
Introduction to knowledge intensive service systems

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The last decade has witnessed the rising significance of services – services are no longer just what the service sector does, but instead, they have become common activities undertaken by nearly every sector. The scale, complexity and interdependence of today's services are unprecedented, posing a major challenge for both practitioners and researchers and entailing a new way of designing and innovating services. The systems approach (Checkland, 1981) has been proposed as a shared framework for describing, structuring, analysing, and modelling services. According to this approach, services are best viewed as complex systems made of people, processes, inputs, outputs, resources, environment, and other service systems (Maglio et al., 2009).

As services pervade a wide range of sectors and occupations, service systems are inevitably diverse and disparate. The study of service systems therefore naturally involves grouping similar service systems into types and investigating each type. This special issue concerns only one type – knowledge intensive service systems (KISS). According to European Statistics¹, KISS are “often seen as major engines of growth in modern economies”. The term ‘knowledge intensive service’ stems from knowledge intensive business services (KIBS), first introduced in 1995 by Miles and his colleagues in a report to the European Commission (Miles et al., 1995). According to that report, KIBS either supply products which are themselves primary sources of information and knowledge, or use their specialist knowledge to produce services which facilitate their clients' own activities. Based on the definition of KIBS, we can deduce that the main characteristic of KISS is that it *directly* and *entirely* depends on professional or

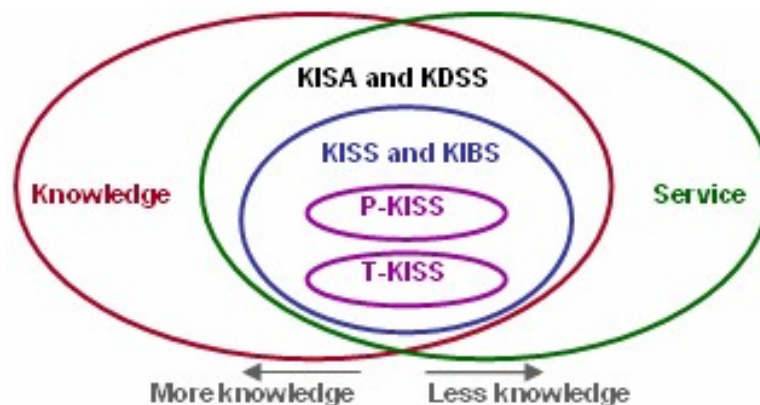
technology knowledge to deliver service operations. According to this characteristic, for example, education and healthcare services are KISS whereas house cleaning and laundry services are not. However, the relationship between KISS and non-KISS is not entirely exclusive as most today's service systems also rely on professional or technological knowledge.

The guest editors of this special issue are leaders of the UK academic network on service sciences (<http://www.ssmenetuk.org>) and the SRII Special Interest Group on Knowledge-Intensive Service Systems (<http://www.ssmenetuk.org/kiss.asp>). This special issue arose from the first European Workshop on Service Systems (EWOSS), held in Eindhoven in November 2009, and aims at presenting a broad understanding of KISS through some sample research topics. Six papers that fit this broad understanding have been selected and introduced below.

In the first paper, Jennifer Wilby, Linda Macaulay and Babis Theodoulidis present a foundational framework for the development of KISS. This framework integrates a set of core systems concepts, principles, and methodologies developed in systems science into a holistic approach to the study of the structure and behaviour of the complex service systems. The paper shows the relevance of this framework to KISS through a review of different definitions and application domains of KISS, and their links to systems science.

The next paper is written by Ian Miles, a pioneer in KIBS since the early 1990s. In this paper, Miles first takes us through a quick tour of the service world and shows us different definitions of services and service systems. He argues that the context of KISS should lie in the intersection between knowledge and service, and KISS may vary in their degree of knowledge. He then introduces us the notion of knowledge-driven service systems (KDSS) and compares it with KISS. Finally, Miles provides us with a colourful taxonomy of KISS, from knowledge-intensive service activities (KISA) to KIBS to professional-KISS (P-KISS) and technological-KISS (T-KISS). Figure 1 illustrates Miles's KISS taxonomy. According to this taxonomy, the remaining papers in this special issue can be classified into focusing on P-KISS or T-KISS.

Figure 1 A taxonomy of KISS, according to Miles (in this issue) (see online version for colours)



In the third paper, Michael Lyons of BT Innovate and Design argues that there are two distinctive types of KISS – value co-creation and mass production – and each requires a different frame of understanding. To support his argument, Lyons illustrates each type of KISS with a real world case study. The purpose of this paper is to show the diversity and

complexity of KISS contexts and the importance of understanding these contexts. This paper targets T-KISS.

In ‘Modelling customer lifetime value in contractual settings’, Christoph Heitz, Marcel Dettling and Andreas Ruckstuhl show that service contracts are complex and dynamic, as they affect customer lifetime value (CLV). They then introduce a formal model for structuring and specifying service contracts. This paper focuses on P-KISS.

The fifth paper, presented by Wout Hofman and Yaohua Tan, focuses on data and process aspects of T-KISS and introduces an ontology for representing these aspects in service models.

Finally, the last paper introduces the concept of quality-of-service (QoS) in the context of developing service-oriented systems (SoSs) – a type of T-KISS. The paper presents a common set of QoS requirements found in the development of SoSs and then describes their software support mechanisms. The paper argues that QoS is a crucial factor that determines the success of KISS and is therefore essential for the development of KISS. This paper is written by Ye Wang, Jie Sun, Liping Zhao, Xinyu Wang, Xiaohu Yang and Aleksander J. Kavs.

Each of these six papers provides a snapshot of KISS research and together, we hope that these papers will make a starting point for a more concerted research effort on knowledge intensive service systems.

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Notes

- 1 http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-08-018/EN/KS-SF-08-018-EN.PDF.