

# Service Innovation: A Review of the Literature

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**Abstract** Services are fast overtaking manufacturing to form a dominant proportion of the world economy. Service innovation is increasingly seen as a vector of sustainable growth and competitive advantage at the firm-, industry- and economy-level. Innovation started evolving as a key discipline of research over the twentieth century. Initially, innovation research was predominantly focused on science and technology and the new product development approach for commercializing ideas and inventions mainly in the manufacturing industry. With the increasing growth of services in today's organizations and economy, the importance of understanding service innovation concepts and practices has been on the rise. Over the last two decades, researchers have hence been directing attention to innovation in the context of services. Today, service innovation has evolved into a vast field encompassing the study of intangible processes and dynamic interactions among technological and human systems that lead to managerial and organizational change in services. The literature on service innovation is expanding into a diverse and cross-disciplinary body of knowledge scattered across economics, marketing, organizational science, and management perspectives. The purpose of this chapter is to cut through this complexity and diversity in the streams of extant service innovation literature, and provide a holistic overview of the literature in this rapidly growing field. Organized across three broad themes: Overview of Service Innovation, The Dynamic and Systemic Process of Service Innovation, and Management of Service Innovation; this chapter presents a consolidated guide to the service innovation concepts and practices.

**Keywords** Service innovation • Dynamic and systemic process • Value co-creation • Servitization • New service delivery • Service value networks • Innovation diffusion • Dynamic capabilities

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## 1 Background

Services are increasingly dominating the world economy, contributing over 70 % of employment in OECD countries and 58 % of worldwide gross national product (Baltacioglu et al. 2007). The move from agriculture- and manufacturing-based to service- and knowledge-based economies has been pronounced in nations, and all future forecasts show no signs of this trend abating (McCredie et al. 2010). Activities of successful companies also reflect this shift from manufacturing to services. Examples include International Business Machines (IBM), General Electric, and Hewlett Packard all of which have transformed themselves from being predominantly manufacturing organizations to service-based organizations (Mills and Snyder 2010). Historically, the concept of value has been associated with economic productivity gained through the production and delivery of tangible goods. The transition toward a service-based economy, however, calls for a revised understanding of value creation within organizations (Pitelis 2009).

Value in service-based organizations is created through the integration of intangible resources and capabilities such as knowledge, competences, cognitive-centric workforce, and customer collaboration (Vargo and Lusch 2008; Michel et al. 2008; Lusch et al. 2009; Agarwal and Selen 2009, 2014). Service employees are increasingly required to understand complex ideas and process large volumes of information in generating novel solutions to customer priorities (Mills and Snyder 2010), and this calls for interaction with customers and other knowledge workers across a network of stakeholders (Leonard-Barton 1995; Sampson and Froehle 2006; Chesbrough 2006, 2011; Moeller et al. 2008). This process of value co-creation provides organizations with an enhanced opportunity and ability to deliver elevated service offerings resulting in service innovation (Agarwal and Selen 2011a).

Innovation is seen as a persuasive avenue for organizations to create value and competitive advantage (Pitelis 2009). Widely recognized as an engine of economic and social progress, innovation started evolving as a key discipline of research over the twentieth century. Initially, innovation was a topic of interest among economics scholars and researchers interested in technological change; therefore early innovation research predominantly focused on science and technology and its link with economic productivity, and the new product development approach for commercialising ideas and inventions (Schumpeter 1942; Griliches 1998; Cainelli et al. 2004). The common theme of these bodies of innovation research is their focus on the manufacturing sector. The study of technical change in the service sector was largely neglected as services were viewed as low technology users (Cainelli et al. 2004; Ferreira Lopes and Godinho 2005).

With the growth of services in organizations and economy, attention has been focussed on innovation in the context of services over the last two decades (Chan et al. 1998; den Hertog 2000; Castellaci 2008; Miles 1993, 2005; Spohrer and Maglio 2008). Today, service innovation is evolving into a vast field encompassing the study of dynamic interactions among technological and human systems driving managerial and organizational change in services. The literature on service

innovation is burgeoning into a diverse and multidisciplinary body of knowledge spanning economics, marketing, organizational science, and management perspectives (Rubalcaba et al. 2012; Ostrom et al. 2010; Miles 2005, 2010).

With this backdrop, the purpose of this chapter is to cut through the complexity and diversity in the streams of extant service innovation literature and provide a holistic overview of the literature in this rapidly expanding field. This chapter aims to present a consolidated guide to service innovation concepts and practices, and is organized across three broad themes: Overview of Service Innovation; The Dynamic and Systemic Process of Service Innovation; and Management of Service Innovation.

## **2 Service Innovation: An Overview**

### ***2.1 Service Innovation and Its Characteristics***

The service sector encompasses a wide variety of activities and markets ranging from consumer services such as hotels and banks to business services such as IT and legal, and large-scale public sector services such as health and education. The usage of technology is equally diverse; personal services like hairdressing involve basic technologies, while financial services are more knowledge-intensive and use advanced information technologies. As a result of this diversity, innovation in services involves transformation in a variety of aspects ranging from how the service is designed and developed to how it is delivered and managed (Miles 2005, 2010; Trott 2012). Service innovation can be said to be an amalgamation of product innovation, that is, “the introduction of a new product, or a significant qualitative change in an existing product,” and process innovation, that is, “the introduction of a new process for making or delivering goods and services” (Greenhalgh and Rogers 2007, p. 4). Innovation in services is an interplay of service concepts, service delivery systems, client interfaces, and technologies (den Hertog 2000), and often entails new ways in which customers view and use the service. Agarwal and Selen (2011a, p. 1172) conceptualize service innovation as an “elevated service offering” that is made up of “new client interface/customer encounter; new service delivery system; new organizational architecture or marketing proposition; and/or improvements in productivity and performance through human resource management”, further highlighting its multidimensional aspects.

Innovation in services is different from innovation in manufacturing essentially because services are characterized by intangibility, heterogeneity, perishability, increased customer interactivity, and simultaneity between production and consumption (Sampson 2001, 2007; Sampson and Spring 2012). The intangibility of services makes service innovation relatively more difficult to make inimitable through patent protection (Trott 2012; Miles 2005) and to measure as its performance is mostly evaluated on the basis of user perception (Bessant and Tidd 2007). As a result, a new service innovation is generally tested in the actual market rather than in

R&D laboratories (Easingwood 1986; Tidd and Hull 2003). The heterogeneity in services means that innovative activities need to be tailored to different service contexts calling for a more dynamic approach to organizing innovation in services as compared to manufacturing. Some service firms such as fast food restaurants have used innovations around application of technology at the customer interface to reduce heterogeneity and achieve standardization of processes. As services are perishable, that is, they cannot be stored and resold as tangible products can, service innovation also entails technology and processes to better manage demand and plan capacity (Trott 2012). Research has shown that both heterogeneity and perishability of services have a positive impact on service innovation (Jaw et al. 2010).

Services are produced, delivered, and consumed simultaneously making it harder to distinguish between service product innovation (what is produced, delivered, and consumed), and service process innovation (how it is produced, delivered, and consumed) (Bessant and Tidd 2007; Trott 2012). The service innovation process involves a high degree of interactivity between the service supplier and customer (Zeithaml and Bitner 2003). This implies that service innovations can focus as much on these interactions as on the actual service product or process, and this is termed as “servuction” in the service innovation literature (Miles 2005). There is a scope to innovate across a variety of service interactions ranging from those that involve the exchange of intangibles like information as in education and consultancy services, to tangible elements as in transportation and logistics services. The customer inputs into the simultaneous creation of services, referred to as Customer–Supplier Duality (Sampson 2001; Sampson and Froehle 2006) makes service innovation complex and multidimensional in nature (Goldstein et al. 2002; Voss and Zomerdijs 2007; Agarwal and Selen 2011a). For example, the extent of customer interaction in the service innovation process results in a high degree of customization in services that in turn increase their heterogeneity. The intangible nature of services, relative to products, makes these open and collaborative customer–supplier exchanges even more challenging to manage. The emerging Service Science research (Spohrer and Maglio 2008; Gruhl et al. 2007; Hefley and Murphy 2008) focuses on these networked and interactive aspects of innovation in services by studying service systems–value–co-creation configurations of people, technology, shared information and value propositions—as the basis for systematic service innovation. The service-dominant (S-D) logic (Vargo and Lusch 2004, 2008, 2011; Vargo et al. 2008), premised on the notions of service centrality and value co-creation among an interrelated network of suppliers and customers, is viewed as a useful perspective in understanding service innovation across service systems (Chandler and Wieland 2010; Gummesson 2008; Gummesson and Mele 2010; Vargo et al. 2012).

Innovation in manufacturing is more product and technology-oriented and relies on technical expertise and professional capabilities, while the role of cultural capabilities (Ettlie and Rosenthal 2012) and human capital capabilities such as person-to-person skills (Johne and Storey 1988) and customer interface and communication skills (Baines et al. 2010) is more significant in service innovation. Also, manufacturing innovation tends to involve a high degree of expenditure on R&D activities around product and technology (Artz et al. 2010; Enkel et al. 2009).

On the other hand, such R&D expenditure is relatively lesser when innovating services (Ettlie and Rosenthal 2011). While service innovation is no doubt distinct from innovation in manufacturing, the service sector has also applied manufacturing practices in undertaking innovation. Many years ago, Levitt (1972) called for the “industrialization” of service through the adoption of standardized, technology-intensive processes as found in manufacturing. The “modularization” of services, that is, the breaking down of services into various modules, for example, has allowed mass customization to go hand-in-hand with standardization by recombining service modules in many ways (Miles 2005; Seite et al. 2010; Tuunanen and Cassab 2011). This has resulted in a variety of service innovations as seen in fast food chains and call centers emanating from productization of services. At the same time, the “servitization” of manufacturing, that is, manufacturers offering services to customers, is also on the rise adding a new dimension to service innovation (Santamaria et al. 2012).

Technology plays a key role in enabling service innovations; for example refrigeration technology has driven innovations in food retail as has genetic engineering in biotechnology and medical services (Miles 2005). However, among all technologies, information technology (IT) has been said to be the most significant enabler of service innovation. Barras (1986, 1990) perceives the IT revolution to be the core of the industrialization of services with the application of IT enabling mass improvements in quality and efficiency in services. Miles (2005) further likens the pervasiveness of IT-based service innovation to the power of energy-based technology such as steam engine or electric power to manufacturing innovation. Historically, however, the service sector has been slow to adopt IT and other technology as compared to manufacturing. This may be attributed to the greater heterogeneity and dynamism in services as a result of which service innovation cannot be organized as a standardized R&D model as in manufacturing (Trott 2012; Ozyilmaz and Berg 2009). A generic technology needs to be reconfigured and tailored before applying for innovation across the service sector, which is particularly challenging given the intangible and dynamic nature of services. This has led to the rise of the knowledge-intensive business services (KIBS) in recent years that provide specialist technical services to enterprises to ensure they are equipped to keep up with the rapid growth of IT and other technology (den Hertog 2000; Shunzhong 2009). Despite the increasing role of technology in service innovation, the extant literature has largely overlooked addressing this aspect (Menor et al. 2002; Boone 2000).

## ***2.2 Classification of Service Innovation***

The current understanding of service innovation has evolved through diverse disciplines such as services marketing (Grönroos 2007; Lovelock and Wirtz 2007), service management (Heskett et al. 1997; Quinn et al. 1994) and operations management (Cook et al. 1999; Johnston and Clark 2005). The varied foci of these disciplines have led to different dimensions of service innovation including user

involvement and collaboration (Magnusson 2003; Matthing et al. 2004), technology- and service-oriented innovation styles (Gallouj and Savona 2009), bundling service innovations in manufacturing (Normann 2002), service-logic innovation (Lusch and Nambisan 2012; Vargo et al. 2008), and service design model innovation (Teixeira et al. 2012). The four key dimensions of service innovation identified by den Hertog (2000)—Service Concept, Client Interface, Service Delivery System and Technological options—provides a useful frame work to classify different types of service innovation. The concept of creating customer experience or service solution forming a core dimension of service innovation is widely discussed in the literature (den Hertog et al. 2010; Goldstein et al. 2002; Grönroos 2007). Accordingly, studies have classified service innovation on the basis of their extent of standardization versus specialization to specific customers (Hipp et al. 2000, 2003). Schmenner's (1986) characterization of services on the basis of degree of labour intensity versus degree of customer interaction or customization also provides a basis for identifying the dimensions for innovation in services. In similar vein, Johnston and Clark's (2005) classification of service processes on the basis of volume versus variety also provides a framework for understanding the scope of service innovation. For example, innovation in high-volume, low-variety services such as fast-food restaurants tends to focus on efficiency and standardization. On the other hand, innovation in low-volume, high-variety, capability-based services such as management consultancies tends to revolve around client-based customization and specialization (Trott 2012).

Service innovation can also be classified based on the type of service that is innovated—physical services, human services, and information services (Miles 1993). Innovation in physical services such as transportation and restaurants involve physical transformation often through the adoption of new technologies, for example, radio-frequency identification (RFID) and refrigeration equipment. Innovation in human services takes the form of improvements in administrative data processing in public sector services and customized IT systems in medical services. Information services are mainly characterised by innovations in IT such as online banking in financial services and interactive digital media in entertainment (Miles 2005). Innovation in services is often differentiated based on whether changes occur in what is offered, that is, product innovation, or how these offerings are produced and delivered, that is, process innovation. In addition, the type of service innovation also differs based on their level of newness or the degree of change, ranging from major service innovations for radically new markets, to relatively minor innovations such as service line extensions and improvements to existing services (Francis and Bessant 2005; Lovelock 1984). Another distinctive aspect of service innovation is that it has the potential to create new business models that can revolutionize an industry sector, and this can also form a basis for classifying different types of innovation in services. For example, the online auction concept like eBay introduced a radically new way of buying and selling, while internet search engine companies like Google revolutionized the way to search for information. The contemporary phenomenon of crowdsourcing (Howe 2006; Surowiecki 2004) where a firm's innovative activities are outsourced to a large

crowd of people is also an example of a radical service business model innovation. Crowdsourcing is being increasingly applied by a variety of firms both in B-C (Threadless, Dell, Starbucks) as well as B-B contexts (InnoCentive, Quirky) (Roser and DeFillippi 2013). Technology, and in particular IT, has been both a key driver and component of such service business model innovations. Some other revolutionary IT-based service innovations include e-commerce through online retailers (Amazon), and innovation in entertainment services, through gaming (Xbox), online music (iTunes), online videos (YouTube) and social networking (Facebook).

### **3 The Dynamic and Systemic Process of Service Innovation**

#### ***3.1 Service Design and New Service Development***

Service innovation is delivered through the process of new service development (NSD) that encompasses stages from idea generation to market launch of new service offerings (Goldstein et al. 2002). In developing a new service, attention needs to be paid not only to designing the core service features and attributes, but also to the service delivery processes that augment the value for its consumers (Papastathopoulou et al. 2001; Trott 2012). It is whilst services are being delivered that opportunities for collaboration arise giving employees the chance to learn, innovate and co-create value with customers (Agarwal and Selen 2011a, b; Voss and Zomerdijsk 2007). Customer interface and technological options has been recognized as significant factors to service design and delivery (Sampson and Spring 2012; Sampson and Froehle 2006; den Hertog et al. 2010). Synergy between all these elements is critical to successful service innovation. For example, a mere technology adoption approach to service design fails to identify key service elements and attributes (Venkatesh and Davis 1996). In the past, the design approach has failed to give consideration to quality as defined by the customer, resulting in poor design, user dissatisfaction, poor take-up rates and low levels of usage (Venkatesh et al. 2010). This furthers the call for behavioral science to be used to learn from customers and co-design services, and thus improve service design and user experience (Cook et al. 2002; Stewart and Tax 2004). According to Venkatesh et al. (2010), service providers can exploit customer differences rather than continually focusing on customer similarities in seeking a variety of ideas and inputs for service innovation. Customers providing input into the service design and delivery process extend the notion of co-production to co-creation of services (Lusch et al. 2009; Sampson and Chase 2010). As the focus of business models move from transactional ownership exchange to relational service-in-use, firms are looking to engage the customer in processes pre-, during and post-service delivery, and extend the time the customer spends at each encounter. This allows firms to respond better to changes in customer behavior with innovative services. Sampson and Froehle's (2006) Unified Service Theory elaborates on this process of exchange between customers and service providers.

Service organizations also make decisions on whether to reduce or accommodate customer-related variability. Given that service delivery and consumption occur simultaneously in services, reducing variability is not always possible as customers may disrupt core operations with their unpredictable behavior. This has significant implications for the service design and the NSD process, which must consider appropriate strategies to minimize variability without trading-off efficiency or quality of the customer experience (Frei 2006). Technology has been used in the past to reduce customer variability. For example, quality assurance checks at the point of online data entry “force customers” to enter correctly formatted information before being able to proceed to the next stage of service delivery (Boyer et al. 2002). On the other hand, technology has also enabled organizations to accommodate customer variability and offer a wider range of customized services that meet the needs of individual customers. Exploring new ways of determining how services can be tailored (involve customers from all backgrounds), delivered equitably (treat customers fairly) and personalized (provide customers with a choice) present opportunities for innovation.

To date, NSD models have been mainly derived from new product development (NPD) models that were intended for the manufacturing sector (Fitzsimmons and Fitzsimmons 2000). Researchers have argued that the sequential NPD approach (Booz and Hamilton 1982) and stage-gate NPD models (Cooper 1990; Stevens and Dimitriadis 2005) that have informed NSD models in the past do not fully capture the dynamic and iterative processes of customer-supplier interactions that are characteristic to service innovation (Tidd and Hull 2003; Menor et al. 2002). Some efforts have been made to overcome this limitation. For example, Johnson et al. (2000) developed a spiral or interactive model that accounts for the iterative processes of NSD, providing more opportunity to incorporate feedback loops (Bullinger et al. 2003). Concurrent service development models have also been suggested that are more flexible and efficient than the sequential models (Vermeulen and Dankbaar 2002). There is further scope to tailor NSD processes that steer away from linear NPD models and better incorporate characteristics that distinguish services from products.

### ***3.2 Open and Collaborative Processes of Service Innovation***

Theorists such as Porter (1985) have previously viewed services as occurring at the end of a linear value chain considering them to be a support function for products. Today’s service-led and dynamic environment has evoked a revised understanding of value creation through services; shifting value chains from being linear to hybrid (Rabelo et al. 2007; Sabat 2002) comprising of a network of stakeholders such as suppliers, customers, partners and intermediaries (Lusch et al. 2009; Vargo et al. 2008; Norman and Ramirez 1993). This transition has led to the development of the concept of open innovation which views innovation as the outcome of interactive and iterative processes across the value network where customers and other



stakeholders are often invited to co-innovate (Chesbrough 2003, 2006, 2011; Enkel et al. 2009; Gassmann et al. 2006, 2010). This process of open collaboration encompasses dynamic knowledge exchange across all value network entities to synergise internal and external resources for innovation (Prahalad and Ramaswamy 2004; von Hippel 2005; Lusch et al. 2007). Russo-Spena and Mele (2012) develop a process of five ‘Co-s’: co-ideation, co-valuation, co-design, co-test and co-launch, through which the network lead users, customers, partners and intermediaries co-innovate. Chesbrough (2011) refers to two types of openness in the open service innovation model: ‘outside in’, where firms incorporate external ideas and technologies within their business, and ‘inside out’, where firms open their ideas and technologies for other business to use. For example, Amazon displays ‘outside in’ openness whilst engaging customer feedback for creating new services, and ‘inside out’ openness when allowing a third party to use Amazon as a channel to sell products (Chesbrough 2011).

The collaborative and distributed processes of open service innovation that combine ideas, knowledge, and resources among a network of actors can be challenging as it calls for a balance between multiple aspects such as: (1) identification of the rationale for co-innovation; (2) coordination of the processes and mechanisms of co-innovation; (3) maintenance of policies to deal with conflicts between collaborating entities; and (4) maintenance of service quality and consistency (Bughin et al. 2008). Chesbrough (2011) suggests that placing customers as the core of the value network, and working closely with all stakeholders to develop new solutions that focus on utility rather than product features are core strategies to foster open service innovation within organizations. Facilitating the necessary knowledge exchange and collaborative learning processes across the value network is the key to co-innovate offerings in the most efficient and effective manner.

One effective way of embracing the open and collaborative processes of service innovation is through the approach of design thinking. Comprising of overlapping phases of inspiration, ideation, prototyping and implementation, design thinking is a creative and integrated process of problem-solving that is inherently human-centered resulting in the development of new service offerings that intuitively fit with user needs (Brown 2008; Leavy 2010). Design thinking, primarily based on the principles, tools and models that have long served the design function, are being increasingly used by businesses and institutions to find radically new solutions to complex service issues such as the provision of low-cost healthcare services (Bessant and Maher 2009).

### ***3.3 Customer as a Co-creator of Service Innovation***

Service innovation is centered on dynamic and relational interactions between suppliers and customers, with customers being regarded as co-creators of innovation through these interactions (Chesbrough 2011; Moeller et al. 2008; Edvardsson et al. 2010). From this perspective, the role of customers is extended to that of

innovators, value chain collaborators and resource integrators (Edvardsson et al. 2011; Vargo et al. 2008). Services with higher proximity and interactivity with its customers are said to present more opportunities for service innovation (Mathieu 2001) as the enhanced knowledge-sharing and learning processes feed into the discovery, development and delivery of new service offerings (Hipp and Grupp 2005; Kale and Singh 2007; Fuller 2010). With the focus increasingly shifting from “selling” toward “helping” customers (Prahalad and Ramaswamy 2000), customer feedback and involvement is critical for co-design and co-development of services (Franke and Shah 2003; Piller et al. 2004). Nambisan (2002) suggests that customers can be involved in the innovation process in three different ways—as a resource, as co-producers and as users. Allam and Perry (2002) extend this by elaborating the various roles and activities that customers can perform in providing inputs across all stages of the service innovation process. These inputs range from strategic planning and idea generation to service testing and commercialization. Scholars have also focussed on leveraging the social wisdom of communal platforms (Nambisan and Nambisan 2008; Nambisan and Baron 2009, 2010) to interact with their customers and generate ideas for service innovation (Surowiecki 2004; Howe 2008).

Effectively engaging customers in the service innovation process is, however, not easy (Trott 2001; Hamel and Prahalad 1994). The insights gained through customer involvement are sometimes not useful as customers are unable to articulate their needs in a way that can be applied (von Hippel 1986). In recent years, firms have found a novel means to overcome this limitation, and are engaging customers in the innovation process through ‘user toolkits’ that provide customers the freedom to design and develop their own customized product or service (von Hippel 2001; Franke and Piller 2004). This is particularly valuable in markets where customers are increasingly seeking personalized offerings (Thomke and von Hippel 2002; Franke and Piller 2004). Customers also play active roles as users of new service offerings. Software firms such as Microsoft have leveraged online user communities for testing prototypes of new software and seeking inputs to refine them. Cisco provides its customers open source access to its systems through an online forum (Trott 2012). Bessant and Tidd (2007) indicate that it is more advantageous to involve customers, and in particular lead users, in the innovation process of high-novelty services rather than low-novelty ones. It is also important to engage lead users across all stages of service innovation rather than just at the end of the process (Athanassopoulou and John 2004).

### ***3.4 Systemic Diffusion of Innovation Through Service Value Networks***

Service innovation in today’s networked world is highly interactive and systemic in nature. Organizations are embedded in service value networks that comprise of a system of entities which include suppliers, intermediaries, customers and partners

that combine core capabilities to co-create service offerings for the consumer. According to Hacklin et al. (2005), networks are multi-layered which enhances opportunities to co-innovate and create systemic value in operations through horizontal, vertical, diagonal and complementary networks. Connections through the networks may be human to human, technical to technical or human to technical; highlighting the importance of both human-centricity and technology in service innovation. Service innovation across value networks are thus far from being a linear transactional process; rather they are a multidimensional systemic phenomenon involving relational interactions between the network entities that result in the co-creation of innovation.

Systemic diffusion of innovation, characterized by the spread and adoption of new ideas and knowledge (Cohen and Levinthal 1990), is critical to the success of any innovation including service innovation. The diffusion of innovation literature has studied the phenomenon of how new products, services and processes spread (Rogers 1962). Based on McGuire's (1989) 'Hierarchy of effects' and Prochaska's (1992) 'Stages of change' models, a five-stage process has been derived to understand how innovation diffuses:

- Stage 1 Knowledge stage—comprehension of knowledge or skill for effective adoption of innovation;
- Stage 2 Persuasion stage—contemplation on new behavior required for adopting innovation;
- Stage 3 Decision stage—preparation to try the innovation;
- Stage 4 Implementation stage—action required for continued use of innovation; and
- Stage 5 Confirmation stage—maintenance of the benefits resulting from innovation through integration into ongoing routines.

Major and Cordey-Hayes (2000) categorize the models of innovation diffusion into two streams; a node model which describes nodes and discrete steps that occur throughout the diffusion process, and the process model which describes diffusion as separate processes that are deliberately undertaken in a certain pattern. The economics and management literature examine the productivity and business benefits of the diffusion of innovation. Marshall (1890) claims that geographic proximity aids agglomeration and the diffusion process resulting in productivity gains to the speed in which new ideas become known and adopted. Porter (1985, 2000) also places importance on locational factors claiming that clustering of firms affect the competitiveness of a firm and region; first, by increasing productivity; second, by driving innovation in a particular field; and third, by stimulating new businesses in the field. Potts (2009), on the other hand, attributes innovation through a community to the creative process rather than geography and consequently stresses the importance of creative industries to the diffusion of ideas.

A variety of systemic frameworks of innovation have emerged that encompass technological, institutional, infrastructural and economic drivers that support diffusion of innovation to occur on a sectoral, regional and national scale (Malerba 2005; Edquist 2005). This has led to the concept of "systems of innovation" where

firms such as suppliers, customers, competitors; and non-firm entities consisting of universities, schools and government institutions collaborate to create and sustain innovation. National systems of innovations involve the collaboration within the network of institutions in both public and private sectors for development, diffusion and use of innovation (Freeman 1987), and include wider economic, social, political and institutional factors (Edquist 1997). In the context of the increasing role of services in today's economy, studying service value network as a system that promotes diffusion of service innovation in services is indeed topical. Often, the entities in a service value network belong to different industries that come together to create value through supplier-intermediary-customer relationships. The systemic and relational nature of service innovation implies that innovation within one industry diffuses and flows across to other industries through the open and interactive exchange occurring between organizations in the value network. These interactions that span industries connecting two or more network nodes lead to cross-industry innovation.

## **4 Management of Service Innovation**

### ***4.1 Dynamic Capability Building for Service Innovation***

In their seminal paper, Teece et al. (1997, p. 515) define dynamic capabilities as “the capacity to renew competences so as to achieve congruence with the changing business environment”. This calls for organizations to focus on aligning internal structures with their capabilities, while also seeking a fit between their dynamic capabilities and the external environment (Wilden et al. 2013). Teece (2007) identifies organizational decision rules, knowledge management practices and governance mechanisms to manage assets and resources as some of the micro-foundations of dynamic capabilities. Dynamic capability building is critical for implementing service innovation, and invokes the organization's ability to sense, seize and shape opportunities, and to create and reconfigure its resource base (Teece 2007, 2007; Helfat 2007) in developing and delivering new service offerings.

The dynamic capabilities required to sustain service innovation has been an area of recent research. Kandampully (2002) identifies the creation of business networks, technological capability, customer engagement and knowledge management as the building blocks of service innovation. Pavlou and Sawy (2011) outline the importance of intra-organizational communication between teams across different organizational units as being critical to service innovation. Agarwal and Selen (2009, 2014) provide empirical evidence that innovation in services is made possible not only through technical capabilities; rather it is the contribution of soft skills such as collaboration and relationship management that enable the realization of such innovation. In addition, dynamic capabilities such as entrepreneurial alertness, co-evolutionary learning, collaborative agility, collaborative innovative capacity and customer engagement contribute to a firm's ability to deliver elevated service

offerings. Tsekouras et al. (2011) reiterate the importance of inter-organizational collaboration and knowledge-sharing to build dynamic capabilities for service innovation. According to de Brentani (2001), other than service-design and delivery factors, the strategic alignment between organizational resources and capabilities and the new service offerings is a critical aspect of service innovation strategy.

den Hertog et al. (2010) adopt a dynamic capability view to develop a six-dimensional framework for service innovation strategy:

1. signalling user needs and promising technological options—identifying unmet user needs, dominant trends and new technology configurations;
2. conceptualizing—codifying the fuzzy types of service innovations by creating service blueprints;
3. (un-)bundling capability—making smart service combinations;
4. co-producing and orchestrating—organizing and acting in open service systems;
5. scaling and stretching—diffusing service innovation through branding and communicating service offerings; and
6. learning—adapting service innovation processes.

In a similar vein, Agarwal and Selen (2011b) use Mathews (2006) RARE strategic framework (**R**esources, **A**ctivities and **R**outines configured and reconfigured through **E**ntrepreneurial actions) to unravel the complexity of strategic decision making in service networks. Through collaboration between customers, suppliers, and other stakeholders that aids a co-evolutionary process of organizational learning and dynamic capability building, organizations can launch a variety of competitive actions to innovate services. Matching internal structures and dynamic capabilities across organizations in the service network in response to a dynamic business environment is an effective strategy to enable enhanced performance through service innovation (Wilden et al. 2013).

## ***4.2 Managing Organizational Knowledge and Learning for Service Innovation***

Managing organizational knowledge is viewed as a key driving force behind innovation of any kind (von Hippel 1978; Nelson and Winter 1982; Malerba 2005). Organizational learning achieved through learning-by-doing (Nonaka 1991; Nonaka and Toyama 2005), experimentation (Schrage 2000; Thomke 2003), knowledge sharing (Lin and Wu 2010; Otto 2012), codification of knowledge (Zollo and Winter 2002; Nonaka and Takeuchi 1995), and absorptive capacity (Cohen and Levinthal 1990) is critical to knowledge creation, which in turn drives innovation. The highly networked and interactive nature of service innovation demands different approaches to managing the knowledge exchange and dynamic learning processes. While the importance of knowledge and learning in the context of services is widely discussed (Khatibian and Jafari 2010; Lee et al. 2011; Matthing et al. 2004), research focusing

on the processes of organizational knowledge and learning for service innovation is relatively scarce. A recent work in this space by Storey and Kahn (2010) finds that firms that manage knowledge by combining the strategy of codification exemplified by processes of documentation, with the strategy of personalization through interpersonal communication mechanisms are best able to build a sustainable competitive advantage through service innovation.

Organizations need to develop systems and processes for managing the knowledge exchange between the human and non-human entities, integrating knowledge from past innovation projects to current knowledge (De Luca and Atuahene-Gima 2007; Zahra and Nielsen 2002), and co-evolving their knowledge base toward generating new ideas on an ongoing basis (Lam 2005; Storey and Kahn 2010). The collaborative learning processes that ensue provide opportunities for service innovation (Agarwal and Selen 2009, 2014). To enable this, service innovation is usually developed and deployed through project management teams that cater for flexible and collaborative knowledge exchange (Subramaniam and Venkatraman 2001) rather than the standardized linear R&D model applied in manufacturing. Successful service innovation calls for structures to promote better inter-organizational collaboration to stimulate knowledge sharing and knowledge recombination processes across the entities involved (Chesbrough 2003; Delbridge and Mariotti 2009). Miles (2005) further indicates that better coordination is required to allow for transfer of knowledge across the service sector so as to replicate or leverage the innovations in other project networks.

It is difficult to overlook the role of knowledge-intensive business services (KIBS) in managing organizational knowledge and learning for service innovation. KIBS—businesses that apply specialized knowledge ranging from technical, market and institutional knowledge to specific requirements of enterprises—are said to form core knowledge sources and intermediaries in the innovation system (Miles 2005; Paallysaho and Kuusisto 2008). KIBS enable organizational innovation by providing inputs to other organizations through their knowledge exchange and learning processes (Kautonen 2001; Miles 1999). The literature also highlights some of the knowledge-related risks associated with the involvement of KIBS. The potential of leakage of commercially sensitive information to competitors acts as a trade-off to gaining access to cutting edge knowledge and expertise through KIBS (Hoechst and Trott 2006). To control this risk, there is a need for organizations to go beyond traditional legal contracting approaches, and develop social control mechanisms, in particular, trust between the collaborating parties.

### ***4.3 Creating an Organizational Culture for Service Innovation***

The role of organizational culture as a driver of service innovation is being increasingly recognized (Boedker et al. 2011; Alam 2010). Service innovation encompasses novel ways for businesses to create new service concepts or

experiences, and in most cases this is achieved through collaboration with customers and other stakeholders in the value network. Thus, service innovation is affected by the socio-cultural dynamics such as norms, values and ethical standards of all actors that form part of the innovation system (Edvardsson et al. 2011), and the co-evolutionary social and political interactions that occur between them. Researchers are acknowledging that the dynamic and complex nature of service innovation warrants a culture that fosters collaborative routines and co-evolutionary learning mechanisms resulting from customer involvement across the service innovation cycle (Simutupang and Sridharan 2005; Bitner and Brown 2008). An innovative culture fosters creativity among employees within and across organizations through informal communication, positive work environment and collaborative working arrangements that promote knowledge sharing and learning required to generate new ideas on an ongoing basis (Hipp and Grupp 2005; Simpson et al. 2004, 2006). Such a culture is imperative to maintain an ecosystem that supports and sustains service innovation.

Tidd and Hull (2005) present four types of structures that create a culture that supports service innovation: client-project orientation, mechanistic customization, hybrid knowledge-sharing, and integrated innovative. The client-project orientation takes a project management approach delivering an agile and flexible setting for service innovation to meet dynamic customer requirements. On the other hand, mechanistic customization is underpinned by standardization and cost reduction through the involvement of customers and suppliers in the service innovation processes. Hybrid knowledge-sharing achieves collaborative group identity, team work and knowledge exchange practices to balance service innovation with efficiency. Integrated innovative organizations foster service innovation through organic cross-functional teams and a flat hierarchy that facilitate communication and collaboration although at increased costs and time. Given the heterogeneity of services, the most ideal structure among these four is contingent on the type and context of the service organization. Irrespective, all the four configurations promote service innovation by fostering a culture of dynamism and flexibility, collaboration and knowledge-sharing, as well as customer involvement and engagement (Tidd et al. 2005; Tidd and Hull 2005). A culture suited to service innovation promotes R&D investment for both service product and process innovation, with an equal focus on achieving effectiveness through identifying customer target markets and efficiency by streamlining the supplier base (Bessant and Tidd 2007).

#### ***4.4 Measurement of Service Innovation and Its Outcomes***

Measurement of service innovation is critical for its effective management. Innovation in manufacturing and services differ. Therefore, the way innovation is measured should also be different. The extant innovation literature predominantly covers the expenditure on R&D activities (Barreto and Kypreos 2004; Cassiman 2006; Enkel et al. 2009) as well as the number of patents (Artz et al. 2010; Hidalgo



and Molero 2009) as the key measures of innovation. This is pertinent for the manufacturing sector, as innovation here mainly revolves around product and technology (Coombs and Bierly 2006). This measurement approach, however, may skew results while assessing innovations within the service sector as the proportion of R&D and patent-related activity is far less in service innovation (Hipp and Grupp 2005). Innovation in services is mainly reliant on novelty created through intangible resources and processes such as knowledge and learning. Therefore, new approaches are required for evaluating and measuring these intangible innovation-related activities in services. Trademarks and copyrights are newly identified tools to protect intangible assets such as brand and intellectual property (IP) involved in sustaining service innovation (Gotsch and Hipp 2012). Recently, progression has been made to develop more measures that reflect the intangible aspects of service innovation. Agarwal and Selen (2011a) develop a multidimensional framework to measure service innovation, and particularly identify the need to measure relational capital that drives network collaboration as a key lead indicator of service innovation. External forces linked with institutional, regulatory and market competition dimensions are also key aspects to be included in the measurement of service innovation (Lee et al. 2009).

Service innovation is gaining prominence as a key contributor to service productivity and performance (Miles 2010). Innovation is recognized as one of the five key drivers of firm-level productivity along with investment, skills, enterprise, and competition (Camus 2007). Firm-level innovation on aggregate is seen as the driver for economic growth and prosperity at a regional and national level. Measuring the effects that innovative activities have on productivity and growth is an area of active research (Hall et al. 2009; Tether and Howells 2007). However, due to the variability and uncertainty inherent in innovation, determining the magnitude of the effect remains elusive. Studies by Van Leeuwen and Klomp (2006), Janz et al. (2004) and Parisi et al. (2006) use R&D as a proxy for innovation and show positive effects on productivity. Majority of other studies use a production function approach with R&D or other innovation measures as an input into production. The result in an underestimation of the impact innovation has on productivity largely because innovation occurs through channels other than R&D that are not captured. Studies have since moved to examining innovation activities as outputs. For example R&D investment, training, technology adoption and sales of products to new markets are seen as the successful outcomes from innovative efforts (Hall et al. 2009). Studies linking innovation, in particular service innovation, to firm-level and economic productivity and growth is currently sparse. The lack of appropriate indicators and measures have been a key factor limiting studies in measuring the impact of service innovation on performance and productivity (Cainelli et al. 2004; Ferreira et al. 2005). Complexity is also introduced where dynamic human-to-human interactions take place between customers, employees and suppliers, as they provide input and share resources to deploy service innovation. These interactions in turn are determining factors of service productivity and performance. Studying the linkage between service innovation and firm-and economy-level growth and productivity therefore remains a topical and fertile area of future research.



## 5 Conclusion

Services are fast overtaking manufacturing to form a dominant proportion of the world economy. Service innovation is increasingly seen as a vector of sustainable growth and competitive advantage at the firm-, industry- and economy-level. With the increasing growth of services in today's organizations and economy, the importance of understanding the service innovation concepts and practices is also on the rise. As a result, the literature on service innovation is expanding into a scattered body of knowledge. This chapter aims to integrate the many streams of service innovation literature and provide a synthesized view of this rapidly growing field.

To provide a structured account, this chapter is organized across three broad themes: Overview of Service Innovation; The Dynamic and Systemic Process of Service Innovation; and Management of Service Innovation. Through these themes, this chapter presents the distinguishing characteristics and dimensions of service innovation. The key concept of service design and NSD is reviewed, as are the complex and dynamic routines involved in collaborating with customers and other stakeholders for service innovation. A systemic perspective of service innovation is used to study systems of innovation in the service economy, and how innovation diffuses across service value networks. This chapter also explores the alignment of appropriate strategies and capabilities to sustain service innovation; and the aspect of managing organizational knowledge, learning and culture for service innovation. The different approaches to measure service innovation and its impact on firm-level productivity and performance, as well as economy-wide growth and prosperity are also reviewed. In all, this chapter presents an aerial view of the service innovation literature by bringing together its complex and diverse aspects emanating from a multidisciplinary body of knowledge.

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