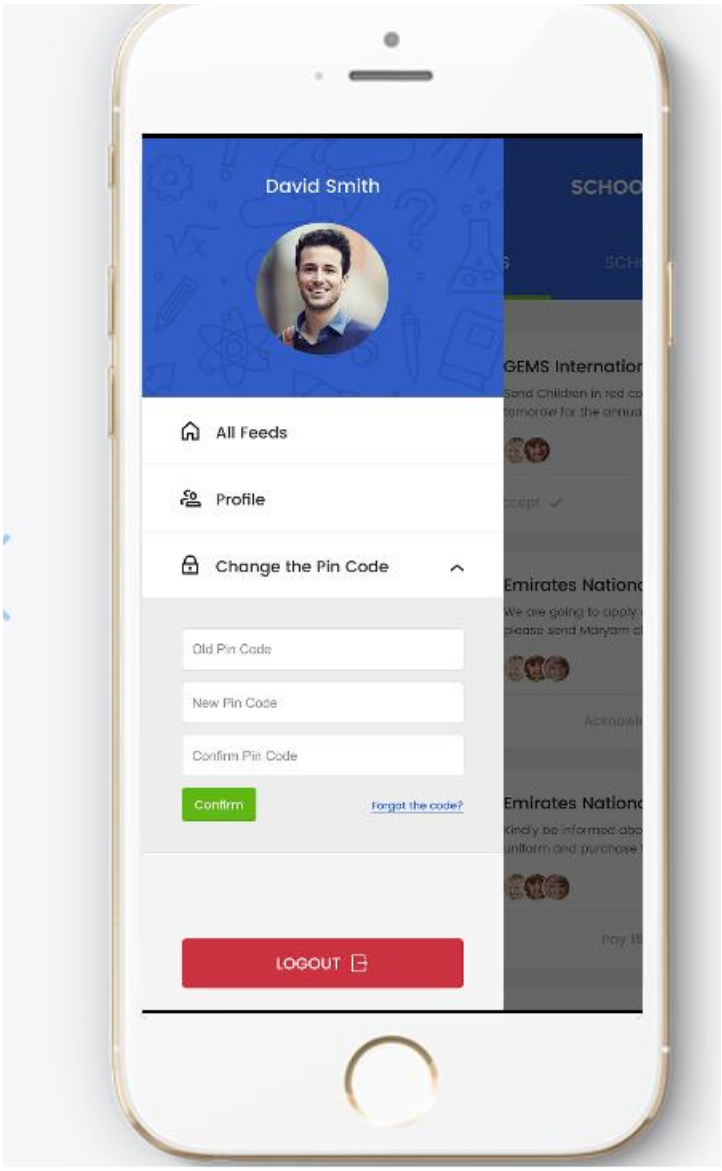


Figure 2-3

2.1.4. Hkt Smart School

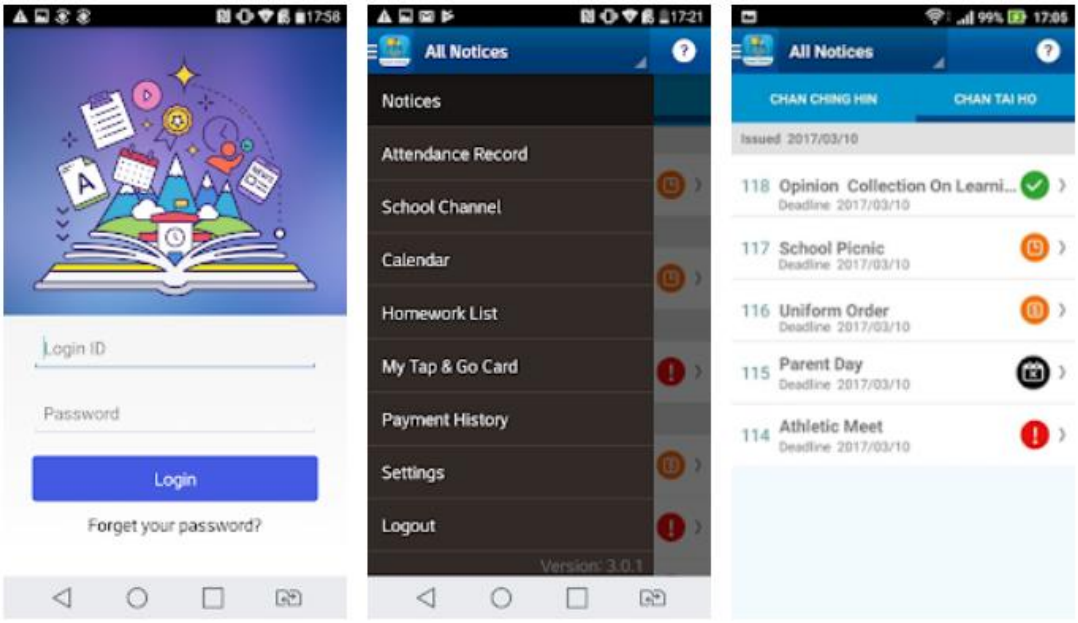


Figure 2-4

HKT education provides a convenient and easy-to-navigate platform for parents of HKTE Smart School partnered schools. You may now view and reply to school's eNotices, eHomework list, and school activities on your smartphone all in one platform.
Ishule App

2.2. Comparative between our system and the related works

After presenting the related works, we can doing the following comparative through the table:

Table 2-1 Comparative table

Service	Our project	My smart school	Smart school mobile app	School voice	Hkt smart school	Ishule App
Mobile Application	Yes	Yes	Yes	Yes	Yes	Yes
Offering wide information about Smart School	Yes	Yes	No	No	No	No
Easy to use by all	Yes	No	Yes	No	No	No
Offering list of services	Yes	Yes	No	No	No	No
Offering financial services	Yes	No	No	No	No	No
Offering conversation with teachers and parents	Yes	Yes	No	Yes	No	No
Saving historical file for the Students	Yes	Yes	Yes	No	Yes	Yes
Its free Application	Yes	Yes	Yes	Yes	Yes	Yes

3. CHAPTER 3

System Analysis

3.1. Introduction

The concept of the project is to easy the operation for study and manage all service in school and transfer all the activities in Scholl to be online Description of Data Flow Diagram (DFD)

3.2Functional and Non-Functional

3.2.1 Functional Requirements

- Super Admin
  - Manage admins
  - Manage students
  - Manage employees
  - Manage accountants
  - Manage fees
  - Manage admission
  - Manage parents
  - Manage teachers

- Admin
  - Manage student
  - Manage parents
  - Manage employees
  - Manage accountants
  - Manage fees
  - Manage admission
  - Manage teachers

- parents
  - pay the fees
  - view the generated report from teachers
- teachers
  - give lessons
  - write report about students
  - connect with the parents and student

3.2.2 Non- Functional Requirements

The non-functional requirement specify the performance characteristic of the system, which are in our system:

- **Reliability**:

  Our application is reliable and it protects all data in the mobile device from an attacker or unauthorized user.

- **Security:**

  The security of our application is to prevent unintended access and resist deliberate attacks intended to gain unauthorized access to information.

- **Usability:**

Our application is easy to use that it has simple pages and links, which enable any user from using it.

- **Maintainability:**

  The application is monitoring to correct any error occurred and making a backup for the database each time.

3.1.1. Data Flow Diagram

Interaction Overview Diagram is one of the fourteen types of diagrams of the Unified Modeling Language (UML), which can picture a control flow with nodes that can contain interaction diagrams. The overview diagram for our system is clear in the following shape: [1]

In this chart, we explain in detail the relationship between the parts of the program that contain four main characters who are the head of the parents, teacher, student and administration.

also explain the relationship that links each of the personalities with the existing system and its role in this system

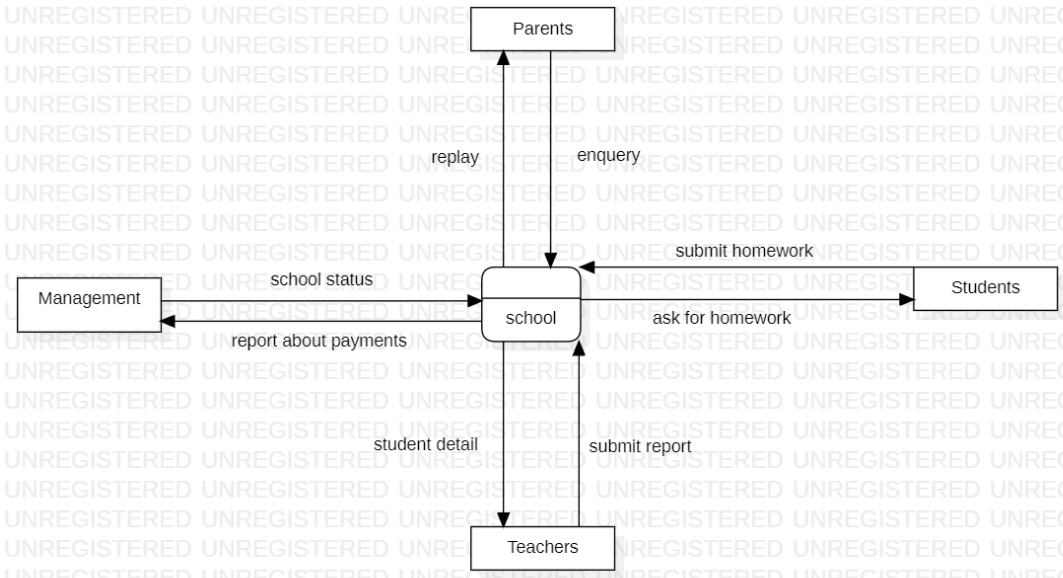


Figure 3-1

3.1.2. Use Case Diagram

2.1.1 Definition

Use case diagram is very important diagram in our system, which explains all users and their special processes, as it is clear in the following diagram:[1]

3.1.2.1. Admin Use Case Diagram

This diagram is detailed diagram for the Admin that he/she can login to the system, manage the Student profile, manage the income, expenses,attendance,examinations,acadmics,library,transport,reports.

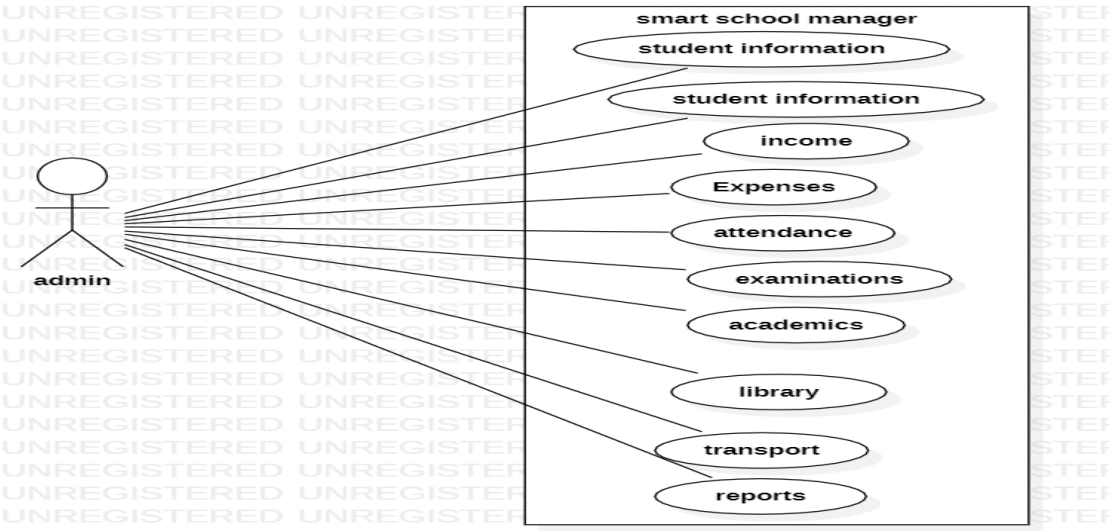


Figure 3-2

3.1.2.2. Student Use Case Diagram

This user can register in the system and manage the special profile, view the fees, do his homework, download from download center , attendance, examinations, library, view his teacher activity, view the subjects, display the transport informations.

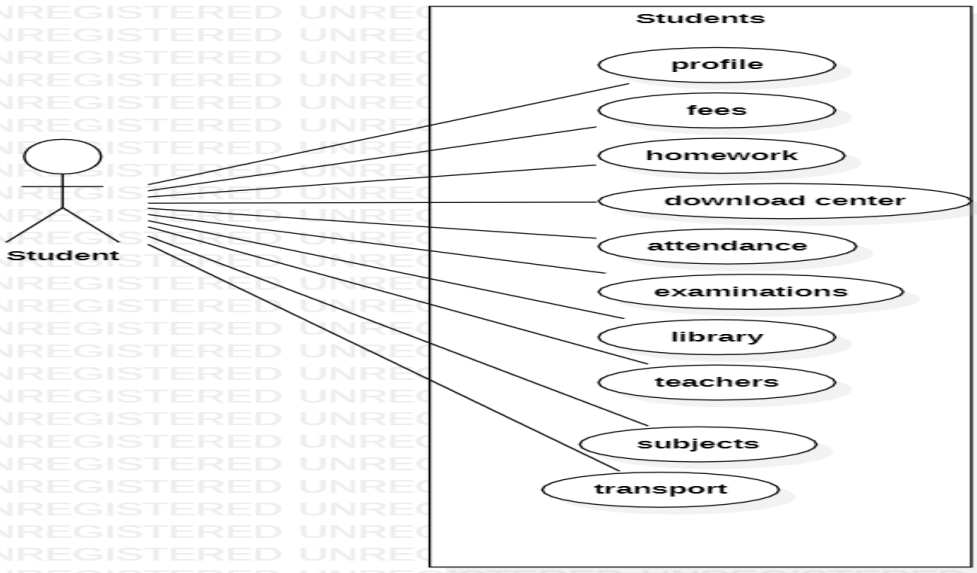


Figure 3-3

3.1.2.3. Parents Use Case Diagram

This user in the administrator in our system that can manage all records related to the student, manage the student account, manage the fees, manage homework, download center, attendance , examinations, library, teachers, subjects, transport, timetable.

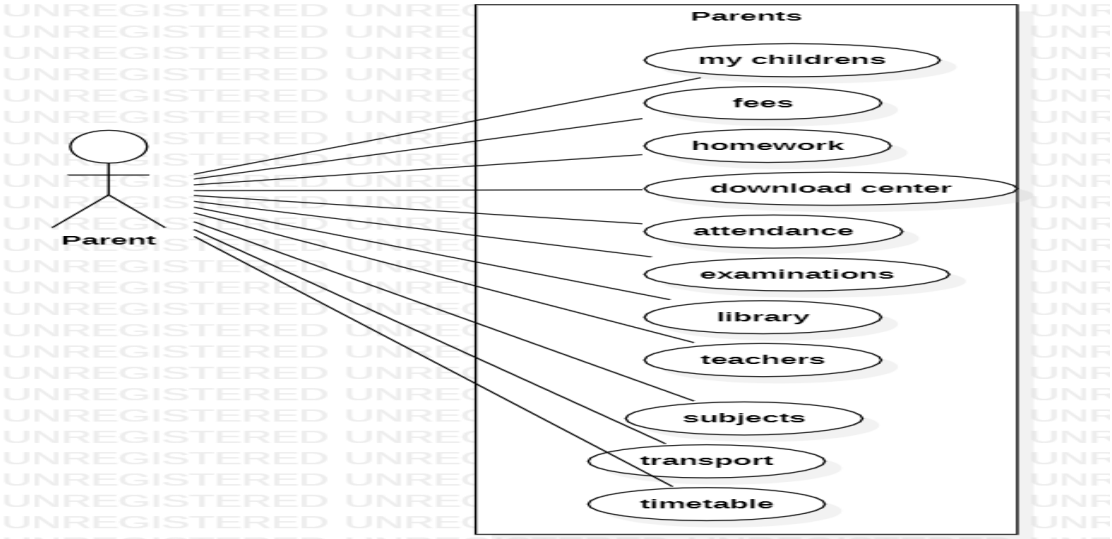


Figure 3-4

3.1.3. Sequence Diagram

In the sequence diagram between our hands, we explain the steps the user takes from the moment he enters the application and performs the registration process and then logs onto the application and requests a service through the application screen that in turn sends data for processing on the server and then connects to the database through the server and then responds to the user successfully Get data or in the event of an entry error and because we have four types of users we have tried to explain in general the roles of users and that the screen that appears to all users is one screen but the powers are changed on it for example the manager logs on to the screen His own and requests statistics on the school and on students who have paid their late fees.

Also on the same screen, the student opens the library and looks at the books there

The accountant also requests the invoices due

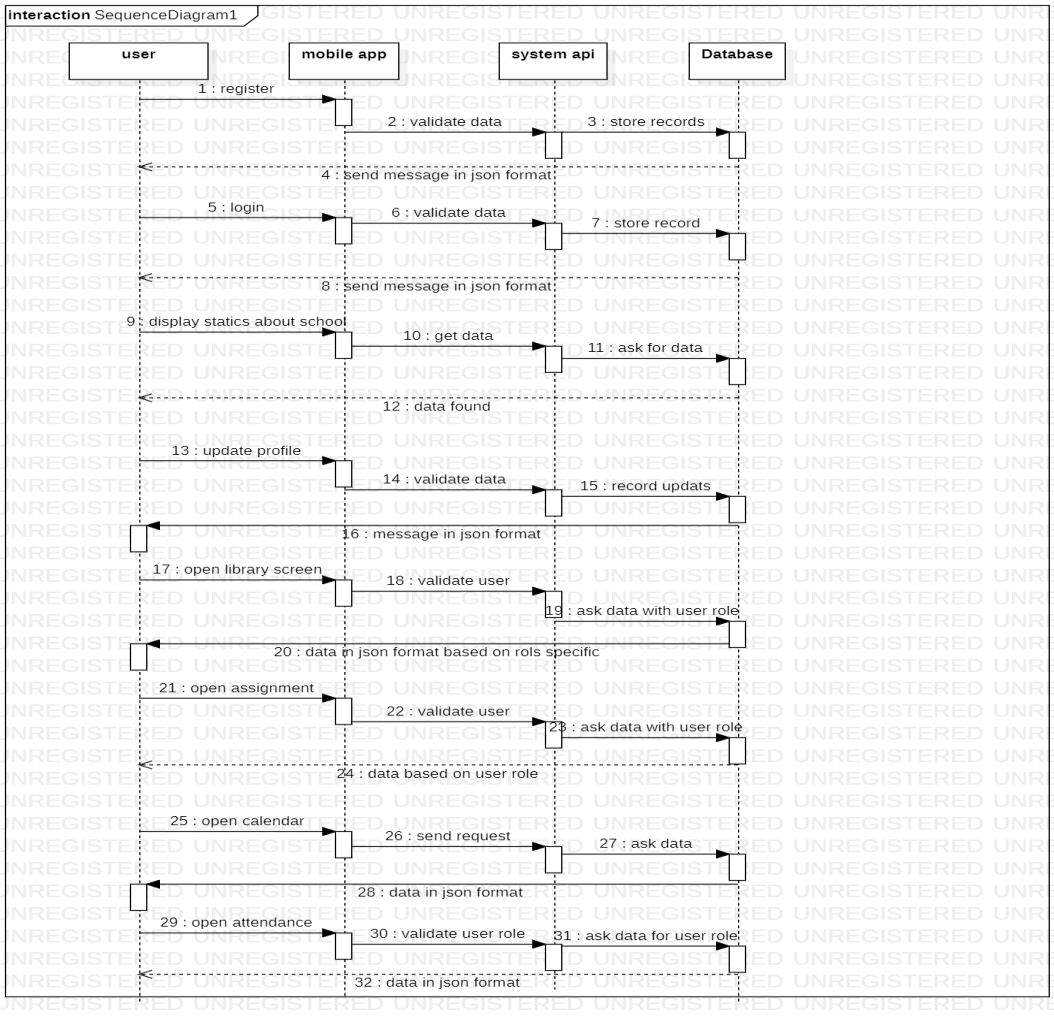


Figure 3-5

Class Diagram

In this diagram, we tried to explain the main relationships and variables within each class, which represents a personality of the characters, and also explain the processes specific to each class, which are briefly represented in:

1) Paretns class
   Include variables :
   Id,name, phone, email, HomeAddress.
2) Mempership_group class

Include variables :

groupID, description, name, allowSignup, needsApproval

3) Students Class

Include variables :

4) Techers class

Include variables :

Id, fullname, gender, Dob, photo, Regno

5) Classes class

Include variables :

Id,name

6) School money class

Include variables :

Id,class, Particulars, total.

7) Timetable class

Include variables :

Id,time_table,class,stream.

8) Subjects class

Include variables :

Id,name.

9) Exams table

Include variables :

Id,subject,student,class,stream,category,marks,term,acadmic_year

10) Event class

Include variables :

Id,name,date,details

11) Bransh classs

Include variables :

Id,name.

12) Class_attendance class:

Include variables :

Id,subject,class,student,reg_no.

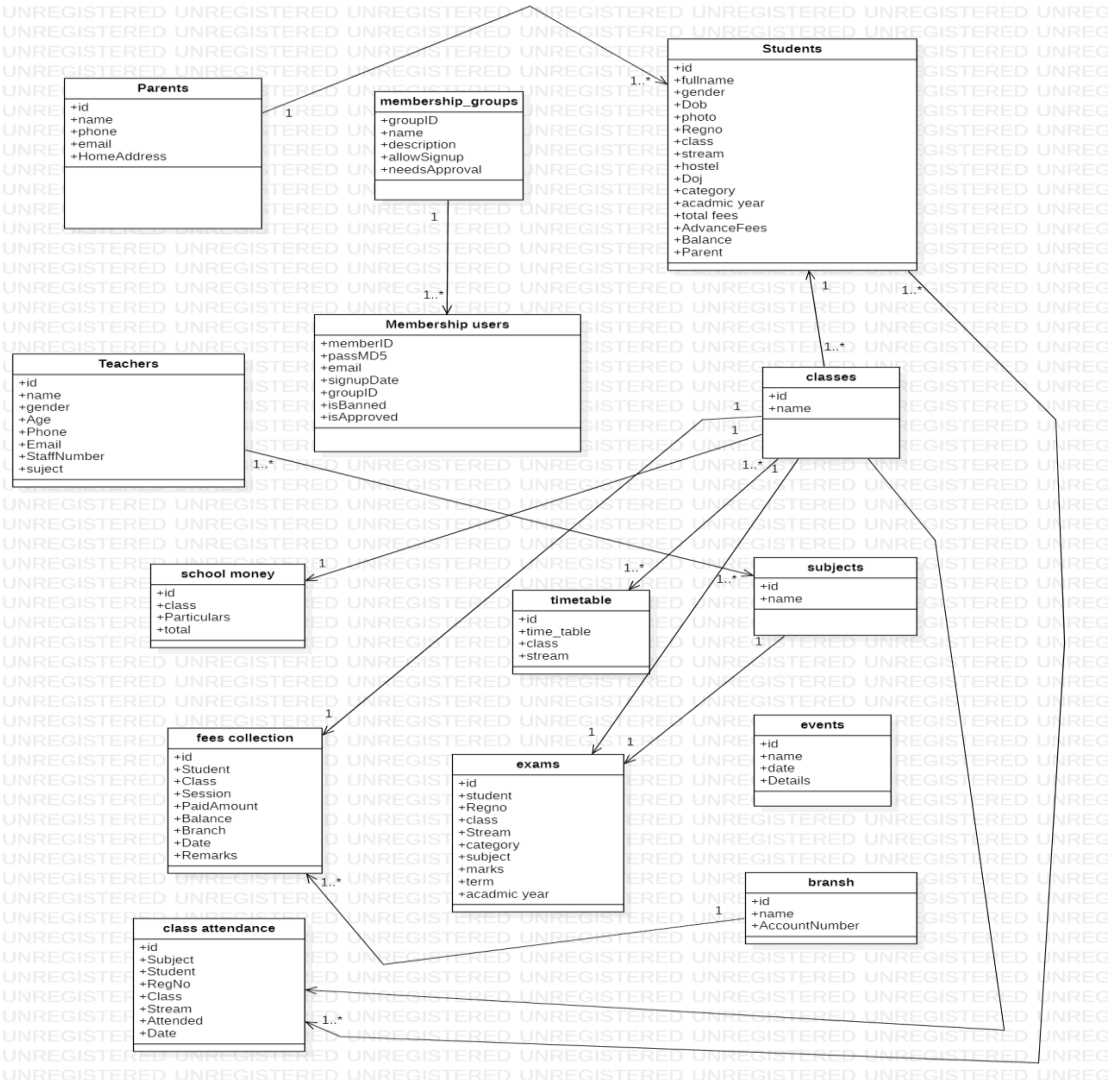


Figure 3-6

3.1.4. ER Diagram

ERD diagram show us all entities with their attributes in our system in addition to the relations between them as follow: [10]

2.1.1 Description of Entities

- Student

  Represents the student of school.
- Parents

  Represents the parent for the student.
- Teachers

  Represents the teacher for student.
- Admin

  Represents the manager of application and school.
- Mempershi_users

  Represents the table where we will save the admins ,accountants ,supervisor .

2.1.2 Description of Relations

- Select

  Relation between Student and Parents (one to many)
- educate

  Relation between teacher and students (one to many)
- chat

  Relation between parent and admins (one to many)
- Practice

  Relation between teacher and parents (one to many)
- Manage

  Relation between admin and teachers (one to many)
- payment

  Relation between parents and accountant (one to many)
- exam

  Relation between teacher and students (one to many)

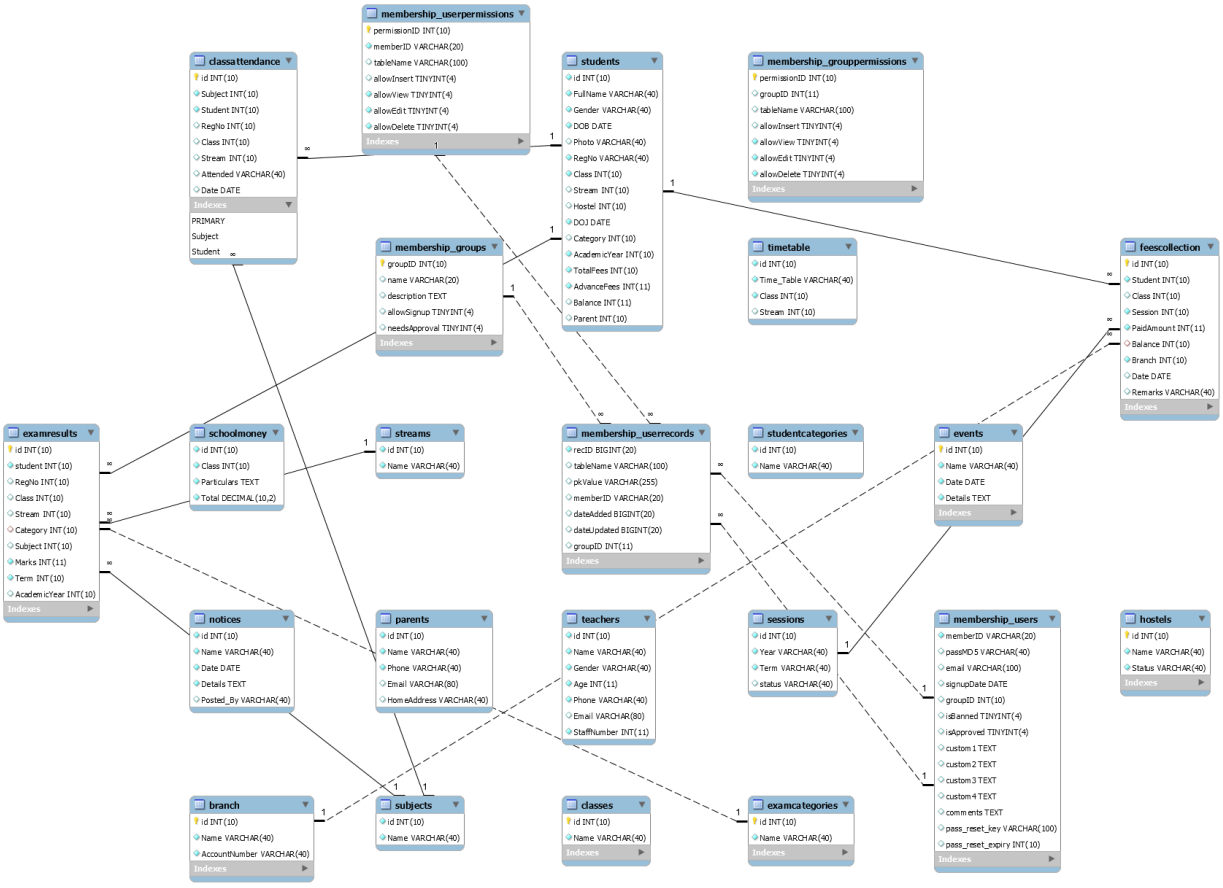
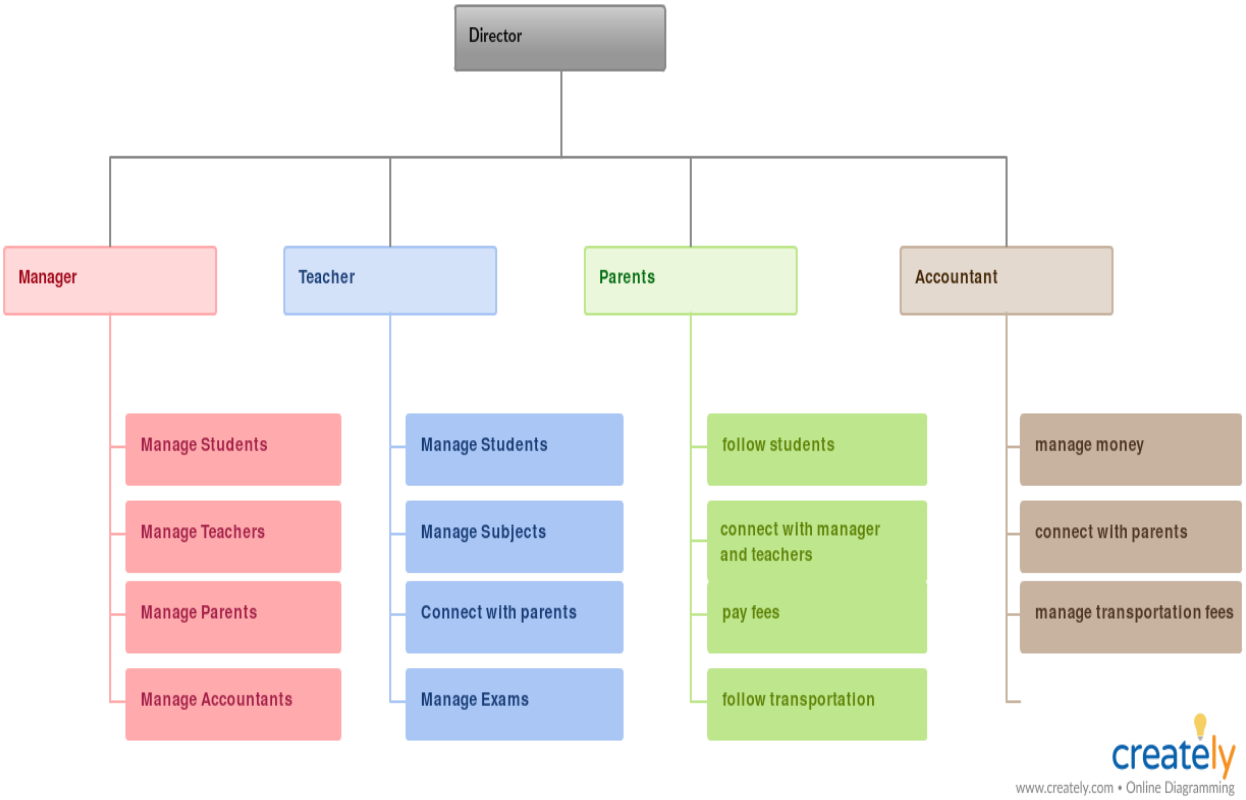

membership_userpermissions
permissionID INT(10)
memberID VARCHAR(20)
tableName VARCHAR(100)
allowInsert TINYINT(4)
allowView TINYINT(4)
allowEdit TINYINT(4)
allowDelete TINYINT(4)
Indexes
classattendance
id INT(10)
Subject INT(10)
Student INT(10)
RegNo INT(10)
Class INT(10)
Stream INT(10)
Attended VARCHAR(40)
Date DATE
Indexes
PRIMARY
Subject
Student
students
id INT(10)
FullName VARCHAR(40)
Gender VARCHAR(40)
DOB DATE
Photo VARCHAR(40)
RegNo VARCHAR(40)
Class INT(10)
Stream INT(10)
Hostel INT(10)
DOJ DATE
Category INT(10)
AcademicYear INT(10)
TotalFees INT(10)
AdvanceFees INT(11)
Balance INT(11)
Parent INT(10)
membership_grouppermissions
permissionID INT(10)
groupID INT(11)
tableName VARCHAR(100)
allowInsert TINYINT(4)
allowView TINYINT(4)
allowEdit TINYINT(4)
allowDelete TINYINT(4)
Indexes
membership_groups
groupID INT(10)
name VARCHAR(20)
description TEXT
allowSignup TINYINT(4)
needsApproval TINYINT(4)
Indexes
timetable
id INT(10)
Time_Table VARCHAR(40)
Class INT(10)
Stream INT(10)
feescollection
id INT(10)
Student INT(10)
Class INT(10)
Session INT(10)
PaidAmount INT(11)
Balance INT(10)
Branch INT(10)
Date DATE
Remarks VARCHAR(40)
Indexes
examresults
id INT(10)
student INT(10)
RegNo INT(10)
Class INT(10)
Stream INT(10)
Category INT(10)
Subject INT(10)
Marks INT(11)
Term INT(10)
AcademicYear INT(10)
Indexes
schoolmoney
id INT(10)
Class INT(10)
Particulars TEXT
Total DECIMAL(10,2)
streams
id INT(10)
Name VARCHAR(40)
membership_userrecords
recID BIGINT(20)
tableName VARCHAR(100)
pkValue VARCHAR(255)
memberID VARCHAR(20)
dateAdded BIGINT(20)
dateUpdated BIGINT(20)
groupID INT(11)
Indexes
studentcategories
id INT(10)
Name VARCHAR(40)
events
id INT(10)
Name VARCHAR(40)
Date DATE
Details TEXT
Indexes
notices
id INT(10)
Name VARCHAR(40)
Date DATE
Details TEXT
Postel_By VARCHAR(40)
parents
id INT(10)
Name VARCHAR(40)
Phone VARCHAR(40)
Email VARCHAR(80)
HomeAddress VARCHAR(40)
teachers
id INT(10)
Name VARCHAR(40)
Gender VARCHAR(40)
Age INT(11)
Phone VARCHAR(40)
Email VARCHAR(80)
StaffNumber INT(11)
sessions
id INT(10)
Year VARCHAR(40)
Term VARCHAR(40)
status VARCHAR(40)
membership_users
memberID VARCHAR(20)
passMD5 VARCHAR(40)
email VARCHAR(100)
signupDate DATE
groupID INT(10)
isBanned TINYINT(4)
isApproved TINYINT(4)
custom1 TEXT
custom2 TEXT
custom3 TEXT
custom4 TEXT
comments TEXT
pass_reset_key VARCHAR(100)
pass_reset_expiry INT(10)
Indexes
hostels
id INT(10)
Name VARCHAR(40)
Status VARCHAR(40)
Indexes
branch
id INT(10)
Name VARCHAR(40)
AccountNumber VARCHAR(40)
Indexes
subjects
id INT(10)
Name VARCHAR(40)
classes
id INT(10)
Name VARCHAR(40)
Indexes
examcategories
id INT(10)
Name VARCHAR(40)
Indexes

Figure 3-7

3.1.5. Structure Diagram



3.2. Conclusion

In this reports we discuss the idea of Application, we explain the problems of the project and determine the solution, and then we draw diagrams to illustrate the stages of work. Our feature work is implementation our application using suitable tools

3.3. References

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Smart School App

1. هل الفكرة قابلة للتنفيذ ام لا

			Response Percent	Response Total
1	نعم		81.13%	43
2	لا		1.89%	1
3	لا اغرف		16.98%	9

Analysis							answered	53
	Mean:	1.36	Std. Deviation:	0.75	Satisfaction Rate:	17.92		
	Variance:	0.57	Std. Error:	0.1			skipped	3

2. بنسبة كم سوف ترشح التطبيق للاستخدم لدى اصدقائك

			Response Percent	Response Total
1	10%		9.26%	5
2	50%		16.67%	9
3	70%		29.63%	16
4	90%		44.44%	24

Analysis							answered	54
	Mean:	3.09	Std. Deviation:	0.99	Satisfaction Rate:	69.75		
	Variance:	0.97	Std. Error:	0.13			skipped	2

3. هل يتشابه التطبيق مع باقى التطبيقات الموجودة

		Response Percent	Response Total
1	نعم	16.98%	9
2	لا	39.62%	21
3	لا اعرف	43.40%	23

Analysis						
	Mean:	2.26	Std. Deviation:	0.73	Satisfaction Rate:	63.21
	Variance:	0.53	Std. Error:	0.1		

answered	53
skipped	3

4. كم تتوقع تقريبا تتوقع نسبة الاقبال على استخدام التطبيق من قبل الطلاب

		Response Percent	Response Total
1	مرتفع جدا	46.30%	25
2	متوسط	46.30%	25
3	ضعيف	7.41%	4

Analysis						
	Mean:	1.61	Std. Deviation:	0.62	Satisfaction Rate:	30.56
	Variance:	0.39	Std. Error:	0.08		

answered	54
skipped	2

5. هل تفضل متابعة ابناءك من خلال زيارة المدرسة مباشرة او من خلال التطبيق

		Response Percent	Response Total
1	زيارة المدرسة	11.11%	6
2	التطبيق	66.67%	36
3	ايهما	22.22%	12

5. هل تفضل متابعة ابناءك من خلال زيارة المدرسة مباشرة او من خلال التطبيق

		Response Percent	Response Total
Analysis	Mean: 2.11 Std. Deviation: 0.57 Satisfaction Rate: 55.56 Variance: 0.32 Std. Error: 0.08	answered	54
		skipped	2

6. هل التطبيق مناسب للاطفال تحت 12 عام

			Response Percent	Response Total
1	نعم		46.30%	25
2	لا		24.07%	13
3	لا اعرف		29.63%	16
Analysis	Mean: 1.83 Std. Deviation: 0.86 Satisfaction Rate: 41.67 Variance: 0.73 Std. Error: 0.12		answered	54
			skipped	2

7. هل يقوم التطبيق بتوفير الوقت والمجهود

			Response Percent	Response Total
1	نعم		79.63%	43
2	لا		9.26%	5
3	لا اعرف		11.11%	6
Analysis	Mean: 1.31 Std. Deviation: 0.66 Satisfaction Rate: 15.74 Variance: 0.44 Std. Error: 0.09		answered	54
			skipped	2