A Conceptual Model of SOA-Enabled Business Process and its Empirical Study

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ABSTRACT

In today’s strong competitive environment, business processes that answer customer needs are required to be flexible and agile so as not to miss business opportunities and to adopt new market requirements and new trends easily so business activity monitoring is becoming more crucial for enterprises. Although obstacles of the mass of hybrid and complex distributed systems make it an effortful issue, SOA researchers investigate solutions to eliminate them. This study proposes a conceptual model for SOA-enabled business process frameworks to identify components of such systems. The model consists of entities and their relationships represented by UML. The proposed model was tested in an international company where its business processes are well-defined and IT is seen as an important necessity for their implementation.

Keywords: Business Process Management (BPM), Distributed System, Enterprise Service Bus (ESB), eService, Service Oriented Architecture (SOA), Web Service, Workflow

INTRODUCTION

Success for an organization’s primal and fundamental objectives is dependent on the performance of its common and collective events related to the business processes (Duncan et al., 2007). A business process is a set of activities which are the operations of one or more kinds of input to create a valuable output for a customer. Furthermore, processes that answer the customer’s needs are called business processes. In their life cycle; the activities of modeling, managing, measuring and creating new successful versions are defined as business process management (BPM).

The World economy is shifting from being product centric to service centric. In developed countries, 70% of GDP comes from service centric (Zhang et al., 2009). According to IBM sales figures, service centric sales are increasing linearly (Jin et al., 2010) and from 2002 results, it is five times that of product centric ones. IT services, known as eServices, are also becoming a popular type of service. With the help of IT evaluation in the service oriented architecture (SOA) paradigm; software, IT
platforms, IT infrastructures, and IT-enabled business processes are turning into eServices which can be consumed 24/7 by overcoming geographic limitations.

The aim of this study is to present SOA-enabled business process management (S-BPM) concepts which play an important role in technology innovation of service science which is a new academic discipline to “analyze, construct, manage, and evolve the complex hybrid system related to economic, social, computer science” (Liu et al., 2010, p. 272). The study harmonizes business and technical aspects of business process. After the concepts are considered, they will be illustrated by a conceptual model which covers basic elements modeled by unified modeling language (UML) notations. A survey related to the model was applied in Siemens Turkey. In the next part of the study, the survey and its results will be presented.

The scope of this study is to model a running business process with implementation of all required services. For this reason, S-BPM concentrates not only on modeling a business process but also implementing, simulating and deploying the business process and eServices consumed in this business process, so that all aspects of BPM are met within the same framework. The new conceptual model proposes a new perspective for the relationship between SOA and BPM and amongst their entities. It is based on two components namely workflow and eService. S-BPM encapsulates these two expectancies of business processes and has a significant importance in discovering and identifying entities, roles, tasks, and participants for the higher mature business process.

SOA AND BPM WORKING IN TANDEM

SOA and BPM are two essential topics of enterprise information systems (EIS). Many enterprises make investments to adopt them. Both of them should be considered together because they are working in tandem to achieve better EIS. While SOA provides technical requirements for EIS like software components, operational resources, and distributed computing; BPM fulfills the needs arising from the business like business processes, their workflows, and their activity monitoring. SOA provides such IT architecture to manage business process in a higher mature process.

In today’s complex systems, unlike the old style of software which run locally, EIS is becoming more heterogeneous and distributed due to need of integrating various applications and systems. Not only dependency on other systems but also separation of tasks into sub-tasks and running them on separate platforms that have distinct physical resources also call this situation. Before WWW, implementing such a distributed system was quite expensive because it required special infrastructure like electronic data interchange (EDI). After the invention of WWW, every single computer can easily become a node in the biggest network which is the internet where no special platform is required.

Extensible markup language (XML) is also another important step towards distributed systems due to the fact that it provides an international standard for data representation and universal format for information exchange (Erl, 2004). Almost all of the distributed systems have XML interpreters and parsers that enable them to connect to any external system via XML files with minimal effort. Web services were invented with the help of XML. A web service can be defined as a distributed software component where the communication language is XML and is accessed via HTTP. Several protocols and/or technologies are used to implement web services like SOAP, WSDL, and UDDI. A web service has three players namely: service provider, service consumer and service broker. A provider registers its service to the broker. When a consumer needs a service, the broker directs the consumer to the provider, and the consumer calls the service. Universal description, discovery, and integration (UDDI) provides such a mechanism.

In SOA terminology, a service is “a component capable of performing a task” (Sprott &
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