Service Oriented Architecture (SOA) Implementation: Success Factors and Realized Benefits

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ABSTRACT

Using a multiple case studies and surveys, this article finds that factors essential to successful Service Oriented Architecture (SOA) implementations include establishing effective SOA governance, establishing SOA registries, starting with a small project, collaboration between business and IT units, strengthening trust among business units, and training. This article also explores business and IT motivations for SOA implementation and the benefits realized from this implementation. The findings from this article can provide a guidance for practitioners on the successful implementation of SOA.

KEYWORDS

Case Study, Organizational Implementation, Realized SOA Benefits, Service-Oriented Architecture (SOA), Success Factors, Survey

INTRODUCTION

In every industry, today’s business environment is more complex, fast-paced, and unpredictable. These market dynamics give rise to a need for business flexibility in order to cope with continual change and to stay ahead of the competition (Le Clair, 2013). To achieve business agility, organizations need the ability to quickly align IT capabilities to fast and unpredictable change in business requirements (Bloomberg, 2015). In response to these challenges, organizations have adopted Service-Oriented Architecture (SOA), an enterprise architecture where business tasks and application functionalities are considered as shared, reusable services (Serrano, Hernantes, & Gallardo, 2015). With shared, reusable services, SOA promises better alignment between IT capabilities and business requirements (Bloomberg, 2015; Choi, Nazareth, & Jain, 2010; Mueller, Viering, Legner, & Riempp, 2010). In addition to providing better alignment between IT capabilities and business requirements, SOA promises many other benefits, such as reducing application development time and maintenance costs, providing real-time information, and facilitating the integration of IT applications (Mueller et al., 2010).

Despite SOA’s organizational benefits, not all organizations have achieved them (Joachim, Beimborn, & Weitzel, 2013; Hirschheim, Welke, & Schwarz, 2010). Therefore, it is important to understand the factors affecting SOA implementation so that those organizational benefits are achieved. Several prior studies (i.e., MacLennan, & Van Belle, 2015; Lee, Shim, & Kim, 2010) have identified success factors in SOA implementation. However, much of the research is based on secondary data or on interviews from a few companies. (Basias, Themistocleous, & Morabito, 2015; Niknejad, Ghani, 2010).

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Hussin, & Razak, 2014). In addition, little has been done to determine whether or not the success factors affect SOA benefits (Joachim et al., 2013). Therefore, it is difficult to arrive at an accurate and more representative picture of success factors in SOA implementation.

The following research question guided our efforts. What factors affect SOA implementation such that organizational benefits can be achieved? This study used a multiple case study and survey. The multiple case study was conducted to qualitatively explore the success factors of SOA implementation and SOA benefits. The multiple case study was based on 12 firms that have already implemented and achieved SOA benefits. Then, a survey of 93 professionals who have worked on SOA projects was used to confirm the findings from the multiple case study. The survey data was used to empirically determine whether or not there are effects between success factors and net SOA benefits by comparing organizations that have adopted the success factors to those that have not.

The insights from this study enhance our understanding of SOA implementation and success. They can provide a guidance for practitioners on the successful implementation of SOA. The paper is organized as follows. We begin with a review the literature on IT diffusion and SOA. We then present our research methodology and findings. We conclude with a discussion of the implications for future research and practice.

LITERATURE REVIEW

To guide our research, we reviewed IT diffusion and SOA literature. In this section, we briefly highlight the findings from our review.

IT Diffusion Literature

Since SOA is enabled by several technologies, such as enterprise services bus (ESB), SOA registries and standards (e.g. XML, SOAP), we expect that some of the factors affecting IT implementation will also affect SOA implementation. We reviewed the IT diffusion literature, which has extensively studied factors affecting IT implementation.

IT implementation is a key part of IT diffusion (Cooper, & Zmud, 1990), which can be affected by the factors including organization-IT innovation fit; innovation delivery system; and innovation, organization, and environment characteristics (Oliveira, & Martins, 2011; Fichman, 2000).

Organization-IT innovation fit is an important factor affecting successful IT innovation implementation (Mu, Kursch, & Butler, 2015). An organization might be struggle in implementing IT innovation that does not fit well with its organizational needs, strategies, resources, or capabilities (Yusof, Kuljis, Papazafeiropoulou, & Stergioulas, 2008). Also, prior studies found that a high level of fit between organizational tasks and IT innovation significantly influence successful implementation of the IT innovation (Khazanchi, 2005).

The delivery system for the innovation is the means by which the implementation process is supported and managed for a particular innovation within an organization (Leonard-Barton, 1988). In prior literature, the most influential characteristics of the delivery system affecting IT implementation include degree of top management support, technology champion, level of training, and other resources invested in organizational learning (Huang, 2015; Hwang, Lin, & Lin, 2012).

Innovation characteristics have been studied by many diffusion researchers (e.g., Rogers, 2010; Tornatzky, & Fleisher, 1990). Rogers (2010) highlights five such characteristics, including relative advantage, compatibility, complexity, trialability, and observability. These innovation characteristics has been found to influence IT implementation (Lin, 2008). In general, innovations with favorable characteristics tend to be more attractive and easier to adopt and, therefore, tend to diffuse more rapidly than those with less favorable characteristics (Rogers, 2010).

Organization and environment characteristics have been found to explain why some organizations are more innovative than others. Organization characteristics include size (Rogers, 2010), organizational structure (Hameed, Counsell, & Swift, 2012), managing user resistance (Lapointe,
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