



**Faculty of Electrical and Electronic Engineering Technology**



**DEVELOPMENT OF SMART EMERGENCY DEPARTMENT  
MANAGEMENT SYSTEM BASED ON ANDROID STUDIO**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**IQBAL FAWWAZ BIN MUHAMMAAD HARIS FADZILAH**

**Bachelor of Computer Engineering Technology (Computer Systems) with Honours**

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**DEVELOPMENT OF SMART EMERGENCY DEPARTMENT MANAGEMENT  
SYSTEM BASED ON ANDROID STUDIO**

**IQBAL FAWWAZ BIN MUHAMAAD HARIS FADZILAH**

**A project report submitted  
in partial fulfillment of the requirements for the degree of  
Bachelor of Computer Engineering Technology (Computer Systems) with Honours**



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**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

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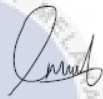
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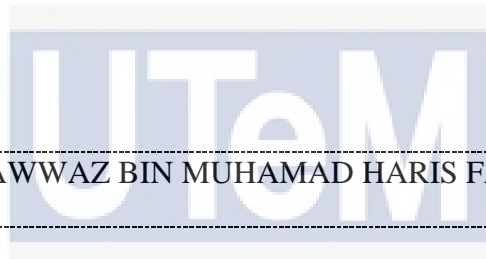
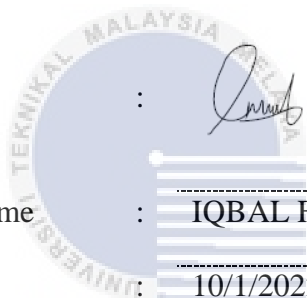
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## APPROVAL

I hereby declare that I have checked this project report and in my opinion, this project report is adequate in terms of scope and quality for the award of the degree of Bachelor of Computer Engineering Technology (Computer Systems) with Honours.

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## DEDICATION

*To my beloved mother, Hanani binti Mat Ali,*

*and*

*To dearest family and*

*All my friends who have been constant source of support and encouragement during the challenges of graduate school and life. I am truly thankful for having all of you in my life.*

*This work is also dedicated to my supervisor, Dr.Suhaila, who guide me in this process and the committee who kept me track.*



## ABSTRACT

In this pandemic outbreak, hospitals in every country became the busiest place than ever with so many patients came in and out of the hospital every single day with different type of illness and condition. The hospital that treat and receive infected patients is most likely to be fully occupied and the medical staffs are sure slammed with the amount of work and patients needed to cover and attend. This scenario can be worsen if the hospital did not have a systematic and reliable management system that control the patient flow and information system. Therefore, the purpose of this project is to develop smart emergency department system for hospital. The objective of this project is to develop a smart emergency department management system based on android application to manage the patients that come in to and out of the emergency department and avoid the overcrowding and unmanagable situation in the ED. This system used two platform for different users which android mobile application for the doctors and website application for the administrator. The system also displayed the information of ED patient list that is placed in the emergency room. The system is proposed so user can upload and key in data efficiently and informative for the staffs in ED. This project is meant to improve the management system in the emergency department to keep up with the current demand of the healthcare these days.

## ***ABSTRAK***

Di dalam wabak pandemik ini, hospital di setiap negara menjadi tempat yang sibuk daripada waktu sebelumnya kerana banyak pesakit yang akan masuk dan keluar dari hospital setiap hari yang datang dengan pelbagai jenis penyakit dan masalah kesihatan. Hospital yang menerima dan merawat pesakit yang dijangkiti wabak berkemungkinan besar akan dipenuhi dengan pesakit dan kakitangan perubatan yang merawat akan menerima bebanan kerja yang besar kerana jumlah pesakit yang banyak. Senario ini akan bertambah buruk sekiranya hospital tersebut tidak mempunyai sistem pengurusan yang sistematik dalam mengawal sistem maklumat aliran pesakit yang masuk dan keluar. Oleh itu, projek ini dijalankan bertujuan untuk membangunkan sistem jabatan kecemasan pintar untuk hospital. Objektif projek ini adalah untuk membangunkan sistem pengurusan jabatan kecemasan pintar berdasarkan aplikasi Android untuk mengurus aliran pesakit yang mendaftar dan dibenarkan keluar oleh pihak hospital untuk mengelakkan kesesakan pesakit di jabatan kecemasan sekaligus dapat mengelakkan daripada keadaan yang tidak dapat dikawal oleh para petugas kesihatan. Sistem ini menggunakan dua platform untuk pengguna yang berbeza iaitu aplikasi mudah alih Android untuk para doktor dan aplikasi laman web untuk para pentadbir (jururawat). Sistem ini akan memaparkan maklumat senarai pesakit di jabatan kecemasan yang ditempatkan di wad kecemasan. Sistem ini dibangunkan supaya pengguna dapat memuat naik dan memasukkan data dengan lebih efisien. Projek ini bertujuan untuk meningkatkan kualiti sistem pengurusan di jabatan kecemasan untuk memenuhi permintaan terhadap servis rawatan kesihatan semasa.

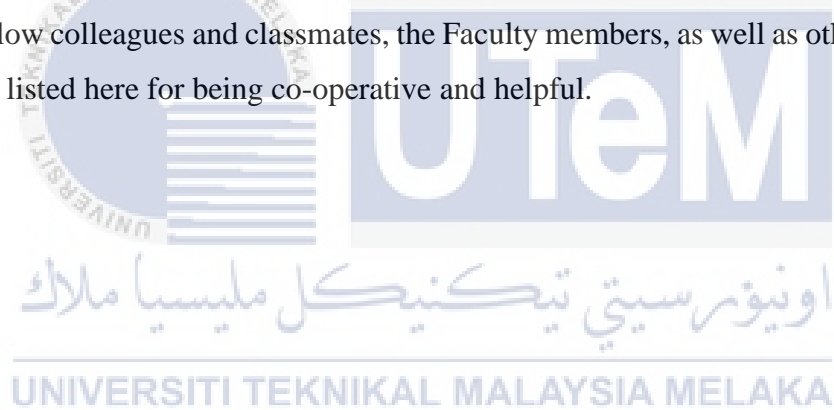


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# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Emergency Department (ED) is a busy place with people of different ages and incredible mix of injuries and illnesses. The physical emergency department is interconnected with much larger web of people and services around the hospital and sometimes beyond, from the ED specialized nurses in charge of assessing patients and keeping everything organized from the front lines to the doctors and on-call experts of surgery, obstetrics and general medicine to networks of testing services like labs, radiology and imaging technicians. All of these people and services are the one who going to take care of the patients that coming through the hospital's emergency room door. Unlike the local walk-in clinics, the emergency room is not a first-come first-serve place. Emergency department staffs need to decide which patients need the most medical attention urgently and the staffs do this using a process called triage where the staffs examine whether the patients need to be attended immediately or the otherwise.

Usually, an emergency department management system is using the centralized information system where the doctors do the health assessment of a patient, the data is passed to the nurses and will be key in into the system at the admin's station. There is nothing wrong with the method, but it will take more time and effort of the medical staffs where they can allocate their energy and time to do

other jobs like assessing patient triage or putting an IV fluid to patients rather than just transferring information from the ED bed to the admin.

Emergency room patients are increasing year by year, even increasing number of staffs and medical team were not able to handle all the patients on time. From patient registration and triage evaluation to order processing and storing patient's credentials to communicating with other department or employee in the hospital, speed and accuracy are crucial. Several operational stages must be completed under intense time restraints and sometimes during the patient overcrowding situation. By using the same or older emergency department management was not the best action because it does not provide the features and functionality to support and handle the amount of work and number of patients in the emergency room.

The idea of this project is to overcome the overcrowding situation in ED and improve data integration between the medical staffs and the information system. The smart emergency department management system is going to apply the use of mobile application where the doctors can just upload patient's information without hassle just by using their mobile phones. This project also will implement the centralized information system where the ED staffs can view the current situation of ED from an ED patient list managed by the administrator.

## **1.2 Problem Statement**

In the proceeding emergency room management system were not well-suited for today emergency department in hospital. The previous management system which were using paper and files or the conventional status board used markers to update and key in patient's data were not the systematic and reliable way for the ED staffs because every new information received, the ED staff need to find the correct files or go to the information whiteboard to update the

information. Without a proper management system, handling emergency department will give a lot of pressure to the doctors, nurses, administrator and other staffs.

Furthermore, during this global pandemic, covid-19, the number of patients come in and out of the hospitals are higher than they ever were. There are many patients with different condition will come through to emergency room to get treatment and medical care. So, a good and reliable management system is very much needed to avoid the overcrowding situation in the ED. The emergency department management system with patient tracking, order management and good data integration are the system that a hospital needed to handle the manages the emergency department. The purposed emergency department management system is planned to be vital and essential piece in preparing for any emergency or disaster events.

### 1.3 Project Objective

The main objective for this project is to develop a smart emergency department management system based on Android application and the following are the other objectives this project:

- a) To develop a smart emergency department management system based on android application and website application.
- b) To develop the mobile application for patient registration and website application for patients' data management.
- c) To develop an ED display board to display patients' information for staffs viewing.

## 1.4 Scope of Project

For this Smart emergency department management system, the system is separated into two parts which are mobile application for the doctors in the emergency room and website application for the administrator. The scopes of this project are:

- a) new user can create new account while existing user must login to use the system.
- b) Doctor can update the patient's information such as patient's history, current treatment, treating doctor and medication.
- c) Admin can view all the information updated by the doctor on the website.
- d) Admin will be able to update the ED patient list display.

## 1.5 Summary

In this chapter, the background of this project has been discussed briefly to portray the general knowledge and overview of smart emergency department management system. The problem statement stated above were mentioned about the features needed to be improved from the existing emergency department management system. In this chapter also reviewed objectives and the scopes of this project that need to be achieved in the development of this project.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

Emergency department is the department of a hospital which responsible for the provision of medical and surgical care to patients arriving at the hospital in need of immediate care. An Emergency Department (ED), also known as an accident & Emergency Department (A&E), Emergency Room (ER), Emergency Ward (EW) or casualty department, is a medical treatment facility specializing in emergency medicine, the acute care of patients who present without prior appointment; either by their own means or by that of an ambulance. Since patient attendance is unplanned, the department is required to provide initial care for a wide range of illnesses and accidents, some of which are life-threatening and require urgent attention. Medical staffs who work in the emergency department need to make fast decision and to do that, they need quick and mobile information about the patients and the status of the ED. There are some studies on smart emergency department that focused on the patient's information, patient flow analysis, emergency department status board, queueing management system and others.

#### 2.2 Review on existing smart emergency department and queueing system

There are many smart emergency department and queueing system developed or created previously to ease the management and flow system of an emergency department. This chapter will review the application features and the system flow of the existing