

**MINING STUDENTS' DATA WITH HOLLAND MODEL
USING NEURAL NETWORK AND LOGISTIC
REGRESSION**

A thesis submitted to the Faculty of Information Technology
in partial fulfillment of the requirements for the degree
Master of Science (Intelligent Systems)
Universiti Utara Malaysia

by

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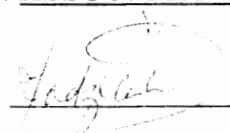
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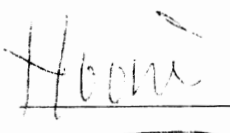
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ABSTRAK (BAHASA MELAYU)

*Bidang pendidikan mempunyai banyak aplikasi perlombongan data yang menarik dan mencabar, serta dikenalpasti sebagai satu alat yang berpotensi digunakan untuk membantu tenaga pengajar dan pelajar, dan memperbaiki kualiti sistem pendidikan. Kesan pengumuman Menteri Pendidikan Tinggi mengenai lebih graduan terutamanya dari universiti awam secara tidak langsung turut memberi kesan kepada pengambilan/kemasukan pelajar ijazah sarjana muda di Universiti Utara Malaysia (UUM). Sehubungan itu, pelajar yang mengikuti program di Fakulti Teknologi Maklumat (FTM) dan Fakulti Pengurusan Teknologi (FTP) mempunyai pelbagai latarbelakang pendidikan. Justeru, kajian ini bertujuan untuk meninjau latarbelakang pelajar tahun pertama yang mengambil program Ijazah Sarjana Muda Teknologi Maklumat (Bachelor of Information Technology-BIT), Ijazah Sarjana Muda Multimedia (Bachelor of Multimedia-BMM), dan Ijazah Sarjana Muda Pengurusan Teknologi (Bachelor of Management of Technology-BMoT) di UUM. Di samping itu, Model Personaliti Holland turut diaplikasikan bagi mengenalpasti jenis personaliti pelajar. Hasil kajian mendapati pelajar BIT bukan dari kumpulan **Social** kerana tiada nilai signifikan ke atas soalan-soalan dari kumpulan **Social**. Kebanyakan pelajar BIT merupakan pelajar dari latarbelakang Sastera kecuali beberapa orang pelajar yang pernah mengambil dan menduduki subjek Perkomp (Perkomputeran) di peringkat Sijil Tinggi Pelajaran Malaysia (STPM). Dari sudut Model Holland pula, pelajar BIT dirumuskan sebagai **Artistic**, **Investigative**, **Realistic** (ARI). Pelajar didapati lebih bersifat **Artistic** berdasarkan 50% daripada soalan-soalan yang diberikan untuk mengenalpasti personaliti pelajar adalah signifikan. Di samping itu, pelajar juga didapati terdiri daripada kumpulan **Investigative** (33.33%) dan **Realistic** (33.33%). Hasil kajian ini adalah selari dengan teori Holland berdasarkan kajian Hansen dan Campbell (1985) yang merumuskan kod personaliti bagi bidang komputer ialah **Investigative**, **Realistic**, dan **Artistic** (IRA).*

ABSTRACT (ENGLISH)

*Education domain provides many interesting and challenging in data mining applications that potentially identified as a tool to help both educators and students, and improve the quality of education system. Nowadays, the impact of Minister of Education (MOE) regarding surplus graduates particularly from public universities somehow had an impact on Universiti Utara Malaysia's (UUM) undergraduate intake. As a result, students who applied to undertake a program at Faculty of Information Technology and Faculty of Management Technology come from various background. Hence this study aims to get some insight into first year students undertaking undergraduate program such as Bachelor of Information Technology (BIT), Bachelor of Multimedia (BMM) and Bachelor in Management of Technology (BMoT) at Universiti Utara Malaysia. The Holland Personality Model was used to indicate the students' personality traits. The study concluded that BIT students are not from the **Social** type since none of the **Social** personality type is significant. Most of BIT students have Arts background, except a few who have sat for Perkom (Perkomputeran) subject during the STPM examination. As for the Holland Model, It also appears that BIT students are more **Artistic** since 50% of the questions that measure the personality type is significant. In addition, the BIT students are **Realistic** (33.33%) and **Investigative** (33.33%) type. The results also reveal that the BIT students concluded as **Artistic, Investigative and Realistic (AIR)** in personality types that are in accordance to Holland personality theory, this finding were also supported by Hansen and Campbell (1985) that suggested that **Investigative, Realistic and Artistic (IRA)** should be the code for computer professionals.*

ACKNOWLEDGEMENTS

In the name of Allah, Most Gracious, Most Merciful. Peace upon the prophet, Muhammad S.A.W. Alhamdulillah, a foremost praise and thankful to Allah for His blessing, giving me the strength in completing this study.

My endless appreciation goes to both of my respective supervisors; Associate Professor Fadzilah Siraj and Miss Nooraini Yusoff for the guidance, patience, encouragement, advice and flourish of knowledge during completing these three semesters course.

My warm appreciation dedicates to the lecturers of Department of Computer Science UUM, the student of MSc. Intelligent Systems (June 2004 and November 2003 batches) and all of my friends for all of the knowledge, advice and moment we've shared. My special thanks also goes to Haji Aris Zainal Abidin, Rahmatul Hidayah Salimin, Kak Ani, Kak Lily.

The first, last and always, a lasting heartfelt gratitude to my mother, Inah binti Haji Hassan for all of the love, *du'a* and support in completing this course, as well as to Long, Ngah, Diya and J.

Special thanks to the respondents and lecturers for the cooperation during data collecting session for this study.

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LIST OF ABBREVIATIONS

DM	Data Mining
NN	Neural Network
MLP	Multilayer Perceptron
STPM	Sijil Tinggi Pelajaran Malaysia
BIT	Bachelor of Information Technology
BMM	Bachelor of Multimedia
BMoT	Bachelor of Management of Technology
UUM	Universiti Utara Malaysia

CHAPTER ONE

INTRODUCTION

This section discusses the background of the study that consists of general overview on data mining techniques, which have been used in this study. A brief description on the selected domain, education domain is also reviewed. The section also consists of the problem statement, list of project objectives, significance of the study conducted, and the study scope. Finally, this section presents the thesis organization that describing the structure of this report.

1.1 Background

Data mining (DM) has been extensively investigated for potential applications in many domains. It is an interdisciplinary field that combines artificial intelligence, computer science, machine learning, database management, data visualization, mathematical algorithms, and statistics (Liao, 2003). The field of data mining and

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