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An Application of Data Mining for a Library Management System

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T.A.U.I. Ranaweera

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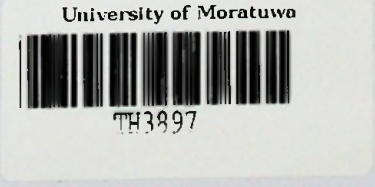

Dissertation submitted to the Faculty of Information Technology, University of Moratuwa, Sri Lanka for the partial fulfilment of the requirements of the Master of Science in Information Technology

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Declaration

We declare that this thesis is our own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

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Signature

Date: 04/04/2019

Supervised by

Mr. Saminda Premarathne

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Signature

Date: 04/04/2019

Department of Information Technology
04 APR 2019
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Dedication

To my family

Acknowledgement

Completing this research would be impossible without the support and guidance of whole bunch of people who were around me during this entire period. First of all I would like to express my deepest gratitude to Mr. Saminda Premarathne for being my supervisor and providing excellent guidance throughout the project. The knowledge I gained from you made me strong enough to complete this challenge. Furthermore, my gratitude goes to the lecturer panel of M.Sc. degree programme and I appreciate the effort they took to improve our subject knowledge throughout these two years.

Obtaining relevant data for the analysis was vital and I would like to thank Mr. Ananda Karunarathne, Librarian of University of Ruhuna for granting approval to access data from the library database. It's with great honor, I acknowledge the cooperation of Mr. Nimal Hettiarachi who provided necessary information on the library system of University of Ruhuna. Without your support, my efforts could have been in vain.

At last, but not least, I would like to thank my family members for being supportive as always. My family is the greatest strength of my life and I have no words to express my gratitude towards them.

List of Abbreviations

DDC – Dewy Decimal Classification

EG - Faculty of Engineering

HS- Faculty of Humanities and Social Science

MD - Faculty of Medicine

MF- Faculty of Management

PCA –Principle Component Analysis

SC – Faculty of Science

Abstract

Data mining has become an emerging concept in today's world. With the development of the technology in every field, a large amount of data can be collected and stored very easily. The challenge is to analyse these data from traditional analysisng techniques. The concept of data mining; which enables users to analyze data and draw conclusions through clearly defined procedures comes into play as a solution for this matter.

The purpose of this research is to test the adequacy of data mining techniques to improve the library usage in Sri Lankan State Universities. A data warehouse was designed and implemented using the most important variables in the raw dataset. After cleaning and preprocessing of data, association rule mining and clustering were basically used in the data analysis phase. Interesting rules were identified and the said results were used in the next stage of the study. A Book Recommendation System was implemented in Java based on the results obtained in the previous stage. The system enables users to select library materials according to their prior borrowing patterns. My SQL, R and Java were basically used in the analysis.

This research will be beneficial to enrich the library usage in state universities in Sri Lanka as well as the researchers those who are interested in Data Mining.

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