FR. PETER SECONDARY SCHOOL MANAGEMENT SYSTEM

THESIS ARTICLE

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ABSTRACT

Automation is the utilization of technology to replace human with a machine that can perform more quickly and more continuously. By automating School Management System documents that took up many large storage rooms can be stored on few disks. However, Fr. Peter Secondary School System is not automated and the teachers usually generate transcripts and reports manually. Also the school administration normally uses their experienced knowledge of miss and hit approaches to prepare timetables while enrollment and registration of students is all done manually. Consequently, it's time consuming and a lot of human errors do involve. Therefore, the research is done on the title "Fr. Peter Secondary School Management System" in order to automate these processes through using an automated school management system.

In preparation of this research, the Descriptive Qualitative Approach was used to collect data, analyze and explain the observations in the field. The method used in systems approach is the Object-Oriented Systems Approach and is visualized with UML (Unified Modeling Language) diagrams such as follows: Use Case Diagrams, Activity Diagrams, Class Diagram, Sequence Diagram, Deployment Diagram, and so on. The system development method used in the research is the Prototype Model.

The proposed system for Fr. Peter Secondary School Management is particulary a web-based system that uses the concept of client-server, in which the client uses a browser while PHP and MySQL are used as the server. This is done online so other clients can access this application through using the internet.The Fr. Peter Secondary School Management System consists of tasks such as registering and enrolling of students, staff profiling, subject management, boarding room allocation, creating class timetable, manage accounting and financial records, produce student transcript as well as ledger, and also manage other sections of the school.

Chapter 1: Introduction

1.1. Background

In this 21st century which is also known as the information/digital/computer age, information technology (IT) is very important and is useful in every aspects of life. That includes, business organizations, government, military, health, entertainment, research, communication, security, education, and so on. Information technology is the study and use of systems for storing, retrieving, and sending information. This can include software,

hardware, applications, and so much more. Information technology tends to bring new dramatic options to living standard of men. Therefore, specifically, in the education, the principal function of information technology is the preservation of knowledge in a form that is durable, accessible, searchable and easily updated. Since information technology has the ability of speeding up information delivery, this ability can be used in improving the education environment.

Automation is the utilization of technology to replace human with a machine that can perform more quickly and more continuously. By automating School Management System documents that took up many large storage rooms can be stored on few disks. However, Fr. Peter Secondary School System is not automated and the record officers generate transcripts and reports manually, school administrators use their experienced knowledge of miss and hit approaches to prepare timetables, enrollment encoder (teachers) and registrar do manual student enrollment and registration which takes up a lot of time and sometime a lot of human errors involved, and so on.

Therefore, the research is done on the title "Fr. Peter Secondary School Management System" (FPSSMS). This school management system consists of tasks such as registering and enrolling students, staff profiling, subjects' allocation, room allocation and managing of boarding students, creating class schedules, manage accounting and financial records, producing student transcript and class timetable as well as ledger of school fee payment for students, and manage other sections of the school.

1.2. Research Problems

The identification of the problem is as follows;

1. Timetable clashes (class schedules collision) due to being manually prepared.
2. Financial problems or crises arise as a result of poor accounting and keeping of the financial records during school fee payment.
3. Over-crowded in the classrooms as well as dormitory rooms (for boarding students) due to poor management of student statistics during enrollment and registration processes.
4. Unfair distribution of class composition specifically regarding gender (male/female) which results in an uncomfortable learning environment.
5. Inaccuracy and mistakes normally involve in the production of student transcript as well as time-consuming since all is done manually and recorded.

1.3. Research Purposes

The purpose of this study is as follows:

1. To create a system that can manage staffs and students personal information (profile), manage subjects, create class schedule, and manage boarding students' accommodation and other sections.
2. To create a system that can perform accounting and financial records more effectively especially the payment of school fee and can produce ledger.
3. To create a system that can manage student enrollment and registration processes in a well-organized manner and done within less time.
4. To create a system that can manage the student statistics effectively and can manage a fair distribution of student population in each classrooms as well as dormitory rooms (manage boarding students).

5. To create a system that can generate quickly a correct and an accurate student transcript on time.

1.4. Location of the Research

The location of the research is as follows:

Location in which this research was taken:
Location: Fr. Peter Secondary School- Fatima
Address: Private Mail Bag 2, Banz 283, Jiwaka,
Papua New Guinea
Phone: (+675) 546 2235/546 2292
Facsimile: (+675) 546 2292
Email: Fatima@datec.net.pg

Chapter 2: Theoretical

This chapter indicates the theory upon which the study is based. That is, the understanding of information system, secondary education, PHP and JavaScript Programming, UML (Unified Modeling Language), Database, HTML, MySQL, Object-Oriented Analysis and Design (OOAD), and so on. It contains a literature review of relevant previous work and background information relevant to this research.

Chapter 3: Object and Methods

3.1. Research Object

The object of the research is Fr. Peter Secondary School that is located in Banz, Jiwaka Province, Papua New Guinea. The research mainly focuses on its management system and was carried out at Indonesian Computer University (UNIKOM), Bandung, West Java, Indonesia.

3.2. Methods Used

That is, method and system development approach used is the object-oriented and the types and method of data collections are primary and secondary data sources. The method the researcher used in systems approach is the Object-Oriented Systems Approach and is visualized with UML (Unified Modeling Language) diagrams as follows: Use Case Diagrams, Activity Diagrams, Sequence Diagrams, Class Diagrams, and Deployment Diagrams. Further analysis of the current system consisting of document analysis, analysis of current procedures with the use of Use Case diagram, Use Case Scenario and Activity Diagram of each use case, and the Evaluation of the current system,

3.3.. Analysis of Document of the Current System

As for the types of documents used in Fr. Peter Secondary School system is: Class Schedule, Room Allocation (Boarding), School Fee Payment, Enrollment, Student Academic Performance, and Registration. Here are the details of each of these documents:

Table 3.1 Document Analysis Table

NO	DOCUMENT NAME	COMMENTARY
1	Class Schedule	**Description:** Documents containing information about the teaching schedules. **Function:** Manage class schedules **Source:** Deputy Principle Cirriculum (DPC)**.** **Attribute:** Teacher name, gender, school year, subject name, class name.
2	Boarding Room Allocation	**Description:** Documents containing information about the allocation of rooms for boarding students. **Function:** Manage boarding students' accommodation. **Source:** Registrar **Attribute:** Student name, student id, grade level, dormitory name, room number.
3	School Fee Payment	**Description:** Documents containing the information about students' school fee payment process. **Function:** Manage students' school fee payment process. **Source:** Cashier **Attribute:** Student name, student id, amount paid, balance, amount yet to pay, year, grade level.
4	Enrollment	**Description:** Documents containing information about the students' enrollment process. **Function:** Manage the students' enrollment process. **Source:** Enrollment Encoder (staff) **Attribute:** Student name, student id, school year, gender, grade level, class name.
5	Student Academic Performance	**Description:** Documents containing information about students' academic performance or grades. **Function:** Produce students' academic transcripts **Source:** Teacher

		Attribute: Student name, student id, grade level, class name, subject grade, gender, class patron name, subject,
6	Registration	**Description:** Documents containing information about the students' registration process. **Function:** Manage the students' registration process. **Source:** Registrar **Attribute:** Student name, student id, place of birth, date of birth, citizen, fathers name, mothers name, address, school year, gender, grade level, class name, etc.

3.4. Analysis of Current Procedures

3.4.1. Use Case Diagram of School System The Ongoing

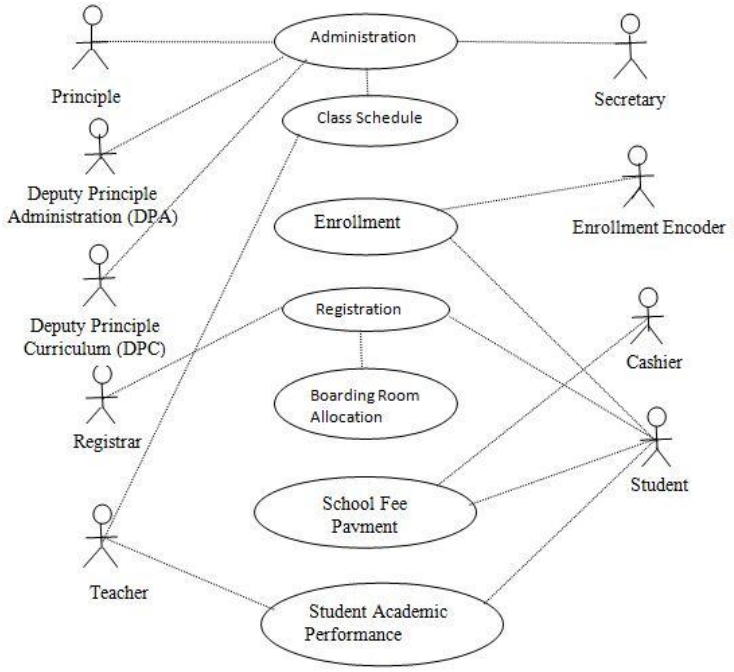


Figure 3.1 Use Case Diagram of School System the Ongoing

3.5. Ongoing Evaluation System

After passing through several stages of analysis of School System that is running in Fr. Peter Secondary School, it can be seen that there are deficiencies in the system; these shortcomings are described in the following table:

Tabel 3.2 Evaluation System the Ongoing

No	Problem	Part	Settlement Plan
1	Making class schedules manually normally results in timetable collisions or clashes	Administration	Creating a system that will manage class schedules more effectively and can also update or improve more easily when there are changes to be made, etc. Also every student can have access to his/her class time anytime to keep up to date with changes made in the timetable
2	Over-crowded in the classrooms as well as dormitory rooms for boarding students	Enrollment and Registration	The creation of a new system that can manage enrollment and registration processes in a well-organized manner and can distribute students equally in every sections, thus, considering the expected maximum number and keeping well-record of students' statistics
3	Financial crises due to school fee problem/payment	School Fee Payment	Creating a system that can manage well the accounting process and financial records effectively and can produce school fee ledger for students to see and keep up to date with their payments.
4	Manual production of students' academic transcripts normally results in inaccuracy of marks given and also so much time is taken to get it prepared	Student Academic Performance	A new system that can manage and display students' grading and marks accurately at the end of every term on the website so students can freely access it.

Chapter 4: Results and Discussion

4.1. Proposed System Overview

The proposed system for Fr. Peter Secondary School Management System is particulary a web-based systemthat usesthe concept of client-server, in which the client uses a browser while PHP and MySql are used as the server. This is done online so other users or clients can access these applications through using the internet.

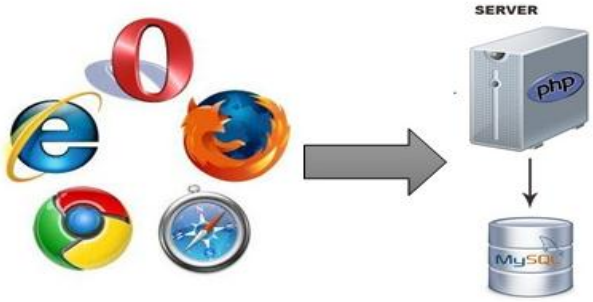


Figure 4.1 Client – Server Scheme

4.2. Use Case Diagram of the Proposed System

The following is the use case diagram of the proposed web-based school management system at Fr. Peter Secondary School.

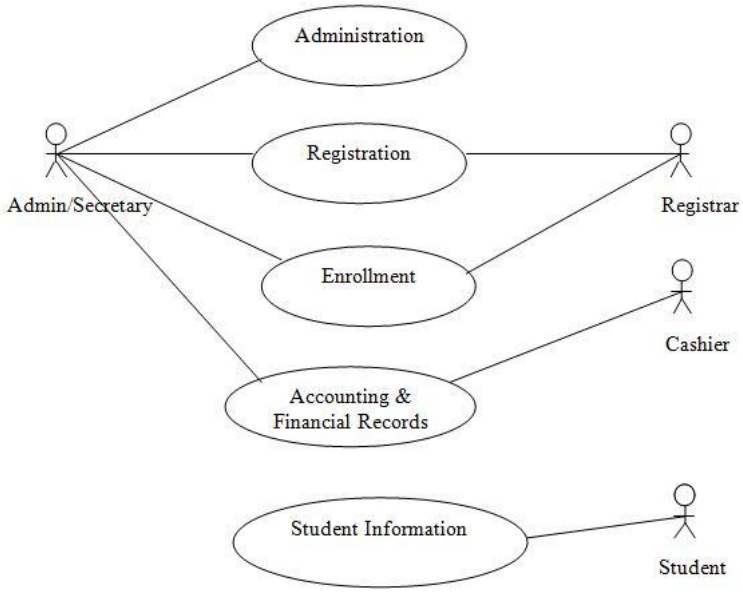


Figure 4.2 Use case diagram of Fr. Peter Secondary School Management System the Web-based

4.3. Network Architecture of the Proposed System

The proposed system is expected to replace the existing manual system by an automated system in all facets. It is mainly based on the system Analysis document (chapter 3).

The architecture used for the system is a 3 tier Client/Server Architecture where a client can use Internet browsers to access the applications provided by the system within the local area network of the school or any where using the Internet. Figure 4.14 below shows the network architecture of the proposed system.

The data tier maintains the applications data such as student data, teacher data, timetable data, etc. It stores these data in a relational database management system (RDBMS).

The middle tier (web/application server) implements the business logic, controller logic and presentation logic to control the interaction between the application's clients and data. The controller logic processes client requests such as requests to view student's grades, to register/ enroll students or to retrieve data from the database. Business rules enforced by the business logic dictate how clients can and cannot access application data and how applications process data.

A web server is a program that runs on a network server (computer) to respond to HTTP requests. The most commonly used web servers are Internet Information Server (IIS) and Apache. The web server used in this system is Apache. HTTP is used to transfer data across an Intranet or the Internet. It is the standard protocol for moving data across the internet.

The client tier is the applications user interface containing data entry forms and client side applications. It displays data to the user. Users interact directly with the application through user interface. The client tier interacts with the web/application server to make requests and to retrieve data from the database. It then displays to the user the data retrieved from the server.

The Network Architecture of the Proposed System is shown below:

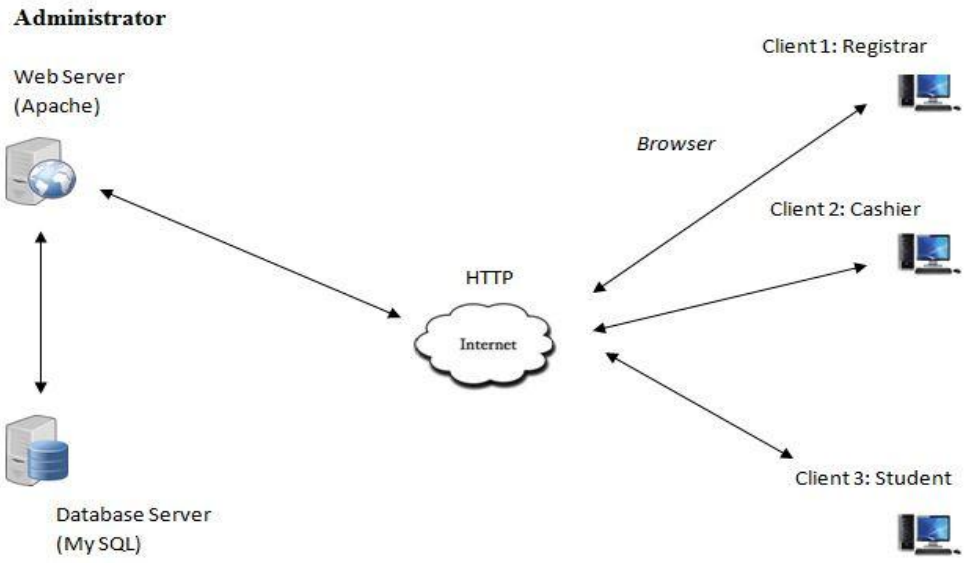


Figure 4.3 Network Architecture

4.4. Implementation

The implementation of this prototype application of Fr. Peter Secondary School Management System is done using PHP and Smarty, MySQL as the database and through using Apache HTTP Server (XAMPP) as the web server. This application is implemented on Windows 7 Operating System.

The purpose of this implementation is to make it possible for the users or clients to have access to the developed system. That is, the users will see whether the newly build system satisfies or meet their requirements or not. So from user's judgment and feedbacks, this system could be (or not) further re-build in order to satisfy the users' needs. .

4.4.1. Implementation Limits

The limit on the implementation of Fr. Peter Secondary School Management System includes:

1. Implementation of this application is only accessible by four users: admin/secretary, registrar, cashier and student.
2. Implementation of the application is only built for Fr. Peter Secondary School.

4.4.2. Software Implementation

The application can be installed on a PC or laptop with Windows 7 operating system. The required softwares to be used in the PC/laptop for the implementation of this system is as follows:

1. Operating System -Windows 7
2. XAMPP-2.5 for Internet and creating local database and data storage.
3. Smarty
4. PHP Storm, Notepad ++, Macromedia Dreamweaver 8, to write coding.
5. Mozilla Firefox as a browser.

4.4.3. Hardware Implentation

In order to to run the designed application,it needs hardware to rely on. The hardware requirements are as follows:

1. Processor: Intel (R) Core(TM) i3 CPU
2. Memory: 2GB RAM
3. Hard drive: 500GB

4.5. Cases and Test Results

Here are the casse to test the software that has been designed and the results using the method which is based on the blackbox testing.

Tabel 4.1 Cases and Test Results for Admin/Secretary section

No	Menu	Test Cases	Test ItemScenario	Expected Results	Testing Results
1	Secretary/Admin	Display user Login	Choosing a login form to the user	When opening the application, the login form will be displayed to the user	[**X**] Accepted [ ] Denied
2	Administrative Menu	Display Year Level	Selecting a Form to add Year Level	When choosing Add, the form will be displayed to add year level	[**X**] Accepted [ ] Denied
		Display Classrooms	Choosing a form to add Classrooms	When selecting the Add option, a form will be shown to add classrooms	[**X**] Accepted [ ] Denied
		Display School Year	Choosing a form to add School Year	When selecting the option Add, a form will be displayed to add school year.	[**X**] Accepted [ ] Denied
		Display Subjects	Select a form to add subject	When selecting the option Add, a form will be displayed to add subject.	[**X**] Accepted [ ] Denied
		Display Teachers	Select a form to add teachers	When selecting the option Add, a form will be displayed to	[**X**] Accepted [ ] Denied

				add teachers	
		Display Class Advisory	Select a form to add class advisory	When selecting the option Add, a form will be displayed to add class advisory	[**X**] Accepted [ ] Denied
		Display Teacher Subjects	Selecting a form to add teacher subjects	When selecting the option Add, a form will be displayed to allocate subjects to teacher	[**X**] Accepted [ ] Denied
		Display Class Timetable	Select a form to create class timetable	When choosing School Year, Year Level and Class on the form displayed, an empty class timetable will be shown	[**X**] Accepted [ ] Denied
		Display Boarding	Select a form to add dormitories	When selecting the option Add, a form will be displayed to add dormitories	[**X**] Accepted [ ] Denied
3	User Menu	Display Users	Selecting a form to add users	When selecting the option Add, a form will be displayed to add user	[**X**] Accepted [ ] Denied

Tabel 4.2 Cases and Test Results for Registrar section

No	Menu	Test Cases	Test ItemScenario	Expected Results	Testing Results
1	Registrar	Display user Login	Choosing a login form to the user	When opening the application, a user login form will be shown	[**X**] Accepted [ ] Denied
2	Registrar Menu	Display registered	Selecting a form to register	When selecting the option Add,	[**X**] Accepted

		Students	student	the registration form will be displayed to register student	[ ] Denied
		Display Encoding of Grades	Selecting a form to encode or allocate grades	When choosing School Year, Teacher, Class and Subject, a form will be displayed to add mark to the given subject	[**X**] Accepted [ ] Denied
		Display Student Grades	Selecting a form to display grades	When selecting choosing School Year, Class and Student, the student's transcript or grades will be shown	[**X**] Accepted [ ] Denied
3	Enrollment Menu	Display enrolled students	Selecting a form to enroll students	When selecting the option Add, the enrollment form will be displayed to enroll student	[**X**] Accepted [ ] Denied

Tabel 4.3 Cases and Test Results for Cashier section

No	Menu	Test Cases	Test ItemScenario	Expected Results	Testing Results
1	Cashier	Display user Login	Choosing a login form to the user	When opening the application, a user login form will be shown	[**X**] Accepted [ ] Denied
2	Cashier Menu	Display Fees	Selecting a form to add fees	When selecting the option Add, a form will be displayed to add the types of fees and their respective	[**X**] Accepted [ ] Denied

				amounts	
		Display School Fee Payments	Selecting a form to pay school fee	When selecting the option Add, a form will be displayed to do school fee payment	[**X**] Accepted [ ] Denied
		Display Student Ledger and Accounts	Selecting a form to produce school fee ledger	When choosing Student and School Year, the financial transaction will be displayed.	[**X**] Accepted [ ] Denied

Tabel 4.4 Cases and Test Results for Student section

No	Menu	Test Cases	Test ItemScenario	Expected Results	Testing Results
1	Student	Display user Login	Choosing a login form to the user	When opening the application, a user login form will be shown	[**X**] Accepted [ ] Denied
2	Student Menu	Display Class Timetable	Selecting a menu to see and download the timetable	When selecting the timetable menu, the timetable will be displayed and can be downloaded as PDF file	[**X**] Accepted [ ] Denied
		Display Student Grade	Selecting a form to see and download transcript	When choosing School Year and Class, the transcript will be displayed and can be downloaded as PDF file	[**X**] Accepted [ ] Denied
		Display School Fee Balance	Selecting a form to produce school fee ledger	When choosing School Year, the ledger will be displayed and can be downloaded as a PDF file	[**X**] Accepted [ ] Denied

Chapter 5: Conclusions And Suggestions

This chapter contains the conclusion of the research, and the suggestions made to further review re-develop the system.

5.1. Conclusions

The conclusion of this research titled "Fr. Peter Secondary School Management System" is as follows:

1. The application can manage financial records and transaction of students' school fee payments, enrollment and registration processes more effectively and can be done within less time.
2. This application enables an effective Administration management system as to manage staffs' profile, subjects and teacher subjects, create class schedules, allocate classrooms and dormitory rooms (for boarding students) thus, avoiding over-crowed and clashes in classrooms and dormitory rooms, and hence, manage other sections in a well-organized manner.
3. This application will avoid problems arise due to timetable collisions, errors in student transcripts, and school fee reports, because all these is effectively done in the system. Therefore, students as one of the users of this new system will have access to see and download their class timetable, transcript and school fee ledger anytime in order to be up to date with the school system.

5.2. Suggesstions

This secondary school management system is not that perfect and still have many short-comings. Therefore, it can be reviewed and re-developed further to add more features or functions to the current application. Here are some suggestions of features or functions that can be added to this application:

1. Online class can be introduced in this system by adding teachers as one of the users and modify the system. They can upload class notes, assignments, quiz, tests, home-work, etc, online and students can access them.
2. Registration process is currently done by the staff (registrar) only but the application can be improved to a student-online-based registration system whereby student themselves can register straight online and save more time.
3. The application can be improved to add parents as users too so they can also have access to their children's transcripts and school fee ledgers.

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