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INFORMATION SYSTEM FOR A SECONDARY SCHOOL IN NIGERIA: A CASE STUDY ON CHSA

BACHELOR'S THESIS | ABSTRACT

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Abstract

Information system for a secondary school in Nigeria: A case study on CHSA

School Management System (SMS) is a Computer-Based Information System (CBIS) that attempts to consolidate all departments and operations of Comprehensive High School, Ayetoro (CHSA) into a single computer system that services each department's specific needs. SMS is a convergence of people, hardware and software into an efficient and service delivery system that increases the productivity of the school.

Based on the author's own preliminary research among major schools (primary and secondary) in Nigeria in June 2012, it was discovered that various problems are associated with manual processing, administration and management of schools.

During the author's own preliminary research, it was found out that the existing system employed a file system of storing data and manual retrieval of information. However, the existing mode of operation was inefficient and less productive.

The developed information system for school management automates all operations performed by the administrators (Bursar, Registrar, Vice-principal and Principal) of CHSA, thereby improving productivity and workflow.

ACKNOWLEDGEMENT

My gratitude goes to Skarli Poppy, and all the lecturers who have imparted knowledge to me all these years. I also want to thank my Supervisor Ferm Tiina for being with me through my thesis.

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ACRONYMS, ABBREVIATIONS AND SYMBOLS

SMS	School Management System
CBIS	Computer-Based Information System
CHSA	Comprehensive High School, Ayetoro
SSADM	Structured System Analysis and Design Methodology
MIS	Management Information System
DSS	Decision Support System
SQL	Structured Query Language
HRDB	Human Resource Development Board
OAS	Office Automation Systems
GUIs	Graphical User Interfaces
LAN	Local area Network
CAN	Campus Area Network
MAN	Metropolitan Area Network
WAN	Wide Area Network
WIFI	Wireless Fidelity
ADO	Active Data Objects
OOP	Object Oriented Programming
ELH	Entity Life History
RDBMS	Relational Database Management System
T-SQL	Transact - Structured Query Language
MS SQL	Microsoft Structured Query Language
XML	Extended Mark-up Language

CHAPTER ONE

1.1 INTRODUCTION

Ever since the advent of Computers in our society, a lot of criticisms have arisen on the danger it will pose on the society. Critics of this new technology express their fear on how this system will be displacing and replacing all human skills, therefore resulting to mass unemployment. However, further developments continue to prove the critics wrong as the invention continues to create additional jobs for those who identify themselves with the technology. Thus, computers are partners to human beings in any field of human endeavor.

In the last 15years, the school administration at Comprehensive High School, Ayetoro (CHSA) has changed from one that is highly administrative to one that is recognized as highly strategic and imperative to the overall success of the school. In this fast-moving world, the computer has served as an aid to decision-making, mostly because of its efficiency in terms of speed, accuracy, reliability, cost and security, among others. In the last 15 years, awareness has existed in people as it concerns the use of computers in planning areas of administrative activities. Schools have adopted the use of Management Information System (MIS) and Decision Support System (DSS) in their decision process which has advanced to Relational Database Management Systems.

School Management System (SMS) attempts to consolidate all department's operations and functions of a school into a single computer system to increase efficiency and productivity.

Based on the author's own preliminary research among major schools (primary and secondary) in Nigeria in June 2012, it was discovered that various problems are associated with manual processing, administration and management of schools. These problems are:

1. Inefficient account monitoring system which gives room to fraudulent activities.
2. Inconsistent records due to manual file management system.
3. Delay in information retrieval as data are manually stored and processed.
4. Manual processing of student registration and results which constitute a monumental waste of time; this time could be used productively.

5. Low optimization of time, since virtually all operations are executed manually.
6. Overall down time in compiling student results due to manual processes.
7. Lack of information flow across the entire system administrators (bursar, registrar, vice-principals and principal)

The aim of this thesis is to design and implement an information system that will assist CHSA administration.

The objectives are to:

1. Automate student registration process.
2. Implement an embedded online transaction system for school fees and other income.
3. Implement result automation and analysis system.
4. Integrate an effective security and role management.
5. Increase the productivity of the school through improved efficiency and low maintenance cost.

This thesis focuses on the management and administration of schools using Comprehensive High School, Ayetoro (CHSA) as a case study.

1.2 METHODOLOGY

The methodology employed in this thesis is the **Structured System Analysis and Design Methodology** (SSADM).

The technology/software to be used is:

1. C#.NET Programming Language
2. Microsoft Visual Studio 2010
3. Microsoft Structured Query Language (SQL) Server 2008
4. NET Framework 4.0
5. Windows Installer 4.1

1.3 ARRANGEMENT OF WORK

This thesis is divided into five chapters as described below:

CHAPTER ONE – Introduction: This chapter illustrates the general overview of this study. It consists of Introduction ,Methodology, and Arrangement of Work.

CHAPTER TWO – Literature Review: The Literature Review gives a detailed description of the area of the work (domain) of this thesis and a review of related publications by researchers pertaining to the work of study.

CHAPTER THREE – System Analysis and Design: This chapter analyzes the proposed system using Logical Data Modeling, Data Flow Modeling and Entity Relationship Modeling. Further, a top down design method will be employed and a clear description of the conceptual or logical model will be obtained from the requirement specifications of the proposed system.

CHAPTER FOUR– Implementation and Documentation: This chapter presents the system implementation and documentation.

CHAPTER FIVE– Conclusion and Summary: This chapter consists of the thesis summary, recommendations and conclusion. Appendix, references and sample source codes are also appended.

CHAPTER TWO

2.1 INTRODUCTION

School Management System (SMS) is a Computer-Based Information System (CBIS) that attempts to consolidate all of the school's departments and operations into a single computer system that services each department's specific needs. SMS is a convergence of people, hardware and software into an efficient and service delivery system that increases the productivity of the school.

School Management Systems provide essential information that assist management with the smooth running of the school. The information is considered to be relevant, timely, accurate, complete and concise and economically feasible. SMSs also have embedded decision support systems that provide the type of information that may not be predictable. They are designed to acknowledge to a wide range of requests and they also assist high administrative officials in making decisions that are not structured or semi-structured.

2.2 CASE STUDY: COMPREHENSIVE HIGH SCHOOL, AYETORO (CHSA)

The need for secondary school system arose in 1960 just after Nigeria gained her independence. The authorities started to consider the need for manpower and the closest solution was to start the secondary school system.

The authorities began by sourcing advice from both international community and by using direct initiatives. Following this, they decided to put science together with the introduction of a technical stream at the school-certificate level on their priority list.

USAID from Harvard University and Ford Foundation assisted the then Western Region Government with the establishment of Comprehensive High School Aiyetoro in February 1963 with a total enrolment of 70 students and lectures from Harvard University, renowened institutions in United State, and education officers in Nigeria . Students population has since risen to over 2000. Ford Foundation provided the funding of the school activities and management until 1973 [1].

CHSA is situated on a 171-hectare land, 37 kilometers west of Abeokuta in Ogun State. The school was founded based on a philosophy and the philosophy was to achieve three goals which are: Serving the potentialities and the educational needs of every child; providing education which is relevant to the technical,economic,social and technical needs of the Nation; and building democratically minded people who would be conscious of their country's economic,social and political problems in every situation.

Comprehensive High School Aiyetoro had benefited from the services of the best experts in the educational ministry. Going by the list, a large number of renowned educationist served the school. Moreover, the school had benefited international supports following the funding, personnel and material which has resulted in the great achievement of the school.

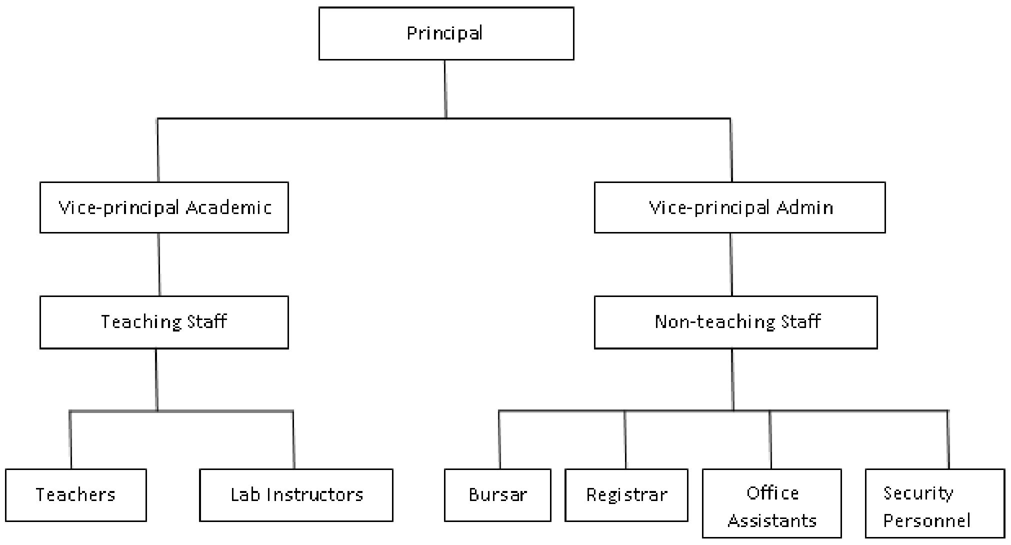


Fig 2.1. *School Administrative Structure*

- **OFFICE OF THE PRINCIPAL:** The principal is responsible for overseeing the functions and operations performed by the vice-principal academic and the vice-principal admin. The principal also ensures that each member of staff performs their individual task and when due by periodic monitoring of the staff. He also makes decisions based on the reports and feedbacks generated by both the vice-principal academic and vice-principal admin.

- **OFFICE OF THE VICE-PRINCIPAL ACADEMIC:** The vice-principal academic is mainly obligated to manage all teaching activities which include drafting time tables, resolving teaching issues, coordinating teachers and lab instructors, and also upholding high academic standard of the school. She also plays a mentoring role for all students of the school by setting aside a scheduled time for counseling and advisory services.
- **OFFICE OF THE VICE-PRINCIPAL ADMIN:** The vice-principal admin manages the administrative aspect of the school. These activities include overseeing the operations of the school bursar, registrar and all other non-academic staff. He also ensures that each expenditure the school is about to make is well scrutinized and then forwards an approval to the bursar for cash payment.
- **OFFICE OF THE BURSAR:** The school bursar is solely responsible for the school finance as regards school fees payment and management of the school account. The bursar manages the school income (school fees and special levies) and issues out all expenditure (salaries and maintenance fees).
- **OFFICE OF THE REGISTRAR:** The school registrar's office comprises of a number of non-academic staff highly skilled in computer usage. They are mainly responsible for record management; that is keying-in of data into spreadsheet packages as well as retrieval of information.

2.3 REVIEW OF EXISTING SYSTEM

The existing system methods and principle mode of operation were examined in order to know how to improve on the system.

Based on the author's own preliminary research in June 2012, it was discovered that the existing system of Comprehensive High School, Ayetoro (CHSA) has its activities grouped into the following:

1. Registration
2. Account
3. Result computation

REGISTRATION: The registration exercise of CHSA is preceded by the admission process. The Human Resource Development Board (HRDB) of the School manages the admission and/or enrollment of new students by conducting the entrance examination and forwards the names of successful candidates to the school registrar. The school teachers also assist HRDB in setting examination questions, screening exercise and supervision during examinations. The office of the registrar then create a file for each successful student and input their records in Microsoft Excel spreadsheet package for storage and further updates.

ACCOUNT: The school account is managed by the office of the bursar. The bursar receives bank tellers of school fees payment and issues a receipt for each payment. The bursar then forwards the schools fees records to include names of debtors to the office of the registrar for inputting into the individual student file in order to capture a complete information when each student's records is been retrieved. The bursar also keeps account of the school's income (school fees payment and special levies), expenditure (salaries, maintenance fees and other miscellaneous expenses) and computes a total balance of the school account. The details of the school account are then made available to the principal and vice-principal admin on request.

RESULT COMPUTATION: The school result computation process is preceded by the each subject teacher grading of student performance which is then collated by each class teacher. The class teacher submits the result grades of every student in his/her class to the vice-principal academic for cross examination and approval. If the vice-principal is not satisfied with a particular subject grading, such result is returned to that subject teacher through the class teacher for remarking; else the result is approved and forwarded to the office of the registrar for recording. The registrar manually inserts the results into the result table with the aid of spreadsheet packages such as Microsoft Excel.

2.4 REVIEW OF RELATED FINDINGS

After review of the existing system at CHSA, the following problems or limitations were identified with the existing system mode of operation:

I. **Gradual transition from manual file management to computerization:** The existing mode of operation partially adopted computerization which involves the use of Office Automation Systems (OAS) such as Microsoft Excel while still retaining the traditional file system of data management. The consequence of this approach is that information cannot be retrieved as a complete whole and this results in data inconsistency due to the fact that data are stored in different locations partially in files and computer systems.

II. **Poor data security:** The existing system currently in use grossly lacks good security features. This is because almost all operations performed on the computer system are carried out using spreadsheet packages which has no provision for security features such as user authentication. In addition, due to the large number of staff using limited systems, anybody, either a staff or an intruder can easily perform an illicit transaction such as fraud, altering of information, deleting relevant files and so on.

III. **Low computer literacy level:** Many school staff members (teaching and non-teaching) have limited knowledge of the use of computer since the existing file system of management encourages computer illiteracy as it requires no computer skills to manage.

2.5 PROPOSED SYSTEM ARCHITECTURE

The proposed system architecture (Fig 2.2) illustrates the system architecture and employs the n-tier model which comprises of three Levels. The levels include:

1. **The External Level:** The external level consists of client systems or Graphical User Interface (GUIs) that receives input from the user, inform of data, and display results to the user as processed information. These client systems are connected through a network such as: Local area Network (LAN), Campus Area Network (CAN), Metropolitan Area Network (MAN), Wide Area Network (WAN), Wireless Fidelity (WiFi), Intranets or the Internet.
2. **The Conceptual Level:** This level is regarded as the logical level because it is neither external nor physical. The level comprises of Active Data Objects (ADO) which are mainly responsible for connecting and interacting with the database. These objects are coded in a class and this class is then instantiated on every

page that interacts with the database. This paradigm of programming is also known as Object Oriented Programming (OOP) which is based on three fundamental principles: Encapsulation, Inheritance and Polymorphism.

3. **The Physical Level:** The physical level acts as a repository data store and is generally called a database. It consists of the relations, stored procedures, transaction logs and triggers that implement every operation perform on the client systems.

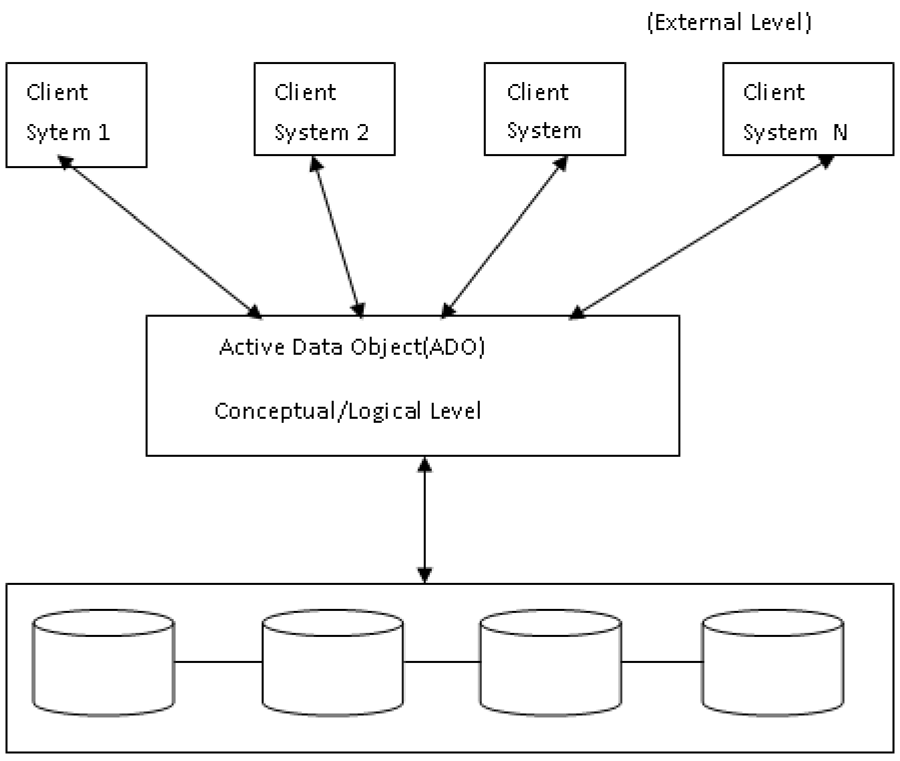


Fig 2.2. *System Architecture*

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.1 ANALYSIS OF THE PROPOSED SYSTEM

The structured system analysis and design methodology SSADM [2] is employed in the analysis and design stages of this thesis. SSADM specifies in advance the modules stages and tasks to be carried out. It also specifies the deliverables to be produced and the methods used to produce the deliverables.

SSADM adopts the waterfall model of the system development.This approach is employed in this thesis because it sets up a comfortable dialogue between the user, analyst, designer and software developer. Structured system analysis and design methodology make use of two key techniques. These are:

1. Entity/ Event Modeling
2. Use Case Modeling

Entity/Event Modeling

This technique helps to recognize, identify and document the events of the organization which affect each entity and the order in which the events occur. This model is made up of a set of entity life histories and relevant documentation.

Therefore the proposed system will be modeled using the tools listed below:

- Entity - Relationship Diagram
- Entity - Life History Diagrams
- Use Case System Diagram
- Use Case Subsystem Diagram
- Database Tables

3.1.1 ENTITY-RELATIONSHIP MODEL OF THE PROPOSED SYSTEM

Identified entities in the system are modeled and the relationships that exist among them. The modeling technique was developed by Peter Chen in 1976 [3]. It is a top-down approach to system design. After observing the operations of CHSA, the following entities were identified (Table 3.1):

- Student
- Bursar
- Registrar
- Vice-principal
- Principal
- School

Table 3.1 below shows the identified entities in the system and their consequence relationships.

Table 3.1. *The Entity-Relationship Matrix overleaf*

	Student	**Bursar**	**Registrar**	**Vice-principal**	**Principal**	**School**
Student						
Bursar	Manage School Fees	Manage Login Info.				Manage Account
Registrar	Manage		Manage Login Info.			
Vice-principal		Oversee	Oversee			
Principal				Oversee		
School						Manage

Participation and cardinality constraints of each of the elements of the matrix are illustrated. This is be done using the Crow Foot notation [5]. The names and the degree of relationships of each entity are shown in Figures 3.1-3.9

Bursar - Student relationship (Fig 3.1) is a one-to-many relationship with mandatory participation for the bursar. This relationship implies that a bursar can manage more than one student school fees.

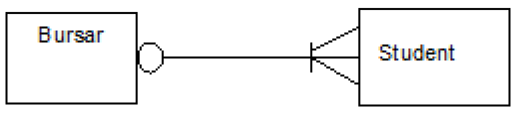


Fig 3.1. *Bursar - Student Relationship*

Bursar - Bursar relationship (Fig 3.2) is a one-to-one relationship which shows that any occurrence of the entity bursar is associated with only one occurrence of the bursar. It illustrates that a bursar can only manage his/her login's information

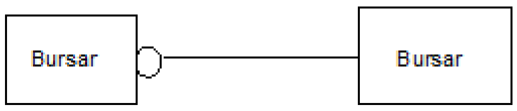


Fig 3.2. *Bursar - Bursar Relationship*

Bursar - School relationship (Fig 3.3) is a one-to-one relationship which shows that any occurrence of the entity bursar is associated with only one occurrence of the school. This implies that a bursar can only manage account(s) for a single school

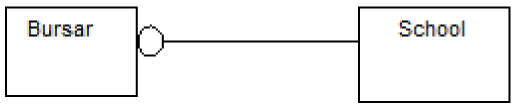


Fig 3.3. *Bursar - School Relationship*

Registrar - Student relationship (Fig 3.4) is a one-to-many relationship which has both optional and mandatory participation. The optional participation shows that not all students are managed by a particular registrar. The mandatory participation illustrates that at least a student will be managed by a particular registrar.

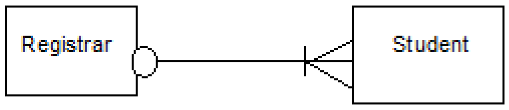


Fig 3.4. *Registrar - Student Relationship*

Registrar - Registrar relationship (Fig 3.5) is a one-to-one relationship which shows that any occurrence of the entity registrar is associated with only one occurrence of the registrar. It illustrates that a registrar can only manage his/her login's information.

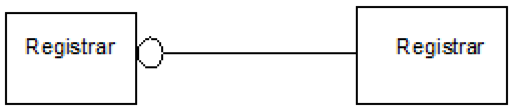


Fig 3.5. *Registrar - Registrar Relationship*

Vice-principal - Bursar relationship (Fig 3.6) is a one-to-one relationship which shows that any occurrence of the entity vice-principal is associated with only one occurrence of the bursar. It illustrates that only the vice-principal has supervision over the bursar.

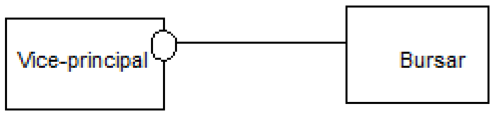


Fig 3.6. *Vice-principal - Bursar Relationship*

Vice-principal – Regisrar relationship (Fig 3.7) is a one-to-one relationship which shows that any occurrence of the entity vice-principal is associated with only one occurrence of the registrar. It illustrates that only the vice-principal has supervision over the registrar.

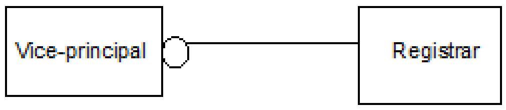


Fig 3.7. *Vice-principal - Registrar Relationship*

Principal – Vice-principal relationship (Fig 3.8) is a one-to-one relationship which shows that any occurrence of the entity principal is associated with only one occurrence of the vice-principal. It illustrates that only the principal has supervision over the vice-principal.

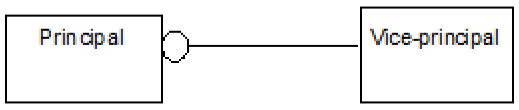


Fig 3.8. *Principal - Vice-principal Relationship*

School – School relationship (Fig 3.9) is a recursive one-to-many relationship which requires only one mandatory participation and it illustrates that a school must be under the supervision of one school which might be itself.

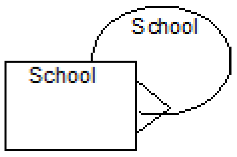


Fig 3.9. *School- School Relationship*

3.1.2 ENTITY- LIFE HISTORIES

An Entity Life History (ELH) diagram describes the life cycle of entities within the database [2]. It is essentially a diagrammatic technique which provides a picture of all possible outcomes for a particular entity in the system (Figures 3.10-3.15)

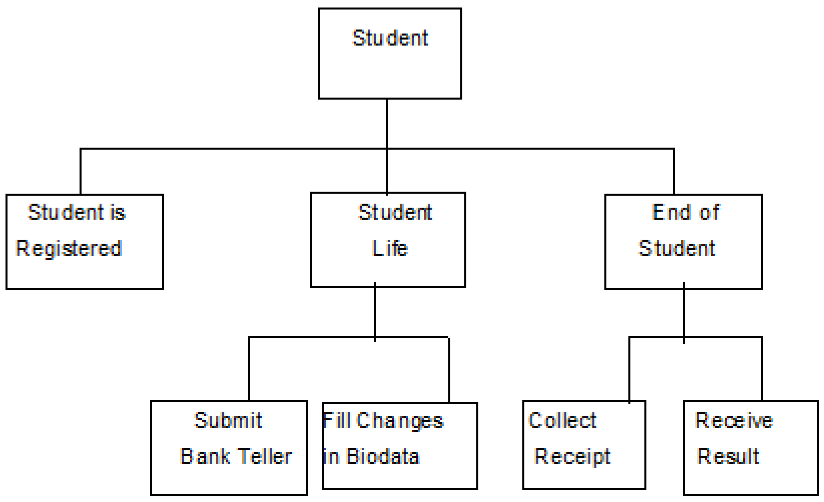


Fig 3.10. *Student Entity Life History (ELH) diagram*

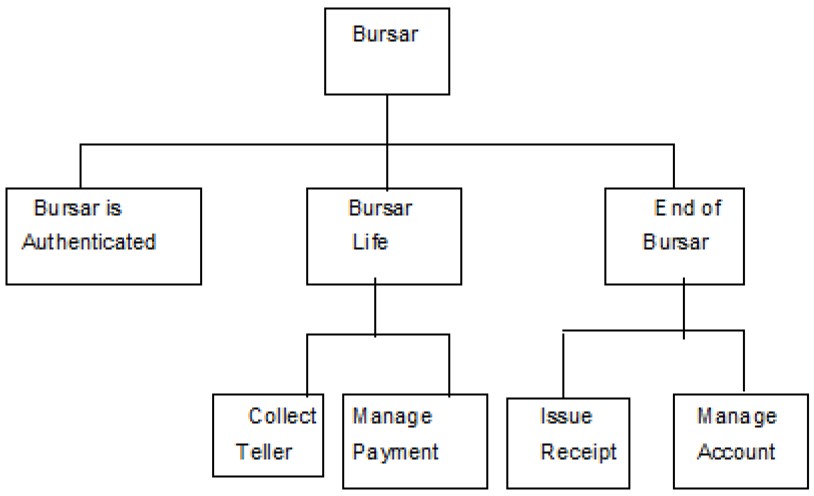


Fig 3.11. *Bursar Entity Life History (ELH) diagram*

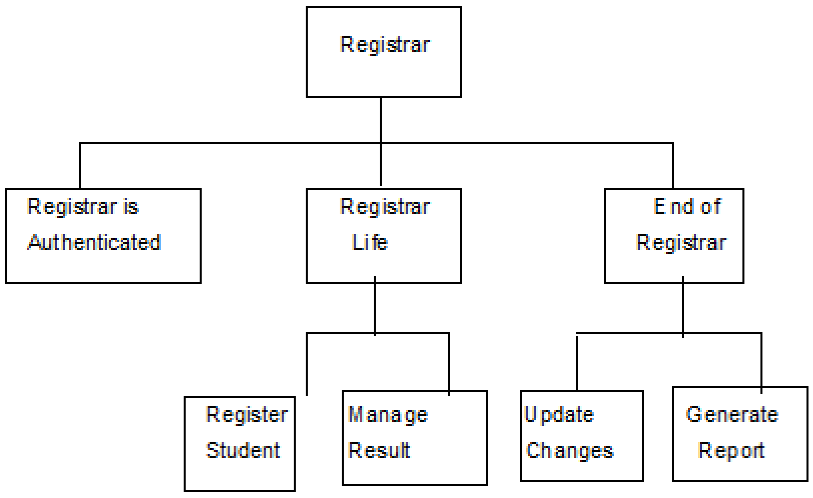


Fig 3.12. *Registrar Entity Life History (ELH) diagram*

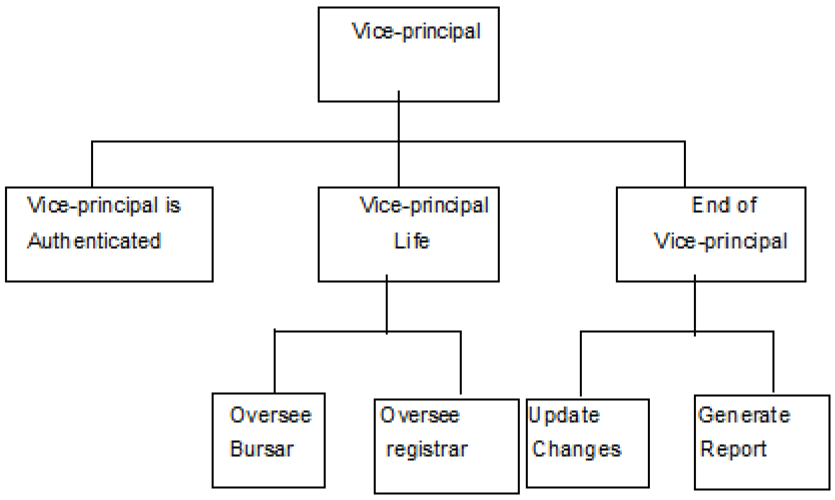


Fig 3.13. *Vice-pricipal Entity Life History (ELH) diagram*

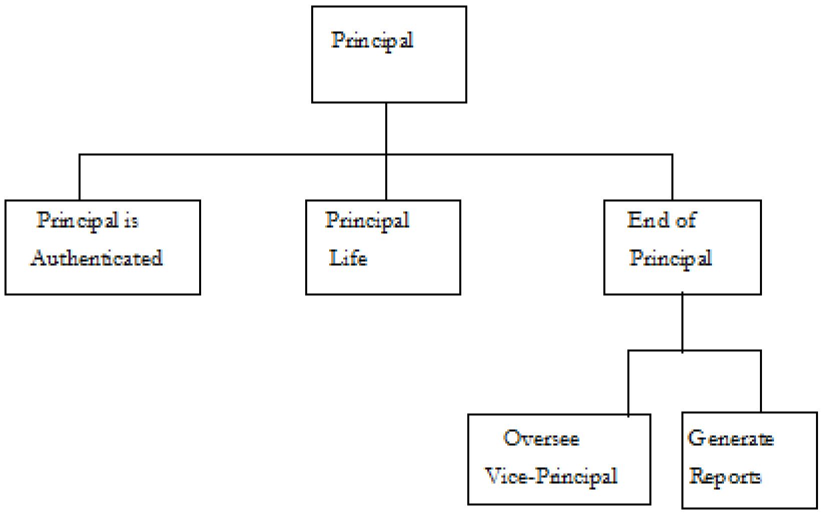


Fig 3.14. *Principal Entity Life History (ELH) diagram*

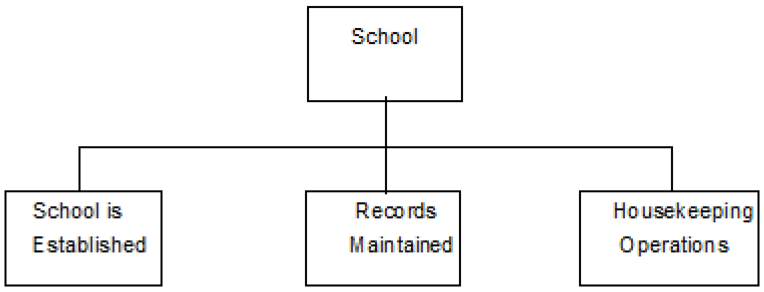


Fig 3.15. *School Entity Life History (ELH) diagram*

Summary of Entity-Life History Diagrams

The diagrams are read from left to right. Maintaining records involves creation, deletion and update of related fields of each entity (table). Housekeeping operations are carried out on each entity (table) in order to prevent the database from becoming too difficult to manage.

3.1.3 USE CASE MODELING

The objective of constructing the use-case model is to anatomize enough requirements information to prepare a model that communicates what is required from a user perspective but free of special details about how the system is built and implemented [4].

Use Cases are initiated or triggered by external users called actors. The actor system initiates system activities and a use case for the purpose of finishing some business task that produces something of measurable value. Identifying system actors assist in concentrating on how the system is used and not how is built [4]. Focusing on the actors helps to restructure and further structure the scope and boundaries of the system.

Table 3.2 shows the description of an actor.

Table 3.2. *Actor Glossary*

Actor Glossary	
Actors	**Description**
Student	A person studying for a leaving school certificate.
Bursar	An employee in charge of school fees and account operations.
Registrar	An employee in charge of student records and results.
Vice-principal	An employee that oversees the bursar and registrar.
Principal	An administrator that oversee the vice-principal and school.

3.1.4 System Use Cases

A use case captures the interactions with the user in a technology and implementation free. Use-cases describe how a real-world actor communicates with the system and how they will use the system.

The elicited functional requirements from the requirement discovery process is represented as use cases. Thus, the system use cases are: (Figs 3.16)

Manage School Fees
Manage Account — BURSAR
Manage Bursar's Login Information

Register Student
Manage Result — REGISTRAR

Manage Staff
Manage Registrar's Login Information
Oversee Bursar
Oversee Registrar — VICE-PRINCIPAL

Manage Vice-principal's Login Information
Oversee Vice-principal
Generate Reports — PRINCIPAL
Manage Principal's Login Information

Fig 3.16. *Use cases for each actor*

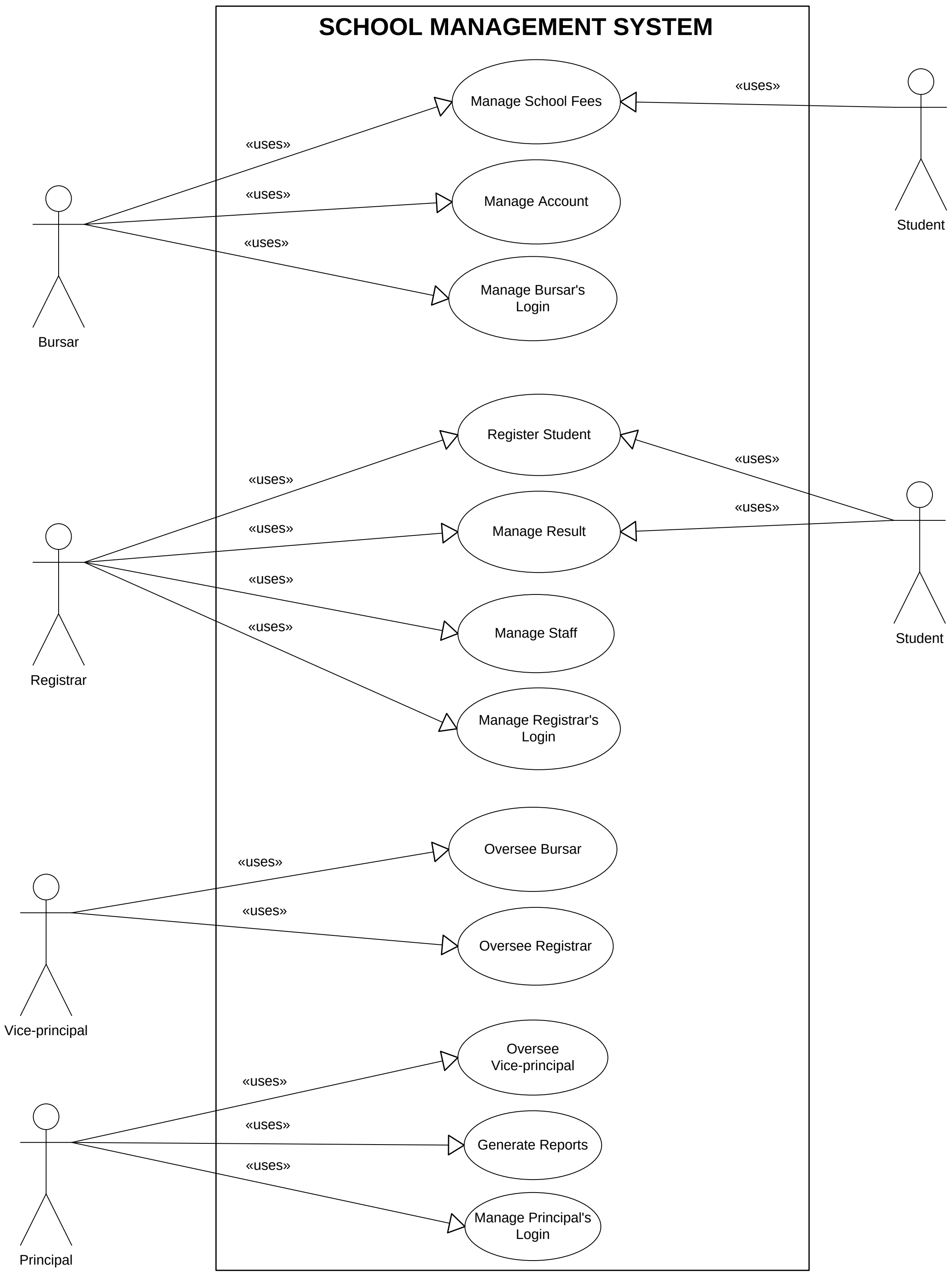


Fig 3.17. *Use Case Diagram (System Modeling)*

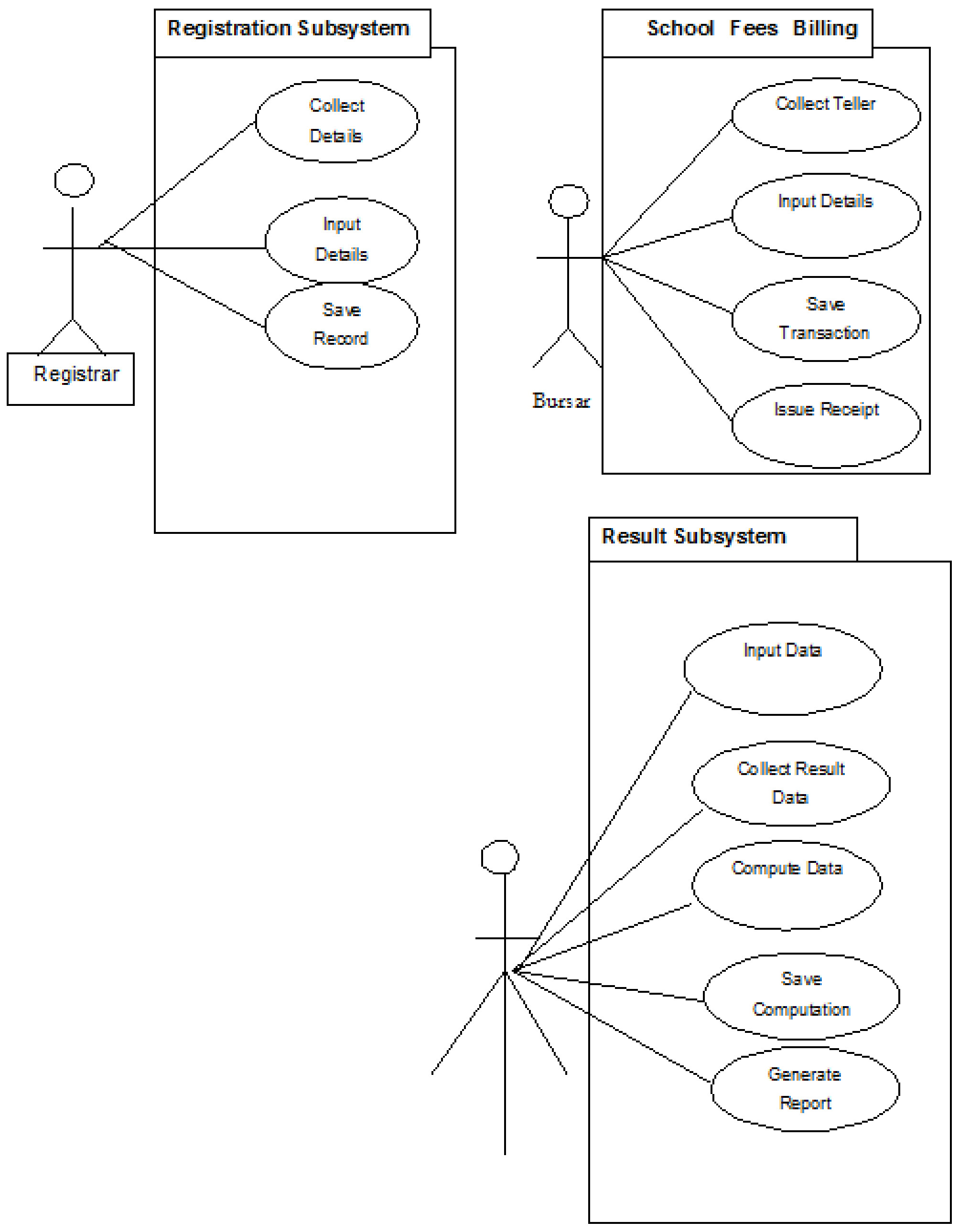


Fig 3.18. *Use Case Diagram (Sub-system Modeling)*

3.2 SYSTEM DESIGN

In the design stage a top-down method is used. A clear description of the logical model was obtained from the requirement specifications. The conceptual model goes through a series of improvements which give the physical model of the system. The implementation of the requirement specifications leads to the physical model.

The implemented design of the system was carried out in three phases:

1. Database design
2. Architecture design
3. Interface Design(Output/Reports)

The design has a front-end Graphical User Interface (GUI) Windows-based application and a back-end Relational Database Management System (RDBMS). The front-end is designed using C#.NET as a programming language - while the back-end is designed with using Microsoft Structured Query Language (SQL) Server 2008. The database is developed based on the Entity-Relationship Model.

3.2.1 DATABASE DESIGN

The physical model of database is constructed based on the ER data model. This essentially means that the logical model is converted to the physical view, i.e., the database. The database makes use of two database objects, which are:

- **Tables:** Store information about each entity of the application.
- **Store/ Procedures:** Implement all the functionality of the application with Transact - Structured Query Language (T-SQL).

The tables and the associated functions are described in tables 3.3-3.7

This database table (Table 3.3) is used for recording all account transactions.

Table 3.3. *Account Database Table*

Account Table	
Field	**Data Type**
TransactionID	Integer
SchoolFees	Varchar
PaymentID	Integer
Expenditure	Decimal
ExpenditureDetails	Varchar
AccountBalance	Decimal
DateOfTransaction	DateTime

The table (Table 3.4) is the database table through which school fees payment are recorded.

Table 3.4. *Payment Database Table*

Payment Table	
Field	**Data Type**
PaymentID	Integer
RegistrationNo	Integer
SchoolFees	Decimal
AmountPaid	Decimal
Balance	Decimal
BankPaidTo	Varchar
PaidInBy	Varchar
TellerNo	Varchar
ReceiptNo	Varchar
DateOfPayment	DateTime
DateOfBalance	DateTime

The database table (Table 3.5) is used for storing result details.

Table 3.5. *Result Database Table*

Result Table	
Field	**Data Type**
RegistrationNo	Integer
SubjectName	Varchar
SubjectTestScore	Integer
SubjectExamScore	Integer
SubjectAverageScore	Integer
SubjectGrade	Char
Class	Varchar
Term	Varchar
TeacherCommet	Varchar
PrincipalCommet	Varchar

The database table (Table 3.6) is used for recording staff details.

Table 3.6. *Staff Database Table*

Staff Table	
Field	**Data Type**
StaffID	Integer
SurName	Varchar
FirstName	Varchar
OtherName	Varchar
ResidentialAddress	Varchar
MailingAddress	Varchar
Email	Varchar
Telephone	Varchar
DateOfBirth	DateTime
DateOfRecruitment	DateTime
Salary	Decimal
Position	Varchar
Gender	Char

The database table (Table 3.7) stores details of students upon registration.

Table 3.7. *Student Database Table*

Student Table	
Field	**Data Type**
RegistrationNo	Integer
SurName	Varchar
FirstName	Varchar
OtherName	Varchar
Age	Integer
DateOfBirth	DateTime
StateOfOrigin	Varchar
Religion	Varchar
ContactAddress	Varchar
SchoolAttended	Varchar
Guardian	Varchar
GuardianAddress	Varchar
Telephone	Varchar
Email	Varchar
BloodGroup	Varchar
Genotype	Varchar
Drugs	Varchar
ClassOfAdmission	Varchar
CurrentClass	Varchar
Term	Varchar
DateAdded	DateTime

Table 3.8 shows the details of the stored procedures

Table 3.8. *Store/ Procedures Table*

Stored Procedures Name	**Description**
Bursar_Login	Authenticates a valid bursar
Registrar_Login	Authenticates a valid registrar
VicePrincipal_Login	Authenticates a valid vice-principal
Principal_Login	Authenticates a valid principal
Student_Registration	Registers a new student records
Staff_Registration	Registers a new staff
SchoolFess_Payment	Insert school fees payment
Update_Payment	Updates subsequent payment
Insert_Income	Insert income into account table
Insert_Expenditure	Insert expenditure into account table
Compute_Balance	Calculate account balance
Bursar_Login_Update	Update bursar’s login credentials
Search_PaymentByName	Searches school fees payment via student name
Search_PaymentByRegNo	Searches school fees payment via registrationNo
Search_PaymentByClass	Searches school fees payment via class
Search_PaymentByTerm	Searches school fees payment via term
Update_Student	Update Student records
Update_Staff	Update staff records
Update_Registrar_Login	Update registrar login credentials
Insert_Result	Insert result data
Update_Result	Update changes in result data
Compute_Result	Begins result computation
Search_ResultByRegNo	Returns result details via registration number
Search_ResultByName	Returns result details via student name
Update_VicePrincipla_Login	Update changes made to vice-principal login info
Update_Principal_Login	Update changes made to principal login info

3.2.2 ARCHITECTURAL DESIGN

The development and implementation of the School Management System application involves having a complete understanding of its design architecture. The design has two phases (Front-end and Back-end). The front-end is the user interface design which consists of windows forms. The back-end mainly contains the database of the application; it contains tables for storing input data and stored procedures for implementing database transactions. The front-end (windows form) and back-end (database) are connected via a middleware program called Active Data Object (ADO.NET) (Fig 3.19)

The middleware layer is implemented using a strongly typed dataset in Microsoft .Net framework. The strongly typed dataset works in such a way that the whole operation that involves the database is performed with the strongly typed dataset component. All the stored procedures and various SQL transactions at the database are mapped to appropriate methods which are created by the dataset component. Strongly typed datasets are implemented as DBAccess class in this application using the concept of Object Oriented Programming (OOP) which supports Encapsulation, Inheritance and Polymorphism.

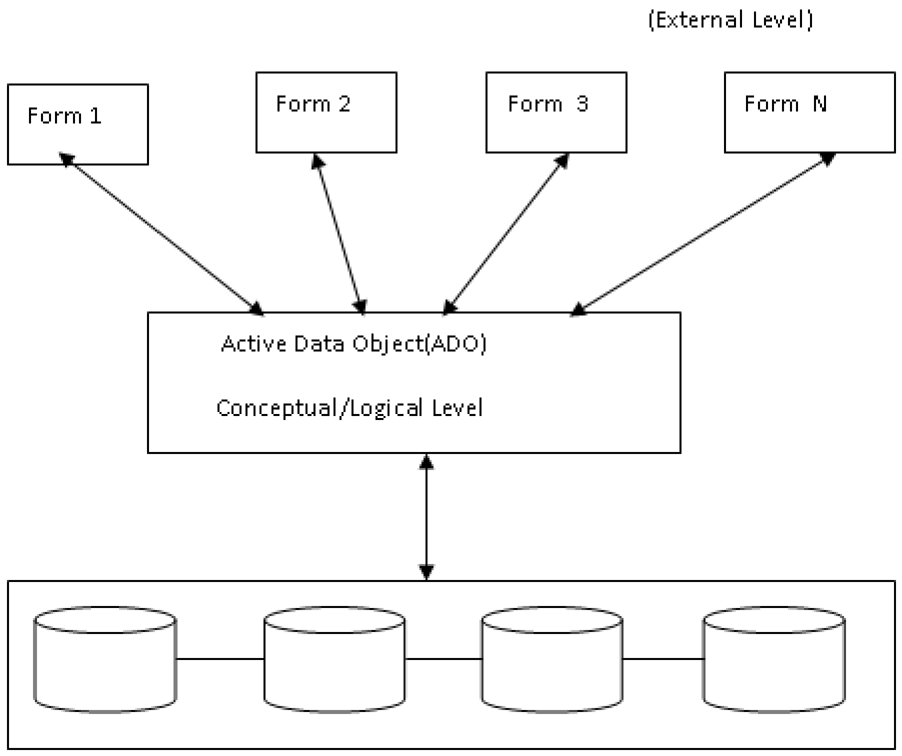


Fig 3.19. *System Architecture*

3.3. INTERFACE DESIGN (INPUT/OUTPUT)

The interface design composes of both input and output designs of the School Management System.

3.3.1 Input Design

The system input is designed to receive data from the user or administrators (Bursar, Registrar, Vice-principal and Principal). The first set of input to the system is a pair of Username and Password. After the pair has been entered, the system authenticates the user by validating the username and password. This is done by calling the login stored procedure which in turn checks the database by verifying if both the Username and Password supplied exist in the database. If true, the system authenticates the user else, the user is denied access. The other inputs to the system are only carried out after the user has been granted access to the system. These inputs include: Student registration details, Result data for computation, Staff details, School fees payment data etc.

3.3.2 Output Design

The system output present information to the user either as a single query or in report format. The system output varies from search results, query reports, login authentication message, exception messages, e.t.c. The system output is the most important component of a working system because the interactivity of the system depends on its output. This is the main reason why the output of an information system determines the effectiveness and efficiency of the system.

CHAPTER FOUR

SYSTEM IMPLEMENTATION AND TESTING

4.1 SYSTEM IMPLEMENTATION

The implementation of the proposed system has a front-end (Graphical User interface) GUI-based application and a back-end Relational Database Management System . The front-end is implemented with C#.NET (using Microsoft Visual Studio 2008 platform) while the back-end is designed with Microsoft Structured Query Language (MS SQL) Server 2008. The database implementation is based on the Entity-Relationship Model. The development processes followed for this project are:

4.1.1 Requirements Elicitation

Requirements elicitation remains one of the most important and challenging steps in systems analysis and design [6].

This phase of the implementation documented the strategic and tactical objectives of the system. It determines the workflow and functional requirements, processes and identifies areas where information needs to be shared, tracked and integrated.

4.1.2 Project Specification

A formal system implementation plan is created and finalized during this phase. A system administrator coordinates all stakeholders as well the system integrator or consultant(s) managing the implementation.

4.1.3 System Implementation

During this phase, installation of the software, workflow policies and procedures are implemented. System configuration, privileges, preferences and security are determined.

4.1.4 System Testing

An operational prototype of the system application is up and running at this stage. Operational issues are identified and resolved, and basic modifications are made.

4.1.5 Deployment & Training

During this phase, the application is completely operational. Training begins for all system administrators and teachers. Ongoing support is provided by the system developers through periodic maintenance.

4.1.6 The Structured System Analysis and Design Methodology Approach

SSADM takes a modular approach to the School Management Software initiative using the best practice guide to proctect the successful implementation of one part of the project at once [2]; this makes the project more scalable. The Relational Database Management (RDBM) of the application is implemented first and tested to make sure that it conforms with all requirements (specifications, business rules and constraints). After that, the front-end GUI (Graphical User Interface) application is integrated. This methodology allows the project to start and break down the implementation process into modules that are attainable, based on the requirements and resource availability.

Technology/Software Used:

- Microsoft Visual Studio 2010
- C#.NET programming language.
- .NET Framework 4
- Microsoft SQL Server 2008 (Database Engine)
- T-SQL (Transact Structured Query Language) database programming language.
- ADO.NET (middleware program)
- Microsoft Visio 2007 (UML Class Diagram, DFD, ER, Use Case)

4.2 SYSTEM REQUIREMENTS

Hardware Requirements

1. Microprocessor: Pentium III, 337MHz (Minimum)
2. Random Access Memory (RAM) Space: 256MB (Minimum)
3. Hard Disk Storage Capacity: 40GB (Minimum)
4. Monitor: 15”, 32MB SVGA

Software Requirements

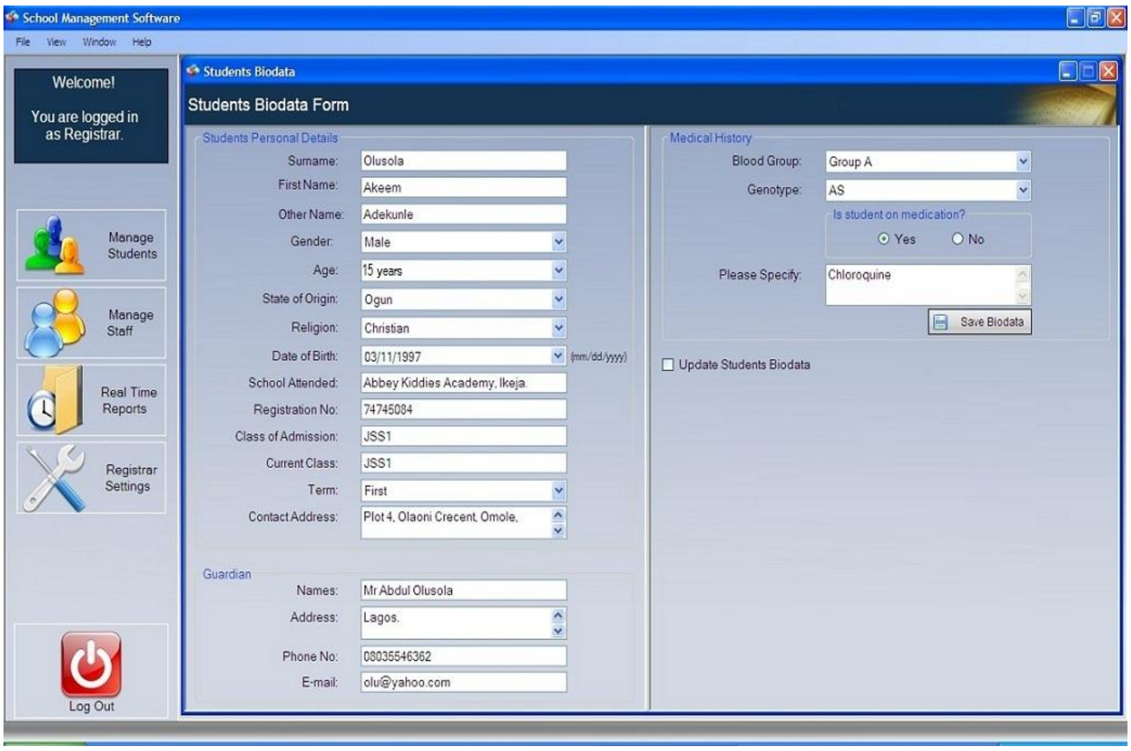
1. Microsoft SQL Server 2008
2. Windows Installer 4.5
3. Operating System (OS): Microsoft Windows 98/Millennium/NT/XP/Vista Operating System.
4. .NET Framework 4

4.3 SYSTEM TESTING

4.3.1 Administrator: Registrar

The registrar is expected to select the administrator role, supply admin name and password before gaining access to the School Management Software. When authenticated, the registrar is given the privilege to perform the operations described in Figures 4.1-4.3

The student registration form (Fig 4.1) enables the registrar to register a new student after completing the entrance examination successfully.



Students Personal Details

Surname:	Olusola
First Name:	Akeem
Other Name:	Adekunle
Gender:	Male
Age:	15 years
State of Origin:	Ogun
Religion:	Christian
Date of Birth:	03/11/1997 (mm/dd/yyyy)
School Attended:	Abbey Kiddies Academy, Ikeja.
Registration No:	74745084
Class of Admission:	JSS1
Current Class:	JSS1
Term:	First
Contact Address:	Plot 4, Olaoni Crecent, Omole,

Guardian

Names:	Mr Abdul Olusola
Address:	Lagos.
Phone No:	08035546362
E-mail:	olu@yahoo.com

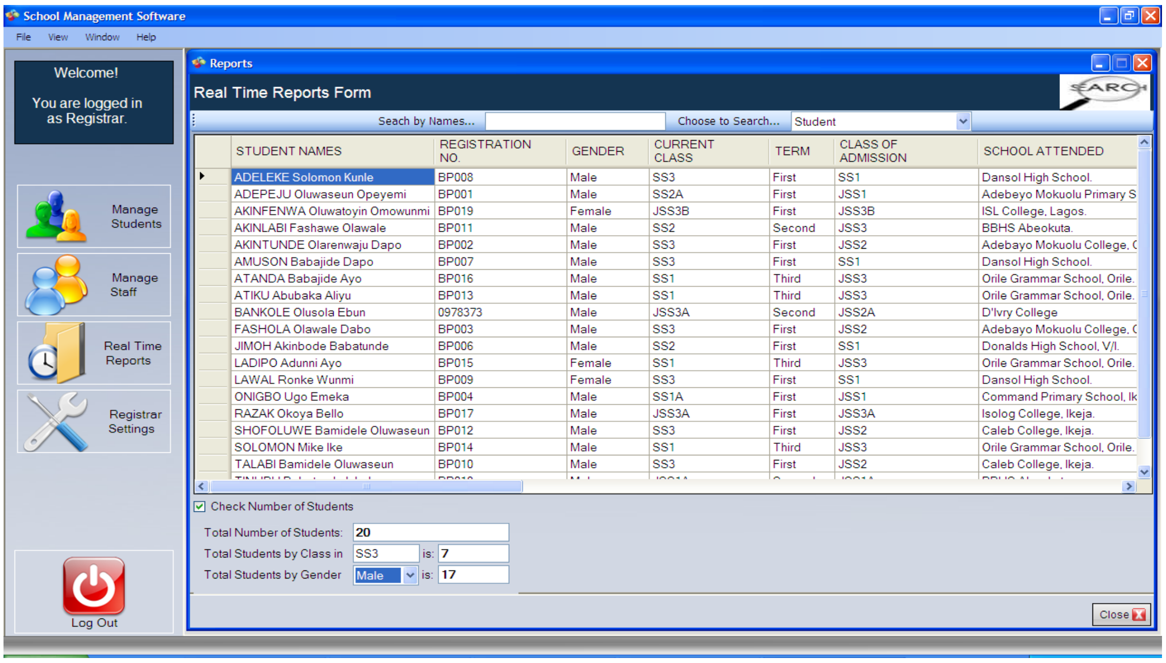
Medical History

Blood Group:	Group A
Genotype:	AS
Is student on medication?	[✓ Yes] No
Please Specify:	Chloroquine

☐ Update Students Biodata

Fig 4.1. *Student registration*

Report generation form (Fig 4.2) enables the registrar to generate reports on students as regards their details and other important information.



Real Time Reports Form

Seach by Names... Choose to Search... Student

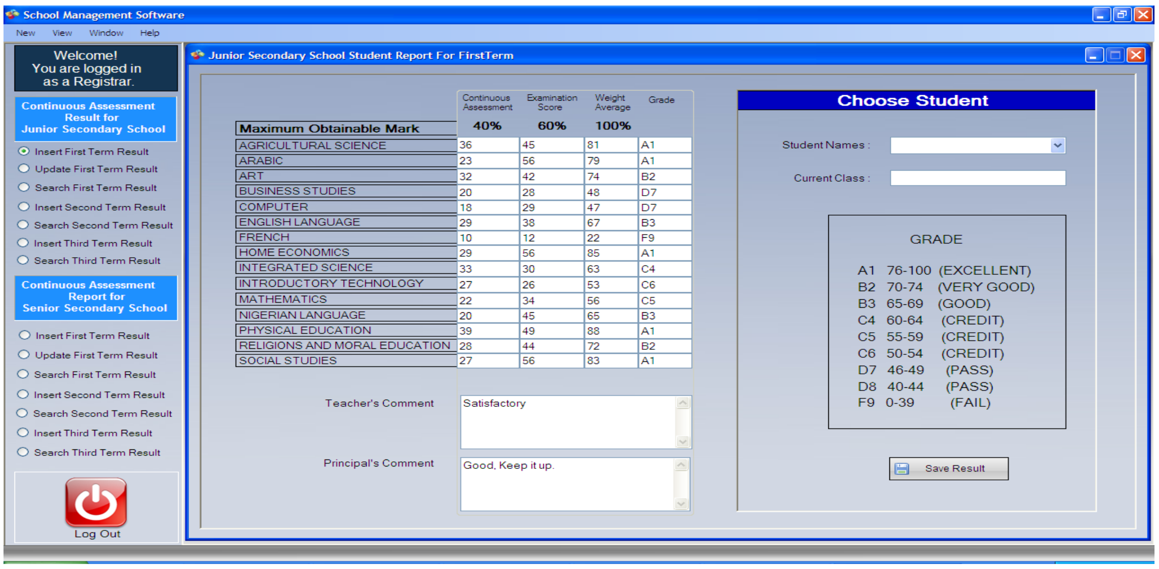
STUDENT NAMES	REGISTRATION NO.	GENDER	CURRENT CLASS	TERM	CLASS OF ADMISSION	SCHOOL ATTENDED
ADELEKE Solomon Kunle	BP008	Male	SS3	First	SS1	Dansol High School.
ADEPEJU Oluwaseun Opeyemi	BP001	Male	SS2A	First	JSS1	Adebeyo Mokuolu Primary S
AKINFENWA Oluwatoyin Omowunmi	BP019	Female	JSS3B	First	JSS3B	ISL College, Lagos.
AKINLABI Fashawe Olawale	BP011	Male	SS2	Second	JSS3	BBHS Abeokuta.
AKINTUNDE Olarenwaju Dapo	BP002	Male	SS3	First	JSS2	Adebayo Mokuolu College, (
AMUSON Babajide Dapo	BP007	Male	SS3	First	SS1	Dansol High School.
ATANDA Babajide Ayo	BP016	Male	SS1	Third	JSS3	Orile Grammar School, Orile.
ATIKU Abubaka Aliyu	BP013	Male	SS1	Third	JSS3	Orile Grammar School, Orile.
BANKOLE Olusola Ebun	0978373	Male	JSS3A	Second	JSS2A	D'Ivry College
FASHOLA Olawale Dabo	BP003	Male	SS3	First	JSS2	Adebayo Mokuolu College, (
JIMOH Akinbode Babatunde	BP006	Male	SS2	First	SS1	Donalds High School, V/I.
LADIPO Adunni Ayo	BP015	Female	SS1	Third	JSS3	Orile Grammar School, Orile.
LAWAL Ronke Wunmi	BP009	Female	SS3	First	SS1	Dansol High School.
ONIGBO Ugo Emeka	BP004	Male	SS1A	First	JSS1	Command Primary School, Ik
RAZAK Okoya Bello	BP017	Male	JSS3A	First	JSS3A	Isolog College, Ikeja.
SHOFOLUWE Bamidele Oluwaseun	BP012	Male	SS3	First	JSS2	Caleb College, Ikeja.
SOLOMON Mike Ike	BP014	Male	SS1	Third	JSS3	Orile Grammar School, Orile.
TALABI Bamidele Oluwaseun	BP010	Male	SS3	First	JSS2	Caleb College, Ikeja.

☑ Check Number of Students

Total Number of Students:	20		
Total Students by Class in	SS3	is:	7
Total Students by Gender	Male	is:	17

Fig 4.2. *Report Generation*

The result computation subsystem (Fig 4.3) enables the automation and computation of student results which is designed to replace the existing broadsheets currently in use.



Junior Secondary School Student Report For FirstTerm

	Continuous Assessment	Examination Score	Weight Average	Grade
Maximum Obtainable Mark	40%	60%	100%	
AGRICULTURAL SCIENCE	36	45	81	A1
ARABIC	23	56	79	A1
ART	32	42	74	B2
BUSINESS STUDIES	20	28	48	D7
COMPUTER	18	29	47	D7
ENGLISH LANGUAGE	29	38	67	B3
FRENCH	10	12	22	F9
HOME ECONOMICS	29	56	85	A1
INTEGRATED SCIENCE	33	30	63	C4
INTRODUCTORY TECHNOLOGY	27	26	53	C6
MATHEMATICS	22	34	56	C5
NIGERIAN LANGUAGE	20	45	65	B3
PHYSICAL EDUCATION	39	49	88	A1
RELIGIONS AND MORAL EDUCATION	28	44	72	B2
SOCIAL STUDIES	27	56	83	A1

Teacher's Comment: Satisfactory

Principal's Comment: Good, Keep it up.

Choose Student

Student Names :

Current Class :

GRADE

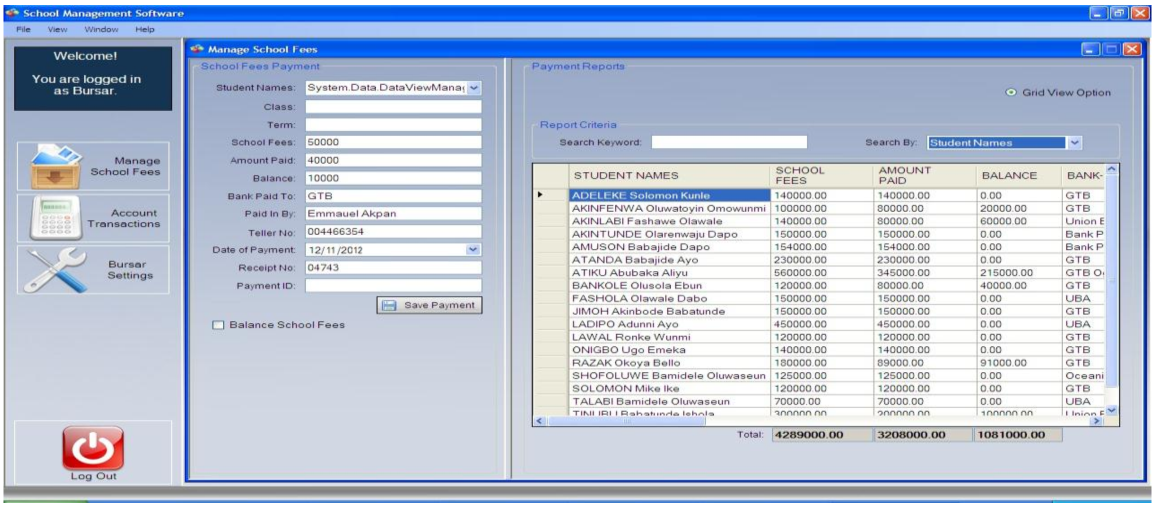
A1	76-100	(EXCELLENT)
B2	70-74	(VERY GOOD)
B3	65-69	(GOOD)
C4	60-64	(CREDIT)
C5	55-59	(CREDIT)
C6	50-54	(CREDIT)
D7	46-49	(PASS)
D8	40-44	(PASS)
F9	0-39	(FAIL)

Fig 4.3. *Result Computation*

4.3.2 Administrator: Bursar

The bursar is required to select the administrator role, supply admin name and password before gaining access to the School Management Software. When authenticated, the bursar is given the privilege to perform the operations described in Figures 4.4-4.5

The school fees payment subsystem (Fig 4.4) allows the bursar to insert record of school fees.



Student Names:	System.Data.DataViewMana
Class:	
Term:	
School Fees:	50000
Amount Paid:	40000
Balance:	10000
Bank Paid To:	GTB
Paid In By:	Emmauel Akpan
Teller No:	004466354
Date of Payment:	12/11/2012
Receipt No:	04743
Payment ID:	

☐ Balance School Fees

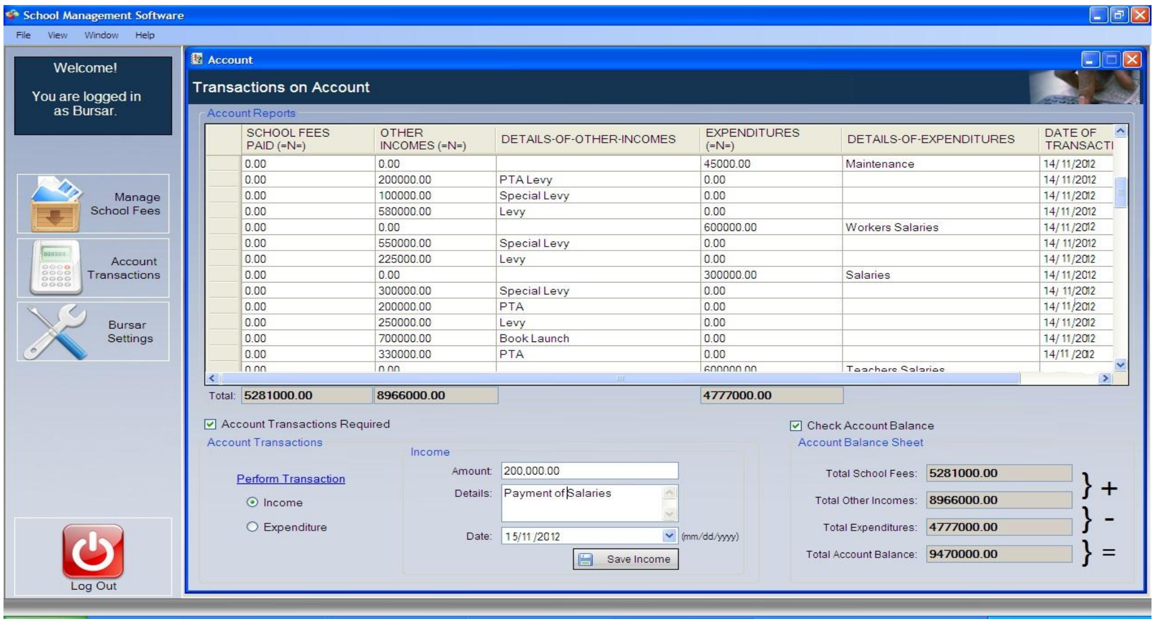
● Grid View Option

Search Keyword: 　Search By: Student Names

STUDENT NAMES	SCHOOL FEES	AMOUNT PAID	BALANCE	BANK-
ADELEKE Solomon Kunle	140000.00	140000.00	0.00	GTB
AKINFENWA Oluwatoyin Omowunmi	100000.00	80000.00	20000.00	GTB
AKINLABI Fashawe Olawale	140000.00	80000.00	60000.00	Union E
AKINTUNDE Olarenwaju Dapo	150000.00	150000.00	0.00	Bank P
AMUSON Babajide Dapo	154000.00	154000.00	0.00	Bank P
ATANDA Babajide Ayo	230000.00	230000.00	0.00	GTB
ATIKU Abubaka Aliyu	560000.00	345000.00	215000.00	GTB O
BANKOLE Olusola Ebun	120000.00	80000.00	40000.00	GTB
FASHOLA Olawale Dabo	150000.00	150000.00	0.00	UBA
JIMOH Akinbode Babatunde	150000.00	150000.00	0.00	GTB
LADIPO Adunni Ayo	450000.00	450000.00	0.00	UBA
LAWAL Ronke Wunmi	120000.00	120000.00	0.00	GTB
ONIGBO Ugo Emeka	140000.00	140000.00	0.00	GTB
RAZAK Okoya Bello	180000.00	89000.00	91000.00	GTB
SHOFOLUWE Bamidele Oluwaseun	125000.00	125000.00	0.00	Oceani
SOLOMON Mike Ike	120000.00	120000.00	0.00	GTB
TALABI Bamidele Oluwaseun	70000.00	70000.00	0.00	UBA
TINUBU Babatunde Ishola	300000.00	200000.00	100000.00	Union E
Total:	4289000.00	3208000.00	1081000.00	

Fig 4.4. *Student Fees Payment*

The account subsystem (Fig 4.5) encompasses the school fee, other income and expenditure. It also presents a structured balance sheet of the school's account.



SCHOOL FEES PAID (=N=)	OTHER INCOMES (=N=)	DETAILS-OF-OTHER-INCOMES	EXPENDITURES (=N=)	DETAILS-OF-EXPENDITURES	DATE OF TRANSACTI
0.00	0.00		45000.00	Maintenance	14/11/2012
0.00	200000.00	PTA Levy	0.00		14/11/2012
0.00	100000.00	Special Levy	0.00		14/11/2012
0.00	580000.00	Levy	0.00		14/11/2012
0.00	0.00		600000.00	Workers Salaries	14/11/2012
0.00	550000.00	Special Levy	0.00		14/11/2012
0.00	225000.00	Levy	0.00		14/11/2012
0.00	0.00		300000.00	Salaries	14/11/2012
0.00	300000.00	Special Levy	0.00		14/11/2012
0.00	200000.00	PTA	0.00		14/11/2012
0.00	250000.00	Levy	0.00		14/11/2012
0.00	700000.00	Book Launch	0.00		14/11/2012
0.00	330000.00	PTA	0.00		14/11/2012
0.00	0.00		600000.00	Teachers Salaries	
Total: 5281000.00	8966000.00		4777000.00		

☑ Account Transactions Required

Account Transactions

Income

(● Income ○ Expenditure)

Amount:	200,000.00
Details:	Payment of Salaries
Date:	15/11/2012 (mm/dd/yyyy)

☑ Check Account Balance

Account Balance Sheet

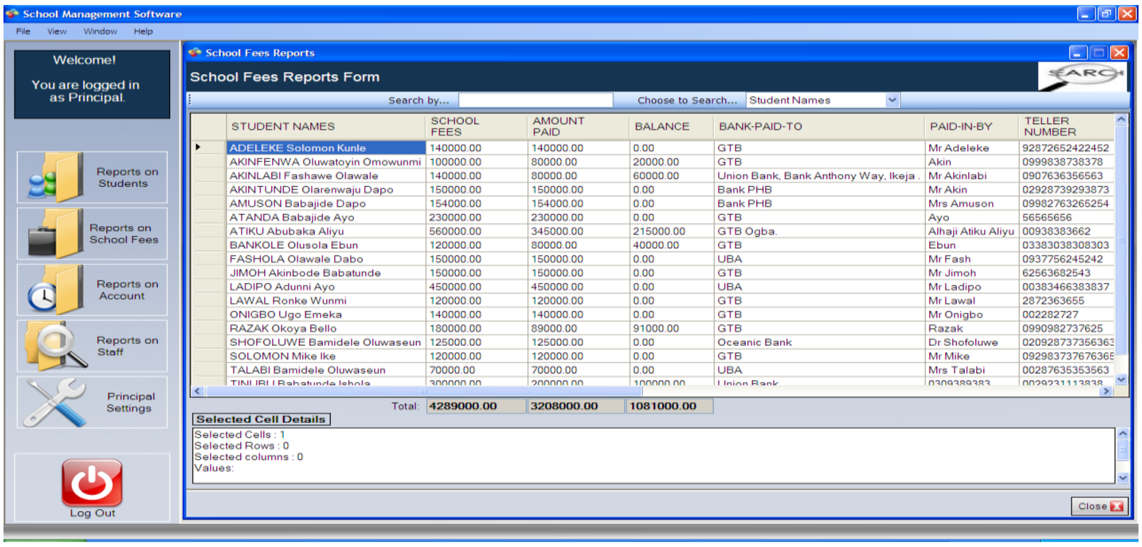
Total School Fees:	5281000.00	} +
Total Other Incomes:	8966000.00	} -
Total Expenditures:	4777000.00	} =
Total Account Balance:	9470000.00	

Fig 4.5. *Management of the School Account*

4.3.3 Administrator: Principal

The principal is required to select the administrator role, supply admin name and password before gaining access to the School Management Software. When authenticated, the principal is given the privilege to perform the following operations:

Generate school fees payment history: This form allows the principal to generate school fees payment history for a particular student within a stipulated time period (Fig. 4.6)



School Fees Reports Form

Search by... Choose to Search... Student Names

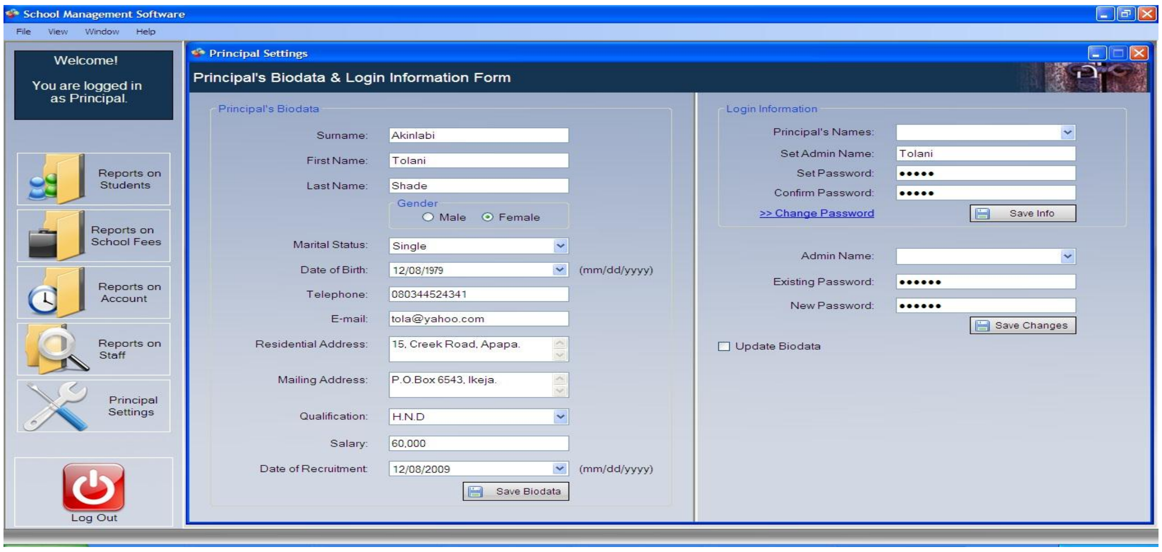
STUDENT NAMES	SCHOOL FEES	AMOUNT PAID	BALANCE	BANK-PAID-TO	PAID-IN-BY	TELLER NUMBER
ADELEKE Solomon Kunle	140000.00	140000.00	0.00	GTB	Mr Adeleke	92872652422452
AKINFENWA Oluwatoyin Omowunmi	100000.00	80000.00	20000.00	GTB	Akin	0999838738378
AKINLABI Fashawe Olawale	140000.00	80000.00	60000.00	Union Bank, Bank Anthony Way, Ikeja .	Mr Akinlabi	0907636356563
AKINTUNDE Olarenwaju Dapo	150000.00	150000.00	0.00	Bank PHB	Mr Akin	02928739293873
AMUSON Babajide Dapo	154000.00	154000.00	0.00	Bank PHB	Mrs Amuson	09982763265254
ATANDA Babajide Ayo	230000.00	230000.00	0.00	GTB	Ayo	56565656
ATIKU Abubaka Aliyu	560000.00	345000.00	215000.00	GTB Ogba.	Alhaji Atiku Aliyu	00938383662
BANKOLE Olusola Ebun	120000.00	80000.00	40000.00	GTB	Ebun	03383038308303
FASHOLA Olawale Dabo	150000.00	150000.00	0.00	UBA	Mr Fash	0937756245242
JIMOH Akinbode Babatunde	150000.00	150000.00	0.00	GTB	Mr Jimoh	62563682543
LADIPO Adunni Ayo	450000.00	450000.00	0.00	UBA	Mr Ladipo	00383466383837
LAWAL Ronke Wunmi	120000.00	120000.00	0.00	GTB	Mr Lawal	2872363655
ONIGBO Ugo Emeka	140000.00	140000.00	0.00	GTB	Mr Onigbo	002282727
RAZAK Okoya Bello	180000.00	89000.00	91000.00	GTB	Razak	0990982737625
SHOFOLUWE Bamidele Oluwaseun	125000.00	125000.00	0.00	Oceanic Bank	Dr Shofoluwe	020928737356363
SOLOMON Mike Ike	120000.00	120000.00	0.00	GTB	Mr Mike	092983737676365
TALABI Bamidele Oluwaseun	70000.00	70000.00	0.00	UBA	Mrs Talabi	00287635353563
TINUBU Babatunde Ishola	300000.00	200000.00	100000.00	Union Bank	0309389383	0029231113838
Total:	4289000.00	3208000.00	1081000.00			

Selected Cell Details

Selected Cells : 1
Selected Rows : 0
Selected columns : 0
Values:

Fig 4.6. *Generate School Fees Payment History*

Update login info: This form (Fig. 4.7) allows the principal/vice-principal to update or make changes to his/her login credentials.



Principal's Biodata & Login Information Form

Principal's Biodata

Surname:	Akinlabi
First Name:	Tolani
Last Name:	Shade
Gender	Male [✓ Female]
Marital Status:	Single
Date of Birth:	12/08/1979 (mm/dd/yyyy)
Telephone:	080344524341
E-mail:	tola@yahoo.com
Residential Address:	15, Creek Road, Apapa.
Mailing Address:	P.O.Box 6543, Ikeja.
Qualification:	H.N.D
Salary:	60,000
Date of Recruitment:	12/08/2009 (mm/dd/yyyy)

Login Information

Principal's Names:	
Set Admin Name:	Tolani
Set Password:	•••••
Confirm Password:	•••••

>> Change Password

Admin Name:	
Existing Password:	••••••
New Password:	••••••

☐ Update Biodata

Fig 4.7. *Update Login Information*

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION AND SUMMARY

The design and implementation of an information system for Secondary School Management is completed. During the analysis phase, it was found out that the existing system employed a file system of storing data and manual retrieval of information. However, the existing mode of operation was inefficient and less productive.

The developed information system for school management automates all operations performed by the administrators (Bursar, Registrar, Vice-principal and Principal) of Comprehensive High School, Ayetoro (CHSA), thereby improving productivity and workflow. The developed information system provides the following functionalities:

1 An internal communication mechanism that performs most activities involved in administration and managerial activities of the school.
2 A well normalized database system for the conceptual, logical and physical model of the repository data store.
3 Easy insertion and retrieval of student and staff record.
4 Reduction of manpower and time wasting.
5 An automated billing system for school fees and other account activities.
6 A result automation and computation for accurate and easy result computation.
7 Reduction of errors encountered in the existing system due to total human dependency.
8 A well designed security provision to prevent unauthorized access and validating ethical users.

Compared to other existing systems, the system developed is better in the following ways:

1 It automates all operations performed by the administrators (Bursar, Registrar, Vice-principal and Principal) of Comprehensive High School, Ayetoro (CHSA) which effectively reduces the resources (time and money) spent on the existing system.
2 It provides a Relational Database Management System (RDBMS) which acts as a repository data store for the information system and a friendly Graphical User Interface (GUI) for easy usage.

3 It serves as an internal communication mechanism for administrators and for easy storage and retrieval of information.
4 It enables security provision by authenticating each administrator before granting he/she access to information.

5.2 RECOMMENDATIONS

The global trend in the world today is that the world is said to be a global village as a result of the internet. For the purpose of future development and/or software forward engineering, the following issues should be taken into considerations:

1 Integration of XML (Extended Mark-up Language) enabled web service that allows the connection of multiple school branches via the internet. The functions and operations of the information system will be hard-coded in the web services such that data are encrypted during storage and decrypted when retrieved.
2 A Short Message System (SMS) alert can be embedded to the system in order to update parent/guardian about payment notification and dissemination of information.

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APPENDIX

SAMPLE PROGRAM LISTING

Registration Subsystem

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Text;
using System.Windows.Forms;

namespace SchoolManagementSoftware
{
   public partial class frmStudentBiodata : Form
   {
      public frmStudentBiodata()
      {
         InitializeComponent();
      }

      private void frmStudentBiodata_Load(object sender, EventArgs e)
      {
         // TODO: This line of code loads data into the
'secondarySchool_DBDataSet3._getStudents' table. You can move, or remove it, as
needed.

//this._getStudentsTableAdapter.Fill(this.secondarySchool_DBDataSet3._getStudents);
         lblDrugs.Hide();
         txtDrugs.Hide();
         groupBox6.Hide();

         // Update Biodata
         if (cmbStudentNames.SelectedValue != null)
         {
            DBAccess db = new DBAccess();
            db.AddParameter("@RegistrationNo",
cmbStudentNames.SelectedValue.ToString());
            txtAge.Text = db.ExecuteScalar("getAge").ToString();
            txtUpContAdd.Text = db.ExecuteScalar("getContactAddress").ToString();
            txtGuardAddrs.Text = db.ExecuteScalar("getAddress").ToString();
            txtUpPhoneNo.Text = db.ExecuteScalar("getPhoneNo").ToString();
            txtUpEmail.Text = db.ExecuteScalar("getEmail").ToString();
            txtUpCurrentCls.Text = db.ExecuteScalar("getCurrentClass").ToString();
            //txtUpTerm.Text = db.ExecuteScalar("getTerm").ToString();
         }
         else
```

```
        { // do nothing!}
        }
    }

    private void rbtnYes_CheckedChanged(object sender, EventArgs e)
    {
        if (rbtnYes.Checked)
        {
            lblDrugs.Show();
            txtDrugs.Show();
        }
        else
        {
            lblDrugs.Hide();
            txtDrugs.Hide();
        }

        if (rbtnNo.Checked)
        {
            lblDrugs.Hide();
            txtDrugs.Hide();
        }
        else { }
    }

    private void rbtnNo_CheckedChanged(object sender, EventArgs e)
    {
        if (rbtnYes.Checked)
        {
            lblDrugs.Show();
            txtDrugs.Show();
        }
        else
        {
            lblDrugs.Hide();
            txtDrugs.Hide();
        }

        if (rbtnNo.Checked)
        {
            lblDrugs.Hide();
            txtDrugs.Hide();
        }
        else { }
    }

    private void chkUpdate_CheckedChanged(object sender, EventArgs e)
    {
        if (chkUpdate.Checked)
        {
            groupBox6.Show();
        }
        else
```

```
            {
                groupBox6.Hide();
            }
        }


        private void btnSaveBiodata_Click(object sender, EventArgs e)
        {
            if (rbtnYes.Checked)
            {
                DBAccess db = new DBAccess();
                db.AddParameter("@RegistrationNo", txtRegNo.Text);
                db.AddParameter("@SurName", txtSurname.Text.ToUpper());
                db.AddParameter("@FirstName", txtFirstName.Text);
                db.AddParameter("@LastName", txtLastName.Text);
                db.AddParameter("@Drugs", txtDrugs.Text);
                db.AddParameter("@Age", cmbAge.SelectedItem.ToString());
                db.AddParameter("@DateOfBirth", DateTime.Parse(dtpDOB.Text));
                db.AddParameter("@StateOfOrigin", cmbStates.SelectedItem.ToString());
                db.AddParameter("@Religion", cmbReligion.SelectedItem.ToString());
                db.AddParameter("@ContactAddress", txtContactAddrs.Text);
                db.AddParameter("@SchoolAttended", txtSchAttended.Text);
                db.AddParameter("@Guardian", txtNames.Text);
                db.AddParameter("@Address", txtAddress.Text);
                db.AddParameter("@PhoneNo", txtPhoneNo.Text);
                db.AddParameter("@Email", txtEmail.Text);
                db.AddParameter("@BloodGroup",
cmbBloodGroup.SelectedItem.ToString());
                db.AddParameter("@Genotype", cmbGenoType.SelectedItem.ToString());
                db.AddParameter("@Gender", cmbGender.SelectedItem.ToString());
                db.AddParameter("@DateAdded", DateTime.Now);
                db.AddParameter("@ClassOfAdmission", txtClassOfAdmin.Text);
                db.AddParameter("@CurrentClass", txtCurrentClass.Text);
                db.AddParameter("@Term", cmbterm.SelectedItem.ToString());
                int i = Convert.ToInt32(db.ExecuteNonQuery("SMS_Student_Insert"));
                if (i > 0)
                {
                    MessageBox.Show("Student's Biodata was successfully saved.", "Student
Biodata Alert!", MessageBoxButtons.OK, MessageBoxIcon.Information);
                    txtRegNo.Clear();
                    txtSurname.Clear();
                    txtFirstName.Clear();
                    txtLastName.Clear();
                    cmbAge.Text = null;
                    cmbStates.Text = null;
                    cmbReligion.Text = null;
                    txtContactAddrs.Clear();
                    txtSchAttended.Clear();
                    txtNames.Clear();
                    txtAddress.Clear();
                    txtPhoneNo.Clear();
                    txtEmail.Clear();
                    cmbBloodGroup.Text = null;
                    cmbGenoType.Text = null;
                    txtClassOfAdmin.Clear();
                    txtCurrentClass.Clear();
                    cmbterm.Text = null;
                    //txtTerm.Clear();
                    cmbGender.Text = null;
                    txtDrugs.Clear();
                }
                else
                {
                     MessageBox.Show("Student's Biodata was successful.", "Student Biodata
Alert!", MessageBoxButtons.OK, MessageBoxIcon.Information);

                    txtRegNo.Clear();
                    txtSurname.Clear();
                    txtFirstName.Clear();
                    txtLastName.Clear();
                    cmbAge.Text = null;
                    cmbStates.Text = null;
                    cmbReligion.Text = null;
                    txtContactAddrs.Clear();
                    txtSchAttended.Clear();
                    txtNames.Clear();
                    txtAddress.Clear();
                    txtPhoneNo.Clear();
                    txtEmail.Clear();
                    cmbBloodGroup.Text = null;
                    cmbGenoType.Text = null;
                    txtClassOfAdmin.Clear();
                    txtCurrentClass.Clear();
                   // txtTerm.Clear();
                    cmbterm.Text = null;
                    txtDrugs.Clear();
                    cmbGender.Text = null;
                }
            }
            else
            {
                DBAccess dba = new DBAccess();
                dba.AddParameter("@RegistrationNo", txtRegNo.Text);
                dba.AddParameter("@SurName", txtSurname.Text.ToUpper());
                dba.AddParameter("@FirstName", txtFirstName.Text);
                dba.AddParameter("@LastName", txtLastName.Text);
                dba.AddParameter("@Drugs", rbtnNo.Text);
                dba.AddParameter("@Age", cmbAge.SelectedItem.ToString());
                dba.AddParameter("@DateOfBirth", DateTime.Parse(dtpDOB.Text));
                dba.AddParameter("@StateOfOrigin", cmbStates.SelectedItem.ToString());
                dba.AddParameter("@Religion", cmbReligion.SelectedItem.ToString());
                dba.AddParameter("@ContactAddress", txtContactAddrs.Text);
                dba.AddParameter("@SchoolAttended", txtSchAttended.Text);
                dba.AddParameter("@Guardian", txtNames.Text);
                dba.AddParameter("@Address", txtAddress.Text);
                dba.AddParameter("@PhoneNo", txtPhoneNo.Text);
                dba.AddParameter("@Email", txtEmail.Text);
                dba.AddParameter("@BloodGroup",
cmbBloodGroup.SelectedItem.ToString());
                dba.AddParameter("@Genotype", cmbGenoType.SelectedItem.ToString());
                dba.AddParameter("@Gender", cmbGender.SelectedItem.ToString());
                dba.AddParameter("@DateAdded", DateTime.Now);
                dba.AddParameter("@ClassOfAdmission", txtClassOfAdmin.Text);
                dba.AddParameter("@CurrentClass", txtCurrentClass.Text);
                dba.AddParameter("@Term", cmbterm.SelectedItem.ToString());
                int i = Convert.ToInt32(dba.ExecuteNonQuery("SMS_Student_Insert"));
                if (i > 0)
                {
                    MessageBox.Show("Student's Biodata was successfully saved.", "Student
Biodata Alert!", MessageBoxButtons.OK, MessageBoxIcon.Information);
                    txtRegNo.Clear();
                    txtSurname.Clear();
                    txtFirstName.Clear();
                    txtLastName.Clear();
                    cmbAge.Text = null;
                    cmbStates.Text = null;
                    cmbReligion.Text = null;
                    txtContactAddrs.Clear();
                    txtSchAttended.Clear();
                    txtNames.Clear();
                    txtAddress.Clear();
                    txtPhoneNo.Clear();
                    txtEmail.Clear();
                    cmbBloodGroup.Text = null;
                    cmbGenoType.Text = null;
                    txtClassOfAdmin.Clear();
                    txtCurrentClass.Clear();
                    cmbterm.Text = null;
                    cmbGender.Text = null;
                }
                else
                {
                    MessageBox.Show("Student's Biodata was unsuccessful.", "Student
Biodata Error!", MessageBoxButtons.RetryCancel, MessageBoxIcon.Error);
                    txtRegNo.Clear();
                    txtSurname.Clear();
                    txtFirstName.Clear();
                    txtLastName.Clear();
                    cmbAge.Text = null;
                    cmbStates.Text = null;
                    cmbReligion.Text = null;
                    txtContactAddrs.Clear();
                    txtSchAttended.Clear();
                    txtNames.Clear();
                    txtAddress.Clear();
                    txtPhoneNo.Clear();
                    txtEmail.Clear();
                    cmbBloodGroup.Text = null;
                    cmbGenoType.Text = null;
```

```
                txtClassOfAdmin.Clear();
                txtCurrentClass.Clear();
                cmbterm.Text = null;
                txtDrugs.Clear();
                cmbGender.Text = null;
            }
        }

    }

    private void groupBox1_Enter(object sender, EventArgs e)
    {

    }

    private void btnSaveChanges_Click(object sender, EventArgs e)
    {
        DBAccess db = new DBAccess();
        db.AddParameter("@RegistrationNo",
cmbStudentNames.SelectedValue.ToString());
        db.AddParameter("@Age", txtAge.Text);
        db.AddParameter("@ContactAddress", txtUpContAdd.Text);
        db.AddParameter("@Address", txtGuardAddrs.Text);
        db.AddParameter("@PhoneNo", txtUpPhoneNo.Text);
        db.AddParameter("@Email", txtUpEmail.Text);
        db.AddParameter("@CurrentClass", txtUpCurrentCls.Text);
        db.AddParameter("@Term", txtupterm.Text);
            int i = Convert.ToInt32(db.ExecuteNonQuery("SMS_Student_Update"));
        if (i > 0)
        {
            MessageBox.Show("Student's Biodata update was successful.", "Update
Alert!", MessageBoxButtons.OK, MessageBoxIcon.Information);
            cmbStudentNames.Text = null;
            txtAge.Clear();
            txtUpContAdd.Clear();
            txtGuardAddrs.Clear();
            txtUpPhoneNo.Clear();
            txtUpEmail.Clear();
            txtUpCurrentCls.Clear();
           txtupterm.Clear();

        }
        else
        {
            MessageBox.Show("Student's Biodata update was successful.", "Update
Alert!", MessageBoxButtons.RetryCancel, MessageBoxIcon.Information);
            cmbStudentNames.Text = null;
            txtAge.Clear();
            txtUpContAdd.Clear();
            txtGuardAddrs.Clear();
            txtUpPhoneNo.Clear();
            txtUpEmail.Clear();
            txtUpCurrentCls.Clear();
```

```
                txtupterm.Clear();
            }
        }

        private void cmbStudentNames_SelectedIndexChanged(object sender, EventArgs
e)
        {
            if (cmbStudentNames.SelectedValue != null)
            {
                DBAccess db = new DBAccess();
                db.AddParameter("@RegistrationNo",
cmbStudentNames.SelectedValue.ToString());
                txtAge.Text = db.ExecuteScalar("getAge").ToString();
                txtUpContAdd.Text = db.ExecuteScalar("getContactAddress").ToString();
                txtGuardAddrs.Text = db.ExecuteScalar("getAddress").ToString();
                txtUpPhoneNo.Text = db.ExecuteScalar("getPhoneNo").ToString();
                txtUpEmail.Text = db.ExecuteScalar("getEmail").ToString();
                txtUpCurrentCls.Text = db.ExecuteScalar("getCurrentClass").ToString();
                txtupterm.Text = db.ExecuteScalar("getTerm").ToString();

            }
            else
            { //do nothing!}
            }
        }


    }
}
```