

Revisiting PSS and service design in the light of the SD-logic

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Abstract

Researchers and practitioners have increasingly recognized the importance of offering value propositions to customers that enable value co-creation as discussed in the service dominant logic (SD-logic). SD-logic recognizes customers as active co-creators and posits that products and services are only *means to an end*. Also, different approaches, methods and tools have been developed to design value propositions however they still lack to explicit the SD-logic principles. The design of solutions that provide value-in-use is at the centre of both Product Service System (PSS) approach and service design (SD). Whereas PSS focuses on designing required functions and aims at sustainability, embedding a more organization-centred approach and problem-solving way of thinking; SD adopts a more human-centred perspective for creative enquiry and focuses on the customer experience, orchestrating interactions between different actors that engage over time, in a complex socio-technological environment. Although SD becomes more established as a discipline, it tends to focus on the early stages of the design process and could further expand its impact if integrated with current organizational innovation approaches. Moreover, PSS design is currently well known in industries and similar principles may be shared among these disciplines. However, so far, these approaches have not been fully integrated. This paper analyses the PSS and SD approaches in light of the SD-logic. It attempts to provide a more comprehensive discussion about these two approaches and proposes a conceptual framework for integrating PSS organizational point of view; and SD human-centred focus to design better service.

KEYWORDS: service design, product-service systems design, service dominant logic

Introduction

The recent development of the service dominant logic (SD-logic) literature reframed service and recognized the customers as active actors that integrate and combine resources to co-

create value (Vargo & Lush, 2014; Vargo & Lush, 2008). From this perspective, customers' roles are evolving from passive recipient to active co-creators of their own service experiences. Although SD-logic contributes to understand the what, how and by whom value is co-created, its high level perspective is difficult to *operationalize* (Wetter-Edman et al. 2014). Recent development in the service design and service innovation literature integrated the premises defined by Vargo & Lush (2008), to form a co-creative and human-centred view of the SD-logic; however such approach remain only partial (Maffei et al. 2005) and could further be integrated with organizational approaches to design new and/or better service. Also, SD-logic posits that value is only determined by customers, in the use-stage of the design process (Vargo & Lush, 2014). As such, companies provide potential value propositions (Grönroos, 2011) and should look for new ways to stimulate longer-interaction with their customers by evolving their design process, business directions and service offerings (Oliva & Kallenberg, 2003), while better incorporating reflections about design thinking practice (Kimbell, 2011a; 2011b). As a consequence of the product-saturated developed world, organizations started to servitize combining services to product offerings (Baines et al. 2007; Baines et al. 2009); and working within larger organizational networks and partnerships (Manzini et al. 2004). The Product-Service System (PSS) approach (Baines et al. 2007), is currently well-known in manufacturing industries; and aims to provide functionality and performance to customers through integrated offers. However, organizations acknowledge that they need to better understand what value is, from their customers' perspective (Baines et al. 2009).

Similarly with Kimbell (2011a; 2011b), this paper recognizes that different approaches to conceptualize service design exist; and focus on the analysis of two of these approaches and their understanding of design to better incorporate service in industries: the product-service system (PSS) organization-oriented approach, and the service design human-centred approach¹ in the framework provided by Kimbell, 2011a). Regardless of their distinct roots, PSS and SD characteristics should be further explored in the light of the value co-creation concepts put forward by the SD-logic. Contributions can be two folded: first, the analysis may provide important findings to better understand design and designing within different context. Acknowledging the differences and complementarities of the approaches may provide richer interpretations; and two, verifying the relation of the PSS and SD to the SD-logic can support the creation of a more unified/integrated vision of the design thinking process that better leverage user- and organizational- co-creation perspectives. To achieve such aims, the paper analyses PSS and SD characteristics, methods and tools; and provides a comparison of the SD-logic value co-creation concepts within those fields.

This paper is organized in five sections. First, a brief introduction to the SD-logic is provided. Then, PSS and SD approaches are reviewed. In section three, the SD-logic concepts are discussed and compared with the design approaches selected. The reflection and discussion section makes an overview of the main results and proposes an integrated view of the PSS and SD approaches with the SD-logic perspective. The last section presents implications for theory and practice.

¹ In this paper the terms SD or design for service (Meroni and Sangiorgi, 2011) to refer to the human-centred design approach of service design

SD-logic as the driver for change

Customers are more demanding and want to find new ways to service their personal needs, either through the means of products or services; to co-create value and reach satisfaction as well (Michel et al. 2008; Manzini & Vezzoli, 2003). Service are expanding worldwide and are claimed to bring economic, marketing and competitive advantages to organizations (Oliva & Kallenberg, 2003). As such, organizations are becoming more interested in incorporating service in their offerings.

For several decades, services have been characterized as different from products. The IHIP was the best known and used model whenever characterizing services was required (Edvardsson, 2005). However, it has been criticized since it describes services according to what they are not; and doesn't reflect what services are in practice (Wetter-Edman, 2009). Moreover service research should focus on differences in how to portray value creation with customers; and not on the differences between goods and services since it limits its potential (Edvardsson, 2005).

SD-logic. Recent developments in service research and marketing emphasized services' value co-creation nature. For Vargo & Lush (2008) services require the application of specialized competences through deed, processes and performances for the benefit of another entity or for the entity itself; and launched what they called the *service-dominant logic*. SD-logic provided a new root to emphasize the customers' role in co-creating value-in-use and -in-context, to improve his/her systems' adaptability and survivability by integrating operand (e.g. knowledge and skills) and operant (e.g. products) resources in different ways (Vargo & Lush, 2008).

SD-logic consists of a radical change and fundamental new perspective to value co-creation between service systems (Vargo & Lush, 2008; Vargo et al., 2008). SD-logic attempts to clarify how value is co-created and stresses the importance of the customers' role in the value co-creation process. Vargo & Lush (2014) highlight that customers are always value co-creators, which indicate that organizations *per se* cannot create value, but rather co-create it with their customers and other actors (stakeholders). Organizations have the opportunity of co-creating value in their customers' sphere of processes and activities (Grönroos, 2011; Vargo and Lush, 2014). As such, firm-focus approach; as the roles and responsibilities in design process must change.

Towards an integrated approach to explicit SD-logic principles. SD-logic axioms discussed by Vargo and Lush (2014) provide a high level perspective of service however there are some difficulties for achieving implementation (Wetter-Edman, 2009). Recent work attempts to integrate SD-logic guidelines with more practice-based disciplines such as service design (Wetter-Edman, 2014). However, design researchers acknowledge that the creative and human-centred approach of service design should find synergies with current organizational innovation approaches (Sangiorgi 2009; Maffei et al. 2005) to have greater impact in companies and further expand the boundaries of the discipline.

Organizations acknowledge that the commoditization of markets makes current differentiation strategies (product innovation, technological superiority, low prices) more difficult to maintain (Michel et al. 2008), and want to evolve their strategies to compete, adapt; and stay relevant. As such, researchers and practitioners developed strategies to servitize companies; and their offerings as well. Servitization and the product-service system design (PSS) approach are currently well-known in industries however they acknowledge that value-perception of PSS offerings could better match customers' needs (Baines et al. 2009)

and further integrate their experiences. As such, PSS could benefit from the co-creative view of SD and the systemic view of the SD-logic perspective.

Approaches to conceptualize service design

This section focuses on analysing servitization in manufacturing, the PSS design and the service design approaches which are concerned with value-in-use for customers; however from quite different perspectives. It analyses the disciplines' backgrounds; as their methods and tools.

Servitization. Servitization is currently well known in the manufacturing industry; and can be defined as a transition process (Oliva & Kallenberg, 2003; Baines et al. 2009) where companies adapt and systemize their competences; and create value by adding services to their products (Baines et al. 2009) thus providing a combination of components named product-service systems (PSS). Oliva & Kallenberg (2003) assert that organizations evolve their strategies progressively, depending on the product technology and customers' adoption maturity as well (Oliva & Kallenberg, 2003; Kujala et al., 2010). One well-known strategy for servitization consists of consolidating existing product-related services; entering the installed base service market; expand relationship and/or process-centred services; and progressively take over end users' operations (Oliva & Kallenberg, 2003). The authors propose a shift from transaction- to relationship-based interaction with customers; evolve contracts from short- to long-term; and focus design activities based on the end-user processes and improve product-efficiency and effectiveness. However, it should be noted that general PSS approaches adopted in product-focused industries tend to result in deepening specialized technical knowledge, or developing special competences for operating complex products that would have high costs in terms of operational failure (Tukker, 2004; Tan, 2010); as such the customers' participation in the co-creative activities become less evident. Their problems are framed and established as *to-be-solved* by organizations.

Product-service systems background. PSS is closely related with servitization and is defined as products and services combined in a system to deliver required user functionality, or value-in-use, while using resources more efficiently (Baines et al., 2007; Baines et al., 2009). PSS first evolved with a strong environmental and operational mind-set. As such most contributions emerged in journals related with cleaner production and sustainability (Baines et al. 2009; Beuren et al. 2013). There are different types of PSS (product-, use- and, result-oriented; Tukker, 2004). Product-oriented PSS are focused in product plus add-on service offerings (e.g. maintenance, repair); Use- and result-oriented PSS are focused in providing the required functionality or performance to customers. As such in these latter PSS offerings, the product component remains in ownership of the company; whilst customers only pay for the usage or performance. Use- and result-oriented PSS are said to have more potential to reduce environmental impact while bringing higher value to customers.

PSS methods and tools. Over the past decade several researches on designing PSS have been developed, resulting in methods and tools and contributions of different fields of knowledge to design solutions. As the researchers of PSS come from a typical cleaner operations background, most approaches identified aim to increase products life cycles by adding services and improve product function availability, efficiency and performance when being used in-context (e.g. Xerox paper management system, Rolls-Royce's Power by the hour availability contracts) (Baines et al. 2007).

The Total Care Product (TCP) (Alonso-Rasgado & Thompson, 2006) integrates product and service design process to develop TCP, starting with marketing assessment, concept development, system design, test and implementation (Alonso-Rasgado and Thompson, 2006). The authors propose to use Quality Function Deployment to relate customer needs to product requirement and service attributes; and activities to be undertaken by the company as well. The concept design stage begins once the customer requirements have been ranked, enabling to sketch attributes, functions, product and services. Also service testing is undertaken in the latter stages of the process so customers can have a better idea of the proposed service. They propose a fast-track design process that clarifies the customer-supplier interactions to add value to the product in the early stages of the design process (business ambition, business solution package, core definition of the offering, product modelling; and risk assessment) (Alonso-Rasgado & Thompson, 2006).

The MEPSS method proposed by van Halen et al. (2005) is a systematic and strategic method that starts by analysing the company's resources and, progressively, tries to eliminate "waste"; and identify the most promising alternatives to optimize the product-use by engineering and system behaviour analysis. Similar with the TCP, the MEPSS' main stages consist in making a strategic analysis, exploring opportunities, develop ideas, develop the PSS solution; and prepare for launch (Halen et al., 2005).

Although these approaches have their merit, they tend to emphasize the good-dominant logic for designing solutions; and reflect the dyad relationship of customer and suppliers. Customers' role tends to focus on providing insights; or testing solutions, which also was interpreted as limitative. Later PSS research acknowledge customers' acceptance of PSS as a challenge. Rexfelt & Örnas (2009) developed a method based on activity theory that aims to inform about the customers' perception of PSS solutions to reduce uncertainties regarding acceptance. Their framework consists in understanding desirable and undesirable activities. PSS solutions are refined according to what customers want to be *enabled to* or *relieved to* do. Although the approach has the merit of observing customers more closely, they are still viewed as providers of insights or testers.

Also, authors emphasize that current PSS approaches may tend to result in cutting-edge technology (product and process optimization) but PSS radical innovation shouldn't necessarily lie in techniques but rather in the way more-or-less existing technologies can be systemized (Manzini & Vezzoli, 2003). Other contribution coming from the service design field suggest to analyse PSS from a more systemic approach; and propose collaborative approaches (build and reconfigure partnerships) to use resources more efficiently, throughout product's life cycle (Manzini & Vezzoli, 2003; and Manzini et al., 2004; Morelli, 2002; Morelli, 2006). Manzini & Vezzoli (2003) identify three classifications for PSS evolution: services providing added value through product life cycle; services providing final results to customers; and enabling platforms for customers (e.g. car sharing). Also, Morelli (2006) focuses on the service-network component to the PSS field. The proposed tools identified aim to design alternative scenarios (map of network of actors, hypothesis generation; and use cases) and the resources required for successful solution delivery (stakeholders' matrix) (Morelli 2006). The focus of this work however, is on analysing service stakeholders (or actors) and their capabilities, rather than on the integration of customers' experiences, resources and requirements in the design process.

Overall, PSS design methods tend to reflect a dyad relationship between customers and suppliers. Despite later research emphasizing an actors' constellation perspective to design solution, the customers' experiences, resources and requirements can be further integrated in

the design process to design better product-service solutions, and systematize the process to design for value co-creation as well.

Service Design background. SD is defined a multidisciplinary, creative, human-centred discipline focused on analysing, envisioning, designing and iteratively refining the quality of a service by analysing and designing the interactions between its tangible and intangible elements (product, technologies, people, and structures) to create alternatives ways-of-doing (Manzini 2009), bringing ideas to life (Patrício & Fisk, 2013) and transform determined situations into preferred ones (Simon, 1969).

SD is a discipline that slowly evolved from the interaction design and established itself as an ordinary practice (Holmlid, 2009); and now merges design disciplines (interaction design, product design, design ethnography) with service management, marketing, operations (service backstage) and information systems (Patrício & Fisk, 2013). The discipline is broadening its scope and deepening its knowledge; and has developed tools and methods that explore actor-to-actor, actor-to-system; and system-to-system interactions (Sangiorgi, 2009). SD adopts a fundamental user-centred and participative approach to design for service (Holmlid, 2009); and has been developing methods and tools to better reflect customers' experiences in the design process. The next paragraphs discuss some of those methods.

SD methods and tools. SD is a discipline steamed from practice and has evolved methods and tools able to express important characteristics that facilitate, through creative and visual-thinking tools, the prototyping, test and refinement of service experiences (Stickdorn & Schneider 2012). Scenarios, storyboards, customer journey, use case, persona, experience prototype, among other tools contribute to visualize and test the service experience from the user point-of-view and to understand the detailed specifications required for co-creating experiences (Stickdorn and Schneider 2012). Also, other works on SD focuses on customers' experience and system perspective.

Teixeira et al. (2012) propose the Customer Experience Modelling method (Teixeira et al. 2012) to represent the different aspect of the customer experience through a diagrammatic representation. It enables to understand customers' experience by integrating and providing a holistic view of customer's flow of activities, contextual elements (artefacts, services and systems) and requirements. Also, by focusing on the analysis customers' tasks and operations through Activity Theory (Mickelsson, 2013); and understanding of customers' experiences, problems and needs, the Multi-level Service design (MSD) Method (Patrício et al., 2011) improves the connection between customers' experience and SD components in three levels: the service concept (what is the offering), service system (which resources are needed) and service encounter (how are they connected) (Patrício et al., 2011).

Service concept definition evolved to reflect more than the supplier view of the service (core and supplementary service); to encompass a network of actors that exchange service-for-service to provide benefits or value (Vargo & Lush, 2014). Although the service concept is a central aspect of service design, there is a limited attention regarding a practical design method to define it (Goldstein, 2002).

Also, SD is defined as partial approach (Maffei et al., 2005; Alonso-Rasgado & Thompson 2006) and tends to focus on the early stages of the design process (Yu & Sangiorgi, 2014). To be effective and further expand in industry, it should be integrated with existing organizational contemporary innovation perspectives (Maffei et al., 2005) to form a coherent approach to design value propositions for value co-creation.

Comparing SD-logic concepts in PSS and Service design literature

As mentioned earlier, the SD-logic axioms defined by Vargo and Lush (2014) clarify the nature of value co-creation; and four fundamental concepts extracted from those axioms can be further discussed: value, co-creation, resource integration; and actors and service systems' roles. This section discusses the concepts and reflects on how they echo on PSS and service design approaches.

Value. In SD-logic value is only determined by the beneficiary of the service (Vargo & Lush 2004). Value is the result of an interaction between customers with a service that translates into being or feeling better off than before (Grönroos, 2011). In PSS literature, value is determined in terms of value-in-use (Baines et al, 2007). As explained in the previous chapter, PSS' offerings focus in delivering performance and functional value (Sandström et al., 2008) as efficiently as possible (Baines et al. 2009). Moreover, other types of value (mental value as explained in Grönroos, 2011; Sandström et al. 2008) are left evident in PSS design. In SD, the value emerges as a result of a service experience which is determined from the customers' point-of-view (Meroni & Sangiorgi, 2011). SD attempts to capture knowledge about customers' emotions and activities as well (Mickelsson, 2013; Wetter-Edman et al, 2014; Meroni & Sangiorgi, 2011) to better understand individuals' experiences and qualities (Wetter-Edman et al, 2014) which shape their perception of value. SD is inspired from that information to co-create new propositions.

Co-creation. SD-logic posits that value is co-created between different actors and service systems; and that customers are always part of the co-creation process (Vargo & Lush, 2014; Vargo et al. 2008). As such, companies can only make *potential*-value propositions that may become *real-value* if used in-context by customers (Vargo & Lush, 2014; Grönroos, 2011). In PSS literature, co-creation is not used explicitly. It may be used to refer to customers' participation in ideation sessions or workshops, to share ideas and insights in the early phases of the design process; or testing/refining the solutions. Also, PSS focus on functionality and performance tend to result in approaches focused in optimizing life cycle analysis; engineering and delivery processes; stakeholders' reconfiguration which are design activities that may not require involving customers. Similarly to SD-logic, SD approach adopts a fundamental human-centred perspective. It evolved participative techniques such as card games, role playing, and narratives, among others (Stickdorn & Schneider, 2012) to engage in a dialogue with customers and bring their experiences to the creative process (Wetter-Edman et al., 2014). Recent studies suggested customer participation to extend beyond the service process, involving them in learning and experimenting; engaging in active dialogue, collaboration, co-development with sellers (Mustak et al. 2013). As such, SD approach considers customers as active co-creators of their own experiences and empowers them through participation (Wetter-Edman et al. 2014).

Resource integration. SD-logic posits that value is co-created through resource integration. Actors can co-create value by applying either skills and knowledge on products, services or systems to exchange service-for-service (Vargo & Lush, 2014). PSS literature tends to focuses on the analysis and reconfiguration of organizational competencies (e.g. stakeholders' map); and the combination of products and services (resource integration) to deliver value. As such PSS still somehow, considers that static resources embedded with "frozen knowledge" that producers create and deliver which reflects the dyad interaction between firm and customers (Michel et al., 2008; Vargo & Lush, 2014). In SD approach resource integration happens during the use- and designing stage as well. It focuses on

peoples' lives and problems to stimulate their willingness to integrate their resources; engage in the co-creation and co-production process to image future systems (Wetter-Edman et al. 2014). It also aims to increase their resourcefulness (Grönroos, 2011), which is their ability to use the resources they have available to co-create value.

Actors, systems; and roles. In SD-logic, actors are all resource integrator (Vargo & Lush, 2004). PSS adopts an organizational constellation perspective. Stakeholders' motivation matrix; actors network (Morelli, 2009) techniques; or the Solution-oriented Partnership Methodological Framework (Manzini et al. 2004) are useful to understand the customers' situation, which partners may participate in the design and delivery of solutions, what is expected from them; and exploration of solution platforms. However, those solutions may not always result in more active customers. Solutions may enable or unable them to take action (Rexfelt & Örnas, 2009; Michel et al. 2008). SD acts upon a continuum where customers' participation evolves from consultation to active co-production activities (Wetter-Edman et al., 2014) and become conscious and active participants of the SD and delivery processes (Meroni & Sangiorgi, 2011). Recently in SD literature, the term user-centred, progressively evolved to human-centred design to consider the role of larger network of actors which go beyond the user (Meroni & Sangiorgi, 2011).

Reflection and discussion

Main overlaps and differences. The previous chapter described how S-logic concepts were understood in PSS and service design literature. Table 1 provides an overall comparison of the design approaches. As discussed, both approaches are concerned with the value-in-use for customers; however it echoes from different points-of-view.

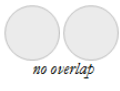



	Service design	PSS	Overlaps Service Design / PSS	
<i>Value</i>	Value is defined as the result of a memorable service experience to customers	Value is defined in terms of value-in-use; focused in offering outputs (functions), while using natural resources more efficiently	Both are concerned with value-in-use. Whereas Service design focuses on the human component (emotions); PSS focuses on the functions provided	 <i>no overlap</i>
<i>co-creation</i>	Customers actively participate in the design process; they are considered fundamental	Co-creation occurs within organizational value networks; and may or may not include customers	Both are concerned with customers participation in the design process; however the purpose of service design is to empower; whilst in PSS is to serve (may lead to more passive customers)	 <i>somewhat overlap</i>
<i>resource integration</i>	Encourages customers to reflect upon, develop and use their own activities, knowledge and skills; and enable them to act in-context	Acknowledges the competencies of the value network from an organizational perspective; integrates operant resources (products, softwares) to create the offering	PSS tends to focus on competencies from a organizational perspective and <i>objectified</i> resources; service design studies customers' skills and knowledge (people's resources) to co-design and co-create future systems	 <i>slightly overlap</i>
<i>actors and systems' roles</i>	Studies users/customers activities, and interactions within their socio-technological world; attempts to empower them and develop more active roles	Organizational networks provide more-or-less integrated offers that may or may not require customers to be more active	Both acknowledge the complexity of networks; PSS organizational approach to design offerings may or may not take over some of the customers' activities; which may lead to less active customers	 <i>somewhat overlap</i>

Table 1. Comparison between PSS, S-design approaches through the SD logic

For PSS, *value* is about delivering a function (Baines et al. 2007); whilst in SD, the focus is on providing usable as well as pleasurable experiences (Wetter-Edman et al. 2014). *Co-creation* somewhat overlaps since customers are considered in the design process of both approaches; however PSS aims to analyse customers to better serve them; whilst SD aims to empower. *Resource integration* in PSS starts with a more strategic and organizational perspective. After

defining the function-to-be-delivered, PSS studies networks competencies; and sort of *leans* the product-service production and delivery processes to design an efficient system. The SD approach starts with people's experiences, activities; as well as their beliefs and dreams to increase their willingness to integrate their own knowledge and skills. SD-logic considers *actors* are all resource integrators. PSS adopts a partnership perspective, where predefined partners join efforts to tackle customers' problems; however the solutions may not always result in enabling platforms for customer. SD considers users as humans in context; that should be enabled and empowered to better serve themselves. In SD, actors are conscious and active participants.

Presenting an integrated framework to design for value co-creation. Further integration is required to better support the integration of product and service components, business processes and activities between actors and networks. PSS can be developed with different focus on business decisions, product planning and life cycle; and detailed design. As such, while designing PSS four levels should be considered (Tan, 2010) (figure 1). Also three dimensions of SD were identified (figure 2).

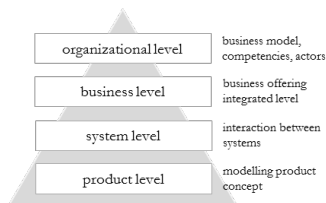


Figure 1. Dimensions to be considered whilst designing with a PSS approach (adapted from Tan, 2010)

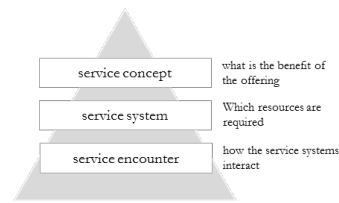


Figure 2. Dimensions to be considered whilst designing with a Service design approach (adapted from Patrício et al. 2011)

The framework presented in figure 3 attempts to better integrate the different contributions discussed so far; and is further discussed below.

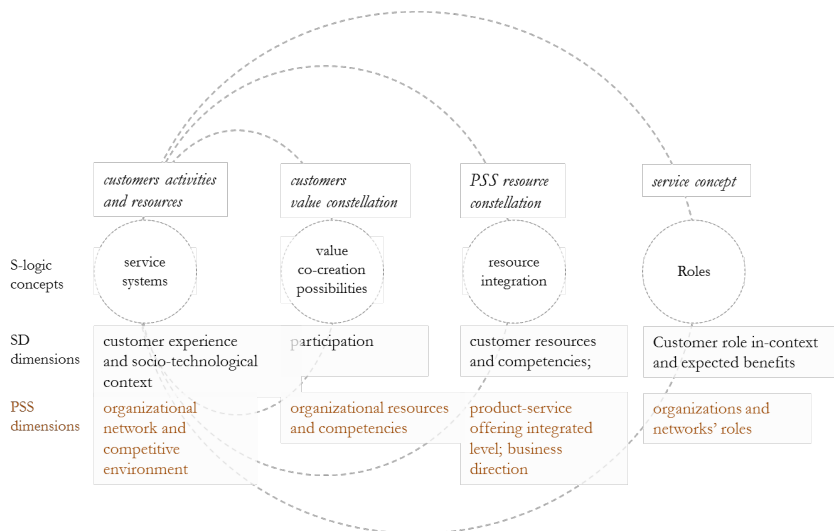


Figure 3. Proposed integrated approach for S-logic implementation

Explore systems and customers' resources. The framework proposed starts by understanding customers' context, activities, experiences, problems; and resources they have and how they use them. The initial stage is an important not only to reflect upon resources but also in resourceness (Grönroos 2011; Vargo & Lush, 2014) of customers as well (their ability to apply what they know to what they have available, to improve their well-being).

Understand and envision new value constellations. Customers can contribute with more than just “insights” for product/service development or usability test for evaluation of an offering. SD considers customers as “experts of their own experiences” (Sander & Stappers, 2008); as such they should be enabled to reflect on their own experiences through participatory and co-creation approaches (e.g. design probes, design games, storytelling, narratives). Customers will share knowledge based on what they have already experienced, and should be asked to share the expected outcomes of the new solution from their point-of-view (Ulwick, 2002; Verganti, 2013). Organizations specialized knowledge should complement customers’ resources; *what if* scenarios or prototypes should be stimulated to provoke divergent thinking.

Explore PSS resource constellation. SD-logic removed the need to distinguish between products and services; and instead proposed to look at solutions as a form of value-in use however such perspective requires to be operationalized. The PSS resource constellation is the interplay between value-in-use as defined by customers, and how they might be realized through means of operand or operant resources (product, services or systems). Customer, organizations and beneficiaries of the solution integrate their resources and competencies; the integration level of the offering, such as the business directions is discussed. Companies can provide more-or-less integrated offers depending on the activities that customers want to be enabled or relieved to do. New tools should be developed to further integrate customers’ and organizations’ resources; and explicit actor’s roles.

Define service concept. At this stage, the service concept is defined. In sD-logic, actors are all part of service production and delivery processes for value co-creation. As such, designing requires active collaboration between actors. The expected benefits and roles should be clearly defined for both organizational network, and for customers as well. Customers can expect more benefits within network if provided value propositions that enable value co-creation. As such, more than continuous refinement of efficiency, companies should work more collaboratively; and enable adaptability within networks.

Conclusions

Theoretical implications. PSS and SD approaches have different origins but are both concerned with value-in-use. As such their characteristics, gaps and complementary were discussed and a conceptual framework was presented. The framework hopefully contributed to better understand how to provide a higher integrated systemic value to customers through efficient resource integration (products-services and knowledge) and in ways that could be more meaningful for both organizations network and customers. In the framework presented, SD-logic enables to better understand what is value; how it is created and by whom. SD participatory and human-centred approach allows to better understand and involve customers in the design process, enabling them (and organizations as well) to understand how their competencies can co-create value in meaningful ways. Finally PSS provides the organizational and business perspective of solutions. PSS allows operationalizing the principles of the SD-logic and service ideas of SD into concrete products and services, from an integrated perspective.

Practical implications. Industries have long been working on transactional-interactions with their customers. As such their design process reflects a *one-way road*, with some feedback loops, when it comes to testing the solutions (e.g. user as tester and provider of insights in

the later stages of the design process). Moreover, service literature tends to focus on analysing and evaluating services in isolation or from a dyad perspective (van Riel et al., 2013; Jaakkola et al., 2015); as such further studies are required to analyse and propose new organizational product-service design approaches when it comes to designing product-service system offerings to enable value co-creation.

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