

# ANAESTHETIST ROSTERING MOBILE APPLICATION FOR HOSPITAL CANCELOR TUANKU MUHRIZ

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## ABSTRACT

Hospital Cancellor Tuanku Muhriz (HCTM) is a place that provides health care services to society. A lot of health-related cases have been referred to HCTM especially at the Surgical Department. In the surgical department, an anaesthetist is a specialist doctor responsible for providing anaesthesia to the patients before or after the surgery phases. The hospital manager must ensure that the anaesthetists must always be available during the surgery phases. Rostering anaesthetists is challenging because it needs to fit with the anaesthetist's preferences and requests, type of duty, the demand of the workstation and rostering planning. The process to balance the workload among anaesthetists for job satisfaction is hard with the manual system. Thus, this work designs and develop a mobile application that can be used to manage the anaesthetist rostering in HCTM. The mobile application has the functions to allow anaesthetist to make a roster request, view roster, and can request a swap roster, accept or reject swap roster request. These functions can give more flexibility to anaesthetist work at their preferred time and day.

## 1 INTRODUCTION

All hospital should deliver excellent and fast services to patients. Due to that, hospital managers must ensure their rostering process can run smoothly and efficiently to avoid the absence of staff on duty and excessive increase in the hospital workload which can cause physical fatigue in healthcare (Güler & Geçici 2020). In Hospital Cancellor Tuanku Muhriz (HCTM), an anaesthetist is an important person who must be available during the surgery phase in the Surgical Department. Currently, the anaesthetist rostering in HCTM uses manual systems such as Google Form and Microsoft Excel to collect the requests, set up the roster planning and organize the roster. This manual system seems unreliable, hard to manage and lead the manual systems inefficient.

Therefore, this work aims to design and develop a mobile application for anaesthetist rostering. The mobile application must be able to allow an anaesthetist to make a roster request, view roster, and can request a swap roster, accept or reject swap roster request etc. In the next section, we begin with the literature review and continue with the methodology for design and develop the anaesthetist rostering mobile application. Next, we show the result of our development and end it with the conclusion.

## 2 LITERATURE REVIEW

An anaesthetist is a physician that has many tasks. They are responsible for administering anaesthetic or sedation during medical procedures (Aghsaei 2014). Preparing a roster for anaesthetists in a hospital is a complicated and time-consuming task. A Schedule often called a roster, is a list of employees and associated information (i.e., location, working times, responsibilities for a given period for a week, month or season) (Yange et al. 2020). The issue of rostering anaesthetist is challenging due to the multiple demands and requests from the hospital and anaesthetists. Duty scheduling is the assignment of tasks to staff. It is the process of analysing the workload in an organization, the time available to implement the workload and the distribution of the work according to the time available (Yange et al. 2020). This task is beyond the capability when the roster maker needs to fulfil anaesthetist requests and always need to keep updating the roster.

Paschou et. al., (2015) proposed an intelligent mobile device application, to deal with lots of obstacles in day-to-day medical rostering management and improved workflow in medical units. A few functions were implemented to allow health care to get informed online and make ad-hoc changes to their shifts dynamically through smartphone (Paschou et al. 2015). Besides that, they implemented a calendar function to increase the efficiency of the application in managing the roster. In other work, (Zhu et al. 2019) enhanced the existing approach of manual staff roster planning by significantly reducing the number of man-hours used in the process of planning and minimizing the possibility of human error in the rostering process.

## 3 METHODOLOGY

### 3.1 The Existing System

HCTM uses a manual system to generate a roster to schedule an anaesthetist. The monthly roster request is prepared every month to collect the request for duty using Google Form. Anaesthetists can choose their duty on preferred days and shift in that month. The roster maker will manage the roster by taking the data from the Google Form and organize it inside Microsoft Excel.

The things that always requested by anaesthetist are:

- Leave
- Workshop/Conference

- Meeting
- Dissertation
- No Call
- AM Shift
- PM Shift
- Others

### 3.2 The Proposed System

The proposed system is a mobile application. This mobile application will help to collect the request from the anaesthetist. The type of requests that are implemented in this application is a Roster Request, Emergency Request and Swap Roster Request. Roster Request is used to collect monthly requests from anaesthetists before the schedule is released. Therefore, the anaesthetist can plan their schedule wisely for that month. Sometimes, anaesthetists will experience an unavoidable situation or problem that causes them unable to work that day or time. Emergency Request can be a good platform for anaesthetists to request or inform the hospital about their situations. This application allows anaesthetists to exchange duty with their colleagues through Swap Roster Request. This function can give more flexibility to anaesthetist work at their preferred time and day.

### 3.3 Use Case Diagram

The use case diagram for the proposed system as shown in Figure 1 depicts the interaction between the system and the actors (anaesthetist and admin).

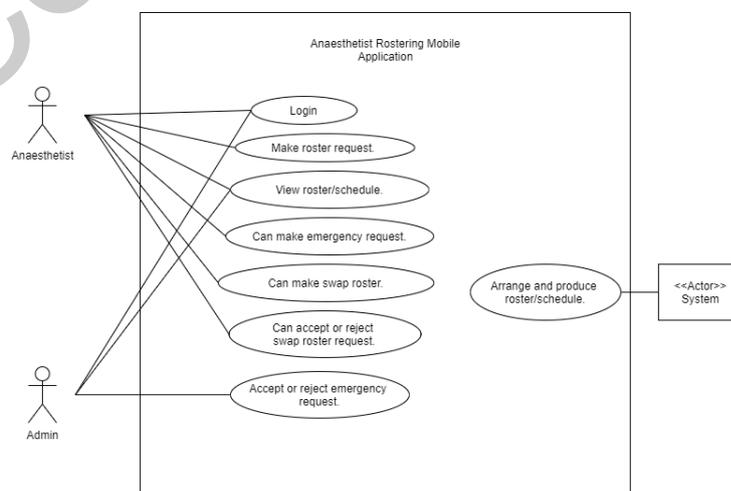


Figure 1 Use Case for System Design

## 4 RESULTS

This section will show the user interface for anaesthetist rostering mobile application. This application was developed using PHP and Dart as the programming language and MySQL as the database. Fig. 2. show the main interface for anaesthetist rostering mobile application which is consists of the roster, request form, emergency request form and swap request.

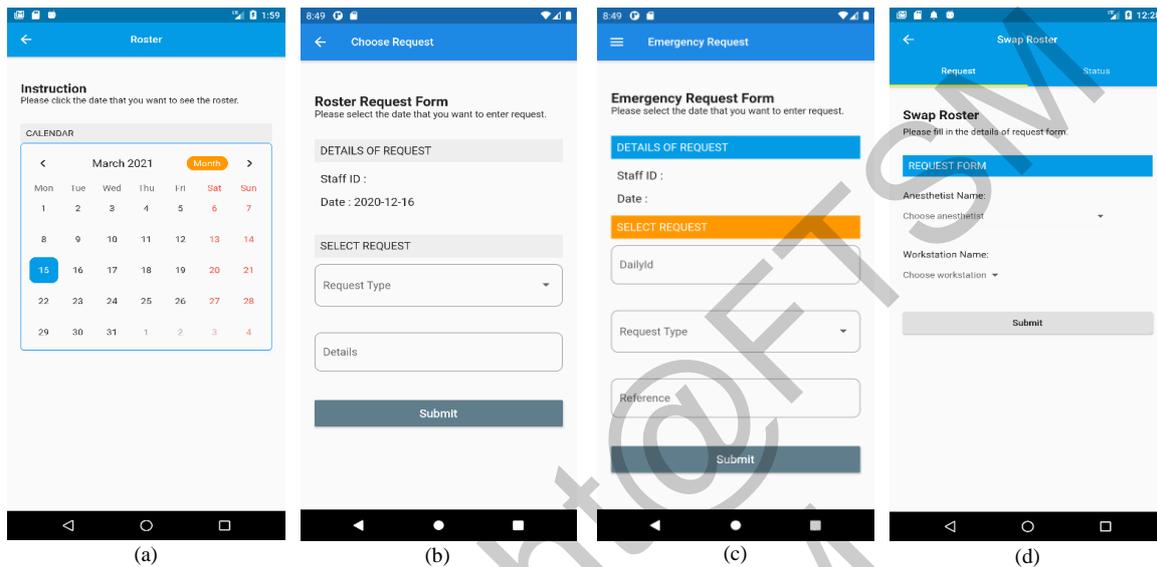


Figure 2 (a) Interface for roster; (b) Interface for request form; (c) Interface for emergency request form; (d) Interface to make swap request

## 5 CONCLUSION

An anaesthetist rostering mobile application that had been presented in this work is not been testing yet because it still under design and development. The aims is to assist the anaesthetist rostering in HCTM by enabling real-time communication between anaesthetists through smartphone and tablets. The features that are being implemented in this system is to give flexibility to the admin, that is the roster maker, to easily manage the request for anaesthetist duty and access the roster from any location. Also, this application can help reduce the workload for the roster maker that is responsible to manage the roster. Further enhancements are still required to make the application work better. Additionally, the proposed mobile application also can be customized to meet the needs of different healthcare facilities that may have different demand from such an integrated system. The mobile application will be integrated with the web-based application and the artificial intelligence engine to automatically

construct the anaesthetist roster based on the request made by the anaesthetist using the Anaesthetist Rostering Mobile Application.

## 6 ACKNOWLEDGEMENT

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