A Detailed Framework for SOA Governance

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ABSTRACT

Service Oriented Architecture (SOA) Governance is a critical factor for the success of SOA implementations, yet a detailed SOA Governance framework is lacking. The paper reintroduces a conceptual SOA Governance framework in a healthcare setting. The proposed framework is based on a rigorous literature review and consist of nine governance elements that should be considered during the SOA practice. The identification and conceptualisation of the elements are grounded in the normative literature. Moreover, the authors propose a unique formulation combining nine elements of SOA Governance with SOA Critical Success Factors (CSFs) and Healthcare Information Systems (HIS) challenges. This proposal aims to pinpoint attributes and guidelines for each element, required to successfully govern SOA and tackle longstanding HIS challenges. The framework is intended to be used as a decision supporting tool for SOA governance in a healthcare setting.

Keywords: Critical Success Factors (CSFs), Healthcare, Healthcare Information Systems (HIS), Service Oriented Architecture (SOA), Service Oriented Architecture Governance

1. INTRODUCTION

The United States spends 17.6% of gross domestic product (GDP) on health care while the average in the European Union (EU) is 7.4%, with a prediction that the cost will increase in the future due to an increasingly aging population (from 600 million people aged 60 and over in 2000, to 1.2 billion by 2025) as the associated care demands for increased chronic illnesses (Fitzpatrick & Ellingsen, 2013). In the past, healthcare organizations worldwide attempted to invest in HIS in order to balance their functional costs and increase the quality of their services. Yet, HIS hold various challenges, such as: (a) IT infrastructure complexity, (b) the non-integrated nature of HIS, (c) medical errors and (d) the lack of global service provision (Lunt et al., 2011). Besides, integrated technologies that have been employed by healthcare organisations, to tackle these challenges, have not shown great levels of adoption due to their barriers, like: (a) high costs, (b) resistance to change, (c) organisational issues, (d) high complexity, (e) large scale of change, (f) time consuming implementation and (g) politics. Thus, the need for integrated HIS in a safer,
interoperable and more manageable environment motivated organizations to consider the adoption of paradigms, such as SOA. According to Erl (2005) SOA is defined as:

An open, extensible, federated, composable architecture that promotes service-orientation and is comprised of autonomous, QoS [Quality-of-Service] capable, vendor diverse, interoperable, discoverable and potentially reusable services, implemented as Web-Services. (Erl, 2005, p.54)

SOA can be beneficial for a healthcare organisation as it provides interoperability and integration of the legacy HIS. This is achieved as SOA is realized well beyond mere software architecture or ICTs to implementing healthcare business strategies, enabling leaner IT departments, facilitating agile process models, and driving new service-delivery processes (Kontogiannis, Lewis, & Smith, 2008). Nevertheless, Heffner (2009) indicates that, 41% of SOA users in the Global 2000 firms believe that: (a) SOA has delivered less benefit than expected, (b) 17% claim they face problems and (c) will not expand SOA use. This reveals that even though SOA is considered a valuable architectural paradigm its application, efficiency and performance are affected by various factors. These statistics indicate that almost half the companies that implement SOA have not figured out how to benefit from their projects. This is attributed to unclear or weak governance planning (Hirschheim, Welke, & Schwarz, 2010; Stephens, 2008). In a recent research on the global status of IT governance standards and models (like COBIT, ITIL/ISO20000 etc.) the findings reveal a tendency to adopt such frameworks, but also a lack of a clear “winner” amongst them. For example, amongst 834 business executives, from 21 countries and 10 industries reveal that ISO20000 or ITIL is referred in 28% of them, while COBIT in 12% (ITGI., 2011). Yet, out of the 839 respondents only 10% have been healthcare executives, thus the percentages drop lower regarding their focus on IT governance in healthcare.

In an attempt to study this issue, in a previous rigorous study the authors focused on SOA CSFs in healthcare, like: (a) alignment of SOA, organization, human and legal aspects, (b) clear goals set from the beginning of the endeavour, (c) complexity introduced to the system, (d) cost, funding and sponsoring the SOA project, (e) SOA culture that can create support and communication between the stakeholders, (f) experience, skills and training of the employees, (g) governance plan to provide compliance and check services concerning capability, security and strategic business alignment, (h) long-term planning to include reusable services that fit future business, (i) adequate measurement of the compliance and performance, (j) maturity identification and progress of the organization in aspects as IT, organization etc., (k) identification of the right candidate projects/pilots, (l) security risks (data confidentiality, access control), (m) detailed roadmap, (n) adequate standards (e.g. XML, WSDL, REST, HL7 etc.), (o) a team with understanding and experience in change management and clear vision of SOA, and (p) testing of the services and impact (Koumaditis, Themistocleous, & Rupino Da Cunha, 2013).

The outcome of the study, emphatically demonstrated that the most frequently reported CSF in the cases reviewed is SOA Governance. In a nutshell, the findings reveal that SOA implementations require governance mechanisms to excel, otherwise the architecture will end up complex, uncontrolled, brittle and eventually discarded (Marks, 2008). Apparently, SOA, as in many sectors has created the opportunities to improve agility and speed in aligning healthcare needs with ICT infrastructure, yet most of the healthcare organizations in the process of applying this technology encounter with challenges and may have failure despite of spending a lot of energy and huge investments. A failure in a healthcare organisation’s IT infrastructure is not an option as the literature is full of cases where healthcare IT failures cost patients’ lives (Johnson, 2011; Kaplan & Harris-Salamone, 2009). Therefore they need to implement a SOA framework for governance (Hirschheim et al., 2010). According to Marks (2008):
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