Chapter 23
Applying Agility and Living Service Systems Thinking to Enterprise Architecture

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ABSTRACT

Adaptive enterprise architecture capability plays an important role in enabling complex enterprise trans-formations. One of the key challenges when establishing an adaptive enterprise architecture capability is identifying the enterprise context and the scope of the enterprise architecture. The objective of this paper is to develop and present an adaptive enterprise service system (AESS) conceptual model, which is a part of The Gill Framework for Adaptive Enterprise Service Systems. This model has been developed using a "Design Research" approach. The AESS conceptual model assimilates agility, service, and living systems thinking (following multi-agent system modelling) for describing and analyzing the enterprise context and scope for establishing an adaptive enterprise architecture capability. The target audience of this AESS model driven approach includes both, enterprise architecture researchers and practitioners.

INTRODUCTION

An 'enterprise' is defined as "any collection of organizations that has a common set of goals" (Harrison 2011). Enterprises need to be agile in response to any expected and unexpected changes. An agile or adaptive enterprise continuously scans and senses their internal and external environment for identifying and responding to changes in a timely manner. An adaptive enterprise requires identifying appropriate capabilities for their consistent and smooth operations and transformation in response to quickly chang-ing business landscape (Doucet et al., 2008; Espinal et al., 2012). The emerging trends of global supply chain, outsourcing and collaborations suggest that "there is an increasing need for a holistic enterprise perspective in the current environment" (Purchase et al., 2012). Modern enterprises operate beyond their physical boundaries and are typically a part of an overall enterprise eco-system, which includes customers, partners, collaborators and community etc. Modern enterprises are essentially "adaptive extended enterprises".

Architecting and managing agile or adaptive extended enterprises are not easy tasks (Qumer 2007). Agile or adaptive enterprise architecture (EA) capability is a key strategic capability that plays an important role in describing the structure, behavior, social, technology, and facility elements of an adaptive enterprise (Gill 2013; ISO/IEC 42010 2007). An adaptive EA capability is critical not only for describing the adaptive enterprise but it also plays a pivotal role in developing enterprise strategy and roadmaps for enabling complex enterprise transformations (Ross et al., 2006). The establishment of an adaptive EA capability first requires describing and analyzing the enterprise context and the scope of the architecture work. The enterprise context and scope of the architecture work is important for determining the time and cost. How best to define the complex adaptive enterprise context and scope for the EA work, is indeed a challenging question. This paper addresses this important question and proposes a conceptual model-driven approach to defining the complex adaptive enterprise context and scope for the EA work.

Architects traditionally use a model-driven approach for developing EA artifacts. A model is defined as a "set of statements about some system under study" (Seidewitz 2003). In the context of this paper, the system under study refers to the "complex adaptive enterprise". The paper presents the adaptive enterprise service system (AESS) conceptual model, which has not been discussed before in the EA discipline. The AESS conceptual model can be used for describing the overall context and scope of an adaptive enterprise. Enterprise architects need to use the enterprise context and scope as a guide for developing the adaptive EA capability and artifacts. The AESS conceptual model adopts the "Theory Triangulation" approach (Thurmond, 2001). The AESS model describes and analyzes the adaptive enterprise context and scope through the lens of three well-known theories: agility (Qumer & Henderson-Sellers 2008), living systems (Miller, 1995; Jennings et al., 1998; Beydoun et al., 2006, Kramer & Magee 2007), and service science (Spohrer & Kwan, 2009).

The paper is organised as follows. Firstly, it discusses the research context. Secondly, it discusses the research method. Thirdly, it discusses the theoretical background and AESS conceptual model development. Fourthly, it describes the AESS conceptual model and its application. Finally, it presents the future directions and concludes with a short discussion about the future research.

RESEARCH CONTEXT

There are a number of well-known EA frameworks such as Zachman (1987), Federal Enterprise Architecture (CIO Council 2001), and The Open Group Architecture Framework (TOGAF) (Harrison 2011) that can be used for developing an adaptive EA capability of an enterprise. However, these frameworks are unlikely to be able to be used or adopted off-the-shelf for any specific organization. Organizations need to tailor their own situation-specific adaptive EA capability by integrating the necessary elements from different well-known EA frameworks (Bokang 2013). Adaptive EA capability needs to be tailored according to specific enterprise context and scope of the EA work (Harrison 2011). The challenge is how best to define the enterprise context and scope of the EA work? The AESS model is developed as a part of The Gill Framework for Adaptive Enterprise Service Systems (Gill 2013 - see Figure 1). The AESS model is intended to be used by organisations for defining an adaptive enterprise context and EA work scope for a specific situation.

The Gill Framework has two main layers: an inner layer and an outer layer (see Figure 1). The inner layer contains capabilities for defining, operating, managing and supporting a situation specific and an adaptive EA capability. The outer layer contains the EA adaptation capability, which includes enterprise

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