



# Toward an Integrated Conceptualization of the Service and Service System Concepts: A Systems Approach

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## ABSTRACT

*Service and service systems concepts are fundamental constructs for the development of the emergent SSME, ITSM, and Service Oriented Software (SOS) knowledge streams. A diversified literature has provided a richness of findings, but at the same time, the lack of standardized conceptualizations is a source of confusion to IT practitioners and academics. Given this problematic situation, we pose that a systems approach is useful to address it. In this article, we review and synthesize key studies in these knowledge streams to design: (i) a framework to characterize both concepts under a system view and, (ii) harmonized definitions (e.g. identification of shared and essential properties) for such fundamental concepts. Our main contribution is scholastic, but we are confident that the posed conceptual artifacts can be further used to elaborate standardized definition for the IT service and IT service system constructs, as well as analysis tools for describe real service systems. [Article copies are available for purchase from InfoSci-on-Demand.com]*

*Keywords: IT Service; IT Service System; Service; Service Systems; Systems Approach*

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## INTRODUCTION

Service Science, Management and Engineering (SSME) (Chesbrough & Spohrer, 2006, Spohrer et al., 2007), IT Service Management (ITSM) (OGC, 2007; Beachboard et al., 2007),

and Service-oriented Architecture/Software Engineering (SOA/SOSE) (Bieberstein et al., 2005; Kontogiannis et al., 2007), are knowledge streams focused on developing an emergent service system engineering and management paradigm founded in the concepts of service, service system and by extension upon: IT ser-

vices, IT service systems, and Service Oriented Software (SOS) concepts.

Such a focus on services has been largely influenced by core marketing<sup>1</sup> and business researchers (Levitt, 1972, 1976; Heskett, 1987; Schlesinger & Heskett, 1991; Quinn, 1992), who independently have envisioned a high-valued and semantically richer concept of service than the traditional simple and low-valued one. In particular Quinn (1992) conceives a new service-based economy, through his studies of strategic re-definitions of product-oriented manufacturing organizations to service-oriented business organizations. At present, this service view has permeated so strongly in business organizations, that the business organizations focused on delivering “*help, utility, experience, information or other intellectual content ... account for more than 70% of total value added in the OECD*” (Sheehan, 2006). Thus the construct of service - as opposed to the product concept or the usual post-sale business activity - has experienced fundamental changes, and acquired a high business practical and theoretical relevance.

In particular since IT technology plays a critical role for the realization of such high-quality, cost-effective and trustworthy services provisioned by service systems (Zysman, 2006; Zhao et al., 2007), we are motivated to provide practical assistance to help to IT stakeholders and to enlighten their understanding of such concepts. Academically we are interested in advancing our formal engineering and managerial knowledge on such systems. Such a diversified literature has provided a richness of findings on such concepts, however at the same time the lack of integrated and/or standardized conceptualizations has precluded a clear understanding to both IT practitioners and academics. For instance, the service concept has been used in the IT knowledge stream from the 1970's (Lewis, 1976; Olson & Chervany, 1980; Leitheiser & Wheteber, 1986) until today (Pitt et al., 1997; Kettinger & Lee, 1997, 2005; OGC, 2007), but with different connotations.

Additionally, the current tight interrelationship of the ITSM and SOSE knowledge streams

increases the conceptual variety and confusion on what are IT services and on how they can be engineered and managed efficiently and effectively. We consider that in the IT stream—and any knowledge stream—ambiguity and imprecision must be avoided by both IT stakeholders and academics. A vast literature of failed IT systems and the contrast of real user's needs versus the final capabilities implemented can be magnified for the multiple conceptualizations of what represents an IT service. For instance, an IT service can vary from a full ERP capability service priced in hundreds of dollars by hour to a single access to a laser printer priced at cents per sheet. Thus the available knowledge on services, service systems and IT services, is not harmonized: e.g. there are multiple definitions, with shared and unshared properties, and with different scope of referents, even though in the same knowledge stream as IT. Furthermore, no similar study on an integrated conceptualization of such concepts was located in the related business and SSME literatures.

We consider also that given the diverse nature of the above mentioned interrelated concepts, a system view (Ackoff, 1971; Gelman & Garcia, 1989) is useful to organize and integrate such diversified literature. Consequently, in this article, we use a systems approach to review and synthesize key studies on such knowledge streams to design: (i) an initial framework to characterize both concepts under a system view, and (ii) initial harmonized definitions (e.g. definitions based on the shared and essential properties of main sources) for such fundamental concepts.

The organization of our manuscript is as follows: we describe the systemic research method instanced as a conceptual design research (Mora et al., 2008c; March & Smith, 1995). Next, we report the review of the set of selected studies - from business and SSME knowledge streams - and the design of the conceptual framework for service and service system constructs. We continue with an analysis of the conceptual evidences, and elaborate on an integrated definition for the constructs of service and service system. Finally, we conclude with

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