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Service Innovation for the Digital World

The foundational principles and conceptual building blocks of customer-centric service innovation (SI) practice are explained, and a resultant integrated framework of SI design practices for customer value co-creation is synthesised. The nexus of service strategy, service concept and business model is identified to assure SI commercialisation. The requisite SI models and processes to systematise the innovation practice are reviewed. The emergent practices of customer and community participation, in a digital world, across the firm's entire SI lifecycle are explicated, together with the requisite strategic management practices for successful service innovation.

1 Introduction

Service innovation – the art and science of creating innovative services that customers value and are willing to pay for – in the digital world exemplifies many of the fundamental challenges of business informatics. Recent studies of service innovation have focused on the effective management of service innovation to enhance firm performance – such as the importance of managing inter-organisational relationships and commitments (Eisingerich et al. 2009), the antecedents and consequences of service innovation (Ordanini and Parasuraman 2011), and a preliminary service-thinking framework for value creation (Hastings and Saperstein 2013). These studies have shown that success in service innovation requires "service thinking" (and attendant service culture) and is contingent on effective collaboration with the firm's customers and partners in the overall innovation process. These authors also concur that service innovation is about the creation of customer value (Grawe et al. 2009). However, the art and science of designing and managing service innovations, especially for the digital world, remains an under-explored research area. This paper seeks to contribute to filling this void by exploring the extant literature to identify the critical constitutive theories and practices that would lead to successful service innovation in line with Eisingerich et al.

(2009); Hastings and Saperstein (2013); Ordanini and Parasuraman (2011). It focuses, in particular, on the various critical roles of customers in value co-creation for themselves in conjunction with the service provider and their network of partners.

The paper is structured as follows. Section 2 describes in detail the fundamental building blocks of service innovation: service dominant logic, service systems, operant resources and dynamic capabilities, value networks, and finally, customer value co-creation – the ultimate purpose of service innovation. Section 3 synthesises from the extant literature a framework of design practices for service innovation, comprising four business strategy-aligned interrelated practices of service conceptualisation, service design, customer experience and value creation, and service architecture which, collectively, are typically pursued by designers iteratively (experimentally) and holistically. Section 4 links the design practices framework to service strategy on one hand and business model design on the other to address the commercialisation aspect of service innovations. Section 5 reviews, individually, the common and foundational service innovation functional models (in terms of the 'scope' of and the 'competence-based approach' to service innovation) and processes (in terms of new service development) for the creation of customer value.

Section 6 and Sect. 7, respectively, review the increasingly important 'open innovation' practices of involving customers and online community in the end-to-end service innovation process in the digital world, while Sect. 8 addresses the requisite strategic management capability to ensure service innovation success. Finally, Sect. 9 concludes the paper by summarising the requisite principles (theories) and service design and innovation management practices for service innovation excellence.

2 Conceptual Building Blocks

2.1 Service Dominant Logic

In the early days (pre-1980) of services marketing, services were seen as a special kind of products. Seen as a unit of production output, services were defined as residues of, and thus subordinate to, products (Lovelock and Gummesson 2004; Vargo and Lusch 2004). From this goods production perspective, services as an output are seen to possess four so-called IHIP characteristics which are distinctly different from physical products: Intangibility, Heterogeneity, Inseparability and Perishability (Lovelock and Gummesson 2004). Intangibility refers to the services output as being intangible. Heterogeneity refers to the services possessing variable input resources and performance outcomes. Inseparability refers to the production and consumption of services occurring simultaneously. Perishability refers to the services output as being non-durable and non-storable. However, these services characteristics were actually shown to be not generally applicable to all services (Lovelock and Gummesson 2004). Leading service scholars around the globe also regard the production-oriented IHIP view as outdated (Edvardsson et al. 2005), because it fails to capture the processual, interactive and relational nature of service co-creation and consumption as seen from the customer perspective (Edvardsson et al. 2005; Fitzsimmons and Fitzsimmons 2010). This alternative customer-centric and relational

view constitutes the service-dominant logic (S-DL) which defines service as a process of applying the competencies and skills of a provider for the benefit of, and in conjunction with, the customer (Vargo and Lusch 2004, 2008). A service offering is produced using the firm's resources including both tangible (such as goods) and intangible (such as knowledge, competence and relationship) assets (Arnould 2008). The value characteristics of the service provisioned, however, are co-created through the interactions of the client's competences with that of the service provider (Gallouj 2002). Thus the client is active in a service interaction; it co-creates value (for itself) with the provider (Fitzsimmons and Fitzsimmons 2010; Gadrey and Gallouj 2002; Gallouj 2002). The central idea of S-D logic is that "exchange is about the process of parties doing things for and with each other, rather than trading units of output, tangible or intangible" (Vargo and Lusch 2008).

2.2 Service Systems

Service systems are the basic unit of analysis of (the customer-centric view of) service (Maglio and Spohrer 2008). A service system is defined as a complex adaptive system of people, and technologies working together to create value for its constituents (Spohrer et al. 2007). For example, a telecom company is a complex market-facing technology-based service system. The study of service systems is focused on creating a basis for systematic service innovation (University of Cambridge and IBM 2007). It requires a multidisciplinary integrative understanding of the ways organisation, human, business and technology resources and shared information may be combined to create different types of service systems; and how the service systems may interact and evolve to co-create value (Maglio et al. 2009). A service system has a service provider and a service client or beneficiary (Maglio et al. 2006). Service systems are connected by value propositions (Maglio et al. 2009). IT or business

process outsourcing service configurations negotiated and agreed to between service providers and clients are examples of service systems. Consistent with S-DL, value-cocreation interactions between service systems are service interactions, each comprising three main activities: proposing a value-cocreation interaction to another service system (proposal); agreeing to the proposal (agreement); and realising the proposal (realisation) (Maglio et al. 2009).

Service systems are dynamic, constantly composing, recomposing and decomposing over time. A service system operates as an open system capable of improving the state of another system through sharing or applying its resources (including competences/capabilities), and improving its own state by acquiring external resources (Maglio et al. 2009). Thus, service systems engage in knowledge-based interactions to co-create value, where value is derived and determined in use – the integration and application of resources in a specific context embedded in firm's output – and captured by price (Vargo et al. 2008). Consequently, advances in service innovation are only possible when a service system has information about the capabilities and the needs of its clients, its competitors and itself (Maglio et al. 2009).

Integral to and as a consequence of service innovation, service systems co-create value through collaboration and adaptation, and establish a balanced and interdependent framework for systems of reciprocal service provision. Service systems survive, adapt, and evolve through exchange and application of resources (especially knowledge and skills -operant resources as explained below) with other systems (Vargo et al. 2008).

2.3 Operant Resources & Dynamic Capabilities

A resource is called an operand resource (i.e., tangible physical resource) "on which an operation or act is performed to produce an effect", or

an operant resource (i.e., intangible knowledge-based capability) "which acts on other operand or operant resource to produce an effect" (Vargo and Lusch 2004). Operant resources are dynamic, which include competences or capabilities that can be nurtured and grown in some unique ways to provide competitive advantage to firms (Madhavaram and Hunt 2008). Operant resources that are valuable, rare, inimitable and not substitutable will generate sustainable competitive advantage for firms. For example, market orientation – i.e., market sensing and customer linking capabilities – is an operant resource that would create that advantage (Arnould 2008). This motivates firms to create and use dynamic operant resources to sustain the competitive advantage.

Highly innovative firms possess "masterfully developed" operant resources accumulated over a long period from institutionalised learning practices (Madhavaram and Hunt 2008). These resources allow the firm to effectively manage co-evolution of knowledge, capabilities, and products or services to sustain its competitive advantage. Collaborative competence is identified as a pivotal operant resource for sustained service innovation (Lusch et al. 2007) – one that assists in the development of two additional meta-competences: absorptive competence, and adaptive competence (also collectively known as dynamic capabilities (Teece 2007)) which enable the firm to, respectively, absorb new knowledge and information from partners, and adapt to the complex and turbulent environments by reconfiguring its resources (and organisational capabilities) with those of the external partners. These operant resources are key components of a service system which is conceptualised as a resource integrator (Spohrer et al. 2007). It is the people's unique knowledge and skills and dynamic capabilities that make service systems adaptive to and sustainable with the changing market environments (Spohrer et al. 2007; Teece 2007; Vargo et al. 2008).

2.4 Value Networks of Digital World

In the increasingly digital world, information technologies are "liquefying" physical assets into

information resources, and transform a service firm into a value-creating service system in which a constellation of economic actors (customers, suppliers, business partners and the like) are able to seamlessly collaborate to co-create value (Normann and Ramirez 1993). This reflects the S-D logic's commitment to explicating the firm's collaborative processes with customers, partners, and employees to engage in the co-creation of value through reciprocal service provision (Lusch et al. 2007). And the customer is regarded as an operant resource – a dynamic resource that is capable of acting on other resources to create value for itself (Vargo and Lusch 2008).

With the ubiquitous digitalisation, goods are increasingly being embedded with microprocessors and intelligence and becoming versatile platforms for service provision with enhanced customer and supplier insights and superior self-service ability. It also reduces transport and communications costs, enhances the ability to interact directly with customers and suppliers and consequently coordination between firms becomes more efficient and responsive (Lusch et al. 2009). Thus, the firm will become an essential service provisioning agent (actor) in a complex and adaptive value network comprising a spatial and temporal structure of loosely coupled value-proposing social and economic actors. The actors interact through institutions and technology capable of spontaneously sensing and responding via their dynamic capabilities to co-produce service offerings, exchange service offerings, and finally co-create value. They are linked together by means of competences, relationships, and information (Lusch et al. 2009). The relationships are collaborative and guided by non-coercive governance. This implies voluntary, reciprocal use of resources for mutual value creation by two or more interacting actors, through the symmetric exchange of information and resources (competences) (Vargo et al. 2008). So in the value network, customers and suppliers become partners, and competitors become collaborators as well (Chesbrough and Davies 2010). Each firm (actor) oper-

ates as an open system (Maglio et al. 2009). Firms must practice open innovation (Chesbrough 2003) and develop systems integration capability (Chesbrough and Davies 2010) as part of its dynamic capabilities (Teece 2007) to integrate the requisite competences and resources from external sources with their own to co-create value; e.g., Apple's creation of the iPod/iTunes music service.

Value co-creation and innovation in the digital world would require firms to institute individualised and immediate customer feedback (to and from the customers) to engender customer and organisational learning (Johannessen and Olsen 2010). This requires a new IT-enabled organisational logic which encompasses modular (multi-sourcing) flexibility, front-line (customer learning) focus, IT-enabled individualisation and "connect and develop" innovation practices (Chesbrough and Davies 2010; Johannessen and Olsen 2010). In addition, the firm needs new cooperation structures by partaking in global competence clusters and practising co-competition (Johannessen and Olsen 2010). Above all, to be agile and adaptable as they learn of changing customer needs, firms need to develop dynamic operant resources – the dynamic capabilities (Teece 2007). The dynamic capabilities allow firms to continually align their competences to create, build and maintain relationships with (thus the value propositions to) customers (the ultimate source of revenue) and suppliers (the source of resource inputs).

2.5 Customer Value Co-creation

Customer is at the heart of value creation and service is about relationship with the customer (Edvardsson et al. 2005). The customer interacts with the service provider via the interface through which information /knowledge, emotions and civilities are exchanged to co-create value (Gallouj 2002). Value is wholly determined by the customer upon, and in the context of, service usage (and customer experience), in which the competence (operant resource) of the provider is integrated with the competence (operant resource) of

the customer to (perform 'a job' to) create (business) value with the customer (Edvardsson et al. 2005; Vargo and Lusch 2008). The service provider cannot deliver value, but only offer value propositions (Vargo and Lusch 2008). To win the service game, the value proposition must consistently meet the customer expectations and behavioural needs (Schneider and Bowen 2010). This can be assured by co-opting the customer competence in co-creating the service offering with the provider (Prahalad and Ramaswamy 2000) – e.g., user toolkits for innovation (Hippel 2001). However, the customer would collaborate with the provider in co-creation of core service offerings only if they would gain benefits, such as: expertise, control, physical capital, risk taking, psychic benefits, and economic benefits (Lusch et al. 2007).

Service innovation must therefore be concerned with effectiveness of value co-creation between the provider and beneficiary. It recognises the principle that a proposed value by the provider, in the context of the client, is actually a composite of benefits and burdens (or costs), which can be evaluated using a customer value equation (Fitzsimmons and Fitzsimmons 2010). Burdens relate to the service's usability (or its relative ease-of-integration with the client's resources or activities to "perform the job the service is hired to do") – the more user-friendly it is the less the burden and the greater the user experience; and the greater the customer efficiency (Xue and Harker 2002). Thus, the most compelling service with the best "value for money" to the client is one that has the largest "benefit-to-costs" ratio. This suggests that user involvement in co-creating the service offerings (or co-designing the value propositions) with the provider would more likely create 'fit-for-purpose' service for the client and thereby maximising the benefit.

Service firms must therefore "consider not only the employees' productivity but also the 'productivity' and experience of the customer" (Fitzsimmons and Fitzsimmons 2010; Lusch et al. 2007; Schneider and Bowen 2010; Womack and Jones

2005). From a service system viewpoint, value, created as a result of integrating the provider's resources with the client's, increases the client system's adaptability and survivability to fit with its changing environment (Vargo et al. 2008).

3 Framework of Design Practices

To create innovative services that sustainably co-create superior customer value in the constantly evolving value networks of the digital world, a design framework is synthesised from the extant literature consistent with the preceding conceptual building blocks. The design framework for service innovation consists of closely inter-related practices of: (a) service concept which defines what the service is and how it satisfies customer needs, (b) service design which defines the service delivery mechanisms to consistently satisfy customer needs, (c) customer experience and value creation which guides service design to align the provider's competences and learning regime to those of the customers to ensure superior experience, and (d) service architecture which systematises service design and innovation. These four interrelated practices are detailed below individually, but are typically practised in the real-world iteratively and holistically.

3.1 Service Concept

A service concept defines the conceptual model of the service. It describes what the service is and how it satisfies customer needs (Bettencourt 2010). Service concept is the most critical component of service strategy, and reflects the alignment of the customer needs (job and outcome opportunities) with the company capabilities. Service concept also forms the fundamental part of service design, service development and service innovation (Fynes and Lally 2008). It is developed as the end-result of the activities of strategic positioning, idea generation and concept development/refinement. The conceptual model of a service consists of seven components which together define the desired customer outcomes

(value propositions) of the service: service benefits, participation activities, emotional component, perception component, service process, physical environment, and people/employee (Fynes and Lally 2008). To define an innovative service concept, Bettencourt (Bettencourt 2010) recommends that a service firm should: focus creative energies on specific job and outcome opportunities; identify where the key problems lie in satisfying high-opportunity jobs and outcomes; systematically consider a diverse set of new service ideas to satisfy the opportunities; and build a detailed concept with service strategy and service delivery in mind.

Service concept is the principal driver of service design decisions at all levels of planning and implementation. It relates to service architecture or service blueprint which guides service design, and to service governance which defines the decision rights and the decision making process for service design, planning and implementation (Goldstein et al. 2002). For example, at the strategic planning level, the service concept drives design decision for new or redesigned services. At the operational level it defines how the service delivery system implements the service strategy and how to determine appropriate performance measures for evaluating service design. At the service recovery level, it defines how to design and enhance service encounter interactions. Thus service concept is the common foundation for new service development, service design and service innovation. For instance, service concept development and testing is at the heart of service design in new service development. Central to service conceptualisation is declaring what the customer value proposition is in relation to the firm's strategic intent, how it meets the customer needs and what is the service logic required in delivering the value proposition (Goldstein et al. 2002). Service concept articulates the service operation – why and how the service is delivered; the service experience – i.e., customer's experience; the service outcome – i.e., customer benefits; and the service value – i.e., the perceived

customer benefits minus the service cost (Clark et al. 2000). Service concept and the corresponding service design (described below) are intended to reflect the service firm's business strategy and therefore directly impact the firm's financial performance. From the perspective of service innovation (or new service development) process (detailed in Sect. 5.2) service concept is developed in the "Create Ideas" phase and selected for design in the "Evaluate and Select Ideas" phase (after experimentation), while the corresponding service design is developed in the "Plan, Design Develop and Implement Ideas" phase. However, in the digital world, the innovation process would tend to be circularly iterative akin to "agile (emergent) development" as opposed to a purely linear (predictive) manner.

3.2 Service Design

Service design starts with the customer/user and defines how the service will be performed using human-centred and user-participatory methods to model the service performance (Holmlid and Evenson 2008). A service is conceptualised as an open system with customers being present everywhere. Service design must address strategic service issues such as marketing positioning and the preferred type of customer relationship, in line with the strategic intent of the service organisation. Service governance is also required to monitor the service qualities and financial performance against the design outputs. The framework for designing the service delivery system must address multiple interrelated factors: standardisation; transaction volume per time period; locus of profit control; types of operating personnel; types of customer contacts; quality control; orientation of facilities; and motivational characteristics of management and operating personnel (Goldstein et al. 2002). The service delivery system fulfills the firm's strategic service vision and is designed/specified by means of service blueprinting (Bitner et al. 2008; Fitzsimmons and Fitzsimmons 2010). Service blueprinting is a map or flowchart of all the transactions constituting

the service delivery process. The map identifies: the potential 'fail-points'; the line of interaction between client and provider known as service encounters; the line of visibility – above it employees actions are visible to the customer (directly affecting customer experience); below it is the 'back-stage'; and the internal line of interactions below the line of visibility (Bitner et al. 2008; Fitzsimmons and Fitzsimmons 2010). The service encounter design is a critical element of service design, because from the customer's viewpoint "these encounters ARE the service" (Bitner et al. 2008). The design focuses on maximising the quality of 'service experience' by the customer. However, service experience is the result of the combined efforts of the 'back stage' information and processes and the 'front stage' customer handling – both must work seamlessly in unison in satisfying the customer request (Glushko and Tabas 2009).

Taking an end-to-end view of service process allows designers to analyse the stakeholders' requirements, pain points and performance metrics from which service design (or redesign for an existing service) could be developed in collaboration with the stakeholders incorporating a combination of changes across process, organisation, technology, and tool in an integrative manner (Maglio et al. 2006).

Service encounter design is guided by the possible relationships between the three parties in the service encounter: the service organisation (whether to pursue a service strategy of efficiency (cost leadership) or effective (customer satisfaction) or both); the contact personnel (following strict rules/order or empowered with autonomy and discretion); and the interaction between contact personnel and the customer (balancing conflicting "perceived control" by both parties) (Fitzsimmons and Fitzsimmons 2010). Technology could be designed into the service encounter in four ways: (a) technology-assisted service encounter – only the contact personnel has access

to the technology; (b) technology-facilitated service encounter – both the customer and the contact personnel have access to the technology; (c) technology-mediated service encounter – the customer and contact personnel are not physically co-located and their interaction is mediated through the (online) technology; (d) technology-generated service encounter – i.e., self-service, the contact personnel is completely replaced by technology (Fitzsimmons and Fitzsimmons 2010; Froehle and Roth 2004). Thus technological innovation in services could require a change in customer role in the service delivery process. Therefore it is critical to take into account the potential customer (as well as employee) reaction to the new technology in the design phase to avoid future problems of acceptance (Fitzsimmons and Fitzsimmons 2010).

Service design must include strategies for handling service variability to ensure sustained level of service quality expected by customers (Glushko and Tabas 2009). For instance, to manage an unexpected deviation from normal service encounter, the service design (per service strategy and governance) may incorporate the notion of service personnel 'empowerment' which grants them the discretion to recover from service deviation (failure) by offering 'compensations' or alternative solutions to the customer to minimise adverse impacts to the customer (Glushko and Tabas 2009). Moreover, where multichannel services are provided, the design must ensure consistent service experience across all channels. Finally, service design needs to incorporate the requirements of lean consumption (Womack and Jones 2005) and achieve the objectives of service profit chain (Heskett et al. 2008).

Design of a service system (which offers the service) similarly must address the roles of people, technology, shared information, as well as the role of customer input in production processes and the application of competences to benefit others. The design must also address the service systems' requirements for agility and adaptability in alignment with their environments (Spohrer

et al. 2007). A learning framework is necessary to sustain the firm's creative design ability, and improve and scale the service systems. The framework is designed to achieve three critical requirements: effectiveness – the right things get done; efficiency – things are done in the right way; sustainability – the right relationships exist with other service systems to ensure the system's long term sustainability (Maglio et al. 2009; Spohrer et al. 2007). Sustainability is achieved through the service system's (brand) reputation, because excellent reputations naturally attract value propositions from other service systems wanting to co-create value. It also requires appropriate amount of shared information to be available to all service systems (the principle of information symmetry) to enhance coordination and mutual sustainability within the service ecosystem. The design is however inherently challenged by the people factor, as people are complex and adaptive.

In sum, service system design, broadly, must address four variables: physical setting; process design – the service blueprinting or mapping which designs 'quality' into the service delivery system; job design – the social technical job design which include addressing the employee motivational requirements; and people – the staff (competence) selection (Goldstein et al. 2002).

3.3 Customer Experience & Value Creation

Customer experience requirements of each service type are usually analysed using use-case scenarios similar to that of service blueprint (Bitner et al. 2008; Patricio et al. 2008). Customer experience is influenced by the service intensity, which is defined in terms of the number of actions initiated by the service provider, or the amount of information exchanged in a service encounter or the duration of the service encounter (Glushko and Tabas 2009). The service design of multi-interface system must unify service management, human computer interface, and software engineering perspectives into an integrated

design embodying the customer experience requirements (Patricio et al. 2008).

Service organisations are increasingly managing customer experiences to promote differentiation and customer loyalty. The experience-centric service providers design the activity and context of the experience to engage customers in a personal, memorable way. The experience design must address the dynamic and ongoing engagement process between customers and the service organisation. The engagement can be emotional, physical, intellectual, or even spiritual, depending on the level of customer participation and the connection with the environment (Zomerdijk and Voss 2010).

Customer value creation process is a dynamic, interactive, non-linear and often unconscious process (Payne et al. 2008). Value is in the context of the performance outcome of the customer's resource integration practice. To ensure optimal value co-creation, the three contiguous processes: the customer value-creating processes; the supplier value-creating processes and the interfacing service encounter processes must all be aligned (Payne et al. 2008). The customer experience is a culmination of the customer's cognitions, emotions and behaviour during the relationship with the supplier. These elements are interdependent and involve the customer in thinking, feeling and doing – leading to customer learning – in the process of value co-creation (Payne et al. 2008). Indeed, a recent study by (Helkkula et al. 2012) showed that "value in the [customer] experience [is characterised] as an ongoing, iterative circular process of individual, and collective customer sense making, as opposed to a linear, cognitive process restricted to isolated service encounters." (p.59) More research is required on "the need for appropriate metrics for the cognitive and emotional demands" of customer experience imposed by different service interaction designs (Glushko and Tabas 2009).

3.4 Service Architecture

Service architecture is conceptualised to systematise service design and innovation. Leveraging concepts from product architecture, service architecture aims to create a common language (comprised of nodes and linkages) across different views on service design and a systematic way to operationalise and measure the degree of service architecture modularity (Voss and Hsuan 2009).

Service architecture is constituted in accordance with the principle of modularity, which in turn is characterised by five dimensions: components and systems as the basic modular units, the interfaces, degree of coupling, and commonality sharing between components, and platform as the overarching configuration of components and interfaces that makes up the product/service architecture (Fixson 2005). Modularity refers to the degrees by which interfaces between components are standardised and specified to allow for greater re-usability and sharing of (common) components among product/service families. It provides the basis for mixing and matching of components to meet the mass-customisation requirements; yields economies of scale and scope, and can help structure products/services to facilitate outsourcing. Platform strategies are the vehicles for realisation of mass customisation (Fixson 2005). As platform decisions often cut across several product/service lines or divisional boundaries, platform strategic decisions must belong in the top management team who need to and can resolve cross-functional conflicts to jointly-achieve the firm overall strategy.

An important and challenging aspect of service architecture is the interface. Interfaces in services can include people, information, and rules governing the flow of information. Service interface can also include the flow of people. In general, an active role in service customisation would be played by both the front-end employees and the customers themselves. This would suggest the service components need to be more

loosely coupled than product components (Roth and Menor 2003).

A service system can be analysed, for the purposes of service architecture, in terms of four levels of increasing details in specification: industry level, service company/supply chain level, service bundle level, and service package/component level (Voss and Hsuan 2009). At level 0, the industry architectural template defines the value creation and the division of labour as well as value appropriation and the division of surplus or revenue among the different players. At level 1, the service company and its supply chain(s) are modelled both upstream and downstream. Both shared (internal cross-functional) and outsourcing of service components are important consideration for the service company level for economic and resource flexibility reasons, in line with its business strategy. At levels 2 and 3, the service concept and service design activities of service innovation practice are harmonised and integrated to assure service agility. At level 2, the individual service bundles of the service offering at the company level are analysed – each bundle is viewed as a set of modules of service delivery, comprising the front- and back-office functions (and associated capabilities). At level 3, the service package and component level, the characteristics of the building blocks (components) are specified that contribute to the overall systems architecture, namely: standardisation, uniqueness, degree of coupling and replicability (Voss and Hsuan 2009). Thus, service architecture enables service agility as new services can be provisioned with minimal cost and little internal change, and the architecture can be dynamically adapted in response to external stimuli. But this would require support by a corresponding modular organisational architecture as well as IS architecture (Voss and Hsuan 2009).

4 Service Strategy & Business Model

There is a four-step approach to developing a successful service strategy: (1) Select the innovation focus, such as new service innovation or service delivery innovation, and the target customer

group(s); (2) Uncover customer needs in terms of jobs to get done and outcomes expected; (3) Prioritise customer needs; (4) Develop a service strategy (and attendant service concept) to fulfil the high priority customer needs (Bettencourt 2010). A successful service strategy fits what the customer will value with what the company can deliver. This means aligning the service concept (what it would take to deliver on the customer value propositions), and hence service architecture, with firm's capabilities, resources, culture and strategy.

Experiences of leading companies, such as Southwest Airlines, show that successful strategies would include: (1) close coordination of the marketing and operations relationship; (2) a strategy built around elements of a strategic service vision; (3) an ability to redirect the strategic service inward to focus on vital employee groups; (4) an appraisal of the effects of scale on both efficiency and effectiveness; (5) the substitution of information for other assets; and (6) the exploitation of information to generate new business (Heskett et al. 2008). In addition, six successful strategic practices have been identified for service commercialisation: (1) leveraging fundamental sources of value that influence shareholder wealth, (2) managing customers' perceptions of the service value proposition, (3) creating an attractive financial architecture for customising pricing for profitability, (4) ensuring service excellence in implementation, (5) planning for service recovery, and (6) managing the holistic service experience (including the servicescape) (Bolton et al. 2007). These successful strategic practices mirror the design of corresponding business model design considerations below and require superior collaborative competence. This is because it leverages the firm's dynamic capability to absorb information and knowledge from the environment, customers, and its value networks, and adapt the service to respond to dynamic and complex environments, while ensuring consistent superior customer experience at each service encounter point.

Strategy defines the choice as to which business model among many options to adopt for competition in the marketplace. Thus the chosen business model is a reflection of the service strategy – it represents the logic of the firm, the way it operates and how it creates value for its stakeholders (Casadesus-Masanell and Ricart 2010; Osterwalder and Pigneur 2005). Service business model defines the end-to-end service delivery activities, in accordance with the service concept, by which firms deliver value to customers, entice customers to pay for value, and convert those payments to profit (Osterwalder and Pigneur 2005; Teece 2010). It articulates the logic, the data, and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value. Business model embodies the organisational and financial 'architectures' of a business (Osterwalder and Pigneur 2005; Teece 2010). A business model can be conceptualised as a system of interdependent (service delivery) activities that transcends the focal firm and spans its boundaries, and enables the firm, in concert with its partners, to create value and also to appropriate a share of that value. The service business model is composed of two building blocks: (a) design elements – content, structure and governance that describe the architecture of a service delivery activity system (Level 2 and Level 3 of service architecture); (b) design themes – novelty, lock-in, complementarities and efficiency that describe the sources of the service delivery activity system's value creation (Zott and Amit 2010).

In sum, a service firm's customer value proposition crystallised by the service concept serves as the bridge connecting its service strategy and business model. The former defines the service concept and service delivery mechanisms (consistent with the service architecture) while the latter defines the revenue and cost models (financial architecture) of the selected activity system (in accordance with the service delivery architecture) designed to serve the targeted customer segments. Both practices tend to be pursued in

parallel and interactively due to their close inter-relationship. And both practices are required to create and sustain the competitive advantage for the firm.

5 Service Innovation Models and Process

Service innovation is about the creation of customer value (Grawe et al. 2009). The source of service innovation opportunities is from discovering how customers define value – for instance, customers hire products and services or solutions to get a job done; or use outcomes to evaluate success in getting a job done; and have distinct needs that arise related to the "consumption" of a solution (Bettencourt 2010). Four types of service innovation can be identified from the customer viewpoint: (1) New service innovation – discovery of new or related jobs to get done; (2) Core service innovation – helping the customer get a core job done better; (3) Service delivery innovation – improving the ways a core job get done; (4) Supplementary service innovation – helping the customer get jobs done related to product usage or consumption done (Fynes and Lally 2008). Service innovation can also be characterised by the degree of interaction with the customer and the degree of information asymmetry within the service relationship (Gallouj 2002). This section reviews the common, foundational service innovation (functional and competence-based) models and processes for creating all types of innovative services that help customers get their jobs done.

5.1 Functional Model of Service Innovation

Service innovation is often a result of a combination of conceptual, technological and organisational innovations combined with new ways of relating to the consumer (Hertog 2002). A commonly used functional model for identifying the focus or vector of a service innovation consists of four dimensions of service: (a) new service

concept – a new idea of concept of how to organise a solution to a job/problem in a given market; (b) new client interface – new information-centric (often online) personalised interface (Gallouj 2002) to facilitate service offering co-design, co-production and value co-creation with the clients; (c) new service delivery system and organisation in line with the firm's strategic service vision and new service concept; and (d) technology options – the specific role of technology selected¹ (Gallouj 2002) in the service innovation (Hertog 2002). Thus service innovation is a multi-dimensional phenomenon. A completely new service (radical innovation) usually means innovations in all the above four dimensions. On the other hand, incremental service innovation means innovation in one or more of the above four dimensions. Equally important is the need to address the linkages between these dimensions in order to implement the service innovation, as they represent the requisite marketing, organisational development and learning processes (human resource) (Gallouj 2002; Maglio et al. 2009; Spohrer et al. 2007) and distribution (supply chain/logistics) capabilities to realise the innovation. For example, launching a new service concept requires marketing expertise. The decision as to whether to develop new services requires organisational knowledge: the organisational capabilities required versus available and suitability of existing organisational structure to deliver the service (Gallouj 2002; Hertog 2002). Thus while service innovation may arise from changing one of the above four dimensions, it requires interdisciplinary collaboration between marketing, human resource, distribution and IT to bring about the change and take the innovation to market. In sum, each particular (type of) service innovation is characterised by the combination of the four dimensions: the weight of the individual dimensions and the relative significance of the various linkages between them

¹Use of technologies in service firms tends to follow the so-called "Barras reverse product cycle RPC" model – start with back-end then front-end process innovations and finally product/service innovation (Gallouj 2002).

(Hertog 2002). To co-create and capture value for the innovative firm, a new business model must be designed that reflects the operating and financial model of the service concept and associated linkages to the other dimensions (Teece 2010).

5.2 Competence-based Model of Service Innovation

There are three different approaches to defining and studying service innovation (Gallouj 2002): an assimilation or technologist approach, which treats services as similar to manufacturing; a demarcation or service-oriented approach, which distinguishes services (possessing the aforementioned IHIP characteristics) from manufacturing innovation; and a synthesis or integrative approach, which suggests that service innovation brings to the forefront hitherto neglected elements of innovation that are of relevance for manufacturing as well as services. The synthesis or integrative approach is widely adopted and it is congruent to the service-dominant (S-D) logic. The best known model of this approach is the Gallouj-Weinstein competence-based model (Gallouj and Weinstein 1997) that represents a product or a service as a system of (provider) competences (PC_i), technical characteristics (PT_i), and final characteristics (O_i), where the service outcome (O_i) is resulted from the interactions between the customer competences (CC_i) and the provider's competences (PC_i) and technical characteristics (PT_i). Service innovations thus consist of changes in one or more of these elements. Provider competences PC_i are then the direct mobilisation of service personnel competences (i.e., without any technological mediation). PT_i are knowledge, competences embodied in tangible (such as front- and back-office characteristics) or intangible (i.e., codified and formalised competences such as job analysis methods). A fundamental characteristic of service activities is client participation (in various forms) in the production of the service (Gallouj 2002).

5.3 Service Innovation Process and Management

Service innovation competence is a crucial operant resource for the firm's competitive advantage. Service innovation practice depends critically on a streamlined and flexible process for internal and external resource coordination and integration to achieve effective and efficient customer value co-creation. Service innovation process, also known as new service development, generally (Engel et al. 2006; Thomke 2003) consists of five phases:

- Create ideas – this phase defines the idea, its scope and business benefits
- Evaluate and select ideas – this phase prioritises the portfolio of ideas and develops the selected idea into a (low cost low risk) experiment to test its feasibility; go/no go decision is made quickly to speed up the chance of identifying a feasible idea (or conversely the rate of failures of infeasible ideas)
- Plan, design, develop and implement ideas – this phase takes the feasible idea through a rigorous service development lifecycle
- Commercialise the ideas – this phase launches the service
- Review the impacts – this phase reviews the results of the innovation to improve current performance and as a feedback for future process improvement

However, as alluded to in the design practices framework (Sect. 3.1), in the digital world this innovation process would not necessarily occur in a purely linear (predictive) manner, rather it would tend to be circularly iterative, akin to "agile (emergent) development".

Research on service innovations has highlighted the critical importance of the front-end stages of new service development: idea generation, idea screening and concept development – collectively known as the fuzzy front-end (Alam 2006). Customer involvements in the front-end stages of a service innovation process are important

so as to reduce the fuzziness (Alam 2006). Service innovation may be incremental for steady business growth – through exploitation of existing competences (O'Reilly and Tushman 2008); or radical for new growth idea (Anthony et al. 2008), which could become a new growth platform (Laurie et al. 2006) – through exploration of new competences/capabilities (O'Reilly and Tushman 2008). But the exploratory activities must be buffered from exploitative activities to ensure co-existence (Benner and Tushman 2003), creating a so-called ambidextrous organisation capable of both exploitative and exploratory innovations simultaneously.

Companies are also increasingly leveraging innovative ideas from outside the firms using an open innovation process (Chesbrough 2003). This means the firm needs to engage customers, partners, suppliers, regulators, and even competitors to co-generate creative ideas, co-produce service offerings and co-create value in a continual non-linear process of service innovation, which supports direct interactions with the customers to match innovations with customers needs (Chesbrough 2011). The aim of customer participation, as described in the next section, is to co-create a "unique personalised customer experience" (Prahalad and Krishnan 2008).

6 Customer Participation

Central to discovering service innovation opportunities is "knowing how customers define value" (Bettencourt 2010). As service value is always determined by the customer, new creative ideas must be developed from the customer's outside-in view (Edvardsson et al. 2007; Payne et al. 2008). Indeed, successful firms are co-opting customer involvement in service and value co-creation (Prahalad and Ramaswamy 2000). Customer participation is equally essential to both the 'old' physical and 'new' digital service worlds. However, involving customer in co-production of a service process is often confronted with conflicting design requirements. For example, scale-economy or efficiency requirements would demand service standardisation, while personalised

service experience requirements would demand service variability tailored to individual preferences. In general, customer participation is inherently a source of variability since each customer has different capabilities and must learn how to interact with the service process (Metters and Marucheck 2007). The concept of customer efficiency is therefore a critical requirement of service process design to denote the customer's ability to participate in self service or coproduce service (Metters and Marucheck 2007; Xue and Harker 2002) – for instance the user innovation toolkit (Hippel 2001). Similarly, customer variability is, thus, a design variable which can be managed to improve both service quality and efficiency (Metters and Marucheck 2007).

Firms compete through service by collaborating (i.e., co-produce offering and co-create value) with customers and network partners to enhance knowledge (Lusch et al. 2007). This requires the firm to possess absorptive capacity (Zahra and George 2002) in order to absorb new information and knowledge from customers and partners to comprehend from the external environments the important trends and know-how which, in turn, give them the ability to adapt/adjust to the complex, dynamic, and turbulent external environments. Firms that draw on the knowledge of their customer base can capitalise on customer competencies for use during the course of their innovation activities (Blazevic and Lievens 2008).

Customer participation or involvement in service innovation can take place at various phases of the new service development process (Alam 2006; Chesbrough 2011). Customer participation or integration can be conceptualised as the incorporation of resources from customers into the service development processes of a company (Moeller 2008). This would include participating in producing and delivering the service (Dong et al. 2008). Business has to develop an adaptive organisational model where customer involvement and innovation is persistent and inherent in the entire service lifecycle – such that the distinction between customers and employees becomes

blurred (Oxton 2008). This organisational model operates as a network of relationships based on the principles of alignment, transparency, identity (reputation) (Oxton 2008).

Customer participation towards creating personalised experience (Prahalad and Krishnan 2008) typically follows a five-stage iterative approach: 1) establishment of antecedent conditions for customer to participate; 2) development of motivations or customer benefits; 3) cost-benefit evaluation; 4) activation of co-creation process by choosing the stages of the "production-consumption" activity chain; and 5) evaluation of the effectiveness of the co-creation strategies against the cost-benefit analysis (Etgar 2008). It is prudent for the provider to institute a continuous learning process with the customer from the co-creation experience to improve their service-usage competence. Learning enhances the customer's competence in seamlessly integrating the value proposition with their lives, objectives and aspiration (Payne et al. 2008). Organisational learning about customer's value creation processes deepens customer insights. Organisational learning is a crucial process for nurturing the provider's collaborative competence to improve the provider's innovation capability and competitive advantage (Edmondson 2008).

The increased digitalisation of services in the internet era is creating new opportunities for knowledge coproduction between customers and the provider (Blazevic and Lievens 2008). In a digital world, customers may take on three different roles for knowledge coproduction—passive user, active informer, and bidirectional creator—each with distinctive declarative and procedural characteristics, and distinct impacts on the three innovation tasks of detection, development, and deployment (Blazevic and Lievens 2008). The digital world also facilitates customer participation in recovery from service failure. This may vary in degrees from firm recovery, joint recovery, to customer recovery (Dong et al. 2008). This would require higher levels of role clarity, but it also tends to enhance satisfaction with the service

experience, perceived value in future co-creation, and intention to co-create in the future (Dong et al. 2008).

7 Community-based Innovation

The advent of social media and clouds-based services has led many firms globally, as part of implementing their social strategies, to directly engage with their customers online across a broad range of activities (such as marketing, customer care, etc.) to co-create value for mutual benefits. This has evolved from a relatively straightforward traditional online customer service platform to a more sophisticated community based innovation (CBI) which requires a new set of organisational capabilities that interact and integrate with those of the customers themselves (Fuller et al. 2006).

CBI is defined as a new online service innovation process that fully engages the firm's customer community from ideation phase right through to the test and launch phase of New Service Development. The community members become the sources of new service ideas as well as the co-creators and evaluators of the service designs. The most common CBI user/customer archetype is called the "lead users" – who are highly knowledgeable of the firm's products/service and have 'job' (problem) needs that are ahead of all other user groups in a given market. Lead users are allowed to design (using interactive toolkits provided by the service provider) their own products/service by trial-and-error according to their wants and needs. Their creativity and problem-solving skills (competencies) using the toolkits (provider competencies) will produce the 'ideal' solutions to match their problems (the 'jobs' to be done) – for instance, Peugeot's "Retrofuturism" car designs were produced using CBI¹ (Fuller et al. 2006). Two other user archetypes are also common: the "insiders" who are strongly associated in the community and highly involved in the topic; the "devotee" who are highly involved with

¹www.peugeot-avenue.com.

the topic but not very much related with the community. CBI communities could be selected on the basis of the exchanged content, professionalism, traffic volume, and number of participants interacting with each other (Fuller et al. 2006). Users could be accessed directly or more often they recommend access via a trustworthy member of the community or via the webmaster to increase acceptance. Feedback to users on their input is regarded critical as is getting users' feedback on their participation experience and their willingness and expectations to participate again in future virtual product/service development projects (Fuller et al. 2006).

Community members engagement in CBI can be fostered and sustained in a three-step process: (1) understand consumer needs and motivations; (2) promote community participation, including encourage content creation, cultivate connections, and create enjoyable experiences; and (3) motivate cooperation, including mobilising member-leaders, inspiring idea creation and selection via a panel/polling (Porter et al. 2011). Community engagement is motivated intrinsically by the value created when community sponsors help user-members meet their needs with their virtual community. So the community sponsor's judicious and targeted efforts to encourage members to act in ways that create greater value for themselves and for the firm are crucial to success (Porter et al. 2011). Members' "embeddedness" (willingness to act in value-creating ways toward a community sponsor) and "empowerment" are seen to be fundamental to driving cooperative, engaging behaviour from the community members (Porter et al. 2011). This, in turn, would require the community sponsor to understand the needs of its community members, build trust with and create value for its members (Porter et al. 2011). CBI tends to focus on firm-community (one-to-many and many-to-one) collaboration. More recently, new social strategies are being proposed that seek to reduce company costs and/or increase customer willingness to pay by helping the community to meet online and

strengthening their relationships – that is focus on many-to-many social activities between community members as exemplified by eBay's Group Gift (Piskorski 2011).

8 Strategic Management for Innovation Success

Innovative service firms have strong commitment to innovation from top management backed by well structured innovation processes and governance together with the aligned culture and systems, and the attendant prioritised resources allocated to innovation efforts. In service innovation "it is not the service itself that is produced but the pre-requisites for the service" (Edvardsson and Olsson 1996). Due to services' real-time production, new service development would require modifications of the service delivery process and changes in frontline employees' skills. This would require strong fit between the new service and existing systems; and close alignment between the customer-service-focused front-end and the operational-excellence-focused back-end systems.

But despite its strategic importance, service innovation is notoriously difficult to accomplish (Dorner et al. 2011). This could be attributed to such managerial deficiencies as: lack of ability to protect services hinders investment; lack of clear "organisational anchoring" of service innovation activities; lack of systematic innovation process; lack of customer participation; and "bad ideas not consistently eliminated" (Chandy and Tellis 1998). So managers need to be vigilant in all innovation stages to assess ideas against the company's strategic goals and market needs in order to determine their commercial viability. Further, managers need to focus on people (evolving competences in line with changing customer value expectations) and structural support (systematic new service development process supported by specific innovation tools, multi-disciplinary teams, the availability of resources, market testing and market research) to ensure successful service innovation (Dorner et al. 2011).

Service innovation is technology-enabled but more human-centred and process-oriented. Therefore, the "envisioning, energising and enabling" capabilities, sound communication/coordination, and reducing intra-organisational conflicts and power struggle have been identified as fundamental and very critical for new service development to minimise organisational inertia/resistance (Nijssen et al. 2006). Innovative firms commonly possess "willingness to cannibalise" mindset and capability – i.e., willingness to make obsolete its existing products/services, prior investments, and/or existing organisational capabilities (Chandy and Tellis 1998; Nijssen et al. 2006). These innovative organisations are said to possess ambidexterity capable of pursuing simultaneous exploitative and exploratory innovations. An ambidextrous organisation "requires a coherent alignment of competencies, structures and cultures to engage in exploration, a contrasting congruent alignment focused on exploitation, and a senior leadership team with the cognitive and behavioural flexibility to establish and nurture both" (O'Reilly and Tushman 2008).

9 Conclusion

Service innovation is focused on creating customer value, and service is about relationship with the customer. Customer co-creates value with the provider by integrating his/her competences/capabilities with those of the provider. Thus customer productivity is as important as that of the provider in service provision as it impacts directly the service experience. Increasingly, in a digital world, customer and member-community participation across the firm's entire service innovation lifecycle is becoming a critical innovation strategy for sustained value co-creation. It has become a core and distinctive organisational capability for service organisations to develop and adapt in line with the evolving external environments and the customers' increasingly mature service competences.

Service innovation is technology-enabled but more human-centred and process-oriented. This

is accentuated by the design practices framework for service innovation which serves as a foundation for systematic service conceptualisation, design, architecture and innovation. Service innovation commercialisation is contingent on mindful alignment of the firm's service strategy, service concept and business model. Firm needs collaborative, absorptive capacity and dynamic capabilities (including organisational learning processes) to continuously adapt its service innovations with the changing external environments including the value networks to which it is connected. From strategic management perspective, the firm needs to be ambidextrous capable of pursuing exploitative and exploratory service innovations simultaneously to create sustained value for itself and its customers.

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