

Collaborative Semantic Editing of Heterogeneous Hierarchical Concepts

by

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Master of E-Commerce Technology

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**Faculty of Science and Technology
University of Macau**

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A thesis submitted in partial fulfillment of the
requirements for the degree of

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Approved by _____
Supervisor

Date _____

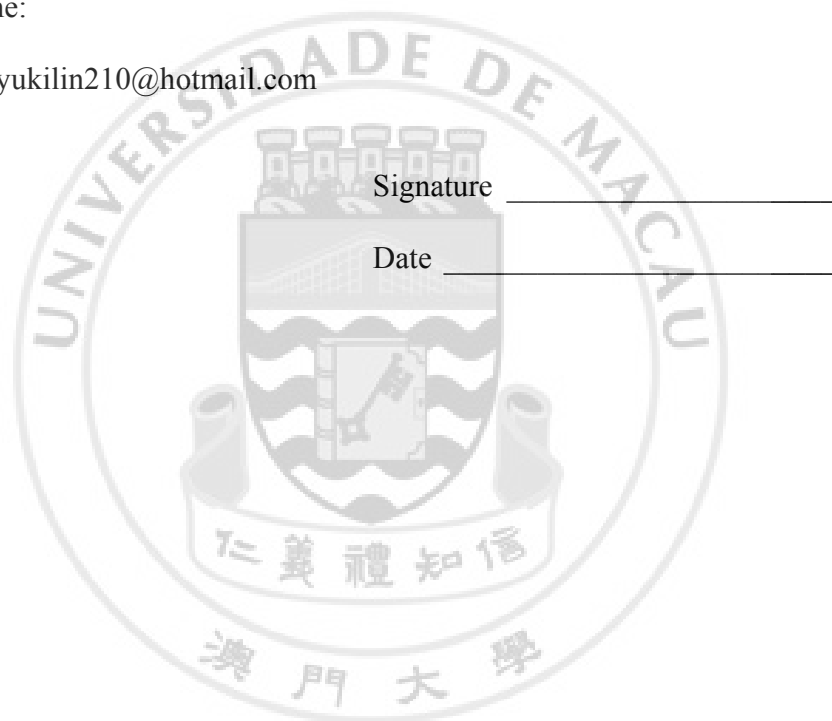
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Abstract

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Master of E-Commerce Technology

In e-business, establishing business interoperability especial semantic interoperability to product information exchange has to consider the ad hoc nature of participating firms from heterogeneous domains. Due to personalized design with individual semantic context, heterogeneous concepts from fragmented e-marketplaces are hard to integrate to interoperable vocabularies with semantic consistency. By the analysis, the features of existing integration approaches and editing technologies are investigated and the problems of semantic consistency maintenance have been summarized. Driven by the motivation of utilizing and improving existing collaboration approach, the research has proposed a novel Collaborative Semantic Editing Platform (CSEP) to provide a solution to semantically integrate the heterogeneous product information into interoperable classified vocabularies.

By contributing a novel CSEP approach, a two-layer framework including common editing systems and a global editing system is designed to provide collaborative editing of common concepts across heterogeneous domains and maintain semantic consistency. A collaborative concept mapping strategy is adopted to accurate and intelligent semantic translation. The key factors of feasibility of semantic consistency include five strategies: IID, XPM, bilingual editing, history buffer and arbitrator. To solve the concurrency issue, a semantic conflict detection mechanism running on the global editing system is designed to coordinate the collaboration of common editing systems.

The feasibility and features of the CSEP approach have been demonstrated in a prototype implementation that provides the services of collaborative bilingual vocabulary compiling with semantic consensus and authorized concept arbitration from multiple heterogeneous concept domains. The implementation details and its evaluation are also included in the thesis in order to make the research more comprehensive.

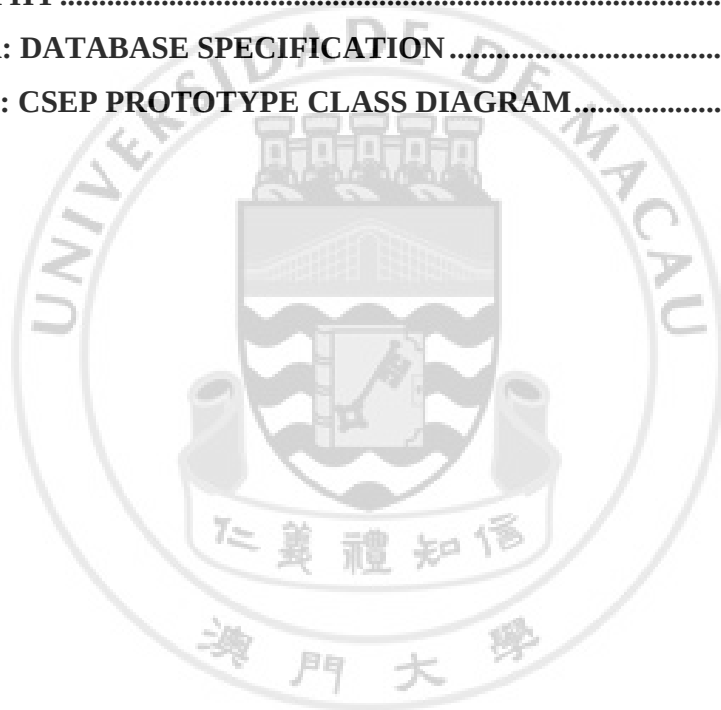


TABLE OF CONTENTS

LIST OF FIGURES	iv
LIST OF TABLES	v
LIST OF ABBREVIATIONS	vi
CHAPTER 1: INTRODUCTION.....	1
1.1. BACKGROUND AND MOTIVATION	1
1.2. OBJECTIVE	4
1.3. DESCRIPTION OF ISSUES	4
1.4. SOLUTION: CSEP APPROACH.....	5
1.5. CONTRIBUTION OF THE THESIS	6
1.6. ORGANIZATION OF THE THESIS.....	7
CHAPTER 2: RELATED WORKS.....	8
2.1. SEMANTIC CONSISTENCY MAINTENANCE TECHNOLOGY	9
2.1.1. MANDATORY STANDARDIZATION APPROACH	9
2.1.2. AUTOMATED MEDIATION APPROACH	10
2.1.3. COLLABORATIVE CONCEPTUALIZATION APPROACH	11
2.2. KNOWLEDGE EDITING TECHNOLOGY	12
2.2.1. SINGLE SEMANTIC EDITORS.....	12
2.2.2. SYNTACTIC COLLABORATIVE EDITORS.....	13
2.2.3. CONEX SEMANTIC EDITING STRATEGY	15
2.3. REQUIREMENTS OF A VIABLE APPROACH.....	18
2.4. SUMMARY	19
CHAPTER 3: COLLABORATIVE SEMANTIC EDITTING APPROACH.....	20
3.1. CONEX-BASED COLLABORATIVE SEMANTIC EDITING SYSTEMS	20
3.2. CSEP SYSTEM FRAMEWORK	23
3.2.1 E-SYSTEM.....	25
3.2.2. G-SYSTEM	27
3.3. SEMANTIC CONSISTENCY MAINTENANCE	28
3.3.1. DEFINITION.....	28
3.3.2. COLLABORATIVE CONCEPT MAPPING STRATEGY	29

3.3.3. COLLABORATIVE CONCEPT MAPPING THROUGH UNIQUE CONCEPT IDENTIFIER	31
3.4. COMPUTING MECHANISM OF SEMANTIC CONSISTENCY MAINTENANCE	32
3.4.1. ADD ALGORITHM.....	34
3.4.2. MODIFY ALGORITHM.....	35
3.4.3. DELETE ALGORITHM	36
3.4.4. MAKE ARBITRATION ON ANY CONCEPTS IN TCDB.....	37
3.5. SEMANTIC CONFLICT DETECTION MECHANISM.....	38
3.6. SUMMARY	40
CHAPTER 4: CSEP PROTOTYPE.....	41
4.1. ARCHITECTURE OF CSEP PROTOTYPE	41
4.2. ARCHITECTURE TECHNOLOGIES BEHIND CSEP PROTOTYPE.....	43
4.3. IMPLEMENTATION DETAIL OF CSEP PROTOTYPE.....	44
4.3.1. STRUCTURED CONCEPT NODE.....	44
4.3.2. MESSAGE EXCHANGE PROCESS	45
4.3.3. CONCEPT COLLABORATOR PROCESS	47
4.3.4. ARBITRATOR PROCESS	49
4.3.5. HISTORY CONCTOL PROCESS.....	51
4.4. ILLUSTRATION OF CSEP	52
4.4.1. START COLLABORATIVE SERVICES OF GLOBAL SERVER.....	52
4.4.2. ISSUING A CONCEPT OPERATION.....	53
4.4.3. COLLABORATION ON CONCEPT FROM ANOTHER LANGUAGE CONTEXT	55
4.4.4. ARBITRATOR OF GLOBAL SERVER	57
4.5. SUMMARY	58
CHAPTER 5: EXPERIMENT ON CSEP APPROACH.....	59
5.1. EXPERIMENTS ON SEMANTIC CONSISTENCY	59
5.1.1. ORIGINAL VOCABULARY HIERARCHY	59
5.1.2. SCENARIOS	60
5.1.3. EXPERIMENTAL SETTING	62
5.1.4. EXPERIMENTAL RESULTS	62
5.2. EXPERIMENTS ON CONCURRENCY	64

5.2.1. EXPERIMENTAL CRITERIA	64
5.2.2. EXPERIMENTAL SETTING	64
5.2.3. EXPERIMENTAL RESULTS	65
5.2.4. EXPLANATION TO EXPERIMENT RESULTS	66
5.3. SUMMARY	67
CHAPTER 6: CONCLUSION.....	68
6.1. SUMMARY	68
6.2. IMPLICATION OF THIS RESEARCH.....	69
6.3. FUTURE WORK.....	69
BIBLIOGRAPHY	71
APPENDIX A: DATABASE SPECIFICATION	76
APPENDIX B: CSEP PROTOTYPE CLASS DIAGRAM.....	82



LIST OF FIGURES

<i>Number</i>	<i>Page</i>
Figure 1: A scenario of a real-time cooperative editing session	15
Figure 2: Centrally-managed P2P/D2F architecture	16
Figure 3: Concept node locking mechanism	18
Figure 4: Collaborative semantic editing platform (CSEP) model	22
Figure 5: CSEP Topology	23
Figure 6: CSEP layered framework as a system	24
Figure 7: E-system model	26
Figure 8: G-System model	28
Figure 9: Example of concept transformation between heterogeneous contexts	32
Figure 10: CSEP prototype architecture	42
Figure 11: Concept node class diagram	45
Figure 12: Workflow of concept collaborator process	48
Figure 13: Workflow of arbitrator process	50
Figure 14: Workflow of history control process	51
Figure 15: Global server interface	52
Figure 16: Login interface	53
Figure 17: Locate to the concept context	54
Figure 18: Execute an operation on concept (New)	54
Figure 19: Confirm concept operation result	55
Figure 20: Initiated operation interface after login in another language context	56
Figure 21: Create semantic equivalent between English concept built and a new concept in his own language	56
Figure 22: Concept arbitration pass	57
Figure 23: Concept status updated after arbitration	57
Figure 24: Initial predefined global English concept vocabulary	60
Figure 25: Average response time of concurrent users	66
Figure 26: Structure of Database	76
Figure 27: CSEP prototype class diagram	82

LIST OF TABLES

<i>Number</i>	<i>Page</i>
Table 1: Operation conflict detection rules	38
Table 2: Example of synonym and homonym concept	39
Table 3: Experiment scenarios of semantic consistency	62
Table 4: Experiment result of semantic consistency	63
Table 5: The experiment results of concurrency evaluation	65
Table 6: Common_voc_log.....	77
Table 7: Common_voc_content.....	77
Table 8: Common_voc_user	78
Table 9: Common_connect_time.....	78
Table 10: Global_voc_log.....	79
Table 11: Global_voc_content.....	79
Table 12: Global_voc_app	80
Table 13: Global_communication_log.....	81

LIST OF ABBREVIATIONS



ADO	ActiveX Data Objects
AOE	Arbitrator's Operation Executor
CC	Common Concept
CCE	Common Collaboration Engines
CCP	Common Concept Provider
CE	Collaboration Engines
CED	Common EDitor
COM	Component Object Model
CONEX	COLlaborative CONcept Exchange
CSCW	Computer Supported Cooperative Work
CSEP	Collaborative Semantic Editing Platform
D2F	Dominator-To-Follower
DOE	Designer's Operation Executor
ECC	Existential Concept Checker
EDI	Electronic Data Interchange
EDM	EDitor Manager
EMP	E-Marketplace Provider
EPC	Electronic Product Catalogue
FIFO	First In First Out
GC	Global Concept
GCS	Global Concept Set
GOT	Generic Operation Transformation
GOT	Global Operation Transformer
HACMP	High Availability Cluster Multi-Processing
IID	Internal concept IDentifier
KAON	KARlsruhe ONtology
KSL	Knowledge Systems, AI Laboratory
LAN	Local Area Network

LCE	Local Collaboration Engine
MEX	Message EXchange
OEE	Operation Event Executor
OKBC	Open Knowledge Base Connectivity protocol
OPT	OPeration Transformer
P2P	Peer-to-Peer
PCDB	Permanent Concept Database
PDP	PCDB DisPlay
PHB	Personal History Buffer
PM	Product Map
RCS	Regional Concept Set
REDUCE	REal-time Distributed Unconstrained Cooperative Editing
SME	Small and Medium Enterprise
SNOBASE	Semantic Network Ontology BASE
TCDB	Temporary Concept Database
TDP	TCDB DisPlay
UCE	Universal Collaboration Engine
UIID	UnIque concept IDentifier
WAN	Wide Area Network
XOP	XPM Operation Parser
XOS	XPM Operation Schema
XPM	Xml Product Map

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