WEB-BASED ACADEMIC INFORMATION SYSTEM OF WAWIN NATIONAL HIGH SCHOOL

ARTICLE

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ABSTRACT

WAWIN NATIONAL HIGH SCHOOL (WANATHS) is one of the six national high schools in Papua New Guinea which was built in 2002 as an aid donated by the Republic of China. However, as off its existence, there are some major setbacks or problems that are encountered at WAWIN NATIONAL HIGH SCHOOL. The setbacks or problems encountered are mainly related to its academic procedures such as subject enrollment, daily learning of the students, grading, scheduling and other academic procedures which are done manually. Thus, it is time consuming, and inefficient.

Therefore, this research was carried out to find solutions and methods that can be used to in terms of technology (World Wide Web) to help solve these problems. The web technology that is used is a web-based academic information system. The research methodology that was used in this research is the object oriented approach method, which will involve the use of UML diagrams (i.e. Use Case Diagrams, etc.). For the system development, the prototype model was used.

In order to overcome these setbacks, it is proposed that the web-based academic information system be designed. This academic system will cater for academic procedures such as online subject enrollment, online grading results, online learning and etc. This can help in solving those academic procedures and become more reliable and efficient for the students learning.

Keywords: Information System, Web-Based Academic Information System

I. INTRODUCTION

1.1 Background

During the last decade, Information Technology (IT) has been the primary force driving the transformation of roles in the education industry. More specifically, the World Wide Web (WWW) and associated technologies provided a new playground with new rules and tools to conduct instruction and create novel approaches to learning. We have seen the application of IT in education in the form of CD-ROMs, web-based academic information system, school apps and etc. With the evolution of the WWW we saw education marketed as long distance learning, web based learner centered environments, internet based learning environments, and self-instructed learning. With all the different models used on the web, few have studied their acceptance and their

effectiveness on learning. Many educational institutions today have embarked in the development of web based academic information system. The main objective of web based academic information system environments, is to enhance learning experiences and improve learning outcomes.

Information has become one of the basic needs for schools, because without information almost all the work will not be completed accordingly. With the developments in the field of science and technology is one that we are familiar with the Internet. The Internet is a circuit that connects a computer network that can be accessed in general around the world, which sends data in the form of data packets based on the standard internet protocol (IP). Internet has now become a bridge for people or students specifically to access a variety of information both local information and even information around the world quickly anywhere and at any time.

With the development of the Internet, web technology has also been developed also into various types, uses and medium. Now almost all medium such as personal computers, laptops, netbooks and smartphones are capable of displaying websites corresponding to the device uses. A Website or written as web site or simply site is a set of pages of information on the Internet about a particular subject published by an individual or an organization. Internet and web are two different things where the Internet that can display its web, while the web is the display of an array of pages that use web technologies and are related to each other.

Technology development and utilization of information is needed, especially to help the process of the work that must be done efficiently and effectively. As the internet can be accessed by students, anywhere within range of an internet service provider, via mobile devices, the web based academic information system has made academic procedures much more flexible for many students and academics. Therefore, many schools worldwide have adapted the web-based academic information system to carry out their academic procedures.

In Papua New Guinea however, most schools are yet to implement the web-based academic information system. Wawin National High School (Wanaths) is one of the six national high schools in Papua New Guinea and it is located in Morobe Province. Wawin National High School was built as an aid to Papua New Guinea by the Chinese

Overseas Engineering Corporation (COVEC) donated by the Republic of China. The school is also known as the School of Excellence. Wawin National High School as of its existence it has a good repetition of producing quality students in the national level of education and sending them to the universities and tertiary institutions in the country.

The students population has increase during the academic years as in 2015 around 150 grade 11 students were selected and enrolled in Wawin National School totaling up with the continuing students, the grade 12 to a total of approximately 300 students. The students' population has resulted in the increase of classes with five grade 11 classes and also five grade 12 classes. Each class contains 30 students.

However, in the academic system of Wawin National High School, there are still some obstacles, limitations and problems that occur in terms of new students when they are selected and enrolled and other academic issues. After officially becoming a student the unavailability of a system which informs the scheduling of lessons so that students obtain a timetable and know when classes begin, which class they are allocated in, choosing of subjects that they want to take weather science or social science as well as the general announcement to the new comers. There are also other problems regarding academic issues such as students' learning, in which daily tutorials, assignments and tasks which are given to the students by their respective teachers in the form of handouts or by writing on the board, viewing of their marks which takes a lot of time to process and is also done manually. Students' parents can also have access to the system by using their children id number which is sent to the student via their acceptance letter by the school in advance. Therefore it is in fact necessary to have a medium that is able to overcome the problems described above in which the system takes advantage of the internet and web development.

The problems encountered as described from the background, the school in fact really needs a web-based academic information system to cater for the problems. A web-based academic information system is an information system that uses internet web technologies to deliver information to the students. From the above background, the author has raised this issue into a research thesis titled "WEB-BASED ACADEMIC INFORMATION SYSTEM OF WAWIN NATIONAL HIGH SCHOOL.

1.2 Problem Identification and Formulation

1.2.1 Problem Identification

As from the background description, the author has identified some of the issues regarding the current academic system of WAWIN NATIONAL HIGH SCHOOL are as listed:

i. For new students, during their subject enrollment procedure, it takes one to two weeks or even more depending on the student's population for students to choose their subject weather it is a social science subject or a science subject and it is time consuming and also leads to classes behind schedule according to education calendar.

ii. The students' schedule or timetable which is created manually results in clashes of class and also goes through a long process before it is ready to be given to the students. Clashes of classes is a daily issue that is common in the current academic system of WAWIN NATIONAL HIGH SCHOOL and as a result it leads to poor academic performance of students because students missing out on the scheduled period of class.

iii. Students' learning which is facilitated by their respective teachers through materials such as daily tutorials, assignments and tasks are given to the students by the teachers through writing on the board or through the form of handouts which leads to more paper being use every day and also it's an expensive exercise of the school administration.

iv. Students' grades or academic report usually takes a long time to process and viewed by students. This result in the students not knowing their academic performance whether they are performing well or not.

1.2.2 Problem Formulation

Therefore based on the identified issues, the current problems of WAWIN NATIONAL HIGH SCHOOL academic system can be formulated as follows:

i. How to analyze the current academic information system of WAWIN NATIONAL HIGH SCHOOL in areas of, subjects enrollment, scheduling, grading and other academic sections.

ii. How to design a web-based academic information system for WAWIN NATIONAL HIGH SCHOOL to help solve problems that are encountered with the current academic information system.

iii. How to test the web-based academic information system at WAWIN NATIONAL HIGH SCHOOL so that it meets the students or users requirements for subjects' enrollment, scheduling, grading and other academic areas.

iv. How to implement the web-based academic information system so that it becomes a ready-made application package at WAWIN NATIONAL HIGH SCHOOL.

1.3 Research Objectives

The main purpose and objective of carrying out this research are as follows:

1.3.1 Purpose

The main aim of this research is to design and develop a reliable web-based academic information system for WAWIN NATIONAL HIGH SCHOOL which will boost in the academic performance of the students. **1.3.2 Objective**

i. To analyze the current academic system of WAWIN NATIONAL HIGH SCHOOL and point out major issues or problems in areas such as subjects' enrollment, scheduling, grading and other academic sections that are usually encounter by the students.

ii. To design a web-based academic information system in WAWIN NATIONAL HIGH SCHOOL so that it helps solve the problems that are encountered with the current academic information system.

iii. To test the web-based academic information system at WAWIN NATIONAL HIGH SCHOOL so that it meets the students or users requirements for subjects' enrollment, scheduling, grading and other academic areas.

iv. To implement the web-based academic information system so that it becomes a ready-made application package at WAWIN NATIONAL HIGH SCHOOL.

1.4 Research Implications

It is expected that this research will be useful by the following parties:

1.4.1 Practical Uses

The development of web-based academic information system will be used by WAWIN NATIONAL HIGH SCHOOL, to improve the student's academic performance. In addition the system may also be implanted in other secondary high schools or national high school in Papua New Guinea which have similar issues or problems that are encountered by WAWIN NATIONAL HIGH SCHOOL.

1.4.2 Academic Uses

1. Institutions

Hopefully in other institutions, this research can be used as a reference journal for future students who are working on similar projects.

2. For Other Researchers

The ideas taken from this research may also be implemented by future researchers who wish to broaden their knowledge about information systems development.

1.5 Limitations of Research

Considering the time limit and ability of the researcher, the discussion of this research will be restricted on the following regarding the development of web-based information system of WAWIN NATIONAL HIGH SCHOOL. The development of web-based academic information system of WAWIN NATIONAL HIGH SCHOOL will contain:

1. Enrollment of student's subjects
2. Scheduling of students daily classes
3. E-learning section of the web-based academic information system where students and teachers can download and upload daily tutorials, materials, assignments and tasks and in addition students can view notices on their respective classes which will be put up by their respective teachers.

4. Attendance of the classes that the students attend during the schooling term.

5. Grading and viewing of their overall termly marks and there will be also some other sections in the development of the web-based academic information system such as, news and events of the school and etc.

II. THEORITICAL

2.4 Research Case

The main case of this research is to develop a web-based academic information system of WAWIN NATIONAL HIGH SCHOOL. The following section will explain more on the concepts related to the case.

2.4.1 Web-Based Academic Information System

A web-based academic information system is an information system that manages the information resources and procedures of an educational institution online.

1. **Enrollment**

In this case, the enrollment section of the web-based academic information system will contain subjects and students are going to choose which subject they prefer.

2. **E- Learning**

This section will be used in the web-based academic information system to upload and download daily tutorials, tasks, assignments and other materials.

3. **Attendance**

This section will be used for students' attendance for their respective classes. Take note that there are four schooling terms in a year and ten schooling weeks in each term. Therefore the total attendance for a student in his/her respective class should be marked ten times, if it is less than ten then, it means that the particular student has missed out on some classes.

4. **Grading**

This section will be used to grade the students from their respective subjects according to their performance.

5. **Scheduling**

This section will be use to assign schedules or timetable to students to attend to their respective classes when and where.

III. OBJECT AND RESEARCH METHOD

3.2.3 Method and System Development Approach

In system development method, system development approach and the analysis and design tools, as briefly explained in chapter two previously, in this section it will be described in more detail**.**

3.2.3.1 System Approach Method

There are usually two types of system approach methods used to carry out studies or research**,** namely; structured approach method and object oriented method which was mention briefly on the previously chapter. However, the system approach method used in this study is the object-oriented approach. The object oriented approach focuses on objects rather than actions, and data rather than logic. For this study, the object oriented approach was chosen because objects are easier for people to understand, data and processes are not artificially separated, and code can be reused more easily.

3.2.3.2 System Development Method

As discussed on the previous chapter, there are several system development methods that are used in researches or studies. There is no restriction in using those system methods such as waterfall, rapid application development (RAD) and agile in any research or study it depends on the researcher which system development method he or she prefers to use.

3.2.3.2.1 Prototype

The system development method used in this study is the development of a prototype model. A prototype is a model or a program which is not based on strict planning, but is an early approximation of the final product or software system. A prototype acts as a sample to test the process.

A prototype development method is employed when it is very difficult to obtain the exact requirements from the system end user. A prototype model makes it easier for

the system user to clarify the user requirements specification to system developers. Developing a prototype models involves gathering user requirements for the desired system, and then developing a prototype system inclined to what the system users really want. A prototype system is usually not the final or real system. However, it provides a display or preview of what the real system will look like. After the prototype system is evaluated by the end user, the system developers can be able to determine the system specifications in accordance with the wishes of system users, and thus create the real system. Illustrated on figure 3.2 is a prototype model:

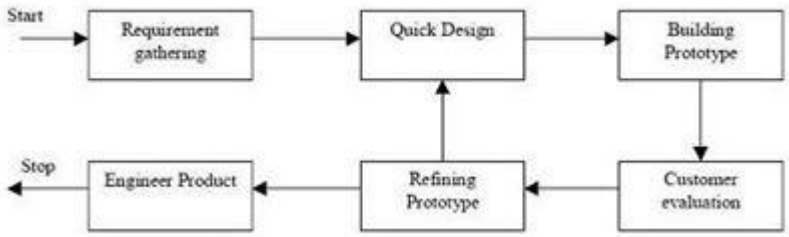


Figure 3.2 Prototype Model

IV. RESULT AND DISCUSSION

4.1 System Design

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. System design is also the process of defining the elements of a system such as the different interfaces of those components and the data that goes through that system. It is meant to satisfy specific needs and requirements of a particular organization through the engineering of a coherent and well-running system.

In this research, the system to be developed is the web-based academic information of WAWIN NATIONAL HIGH SCHOOL. This system will assist students' and teachers to carry out daily academic procedures of the school.

V. CONCLUSION AND SUGGESTIONS

5.1 Conclusions

Based on this research thesis entitled “The Web-Based Academic Information System of WAWIN NATIONAL HIGH SCHOOL”, which was developed and had solved the problems that were identified in the current system as follows;

1. The development of web-based academic information of WAWIN NATIONAL HIGH SCHOOL has solved the problems of subject enrollment by performing the procedures online which is time saving.

2. The web-based academic information system of WAWIN NATIONAL HIGH SCHOOL also solved the problem of scheduling which can be viewed online and also print out copies by themselves.

3. The web-based academic information system of WAWIN NATIONAL HIGH SCHOOL also solved the problems of learning by providing an alternative method of learning, allowing teachers to upload daily tutorial materials for their students to download.

4. The web-based academic information system of WAWIN NATIONAL HIGH SCHOOL also solved the problem of students having access to their academic results on time which allows students to have access to their academic results online and also print out copies by themselves.

To conclude the above points, Web-Based Academic Information System of WAWIN NATIONAL HIGH SCHOOL is a new method of upgrading the traditional systems of the academic in the school and co-op up with the digital world. The web-based academic information system also at the other end helps in the academic performance of the students.

5.2 Suggestions

As the academic system will be used by the students and teachers, it is necessary to make further maintenance on the system to cater for any security flaws and other system errors. Feedbacks from the users will also be used to evaluate and make any changes to the system by the developers. In addition to that, as students are more

familiar with android devices today, it is suggested that after implementation of the web-based system, an android application be developed to make the academic information system more flexible.

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APPENDIX

UNIVERSITAS KOMPUTER INDONESIA
PROGRAM STUDI SISTEM INFORMASI

KARTU BIMBINGAN



Nim : 14012507
Nama : BARTH . S . ASAFO
Program Studi : INFORMATION SYSTEM
Pembimbing : IMELDA, S.T, MT & CITRA N, M.AK
Judul : WAWIN NATIONAL HIGH SCHOOL WEB - BASED ACADEMIC INFORMATION SYSTEM

PELAKSANAAN BIMBINGAN

No	Tanggal	Materi Bimbingan	Usulan Perbaikan	Paraf Pemb.
1	9/11-2015	Chapter 1	Introduction	
2	12/11-2015	Chapter 1	Background	
3	16/11-2015	Chapter 1	Introduction	
4	4/12-2015	chapter 1	Problem Identification	
5	7/12-2015	Chapter 3	Object & research method	
6	5/12-2015	Chapter 3	Organizational structure	
7	16/12-2015	Chapter 3	Research Method	
8	24/12-2015	Chapter 3	Evaluation of Current System	
9	29/12-2015	Chapter 4 (design)	class & object diagram	
10	29/12-2015	Revision of Chapter 4	system Design	
11	30/12-2015	Revision lay out	system Design objectives	
12				
13				
14				

BIMBINGAN PROGRAM

No	Tanggal	Catatan Revisi	Tanggal Rancana Revisi	Paraf Pemb.
1	29/12-2015	Display outline of program		
2				
3	29/12-2015	Display outline of program		
4				
5				

KEHADIRAN DI SEMINAR

No	Tanggal	Materi Seminar	Penyaji	Paraf Pemb.
1	25-01-16	Sandaun Province Tourism Guide	Arthur Awingi	
2	25-01-16	Academic Information System	Akbarzhon Khojimurov	
3	26-01-16	Online Booking Taxi Service of CMNS	Nurali Sodikov	
4	26-01-16	Online Travel Agency in Tajikistan	Zafar Ergashov	
5	26-01-16	Kiyra NHS Student Attendance	Nelson Buka	
6				
7				
8				
9				
10				

PELAKSANAAN SEMINAR DAN SIDANG

No	Tanggal	Kegiatan	Catatan	Paraf Pemb.
1	29/1-2016	Seminar		
2	12/02-2016	Sidang		
3				
4				

Mengetahui
Dosen Pembimbing,

Bandung,
Ketua Panitia TA/Skripsi,

Mariana Budhiningtyas, S.Si., M.Si
41277026020

UNIKOM
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PROGRAM STUDI
SISTEM INFORMASI

Bandung, 20 Februari 2016

Nomor : 437/Prodi-IS/FTIK/UNIKOM/II/2016
Lampiran : -
Perihal : Permohonan Penelitian

Kepada Yth.
Pimpinan Wawin National High School
Papua New Guinea

Dengan Hormat,

Kami dari **Universitas Komputer Indonesia**, dengan ini mengajukan permohonan kepada Bapak/Ibu untuk dapat kiranya menerima mahasiswa/i kami berikut ini:

Nama : Barth S. Asafo
Nim : 14012507
Program Studi / Jenjang : Sistem Informasi / S1

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Demikian permohonan ini kami sampaikan, atas perhatian dan kerjasamanya kami ucapkan terima kasih.

Hormat Kami,
Ketua Program Studi Sistem Informasi
Universitas Komputer Indonesia

Citra Noviyasari, S.Si, MT
Nip. 4127.7026.009

WAWIN NATIONAL HIGH SCHOOL
C/-Division of Education P.O. Box 315, Lae, Morobe Province, Papua New Guinea
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Date: 27/02/2016

Attention:
Citra Noviyasari,S.Si,MT
Head of Information System Department
University of Computer Indonesia

Dear Madam

Subject: RESEARCH APPROVAL LETTER

Thank you for your request letter number 437/Prodi-IS/FTIK/UNIKOM/II/2016 dated on the 20th of February, 2016. I as the Principal of Wawin National High School greatly appreciate and by all means give approval to this student:

Name:	Barth Senah Asafo
Nim:	14012507
Program Study:	Information System/Bachelor

To continue his final year thesis research based on the Web-Based Academic Information System of Wawin National High School in University of Computer Indonesia.

Yours Faithfully,

The Principal
Wawin National High School

Pal Pe, Mr