UNIVERSITI TEKNOLOGI MARA

CONSTRUCTING AN ONTOLOGY MODEL FROM RELATIONAL DATABASE

ALYMUNIRAH BINTIMANAP

Master of Science (Information Technology)

Faculty of Computer and Mathematical Sciences

June 2014

ABSTRACT

In knowledge management, ontology is one technique available for data sharing. The ontology is defined as explicit specification of a shared conceptualization. In present, ontology has started to be implemented such as semantic web, data mining and also artificial intelligent. These applications are available features for web 3.0. Currently, huge amount of database are stored in relational database for web 2.0 and for web 3.0 relational database are associated with ontology model. The ontology is an important interface for advance searching management together with relational database where multiple database from different sources can be united which cannot be happened in web 2.0. In order to create ontology model from scratch, there are many tools available such as protege and Neon Toolkit. However, for creating the ontology model from relational database, it involves method to apply such as in ontology engineering where the modelling is started with conceptual model, taxonomy model and visualizing with UML diagram that shows cardinality and domain-range axiom before constructed the ontology using protege software. Knowledge modeling helps other user on how to model the ontology and this research will help them to understand the concept and rules for ontology model because it involves the conversion technique of relational database to ontology model.

Keyword: Knowledge Modelling, Ontology, Taxonomy Model, Conceptual Model, Ontology Engineering ,Semantic web.

ACKNOWLEDGEMENT

"In the name of ALLAH S. W. T. the Most Beneficent and Most Merciful"

AlhamduliUah, **I** am really grateful to the Allah by His grace gave me good health, strength and perseverance in completing this thesis or IT Project Report as partial fulfillment of the requirements for the Master of Science in Information Technology which title Constructing An Ontology Model From Relational Database. This IT Project Report was prepared for the Faculty of Computer and Mathematical Sciences (FSKM), Universiti Teknologi MARA (UiTM), Shah Alam, basically for student in final year to complete the postgraduate program that leads to the degree of Master of Science in Information Technology.

Firstly, million thanks to my supervisor, Associate Prof Dr Haryani whose help and encourage me in finishing this project and, it is an honor for me to express my special thanks to my co-supervisor, Dr Nor Shahniza Akmal Bashah who had patiently guided and support me, gave brilliant ideas and comments, gave enthusiasm and attention to me and willing to spend her time to me in completing this project. The supervision and support that they gave truly help the progression and smoothness of this project. Thank you for everything.

I would like to express my appreciation to all my lecturers and friends in UiTM for providing me valuable helps, advice and knowledge in the completion of this research. Lastly, millions thanks to my parents and friends for supporting me and never lose hope in me. Only Allah can reward the good deed that all of you have done to me.

TABLE OF CONTENTS

STUDENT'S DECLARATION
ABSTRACT
ACKNOWLEDGEMENT
TABLE OF CONTENTS
LIST OF FIGURES
LIST OF TABLES

1.0 CHAPTER 1 : INTRODUCTION

1.0 Introduction
1.1 Research Background
1.2 Research Problem
1.3 Research Question
1.4 Research Objective
1.5 Research Scope
1.6 Research Significant
1.7 Organizational of Report Contents

2.0 CHAPTER 2 : LITERATURE REVIEW

2.0 Introduction
2.1 Knowledge Management
2.2 Knowledge Modelling
2.2.1 Ontology Model
2.2.2 Taxonomy Model
2.2.3 The Relational Model
2.2.4 The UML model
2.3 Tools for Creating The Ontology Model

2.4 Ontology Development Based on Relational Database 11
2.5 Web Evolution 17

3.0 CHAPTER 3 : RESEARCH METHODOLOGY

3.0 Introduction 19
3.1 Research Methods 19
3.2 Research Paradigm 19
3.3 Research Approach 20
3.4 Research Strategy 20
3.5 Research Design 21
3.5.1 The Planning Phase 21
3.5.2 Analysis and Design Phase 22
3.5.3 Development Phase 23
3.5.4 Evaluation Phase 31
3.5.5 Documentation Phase 32

4.0 CHAPTER 4 : RESULT AND ANALYSIS

4.0 Introduction 33
4.1 Planning Phase 33
4.1.1 User Background Study 33
4.2 Analysis and Design Phase 34
4.2.1 Problem Identification 34
4.2.2 Data Collection 34
4.2.3 The Taxonomy Model 42
4.2.4 The Data Model 45
4.2.4.1 The Relational Database Model 45
4.2.4.2 Relational Data Model 47
4.2.5 The UML Model 62
4.3 Development Phase 68