

Improving Enterprise Architecture Evaluation Based on Concepts from the Normalized Systems Theory

Philip Huysmans, Department of Management Information Systems, University of Antwerp, Antwerp, Belgium

Jan Verelst, Department of Management Information Systems, University of Antwerp, Antwerp, Belgium

ABSTRACT

In this paper, the authors present the results of a design science research project to develop a method for the evaluation of enterprise architecture projects. The methodology is based on the SAAM methodology, and applies concepts from the Normalized Systems theory to provide a more systematic way of performing architectural evaluations. They first discuss the problem statement, the objectives of our solution and the design of the method. The authors then demonstrate how the method has been applied in a real-life organization. Finally, they evaluate the proposed method using the criteria formulated in our problem statement.

Keywords: Business/IT Alignment, Enterprise Architecture, Enterprise Engineering, Normalized Systems, Organizational Modularity

1. INTRODUCTION

The central mission of scholars in applied research domains should be to conduct research that advances academic knowledge while at the same time enlightens professional practice (Van de Ven, 2007). Nevertheless, much published research is “not contributing in intended ways to either science or practice” (Van de Ven, 2007). The design science methodology attempts to remedy this situation and fulfill this mission

by providing a structure for research efforts and reports to ensure practical relevance, while adhering to the required academic rigor (Peffer et al., 2007). This structure starts by clearly stating the problem identification and motivation. This explicit statement ensures the practical relevance of the research project. Next, the objectives of a solution are to be clarified. These objectives need to be evaluated at the end of the research project using sufficiently rigorous methods. This phase should indicate as well by which elements from the scientific knowledge base the design will be driven (Hevner et al.,

DOI: 10.4018/jitbag.2012070103

2004). The used knowledge can originate from different scientific fields. By demonstrating the applicability of available scientific knowledge in different fields, a scientific contribution can be made. Then, the design and development of an artifact which enables the mentioned objectives is described. The discussion of the design in this phase should highlight how the proposed artefact improves the elements from the knowledge base it builds on. Finally, the demonstration and evaluation phases require the actual use of the proposed artifact and the evaluation of the presented solution objectives.

In this paper, we follow this proposed structure to present the findings of a research project which attempts to improve the evaluation of enterprise architecture projects. An important issue which is observed concerning such evaluation is the complexity of enterprise architecture projects. Following the design science methodology, we attempt to improve the ability to cope with this complexity by designing an artifact that applies the insights of theory from the knowledge base which has proven its relevance when dealing with complexity. For this research project, the Normalized Systems theory has been selected (Mannaert & Verelst, 2009; Mannaert et al., 2011a,b). The Normalized Systems theory proposes a scientifically founded way to address the increasing complexity in software systems. In this field, the law of increasing complexity as posited by Manny Lehman states that “as a system evolves its complexity increases unless work is done to maintain or reduce it” (Lehman, 1980). Normalized Systems theory identified combinatorial effects as an important cause of this complexity. A combinatorial effect occurs when the effort required to apply a certain change is dependent on the size of the system. By focusing on preventing combinatorial effects, a modular structure for software can be developed which allows to control the complexity in the software system. Recent research already demonstrated that combinatorial effects are not only relevant in software systems, but can be observed on the level of business processes (Van Nuffel, 2011) and enterprise architectures (Huysmans, 2011)

as well. Consequently, the application of the concept of combinatorial effects on the issue of evaluating enterprise architecture projects could provide valuable insights. We therefore introduce a method to perform an evaluation of enterprise architecture projects, based on the identification of combinatorial effects. This method builds on the Software Architecture Analysis Method (SAAM), which is extended to (1) accommodate the specificity of enterprise architecture projects, and (2) document the combinatorial effects in these projects.

The remainder of this paper is organized as follows. In Section 2, we elaborate on the problem identification and motivation for this research. In Section 3, we outline the objectives of a relevant solution for this problem. In Section 4, we discuss how the artifact in this research project was designed. In Section 5, we demonstrate how the artifact has been applied in a real-life case study. In Section 6, the evaluation of the artifact by the stakeholders is discussed. Finally, we present the conclusions of this research project in Section 7.

2. PROBLEM IDENTIFICATION AND MOTIVATION

A CIO is responsible for the management and evolution of the enterprise information systems. In large organizations, this results in a complex task, where multiple concerns have an impact on every decision. As a result, support from other CxO's may be required to design a certain architectural solution. Enterprise architectures are suggested as an aid to provide information and insight during this decision-making process (Johnson, 2004; Ross et al. 2006). Instead of being limited to IT-artifacts, enterprise architectures include organizational artifacts as well. As a result, a more complete set of concerns can be represented in such an architecture. However, many different enterprise architecture frameworks and models are available, each with its own focus and merits (Johnson, 2007a; Noran, 2003). As a result, it is often unclear for enterprise architects which

11 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product's webpage:

www.igi-global.com/article/improving-enterprise-architecture-evaluation-based/75318?camid=4v1

This title is available in InfoSci-Journals, InfoSci-Journal Disciplines Business, Administration, and Management.

Recommend this product to your librarian:

www.igi-global.com/e-resources/library-recommendation/?id=2

Related Content

Accountability and Web Usage in University Foundations: The United States Case Study

María del Mar Gálvez-Rodríguez, María del Carmen Caba-Pérez and Manuel López-Godoy (2014). *ICT Management in Non-Profit Organizations* (pp. 223-241).

www.igi-global.com/chapter/accountability-and-web-usage-in-university-foundations/107857?camid=4v1a

Technology, Web 2.0 and Beyond

Laurence Lock Lee (2009). *IT Governance in a Networked World: Multi-Sourcing Strategies and Social Capital for Corporate Computing* (pp. 258-294).

www.igi-global.com/chapter/technology-web-beyond/24753?camid=4v1a

Measuring and Managing E-Business Initiatives through the Balanced Scorecard

Wim Van Grembergen and Isabelle Amelinckx (2004). *Strategies for Information Technology Governance* (pp. 152-168).

www.igi-global.com/chapter/measuring-managing-business-initiatives-through/29902?camid=4v1a

Governing Information Technology through COBIT

Erik Guldentops (2004). *Strategies for Information Technology Governance* (pp. 269-309).

www.igi-global.com/chapter/governing-information-technology-through-cobit/29907?camid=4v1a