UNIVERSITI TEKNOLOGI MARA

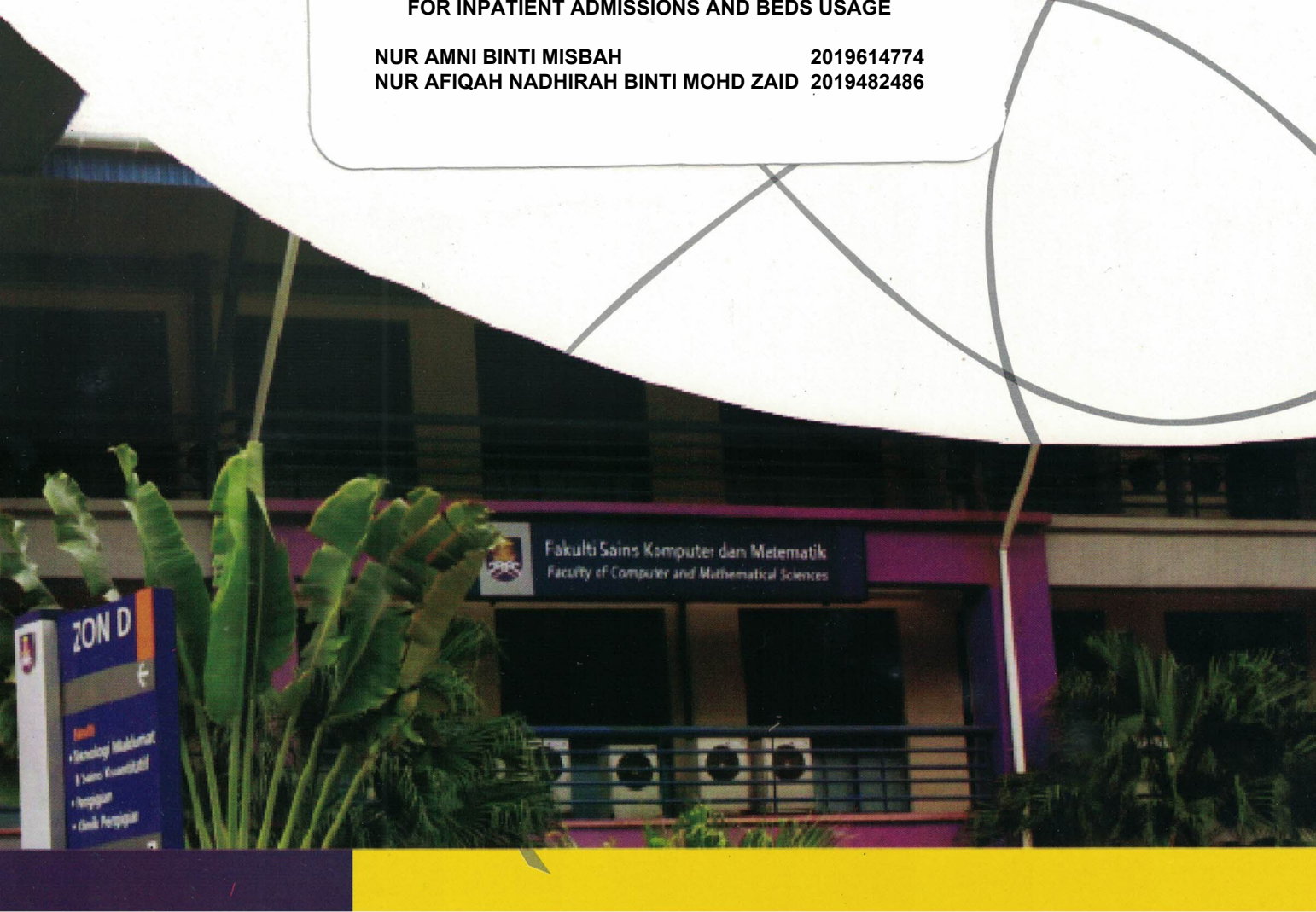
Nombor Sijil: 404073

Fakulti Sains Komputer Dan Matematik

TECHNICAL REPORT
FINAL YEAR PROJECT
CS249
MARCH 2022 - AUGUST 2022

IMPLEMENTING SYSTEM DYNAMICS SIMULATION AT HCTM FOR INPATIENT ADMISSIONS AND BEDS USAGE

NUR AMNI BINTI MISBAH	**2019614774**
NUR AFIQAH NADHIRAH BINTI MOHD ZAID	**2019482486**



ACKNOWLEDGEMENTS

In the Name of Allah, The most Gracious, The most Merciful. Alhamdulillah all praises belong to Almighty Allah for the completion of our Final Year Project (FYP). Peace and prayers be upon His Final Prophet and messenger Muhammad, whose way of life has been a continuous guidance for us.This final year project report is prepared in partial fulfilment of the requirement for the degree of Bachelor of Science (Hons.) Mathematics Universiti Teknologi MARA (UiTM).

With great pleasure, we would like to extend our sincere gratitude to all those who participated in the completion of our FYP. Deep appreciation is extended to them, who patiently gives guidance, suggestion and advice which help us very well particularly in writing this project. A special appreciation to our supervisor, Madam Aimi Zulliayana Binti Rosli, for her wonderful assistance throughout our project.

Finally, a deepest appreciation to our family and friends for their continuous moral support when undertaking this project. And not to forget, we want to thank ourselves for working so hard to finish the entire report. These commitments allowed us to successfully complete this project on time. Thank you.

TABLE OF CONTENTS

ABSTRACT

Malaysia, a Southeast Asian country with 32.37 million population in 2020 requires better planning in each sector of economic areas especially healthcare as the increasing number of Malaysians imply changes in healthcare services needed in the future. This developing country experiences a worldwide phenomenon which is population ageing as the median age of a country rises and shifts the distribution of that country's population towards older ages and be the challenges for the government as the priority toward healthcare needs to be increased. Hospital, an institution providing services regarding healthcare is a perfect reference in this case.

Hospital Canselor Tuanku Muhriz UKM (HCTM), one of the busiest hospitals in Wilayah Kuala Lumpur receives thousands of inpatients per year seems to require several action plans to ensure the smooth functioning of the hospital in the future. System Dynamic Simulation (SDS), one of the simulations that are widely used, was discovered in order to predict the total inpatient and the bed usages in 10 years ahead. The year of 2018 setted as initial in this SDS model and the result obtained by running the model.

From the result obtained, approximately 3000 and above inpatients are predicted to increase by following years. As a total of 3777, 4155, 4570 and 5027 inpatients will increase in 2019, 2020, 2021 and 2022 as revealed in the model. Following the model, it disclosed the constant number of beds needed, 873 for 10 years ahead. This means the hospital is ready for the next 10 years with a sufficient number of beds. The discovery of increasingly inpatients will help hospital administration, especially the inpatient division, which is closely related to inpatient admissions to have a brilliant future plan in order to improve its facilities and services aiming to increase patient satisfaction with the hospital's management of their care.

1 INTRODUCTION

Forecasting accuracy is critical for effective healthcare planning as over the years, healthcare requirements have evolved over time and healthcare organizations have risen in size, complexity, and cost. For many years, Malaysia has been concerned about the quality of healthcare systems in each hospital as it requires to deliver the best performance for Malaysians. As of 2019, 376 hospitals are functioning in Malaysia and the healthcare system in Malaysia consists of two main categories: the publicly funded healthcare system run by the government and the private healthcare system. Healthcare is a specialty service with its own set of characteristics as customers in healthcare are immediate patients, followed by their families and possibly friends, because the outcome of the healthcare service has the ability to touch all of their lives (Ahmed et al., 2017). Exposure to diseases knows no boundaries and affects all human beings at some time in their lives and demand for healthcare is expected to increase as populations age and expectations toward medical equipment rise. Durable medical equipment or medical equipment that is built to last and offer patients with support in a safe and comfortable way such as hospital beds, wheelchairs or any mobility assistive equipment are one of the common examples that needed to be focused in order to achieve effective healthcare planning as it is a necessity to this aging population.

Practically, simulation has found extensive use in health care and health-care delivery systems for a variety of reasons. Hospitals, extended care, rehabilitation, specialist care, long-term care, public health, and other health care environments have mostly been researched using simulation (Roberts, 2011). The authors also state that simulation is a strategy that is used to investigate the health care delivery system and to break down barriers. A simulation toward future development of hospitals usually can help to reduce waiting time, arrangement of patient flow, facility capacity and design, admissions or scheduling, appointments, logistics, and planning are all common issues in the hospital. The advancement of technology makes com-