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**SIMULATION STUDY OF IMPROVING SERVICE FOR  
PATIENT TREATMENT  
AT HOSPITAL BESAR ALOR STAR (HBAS)**

A thesis submitted to the Graduate School in partial  
fulfilment of the requirements for the degree  
Master of Science (Decision Sciences)  
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By  
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## ABSTRACT

Medical service is very important for society. The demand for this service increases every year. The limitation of treatment rooms, the high doctor-patient ratio and other problems give challenges for the hospital management to make decisions. The main objective of this study is to analyze the increase of patients as compared to the available of resources. The method of this study is to analyze model that has been developed using a simulation software call ARENA. Inputs for this model were collected from the daily report book, through observation and from interviews with the management. These data was analyzed using the ARENA Input Analyzer. The model was verified and validated to determine the model give right characteristic to the real system. The models have also been experimented to find the best scenario for the management to make a decision. The result of this study is that the management should increase the number of doctors by sharing treatment rooms to receive more patients. This will decrease the waiting time of patients

Keywords: simulation, hospital, healthcare, medical, resources management

## ABSTRAK

Perkhidmatan Kesihatan amat penting kepada masyarakat. Dari tahun ke tahun, permintaan terhadap perkhidmatan ini telah meningkat. Kekurangan bilik rawatan, bilangan doktor dan sumber-sumber lain memberi satu cabaran kepada pihak pengurusan untuk membuat keputusan yang tepat. Objektif kajian ini adalah untuk menganalisa peningkatan bilangan pesakit dengan bilangan doctor sedia ada. Kaedah kajian ini adalah membangunkan model dengan menggunakan perisian simulasi, ARENA. Input kepada model ini diambil dari buku laporan harian, pemerhatian dan pertanyaan kepada pihak pengurusan. Data- data ini kemudiannya dianalisis dengan menggunakan perisian ARENA Input Analyzer. Model ini diuji pengesahan dan penentusahan bagi menentukan model yang telah dibina itu memberikan sifat seperti sistem sebenar. Model ini juga dieksperimenkan bagi mencari senario terbaik kepada pengurusan. Keputusan kajian ini adalah pihak pengurusan seharusnya meningkatkan bilangan doktor dengan berkongsi bilik bagi mengatasi masalah peningkatan pesakit.

Kata Kunci: Simulasi, hospital, penjagaan kesihatan, perubatan, pengurusan sumber.

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## **Chapter 1**

### **Introduction**

#### **1.1 Background**

A hospital is continually on the quest for ways to improve its efficiency. Much of the challenge faced in healthcare management today is how to improve the efficiency of its operations i.e. determining the best way to organize the resources required for the delivery of care. The task becomes harder due to the dynamic nature and randomness of the hospital operations. Patients, doctors, nurses, equipment and supplies are interacting in ways that are complex and difficult to analyze. Determining how to allocate and schedule these resources is usually performed with the aid of a simple and static formula or using common sense.

The simulation study has been conducted at the Department of Medicine (MOPD) Hospital Alor Star (HAS) with the aim to improve the operational performance of the hospital. The MOPD started its operation since 1907. The medical wards have a total of 178 beds and provide health care services to the population in Kota Setar, which comprises of approximately 400 000 residents. It also serves as a referral hospital for

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