



**AN AUTOMATED APPROACH TO VALIDATE CORRECTNESS  
AND COMPLETENESS OF REQUIREMENTS SPECIFICATION**

By

Yazan Mahmoud Al-Kasabrah

Supervisor

**Dr. Aysh Al-Hroob**

This thesis was submitted in partial fulfillment of the requirements for the  
Master's Degree of Science in Software Engineering

Faculty of Graduate Studies

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The undersigned have examined the thesis entitled '**An Automated Approach to Validate Correctness and Completeness of Requirements Specification**' presented by **Yazan Al-Kasabrah**, a candidate for the degree of Master of Science in Software Engineering and hereby certify that it is worthy of acceptance.

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Date

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Dr. Aysh Al-Hroob

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Date

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Dr. Adi Maaita

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Date

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Dr. Thamer Al-Rawashda

## **DEDICATION**

**I dedicate this thesis to my Father and Mother who encouraged me too much.**

**To my brothers and sisters for supporting me.**

**To my wife who stood with me side by side to accomplish this work, not forgetting  
my two little kids.**

**To my colleagues at ISRA University**

**To my faithful friends in Master degree program**

*Yazan M. Al-Kasabrah*

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## LIST OF ABBREVIATIONS

#	Abbreviation	Full Expression
1	3Cs	Correctness, Completeness and Consistency
2	CBR	Checklist-Based-Reading technique
3	C&C	Correctness and Completeness
4	DBR	Defect-Based-Reading technique
5	FSF	Functional Scenario Form
6	HLR	High Level Requirements
7	NLP	Natural Language Processing
8	NQQR	Non-Quantified Quality Requirements
9	PBR	Perspective-Based-Reading technique
10	POS	Part-Of-Speech
11	QQR	Quantified Quality Requirements
12	RDF	Resource Description Framework
13	RQA	Requirements Quality Analyzer
14	RS	Requirements Specification
15	SOFL	Structured Object-Oriented Formal Language
16	SR	System Requirements
17	SRS	Software Requirements Specification
18	UML	Unified Modeling Language
19	VBA	Visual Basic for Application
20	V&V	Verification and Validation

# **An Automated Approach of Correctness and Completeness to Validate Requirements Specification**

## **Abstract**

Requirements is the first phase in software development process that should be taken into consideration, which is a milestone to achieve software success and quality, the difficulty in requirements is requirements changeability, which is hard to control by following the services and functions.

Meanwhile, it is important to pin down a set of formal customer requirements, which points out Correctness and Completeness, addressing them through customer satisfaction that revolves around precise services requests, to be conveyed to deep Completeness, through Consistency. Mentioning that Correctness and Completeness point at Quality, while enhancing the Requirements Specification increases its quality, which in turn reflects positively on the product quality.

This research addresses the problem of achieving Correctness, Completeness and Consistency in Requirements Specification through UML use case diagram. Applying an automated approach and a (VBA/MS excel) programmed tool based on standard rules to evaluate the approach. The evaluation is established using two standard use case diagrams from the UML site, resulted in improving the Correctness and Completeness criteria in Requirements Specification, and so the quality.

**Keywords:** Correctness, Completeness, Consistency, Quality-based requirements, Use case diagram, Requirements Specification.