

**CEP-ML: META-LANGUAGE TO SUPPORT
INTEROPERABILITY BETWEEN HETEROGENEOUS
COMPLEX EVENT PROCESSING SYSTEMS**

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Degree of Master of Science

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Sri Lanka

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Thesis submitted in partial fulfilment of the requirements for the degree Master of
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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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Date

The above candidate has carried out research for the Master of Science thesis under my supervision.

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Dr. Surangika Ranathunga

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Date

ABSTRACT

Distributed complex event processing systems give many benefits over centralized systems mainly in terms of scalability and extendibility. There are many types of CEP engines with different characteristics and query languages specialized to each domain. When it comes to deploying these distributed CEP systems in an industrial context, supporting interoperability between these heterogeneous event processing systems has become a major problem.

Not having a generally accepted definition language is a prime problem when integrating different CEP engines to achieve one goal in a distributed environment. There have been introduced new systems and languages to be operated efficiently in a distributed environment but, they have not addressed the problem of not having a generally accepted language when communicating between different CEP engines. There has been little quantitative analysis done on developing a meta-language and a language conversion parser. The absence of a language parser to convert between any available meta-language and other existing CEP languages is another noticeable shortage when migrating between different CEP systems.

This research presents a generally accepted definition meta-language for complex event processing to support interoperability between CEP systems along with a language parser to convert between this meta-language and existing languages. It acts as an intermediate language format in language conversion. The meta-language supports the main common language functions to reach the industrial level. CEP ML language parser supports three popular languages SiddhiQL, EPL and Stream that have dominated the field for years. Further, we have developed a web-based try-out tool which users can easily use to convert between these languages.

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TABLE OF CONTENTS

DECLARATION	I
ABSTRACT.....	II
ACKNOWLEDGEMENTS	III
LIST OF FIGURES.....	VI
LIST OF TABLES	VII
LIST OF ABBREVIATIONS	VIII
1. INTRODUCTION.....	1
1.1. OVERVIEW	1
1.2. PROBLEM AND MOTIVATION	2
1.3. OBJECTIVES	4
1.4. CONTRIBUTIONS.....	5
1.5. ORGANIZATION OF THE THESIS	5
2. LITERATURE SURVEY	7
2.1. OVERVIEW	7
2.2. COMPLEX EVENT PROCESSING ENGINES	7
2.3. CHALLENGES IN INTEROPERABILITY BETWEEN HETEROGENEOUS CEP ENGINES	8
2.4. CEP QUERY LANGUAGE CATEGORIZATION.....	9
2.4.1. Expressibility of different query types by CEP query languages	10
2.4.2. EPL in ESPER.....	12
2.4.3. SiddhiQL in Siddhi	12
2.4.4. CQL in STREAM	13
2.4.5. Comparison on Functions of EPL, SiddhiQL and CQL	13
2.5. RULEML	15
2.5.1. Reaction RuleML for CEP	15
2.5.2. RuleML limitations	16
2.6. XML FOR QUERY LANGUAGE DESIGNS.....	17
3. METHODOLOGY	18

3.1.	OVERVIEW	18
3.2.	CEP-ML – META-LANGUAGE FOR CEP QUERY LANGUAGES	18
3.2.1.	Structure of the language	18
3.2.2.	CEP-ML operators	20
3.2.3.	CEP-ML syntax compared with other languages syntax	24
3.2.4.	CEP-ML as a mediator language	26
3.3.	LANGUAGE PARSER	27
3.3.1.	Parse languages using CEP-ML language parser.....	27
3.3.2.	Query Parser and Query Printer	28
3.3.3.	Language parser implementation	30
3.3.4.	Query Model	31
3.4.	WEBUI.....	32
4.	EVALUATION.....	34
4.1.	OVERVIEW	34
4.2.	EVALUATING CHARACTERISTICS OF CEP-ML SYSTEM	34
4.2.1.	Readability and understandability.....	34
4.2.2.	Extensibility	35
4.2.3.	Platform independent language parser and tools	35
4.2.4.	Expressibility of CEP-ML.....	35
5	CONCLUSION AND FUTURE WORK.....	38
	REFERENCES.....	39
	APPENDIX A: DOM TREE VIEW OF THE CEP XML LANGUAGE.....	42
	APPENDIX B: CEP XML LANGUAGE OPERATIONS TAGS	43
	APPENDIX C: CEP ML IMPLEMENTATION MODELS CLASS DIAGRAM	46
	APPENDIX D: LANGUAGE PARSER API METHODS	47
	APPENDIX E: CEP ML TRY-OUT TOOL.....	48

LIST OF FIGURES

Figure 1.0	Distributed Complex Event Processing	2
Figure 2.1	Data stream query languages operation pattern	9
Figure 2.2	Taxonomy of RuleML rule	15
Figure 2.3	CEP RuleML sample	16
Figure 3.1	Structure of CEP ML	19
Figure 3.2	Projection with conditions	21
Figure 3.3	Window filters	21
Figure 3.4	Grouping with conditions	22
Figure 3.5	Conjunction	23
Figure 3.6	Aggregation functions	24
Figure 3.7	Outline of language parser	28
Figure 3.8	Model Driven architecture of language parser	31
Figure 3.9	JAXB Query model	31
Figure 3.10	CEP ML Try-out web UI	32
Figure 3.11	CEP-ML complete system component Diagram	33

LIST OF TABLES

Table 2.1	Symbolic meanings	10
Table 2.2	Different query types	11
Table 2.3	Expressibility of each query by language	10
Table 2.4	Comparison of functions of query languages	15
Table 3.1	Comparison between language query syntax	26
Table 4.1	Expressibility of CEP - ML language	36

LIST OF ABBREVIATIONS

Abbreviation	Description
API	Application Programming Interface
BPM	Business Process Management
CEP	Complex Event Processing
CPU	Central Processing Unit
CQL	Continuous Query Language
EPL	Event Processing Language
JAXB	Java Architecture for XML Binding
REST	Representational State Transfer
SQL	Structured Query Language
SiddhiQL	Siddhi Query Language
UI	User Interface
WAR	Web application Archive
XML	eXtensible Markup Language