

Product-Service Systems across Life Cycle

Understanding the conditions of separation for an integrated organizational setup – PSS divisional boundaries in the light of heterogeneity and duality theories

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Abstract

Determined by an integrated value proposition PSS constitute a unique organizational setup that is pivotally grounded in the co-existence of integrated but yet separate product-, service- and customer sub-systems. In order to benefit from the variety of available skills, competences and knowledge resources, PSS try to arrange sub-system boundaries most permeable, thus striving for the highest possible level of integration. At the same time, PSS decrease the level of divisional separation towards a minimum. However, the relation of integration and separation needs further analysis in the light of organizational theory. While recognizing the need for increasing integration towards product&service co-designed, customer integrated solutions, research also claims that a separation-typed setup determines the crucial resource configuration that is needed for novel problem-solving approaches in PSS. More precisely, it is said that the upholding of a minimal threshold between separated organizational elements secures sufficient tension between established organizational thought-worlds which again may initiate processes of organizational learning and renewal. The contradictory nature of decreasing while also pertaining separation under the umbrella of an integrated organizational setup raises the need for a nuanced understanding of how boundaries within PSS form an important area of operation for the dynamic balancing of divisional knowledge transfer versus identity-shaping. With reference to the organizational development process towards a fully integrated PSS this paper presents suggestions about how PSS can design minimal threshold for a mutual but fluid co-existence of product-, service- and customer sub-systems.

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1. Introduction

Determined by an integrated value proposition PSS constitute a unique organizational setup that is pivotally grounded in the co-existence of mutually dependent and integrated product-, service- and customer sub-systems [1,2]. It is claimed that it is exactly the rich heterogeneity of this setup that provides the variety of skills and competences to sustain customized and innovative solutions [3,4,5]. By designing a PSS organizational setup that successfully integrates product-, service-, and customer sub-systems the transfer of information

and knowledge secures a common knowledge base in order to fuel innovative capacities and to constitute the adaptive value-co-creation for changing customer needs [6,7]. Consequently, this setup calls for an optimized degree of the permeability of PSS boundaries and a decrease of divisional and functional separation [3]. Following this line of argumentation the level of integratedness becomes a crucial determinant of what PSS is in the light of organizational theory and what benefits may arise from its unique organizational setup [3,8]. At the same time, literature also points to the fact that PSS should be set up to orchestrate mutually dependent but yet separate product-,

service- and customer subsystems [2,8,9]. This need for separation becomes a crucial factor of organizational renewal and growth as PSS aim for an integrated solution offering that dynamically responds and adjusts to the “front end’s pull for customization” [10] by continuously repatching the portfolio of PSS entities or recoupling the links among them [2,9,11,12] striving for “the back end’s standardization” [10]. As such, pertaining separation for adaptability and renewal demands for boundary stability and identity maintenance by at least a minimal threshold [13] between PSS divisional sub-systems.

It is exactly the seemingly contradictory nature of decreasing and pertaining separation in the development of PSS that calls for a nuanced understanding of the critical boundary conditions between integrated, but mutually dependent and separated product-, service and customer sub-systems.

2. Research aim and scope of theoretical background

PSS feature a high organizational complexity in terms of the heterogeneous constituent components, diversified stakeholders, and dynamic evolution [14]. Only by means of successful integration the benefits of the PSS organizational setup can be fully harvested [3,15]. In this regard, various means and organizational design aspects for securing permeability of sub-system boundaries have been named in PSS literature [16,17,18,19,20]. Most of this work is based on implicit assumptions about the positive effects of knowledge integration for cross-functional and cross-divisional teams and it refers to the intended effects by means of knowledge transferring or traversing for (rapid) solution co-creation in novel problem situations and across internal team boundaries [21]. In referring to the question of a PSS organizational setup as systems seller vs systems integrator a recent work from Salonen & Jaakkola [22] has applied different theoretical boundary conceptions to PSS in order to highlight that the matter of integration needs to be evaluated from more than just pure transaction cost logics. This work shifts attention to external PSS organizational boundaries under the conceptions of identity, competence and power in order to maintain the adaptability and reconfigurable resource portfolio for dynamic and novel conditions of integration and customization [22]. However, in an organizational setup for solution selling the formerly clear distinction between internal and external organizational boundaries becomes blurred with increasing integration of a product-, a service- and a customer sub-system. As such, PSS constitute a relatively new problem driven boundary phenomenon with new boundary choices where former organizational boundaries morph and reappear as cross-functional and cross-divisional boundaries inside of the PSS organization.

In order to start a discourse on this rather contemporary boundary issue in PSS this paper seeks answers to three guiding questions about the decisive conditions of a separation-typed internal PSS setup: First, if integratedness is a driving goal in organizing for PSS, what is the nature of separation and its relation to integration? Second, if separation is named as a pivotal feature in securing innovation and strategic renewal for PSS, what theoretical perspective may be applied in order to underline this line of argumentation for a minimal threshold

between highly integrated PSS sub-systems? And third, if the PSS organizational setup relies on integration and separation likewise, what are useful conceptions of the boundaries lines between a product-, a service- and a customer sub-system in PSS in order to achieve a maximum level of integratedness for efficient knowledge transfer while at the same time pertaining sufficient tension from separation for innovation and renewal? In addressing these issues this paper summarizes extensive literature research that links a theoretically distinct type of heterogeneity, namely separation [23] with a dualities-aware perspective on paradoxical tensions of organizing separation [24] for the case of PSS. Insights are framed by two boundary conceptions, namely boundaries as competence demarcation and boundaries as identity demarcation [25], as they provide the framing of meaning for a nuanced understanding of the conditions of a separation-typed PSS organizational setup.

3. Competence and identity as applicable boundary conceptions for organizational challenges of innovation, growth, adaptability and strategic renewal

In moderately and highly dynamic environments organizational boundary decisions often mirror the coevolution of resources with environmental opportunities [25]. As such, contingency approaches [26] and a resource based view on the firm [27] set up the theoretical grounding of a boundary conception as competence demarcation. This conception relates the firm’s configuration of a heterogeneous resource base to competitive advantage and superior performance [28,29]. Shared access to a variety of knowledge resources enables innovative activities associated with adaptation and flexibility [30]. However, as environment dynamism increases, the coupling of resources becomes more loosely. Next, dynamic capabilities become essential as they represent organizational efforts by which members rearrange resources to set up new value-creating strategies [31,32]. Based on these organizational processes organizations manage to recombine existing resources in new ways and among other processes master the recoupling of business units to create value by building new resources [32]. Finally, with extreme ambiguity in high velocity markets the loose coupling of resources even blurs the distinction between horizontal and vertical boundaries [33], thus also pulling down the distinction between internal and external. Therefore, under highly dynamic and complex circumstances, the competence conception may even mismatch established functional, divisional and organizational boundaries. In order to guarantee organizational adaptability to disruptive environmental changes the competence conceptions therefore focuses boundary decision as the quantitative and qualitative choice about the integration of a variety of loosely coupled resources in the organization’s portfolio.

The identity view recognizes the mostly unconscious boundaries of the mind that can exist for organizational members. Identity boundaries mirror the inclusion of activities perceived as coherent with team or organizational identity [25]. They are particularly resistant to change because of their unconscious character. Based on the deep emotional component identity focuses on boundary decision as the choice of “who we are.” [25]. As such, the identity conception is particularly

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