Chapter 11
Towards Event-Driven Enterprise Architecture

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ABSTRACT

Enterprise Architecture (EA) has been researched to supply components for enterprise system modelling, including taxonomies, meta-models, architecture development methods, and modelling tools. However, EA now faces a big challenge due to the rapidly changing market demands and business environments. From the technology point of view, there are already matured, promising paradigms that tackle this challenge, such as Complex Event Processing (CEP). However, this has not been fully explored with EA. This chapter investigates the possibility of integrating Event Driven Architecture (EDA) into EA modelling. A modelling framework, “Event Driven Enterprise Architecture Modelling Framework” (EDEMF), is proposed for the adoption of complex events as a main viewpoint and incorporation of event process modelling in EA. An event-centric thinking is applied to the contextual analysis, followed by a translation of the analysis into conceptual and logical EA models, including complex event model: the EA models are then transformed into physical models grounded in existing or new enterprise system components. This approach has been achieved by providing an extension to ArchiMate, an EA modelling language. The feasibility of the proposed approach is demonstrated using a case study that applies to a student internship program. The case study uses a semantic web platform.

DOI: 10.4018/978-1-4666-4667-4.ch011
INTRODUCTION

Enterprise Architecture (EA) has been defined as the organization of a system embodied in its components, relationships to each other, environment, the principle guiding its design and evolution (IEEE, 2012). Lankhorst’s defines EA, as “a codified understanding covering elements ranging from organization to infrastructure” (Lankhorst, 2013). Fischer et al. (2010) offer a definition of EA as consisting of coherent principles, methods, and models used in the design and realisation of organisational structure, business processes, information systems and infrastructure. Many practitioners also have scoped the broad character of EA to offer their own definitions as it fits their purpose (Schekkerman, 2003; Winter, 2007; Tang et al, 2006). Regardless of these definitions, the authors agree that an important characteristic of EA is to provide a holistic view of the enterprise and to visualize the relevant aspects of the business for specific stakeholders for the purposes of achieving desired goals of the organization. To achieve this, methodologies that effectively offer a platform in which business, process, activities and objects can be viewed, evaluated and aligned with IT applications and infrastructure are needed. In these methodologies, alignment of business functions and IT systems are addressed as a form of harmonization between the current state of a business (as-is) and a desired state of a business (to-be). But this sort of harmonization is rudimentary and does not tackle intricate challenges arising from contemporary dynamic market trends and business environments; demands that require agile system response and self-evolutionary behaviour through quick decision-making processes (Kim et al., 2006). It is therefore our view that in order to support these challenges, EA must be incorporated with potentials that allow its design to meet these requirements at the conceptual level.

One feasible approach to this phenomenon is to employ a perspective that deploys the Model Driven Architecture (MDA) concepts to assist better business and IT alignment with automated model transformation from business models into executable program codes. Applying MDA for EA can be adopted by identifying architectural styles and patterns to assist business and IT modelling. Several different styles of architecture are possible, including; Service Oriented Architecture (SOA) and Event Driven Architecture (EDA).

SOA involves the publication of logically coherent groups of business functionality as interfaces used for synchronous or asynchronous messaging. Several efforts have been made to integrate SOA to EA. For example, OMG published a language specification called SoaML for SOA based business modelling. It supports service modelling at business level, integration of the modelled services with business processes at IS/IT level through service orchestration or choreography (Casanave, 2009). A leading EA industry consortium, the Open Group, published their efforts on SOA driven enterprise modelling, demonstrating fitness of their TOGAF framework to service oriented modelling (The Open Group, 2011). However, their publications demonstrate very scanty inferences to the application of event in EA.

EDA is a technique, which reduces coupling between business components, thereby increasing the scope for component reuse and promoting the production, detection and consumption of events (Engels, 2008). Using event processing based schemas that conform to Event Driven Architecture (EDA) enables process model to respond the dynamic event rules rather than follow predefined flow. Analysis of many EA frameworks indicate that there have not been adequate and purposeful attempts to involve event analysis in EA; specifically to standardize the modelling of business and IT systems with the EDA approach in a consistent way (Kim et al., 2006).

A distinction between SOA and EDA is that the latter generally provides scope for Complex Event Processing (CEP) in which the business activities are triggered by multiple, possibly tem-