Chapter 5
An IT Service Engineering and Management Framework (ITS-EMF)

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ABSTRACT

There is a rich amount of literature on services from Information Technology (IT) (Management view) and IT System Engineering (ITSE) (Engineering view) domains. However, such a variety has produced disparate views. Furthermore, given that IT and ITSE service-based systems must be linked to business services (the User view), conceptual interrelationships are increased, causing yet more diversity. This paper identifies that this generates a lack of theoretical conceptual cohesion and leads to multiple practical confusions. To address these issues and to reduce such conceptual gaps, an IT Service Engineering and Management Framework (ITS-EMF) is proposed. ITS-EMF is generated by careful review and examination of the main conceptualizations on IT, ITSE and business services. The paper claims that ITS-EMF is useful for: (1) mapping services concepts from disparate IT literature, (2) reducing service conceptual confusion from the multiple available sources, and (3) providing conceptual links between service constructs used in business services and IT and ITSE services layers. It concludes with the implications, both academic and practical, for engineering and managing IT services in business organizations.

1. INTRODUCTION

Services are distinct from products as main trading items (Farr & Buede, 2003). Services have had a high economic impact in the last 30 years (Quinn, 1992; Lusch & Vargo, 2006). Nowadays, many business organizations are focused on delivering services “help, utility, experience, information or other intellectual content … account for more than 70% of total value added in the OECD” (Sheehan, 2006). This shift in economic perspective from product design, manufacturing, and
distribution towards service design, composition, and delivering, can be explained from a market focus on guaranteed functionalities of systems as products per se, or as systems using products, process, technology and people (Chesbrough & Spohrer, 2006). Furthermore, services are needed to cope with the incremented business process engineering and management complexity in worldwide organizations to perform their daily, tactical and strategic business activities (Sage & Cupan, 2001). Complementary to another business practices, companies have addressed such organizational complexities through large Information Technology (IT) investments (OECD, 2004) and by consequence, these organizations now rely on Complex IT-based Organizational Systems (CITOS) (Hunter & Blosch, 2003; Mora et al., 2008a). Hence, the concept of service emerges as fundamental in the disciplines of both IT (e.g. the management view) and IT System Engineering (ITSE) (e.g. the engineering view), and thus, IT management and IT systems engineering integrated conceptual schemes for IT services are relevant to be elaborated.

Academic and professional efforts in business (Service Science, Management & Engineering (SSME) (Chesbrough & Spohrer, 2006)), ITSE (Service-Oriented Architecture (SOA) software engineering (Bieberstein et al., 2005; Kontogiannis et al., 2007)), and IT domains (service management (OGC, 2007)) have been focused on developing such conceptual schemes. These efforts aim to fill knowledge gaps and/or develop new service system paradigms. Furthermore, the IT service construct has been used from early 1970 and 1980 decades (with different connotations) in the IT literature (Lewis, 1976; Olson & Chervany, 1980; Leitheiser & Wheteber, 1986). However, we identify that because of the complexity and diverse range of disciplines involved (IT, ITSE, and Business Management), the current view of what is an IT service is not integrated. Given that IT technology plays a critical role for the realization of high-quality, cost-effective and trustworthy services (Zysman, 2006), we consider that doing research: (1) to integrate the main perspectives of the concept of IT service, and (2) to formulate a engineering and management framework for IT services (ITS-EMF) is relevant and required.

### 2. A REVIEW AND SYNTHESIS OF IT SERVICE LITERATURE

Consequently, in this paper through a conceptual design research method (Glass et al., 2004; Hevner et al., 2004; Mora et al., 2008b) (see Table 1) we: (1) elaborate on an integrated conceptualization of the IT service concept (ITS); (2) formulate and illustrate the ITS-EMF; and (3) identify the academic and practical implications to engineering and managing such services in business organizations. We claim that this framework is useful for mapping services concepts from disparate literature, reducing service conceptual confusion from the multiple available sources, and providing conceptual links between service constructs used in business services and IT and ITSE services layers.

#### 2.1. The Classic IT Management View of Services

The use of the service concept is not new in IT literature. However, we believe that the modern concept of service has not been used in most of this literature, with the exception of the ITIL/ITSM stream (OGC, 2007). While the IT service construct has been used implicitly but not defined in several IT studies (Lewis, 1976; Olson & Chervany, 1980; Leitheiser & Wheteber, 1986; Pitt, Watson, & Kanvan, 1997; Kettinger & Lee, 1997, 2005), several insights are useful to formulate an integrated concept. First definitions on IT service construct are provided by ITIL (the Information Technology Infrastructure Library) v.2, and v.3 models (OGC, 2007) and related models (ITUP, MOF). In related ITSE literature (Bieberstein et
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