Planning a Systematic Review on Business Case for Reference Architectures

Silverio Martínez-Fernández[1] , Lucas Bueno R. Oliveira[2] , Claudia Ayala[1] , Xavier Franch[1], Elisa Y. Nakagawa[2]

[1] GESSI Research Group, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain

{smartinez,cayala,franch}@essi.upc.edu

[2] Dept. of Computer Systems, University of São Paulo (USP), São Carlos, Brazil

{buenolro,elisa}@icmc.usp.br

Reference Architecture

A **Reference Architecture (RA)** refers to an architecture that encompasses the knowledge about how to design concrete architectures of systems of a given application domain. Therefore, it should address business rules, architectural styles, best practices of software development, and software elements that support development of systems for that domain. This must be supported by a unified, unambiguous, and widely understood domain terminology [1].

Software Reference Architecture

Software System ... Software System

Systematic Review (SR)

A **Systematic Review** aims at synthesizing studies from a given research topic or application domain. It is a literature review technique performed according to a systematic and reproductive process [2].

Is it worth for an organization to invest on the adoption of an RA?

Phase 1: Plan Review
1. Specify Research Questions
2. Develop Review Protocol
3. Validate Review Protocol

Phase 2: Conduct Review
4. Identify Relevant Research
5. Select Primary Studies
6. Assess Study Quality
7. Extract Required Data
8. Synthesise Data

Phase 3: Document Review
9. Write Review Report
10. Validate Report

Motivation

- ✓ Little research evaluating the economic viability of RAs [3][4].
- ✓ Absence of work that summarizes the existing information to calculate the Return On Investment of RAs (but strong base in Product Line Architectures (PLA) [5][6]).

GOAL

(1) To identify and classify metrics to perform cost-benefit analysis of RAs and to quantitatively analyze their quality. (2) To support making the business case for RAs and therefore make better decisions in the adoption of RAs.

Research Questions of the Systematic Review

- **RQ 1: Which analysis techniques have been proposed to build business case for RAs?**

  - ✓ What *quality attributes* of RAs have been reported to bring more benefit to the development and maintenance of software systems?

  - ✓ What *metrics* have been used to quantify such quality attributes?

  - ✓ What *economic models or analysis techniques* have been proposed to reason about the adoption of an RA?

- **RQ 2: Which economic models for software PLAs are applicable to RAs?**

  - ✓ What *quality attributes* of PLAs that bring benefit to the development and maintenance of software systems are applicable to RAs?

  - ✓ What *metrics* that have been used to quantify quality attributes of PLAs are applicable to RAs?

  - ✓ What *economic models or analysis techniques* that have been proposed to reason about PLA s adoption are applicable to RAs?

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Group of Software and Service Engineering
UNIVERSITAT POLITÈCNICA DE CATALUNYA

ICMC USP SÃO CARLOS