CENTERIS 2014 - Conference on ENTERprise Information Systems / ProjMAN 2014 - International Conference on Project MANagement / HCIST 2014 - International Conference on Health and Social Care Information Systems and Technologies

Service-oriented architecture projects in practice: A study of a shared document service implementation

Eli Hustad[a]*, Christer de Lange[b]

[a]University of Agder, Gimlemoen 25, 4630 Kristiansand, Norway
[b]Norwegian Defence, Kjevik airport, Norway

Abstract

This paper reports on a case study focusing on service-oriented architecture (SOA) projects in practice. The aim of these projects has been to develop a shared document service supporting different business divisions in a large Norwegian governmental institution. The research question guiding this research is: *How are SOA projects carried out in practice? What are the challenges of developing shared services in service-oriented architecture?* SOA projects are accompanied by a complex socio-technical system development environment. In the present study we followed parallel system development processes and identified several issues associated with competence requirements, distributed coordination principles and control, lack of communication, tuning of parallel projects, and selection of appropriate project management approaches and system development methods. Clearly, there was a difference between undertaking a system development project within one organizational unit (silo) compared to the development of shared services to provide support across a large organization. Findings demonstrate that the complexity of SOA projects was underestimated by the project managers, and ad hoc governance was practiced in terms of control, coordination, and communication. To capture the entire system development context of an SOA project, a holistic approach and mind-set comprising time management and fine tuning of all parallel SD activities is necessary. Organizational maturity to carry out SOA projects is also of significance. The study has implications for SOA adopters in general and for system developers and project managers working in an SOA context in particular.

---

* Corresponding author. Tel.: +047 38141000; fax: +047 38141001.
 E-mail address: eli.hustad@uia.no

1. Introduction

Recently, service-oriented architecture (SOA) has received increased attention as a platform from which to approach challenges related to the development and maintenance of heterogeneous information technology (IT) portfolios [1-3]. Several organizations face architectural challenges arising from complex mixes of different legacy systems, enterprise systems, platforms, and applications. To achieve the amalgamation of these components, point-to-point integration and implementation of middleware solutions (e.g., enterprise application integration [EAI]) has increased [4]. The resources required for the development and maintenance of these compound solutions, however, have become extensive. SOA can meet these challenges, and its module-based architecture and the services it offers promise increased flexibility and reusability [5]. The focus on services makes SOA unique, because it provides transparency across multiple (legacy) applications and data sources that are black boxed. Because the services are defined by open standards, SOA makes available a common pool of IT resources despite the presence of different IT systems, functionalities, language codes, and platforms.

The implementation of SOA, however, requires long-term projects that involve comprehensive organizational changes in terms of new approaches to system development and different IT governance mechanisms, as well as changes in the roles and responsibilities of employees and system developers in particular [1, 5]. SOA should be utilized as a business transformation tool for solving larger business needs, rather than strictly as an IT architectural initiative [3, 5, 6]. Moreover, SOA should be seen as a means to drive organizational strategy that focuses on the alignment of business and technology for agility [1]. So far, SOA research has been mainly technology-oriented, and there is a need to study the socio-technical issues associated with SOA. There is an increasing interest in how to approach SOA governance, and several frameworks and models have been developed by both vendors and academics [2, 7, 8]. However, few empirical studies have focused on SOA projects in practice and the challenges SOA adopters encounter. This study seeks to bridge this gap. SOA projects demand a different system development (SD) approach, and knowledge about how to accomplish SOA governance in practice.

For the purpose of this paper, we go beyond a technical perspective on SOA to view this architectural infrastructure as socio-technical system that affects the enterprise at different levels: business processes, system development practices, and IT governance mechanisms.

We conducted a case study in the IT and Service Department (ITSD) of NORDIC PI (pseudonym) which is a Norwegian governmental institution. The organization began an SOA program in 2008. During the study, we followed system developers, system architects, and project managers across different functions working on specific SOA projects. Our aim was to understand how such projects are carried out and managed in practice. The system developers in a SOA program work across different functions (silos) and seek to develop shared IT services. The following research questions guided our study:

How are SOA projects carried out in practice? What are the challenges of developing shared services in service-oriented architecture?

To explore these issues, we followed SOA projects in practice to identify the specificities of SOA projects and the particular challenges SOA adopters and system developers run into when working in an SOA environment.

The paper is organized as follows. Section 2 conceptualizes SOA, presents some relevant research, and discusses SD challenges in an SOA context. Section 3 introduces the research site and method. Section 4 provides an overview of the SOA program and SOA projects under study, while Section 5 provides a discussion and the implications of our research. In Section 6, we provide some concluding remarks.

2. SOA concepts and related research

SOA definitions. There are several conceptualizations of SOA in the literature. SOA is technically defined as follows: "Service-Oriented Architecture is an IT architecture where data and logic functionality are 'black boxed' or