# CHAPTER 1

# INTRODUCTION

## 1.1. Background

In this 21$^{st}$ 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.

Information is the basis of management, planning and evaluation of an education system. During the education management process, the education management information system (EMIS) inform the different actors and partners on the state of the sector, its internal and external efficiency, its pedagogical and institutional operation, its performance, shortcomings and needs. A solid information system does not only aim to collect, store data and process information but help in the formulation of education policies, their management and their evaluation.

Education system forms the backbone of every nation. And 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. Advanced technology available today can play a crucial role in streamlining education-related processes to promote solidarity among students, teachers, parents and the school staff.

Basic education is free and compulsory in Papua New Guinea for students aged 6-14 years. The Department of Education Papua New Guinea published a national educational plan in 2004 titled "Achieving a Better Future" meant to guide the nation's educational development from 2005-2014. The main objectives of this plan include: universal access to education; improved retention rates; improvement of teacher deployment for primary schools; improvement of quality, curriculum and teacher development for secondary schools; and emphasis on shorter, more concise vocational courses. According to the Education (Amendment) Act of 1995, secondary education lasts for four (4) years and is divided into two cycles: lower (grades 9 and 10) and upper secondary (grades 11 and 12). Students sit two examinations: the School of Certificate Examination at the end of grade 10, and the Higher School Certificate Examination at the end of grade 12.

Busu Secondary School is one of the top high schools in Papua New Guinea. It is located in Lae, Morobe Province of Papua New Guinea. But due to the inefficiency of the current manual system, the school has so far been progressing very poorly and do face a lot of problems in the past years until now. The academic performance of grades 10 and 12 every year is really poor. In every beginning of a new academic year, the enrollment process normally takes up a lot of time and as a result, classes normally commence late. The statistics of student is not well recorded which normally results in over-crowded in the classrooms as well as at the dormitories

(for boarding students). Also to produce student transcript, it take a lot of time as well as problems arise from inaccuracy on the student marks and grades. Then, in order to facilitate and simplify these actions one of the major tools is to have automated school management system.

By automating School Management System documents that took up many large storage rooms can be stored on few disks. However, Busu 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 "Busu Secondary School Management System" (BSSMS). 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. Problem Identification and Formulation

The identification and formulation of the problem is as follows;

### 1.2.1. Identifying the Problem

From the background outlined above, the problems can be clearly identified 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.

### 1.2.2 Problem Formulation

Based on the aboved stated problems, problem formulation are;

1. How to specify the design process of the school management system that can perform tasks such as enrolling and registering students, creating staff profile and allocation of subjects, create class schedules, manage boarding students' accommodation, do accounting and financial records of school fee payment effectively, and producing student transcript as well as ledger of school fee payments, in Busu Secondary School.

2. How to create or develop the school management system that includes web-based and can perform tasks such as registering and enrolling students, staff profiling and create class schedules, manage accounting and financial records, manage subjects, manage boarding student's room allocation, producing student transcript, in Busu Secondary School.

3. How to test the application of the school management system that includes web-based and can perform tasks such as enrolling and registering students, manage subjects, staff profiling and creating class schedules, manage accounting and financial records,

producing student transcript, and manage boarding students' accommodation, in order to avoid system functional error.

4. How to implement the school management system into a programming language that is integrated with a database so that it becomes a ready-made application package in Busu Secondary School.

## 1.3 Research Objectives

The research Objectives are as follows:

### 1.3.1. Research Objective

The main objective of this research is to create a secondary school management system that can manage an effective enrollment and registration processes, create staffs and students profiling, manage subjects, class scheduling, manage boarding students' accommodation, manage accounting and financial records, student statistics, and generate an accurate student transcript on time.

### 1.3.2. The Purpose of This Research

The purpose of this study is as follows:

1. To create a system will also perform tasks such as enrolling and registering students, creating staff profile and allocation of subjects, create class schedules, manage boarding students' accommodation, do accounting and financial records of school fee payment effectively, and producing student transcript as well as ledger of school fee payments, in Busu Secondary School.

2. To create or develop the school management system that includes web-based and can perform tasks such as registering and enrolling students, staff profiling and create

class schedules, manage accounting and financial records, manage subjects, manage boarding student's room allocation, producing student transcript, in Busu Secondary School.

3. To create a test application of the school management system that includes web-based and can perform tasks such as enrolling and registering students, manage subjects, staff profiling and creating class schedules, manage accounting and financial records, producing student transcript, and manage boarding students' accommodation, in order to avoid system functional error.

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 implement the school management system into a programming language that is integrated with a database so that it becomes a ready-made application package in Busu Secondary School and 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).

## 1.4. Research Implications

The benefits of research are as follows:

### 1.4.1. Practical Uses (School)

This research has limited users practically.

1. **Administration**

Manage the whole sections of the school system such as staffs' (teachers, cashier, registrar, etc) and students' profile, registration, enrollment, school fee payment, subjects profile and

allocation, class advisory, create class schedules, manage boarding students' accommodation, and other sections.

### 2. Registrar

Manage the registration and enrollment processes, and produce students' grades or transcripts.

### 3. Cashier

Manage the recordings of school fee payments, and produce the students' ledgers.

### 4. Student

View their transcripts, class schedules and school fee balance and can print or download them.

## 1.4.2. Education System

In the education system, this research can be of great help in the following areas:

1. Displacing of the manual school system with automated system can improve the quality of education and learning progress of students.

2. The implementation of a fast, easy and systematic way of managing student/staff profiling, enrollment and registration processes, creating class schedules, and assessment of students can greatly influence a school's progress in a more positive way and this may contribute towards meeting the general objectives and goals of the education system.

## 1.4.3. Academic Purpose

Other researchers may use this project as a reference to improve and design a more effective system related to this project or can be of reference to any other research done later.

## 1.5. Limitations of Study

To clarify the time limit and the ability of the researcher, the discussion of this study, disseminate the restrictions to the development of the Busu Secondary School Management System. The limitations or restrictions involved in this project are as follows:

**1. Administration**

Manage the whole sections of the school system such as staffs' (teachers, cashier, registrar, etc) and students' profile, registration, enrollment, school fee payment, subjects profile and allocation, class advisory, create class schedules, manage boarding students' accommodation, and other sections.

**2. Registrar**

Manage the registration and enrollment processes, and produce students' grades or transcripts.

**3. Cashier**

Manage the recordings of school fee payments, and produce the students' ledgers.

**4. Student**

View their transcripts, class schedules and school fee balance and can print out or download them.

**1.6.2. Online**

It is an online school management system so clients or users can access through using internet.

**1.6 Locations and Research Time**

The location and time of the research are as follows:

### 1.6.1. Location of the Research

Location in which this research was taken:

Location: Busu Secondary School- Lae
Address: PO Box 306,Lae 411 Morobe Province,
Papua New Guinea
Phone: (+675) 472752
Facsimile: (+675) 4724234
Email: bususec@datec.net.pg

### 1.6.2. Research Time

Ihe research location was set at Indonesian Computer University (Unikom), Bandung, West Java,

Indonesia. The schedule of the research is as follows:

**Table 1.1 Research Time**

| SCHEDULE | MONTH | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MAY 2018 | | | | JUNE 2018 | | | | JULY 2018 | | | | AUGUST 2018 | | | | SEPT 2018 | | | |
| 1. Requirements | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| a. Observing | X | X | X | X | | | | | | | | | | | | | | | | |
| b. Interview | | X | X | X | | | | | | | | | | | | | | | | |
| c. Collect Analysis | | X | X | X | | | | | | | | | | | | | | | | |
| 2. Design | | | | | | | | | | | | | | | | | | | | |
| a. Design Process | | | X | X | X | X | | | | | | | | | | | | | | |
| b. Design Database | | | X | X | X | X | | | | | | | | | | | | | | |
| 3. Implementation | | | | | | | | | | | | | | | | | | | | |
| a. Make Program | | | | | | X | X | X | | | | | | | | | | | | |
| 4. Verification | | | | | | | | | | | | | | | | | | | | |
| a. Black box testing | | | | | | | | | X | X | X | X | X | X | | | | | | |
| 5. Maintenance | | | | | | | | | | | | | | | | | | | | |
| a. Maintain | | | | | | | | | | | | | | | X | X | | | | |

**1.7 Thesis Outline**

The Systematics Writing is as follows:

**CHAPTER 1 INTRODUCTION**

Chapter 1 contains a description of the background information and the importance of the research; problem identification and formulation, the main objectives and purposes of the project, and the benefits of the research. Furthermore, this chapter includes the limitations or restrictions of the project, the location and time of the research and the systematic writing.

**CHAPTER 2 LITRATURE REVIEW**

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 relevent to this research.

**CHAPTER 3 OBJECT AND METHODS**

Chapter 3 describes the object of the research and the approach and methods used in this research. That includes; the object's organizational structure with job descriptions and method and system development approach used is the object-oriented the types and method of data collections (primary data source and secondary data source). 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,

**CHAPTER 4 RESULTS AND DISCUSSION**

This chapter describes the design and construction of the system, testing results and discussions about the designed system. That is, it includes: description of the system design and its objectives, overview of the proposed system consisting of Use Case Diagram, Use Case Scenarios, and Activity Diagrams, Class Diagram, and Deployment Diagram. Further the Implementation phase includes the software implementations, hardware implementation, database implementation, and interface implementation. Finally, is the testing that includes; testing plans, test cases and results, and conclusions of the test results.

**CHAPTER 5 CONCLUSIONS AND SUGGESTIONS**

This chapter contains the conclusion of the research, and the suggestions made to further review

re-develop the system.