

## TABLE OF CONTENTS

CHAPTER	PAGE
<b>1. INTRODUCTION .....</b>	<b>1</b>
<b>Motivation for the Study .....</b>	<b>1</b>
<b>Research Questions .....</b>	<b>4</b>
<b>Significance of Research .....</b>	<b>6</b>
<b>Organization of the Study .....</b>	<b>8</b>
<b>2. LITERATURE REVIEW .....</b>	<b>9</b>
<b>Research Framework .....</b>	<b>9</b>
<b>Activities in Data Management .....</b>	<b>10</b>
<b>Elicitation .....</b>	<b>10</b>
<b>Representation .....</b>	<b>11</b>
<b>Validation .....</b>	<b>11</b>
<b>Data Definition .....</b>	<b>12</b>
<b>Query Formulation .....</b>	<b>12</b>
<b>Database Design .....</b>	<b>12</b>
<b>Human-Computer Interface Model .....</b>	<b>13</b>
<b>Previous Research .....</b>	<b>15</b>
<b>The Comparison among Logical Models .....</b>	<b>17</b>
<b>The Comparison between Logical and Conceptual Models .....</b>	<b>18</b>
<b>The Comparison among Conceptual Models .....</b>	<b>23</b>
<b>3. RESEARCH METHODOLOGY AND DESIGN .....</b>	<b>26</b>
<b>Research Model .....</b>	<b>26</b>
<b>Data Model .....</b>	<b>27</b>
<b>Task Factor .....</b>	<b>27</b>
<b>Human Factor .....</b>	<b>28</b>
<b>Performance .....</b>	<b>28</b>
<b>Research Hypotheses .....</b>	<b>29</b>
<b>Hypotheses Derived from</b>	
<b>Research Question 1 .....</b>	<b>30</b>
<b>Main Effects of Data Model .....</b>	<b>31</b>
<b>Main Effects of Task .....</b>	<b>33</b>
<b>Interaction Effects between Data Model and Task .....</b>	<b>35</b>
<b>Hypotheses Derived from</b>	
<b>Research Question 2 .....</b>	<b>38</b>
<b>Main Effects of Data Model .....</b>	<b>38</b>
<b>Main Effects of Task .....</b>	<b>39</b>
<b>Interaction Effects between Data Model and Task .....</b>	<b>40</b>
<b>Relationship of Research variables .....</b>	<b>41</b>
<b>Independent Variables .....</b>	<b>43</b>
<b>Data Model .....</b>	<b>43</b>
<b>Task Complexity .....</b>	<b>45</b>

Dependent Variables .....	46
Control Variable .....	48
Research Instrument Design .....	49
Experimental Procedures .....	50
Pilot Study .....	52
<b>4. RESULTS OF THE EXPERIMENT .....</b>	<b>54</b>
Subject Demographics .....	54
Results .....	55
Testing Hypotheses Derived from Research Question 1 .....	58
Interaction Effects between Data Model and Task .....	59
Main Effects of Data Model .....	61
Main Effects of Task .....	78
Testing Hypotheses Derived from Research Question 2 .....	81
Interaction Effects between Data Model and Task .....	81
Main Effects of Data Model .....	84
Main Effects of Task .....	92
<b>5. DISCUSSION AND CONCLUSIONS .....</b>	<b>94</b>
Discussion of Results .....	94
Interaction Effects between Data Model and Task .....	94
Main Effects of Data Model .....	97
Relationships .....	97
Identifiers .....	101
Efficiency .....	102
Main Effects of Task .....	102
Implications .....	103
The Superiority of Conceptual Data Models .....	103
Problems with the Relational Representation .....	104
The Difficulty of Model Conversion .....	105
Limit to the Degree of the Relationship .....	105
Training and Support .....	106
Limitations .....	106
Directions for Future Research .....	108
<b>LIST OF REFERENCES .....</b>	<b>110</b>
<b>APPENDIXES .....</b>	<b>116</b>
<b>A. A QUESTIONNAIRE FOR DEMOGRAPHICS AND COMPUTER EXPERIENCE DATA .....</b>	<b>117</b>

B.	A CASE DESCRIPTION OF A HYPOTHETICAL ORGANIZATIONAL DATABASE APPLICATION (TASK 1) .....	121
C.	THE SOLUTION USING OBJECT-ORIENTED MODEL (TASK 1) .....	124
D.	THE SOLUTION USING EXTENDED ENTITY-RELATIONSHIP MODEL (TASK 1) .....	126
E.	THE SOLUTION USING RELATIONAL MODEL (TASK 1) .....	128
F.	A CASE DESCRIPTION OF A HYPOTHETICAL ORGANIZATIONAL DATABASE APPLICATION (TASK 2) .....	130
G.	THE SOLUTION USING OBJECT-ORIENTED MODEL (TASK 2) .....	134
H.	THE SOLUTION USING EXTENDED ENTITY-RELATIONSHIP MODEL (TASK 2) .....	137
I.	THE SOLUTION USING RELATIONAL MODEL (TASK 2) .....	139
J.	A QUESTIONNAIRE FOR USER PERCEIVED EASE-OF-USE AND CONFIDENCE LEVEL .....	141
K.	ITEMIZED SOLUTIONS FOR TASK 1 .....	145
L.	ITEMIZED SOLUTIONS FOR TASK 2 .....	148
M.	GRADING SCHEME FOR THE STUDY .....	153
N.	ANSWER SHEET DESIGN .....	156
	VITA .....	162