

**IDENTIFYING SOFTWARE ARCHITECTURE  
EROSION THROUGH CODE COMMENTS**

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June 2018

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Thesis submitted in partial fulfillment of the requirements for the  
degree Master of Science in Computer Science and Engineering

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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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The above candidate has carried out research for the Masters thesis under my supervision.

Name of the supervisor: Dr. Indika Perera

Signature of the supervisor: .....

Date: .....

## Abstract

Software architecture erosion or the as-implemented architecture is not complying with the as-intended architecture is one of the major problems faced by many organizations. There is no easy way to trace design decisions or tracking back or reconstructing those decisions by looking at the source code level elements is one of the major reasons for software architecture erosion. Other than that the mistakes or carelessness of the programmer may lead the system to an eroded status eventually. Lack of domain knowledge, lack of knowledge about intended architecture and unable to identify possible violations of as-intended architecture (by identifying architectural degradation) are some other reasons for software architecture erosion.

There are various methodologies and tools for architecture conformance checking and analyzing the static architecture and provide comparison results which can be used to determine whether the architecture of a system is altered or not [10]. Most of them require high end tool support and providing the implemented architecture and the intended architecture each time the analysis needs to done.

As the main research objective it identified a missing area of software architecture conformance checking methodologies and analyzed and identified a way to prevent software architecture erosion using that. This research is more focused on unconventional usability of the code comments and how it can be leveraged to capture the architecture of the application and how it can be used as an effective architecture conformance checking mechanism.

This research states a methodology which uses Java Doc comments to inject architecture specific information into the code base and a mechanism to capture them and compare them with a pre-defined architecture rule set. An empirical and theoretical evaluation has been done to prove this concept actually works in real life scenarios. It opened up a new area of architecture conformance checking to the future researchers of the field of software architecture.

## **ACKNOWLEDGEMENT**

My sincere appreciation goes to my family for the continuous support and motivation given to make this thesis a success. I also express my heartfelt gratitude to the research supervisor Dr. Indika Perera, for the supervision, advice and continues guidance given throughout to make this research a success. Also I am grateful for the support and advice given by Dr. Malaka Walpola, by encouraging continuing this research.

My special thanks go to Mr. Umesh Indith Liyanage and Dr. Rasika Withanawasam for sharing their knowledge regarding software architecture and software architecture conformance.

Finally I wish to thank the academic and nonacademic staff of Department of Computer Science and Engineering and colleagues of MSC'16 for the support and encouragement given.

# TABLE OF CONTENTS

DECLARATION .....	i
Abstract .....	ii
ACKNOWLEDGEMENT .....	iii
TABLE OF CONTENTS .....	iv
LIST OF FIGURES .....	vii
LIST OF TABLES .....	ix
LIST OF ABBREVIATIONS .....	x
Chapter 1 INTRODUCTION .....	1
1.1 Background .....	2
1.2 Software Architecture and Software Engineering.....	3
1.3 Problem Statement .....	3
1.4 Motivations to Solve the Problem .....	4
1.5 Research Objectives .....	5
1.6 Overview of the Document .....	6
Chapter 2 LITERATURE REVIEW.....	7
2.1 Software Architecture Erosion and Industry Software.....	8
2.2 Industrial Examples of Design and Architecture Erosion .....	8
2.3 Causes of Erosion .....	9
2.4 Effects of Architecture Design Erosion on a System .....	11
2.5 When to Decide the Software Is Eroding and Needs to Be Repaired .....	12
2.6 What Kind of Solutions Are Applied To Fix an Eroded System .....	12
2.7 Architecture Reconstruction Techniques .....	13
2.8 Architecture Refactoring .....	14
2.9 Preventing Architecture Erosion .....	14
2.10 Preventing Software Architecture Erosion through Static Architecture Conformance Checking.....	15
2.11 GRASP ADL Based Static Architecture Conformance Checking Tool for Java	17

2.12	Reflexion Modeling and Inverting Reflexion for Design Control (An Industrial Case Study of Architecture Conformance).....	19
2.12.1	Reflexion Modeling .....	20
2.12.2	Inverting Reflexion for Design Control .....	21
2.13	Traceability Model For Viewing Architectural Tactics Using Code Comments .....	22
Chapter 3	METHODOLOGY.....	26
3.1	Identifying a Possible Architecture Capturing Mechanism .....	27
3.2	Identifying Possible Architecture Violation Types to Consider For a Proof of Concept .....	28
3.3	Developing a Proof of Concept .....	29
3.4	Evaluation of the Proof of Concept .....	29
Chapter 4	SOLUTION ARCHITECTURE AND IMPLEMENTATION.....	30
4.1	Presentation of Rules for Style Invariants and Prescriptive Architecture ...	31
4.1.1	Presenting the Rules via XML .....	31
4.1.2	Presenting the Rules via JSON .....	32
4.2	Mapping Source Elements to Architectural Information .....	33
4.2.1	Mapping Elements Using Java Annotations .....	34
4.2.2	Mapping Elements Using JavaDoc Tags .....	35
4.2.3	Comparison of Java Annotations and JavaDoc.....	36
4.3	Solution Architecture .....	37
4.3.1	Validating System Architecture Using JavaDoc Tags in the Source Code .....	38
4.3.2	How Descriptive Architecture Information Is Identified .....	39
4.4	Prototype Implementation .....	41
4.5	Generating Views for the Reports .....	43
4.6	Style Invariants Checker Added As a Separate Dependency through Maven	43
Chapter 5	EVALUATION.....	49
5.1	Empirical Evaluation the Correctness Of the SIC.....	50
5.1.1	Evaluate the Correctness of the Loaded Prescriptive Architecture by SIC .....	51
5.1.2	Evaluation of the Style Invariants Checker Validation Components.....	52

5.1.3 Evaluation of the Success Path .....	53
5.1.4 Evaluation of the Failure Paths .....	54
5.2 Performance Testing of SIC .....	57
5.2.1 Performance Testing By the Complexity of the Prescriptive Architecture Rule Set .....	57
5.2.2 Performance Testing By the Size of the Code Base .....	59
5.3 Analytical Evaluation Of The Impact Of SIC When It Is Added To A Continuous Integration Flow .....	62
Chapter 6 CONCLUSION .....	64
6.1 Research Contribution .....	65
6.2 Research Limitations .....	66
6.3 Future work and Conclusion .....	66
REFERENCES.....	67
APPENDIX A .....	70
APPENDIX B .....	72