Chapter 12
Service Oriented Enterprise and Contracted Profit Sharing

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ABSTRACT

Service Oriented Enterprises (SOEs) outsource their functionalities via third party web services. Therefore, there is a need for a systematic approach to manage the cooperation of the services. SOEs perform their functionalities in an extremely dynamic environment. Changes that happen to a SOE are categorized in two types: top-down changes and bottom-up changes. This paper considers top-down changes which are initiated by SOE’s management. In order to manage a top-down change, the SOE’s management should consider the possible conflicting interests of the different parties. This study finds a situation in which none of the services have to incur losses. Consequently, this paper proposes ex-ante contracted profit sharing principles that can attract the services to the change. The problem is modeled and Security improvement is discussed as an example to describe this approach.

INTRODUCTION

The recent convergence of information and communication technology (ICT) design, execution, storage, transmission and reusable knowledge is creating new opportunities. They include re-deploying people, reconfiguring organizations, sharing information (e.g., language, processes, metrics, prices, policies and laws), and investing in technologies. The investments are intended to yield technical solutions that adjust to a changing business environment, and effectively leverage the value of knowledge in service relationships that produce high business value (Demirkan et al., 2008). These are what we call services and service-oriented thinking.

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The Web has grown from a mere repository of information to a platform for service provision. Web services are gradually taking root following the convergence of business and government efforts for making the Web primary medium of inter-actions (Varadan et al. 2008). Web services are the evolution of the RPC, DCE, DCOM, CORBA, RMI, … standards of the 1990s. The main innovation is an XML base that facilitates interoperability among implementations (Gray, 2008). The maturity of XML based Web service standards, such as SOAP, UDDI, and WSDL, are driving the rapid adoption of Web services (Curbera et al., 2002; Casati et al., 2003). This trend is motivating a paradigm shift in enterprise structure from the traditional single entity to a collaboration of Web services. Such service oriented enterprises (SOE) would potentially open the door of entrepreneurship to all Web users. A SOE is a temporary and dynamic collaboration between autonomous Web services that collectively provide a value added service to users. These services are typically provided in a frequently changing environment. Service oriented enterprises are also referred to as adaptive, on demand, virtual, extended, market-driven, or Web service based enterprises. We use the terms service oriented enterprise, SOE, and enterprise interchangeably to refer to these types of enterprises.

SOEs outsource their functionalities via third-party Web services. This triggers a need for a systematic approach to manage and maintain the proper functioning and cooperation of these services. This is of significant importance and very difficult because a SOE has to perform its functions in an extremely dynamic environment (i.e., on the Web). Market requirements and business regulations may change and individual services may come and go at will. In SOEs, changes are the rule, and are not the exception, as it is the case in traditional enterprises (Liu & Bouguettaya, 2007). Therefore, providing a framework for change management in SOEs is important.

There are two types of changes that happen to a SOE: top-down changes and bottom-up changes (Akram et al., 2003, 2004; Liu & Bouguettaya, 2007). Top-down changes refer to the changes that are initiated by SOEs’ owners. Bottom-up changes refer to the changes that are initiated by the outsourced Web service providers. A SOE may frequently make top-down changes to improve business processes, enhance market competitiveness, and comply with new regulations. In this paper, we focus on top-down changes that are always triggered by either new business strategies or new regulations, from an economic point of view.

The rest of the paper is organized as follows. First of all, a brief introduction to SOEs and its changes is presented. Then, the paper discusses top-down changes and describes the problem using an example and presents a game theoretic model to deal with top-down changes. In this section three different ways to share the surplus utility gained through a change are proposed and then, using a numerical simulation, results of them are compared. Finally, the last section concludes the paper and outlines future work.

Service Oriented Enterprise (SOE)

A service oriented enterprise is an extended, virtual, real-time, and resilient enterprise. The essential characteristics of an extended enterprise are its involvement and ability to realize straight-through processing of a number of organizations to deliver goods and services to customers. Extended enterprise is about connectivity between various service providers and service requestors. Therefore, a service oriented enterprise achieves the delivery of the supply chain or value chain. As mentioned throughout the literature (Khoshafian, 2007; Maglio et al., 2006; Varadan et al., 2008), service orientation deals with loose coupling. An essential feature of loose coupling is the idea that services can be developed independently and then integrated with minimum or no dependency of the