Enterprise Architecture Development Approach in the Public Sector

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ABSTRACT

Despite the increasing interest to adopt enterprise architecture (EA) concept, there is a scarcity of literature that discusses the development of EA in the public sector. Hence, the purpose of this article is to empirically investigate the development approach of EA in the public sector. The research used a qualitative case study to build an in-depth understanding of the development approach as well as the enterprise architects' roles and the stakeholders' roles played at each development stage. The government architecture framework (GAF) of the Omani public sector was used as the case study that included GAF documentation review and interviews with architects and stakeholders who participated in the development of GAF. The findings showed that the GAF development started by establishing architecture knowledge, EA frameworks & IT standards analysis, high-level architecture framework, working group formation and the development of architecture documents. The enterprise architects had six roles whereas the stakeholders played three roles during the development of GAF. The findings are expected to expand the knowledge of the EA development approach to promote developing a standard EA framework for the public sector.

KEYWORDS

Enterprise Architects, Enterprise Architecture Development, Public Sector, Qualitative Case Study, Stakeholders

1. INTRODUCTION

The increasing complexity of business processes and services caused challenges for the organizations to see the holistic view of their business (Al-Kharusi, Miskon & Mahadi, 2017a). Moreover, the high turnover of IT solutions and the increased reliance of business on IT created a challenge to align business strategy with IT investment (Al-Kharusi, Miskon & Mahadi, 2017b; Birkmeier, Gehlert, Overhage, & Schlauderer, 2013). Hence, Enterprise Architecture (EA) was suggested as an approach to improve business IT alignment, manage organizational complexity, and support organization transformation (Al-Kharusi, Miskon & Mahadi, 2017b). Lankhorst defined EA, as “…a coherent whole of principles, methods and models that are used in the design and realization of an enterprise’s organizational structure, business processes, information systems, and infrastructure…” (Penttinen & Isomäki, 2010, p. 1).

The enterprise architects and the stakeholders are the main actors in the development of EA (Al-Kharusi, Miskon & Mahadi, 2017b). The enterprise architects are responsible of collecting information about EA (Al-Kharusi, Miskon & Mahadi, 2017b; Buckl, Matthes, & Schweda, 2010b). They evolve the EA through a set of models and play the role of managing, communicating, leading and
modeling (Clark et al., 2014; Gotze, 2013). Although enterprise architects are part of EA stakeholders but distinguished as enterprise architects to differentiate their role of leading and managing the development process of EA (Al-Kharusi, Miskon & Mahadi, 2017b). The enterprise architects use the EA’s framework to guide the development and implementation of EA in the organization. EA framework is a set of guidelines, models and artifacts descriptions that are used by the architects (Alaeddini & Salekfard, 2013). It provides a structure and organizing logic for the organization-captured information (Berrada & Bounabat, 2013). Bourey and Medini (2012) explained that EA frameworks provide steps on how to analyze and build the as-is architecture and actions required to reach the to-be architecture. The description of the framework in EA development differs based on the type of the used framework. The first published framework was Zachman framework and later several frameworks proposed, such as The Open Group Framework (TOGAF) (Kloekner & Birkmeier, 2010).

The concept of EA gained the attention from many governments around the world to support e-Government initiative that aims to improve the quality and speed of service to citizens (Bakar & Selamat, 2016). Both Zachman and TOGAF frameworks can be used to develop EA for an enterprise (Rouhani, Mahrin, Shirazi, Nikpay & Rouhani, 2015). Since these EA frameworks designed for the enterprises, the governments tend to tailor their own EA development approach. Despite the wide temptation especially in the developed countries governments towards EA, limited literature discussed the details of the development approach followed by these governments to develop their wide government EA. In particular, the study attempts to answer the question: How could the enterprise architects develop EA for the public sector? To address the question, the researchers used a qualitative case study approach by selecting Government Architecture Framework (GAF) project as a case. GAF was developed to enable the integration between government entities as well as to automate and simplify services provided to the citizens of Oman.

The rest of paper sections present literature of EA development in the public sector, and then it details the methodology and results of the case study. Finally, it discusses the findings and concludes it by key remarks.

2. EA DEVELOPMENT IN PUBLIC SECTOR

Around 67% of countries embarked on EA program to improve interoperability between government entities, among them USA, Australia, Canada, Korea and some European countries (Bakar & Selamat, 2016; Du Lee & Kwon, 2013; Moreno, Paez, Parra & Campos, 2014). This attention is also driven by UN e-Government evaluation in which the implementation of EA plays a role in the evaluation score (Du Lee & Kwon, 2013). The development and implementation of wide EA government is challenging due to the involvement of many government entities (AlSoufi & Ahmed, 2012). AlSoufi & Ahmed (2012) investigated the first iteration of EA development in Bahrain government as part of National EA framework project. The focus of the first iteration was 167 services in 26 government entities in which the scope was to develop target architecture for the government services, technology standards, maturity program and governance framework to guide the development. The developed framework was based on a combination of TOGAF, Zachman and methodology-oriented frameworks. The project was seen as a corner stone towards the successful adoption of e-Government. Moreno et al. (2014) and Moreno et al. (2016) provided a high-level description of the main components of the Colombian Government Architecture Framework that aimed to standardize IT management for the purpose of improving the interoperability between government entities but did not explain the development approach of the framework. Similarly, Lee et al. (2013) explained details on the Korean Government Architecture Framework components that aimed to improve the interoperability, to avoid duplication of effort and to enable integration between government entities.

Other EA literature addressed different challenges related to the wide government. Hjort-Madsen & Pries-Heje (2009) studied the drivers of using EA concept in Danish central government and it concluded that EA to a large extent driven by fashion. On the other hand, there were studies that
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