

PATIENT SMART SYSTEM  
(PatiSys)

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Specially dedicated to my father, Mat Yasim Bin Awang and my mother Nisah Binti Mamat and all my siblings that gives more support and advice until I had finished my final year project. Not forgotten my supervisor Puan Noor Mazlina Binti Mahmud who helps me to achieve this project until successful. Thank you very much to all of you.

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## ABSTRACT

Patient Smart System (PatiSys) is implemented to guide doctors and clinic staff to find information of patients easily by showing the patient's profiles. PatiSys that have been discussing in this documentation will eliminate the system constraint that happen to the current system, such system availability and accessibility of the system and data. This system will be focused on three major modules based on the main task that will carry out. The modules are Patient registration Module, Consultation Module and Patient Medical Module. With this system, for patients who have not registered, the clinic staff will include the new data into database. For patient already registered to before this, just wait turn to meet with doctor. For the consultation task, doctor will be getting the patient health information about their sickness. The process that is includes in this module such as generate treatment records, generate patient history records, and medicines reports. For the patient medical module, doctor will manage the reports such as treatment report and medicines reports. The medicines reports will be sending into dispensary's computer to provide medicines that are required by the patient. Basically, the system operation is integration between software Microsoft Visual Basic.Net 2005 and Microsoft Access 2003. Microsoft Visual Basic.Net is used to implement the graphical user interface (GUI). This software will get information and process the data from the user and display the information of patient through this GUI. Microsoft Access 2003 is used to keep database. Overall, these projects have been succeeded and achieve the objectives and scopes that have been decided. However, the research about overall development towards such projects still has to keep moving on in order to improve its better quality in the future.

## ABSTRAK

Sistem pintar bagi pesakit (PatiSys) adalah dilaksanakan untuk memberi panduan kepada para doktor dan pekerja klinik untuk mencari maklumat-maklumat pesakit dengan mudah dengan memaparkan profil pesakit. Sistem pintar yang dibincangkan dalam kertas ini akan menghapuskan kekangan sistem semasa seperti *system availability* dan *system accessibility* pada data dan sistem. Sistem ini akan ditumpukan pada tiga modul utama berdasarkan tugas utama yang akan dijalankan. Modul-modul tersebut adalah modul pengurusan dan pendaftaran pesakit, modul perundingan dan modul perubatan untuk pesakit. Bagi pesakit yang belum berdaftar, pekerja klinik akan memasukkan data baru kedalam pangkalan data. Manakal, bagi pesakit yang sudah berdaftar, mereka hanya perlu menunggu giliran untuk menemui doktor. Bagi modul perundingan, doktor boleh mendapatkan maklumat kesihatan pesakit mengenai penyakit mereka. Proses ini termasuklah, menjana rekod-rekod rawatan, menjana sejarah pesakit dan menjana laporan-laporan perubatan. Bagi modul perubatan, doctor akan menguruskan laporan-laporan seperti laporan rawatan dan laporan ubat-ubatan. Laporan ubat-ubatan akan dihantar kepada komputer dispensary supaya ubat-ubatan yang diperlukan oleh pesakit dapat disediakan. Pada asasnya, system ini adalah penyepaduan diantara perisian Microsoft Visual Basic.NET 2005 dan Microsoft Access 2003. *Microsoft Visual Basic.NET* digunakan untuk menghasilkan *Grafical User Interface (GUI)*. Perisian ini akan mendapatkan maklumat dan proses data yang diterima dari pengguna dan seterusnya memaparkan maklumat pesakit melalui GUI. Manakala, *Microsoft Access 2003* digunakan untuk menyimpan pangkalan data. Keseluruhan projek ini telah berjaya dan mencapai objektif dan skop yang telah ditetapkan. Walau bagaimanapun, penyelidikan perlu dijalankan untuk memperbaiki projek ini pada masa hadapan.



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## LIST OF ABBREVIATION

ADO	-	Activex Data Objects
DAO	-	Data Access Object
DBLC	-	Database Life Cycle
DBMS	-	Database Management System
GUI	-	Graphic User Interface
PatiSys	-	Patient Smart System
PSM 1	-	Projek Sarjana Muda 1
PSM 2	-	Projek Sarjana Muda 2
SQL	-	Structured Query Language
VBA	-	Visual Basic for Application

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## CHAPTER 1

### INTRODUCTION

Chapter 1 give an overview of Patient Smart System, The objective of the project are stated clearly. There are few problem statements that explain about the existing problems which is eventually lead to this project development. The methodology explains briefly about the project flow. The scope of work which consisting of hardware and software development is being discussed in this chapter as well.

#### 1.1 Introduction of Project

The Patient Smart System (PatiSys) will be developed for patient information management system for any clinic especially for the new clinic. As in uses of technology present in rising daily life, a system named patient smart system is created. This system to replace long method namely card usage. This system also able accelerates process which need is being passed by patient. PatiSys will be developed using Visual Basic.Net and integrates with Microsoft Access as database. This system intends to replace the current manual patient record system used at the clinic (i.e. data recorded on card) and introduce an electronic computerized-system to systematically manage the patient record in more efficient way. PatiSys will record the entire patient's data (i.e. personal data, visit dates, etc.) and the patient's health

information (i.e. health history, current health condition, treatment done, etc.) The system also allows the doctor to insert comment about patient's health condition, the type of medicine required, and to schedule the patient's visit to the clinic again (if necessary). The PatiSys will be frequently updated to keep track of the patient's information from time to time.

## **1.2 Objective of the Project**

Project Objectives:

1. To develop a patient database management system for 'Poliklinik Mesra'.
2. To develop a systematic system to manage patient's record and information.
3. To provide a manageable database for easier data and information retrieval
4. To expose the ICT technologies among the staff at 'Poliklinik Mesra'
5. To reduce the miscellaneous waste, office resources (i.e. paper, card and etc).
6. To save time and increase the service efficiency

## **1.3 Problem Statement**

The Patient Smart System (PatiSys) is built to replace the current manual patient record system used at the clinic (i.e. data recorded on card) and introduce an electronic computerized-system to systematically manage the patient record in more efficient way. Currently, using manual system is not systematic and hard to manage patient's record. The system is also hard to retrieve data or record. With the PatiSys, the time for tracking and recording the patient's data can be minimize as the normal system take times to record the patient's data. Some of the patients' data can be mislaid and by using this system, the problem can be solved. This system also allows doctors to record and handle the patient more easily. They just can refer the history of the patient through their hands. It also will be connected with the dispensary's computer system in dealing with the medications. As the doctor

prescribes the medication for the patient, the dispensary will get the prescription at the same time. So, they can prepare the medication and as soon as possible.

#### **1.4 Scope of Work**

The project will be focused on the two major points of view which are firstly focused on users and the finally focused on system itself. The scopes as describe below:

##### 1) Scope of User

The main user of this system is basically for the staff at clinics especially for doctor.

##### 2) Scope of System

This system will be focused on three major module based on the main task that will carried out. The modules are Patient Registration & Management Module, Consultation Module and Patient Medical Module. The scopes of each module as describes below:

###### 1. Patient registration & Management Module

The objective of this module is managed the patient registration and managing the patient records. The process that is related on the registration will be put in this module such as patient getting their queue number from the registration process. If that patient is new customer, all personal information must entered by staff before are meeting with doctor. If he/she is already registered, patient only needs to wait turn to see with doctor.

## 2. Consultation Module

The objective of this module is conducting and managing consultation task. During this task doctor will getting the patient health information about their sickness. The process that is included in this module such as generate treatment records, select patient in queue list, and generate drugs reports.

## 3. Patient Medical Module

This objective of this module is managing the patient medical such as manages the medicines that will dispense. Staff will determine price for each medicine needed by patient. A copy of report which contains ways for eating medicine and also medicine prices which need paid will be given to patient as reference.

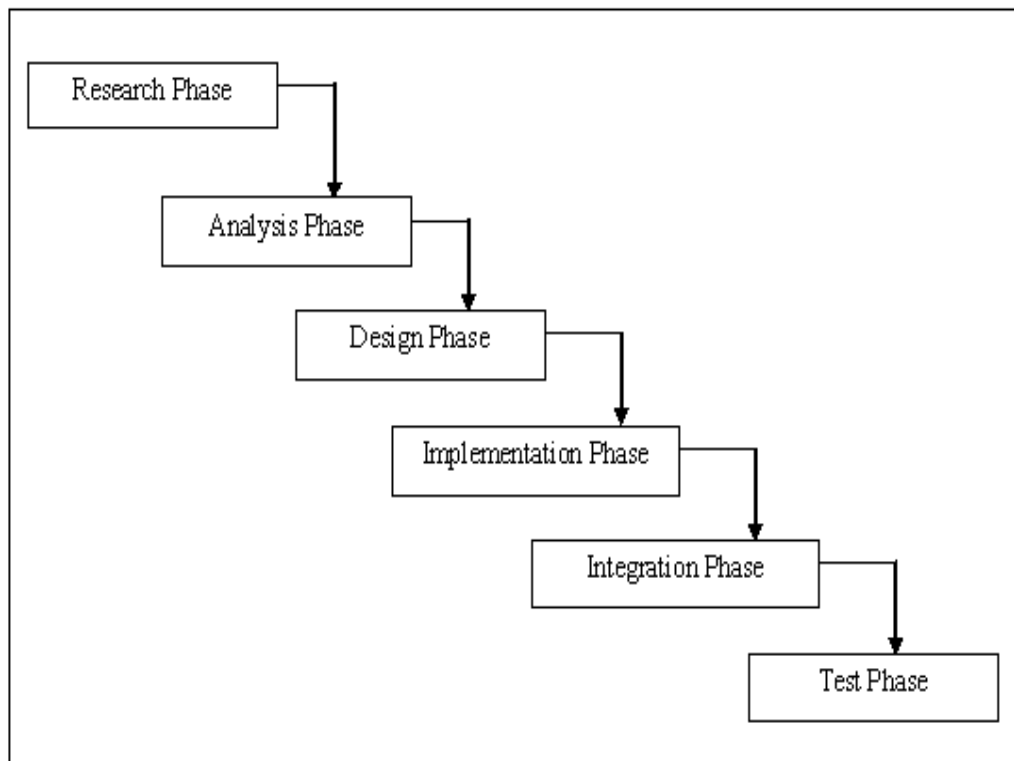
### **The limitations of this project are:**

1. To design a system to record the patient's information to the system.
2. PatiSys user is limited to staff at clinic especially for doctor. The doctor will record patient's data, update the data, post the comment and more.
3. The system will be designed to be platform independent and a standalone system. This system will be located in doctor room.
4. The system functionalities of PatiSys will cover from patient's recording which include the personal data, visit date, health history, current health condition, treatment done, comment from doctor and type of medicine required

### **1.5 Methodology of Project**

Before implementing the Patient Smart System (PatiSys) with the real system, the concept of the programmed visual basic.NET and integrates with the Access

database must be fully understood. This aimed to ensure project want made to be workable with successful. It begins by choosing a topic of project, research and finally completing by developing the system. The research carried out to be sure how far this project is accepted or necessitated by clinic found off. The purpose in the methodology is to implement this system smoothly and follow the planning that has been decided. So during this project development process, the best methodology has been chosen is the Waterfall Model. There have six phases to implement this project which are research phase, analysis phase, design phase, implementation phase, integration phase and test phase. These two phases is done in PSM1, while design, implementation, integration and test phase is done in PSM2. In the other words, this method is reference to inside student complete project which took a period of about one year. Figure 1.1 show the waterfall model.



**Figure 1.1 Waterfall Models of Project Phases**

## CHAPTER II

### LITERATURE REVIEW

#### 2.1 Introduction

In this chapter, the literature review will focus on Related Previous Project and Theoretical Study. The Related Previous Project gives some review on several previous projects. Of these projects, it has become inside guide provides the PatiSys system. Beside that, it also had given idea me namely whatever necessary added and how to design its. In addition, the Theoretical Study will be discussing on some related theories and explanations on each equipment used in this project. Fact and finding is the formal process to collect and capture the entire information about system, system requirements and system preferences. Fact and finding is most crucial to the system planning and system analysis phase. It helps to learn about the vocabulary, problems, opportunities, constraints, requirements and priorities of a business and a system.

Interview, research and case study are the fact-finding techniques the commonly used for each of the system developers during develop their system. These techniques are used during the early stage of the system planning and system analysis phase in order to collect the related information about their system. Resource of information should be collected from variety source. Information source can be gathered in formal sources and informal sources. For formal sources the information can be gathered from books, journal, research papers, encyclopedias,

newspapers, magazines, handbooks, thesis, bibliographies and World Wide Web (WWW). For formal information sources it includes contact with peers, colleagues, supervisor and the user of the system. As a whole, the literature review draws on the knowledge, culture, methodology and theories of the topic.

## 2.2 Related Previous Project

In this section, the related system of healthcare information system will be choose for making some comparison in terms to gathered the information which can be used during the next development phase. The example of the system that has been chosen is:

- 1) Indian Health Service – Electronic Health Records System.  
(<http://www.ihs.gov>)

The IHS Electronic Health Record (ISH-EHR) is intended to help providers manage all aspects of patient care electronically, by providing a full range of functions for data retrieval and capture to support patient review, encounter and follow-up [1]. By moving most (and eventually all) data retrieval and documentation activities to the electronic environment, patient care activities and access to the record are able to occur simultaneously at multiple locations without dependence on availability of a paper chart. Moreover, point-of-service data entry ensures that the record is always up to date for all users. ISH – EHR supports function as:

- Patient lookup and management of personalized patient lists
- Problem list management
- Provider order entry for laboratory, radiology, medications
- Results notification and retrieval
- Report retrieval

- Health maintenance and disease state management reminders
- Clinical encounter documentation
- Clinical decision support (order checks and clinical reminders)
- Documentation of immunizations, patient education, health and personal health history, etc.
- Consult/referral generation and tracking

#### Software Requirements

In order to successfully install RPMS EHR, a number of system requirements must be met. These include:

- File 200 must be current
- Fileman 22/Kernel 8 with latest patches
- Cache operating system
- Pharmacy v4.5 Suite
- Patient Information Management System (PIMS) version 5.3 (this includes Admit/Transfer/Discharge (ADT), Scheduling, and Sensitive Patient Tracking)
- Three additional VHA applications that are required to run in the background:
  1. Lexicon v2.0
  2. Visit Tracking v2.0
  3. VA Health Summary v2.7

## **2) Clinicare's CMR – Computerized Medical Records.** (<http://www.clinicare.com>)

Clinicare's CMR, Computerized Medical Records, application enables the physician to enhance the care which patients receive. Rapid, specific access to a patient's medical record allows easy review of essential information during an encounter or antecedent to it. Designed for both single-user and multi-user settings, it can be used on a personal computer or simultaneously accessed from any number of terminals [2].