



Faculty of Computer Science and Information Technology

***INCERS: INTEGRATED NURSING COMPETENCIES ELECTRONIC RECORD  
SYSTEM***

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Bachelor of Computer Science with Honours

(Computational Science)

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INCERS: INTEGRATED NURSING COMPETENCIES ELECTRONIC RECORD  
SYSTEM

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56924

This project is submitted in partial fulfillment of the requirements for the degree of  
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INCERS: SISTEM RAKAMAN ELEKTRONIK UNTUK KEUPAYAAN  
KEJURURAWATAN KOMPREHENSIF

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Projek ini merupakan salah satu keperluan untuk  
Ijazah Sarjana Muda Sains Komputer dan Teknologi Maklumat

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2019

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## **ABSTRACT**

*The yearly intake of students that pursue Bachelor Degree in Nursing in the Faculty of Medicine and Health Science (FMHS) is around 60 to 70 students. The duration of the program will take 4 years to complete which is 8 semesters and the nursing students have to go for posting each semester start from the second semester. Currently, the student's procedure records are recorded manually on the target book and cross book. The target and cross book are the only evidence that they will keep in record and there are many potential risks. For instance, students may lose their books, either misplaced them or being stolen. Furthermore, students may also accidentally spoil or dirty their books. Therefore, a healthcare education management system is needed to manage the performed procedures records of each nursing student.*

*INCERS is a web-based application that developed to computerize the nursing student's competencies records of Faculty of Medicine and Health Science (FMHS), UNIMAS. This management system can be used by the students to keep a record on their performed procedure and the clinical instructors are able to evaluate the performed procedure of each student via this management system. The development of the system provides the user with an effective and efficient way of managing the performed procedure records.*

## **ABSTRAK**

Pengambilan tahunan pelajar yang mengikuti Ijazah Sarjana Muda Kejururawatan di Fakulti Perubatan dan Sains Kesihatan (FPSK) adalah sekitar 60 hingga 70 pelajar. Tempoh program ini akan mengambil masa 4 tahun untuk diselesaikan iaitu 8 semester dan pelajar kejururawatan perlu menjalani posting setiap semester bermula dari semester kedua. Pada masa ini, rekod prosedur pelajar direkod secara manual pada buku sasaran dan buku salib. Sasaran dan buku silang adalah satu-satunya bukti bahawa mereka akan menyimpan rekod dan terdapat banyak potensi risiko. Sebagai contoh, pelajar mungkin kehilangan buku mereka, sama ada mereka salah atau dicuri. Selain itu, pelajar juga boleh merosakkan atau mengelirukan buku mereka secara tidak sengaja. Oleh itu, sistem pengurusan pendidikan penjagaan kesihatan diperlukan untuk menguruskan rekod prosedur yang dilakukan setiap pelajar kejururawatan.

INCERS adalah aplikasi berasaskan web yang dibangunkan untuk mengkomputerkan rekod kecekapan pelajar kejururawatan Fakulti Perubatan dan Sains Kesihatan (FMHS), UNIMAS. Sistem pengurusan ini boleh digunakan oleh para pelajar untuk menyimpan rekod mengenai prosedur yang mereka lakukan dan pengajar-pengajar klinikal dapat menilai prosedur yang dilakukan oleh setiap pelajar melalui sistem pengurusan ini. Perkembangan sistem menyediakan pengguna cara yang berkesan dan cekap untuk menguruskan rekod prosedur yang dilak



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## **CHAPTER 1: INTRODUCTION**

### **1.1 Introduction**

The yearly intake of students that pursue Bachelor Degree in Nursing in the Faculty of Medicine and Health Science (FMHS) is around 60 to 70 students. The duration of the program will take 4 years to complete which is 8 semesters and the nursing students have to go for posting each semester start from the second semester. Each of the nursing students must go through a series of clinical practices in order to be proficient in certain skills e.g. performing wound dressing, take wound swab culture and sensitivity (C&S) and etc. If the student is qualified for that specific skill, the clinical instructor will verify the student's cross book as proof of their competency cross. In such a way, the books are the only evidence to prove that the students had completed the procedure training and being certified. This traditional method of tracking presents the problem as discussed in section 1.2.

## **1.2 Problem Statement**

Currently, the student's posting records are recorded manually on the target book and cross book. By the end of the posting, clinical instructors will need to review each student's target and cross books to check if they have completed at least 80% of the procedures required for the particular posting session to pass the clinical posting requirement. The clinical instructor must count every cross book by hand to generate a report and send to the nursing board. Besides, some of the students may overlook the procedure that they haven't completed. However, the target and cross book is the only evidence that they will keep in record and there are many potential risks. For instance, students may lose their books, either misplaced them or being stolen in the locker. Furthermore, students may also accidentally spoil or dirty their books. Therefore, the Integrated Nursing Competencies Electronic Record System (INCERS) is proposed to solve the mentioned problems.

### **1.3 Scope**

The scope of this project covers the following:

- a) Development of INCERS that will store the procedural progress of posting students and able to verify by the clinical instructors.
- b) The system will be accessible by students and clinical instructors of FMHS only.
- c) The system will generate a procedural progress report which consists of a list of procedures and completion percentage for each student.
- d) The system will be hosted temporarily on 000webhost.



## **1.4 Objective**

The main objective of this project is to develop a web-based healthcare education management system for the students and clinical instructors of the Faculty of Medicine and Health Science (FMHS), University Malaysia Sarawak (UNIMAS). The sub-objectives include:

- a) To design and develop a database to store records and progress of each posting of the nursing students.
- b) To enhance data security & integrity through proper designated and centralized access.

## 1.5 Brief Methodology

The development of the system will be done using the Waterfall methodology.

Waterfall Model has the following six SDLC phases as shown in Figure 1 below:

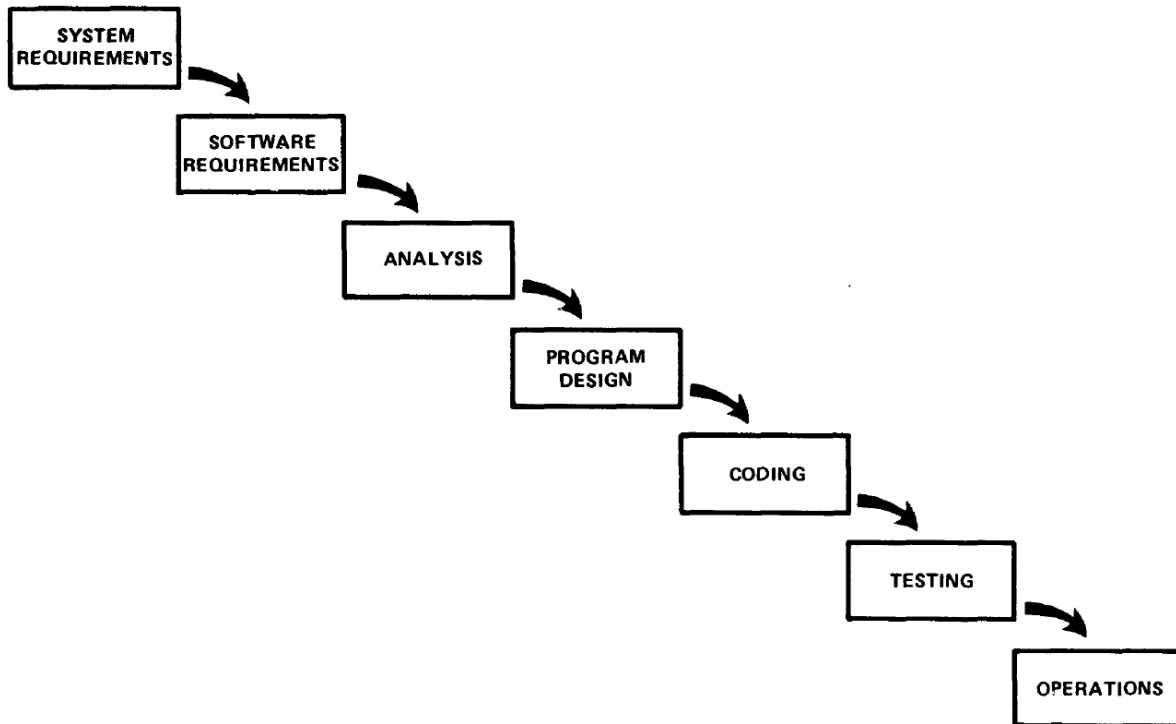


Figure 1. 1: Waterfall Approach (Royce, 1970)

### Phase 1: Requirement Gathering and Documentation

In this stage, the scope of the project is determined. It is planned to be a web-based system and it is accessible by the lecturer of Faculty of Medicine & Health Sciences (FMHS) only. Besides, the requirements and specifications of the system are gathered through interview sessions with FMHS. Furthermore, the requirements and specifications are analyzed to determine the goal and expectations of the lecturer towards the system. The project will be developed according to the project schedule as shown in section 1.7.

## **Phase 2: System design**

In stage 2, using the established requirements and specifications during stage 1, the specifications that were gathered are being reviewed and analyzed to define the data objects crucial for the system. UML model will be used for the architectural design in this project and the programming language of HTML, CSS, JavaScript, PHP, and MySQL will be used for the database and interface design.

## **Phase 3: Implementation**

The actual coding will be taking place in this stage. A functioning system will be developed according to the design done in stage 2. The small pieces of codes will be integrated at the end of this stage. The system will be hosted on 000webhost once it is done.

## **Phase 4: Testing**

In this stage, all the coding is done, and a functioning system is developed. The testing of the product can begin at this stage. Testers methodically find and report if any problems arise in this testing stage. If there are any serious issues arise in this stage, the project may need to return to stage one for re-evaluation purpose.

## **Phase 5: Delivery and Deployment**

In this stage, the system is developed completely, and deliverables will be delivered to FMHS.

## **Phase 6: Maintenance**

The product has been delivered to the user which is the lecturer of FMHS and is being used.

As issues arise, patches and updates may need to be created and address to users. If any big issues happen may necessitate a return to stage one.

## **1.6 Significant of Project**

The significance of this project is the digitalization of the current manual method of nursing student's procedural record management. The system helps to simplify the verification process by allowing clinical instructors to verify the procedure performed by the students online. Besides, students can track their progress easily on the system.

## 1.7 Project Schedule

The project will be divided into 2 parts, FYP 1 and FYP 2. FYP 1 will be focused on requirement gathering and system design, for FYP 2, will focus on implementation and testing of the system. The project planning for FYP 1 is shown in Figure 2 below:

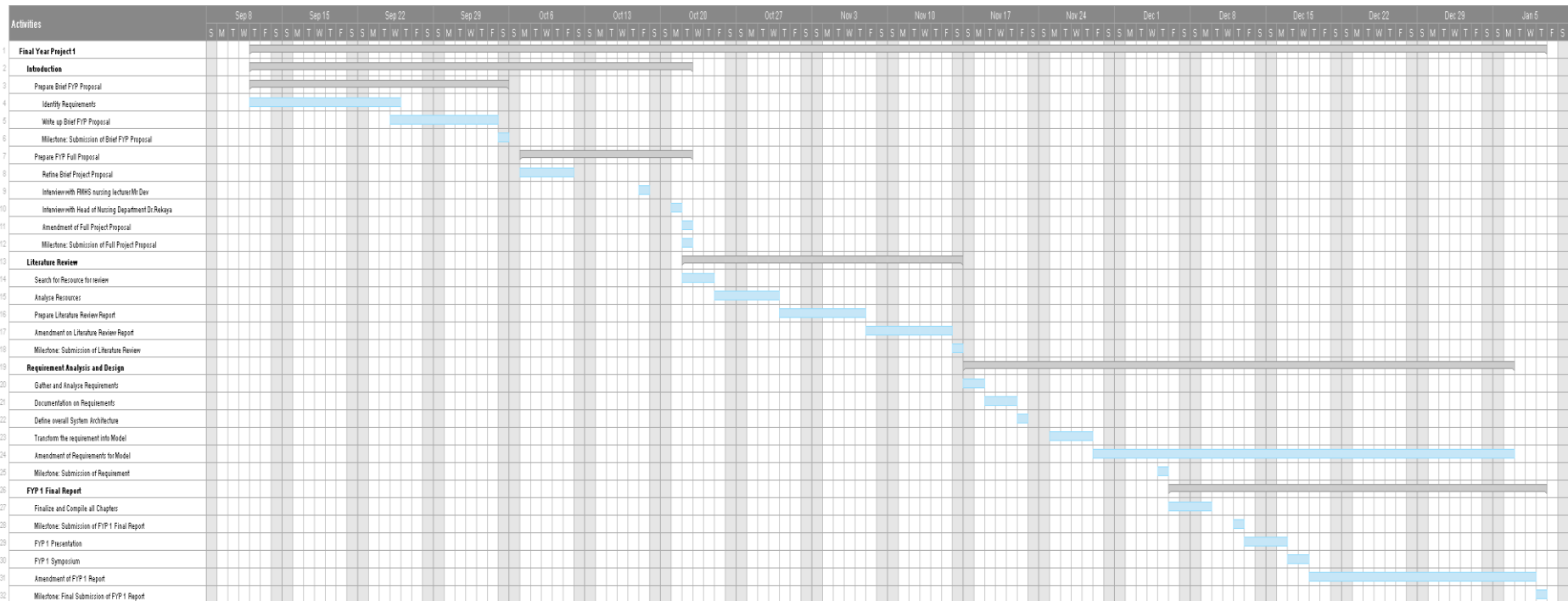


Figure 1. 2: Gantt Chart for FYP 1

## **1.8 Expected Outcome**

A web-based system, INCERS that is integrated with a database to store all of the nursing procedural information for FMHS. It allows the clinical instructors to track and verify the students' procedure completeness and students can easily keep track of their procedure progress. This will keep students in compliance with the procedure requirements of the industry regulations and puts them on track for advancement. INCERS will generate a procedural progress report which consists of a list of procedures and completion percentage for each student.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter provides an explanation of the relevant literature reviews of related works and ideas on the progress of this final year project. In this chapter, the four (4) existing systems that are similar to the healthcare education management system will be reviewed. The functionality and usability of these four (4) existing systems will be reviewed and discussed in detail in section 2.2. Furthermore, this review will discuss the advantage analysis and deficiency of the current existing systems compared to the proposed system. Finally, the review will be covering the software tools that will be used throughout this project.

### **2.2 Review of Related Existing System Applications**

Before designing a system, a good understanding of information flow for the related current existing system is important. In this section, four (4) existing systems were reviewed. They are “Typhon Group's NSST Student Tracking System”, “E\*Value” by MedHub, “nTrack” and “Medatrax”. These four (4) existing systems will be discussed in detail in the following subsections.

#### **2.2.1 Typhon Group's NSST Student Tracking System**

Typhon Group's NSST Student Tracking System is a Web-based tool used by students and faculty of The University of Arizona serves as a complete and secure electronic student tracking system that includes comprehensive clinical skills logs and reports, full-featured assessment and survey components. Besides, this system also provides the features for student schedules, student electronic files, student and recipient databases. On the other hand, the faculty side is provided with the functions of the clinical site database, Curriculum mapping, secure document management and etc. NSST Student Tracking System provides the clinical