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A service science perspective on business model innovation

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ABSTRACT

Using four basic principles of service science, we systematically explore value-proposition design as one type of business model innovation. Service science combines organization and human understanding with business and technological understanding to categorize and explain service systems, including how they interact and evolve to cocreate value. Our goal is to apply a scientific approach to advance design and innovation in service systems. Our foundation is service-dominant logic, which provides perspective, vocabulary, and assumptions on which to build a theory. Our basic theoretical construct is the service system, entities that are dynamic configurations of four kinds of resources. Our core principles center on the way value is computed within and among entities, how interaction is based on access to resources and their capabilities, and on how value computation and interaction depend on symbol processing and language guided by mutually agreed-to value propositions. In this context, service science can inform and accelerate value-proposition design by systematizing the search for adaptive advantages that improve existing offerings, create new offerings, or reconfigure the value-creating ecosystem.

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1. Introduction

The rise of globe-spanning service-based business models has transformed the way the world works. This transformation has been enabled by new information and communications technologies, specialization of businesses and professions, global regulations, and increased use of external service by entities at multiple scales (Wirtz & Ehret, 2012). Service innovation is now a key priority for nations, businesses, and citizens (Council on Competiveness, 2005). In this context, there is a growing awareness of the need for a new interdisciplinary science of service to help make innovation more systematic and more sustainable (Abe, 2005; Chesbrough & Spohrer, 2006; Horn, 2005; IBM Research, 2004; IfM & IBM, 2008; Maglio, Kieliszewski, & Spohrer, 2010; Ostrom et al., 2010; Spohrer, Maglio, Bailey, & Gruhl, 2007; UK Royal Society, 2009; US Congress, 2007). Over the last two hundred years, and accelerating in recent decades, we have witnessed a rise and fall in resources allocated and interactions dedicated to local production of goods, with more reliance on increasingly complex cognitive and social interactions with others (Bell, 1973; Clark, 1940/1957; Fuchs, 1968; Levitt, 1976; Pine & Gilmore, 1999). This represents the rise of the so-called "service sector" of the economy (Fitzsimmons & Fitzsimmons, 2010), and despite its obvious importance, many myths about the service sector persist, including: (1) productivity is stagnant in the service sector; (2) service sector jobs are low skill and low wage; (3) the service sector is all labor and little technology; (4) science, technology, engineering, and math (STEM) graduates cannot find good jobs in the service sector; (5) service quality is subjective and resists systematic improvement; and (6) the service sector is too diverse to be studied systematically. These can all be easily refuted (see Spohrer & Maglio, 2010b).

Business model innovation can aim at differentiation or cost advantage, often unguided by principles or theory (Zott & Amit, 2008). Similarly, value-proposition design can aim for adaptive advantages (improve existing offerings, create new offerings, or reconfigure the ecosystem), without taking proper account of constraints (Ricketts, 2007). Systematic techniques shift the key performance indicators (Anderson, Kumar, & Narus, 2007; Womack & Jones, 2005), the field of competition (Kim & Mauborgne, 2005), toward adjacent spaces (Slywotzky, Wise, & Weber, 2003), toward open ecosystems (Chesbrough, 2006), away from the priorities of the past (Moore, 2011), or otherwise reconfigure the actors or rules of the game (Brandenburger & Nalebuff, 2007). These shifts and reconfigurations can lead to upward spirals in capabilities over time, or boom and bust cycles (Perez, 2003) or collapse entirely (Diamond, 2005).

In this article, we present a new view of value-proposition design in the context of complex service systems, and particularly from the perspective of service science. We first describe our service science perspective, and then elaborate our four core principles of service science. In the end, we show how to apply our principles to value-proposition design and describe managerial implications of this approach.

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2. Rethinking value creation from a service science perspective

Rethinking value-creation from isolated local-processes to interconnected global-networks, IBM has shifted from a manufacturing logic to a service logic, establishing itself as role model in this regard (Chesbrough, 2011; Maglio, Nusser, & Bishop, 2010; Palmisano, 2006). IBM's service division has grown quickly to dominate revenue, now accounting for more than software and systems revenue combined (Spohrer & Maglio, 2008). Providers such as IBM deploy consultants, practitioners, and technologies to help clients transform businesses (Ricketts, 2007). To improve and innovate, providers invest in the talent of employees, the support environment employees operate in, the information systems employees use, the partnership networks that complement in-house capabilities and enable service delivery, and technologies to automate service delivery. Overall, the aim is to raise the competence of the provider side of service systems. Increasing employee competence is critical to improvement and innovation (Johnson, Manyika, & Yee, 2005). And little is known about the operations and capabilities needed to support and improve effective business-to-business services (Oliveira & Roth, 2011).

How can IBM and other companies reliably improve and innovate in service? Is it all about raising human capabilities? What new business models will effectively bring advanced technological capabilities to market? How can firms leverage an understanding of value cocreation and value-proposition design to configure service systems effectively? What is the relationship between technology and human capabilities? How can nations use new rules to accelerate business model innovation? These are just some of the key business model questions facing modern enterprises. And they are also some of the key questions for any theory of service systems. We believe service science can offer insights into effective value-proposition design, accelerating business model innovation through systematic exploration of the space of value propositions.

Consider information technology (IT) outsourcing, in which a service provider enters into a formal agreement to maintain all or part of a client's information technology systems, such as computing, networking, and storage infrastructure, business applications and data, or end-user help (BusinessWeek, 2006). More and more firms today prefer to focus on their own customers and business model, leaving IT to others (Hirschheim, 2009). Shifting to an outsourced service model may lead to productivity gains simply by formalizing agreements between parties and making explicit the costs that govern their interactions (Knittel & Stango, 2010). Nevertheless, service providers must be very focused on understanding and improving practices to improve service and reduce costs. But for IT outsourcing, human labor costs have grown to dominate, accounting for more than two thirds of the overall cost of IT, and the proportion is growing every year (Bozman & Perry, 2010). Increasing labor costs results from increasing technical complexity of IT systems, and also from increasing interaction complexity among businesses, organizations, and technologies. The issues of IT outsourcing illustrate many fundamental service issues (cf. Ehret & Wirtz, 2010).

2.1. The service-dominant worldview

Service arises naturally in the context of distinct entities, such as people, businesses, and nations, that have information-processing and communication capabilities as well as distinct resource-based capabilities. These diverse entities opportunistically and systematically interact to realize mutually beneficial outcomes. Simply put, service phenomena arise in a real-world ecology of entities, their interactions, and their capacity for finding mutually beneficial outcomes.

We take the view that all businesses are service businesses because all value is cocreated between economic entities that possess information-processing and resource-based capabilities (Vargo & Lusch, 2004). In fact, Vargo and Lusch's (2004) service-dominant logic (SDL) is one of the cornerstones for the emergence of service science, providing an appropriate perspective, language, and worldview (Maglio & Spohrer, 2008; Vargo, Lusch, & Akaka, 2010). SDL's primary definition is that service is the application of competences for the benefit of another entity, and its primary tenet is that all economic activity is an exchange of service for service. This worldview effectively flips the usual "goods-dominant" worldview on its head and takes service to be the primary category of economic activity. And it can be difficult to understand, in large part because a goods-dominant logic has served us so well for so long. Despite the conceptual challenge, the growth of the service sector has made the adoption of a service-dominant logic a practical imperative for innovators (Chesbrough, 2011). When all economic activities are seen as direct or indirect exchange of service for service, goods become a vehicle for transmitting service, that is, for applying human competence. On this view, a massage chair becomes a way to package human knowledge and amplify a human competence (Yoshikawa, 2008). All goods can be viewed as packages of applied human competence (Bastiat, 1850/1979). Improvements in massage chair design, production, distribution, and marketing all result from applying human competence. Increasing levels of automation used in manufacturing shift value-cocreation opportunities from the focal production-assembly activity to design, distribution, marketing, and related activities, representing a broad move from vertically integrated companies toward orchestrated value networks or service systems (see also Normann & Ramirez, 1993; Quinn, 1992). Because of the increasing use of technology for routine manual, cognitive, and social activities, value-cocreation opportunities migrate over time toward more expert thinking and complex communication skills (Levy & Murnane, 2004) — in other words, from routine activities to innovation activities (Brynjolfsson & McAfee, 2011).

2.2. Four principles of service science

Following the SDL worldview, we consider an economic entity to be a collection of resources, including people, technologies, organizations, and information (Spohrer, Maglio, Bailey, & Gruhl, 2007). SDL identifies two types of resources, namely operand and operant: operant resources, such as people and businesses, operate on operand resources, such as technology (using tools) and information (symbolic processing); thus, to first approximation, our four types of resources – people, technology, organizations, and shared information – are simply kinds of SDL's two types of resources. Collections of resources or entities interact by granting access rights to one another's resources, forming service systems (Spohrer & Maglio, 2010b). Interacting service system entities form networks that may be fully or partially contained with larger service system entities, such as cities, states, and nations (Maglio, Vargo, Caswell, & Spohrer, 2009).

The service system is the fundamental abstraction of the study of value cocreation or *service science* (IfM & IBM, 2008; Maglio & Spohrer, 2008; Spohrer & Maglio, 2010a; Vargo, Lusch, & Akaka, 2010). The idea of non-zero-sum interactions or value cocreation is not new (see also Wright, 2000): value emerges when entities work together for mutual benefit, the key being design or orchestration of these entities for effective value cocreation in constellations (e.g., Normann & Ramirez, 1993) and networks (Gummesson, 2010). Service systems are physical symbol systems that compute the changing value of knowledge in the global service system ecology (Spohrer & Maglio, 2010b). Viability of entities within the ecology depends in part on their strategies for resource allocation and interaction with others, which influences their relative efficiency and capability (Spohrer & Maglio, 2010a).

In what follows, we describe our four basic principles for service science in more detail, weaving together threads from a number of prior papers to present in one place a single coherent view. First, we describe how service systems, the basic units of analysis for service science, are composed of four basic types of resources (Maglio, Vargo, Caswell, & Spohrer, 2009). Second, we describe how the relationships between entities in service systems are based on value propositions (cf. Anderson,

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