

Design and Development of an Automated School Management System for Kasalu Primary School

By: Vernon Chigwele

Department of ICT

Information and Communications University

Lusaka, Zambia

chigwelev@gmail.com

Advisor: Innocent Nsunga

Department of ICT

Information and Communications University

Lusaka, Zambia

innocentnsunga@gmail.com

ABSTRACT

Design and Development of an Automated School Management System project was the research work developed to help enhance an effective information management system for Kasalu Primary School. The designed system can help bring about a more reliable and effective source of documenting all school activities such as to record pupils, exam results, school fees, classrooms, subjects/courses, timetables, attendance, events/announcements and report generation. In this project one application has been developed that is a web based (thin client), the web application can be accessed on any device provided there is an internet connection and user have access rights. The main aim of this project work was to achieve an effective and efficient way of processing pupil records, school fees payment, exam timetables, subjects, classes, pupil attendance, pupil results and announcements. The development of this project was carried out using PHP, CSS, JavaScript and Xamp server. In conclusion, the result obtained from this project met its intended objectives that include eliminating errors, reduce time consumption, eliminating paper work requirements and cost incurred from the manual system which is not consistence.

Keywords: *Thin-client, automated Database, Xamp, server, HTML5, Javascript, PHP and MySQL.*

INTRODUCTION AND BACKGROUND

Automated School Management System is a system that is developed for schools to manage all school processes ranging from pupil registration, exam time tables, class registers, school fees payments, pupil attendance, exam results, announcements and generating of reports. This system is developed to ensure smooth operation of the administrative management of the school, pupils, parents and members of staff. Additionally, the system is created to solve the problem occurring due to no system to manage the pupil process as outlined above. However, the automated system can solve this problem because of its efficiency and effective to prevent errors and loss of student files.

Kamile Demir (2006) we are living in an information age where many technologic developments have been experienced and the biggest risk that an organization can take is to stay insensitive to change. According to the project study conducted by Nwoke Benjamin O. & Igboji Kingsley O. (2015), education system forms the backbone of every nation; hence, it is important to provide a strong educational foundation to the young generation to ensure the development of open-minded global citizens

securing the future for everyone. Don Passey (2002), ICT is becoming increasingly used in schools and educational institutions, established in professional and classroom practice. Eludire (2011) noted that the data generated by organizations are usually created in files for use by different departments/units within the organization. Vecchioli (1999) noted that organizing and managing student records into a cohesive and efficient system might seem like an impossible task. However, this study was carried out to verify the manual process involved in schools and to seek a way of automating the system for effective operations. Hence, the need to evolve a computerized process that will effectively and efficiently capture all the important data associated with the pupil registration, timetables, pupil attendance, payments, subjects, classrooms and announcements processing within the School.

However, with all this increase in technology, there is need to develop and adopt new systems in schools, systems that integrates interrelated modules and manage the administration of school efficiently. According to Aquino (2005), Computer applications are increasing being developed day by day. Hence, these applications available today can be used in streamlining education-related processes to promote solidarity among students, teachers, parents and the school staff.

Therefore, in order to effectively and efficiently handle these actions one of the major tools is to have automated school management system. Degif Teka (2008), automation is the utilization of technology to replace human with a machine that can perform more quickly and more continuously. And according to the project study conducted by Mr. Aditi Sarker (2016), a school management system is a large database system which can be used for managing school's daily work. Telem (1999) defined school management

system as a management information system designed to match the structure, management task, instructional processes and special needs of the school.

The school management system is used to record student information, attendance, exam results, capture student payments, timetables, classrooms, subjects, events/announcements and managing school resources. However, this system consists of web based (thine-client) application. This shows that the system can be accessed 24/7 on any device provided there is internet connection. The system has the facilities capable of generating various types of reports, which are required by the management during normal business operations to operate the business efficiently and effectively. Such as producing daily reports, preparing timetables and printing of transcripts.

Furthermore, this system aims at eliminating the current manual system of doing things; most Schools in Zambia operate manually starting from student registration, class registers, exam timetables and generation of reports. Nevertheless, the manual system requires more administrative work and consumes more time due to repetition of processes. Tom Cassidy (2005) says that Information and Communication Technology (ICT) is widely believed to be important potential levers to introduce and sustain education reform efforts. Therefore, with this technological advancement there is need to change the way of operations by developing advanced IT driven systems in schools.

Motivation and Significance of the study

This research work critically explores the possible ways of managing academic works effectively and efficiently in a school set up. It enables better management of school administration and processes. The study has

gone a long way to cutting down on time consumption, inefficient use of student data, manual mistakes and duplication done by both academic personnel and staff. This system also ensures security of school records or information, enhance efficient inquiring and query, and assist the school to cope with the daily activities. Additionally, the system increases accessibility and availability of real-time up to date information and cuts down the school management costs such as buying of stationery and office cabinets. The system makes it possible to access and retrieve the required information and activities instantly at one place.

Scope of the study

The scope of this project was limited to the design and development of a web-based school management system for Kasalu Primary School in Nangoma. It focused on Primary and Secondary grades which are from grade one to grade twelve. The system ensures sound planning, good direction and efficient and systematic execution of day to day school management. The system is designed to help management in making workable decisions and strengthen the position of the school. The system benefits the pupils, teachers, parents and administrators of the school.

Problem Statement

According to the research analysis, many schools in Zambia today, school processes are done manually, because many school Managers and Principles have been lacking the opportunity to manage their administrative activities using the technological advancements such as computers and internet. According to Powell (2005), "Lack of information breeds analysis paralysis". The manual process is time consuming and the possibilities of errors are

very high, sometimes loss of important documents. The manual system requires more manpower, large storage spaces, very difficult in retrieving, and updating of records and it is very costly to manage. Additionally, release of student results is a challenge and takes more days in the manual system and there are always clashes in the scheduling and release of the academic calendars and examination timetables. Lastly, with the manual system, sensitive information can easily be accessed by everyone due to lack of security; security is limited to physical controls. However, the developed system reduces administrative work, saves time, and reduces the errors that include loss of information and errors that occur on student records. Pegler (1992) School Management System both meets the demands and expectations of its inner the teacher, student and outer members; and ensures that school activities are arranged accurately and on time.

Aim of the study

The main purpose of this study was to design and develop an automated school management system for Kasalu Primary School that is able to handle and manage the activities that take place in a school set up in an efficient and reliable manner. The system has been developed which is easy to use (user friendly) and easy searching (availability).

Objectives of the study

1. General Objective

To Design and develop an automated school management system for Kasalu Primary School.

2. Specific Objectives

In order to attain the general objective, the following are the specific objectives;

- i. To investigate the methods and operations used in an existing system in

order to arrive at vital and relevant facts to assist in the design and development of the new system;

- ii. To investigate security weaknesses in the current system and come up with the best recommended security measures;
- iii. To develop a system that is able to keep the records of the pupils and the entire school data and information in a secure place;
- iv. To develop a reliable and user-friendly system to ensure only authorized persons have access to the system.

Research Questions

The study was guided by the following research questions:

1. To what extent does the current school management system impact the day-to-day school activities?
2. What actions should the school take to ensure smooth, efficient, secure and reliable operation of day-to-day school activities?
3. What is the most significant effect of managing school management processes manually?
4. To what extent does the current system impact the pupils, parents, teachers and administrators work performance?

Summary

Design and development of an automated school management system is a web-based system which can be used for managing school day to day activities. It allows users to store almost all of their school's information online, including pupil's information, teachers, parents and administrators. Most importantly, this system

can be accessed 24/7 everywhere with authorized users, records can be searched, and reports can easily be generated. It reduces paper-work requirements and manpower. Using this system, finding pupil's information is just less than a minute which might have cost several minutes even more than a day in the manual system. It is secure, accurate, cost effective and user friendly.

METHODOLOGY

A. Introduction

Systems Development Life Cycle (SDLC) is a software development process. It provides a consistent framework as the task and deliverables needed to develop a system. An SDLC should result in a high-quality system that meets or exceeds customer expectations, within time and cost estimates, works effectively and efficiently in the current and planned information technology infrastructure, and is cheap to maintain and cost-effective to enhance. SDLC is the most suitable methodology for this system and the model that has been used is the RAD (Rapid Application Design) model. In Automated School Management System, the system development life cycle (SDLC) method has been selected to make sure the project will do properly. In this project five stages of process have been used. They are identification, planning, analysis, Design, implementation and testing.

B. Data collection

There are different approaches when it comes to data collection, the type of approach depends on the nature of the research being conducted. However, in this project, the methods of data collection adopted include the following: World Wide Web, Interview, Consultation and

references to published and unpublished collection. Nevertheless, the data collected for this research work can be broadly classified into two types, namely: the primary and secondary data.

Primary data is the data collected directly from respondent relevant to the subject under investigation. The primary data used in this case is interview method according to Enr. D. O Dimoji (2009) says that primary source data collection is the data obtained from the source or firsthand information. The tools for gathering the primary source of data collection include; interview, observation and questionnaire. However, in this research the interview approach was used.

The oral interview, questionnaires and observation method were used by consulting of teachers, pupils, parents and downloading of information via website to investigate the system. The oral interview and distribution of questionnaires was conducted in this school which involved about 5 teachers, 5 parents and 50 pupils.

The secondary sources are source of data collection in which an already made data have been obtained that is already in printed form. Sources of secondary data include; textbooks, magazines and journals in the case of this project, most of the data are published, documents and references.

The required data including grades, subject details, pupil personal details, timetables, payment details and announcements were collected. However, the data collected would help identify attributes, relationships, classes, entities/objects that describe, relate and interact with the system.

The researcher also took time in studies of the academic operation of Kasalu Primary School which is the manual system. All the processes were also studied. Data were collected from the

pupils, parents, teachers and school administrators which formed the basis for the data analysis.

C. Research Approach

The Scheme of work creation and management system use RAD (Rapid Application Design) methodology. James Martin (1997) Rapid Application Development (RAD) is a development lifecycle designed to give much faster development and higher-quality results than those achieved with the traditional lifecycle. It is designed to take the maximum advantage of powerful development software that has evolved recently. However, this methodology method follows the System Development Life Cycle (SDLC) in a sequential and structured way. RAD is a methodology for compressing the analysis, design, build, and test phases into a series of short, iterative development cycles. This has a number of distinct advantages over the traditional sequential development model. Iteration allows for effectiveness and self-correction.

RAD projects are typically operated with small-integrated teams comprised of developers, end users, and IT technical resources. Small teams, combined with short, iterative development cycles optimize speed, unity of vision and purpose, effective informal communication and simple project management. Figure 3.0 shows the RAD model.

Furthermore, Rapid Application Development has four essential aspects: methodology, people, management, and tools. If any one of these ingredients is inadequate, development will not be high speed. Development lifecycles, which weave these ingredients together as effectively as possible, are of the utmost importance. Figure 3.1 shows the Essential aspect of RAD.

D. System Design

Data Design

The data design specifies all the inputs, outputs and stored files that the system accepts. This gives the specification of the structure of the data that should be input into the system and the output that is expected from the system. This is conducted via a framework, which in this case an Entity Relationship Diagram was used to show the entities and attributes and how these entities are related to each other. Entity Relationship Diagram starts with identifying the entities or objects that comprise the system and identifying which kind of data will be collected about such entities and then identifying relationships among them. The database is a relational database that comprise of tables with each table having field names, type field and the size of the field. Some of the major entities were identified as the ones required for the system: admin, teacher, pupil, parent, attendance and class.

Table 3.4, 3.5, 3.6, 3.7, 3.8 and 3.9 shows the attributes of the data structures.

E. Physical Design

The system resides on the web server which sends data that is stored by the database and retrieving data from the database. The client's machine either the Laptop or a desktop have the browser which is used to access the system through an internet connection as shown in figure 3.2.

F. Logical Design

A logical design is a more detailed design which includes all major components and entities plus their relationships. The data flows and connections are detailed in this stage. The target audience is typically developers or other systems architects. However, it is possible to

create logical designs for business purposes to ensure that all components and functionality is accounted and well understood. Logical designs do not include physical server names or addresses. They do include any business services, application names and details, and other relevant information for development purposes. The system uses the flow charts method to show the logical design of the components of this system. The Automated School Management web-based System was designed and developed using a top down approach. Figure 3.3 shows the various modules which constitutes the system.

G. Interface Design

The user Interface is the means in which a person interacts or controls a software application or hardware device. This design involves the design of websites, computers, appliances, machines, mobile applications and so on with the focus on the user's experience and interaction. The goal of user interface design is to make the user's interaction as simple and efficient as possible. The website's application's user interface shall be as user friendly as possible. The aim is to produce a simple to use interface but packed with all the basic functionality.

The interface has the following further characteristics:

- A clear and easy-to-follow navigation system, that allows the user to access various parts of the application, and further, allow them to know where he/she is at any particular time.
- A neat appearance, that pleasing to the eyes.
- An attribute of attractiveness—visitor should be drawn to the site and fall in love with it at a glance. Because everything is in its place.

H. Security Design

Each user is provided with a unique username and password that gains them access to the system. Depending on position, rights on the system differ from user to user so as to enforce security. When a user enters login details, the system has to compare the details with those stored in the database, if they match, access is granted, and if they are no match access is denied. Figure 3.4 shows the flow chart.

I. User Interface Design

All the users need to have the login credentials for them to access the system (Automated School Management System). The login credentials are given to them by the admin when the account has been created. Note that the system uses only one login form in order to grant access to the different users of the system. This simply means that the administrators, teachers, pupils and parents all use the same login form in order to access the system. Figure 3.13 shows the flow chart and login page that is used for authenticating users that want to access the system.

Furthermore, the system makes use of user authentication mechanism to ensure that only authorized users are granted access to the system. The system enables a mechanism that makes sure that only users with authorized access are able to access the system and that they are only able to access part of the system that pertains to the kind of work they are required to do. The school administrators, teachers, pupils and parents will only view parts of the system according to their kind of access they are given.

RESULTS

The system has been designed and developed which can run on the server/computer with the network connectivity to the client systems. The

database has been created using Xampserver and web pages using PHP, the data is stored in database tables, users are able to key in data to tables through the forms which have been designed for this purpose, and these forms are the interface between users and the database. The forms run in web browsers, preferably internet explorer, Chrome or Mozilla Firefox.

To run the automated school management system, you need to open the web browser of your choice, then, type the path of the location where the application is located in the address bar in this case it is: localhost/sms. When the page successfully opens, the user will be required to login depending on the type of a user as shown in figure 4.0.

DISCUSSION

The Automated School Management System is an economically suited software management tool that is aimed at bringing efficiency in the education system. The results that have been obtained show that the system was successfully designed, developed and found to be working as planned.

The designed system satisfied user objectives and can be fitted easily into the current manual school management system. Moreover, the solution is operationally possible to work and it can not cause any problem under any circumstances because it does not require any expert knowledge to interpret results. Economically, Automated School Management System is feasible in that the cost of development is very minimal compared to the financial benefits of the application. All the technologies required to develop the system are readily available.

However, this system can give guarantee of accuracy, ease of use, reliability and data security. Additionally, once the system is in operational the school no longer needs the current manual system which is more

susceptible to errors. With minimal human interference, all school activities are completed, hence, a great financial saving resulting from reduction in manpower.

System Implementation Results

System implementation involves all the activities starting from the installation of the new system, in order to implement the full operation.

1. Programming Language and Program Design

The programming language used in this project is HTML, PHP, JAVA SCRIPT and adobe dreamweaver, while the backened database is XamppServer. The selection is as a result of its flexibility when integrated with PHP, HTML helps in the web and interface design. The system was designed in models which is the structure it should be. The source and object code are provided in appendix column.

2. Program Testing and Debugging

Debugging involves the identification and removal of bugs from the system. Programs are typically integrated in a top down incremental fashion for ease of testing. However, in project the system needs to adequately evaluate for accessibility. On the other hand, consultant and lab technicians can also be hired to perform user testing depending on affordability. The system should be checked constantly once it is running. The list of each page has to be kept for backup. Data need to be updated constantly, should come up with the calendar and that someone should be put in charge of updating information. Additionally, ways to improve the system should put in place. Constant check on users should be implemented. This will help to evaluate whether the system is user friendly or not.

3. Staff Training

The training should include the administrators, teachers, parents and pupils as a whole. The training should also be designed to help teachers to meet their demands. Additionally, resource allocation to teacher education should be directed towards educational activities such as information security, policy and strategy.

- **SECURITY:** The implementation of this system introduces several user securing concerns. Therefore, it is a must that the system should have the following components; availability, confidentiality and integrity at all times.
- **POLICY:** The school security policy has to be defined as acceptable behavior regarding information security and what response will be to violate that behavior. All the users must be educated on the policy and agree with its guidelines. The security policy has to be reviewed frequently to reflect new technologies and applications.
- **STRATEGY:** This includes user authentication (username and password), Access control (TCP/IP port verification) and Data concealment (Encryption).

4. Change over Procedure

Traditionally, it is advisable to run the old information system alongside the new system at the same time until management decides that the old system be discarded. This procedure would ensure that the school activities are not interrupted and that all the information is captured and stored in the new system.

5. System Evaluation and Maintenance

System maintenance is the process of monitoring, evaluating and modifying a system to make desirable changes. System maintenance involve the constant review of output from the

system and updating its format as well as the need of the changing the current situation. Therefore, evaluation ensures improved performance and great efficiency. If the system performance is below the desired standard set in the design. Then, it will need to identify the faults by the application of relevant maintenance methods.

6. Documentation

Documentation it is the detailed information about a systems design specification, its internal workings and its functionality. It includes information on how to use the system and how it works.

Installation

Download Wampserver from using this link <http://www.wampserver.com> and install the software on a local Computer. When the installation is done, copy the project folder named (sms) and paste it into My Computer > Local Disk (C:) > Wamp > www.

Run Wampserver as admin and go to the web browser search for(<http://localhost/phpmyadmin>). Go to databases and create database name (pro_sms) and import the sql file named pro_sms into the newly created database.

You can now go to the web browser and search for (localhost/sms), the system will open and prompt for log in details as shown in the figure below. Note that the log in details have been provided in the file named: user names and passwords.

CONCLUSION

This paper has helped to promote the importance of an automated school management system in schools, because it enables the process of capturing, storing and retrieval of academic information instantly at one place. Automation

of this process reduces the time consumption, human involvement and mistakes that could occur while making use of the manual method.

The developed application utilizes a web-based interface which can be accessed anywhere at any time provided there is internet connection. The application was successfully designed, developed and found to be working as planned. It is able to store and retrieve academic records with high speed and accuracy, and producing useful information to the users. The qualities of this application are; the reduction in the cost of buying record books and papers, reduction of man power and infrastructure requirements, reduction in the time spent in the computation of pupil's grades and the elimination of errors.

The system runs on any web browser such as Mozilla Firefox, chrome and internet explorer. It is very secure, it enforces data integrity from the use of a relational database management system, and the system also minimizes data redundancy and is user-friendly.

This chapter summarizes the research in automated school management system for Kasalu Primary School. The literature shows that an automated school management system can be a useful tool in educational management. Schools use SMS in various ways to enable and speed up administrative decision making. However, in this project an automated school management system has been developed that facilitates the various activities taking place at school. The pupil's data and information obtained can be captured, saved and accessed at any time.

Therefore, it is highly recommended to have automated school management system, the system that enables administrators, teachers, pupils and parents to get the required information without delay. This system is essential for schools to reduce workload. The developed system consists of a web-based

application that can be accessed on any device connected to the internet anywhere. When proper planning and management is followed, this application can be a valuable resource to many, ranging from teachers, parents and local school officials to researchers and policy-makers. Besides this, the design and implementation are made only once, therefore, it is important to note that some aspects of planning and management are recurring and must be reviewed regularly to ensure long-term effectiveness. Care must be taken into consideration each time data is entered into the system in order to promote data integrity. On the same note, security measures must be continuously updated and monitored to ensure that confidentiality of school record is maintained. The review of users will be reviewed on a periodic basis to ensure that the system is meeting the needs of the users.

Automated school management system is meant to help school administrators to automate pupils' record and to make permanent workable decisions at the same time protecting confidential information. The data structures are used to implement the timetable designed. Moreover, the prototype has been tested with data from Kasalu Primary School to ascertain proper functionality. It showed that the system effectively registers pupils, tabulate pupils' marks, stores parental information, retrieve information about a pupil and generates the reports such as pupil attendance and exam results.

Therefore, the study was able to achieve the stated aim. It was able to address the issue delay

inefficiency and inaccuracy of data processing and information storing, accessing, retrieving and editing.

Future works

Owing to some problems and limitations beyond the research's control, I therefore suggest that future research should be made both windows based and web based automated school management system. Also, the system should include electronic learning, library management system and the system should as well allow online payments.

ACKNOWLEDGEMENT

My humble appreciation goes to God who made it possible for me to complete this project and the program for which it was undertaken. I would further express my deepest gratitude to my supervisors Mr. Innocent Nsunga, Mr. Lameck Nsama and Ms. Silvia Nanyangwe for their tremendous support, guidance, and continuous enthusiasm and encouragement throughout the project. I would also like to extend my sincere thanks to my colleagues, members of staff and Pupils at Kasalu Primary School for their cooperation by sharing and contributing the information that made this project a success. Finally, I want to thank my family more especially my wife, who also played a part by giving me suggestions, supports and corrections throughout the project. To God be the glory.

TABLES AND FIGURES

Tables

Options	Response	Percentage %
Manual	50	100.0
Automated	0	0
Total	50	100.0

Table 3.0: Mode of Operation

Source: Kasalu Primary School - field survey

Options	Response	Percentage
Very efficient	5	10.0
Efficient	15	30.0
Faulty	30	60.0
Total	50	100.0

Table 3.1: Efficiency of the mode

Source: Kasalu Primary School - field survey
2019

Option	Response	Percentage
Yes	15	30.0
No	25	50.0
Indifferent	10	20.0
Total	50	100.0

Table 3.2: Awareness of Automated School Management System

Source: Kasalu Primary School - field survey,
2019

Option	Response	Percentage
Easy Access	6	12.0
Efficient	8	16.0
All of the above	36	72.0
Total	50	100.0

Table 3.3: Anticipated Benefits of Automated School Management System

Source: Kasalu Primary School - field survey,
2019

Attribute Name	Data Type	Size
Admin_id	int	11
name	Longtext	
email	Longtext	
password	Longtext	
phone	Longtext	
address	Longtext	
owner_status	int	11
username	Longtext	
status	int	11
birthday	Longtext	

Table 3.4: Admin Table

Source: Svsstem Database

Attribute name	Data Type	Size
teacher_id	int	11
name	Longtext	
birthday	Longtext	
sex	Longtext	
address	Longtext	
phone	Longtext	
email	Longtext	
password	Longtext	
salary	Longtext	
username	Longtext	

Table 3.5: Teacher Table
Source: System Database

Attribute Name	Data Type	Size
Attendance_id	int	11
timestamp	Longtext	
year	Longtext	
Class_id	int	11
Section_id	int	11
Student_id	int	11
status	int	11

Table 3.7: Attendance Table
Source: System Database

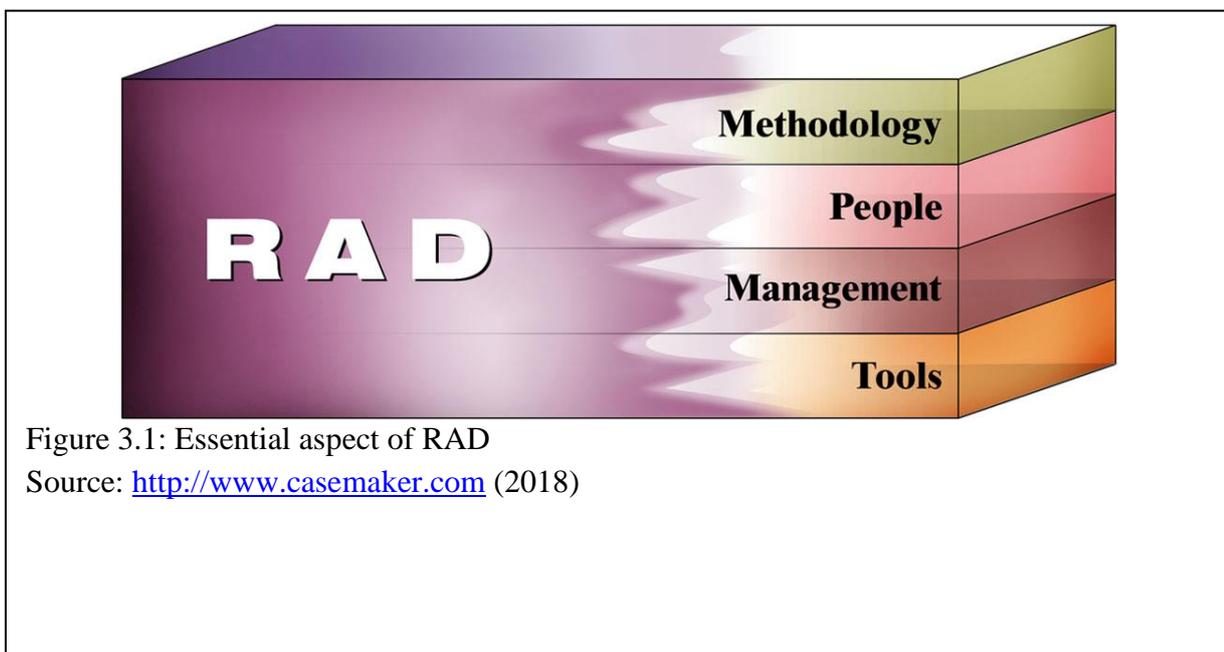
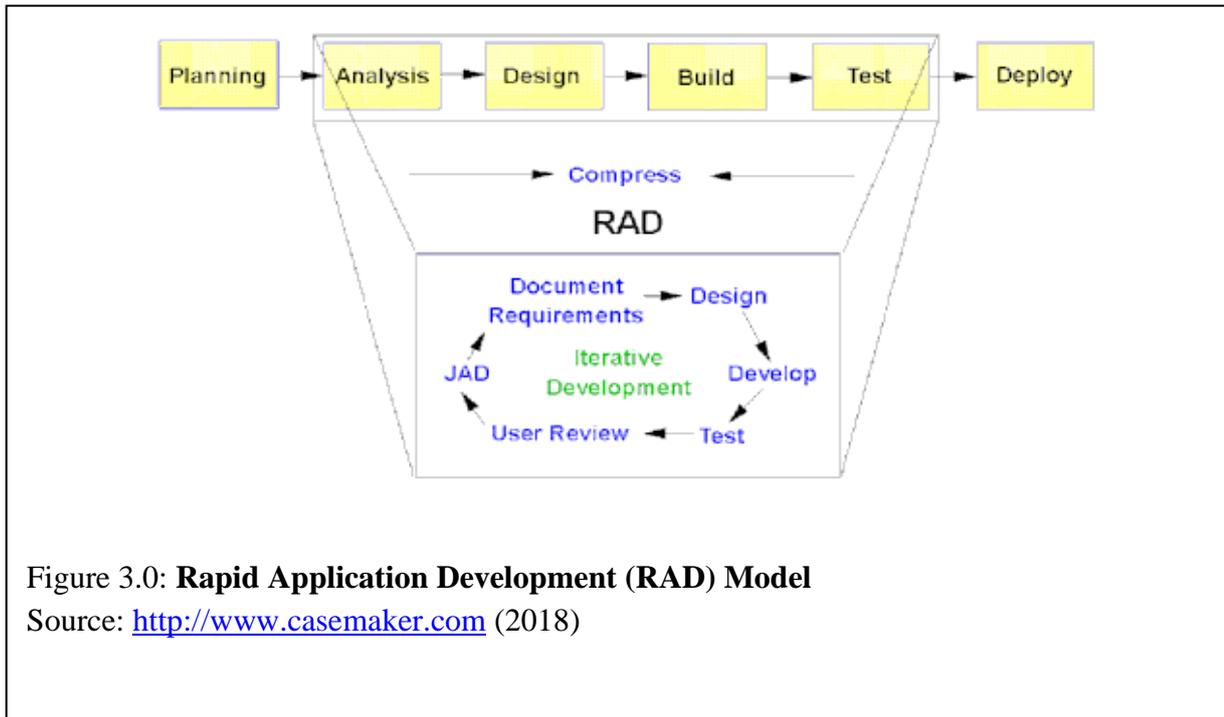
Attribute Name	Data Type	Size
Parent_id	int	11
name	Longtext	
email	Longtext	
password	Longtext	
phone	Longtext	
address	Longtext	
profession	Longtext	
username	Longtext	

Table 3.6: Parent Table
Source: System Database

Attribute Name	Data Type	Size
class_id	int	11
name	Longtext	
Name_numeric	Longtext	
Teacher_id	int	11

Table 3.8: Class Table
Source: System Database

Figures



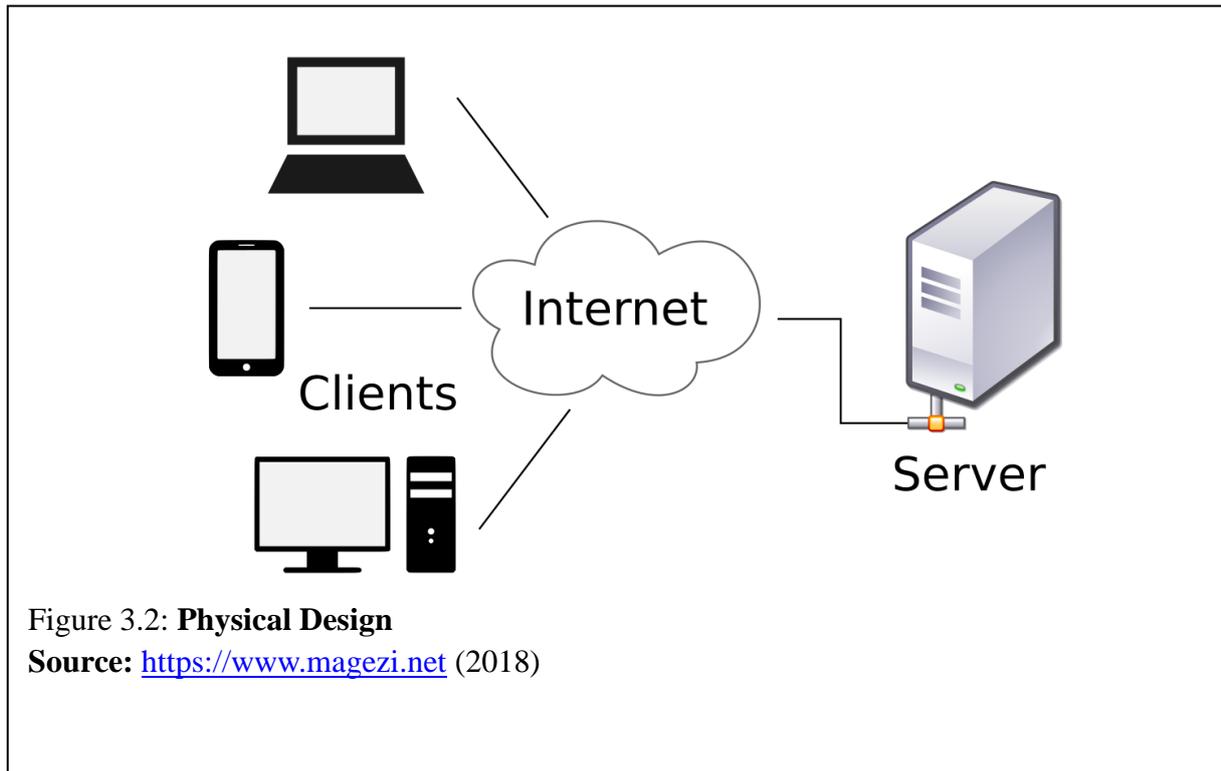


Figure 3.2: Physical Design

Source: <https://www.magezi.net> (2018)

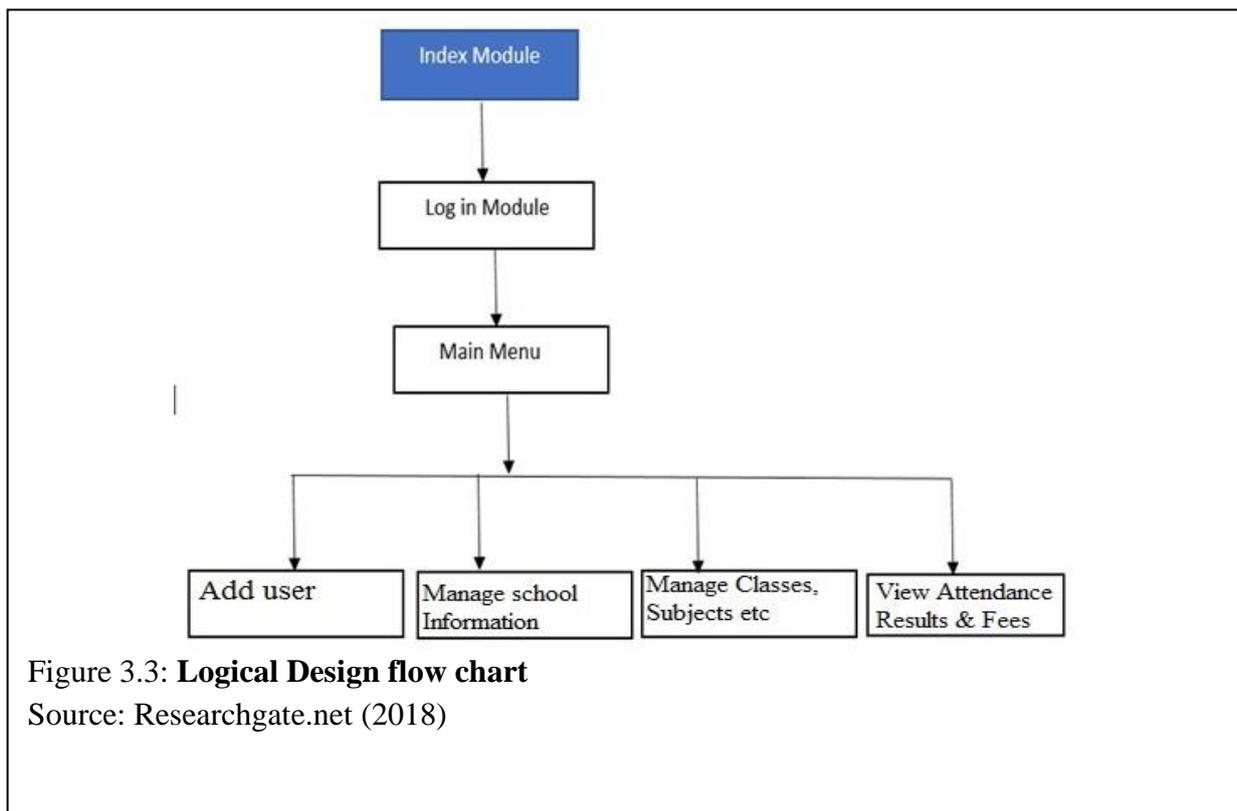
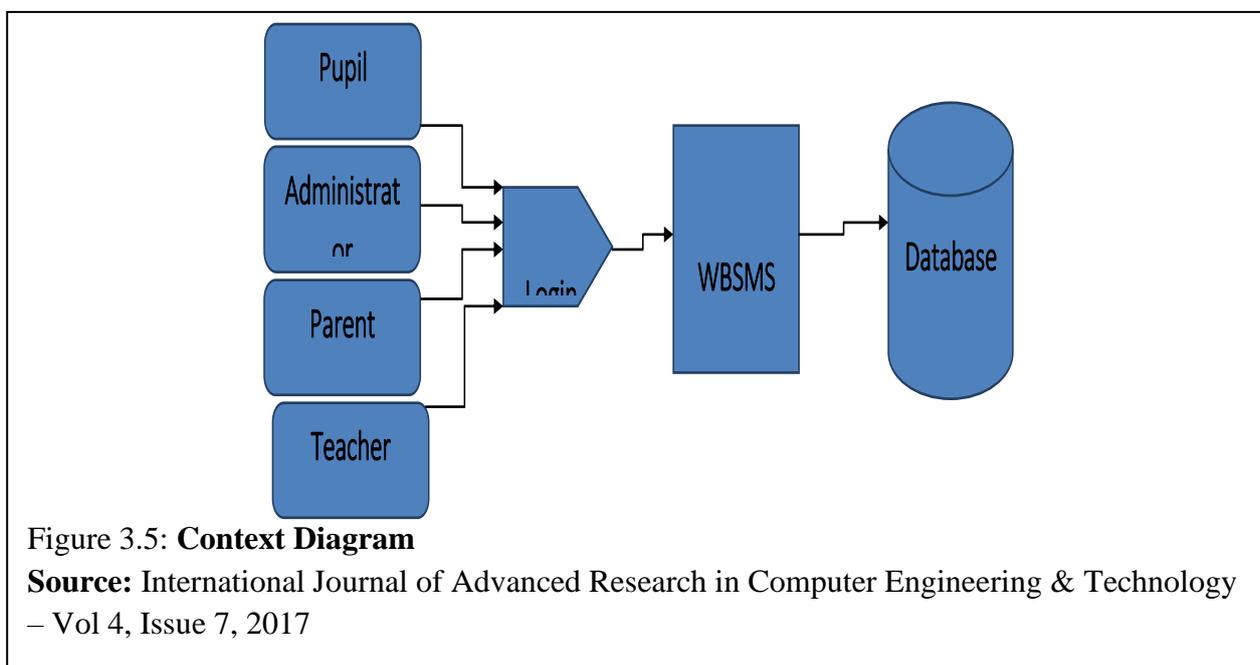
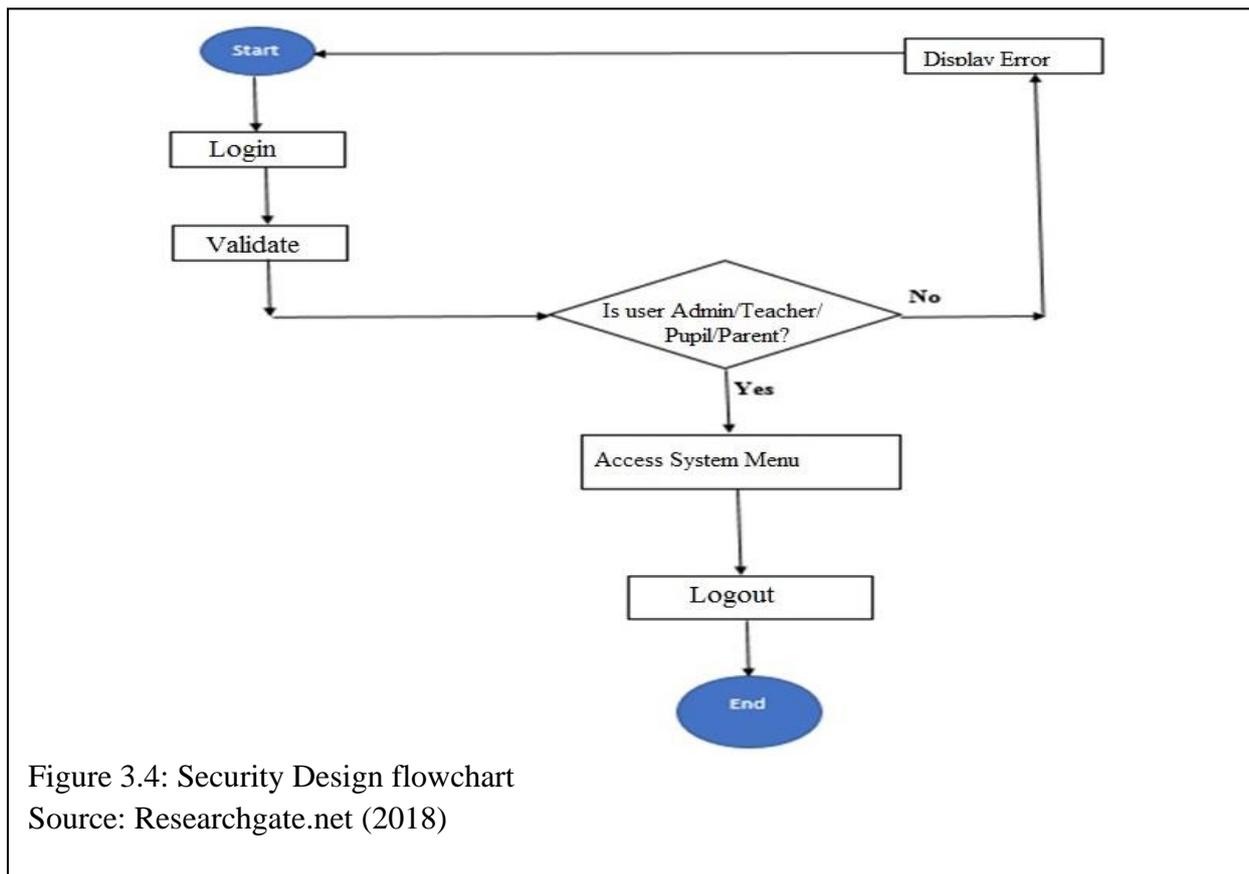


Figure 3.3: Logical Design flow chart

Source: Researchgate.net (2018)



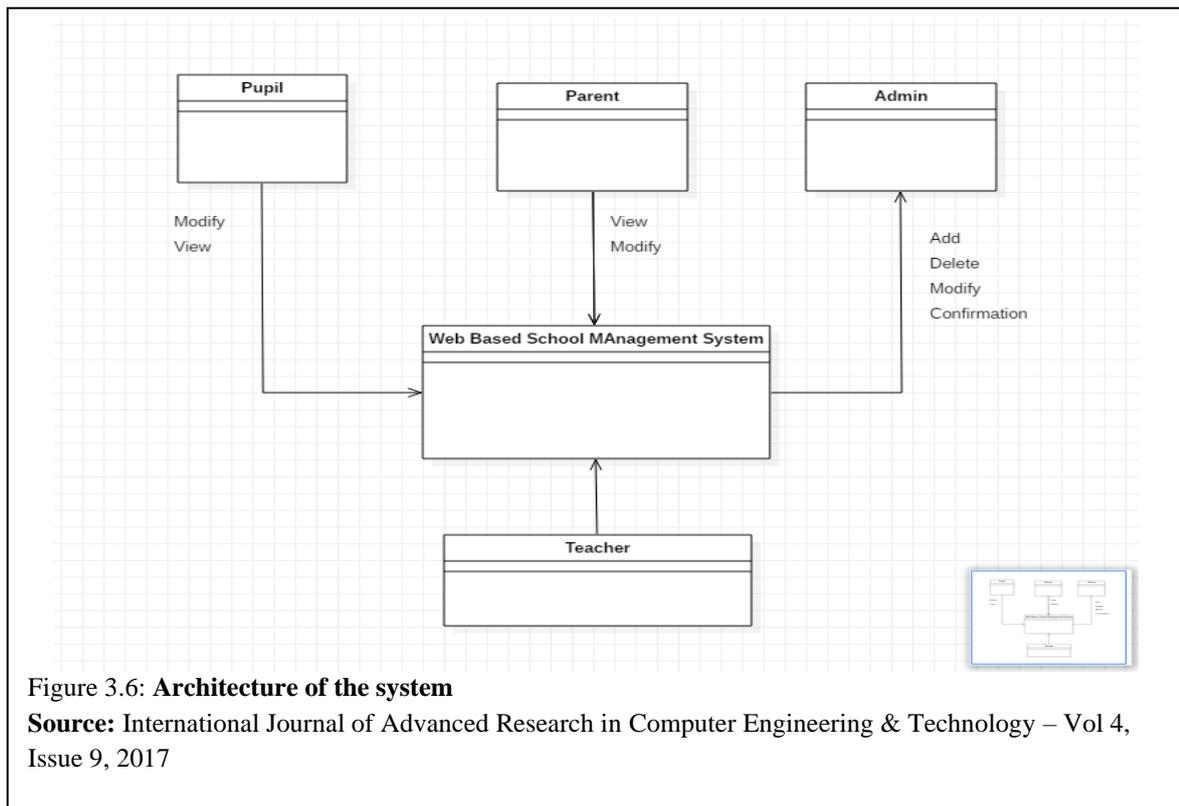
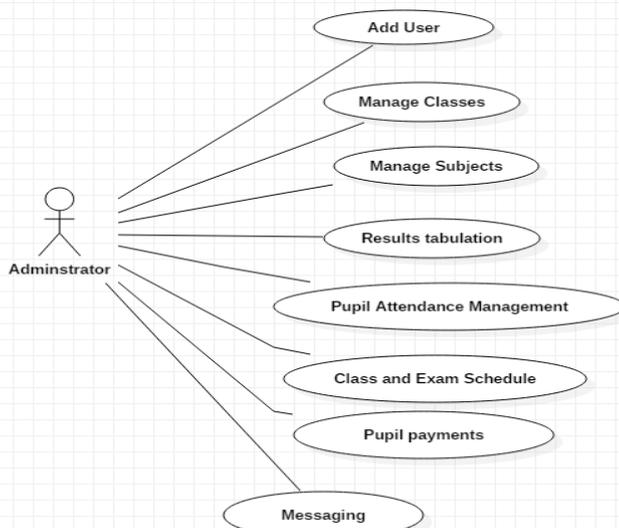


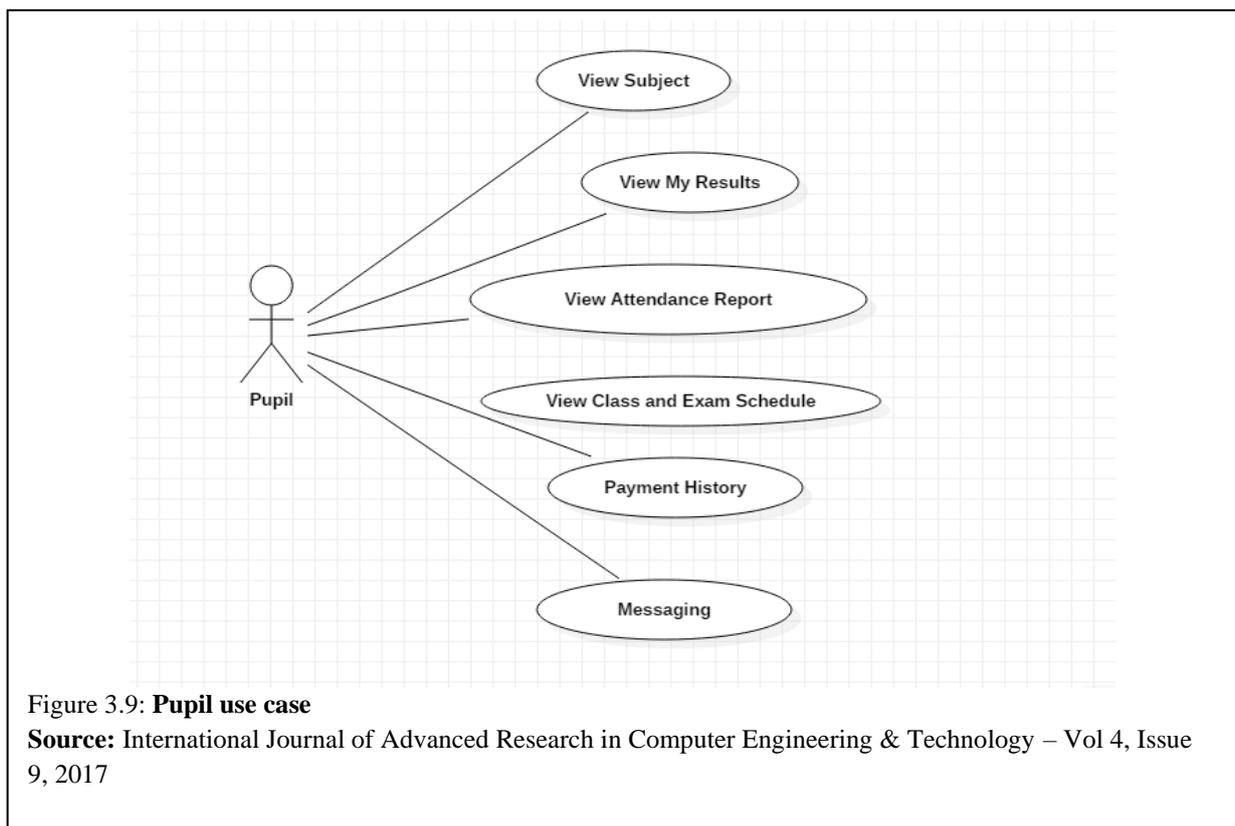
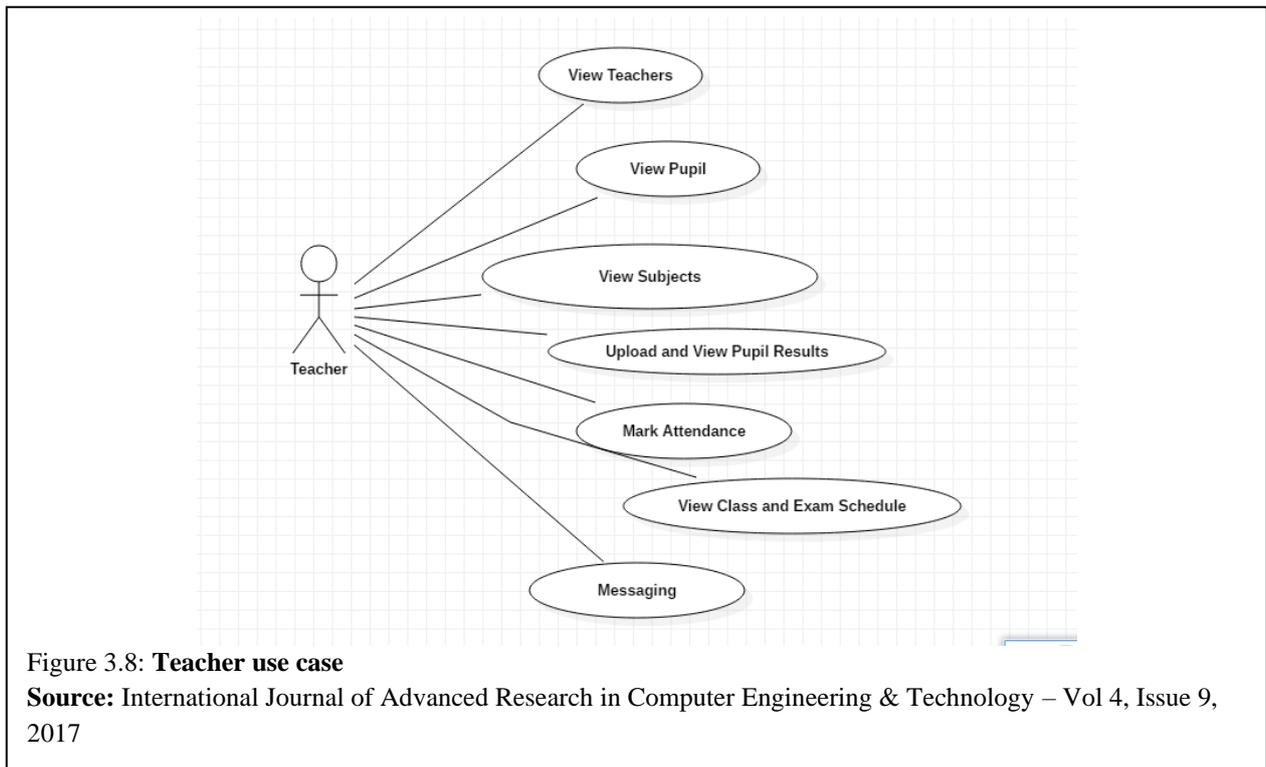
Figure 3.7: Admin Use Case

Source: International Journal of Advanced Research in Computer Engineering & Technology – Vol 4, Issue 9, 2017



Issue 9, 2017

Source: International Journal of Advanced



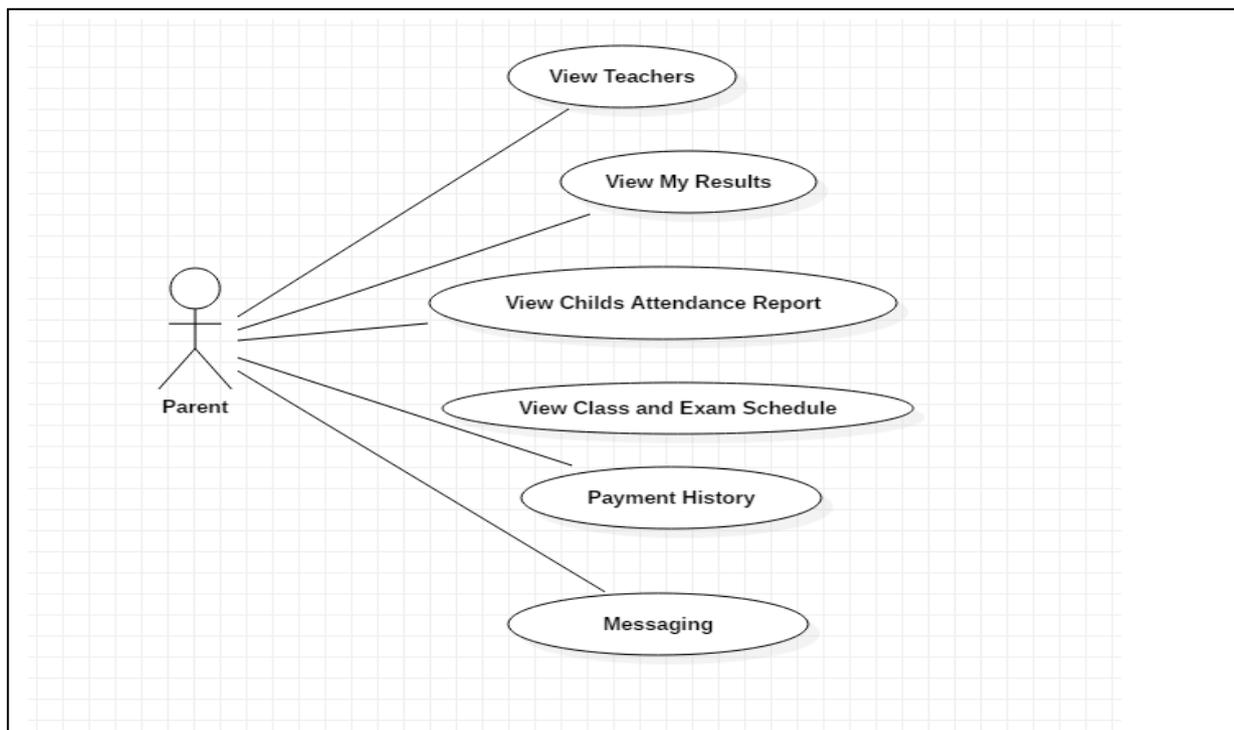


Figure 3.10: **Parent Use case**

Source: International Journal of Advanced Research in Computer Engineering & Technology – Vol 4, Issue 9,

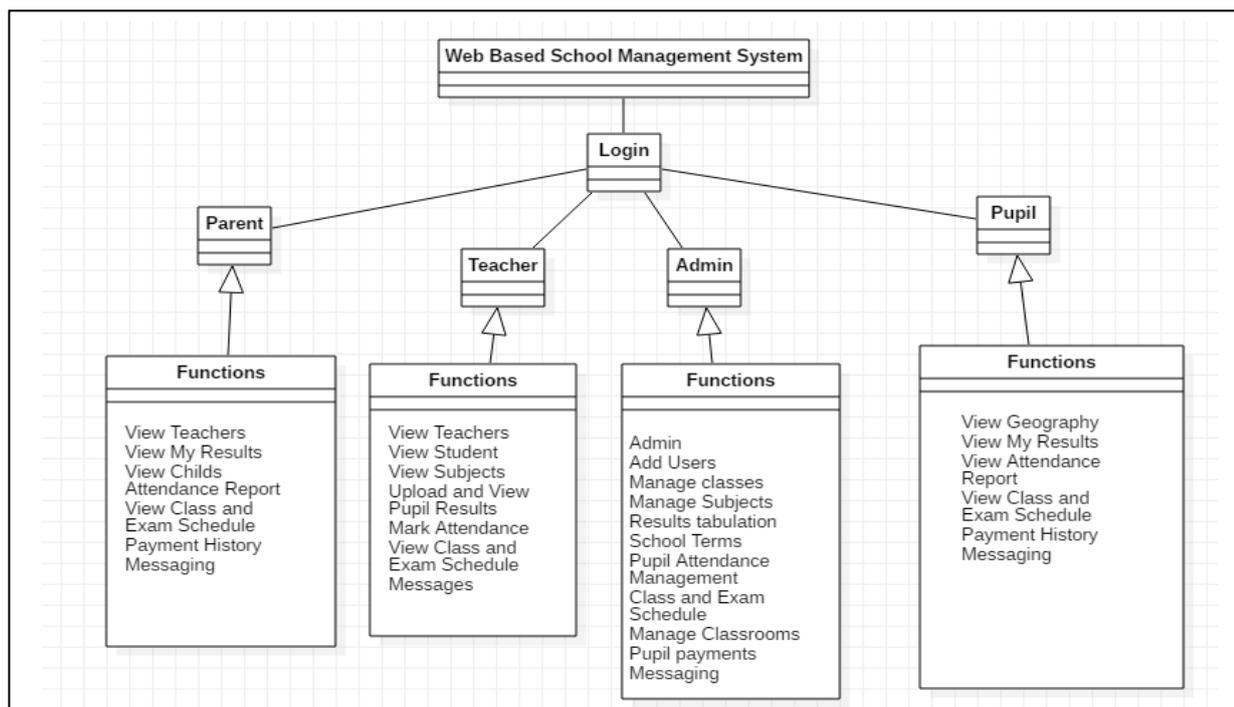


Figure 3.11: **System Class Diagram**

Source: International Journal of Advanced Research in Computer Engineering & Technology – Vol 4, Issue 9, 2017

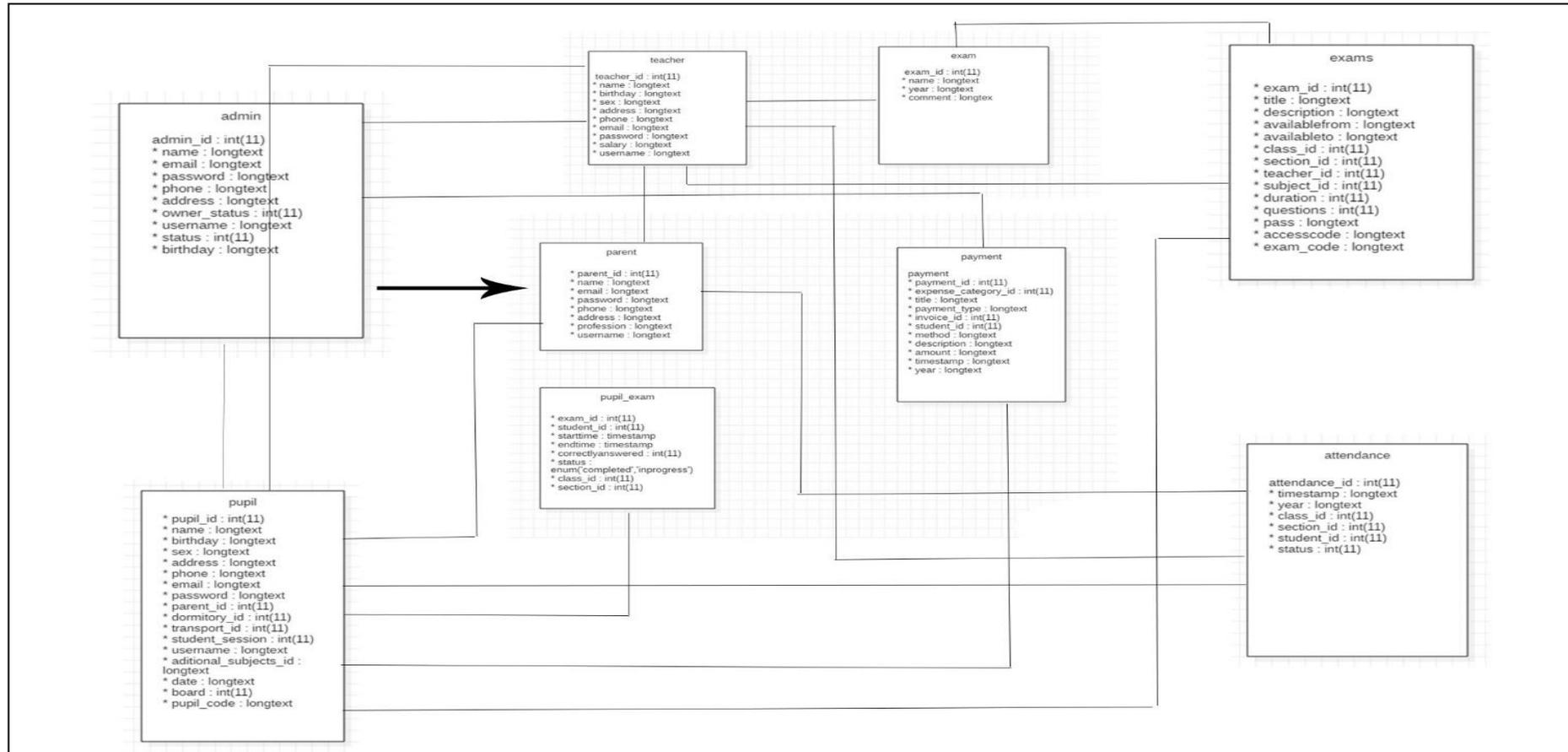


Figure 3.12: System Data Model Design

Source: International Journal of Advanced Research in Computer Engineering & Technology – Vol 4, Issue 9, 2017

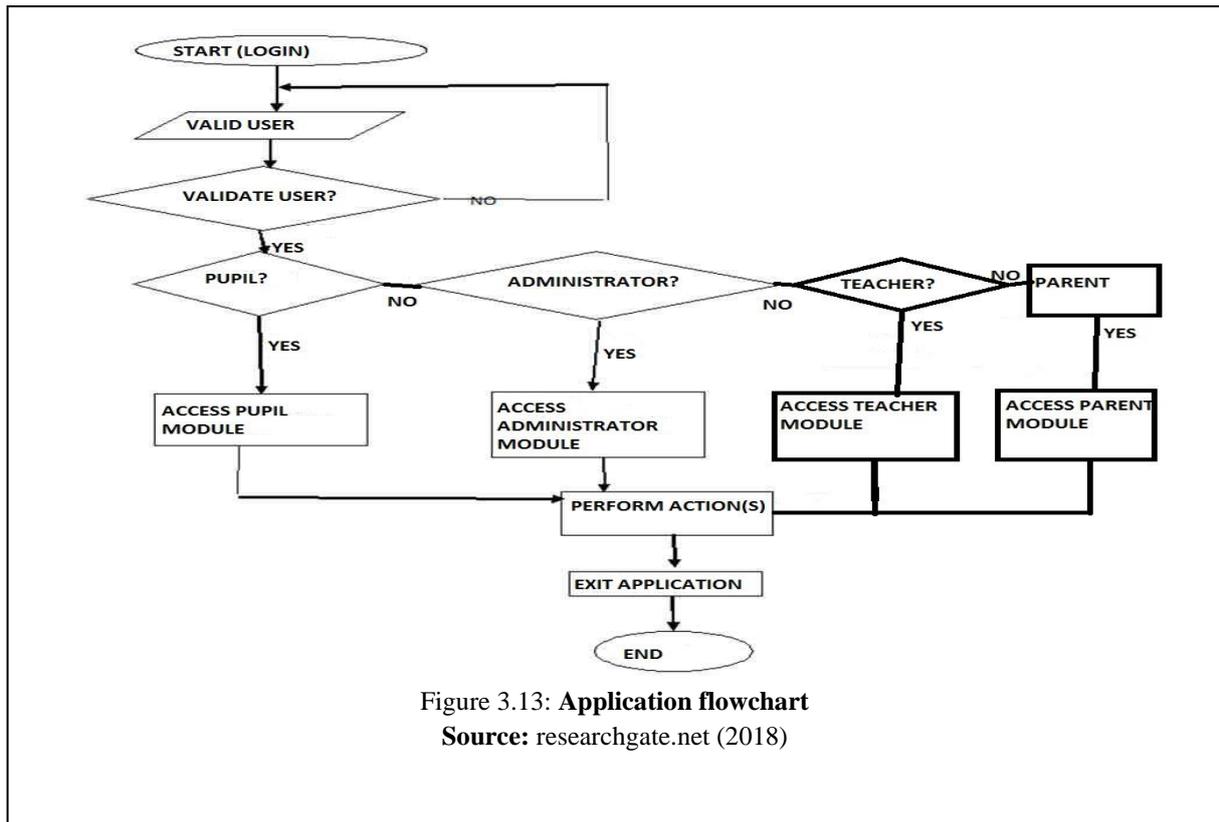


Figure 3.13: Application flowchart
Source: researchgate.net (2018)

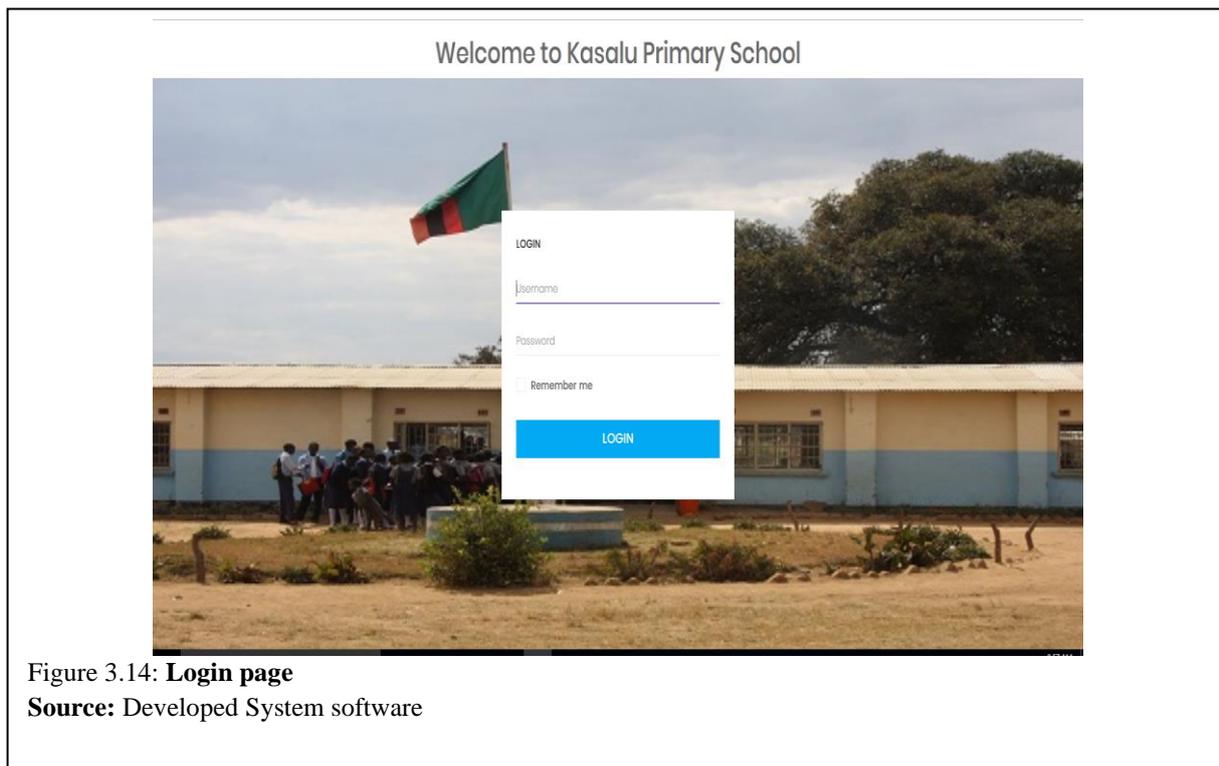


Figure 3.14: Login page
Source: Developed System software

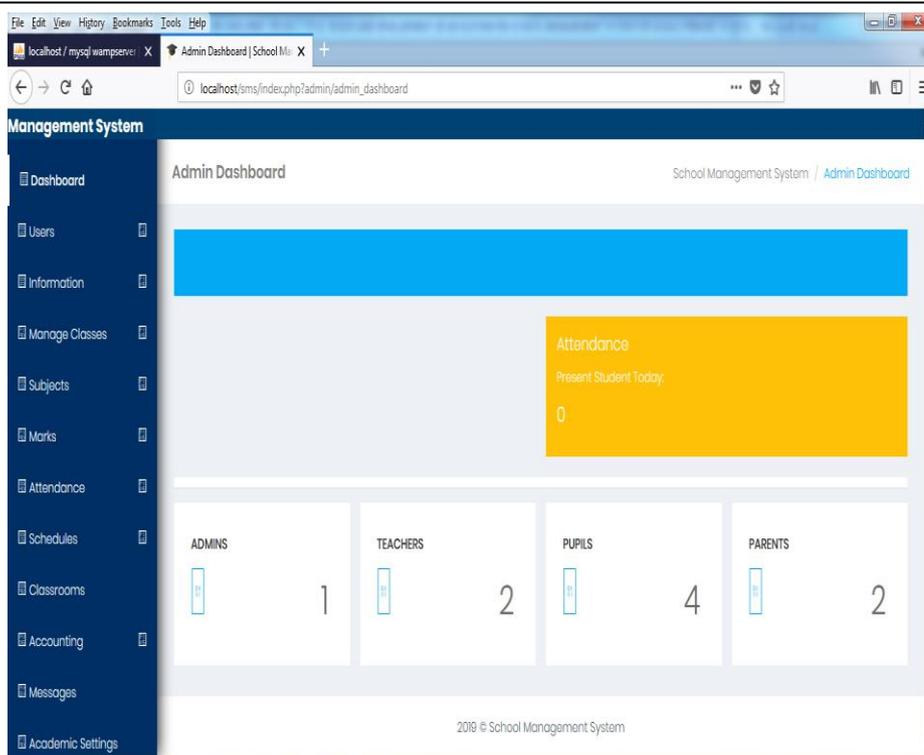


Figure 3.15: Admin Dashboard

Source: Developed System software

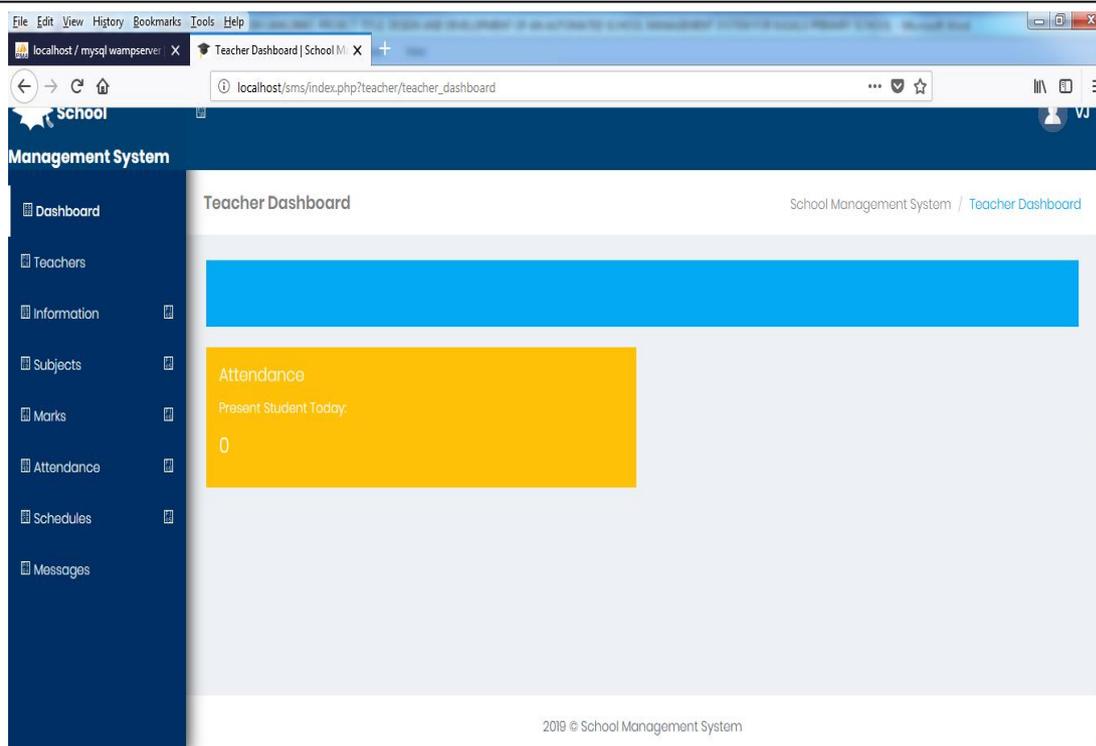


Figure 3.16: Teacher Dashboard

Source: Developed System software

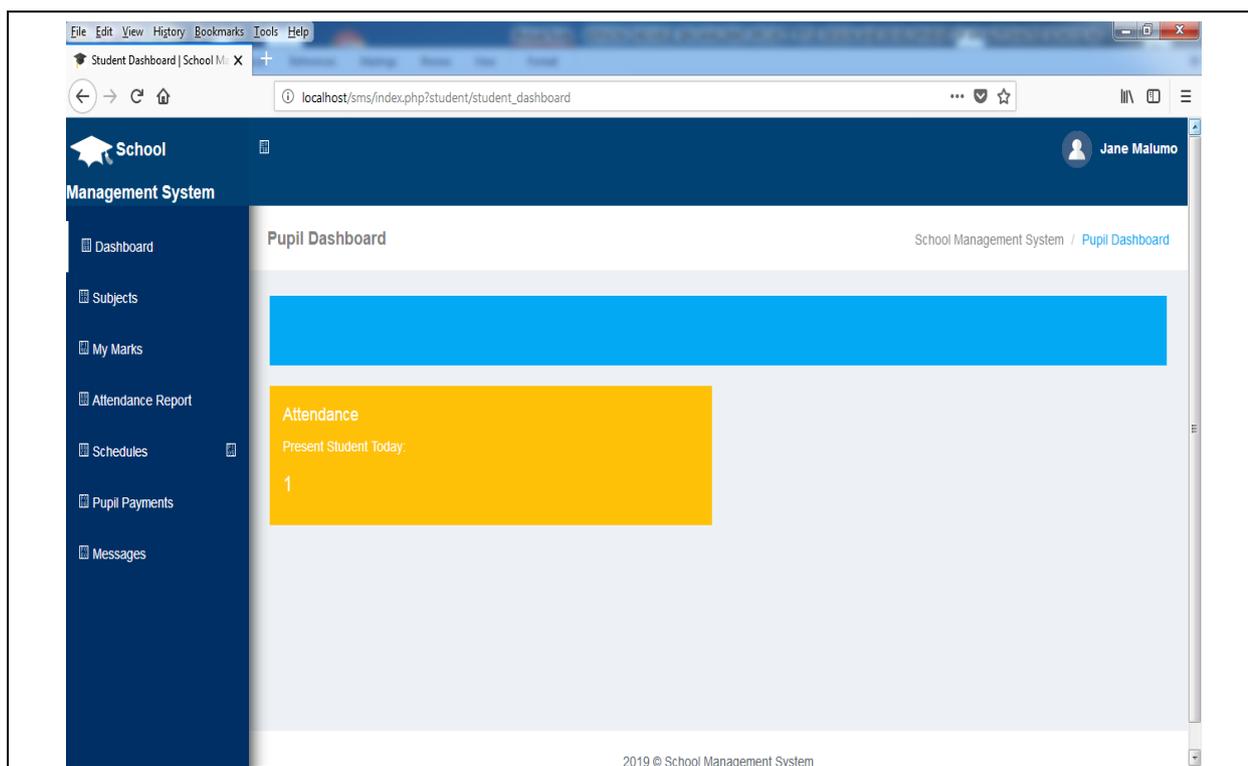


Figure 3.17: **Pupil Dashboard**
Source: Developed System software

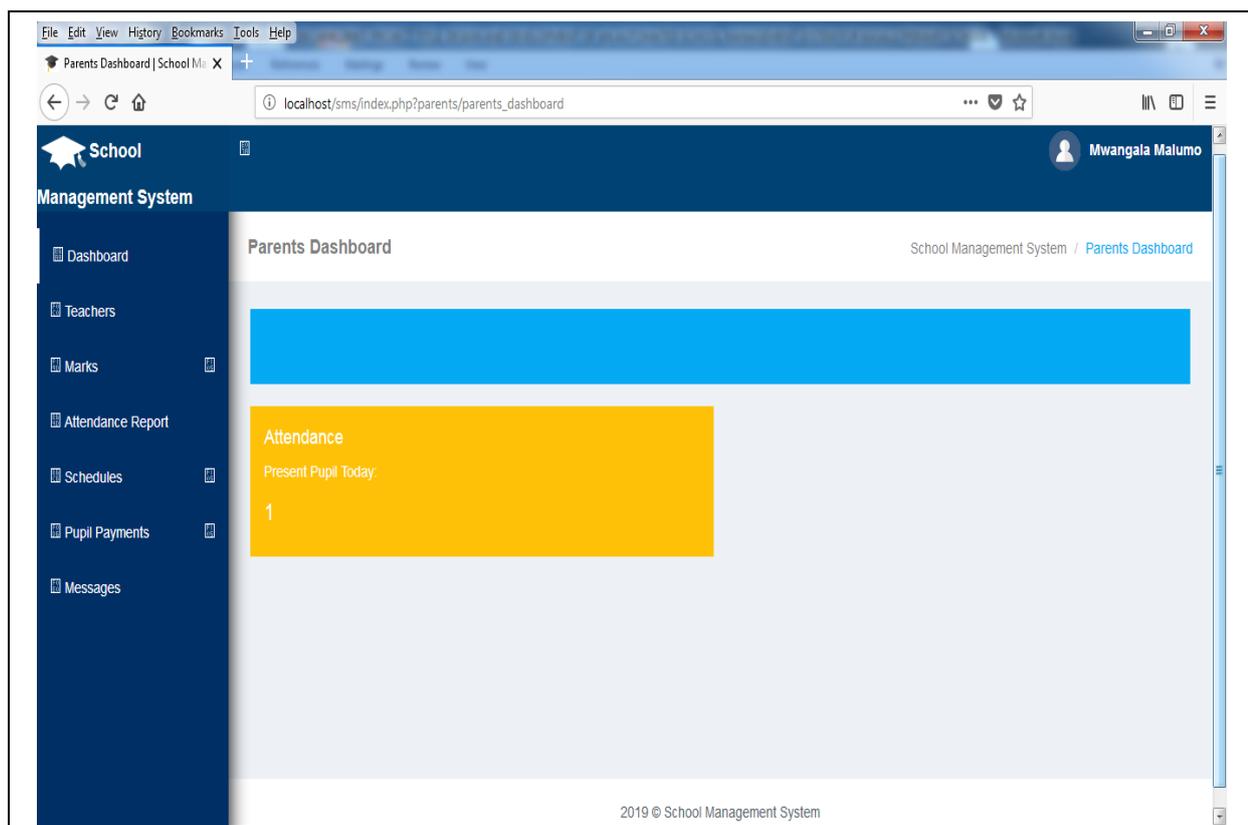


Figure 3.18: **Parents Dashboard**
Source: Developed System software

REFERENCES

- [1] Anderson, R.E.; Dexter, S. (2005). *School Technology Leadership: An Empirical Investigation of Prevalence and Effect*. Educational Administration Quarterly.
- [2] Anigbogu, S.O. (2000). *Computer Application and Operation*, (1st Ed., Vol. 1, No.2, Pp. 30-39). Awka: Optimum Press.
- [3] Amar, J. S. And Mohini, B. (2009). Single Portal for Integrated Examination System. *Journal of Emerging Technologies In E-Governance*, (Pp. 287-293).
- [4] Arnold, D.M. (1998). *A Descriptive Study of Principals' and Teachers' Perceptions of The Value of Technology for Schools*. Doctorate Thesis. University of Cincinnati.
- [5] Barrett, S. (1999). Information's Systems: An Exploration of Factors Influencing Effective Use. *Journal of Research on Computing in Education*, (Vol. 32, No. 1, Pp. 4-16).
- [6] Bellum, J.M. (2003). *Rogers' Innovation Process in Organizations: Information Systems Implementation in Education Organizations*. Doctorate Thesis. Nebraska: University of Nebraska.
- [7] Christopher, J.C. (2003). *Extent of Decision Support Information Technology Use by Principals in Virginia Public Schools*. Doctorate Thesis. Virginia: Virginia Commonwealth University.
- [8] E. Burke And W. Eeben. *Practice and Theory of Automated Timetabling*, Third International Conference, Germany, Springer Private Limited, August 2000.
- [9] Ekpenyong, M. E. (2008). A Real-Time Ikbs For Students' Results Computation. *International Journal of Physical Sciences*, (Vol. 20, No. 3).
- [10] Eludire, A.A. (2011). *The Design and Implementation of Student Academic Record Management System*.
- [11] Emmanuel, B. And Choji, D. (2012). A Software Application for Colleges of Education Student's Results Processing. *Journal of Information Engineering and Applications*, (Vol. 2, No.11).
- [12] Ezenma, A. A., Emmanuel, B., And Choji, D. N. (2014). Design and Implementation of Result Processing System for Public Secondary Schools in Nigeria. *International Journal of Computer and Information Technology*, (Vol. 2, No 1, pp. 121-122). Retrieved from: <http://www.ijcit.com/>