

SMART CARE I-PHARMACY SYSTEM



UNIVERSITI TEKNIKAL MALYSIA MELAKA

SMART CARE I-PHARMACY SYSTEM

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This report is submitted in partial fulfilment of the requirements for the award of Bachelor of Computer Science (Software Development)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

UNIVERSITI TEKNIKAL MALAYSIA MELAKA


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DECLARATION

I hereby declare that this project report entitled
SMART CARE I-PHARMACY SYSTEM

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date: _____
(Shammugam A/L Ramasamy)


I hereby declare that I have read this project report and found
this project report is sufficient in term of the scope and quality for the award of
Bachelor of Computer Science (Software Development) with Honours.

SUPERVISOR : _____ Date: _____
(PROF. DR MOHD KHANAPI ABD GHANI)

DEDICATION

God

Thank you god for given me your blessing and guidance in completing this project

Dear Beloved Family

Thank you because always supporting me in every part such giving me motivations ideas and accompany me while I am doing this project

Dear Supervisor and Lecturer

Thank you all your guidance, patience, encouragement, and supervision to enable me finish this project

Dear Friends

Thank you for all the knowledge, support and encouragement and share all the know ledges together.



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I would like to express my deepest appreciation to all those who provided me the possibility to complete this report. Firstly, I would like to thank god for giving me a lot ideas and knowledge alongside with a good health that helped me to finish this project.

I would like to thank to my beloved supervisor Prof. Dr Mohd Khanapi bin Abd Ghani for his guidance, constant patience, excellent support, motivation and continuous understanding throughout this semester of my Final Year Project in Universiti Teknikal Malaysia Melaka (UTeM). His guidance played an important part helping me in finishing my project.

I would also like to dedicate my appreciation to my entire family that always support and guide me with their love. They also gave me a lot of motivation that helped me to finish this project.

Lastly, I am thankful to all friends for their understanding, suggestions and comments throughout this project, which made my final year memorable.

ABSTRACT

The pharmacy of a hospital is complicated and a hard system to be developed because of the complex nature of the hospital itself. The ability to provide and manage the medicine needed without any delay in time and quality is a key to maintaining the standards of the hospital's pharmacy. Smart Care I-Pharmacy System is built or developed to ease the pharmacy staff in managing pharmacy with the help of new technologies. This system is very well designed to save resources, to speed data access process and increase security for the pharmacy data. There are two problem statements, first one is because of the traditional way of storing medicine details which is by using documents where this will create problem to the pharmacy staff when the document that they use to store the medicine details is lost or damaged. The second problem is where security and confidentiality for private medicine files are limited and this can cause data of medicine in the document can be modified by anyone easily. So this system is developed to solve both of these problems. There are 4 main objectives or purpose of the system. The first objective is to manage pharmacy drug inventory. Second objective is to manage and dispense drug order from customer. The third one is to maintain the stock of the drug inventory. The last one is to generate medicine label and produce report for pharmacy transaction. The methodology that is used to develop this system is the Rapid Application Development (RAD). Compared to waterfall development, RAD's developments are time boxed, delivered and then assembled into a working prototype. This can quickly give the customer something to see and use so that they can provide feedback. I like to dedicate my sincere thanks to my supervisor Prof. Dr. Mohd Khanapi Bin Abdul Ghani for guiding me during the development of this project. I also extend my sincere thanks to my family and friends for their support that they gave me during the development process of this project. As conclusion, this system will help the pharmacy staff in managing the pharmacy in easy and efficient way.

ABSTRAK

Sistem farmasi sebuah hospital adalah rumit dan sukar untuk dibangunkan kerana sifat kompleks hospital itu sendiri. Keupayaan untuk menyediakan dan mengurus ubat-ubatan yang diperlukan tanpa sebarang kelewatan masa adalah kunci untuk mengekalkan piawaian farmasi hospital. Sistem Penjagaan Pintar I-Farmasi dibina atau dibangunkan untuk memudahkan kakitangan farmasi dalam menguruskan farmasi dengan bantuan teknologi baru. Sistem ini direka dengan baik untuk menjimatkan sumber daya, untuk mempercepat proses akses data dan meningkatkan keselamatan data farmasi. Terdapat dua pernyataan masalah, yang pertama adalah cara tradisional menyimpan butiran perubatan yang menggunakan dokumen di mana ini akan menimbulkan masalah kepada petugas farmasi apabila dokumen yang mereka gunakan untuk menyimpan butiran perubatan hilang atau rosak. Masalah kedua adalah di mana keselamatan dan kerahsiaan untuk fail perubatan adalah terhad dan ini boleh menyebabkan data ubat-ubatan dalam dokumen itu boleh dimodifikasi oleh sesiapa sahaja dengan mudah. Jadi sistem ini dibangunkan untuk menyelesaikan kedua-dua masalah ini. Terdapat 4 tujuan utama atau tujuan sistem. Objektif pertama adalah untuk menguruskan inventori dadah farmasi. Objektif kedua ialah mengurus dan menyetepikan pesanan ubat dari pelanggan. Yang ketiga adalah untuk mengekalkan stok inventori dadah. Yang terakhir adalah untuk menghasilkan label ubat dan menghasilkan laporan untuk transaksi farmasi. Metodologi yang digunakan untuk membangunkan sistem ini ialah Rapid Application Development (RAD). Berbanding dengan pembangunan Waterfall, perkembangan RAD adalah terhad kepada masa dengan menyediakan prototaip. Ini dengan cepat dapat memberi pelanggan sesuatu untuk dilihat dan digunakan supaya mereka dapat memberi maklum balas atau komen. Saya ingin mendedikasikan ucapan terima kasih saya yang tulus kepada penyelia saya, Prof. Dr. Mohd Khanapi Bin Abdul Ghani untuk membimbing saya semasa pembangunan projek ini. Saya juga ingin mengucapkan terima kasih kepada keluarga dan rakan saya atas sokongan mereka yang mereka berikan kepada saya semasa saya membangunkan sistem ini. Sebagai kesimpulan, sistem ini akan membantu kakitangan farmasi dalam menguruskan farmasi dengan mudah dan berkesan.

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CHAPTER I

INTRODUCTION

1.1.Introduction

Smart Care I-Pharmacy System is developed as Projek Sarjana Muda 1 in partial fulfilment of the requirement for me for subject BITU 3973. This system use to assist the staff of the pharmacy management in a hospital. This system consist two big module which are the pharmacy inventory and the pharmacy order management.

In the pharmacy inventory part, the system will help the staff to manage the ATC and MDC medicine information. They can insert new medicine detail and update old medicine detail to keep the data up to date. They can also manage the supplier details using this module. This feature will help them to know which supplier that is still supplying stock for them. So in short explanation, this module will help the staff to manage all the basic information need to organise the pharmacy. The second module is the pharmacy order management where the all the order information is stored in this part. This module allow the staff to manage the order by inseting new order or deleting old ones. All the order will be displayed in a list form which will allow easier management for the staff. All this data is save over a secured server that can only be accessed with good credentials and which also improve the security of the Smart Care I-Pharmacy System system.

The expected outcomes from this project is the objective are fully achieved by developing a Smart Care I-Pharmacy system that can improve the way of storing the medicine details to imit the tradisional method and secure the system with a good security.

1.2.Problem Statement

There are two problem statement in this project. The first one is the use of traditional way of storing medicine details which is by using documents. This will give problem to the staff when the document that they use to store the medicine details is lost or damaged. They cannot get the details from the damaged document and they cannot refer other document as they don't have other source to refer. The second problem statement is security and confidentiality for private medicine files in a pharmacy is limited and simple. This is a big problem because the data of medicine in the document can be modified or changed by anyone easily as long as they have the document with them which makes the data integrity of current system is not good.

1.3.Objective

There are 5 objective in this project. The first one is to manage the drug code in a pharmacy such as ATC and MDC drug codes. The second objective is to manage the drug order that comes from a specific customer. The third objective is to dispense drug order in faster and systematic way. The fourth one is to manage the drug stock in efficient way. The last objective is to produce report and enable label printing for the dispensed medicine.

1.4.Scope

This project covers the development on one of the Integrated Hospital Information System (iHIS) part. This system allow the pharmacist to dispense the drug order that they receive from the doctor for the patient. They also can manage the pharmacy data and medicine detail using this web based system. All the process or transaction is automated and there are many features included in this system such as label

generation, inventory summary and many to help the pharmacy staff to manage the pharmacy. There is only one user for this module which is the pharmacist. Below is the list of pharmacy job scope:

- **Manage Drug Order**

- Viewing Drug Order
 - Viewing all the drug order master from the doctor to the pharmacy.
 - Viewing all the drug order detail from the doctor to the pharmacy.
- Create New Order.
 - Inserting or registering new drug order to the patient order list for the patient on doctor's advise.
- Update New Order
 - Updating or modifying drug order for order dispense to maintain the intergration of the pharmacy.
- Deleting Drug Order
 - Removing or deleting the drug order for specific reason on doctor's advise from the patient order list.
- Generate label for specific drug order
 - Generate label for the medicine dispensed from pharmacy.
- Call Patient for dispensing drug order
 - Call patient for dispensing a specific drug order.
- Decline Call Patient for dispensing drug order

- Rollback or decline patient call for dispensing a specific drug order.

- Dispensing drug order
 - Dispensing a specific drug order from the pharmacy.

- **Manage Drug Code (ATC AND Pharmacy Drug Code)**
 - Create Drug Code. (For Both ATC And Pharmacy Drug Code)
 - Inserting or registering new Drug Code into the pharmacy for the order usage.

 - Update Drug Code. (For Both ATC And Pharmacy Drug Code)
 - Updating or modifying the existing drug code for keeping the drug code up to date.

 - Deleting Drug Code. (For Both ATC And Pharmacy Drug Code)
 - Removing or deleting the drug code that is not used by the pharmacy staff

 - Cloning Drug Code. (For Both ATC And Pharmacy Drug Code)
 - Cloning the standard drug code from the database for the pharmacy usage.

 - Viewing Drug Code. (For Both ATC And Pharmacy Drug Code)
 - Viewing all the drug code that that are available in the pharmacy.

 - Viewing Drug Summary. (For Pharmacy Drug Code Only)
 - View all the drugs in the pharmacy that will expire in 150 days.
 - View all the drugs in the pharmacy that have limited stock.

- **Manage Drug Stock**

- Viewing Past Invoice.
 - Viewing all the past drug invoice master.
 - Viewing all the past drug invoice detail.
- Update Drug Stock
 - Add new drug invoice detail
 - Adding new drug invoice detail to update stock.
 - Update drug invoice detail
 - Updating drug invoice detail to update stock.
 - Delete drug invoice detail
 - Delete drug invoice detail to update stock.
 - Update stock of pharmacy drugs
 - Updating stock for all the pharmacy drugs in the invoice.

- **Manage Supplier.**

- Create Supplier.
 - Inserting or registering new supplier details into the pharmacy system.
- Update Supplier
 - Updating or modifying the existing supplier information in the database.
- Deleting Supplier
 - Removing or deleting the supplier details from the database
- Viewing Supplier
 - Viewing all the supplier that is available for the pharmacy.

- View And Export Pharmacy Sales Report
 - View report
 - Staff can view the sales report according to category
 - Report category
 - ❖ List of ATC codes
 - ❖ List of Pharmacy drug codes
 - ❖ List of suppliers
 - ❖ List of pharmacy drugs below reorder level
 - ❖ List of pharmacy drugs below minimum level
 - ❖ List of pharmacy incomple order
 - ❖ List of pharmacy sales (daily, monthly and yearly)

- Print report
 - Print all the pharmacy report category above using standard format as the reference for the pharmacy staff.

- Export report
 - Export all the pharmacy report category above to the excel format as the reference for the pharmacy staff.

1.5. Project Significance

This project absolutely related to the software development field as it involves the development team that requires completing the module given. Integrating the module in to a server could be challenging as this project is develop under development of real project environment. Pharmacist benefit a lot from this system where they can manage the pharmacy daily transaction in much more efficient and simple way. They no need to search through a big bundle of document and paper for

just a simple information. This system reduce the wasting of time in a pharmacy. As the result, the transaction in a pharmacy will be faster and smoother.

Other than that, the pharmacy system comes with many module that is intergrated together to produce a nice and much more perfect system that can be used to manage a big and busy hospital. The main concern and focus of this project is to produce an intergrated healthcare system that can help the hospital staff in managing the hospital. Since Malaysia is a developing country on medicine domain, so in future this system have a great opportunity to provide a good health care support for the entire nation.

1.6.Expected Output

The expected outcomes from this project is that Smart Care I-Pharmacy system are fully developed and intergrated with iHIS software to improve tradisional information storage technique which is using document oriented to mordern web based system and securing the project with good security.

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1.7.Conclusion

As a summary, it can be concluded that everything stated in this chapter is the main fact as it is the first area readers will refer when look into this project. It is also show the process of the project as a whole and the general idea to make it as easy reference. Next chapter is Chapter 2 which will explain about project methodology that will be used and also the literature review of this project.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1.Introduction

The Pharmacy of a hospital is complicated and a hard system to be developed because of the complex nature of the hospital itself. Even though the pharmacy is a hard system to be implemented, the demand for it is increasing steadily over the past decade in Malaysia. The ability to provide and manage the medicine needed without any delay in time and quality is a key to maintaining the standards of the hospital. The current workflow of a pharmacy is not effective due to every details is managed through documentation and unsecured application. This may cause too many problem such as, usage of medicine that have passed expire date, wrong medicine dispensed from pharmacy, unchecked stock maintenance lead to stock limitation and many more. All this problems can be solved with this new system due to the feasibility of using the web service technology to improve the work flow management and securing the details with good security. Thus, this will help many hospitals in managing a pharmacy is a good and quality way to keep the high standard of the hospital in Malaysia.

2.2.Facts and Finding

Domains that is selected for this project is healthcare and web based application. The folowing section will explain all the releted details for this domain.

2.2.1. Healthcare

Health care or healthcare is the maintenance or improvement of health via the diagnosis and treatment of disease, illness and other physical and mental impairments in human beings.

2.2.1.1. Introduction to Healthcare

Health care as known in American terms includes several sectors which are very much dedicated to provide services and products in order to improve individual health. This includes health care equipment and pharmaceuticals, services, biotechnology and life sciences. According to United Nations standards, the word health care refers to hospital activities, medical and dental services and other activities related to human health.

2.2.1.2. Healthcare or Medical Classification

- **ATC codes (Anatomical Therapeutic Chemical classification system)**

The Anatomical Therapeutic Chemical (ATC) Classification System is used for the classification of active ingredients of drugs according to the organ or system on which they act and their therapeutic, pharmacological and chemical properties. It is controlled by the World Health Organization Collaborating Centre for Drug Statistics Methodology (WHOCC), and was first published in 1976.

- **ICD-10 (International Classification of Diseases)**

ICD-10 is the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD), a medical classification list by the World Health Organization (WHO). It contains codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases.

- **Systematized Nomenclature of Medicine (SNOMED)**

The Systematized Nomenclature of Medicine (SNOMED) is a systematic, computer-processable collection of medical terms, in human and veterinary medicine, to provide codes, terms, synonyms and definitions which cover anatomy, diseases, findings, procedures, microorganisms, substances, etc. It allows a consistent way to index, store, retrieve, and aggregate medical data across specialties and sites of care.

- **Malaysia Drug Code (MDC)**

Malaysia Drug Code (MDC) is a code assigned to a particular drug for identification. It is assigned uniquely to identify all drug products involving prescribed medicines and over the counter (OTC) products that have been registered with Drug Control Authority or have obtained special approval for use in Malaysia. The MDC will be used as a standard code for drug management in all health application systems in the Ministry of Health institution and for information sharing among health care providers.

2.2.2. Web Based Application

Web based application is a application that uses the sources from the internet or server to excute the program or application. The function and the benefit will be discussed in the section below.

2.2.2.1. Inroduction to Web Based Application

Web based application is a client-server software application that uses browser to display the result. Example of widely used or commonly used web application include online sales, mail, messaging and many more. Over a passed decade, the web application evolve from simple application to a multifunction performing tool. During the old times, the web application has own pre-compiled client program installed on each users computer. So an update in the server side requires the client side to be updated also. Nowadays, web services use document written in a standard format such as HTML, javascript and may more that supported by all the browser in market now.

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2.2.2.2. Advantages Of Web Application

- **Zero install**
 - This is because now days, web application can be executed in any pc as all pc have their own browser to open the web application. So addition software does not need to the web application.
- **Good accessibility**
 - Anyone can access the web application from anyplace. So this keep all the data in the web application is real time and up to date.