Chapter 5
Servitized Enterprises for Distributed Collaborative Commerce

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ABSTRACT

Agility and innovation are essential for survival in today's business world. Mergers and acquisitions, new regulations, rapidly changing technology, increasing competition and heightened customer expectations mean companies must become more responsive to changing demands. This move to agility through innovation can be possible with the service oriented solutions offered by Collaborative Servitized Enterprises (CSE). In this article, the authors demonstrate the architecture of a CSE and develop a multidisciplinary research program, incorporating a more science-based approach to the effective, scalable, secure, and knowledge-driven design and development of collaborative servitized enterprises, to address some of today's commoditization lead issues. The authors' primary objective is to lay the foundation of an integrated service culture, which is characterized by a cross-disciplinary attitude that fulfills customers' needs. A secondary attitude within that culture is an awareness of the complexities associated with service tradeoff decision-making, requiring a careful balance of value, risk, cost, and quality of service.

INTRODUCTION

The Internet has significantly affected the manner in which most organizations conduct business (Porter, 2001). The recent convergence of information and communication technology (ICT) design, execution, storage and transmission is creating new opportunities and also new challenges. Within a single organization, data, software and infrastructure services can be highly distributed and deployed among multiple computing platforms, e.g. software-as-a-service, infrastructure-as-a-service, cloud computing. Most organizations must also compete on a global

scale, participating in *collaborative commerce* by conducting electronic business through contact with distributed service providers (Luo & Seyedian, 2003). A multi-organizational manufacturing supply chain provides an example of this type of collaboration, creating a virtual organization where business is conducted through distributed systems integration with complex, high-volume, transactional (operational) and decision support (data warehousing) activities that must be concerned about requirements such as agility, security, auditability, availability and service level agreements (Foster et al., 2001; Singh & Huhns, 2004). Other examples of distributed applications can be found in banking, credit card processing, health care, and homeland security, requiring either material flow, information flow, knowledge flow, and/or cash flow between multiple organizations (Schoenbachler & Gordon, 2002).

The servitization of processes, architectures and technologies (e.g. service-oriented organizations, service-oriented architectures, service-oriented computing and service-oriented infrastructures) have evolved as a new paradigm for enterprise systems development, supporting intra-enterprise and inter-enterprise collaboration through access to autonomous, implementation-independent interfaces to data, software and infrastructure services (Demirkan, 2008). In this paradigm, the most commonly used term is Service Oriented Architecture (SOA). In this article, we use the definition of service-oriented architecture from the Organization for the Advancement of Structured Information Standards (OASIS) (Oasis, 2006): "A paradigm for organizing and utilizing distributed capabilities that may be under the control of different ownership domains. It provides a uniform means to offer, discover, interact with and use capabilities to produce desired effects consistent with measurable preconditions and expectations." Service-oriented architecture is not limited to just Web services, or technology or technical infrastructure either (Brittenham et al., 2007). Instead, it is about a new way of thinking

about the value of commoditization, reuse and information, and creates business value (Bieberstein et al., 2005; Bardhan et al., 2010).

The service-oriented thinking is one of the fastest growing paradigms in academia and industry in response to the growing need for greater business integration, flexibility, and agility (Demirkan et al., 2009). When we look at the global economy we see that lead by the USA, the world economy is currently transitioning from a goods-based economy to an economy in which value creation, employment, and economic wealth depend on the service sector (Chesbrough & Spohrer, 2006; Spohrer & Maglio, 2008). Services account for 75% of the U.S. gross domestic product (Pal & Zimmerie, 2005) and 80% of private sector employment in the U.S. (Karmakar, 2004). They also play a similarly important role in all of the Organization for Economic Cooperation and Development countries. The OECD has thirty member countries, representative of the leading economies in the world. They include: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States (www.oecd.org). Moreover, industries that deliver consulting, experience, information, or other intellectual content now account for more than 70% of total value added in these countries (Spohrer, 2005). Market-based services, excluding those provided by the public sector (e.g., education, health care, and government) account for 50% of the total, and have become the main driver of productivity and economic growth, especially as the use of Information Technology (IT) services has grown (Spohrer, 2005). Similar to many other areas, this service-oriented global economy started to influence information technology field as well. According to Babaie et al. (2006), worldwide end-user spending on IT services will grow at a

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