
Resource Integration and Value Co-Creation: Evidence from the Energy Sector

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Abstract: The paper looks at the under investigated topic of mutual resource integration of multiple actors to co-create value. Drawing on seven in-depth cases from resource integrating ecosystems in the energy industry, we find two prototypical pathways of resource integration that are developing alongside the directions of interaction of resources and interaction of organizations and actors. Furthermore, we found that these pathways are contingent to the focal's firm endowment of operant and operand resources, its size, ecosystem engagement and flexibility in initial value proposition design. We furthermore found, that the synchronization of interaction alongside the interaction of resources and interaction of organizations is a necessary condition for successful value co-creation. We hereby give a guiding framework for firm's and managers to analyse and direct their value co-creation activities.

Keywords: value co-creation; service-dominant logic; resource integration as institutions; synchrony of interaction

1 Introduction

Access and control of resources have long been acknowledged to be pivotal for the success of firms (Barney, Ketchen & Wright, 2011). However, with ever increasing micro-specialization of organizations in terms of resources and capabilities the locus of resources switches from firms to networks and ecosystems (Prahalad & Ramaswamy, 2013). This development has also reached innovation research, which increasingly emphasizes the

importance of resources for innovation that reside outside the firm's boundaries (Nieto and Santamaria, 2007). In this context, value co-creation, becomes the cornerstone of firm's strategies. The possible impact of value that is co-created between firms and customers is nicely illustrated by start-ups such as UBER, AirBnB, Lyft or Alibaba, which centre their value creation on customer resources and integrate these in novel ways. Following that logic, in contexts where the value creation of companies is based on customer resources, resource integration becomes critical to organizations. A recent study by PwC (2015) showed that this development is reaching various sectors (e.g. mobility, energy, healthcare) and has the potential to turn around the complete value creation logics of these sectors. Despite its severity, knowledge of this phenomenon is still very scarce in practice and literature. Therefore, this study looks at a typical account of value co-creation in the energy sector, where many distributed energy resources get integrated with a focal organization and additional value is created through this integration. The study finds, that for this integration two prototypical pathways of resource integration can be identified. These pathways follow alongside the dimensions of degree of resource interaction and degree of organization or actor interaction. The study furthermore finds, that the synchronization of interaction focus and timing is central to achieve the desired value creation in this multi-actor value creation network. Lastly, the study finds firm characteristics that determine the prototypical resource integration pathway of firms.

The study therefore contributes to the studies of value co-creation within the service-dominant logic, by empirically determining processes and strategies for resource integration of actors. Moreover, the study highlights the importance of synchronization of actors for collaborative value creation and therefore adds to the understanding, that value co-creation is coordinated through actor-generated institutions and institutional arrangements as creating the necessary synchronicity within the ecosystem.

Furthermore, the resulting framework of this paper gives firms and managers a decision guide to analyse and direct their efforts for value co-creation and effectively manage actor synchronization in the network.

2 Literature Overview

The requirement of external access to resources for innovation and the firm's need for integration per se is not novel and has already been addressed by publications on strategic alliances, open innovation and dynamic capabilities. However, the degree of change that this deep integration of former customers poses for firms cannot be addressed by the current literature (Williamson & De Meyer, 2012).

Value Co-Creation

Value Co-Creation is a term used in innovation management (Chesbrough, 2003; Von Hippel, 2005) strategy (Grant, 1996; Teece, 1997) and service research (Gummesson, 2008) and generally tries to conceptualize the role of the customer in the process of value creation (Rihova et al., 2015). The most advanced view can be found in marketing's service-dominant logic. In this view, value is created through the application and integration of resources from actors in service exchanges (Vargo and Lusch, 2004) and

instantiates in form of value-in-use (Vargo and Lusch, 2008). In brief, SDL's view is, that the customer is always part of the value creation, as value only unfolds when the customer *uses* the offered value proposition (value is always uniquely and phenomenologically determined by the beneficiary). The value co-creation of involved actors happens through the integration of resources, is relational and coordinated through actor-generated institutions and institutional arrangements. A central concept within the logic of value co-creation therefore is the integration of resources a key mechanism to create value (Korkman, Storbacka & Harald, 2010; Lusch et al., 2008; Mele & Polese, 2010; Nenonen & Storbacka, 2009)

Resource Integration for Value Co-Creation

Although the integration of resources is one of the central aspects of co-created value, only little empirical research is done in the SDL-domain and in adjacent research fields. Many authors from the SD-logic maintain that the integration of resources is the result of interaction (Ballantyne & Varey, 2006; Fyrberg & Jürriado, 2009; Grönroos, 2011; Vargo, Maglio & Akaka, 2008) and contingent to coordination and adjustment mechanisms (Edvardsson, Kleinaltenkamp, Tronvoll, McHugh, & Windahl, 2014). Moreover, scholars started to distinguish broader processes of resource integration – resource integration as a *process of emergence* vs. resource integration as a *process of accumulation* (Peters et al., 2014; Peters, 2016).

On the other hand, the integration of resources has also been studied in the context of strategic alliances (Gulati, 2007; Wassmer & Dussauge, 2011). In fact, one of the foremost motives for alliance formation is to provide access to partner resources (Lavie, 2006). Studies on resource integration practices in alliance portfolios focus on interaction and knowledge for resource integration and on the diversity of the resource itself. Authors identify that interaction with alliance partners improves knowledge sharing, communication, and the absorptive capacity which is beneficial for the integration of resources (Lane & Lubatkin, 1998; Mowery, Oxley, & Silverman, 1996) and that a focal firm's ability to utilize the resources depends on internal knowledge resources of the firm (Cohen and Levinthal, 1990; Vasudeva & Anand, 2011). Lewin et al. (2011) for the integration of knowledge find, that past routines constitute the building blocks of a capability to integrate knowledge.

Another research stream that deals with the incorporation of external resources into the organization is the literature on open innovation (OI) where interaction outside of firm boundaries results in a significant amount of external knowledge exploration and exploitation (Chesbrough, 2003). Although OI only specifically deals with knowledge flows between actors (Chesbrough, 2006) it looks at integration practices of firms (Lichtenthaler, 2011) and also points to interaction as required element for resource integration (Lichtenthaler & Lichtenthaler, 2009). Studies on integration practices focus on cultural barriers of integration (West & Gallagher, 2006) and find contradicting evidence to successfully overcome those by either fully integrating the innovation (Christensen, Olesen & Kjaer, 2005) or to keep them at arm's length (Jaspers & van de Ende, 2010) for a successful integration.

In summary, current research on resource integration from multiple actors to co-create value finds that interaction is a constituent element of resource integration, it is contingent on the nature of the resource, finds two prototypical ways of integration being fully

integrating and arm's length and suggests that firm specific capabilities define the success of resource integration. However, research lacks to uncover the inner mechanics of successfully profiting from external resources and despite the importance of resource integration itself, a granular account of how firms efficiently integrate resources is lacking.

Prosumer-Logic and Resource Integration Imperative in the Energy Sector

The current transition of the energy sector creates a prototypical account of value co-creation. The recent policy and social changes require an almost complete transition from a CO₂-heavy and centralized system to transform towards a CO₂-neutral and decentralized system (European Climate Foundation, 2010). This reconstruction affects the size, nature, ownership, governance and geographic dispersion of power production sites and requires new forms of interaction between the actors in this system. In this transition, the increasing decentralization of new complementary resources such as renewable energy resources creates new opportunities and the need to integrate resources to co-create value (Nosratabdadi, Hooshmand, & Gholipour, 2017). An emerging solution to these challenges are VPPs, which can be defined as the technology enabled aggregation of distributed energy sources and loads, where multiple actors give away control of energy sources (while keeping the ownership of them) to form an imaginary power plant (Othman, Hegazy, & Abdelaziz, 2015). In the energy sector, the term *prosumer* already gained prominence in the 1990s, describing a customer, that is partly *producer* and *consumer*. These prosumers can be seen as a prototypical actor as described in the SDL and therefore represent an ideal example to investigate

3 Methods

Our study utilized a multiple case study approach (Eisenhardt, 1989), which is especially suitable to study novel phenomena and to answer how and why questions. We base our study on seven in-depth cases of Swiss and German firms that operate Virtual Power Plants. The case firms have different experiences with the operation of Virtual Power Plants (one to 12 years) and vary in their sizes (120 to 348'000 employees), which enabled a cross-case analysis. Furthermore, we included the respective value co-creation ecosystem of the Virtual Power Plants by interviewing the value co-creation partners (owners of decentral renewable energy sources) that provide the resources that the firms integrate. We base our insights on interviews, presentations and observations with the case companies as well as interviews with the partners. Overall, we conducted 17 interviews and 23 follow-up interviews in case of ambiguities and created a journal of 127 pages primary interview data and 160 pages of firm's internal data such as presentations, memos and press articles to triangulate the findings which was then independently coded and analyzed by the authors.

4 Findings

Synchronicity of Resource Adaptation

First, our study finds that in cases of customer's resource integration for value co-creation, the synchronous adaptation of resources between actors is a necessary condition for resource integration.

As already described in the literature, we also found that for resource integration, interaction is a necessary condition. The interviewee's responses showed interaction between all actors included in the value co-creation ecosystem on several levels and different levels of intensity.

However, in contrast to these already documented findings, we found that interaction needs to be further divided to fully capture and understand the underlying processes of resource integration for value co-creation. In the studied cases, on the one hand side the resources were either integrated through (technical) adaptations as illustrated by the representative statement below.

"It [taking part in the Virtual Power Plant] needs to be very simple and standardized for the partners in order to make it a [business] case for them. If the partner needs to change their behavior or processes, they are not willing to share their flexibility of assets" (Case H)

On the hand, individual consideration and support, with a high degree of interaction was seen as key success factor, as the following statement illustrates:

"You need to help the partner to think about his resources in a different way. In order to achieve that, you need to work very closely with them, adapt their processes and energy producing assets, so they are willing to share them with you" (Case D)

We therefore summarize, that the resource integration mechanisms and subsequently the interaction for resource integration can be subdivided into *interaction of resources* and *interaction of organizations and actors*. In this, almost all actors stressed an either-or approach of interaction. Either, the adaptation of resources is achieved by an increased degree of organizational interaction or by a higher degree of resource interaction. Subsequently to the finding of subdividing the interaction of actors, we found that the synchronicity of interaction is another necessary condition to co-create value through mutual integration of resources. Exemplary for many statements, case interviewees responded that:

"We need to make sure that we are on the same page and somehow coordinate our actions in the network. If some of our partners hires new staff to manually manage their plant and we plan to further automate our processes, trouble is inevitable." (Case C)

"If you are not part of the very core processes of the customers – what you are generally not – then it is generally important to correspond to needs and shortcomings of your partner. For example, if he does cannot free the resources to manage the plant [resource] then you need to help him or to simplify the process. This would be possible for several partners, but in a big network, mutual parallelization is key." (Case A)

These statements point to two aspects of synchrony of adaptation: the synchronous adaption of the **same focus of interaction** and the synchronous adaption of the same interaction focus at the **same time**. Synchrony of focus of interaction addresses the imperative to choose either an increased degree of interaction of organizations or an increased degree of interaction of resources to integrate the resources under consideration. This either-or-approach was repeatedly stressed throughout the cases as key success factor for a functioning co-creation ecosystem, but on the other hand creates the necessity to coordinate the focus of interaction within the ecosystem.

On the other hand, synchrony in time refers to aligned temporal actions, so that coordinated actions of actors are enabled. Case partners repeatedly reported, that in both areas of synchronization, limits to co-create value can be identified. The cases revealed, that an asynchrony in the focus of interaction very much limits the possibility to co-create value as the resources could not be integrated to its full potential. Asynchrony of interaction focus resulted in situations where the resources (e.g. installed base) could not automatically communicate with other actors' resources in the ecosystem, systems were not compatible, new investments were directed in different directions and there was a mismatch of organizational interaction requirements. All this was reportedly resulting in not fully capturing the potential of integrating the resources as well as frictions within the ecosystem.

On the other hand, asynchrony of timing lead to incongruent elements of practice and subsequently to perceived value co-destruction for multiple actors with the ecosystems. The incongruent practices could be identified in accidental or intentional misuse of resources, incongruent behavior of actors and subsequently in a failed resource offer (value proposition). The resulting co-destruction of value was perceived as discrepancy between desired and actual state in form of the negative feeling of resource losses such as not gaining all benefits of the employed resources or even destruction of the resource (misuse of the resource through the agreement of integration). Moreover, we found in three cases, that once an asynchrony of timing is established, synchronizing got increasingly complicated.

Pathways of Resource Integration Practices

Integrating the previous findings, we found that the case companies followed in summary two prototypical pathways for increased resource integration and co-created value. Figure (1) illustrates these pathways in the matrix of interaction of resources / organizations and actors.

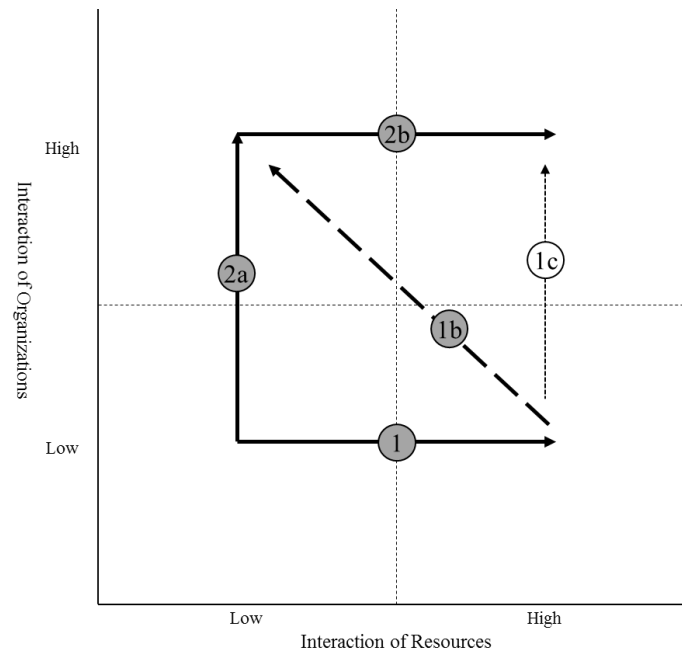


Figure 1 Pathways for Resource Integration

The either-or-approach of its focus of interaction is the critical starting point to follow one of these pathways. Case companies either focused on an increased interaction of the involved resources for resource integration (1), or on an increased interaction of the involved organizations (2). The increased interaction of involved resources was then either followed by a decreased interaction of resources but higher interaction of organizations/actors (1b) in the case of the described first pathway or preserved in the lower right quadrant. Typically, case companies that remained in the lower quadrant either focused on additional technical developments of their integration or the integration became of less strategic value to the organization itself, thus there were no new developments to increase the targeted co-created value. On the other hand, case organizations that focused on an increased interaction of organisations/actors in the beginning (2a) followed to increase the resource interaction in a second step (2b). These cases understood the interaction of organizations as vehicle to gain a better understanding of the potential value under observation and examine the ideal way to create this value together with the actors in the ecosystem. On the other hand, in these cases the high interaction between organizations or actors was partly substitute for a higher interaction or resources and functioned as a workaround for technical developments. Surprisingly, our cases did not include the pathway of increased resource interaction (1) followed by an increased interaction of organizations/actors (1c).

Pathways and Company's Characteristics

The cases furthermore revealed, that organizations' characteristics regulates the adopted pathway of resource integration options. We found, that the relative endowment of

organizations with operant versus operand resources, the size of the organization, the degree of ecosystem history and the value proposition range have an impact on the specific pathway taken.

In specific, we found that case companies with a relative high endowment of operand resources (resources that is acted upon such as goods, materials, proprietary technologies) over operant resources chose to follow pathway one as described in Figure 1. For example, case firms that had a strong technical background or proprietary technologies chose to follow that pathway. On the contrary, case firms with a relative high endowment of operant resources (resources that act on others such as knowledge, employees, network capabilities, relationships) over operand resources, chose to follow pathway two as described in Figure 1. For example, these were firms or departments that mainly relied on human resources to create value. Furthermore, companies that followed pathway one were relatively big firms with an established ecosystem where the additional resource integration was only a small aspect in the overall portfolio of value creation in the firm. Contrary to that, the pathway two was mostly chosen by firms, that developed their ecosystem around the new value creation opportunity and often by small organizations. Subsequently, within pathway two the initial value proposition was rather vague compared to the initial value propositions in pathway two. For example, contracts or the terms of collaboration were open or refined frequently in the pathway two, whereas within the pathway one, the contracts and terms of collaboration were rarely modified throughout our period of observation. In summary, the firm's characteristics that we found to influence the way resources are integrated is displayed in Table 1:

<i>Integration Pathway One</i>	<i>Integration Pathway Two</i>
relatively high operant resources over operand resources	relatively high operant resources over operand resources
relatively big organizations	relatively small organizations
established ecosystem (e.g. customer base)	development of ecosystem
clear initial value proposition	Vague initial value proposition

Table 1 Overview of company characteristics determining resource integration pathways

5 Discussion & Practical Implications

Our findings give interesting new insights into how firms integrate resources for value co-creation, the pathways firms take and the characteristics that determine the decision for the respective pathway. These findings extend our understanding of the phenomenon on the one hand, but also correspond to existing literature.

On the one hand, the first decision whether to integrate resources through increased interaction of resources or increased interaction of actors showed to be of strong influence of the achieved outcome. This phenomenon has already been described in the theory of path dependency where historical events can be magnified and economies can be locked-in by historical decisions (Powell, 1991) or as imprinting where in a sensitive period

elements of the environment are reflected in the organization and these characteristics show persistence after the sensitive time period (Marquis & Tilcsik, 2013). In the observed cases, organizational structures such as the size of the organization and the degree of existing ecosystems and capabilities as shown with the firm's endowment with operand or operant resources showed to have an impact on the pathways of the value co-creation activities. Therefore, it can be said that the co-creation activities were designed to fit the initial institutional environment and the synchronization is a mechanism to ensure this throughout the maturization of the value co-creation. The relative stability of the pathway later can be then explained by institutionalism (Marquis & Huang, 2010; Kimberly, 1975). On the other hand, recent literature finds, that the constraints of initial resource and technology environment shape initial practices and capabilities as shown for example in a study of Kriauciunas and Kale (2006). In our sample, firms that showed a background in technology development or were familiar with several technology-based value creation activities, focused to take these initial resources to leverage them for resource integration through a higher degree of resources interaction. Contrary, firms with low technology resources focused on high interaction of organizations and maintained this over time. However, contrary to the findings of Kriauciunas and Kale (2006), in the case of value co-creation initial resource and technology constraints need to be evaluated based on the included overall ecosystem and synchronized alongside the actors. Therefore, the path dependency or imprint has an impact on the overall ecosystem and seems to get stronger in its effect.

Moreover, the counterintuitive finding that pathway 1c is impassable to the studied firms needs some further investigation. The authors suggest, that the identified foci of resource integration can be understood as form of actor-generated institution (Vargo & Lusch, 2016) which are arrangements between specific resource integrating actors. By deciding for one focus of interaction, the actors create institutions around this decision. Surprisingly, the findings suggest, that the lock-ins established by institutions around the interaction of resources are higher than lock-ins around institutions created in the case of interaction of organizations. Although, a high interaction of resources creates the 'glue' to co-create value by establishing a form of regularized interaction between resources, it seems to be difficult to transform or adapt this established institutions to other ecosystem actors. In contrary, the institutional arrangements created through a higher degree of organizational interaction creates institutions and arrangements that can be transferred or adapted to other actors for resource integration more easily.

In general, our findings are valuable for managers that must deal with the potential integration of customer's or partner's resources making them a cornerstone of their value co-creation activities. For these instances, our study offers practices that enable firms and managers to more strategically pursue this way of value creation with their customers.

As a first step, firms or managers should analyse their relative degree of operand resources over operand resources, their possibility to draw on existing ecosystems for resource integration and their strategic intent of clear versus vague initial value proposition. Following this analysis, firms or managers should decide the resource integration pathway, that echoes with their firm's characteristics, including the identified pathways in their strategic planning.

Second, as our analysis shows, firms or managers need to make sure, that indifferent of their specific pathway, they need to ensure that they synchronize the development within the respective ecosystem. The introduced differentiation of interaction of resources and

interaction of organizations and actors can give a valuable lens for analysis communication internally and externally to achieve this synchronization.

References and Notes

- Ballantyne, D., & Varey, R. J. 2006. Creating value-in-use through marketing interaction: the exchange logic of relating, communicating and knowing. *Marketing Theory*, 6: 335–348.
- Barney, J. B., Ketchen, D. J., & Wright, M. (2011). The future of resource-based theory revitalization or decline? *Journal of Management*, 37(5), 1299-1315.
- Chesbrough, H (2003), Open Innovation: The New Imperative for Creating and Profiting from Technology, Boston, MA: *Harvard Business School Press*
- Chesbrough, H. W. (2006). Open innovation: The new imperative for creating and profiting from technology. *Harvard Business Press*.
- Christensen, J. F., Olesen, M. H., & Kjær, J. S. (2005). The industrial dynamics of Open Innovation—Evidence from the transformation of consumer electronics. *Research Policy*, 34(10), 1533-1549.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 128-152.
- Edvardsson, B., Kleinaltenkamp, M., Tronvoll, B., McHugh, P., & Windahl, C. 2014. Institutional logics matter when coordinating resource integration. *Marketing Theory*, 14: 291–309.
- Eisenhardt, K. M. 1989. Agency theory: An assessment and review. *Academy of Management Review*, 14: 57-74.
- European Climate Foundation. Roadmap 2050: A practical guide to a prosperous, low-carbon Europe. *Technical report*, 2010.
- Fryberg A. and R. Jürjado. 2009. ‘What about interaction? Networks and brands as integrators within the service- dominant logic’, *Journal of Service Industry Management*, 20: 420–432.
- Grönroos, C. 2011. A service perspective on business relationships: The value creation, interaction and marketing interface. *Industrial Marketing Management*, 40(2): 240-247.
- Grönroos, C., & Voima, P. (2013). Critical service logic: making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, 41(2), 133-150.
- Gulati, R. (2007). Managing network resources: Alliances, affiliations, and other relational assets. *Oxford University Press on Demand*.

- Gummesson, E. (2008). Extending the service-dominant logic: from customer centricity to balanced centricity. *Journal of the Academy of Marketing Science*, 36(1), 15-17.
- Jaspers, F., & Van den Ende, J. (2010). Open innovation and systems integration: how and why firms know more than they make. *International Journal of Technology Management*, 52(3/4), 275-294.
- Kimberly, J.R. (1975). Environmental constraints and organizational structure: A comparative analysis of rehabilitation organizations. *Administrative Science Quarterly*, 20, 1-9
- Korkman, O., Storbacka, K., & Harald, B. (2010). Practices as markets: Value co-creation in e-invoicing. *Australasian Marketing Journal (AMJ)*, 18(4), 236-247.
- Kriauciunas, A., & Kale, P. (2006). The impact of socialist imprinting and search on resource change: A study of firms in Lithuania. *Strategic Management Journal*, 27 (7), 659-679.
- Lane, P. J., & Lubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*, 461-477.
- Lavie, D. (2006). The competitive advantage of interconnected firms: An extension of the resource-based view. *Academy of Management Review*, 31(3), 638-658.
- Lewin, A. Y., Massini, S., & Peeters, C. (2011). Microfoundations of internal and external absorptive capacity routines. *Organization Science*, 22(1), 81-98.
- Lichtenthaler, U. (2011). Open innovation: Past research, current debates, and future directions. *The Academy of Management Perspectives*, 25(1), 75-93.
- Lichtenthaler, U., & Lichtenthaler, E. (2009). A capability-based framework for open innovation: Complementing absorptive capacity. *Journal of Management Studies*, 46(8), 1315-1338.
- Lusch, R. F., Vargo, S. L., & Wessels, G. 2008. Toward a conceptual foundation for service science: Contributions from service-dominant logic. *IBM Systems Journal*, 47(1): 5-14.
- Madhavaram, S., & Hunt, S. D. (2008). The service-dominant logic and a hierarchy of operant resources: developing masterful operant resources and implications for marketing strategy. *Journal of the Academy of Marketing Science*, 36(1), 67-82.
- Marquis, C., & Huang, Z. (2010). Acquisitions as exaptation: The legacy of founding institutions in the U.S. commercial banking industry. *Academy of Management Journal*, 53 (6), 1441-1473
- Marquis, C., & Tilcsik, A. (2013). Imprinting: Toward a multilevel theory. *Academy of Management Annals*, 7(1), 195-245.

- Mele, C., & Polese, F. 2010. Key dimension of service systems: Interaction in social & technological networks to foster value co-creation. In H. Demirkan, J. Spohrer, & V. Krishna (Eds.), *The science of service system*. New York: Springer.
- Mowery, D. C., Oxley, J. E., & Silverman, B. S. (1996). Strategic alliances and interfirm knowledge transfer. *Strategic Management Journal*, 17(S2), 77-91.
- Nenonen, S., & Storbacka, K. 2010. Business models design: Conceptualizing networked value co-creation. *International Journal of Quality and Service Sciences*, 2(1): 43–59.
- Nieto, M.J. and Santamaria, L. (2007), “The importance of diverse collaborative networks for the novelty of product innovation”, *Technovation*, Vol. 27 No. 6, pp. 367-377.
- Nosratabadi, S. M., Hooshmand, R. A., & Gholipour, E. 2017. A comprehensive review on microgrid and virtual power plant concepts employed for distributed energy resources scheduling in power systems. *Renewable and Sustainable Energy Reviews*: 341-363.
- Othman, M., Hegazy, Y.G., Abdelaziz, A. 2015. A review of Virtual power plant Definitions, Components, Framework and Optimization. *International Electrical Engineering Journal*, 6: 2010-2024.
- Peters, L. D. 2016. Heteropathic versus homopathic resource integration and value co-creation in service ecosystems. *Journal of Business Research*, 69: 2999–3007.
- Peters, L. D., Löbler, H., Brodie, R. J., Breidbach, C. F., Hollebeek, L. D., Smith, S. D., & Varey, R. J. 2014. Theorizing about resource integration through service-dominant logic. *Marketing Theory*, 14: 249-268.
- Powell, W.W. (1991). Expanding the scope of institutional analysis. In W.W. Powell & P. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 183–203). Chicago, IL: University of Chicago Press
- Prahalad, C. K., & Ramaswamy, V. (2013). The future of competition: Co-creating unique value with customers. *Harvard Business Press*.
- PwC. 2015. The Sharing Economy — Sizing the Revenue Opportunity. Accessed 04th January 2017 on <http://www.pwc.co.uk/issues/megatrends/collisions/sharingeconomy/future-of-the-sharing-economy-in-europe-2016.html>
- Rihova, I., Buhalis, D., Moital, M., & Gouthro, M. B. (2015). Conceptualising customer-to-customer value co-creation in tourism. *International Journal of Tourism Research*, 17(4), 356-363.
- Teece, D, Pisano, G & Shuen, A (1997), "Dynamic Capabilities and Strategic Management," *Strategic Management Journal*, 18 (7), 509-533.

- Usman, A., & Shami, S. H. 2013. Evolution of communication technologies for smart grid applications. *Renewable and Sustainable Energy Reviews*, 19: 191-199.
- Vargo, S. L. (2011). Market systems, stakeholders and value propositions: Toward a service-dominant logic-based theory of the market. *European Journal of Marketing*, 45(1/2), 217-222.
- Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: an extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, 44(1), 5-23.
- Vargo, S. L., Maglio, P. P., & Akaka, M. A. 2008. On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26(3): 145-152.
- Vargo, S. L., Maglio, P. P., & Akaka, M. A. 2008. On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26(3): 145-152.
- Vargo, SL & Lusch, RF (2004), "Evolving to a New Dominant Logic for Marketing," *Journal of Marketing*, 68 (1), 1-17.
- Vargo, SL & Lusch, RF (2008b), "Service-Dominant Logic: Continuing the Evolution," *Journal of the Academy of Marketing Science*, 36 (1), 1-10.
- Vasudeva, G., & Anand, J. (2011). Unpacking absorptive capacity: A study of knowledge utilization from alliance portfolios. *Academy of Management Journal*, 54(3), 611-623.
- Von Hippel, E (2005), *Democratizing Innovation*, MIT press
- Wassmer, U., & Dussauge, P. (2012). Network resource stocks and flows: how do alliance portfolios affect the value of new alliance formations?. *Strategic Management Journal*, 33(7), 871-883.
- West, J., & Gallagher, S. (2006). Challenges of open innovation: the paradox of firm investment in open-source software. *R&D Management*, 36(3), 319-331.
- Williamson, P. J., & De Meyer, A. (2012). Ecosystem Advantage. *California Management Review*, 55(1), 24-46.