TABLE OF CONTENTS

Declaration (i)
Acknowledgement (ii)-(iii)
Abstract (iv)-(v)
Abbreviations (vi)
List of Tables (x)
List of Figures (xi)-(xii)
List of Publications (xiii)

CHAPTER 1: INTRODUCTION 1-10
1.1 Introduction 1
1.2 Motivation 5
1.3 Aims and Objectives 7
1.4 Research Methodology 8
1.5 Scope of the Study 9
1.6 Outline of the Thesis 9

CHAPTER 2: STUDY AND ANALYSIS OF REQUIREMENTS 11-45
ENGINEERING APPROACHES 12
2.1 Requirements Engineering (RE) 13
2.1.1 Requirements 15
2.1.2 Requirements Engineering 19
2.1.3 Traditional Requirements Engineering Approaches 19
   i. Use Case Approaches 19
   ii. Goal-oriented Approaches 23
   iii. Viewpoint-oriented Approaches 29
2.1.4 Flaws Encountered in Traditional Requirements Engineering Approaches 36
2.2 Aspect-Oriented Requirements Engineering (AORE) 37
   2.2.1 Separation of Concerns and Crosscutting Concerns 37
   2.2.2 Advanced Separation of Concerns (ASoC) 40
   2.2.3 A Brief Introduction to Aspect-Oriented Software Development 40
CHAPTER 3: REVIEW OF ASPECT-ORIENTED REQUIREMENTS ENGINEERING (AORE) APPROACHES

3.1 A Review of AORE Approaches

3.1.1 Aspect-Oriented Component Requirements Engineering (AOCRE)

3.1.2 Early Aspects: A Model for Aspect-Oriented Requirements Engineering

3.1.3 Theme: An Approach for Aspect-Oriented Analysis and Design

3.1.4 Aspect-Oriented Software Development with Use Cases

3.1.5 Concern-Oriented Requirements Engineering (CORE)

3.1.6 Aspect-Oriented Agile Requirements Approach

3.1.7 Integrated Approach for Aspectual Requirements

3.1.8 Aspect-Oriented Requirements Modelling

3.1.9 Requirements Description Language (RDL)

3.1.10 Aspect-Oriented Approach to Handle Crosscutting Concerns in Activity Modelling

3.1.11 SLA1 Methodology: an Aspect-Oriented Requirement Identification Process

3.1.12 Crosscutting Concern Identification Using NLP

3.1.13 Aspect-oriented User Requirements Notation (AoURN)

3.1.14 Representing Aspects in Design

3.1.15 Candidate Aspects in Software Requirements

3.1.16 Use Case and Non-functional Scenario Template-Based Approach to Identify Aspects

3.2 Critical Analysis of AORE Approaches

3.3 A Roadmap to Research

3.4 Summary

CHAPTER 4: TOWARDS AN INTEGRATED AORE PROCESS MODEL

4.1 Integrated AORE Process Model: A Proposal

4.1.1 Identify Concerns

4.1.2 Specify Concerns

4.1.3 Identify Crosscutting Concerns
4.1.4 Compose Concerns

4.2 Case Study
   4.2.1 Identify concerns
   4.2.2 Specify Concerns
   4.2.3 Identify Crosscutting Concerns
   4.2.4 Compose Concerns

4.3 The Comparison Criteria To Evaluate Proposed Approach Against Other Approaches Existing In Literature

4.4 Summary

CHAPTER 5: FUZZY INTERVAL BASED APPROACH FOR HANDLING CONFLICTS IN AORE

5.1 Introduction
5.2 Related Work
5.3 Fuzzy Interval Based Approach for Handling Conflicts in AORE
   Step 1: Building the Contribution Matrix (Concern * Concern)
   Step 2: Prioritization of Scenarios
   Step 3: Prioritization of Concerns
   Step 4: Concern / Stakeholder Matrix
   Step 5: Weighted Concern / Stakeholder Matrix
   Step 6: Modified Concern / Stakeholder Matrix

5.4 Case Study
   Step 1: Building the Contribution Matrix (Concern * Concern)
   Step 2: Prioritization of Scenarios
   Step 3: Prioritization of Concerns
   Step 4: Concern / Stakeholder Matrix
   Step 5: Weighted Concern / Stakeholder Matrix
   Step 6: Modified Concern / Stakeholder Matrix

5.5 Summary

CHAPTER 6: CONCLUSIONS AND FUTURE WORKS

6.1 Background
6.2 Significant Contribution
6.3 Future Work
6.4 Conclusion

REFERENCES