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Value co-creation: from an emerging paradigm to the next practices of innovation

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Abstract: This study contributes to the conceptual clarification of the value co-creation paradigm by using quantitative web content analysis to provide empirical insights on: i) the specific ways employed by firms using the Internet to actively engage their customers and end users into value co-creation activities; ii) the relationship between the degree of use of particular types of value co-creation activities and the degree of innovativeness of firms' new products processes and services. The focus is on the potential impact from the adoption of co-creation practices on firms' capacity for innovation. The practical implications of our research would be of interest to executive managers of existing technology-driven firms who would find the results particularly useful in the identification of new sources of innovation and competitive differentiation.

Keywords: value co-creation activities, innovation capacity, empirical study, principal component analysis (PCA), regression analysis

1 Introducing the value co-creation paradigm

Value co-creation is an emerging business, marketing and innovation paradigm describing how customers and end users could be involved as active participants in the design and development of personalized products, services and experiences (Prahalad & Ramaswamy, 2004; Etgar, 2008; Payne, Storbacka, & Frow, 2008). It is based on the development of customer participation platforms providing firms with the technological and human resources, tools and mechanisms to benefit from the engagement experiences of individuals and communities as a new basis of value creation. The active participation of customers and end users is enabled through multiple interaction channels, very often by means of specifically designed technological platforms through the Internet (Sawhney, Gianmario & Prandelli, 2005; Nambisan & Nambisan, 2008; Nambisan & Baron, 2009).

¹ The research findings presented in this article were formulated on the basis of data collected and analyzed by students in the Product Development and Innovation (PDI) program at the University of Southern Denmark, Odense, Denmark. The names of all the students who participated in this project are given in the acknowledgments section.

A more systematic search in existing research literature identified several emerging streams in value co-creation research: i) *general management perspective* (Prahalad & Ramaswamy, 2000, 2004; Jaworski & Kohli, 2006; Etgar, 2006, 2008; Nambisan et al., 2008; Payne et al., 2008; Ramaswamy, 2009; Ramaswamy & Gouillart, 2010; Pini, 2010), ii) *new product development and innovation* (Prahalad & Ramaswamy, 2003; Sawhney et al., 2005; Roberts, Bake, & Walker, 2005; Prahalad et al., 2008; Franke & Schreier, 2008; Kristenson et al., 2008; Michel, Brown, Gallan, 2008; Midgley, 2009; Romero & Molina, 2009; Tanev et al., 2009; Nambisan, 2009; Bowonder, Dambal, Kumar & Shirodkar, 2010; O’Her & Rindfleisch, 2010), iii) *virtual customer environments* (Edvardsson, Enquist & Johnston, 2005; Nambisan et al., 2007, 2008, 2009; Nambisan, 2009; Kohler, Matzler & Füller, 2008; Bonsu & Darmody, 2008; Droge et al., 2009; Füller, 2010), iv) *service science and service-dominant logic (SDL) of marketing* (Vargo & Lusch, 2004; Edvardsson et al., 2005; Vargo, 2008; Ballantyne & Varey, 2008; Cova & Salle, 2008; Dong, Evans & Zou, 2008; Maglio & Spohrer, 2008; Kristenson et al., 2008; Bolton & Saxena-Iyer, 2009; Brohman, Piccoli, Martin, Zulkernine, Parasuraman & Watson, 2009; Ng, Maull & Yip, 2009; Ferguson & Paulin, 2010; Ostrom, Bitner, Brown, Burkhard, Goul, Smith-Daniels, Demirkan & Rabinovich, 2010). For the purpose of this article we will briefly discuss some of the key insights of the first three research streams – ‘general management perspective,’ ‘new product development and innovation’ and ‘virtual customer environments.’

General Management Perspective (GMP)

The GMP provides several frameworks describing the principles, the organizational, management and marketing aspects of value co-creation practices (Prahalad et al., 2004, Payne et al., 2008, Etgar, 2008). From a managerial perspective, the work of Prahalad et al. (2004) is of particular interest (Payne et al., 2008) as their research suggests a more holistic generative framework describing the fundamental building blocks of value co-creation practices, including Dialog, Access, Risk management and Transparency (thus, DART framework). The open *Dialog* between the multiple actors within the value network encourages knowledge sharing and mutual understanding (Ballantyne, 2004; Jaworski & Kohli, 2006). It provides an opportunity for customers to interject their view of value into the value creation process and helps companies understand the emotional, social, and cultural contexts of end user experiences. The initiation of dialogue during co-creation requires a forum with clear rules of engagement leading to an orderly, productive interaction within emerging thematic communities. The focus on *Access* challenges the notions of openness and ownership (Prahalad et al., 2004; Prahalad et al., 2006, p. 11). Providing customer access to resources, information, tools, assets and processes at multiple points across the value network provides companies with innovative ideas about new products and services, new business opportunities and new potential markets. As customers become co-creators of value, they become more vulnerable to *Risk* and demand more information about the potential risks associated with the design, manufacturing, delivery and consumption of particular products and services. Proactive risk communication and management offers companies with new opportunities for competitive differentiation. *Transparency* builds trust between both institutions and individuals. It enables a creative dialogue in which trust emerges (Ballantyne, 2004; Romero et al., 2009). When companies make vital business process information available

to consumers, they hand over part of the control of the value creation process. Empowering customers with such control becomes a key component of companies' customer relationship management and differentiation strategies. In addition to the DART framework, Prahalad and Ramaswamy (2004) identified four dimensions of choice that could enable personalized co-creation experiences: i) co-creation across multiple channels that enabling new co-creation horizons, ii) co-creation through multiple options where customers could go beyond the options designed by a company in order to fit its value chain in terms of profitability alone (enabling the possibility for customers to create their own options opens the door for user-driven innovation), iii) co-creation through multiple transactions at multiple points of access across the value network enable customers and end users to affect the way a product or service is designed, to reject unnecessary features, to negotiate a particular price component or decide to get engaged in the value creation process, iv) co-creation through the ability to influence the relationship between price and experience (Etgar, 2006) where customers could associate their specific choice with the type of experiences they are willing to pay for. While the literature within this stream provides multiple examples of firms that have adopted co-creation principles and useful insights about the specific business and marketing issues that need to be addressed, there is relatively little research on the specific groups of activities that should be undertaken in order to enable the value co-creation processes (Payne et al., 2008). There is a need of more research studies that would contribute to the development of value co-creation platform design rules, transition pathways and maturity implementation models (Warnke, Weber & Leitner, 2008).

New product development and innovation (NPDI)

It should be pointed out that this research stream emerges by means of a terminology that oscillates between the semantics of two other paradigms – user-driven innovation (von Hippel, 2005; Bogers, Afuah & Bastian, 2010) and open innovation (Chesbrough, 2003). User-driven innovation distinguishes itself by promoting a single firm-driven, product-centric, non-transactional and participatory approach to user involvement in the design of new products and services. However, its focus on innovation toolkits (von Hippel, 2001) and innovation communities brings it close to the value co-creation paradigm with its focus on customer participation platforms, personalization of market offers, multiple stakeholder interactions and access to global resources (Prahalad et al., 2008), customer-driven business models, and virtual customer experience environments. On the other hand, the open innovation paradigm promotes a more generic and broader vision of the innovation landscape. It articulates the key mechanisms for inbound and outbound business and innovation processes, intellectual property, knowledge and resource flows used by firms to engage into a more proactive pursuit of new markets and innovations (Chesbrough, 2003).

The participatory platform nature of value co-creation practices enables a broader and more systematic positioning of customers and end users across the entire innovation lifecycle leading to a significant enhancement of the user-driven innovation potential (Bilgram, Brem & Voigt, 2008). As a result, the development of value co-creation

platforms is increasingly recognized a promising innovation strategy associated with an ongoing change of the nature of innovation itself (Prahalad et al., 2003; Nambisan, 2009; Romero et al., 2009; Midgley, 2009; Bowonder et al., 2010). The co-creation paradigm positions the source of value within the co-creation experience which is actualized through the company-customer interaction events. By co-creating with the network, the customer becomes an active stakeholder in defining both the interaction and the context of the event including their specific personal meaning (Prahalad et al., 2003). The personal nature of the interactive experiences enables new dimensions of value which are based on the quality and the personal relevance of the interaction events as well as on the opportunity for customers to co-create their own unique end products, services and experiences (Franke et al., 2008). These dimensions are critical for the emergence of experience innovation networks putting the individual at the heart of co-creation experience through the development, access and dynamic reconfiguration of appropriately designed technological, business process and human resource infrastructures (Prahalad et al., 2008). In this sense, the value co-creation paradigm represents a specific market-driven approach to the adoption of an open innovation business philosophy. It provides a dynamic understanding of firms' innovation boundaries which opens the possibility for a better competitive positioning through a better articulation of their innovativeness. Existing literature clearly emphasizes that customer participation in value co-creation activities should impact their innovation outcomes, such as innovation cost, time-to-market, new product/service quality and development capacity (Kristensson, 2008; Prahalad et al., 2008; Nambisan, 2009; Midgley, 2009; Romero et al., 2009; Bowonder et al., 2010; Ramaswamy et al., 2010). However, most of the existing studies are case-based and there is little quantitative research focusing on the relationship between the degree and the scope of firms' involvement in value co-creation activities and their innovation related outcomes.

Virtual customer environments

The design and development of VCEs has clearly emerged as one of the research streams in studying value co-creation. One of the key messages of coming out this stream is the emphasis on that fact that involving users in the development of new products "can offer important (and often hidden) benefits beyond the innovation outcomes" (Nambisan et al., 2008). The usual outcomes of co-creation initiatives such as new ideas, new concepts, new designs, new applications or market-ready solutions, are often the only results companies consider when considering the coordinating projects and then measuring the performance of these. The valuable impact co-creation initiatives have, for instance, on brand perception or the customer-company relationship is often ignored or not deliberately nurtured. Online co-creation platforms or virtual customer environments serving the purpose of co-innovating with external stakeholders in the first place can be considered as massive interactive marketing campaigns due to the sheer number of contact points with potential customers. The potential impacts in terms of both experience co-creation and co-creative innovation were found to be mutually beneficial since users' willingness to collaborate in the future was found to be positively influenced

by their current participation experience (Nambisan et al., 2007). Thus, experience innovation helps companies to establish themselves as a preferred co-creation partner for innovative users. Although discussing the technological infrastructures of value co-creation platforms, existing research focuses on issues related to customer experience and relationship management, pointing out that companies underestimating the broader impact of VCEs are and will be lacking a fundamental source of competitive advantage.

2 Research objective and methodology

Objective and research hypothesis

The objective of this article is to apply an empirically-derived quantitative approach to examine the relationship between the extent of firms' value co-creation activities and their innovativeness which is measured by the number of new products, processes and services for the last three years. It is based on a previous study which identified the key components of value co-creation based on a methodology using web search generated data and Principal Component Analysis (PCA) techniques and applied a similar, web search-based approach to evaluate the perception of firms' innovativeness by measuring the frequency of firms' online comments about their new products, processes and services (Tanev et al., 2010). The objective of the present article consists in the extension of the work by Tanev et al. (2010) to examine the relationship between co-creation and innovation by means of conventional innovation metrics such as the number of new products, processes and services, as well as, in using the new results as a calibration tool for the previously used online innovation perception metric. The underlying hypothesis of this research was developed on the basis of the insights discussed in the brief summary of the literature on value co-creation:

Hypothesis: Firms with a higher degree of involvement in co-creation activities have a broader access to innovative resources which makes them able to introduce a larger number of new products, processes and services.

Methodology

Hicks et al. (2006) and Ferrier (2001) pioneered the concept that an analysis of the frequency of use of specific keywords on public websites and corporate news releases can be an adequate representation of the degree of importance the firms place on the concepts those keywords were chosen to represent. Allen et al. (2009) and Tanev et al. (2010) demonstrated that this concept could be applied to classify value co-creation practices and articulated the key steps of the data gathering and data analysis work flow. Their research showed that factor analysis of the frequencies of a specifically designed set of keywords can be used to extract the key components of value co-creation in a large sample of firms. Tanev et al. (2010) added an additional step to the methodology by focusing on: i) examining the perception of firms' innovativeness by measuring the frequency of firms' online comments about their new products processes and services, ii) applying linear regression analysis to test for a positive association between the degree of firms' involvement in value co-creation activities and the degree of articulation of their

innovativeness. The research methodology adopted in this article relies on value co-creation components derived by Tanev et al. (2010) and provides a better way of measuring the innovation-related outcomes of value co-creation practices by using the number of new products, processes and services.

The data was collected by a group of students involved in the Product Development and Innovation program at the University of Southern Denmark.¹ Due to the lack of space it was impossible to list them all as co-authors. However, the names of the students can be found in the acknowledgments section. The students were introduced to the objective, relevance, contributions and deliverables of the research study as well as familiarized with the distinction between products, processes and services. The firms in the sample were then split into 23 equal groups and each group was assigned to a specific student. The students were asked to visually examine the news release web pages of each the firms and analyze the information available online for the last three years about new products, processes and services. Each of the students provided an Excel document containing a summary of the number of new products, services and processes for each of the firms in his/her specifically assigned group of firms. The Excel document also contained additional worksheets (corresponding to each of the firms) with the URL of the online text providing information about every specific product, process or service that was counted as new during the data collection process. The data collected in this way was used to define the three innovation-related metrics (variables) used in the linear regression analysis. The research sample consisted of all the firms that were used in the previous study by Tanev et al. (2010) including firms used as cases in value co-creation research publications and firms involved in open source projects (Table 1).

Table 1 Organizations included in the research sample organizations: GEN – general type firms, ECL – members of the Eclipse Foundation, OSS – non-Eclipse open source software firms.

<i>Type of firms</i>	<i>Frequency</i>	<i>Percent</i>	<i>Cumulative Percent</i>
1 GEN	65	23.8	23.8
2 ECL	133	48.7	72.5
3 OSS	75	27.5	100.00
Total	273	100.0	

3 Research results

Value co-creation components

Table 2 shows the specific composition of the extracted principal value co-creation components that was used to construct three value co-creation component variables for

¹ The Product Development and Innovation program at the University of Southern Denmark is an interdisciplinary program designed to operate across the engineering and social sciences. It focuses on technology innovation management, product innovation, experience design, global sourcing and business development:
http://www.sdu.dk/Uddannelse/Kandidat/Product_Development_Innovation

each of the firms in the sample (Tanev et al, 2010). Based on these results, the first co-creation component was interpreted as “Resources, processes, tools and mechanisms enabling customer and user involvement in production, assembly, manufacturing and self-service aiming at design and process flexibility based on product modularity and sharing of internal expertise, resources and IP.” The second co-creation component was interpreted as “Customer relationships enabled through partnerships and cooperation aiming at cost reduction, design and process flexibility, and leading to better customer and end user experiences based on risk management, transparency and trust.” The third co-creation component was interpreted as “Mutual learning mechanisms based on the existence of user networking forums enabling customer suggestions, input, demands and requests, and leading to multiple options for users through involvement in test and beta trials.” Table 3 shows the descriptive statistics of the three co-creation variables that were constructed by adding up the ratings of each of the keywords weighted by their loadings.

Table 2 Composition of the three principal value co-creation components

<i>Component # 1</i>	<i>Loading</i>
customer+OR+user+produce+OR+assemble+OR+manufacture	.727
product+OR+process+modularity+OR+modular+OR+module	.705
customer+OR+user+IP+OR+”intellectual+property”	.669
design+OR+process+flexibility+OR+flexible+OR+adaptable	.599
internal+expertise+OR+resource	.554
lease+OR+rent+OR+license+OR+”self+serve”+OR+”self+service”	.550
product+OR+process+OR+service+evolution+OR+evolve	.521
<i>Component # 2</i>	<i>Loading</i>
customer+partnerships+OR+interaction+OR+relationship+OR+participate+OR+participation+OR+activity+OR+action	.778
customer+OR+user+risk+manage+OR+management+OR+control+OR+assess+OR+reduce+OR+reduction+OR+potential+OR+ Exposure	.698
customer+OR+user+cooperate+OR+cooperation+OR+collaboration+OR+partnership	.691
cost+reduce+OR+reduction+OR+saving	.685
trust+OR+honesty+OR+integrity+OR+transparency	.647
customer+OR+user+experience	.627
<i>Component # 3</i>	<i>Loading</i>
customer+OR+user+learn+OR+learning	.752
customer+OR+user+suggest+OR+suggestion+OR+input+OR+request+OR+demand	.737
customer+OR+user+OR+forum+OR+connect+OR+network+OR+networking	.716
customer+OR+user+options+OR+choice+OR+choose	.524
customer+OR+user+test+OR+trial+OR+beta	.512

Innovation-related metrics

Table 4 shows the descriptive statistics of the three innovation metrics related to the number of new products, service and processes, together with the perception of innovativeness metric that was used by Tanev et al. (2010). It was measured by the frequency of firms’ online comments about new products, services and processes and

collected by means of the composite keyword: *new AND product OR service OR process OR application OR solution OR feature OR release OR version OR launch OR introduction OR introduce OR “new product” OR “new service” OR “new process” OR “new solution” OR “product launch.”*

Linear regression analysis

The results from the linear regression analysis are presented in Table 5 including two different cases: the general type firms alone and the firms involved in OSS projects alone. The linear regression models for firms’ perception of innovativeness suggested by Tanev et al. (2010) are also included as a comparison. The explanatory power is determined by the R square value.

Table 3 Descriptive statistics of the three principal component variables

Component	Mean	Std. Deviation	Skewness		Kurtosis	
			Statistic	Std. error	Statistic	Std. error
Component_1**(1/3)	2.290	.821	.087	.147	-.105	.294
Component_2**(1/4)	1.857	.556	.028	.147	.251	.294
Component_3**(1/2)	5.984	2.457	.264	.147	-.126	.294
Component_All**(1/3)	3.973	1.105	-.078	.147	-.238	.294

Table 4 Descriptive statistics of the innovation-related metrics

Innovation metric	Mean	Std. Deviation	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. error
New products**(1/5)	1.025	0.727	-0.144	0.150	-0.421	0.300
New services**(0.27)	0.748	0.747	0.411	0.150	-0.647	0.300
New processes**(1/3)	0.411	0.617	1.011	0.150	-0.533	0.300
Perception**(1/2)	4.745	1.760	-0.126	0.147	-0.286	0.294

Table 5 Linear regression results about value co-creation and innovation-related outcomes

Type of firm	Model	Linear regression model	Expl. power
General firms	1	New products = const + 0.599 * C#2	13.8%
	2	New (products + services) = const + 0.554 * C#1	15.2%
	3	New services = const + 0.330 * C#1	14.5%
	4	Perception = const + 0.657 * C#2	43.1%

Source: The linear regression models for the perception of innovativeness are from Tanev et al. (2010).

4 Analysis of the relationship between value co-creation and innovation

The innovation capacity of the firms was measured by the number of their new products, services and processes. These results were compared to previous results about firms’ perception of innovativeness that was measured by the frequency of online comments about firms’ new products, processes and services. It should be pointed out that the perception of innovativeness is not a traditional innovation metric since it does directly count the number of new products, processes and services but the frequency of online

comments about them. It could be expected, however, that this frequency will be proportional to the number of new products, processes and services. In this sense, there is an opportunity by properly “calibrating” or optimizing the perception metric to construct a modified innovation metric that would be based on information available online and that could be used for an automated quick estimation of firms’ overall innovation capacity.

Indeed, the application of correlation analysis indicates that there is a modest statistically significant positive association between the perception of firms’ innovativeness and their number of newly introduced products. The Pearson correlation coefficient is 0.155 ($p < 0.025$) suggesting that only 15% of the perception metric corresponds to comments about the introduction of new products, the rest being related to discussing the innovative features of existing produces. The correlation between the perception of innovativeness and the number of new service and processes was found to be statistically insignificant.

A closer examination of the linear regression results leads to a number of findings.

First, in the case of the entire research sample, there is no statistically significant relationship between value co-creation and innovation. This situation is different from the one studied by Tanev et al. (2010) where in this case there was a positive association between firms’ extent of value co-creation activities and the perception of their innovativeness.

Second, in the case of firms involved in OSS projects, there is no statistically significant relationship between value co-creation and innovation. Again, this situation is different from the one studied by Tanev et al. (2010) where for this type of firms there was a positive association between firms’ extent of value co-creation activities and the perception of their innovativeness.

Third, statistically significant models were found in the case of general type firms alone. The second value co-creation component “Customer relationships enabled through partnerships and cooperation” appears as the only independent variable in the model describing its relationship to the number of new products (Table 5, Model 1). This finding is similar to the one suggested by Tanev et al. (2010) where in the case of general type firms there was a positive association between the perception of innovation and the second co-creation component (Table 5, Model 4). The key difference is that in the present case the explanatory power of the model is only 13.8%, as compared to 43.1% in the other case. However, the lower explanatory power corresponds to the modest level of correlation between the innovation and perception metrics. It is important to point out that the second co-creation component has the lowest rate of use as compared to the other two co-creation components (Tanev et al., 2010) but it happens to be the component that provides the statistical evidence in support of our initial hypothesis about the existence of a positive relationship between the innovative capacity of firms and the extent of their value co-creation activities.

Third, there is a positive association between the first co-creation component “Resources, processes, tools and mechanisms enabling customer and user involvement in production, assembly, manufacturing and self-service,” and the total number of firms’

new products and services (Table 5, Model 2). An additional analysis suggests that in this case the value co-creation activities appear to be more beneficial in terms of firms' potential for new service introduction (Table 5, Model 3). Such positive association is similar to one of the findings of Tanev et al. (2010) suggesting a positive association between the total value co-creation component and firms' perception of innovation (Table 5, Model 4). However, again, the explanatory power in the present case is 15.2%, as compared to 43.1% in the other case. Models 2 and 3 (Table 5) suggests a higher relevance of the first co-creation component as compared to the previous study. This is a new finding that needs to be further studied.

5 Conclusions

The summary of the research results provides partial support to our initial hypothesis about the existence of a positive association between the extent of value co-creation activities and firms' innovation capacity in the case of general type firms: i) the extent of value co-creation activities related to the development of stronger customer relationships was found to be positively associated to the number of new products, ii) the extent of value co-creation activities related to the development of resources and processes for customer involvement in production and self-service was found to be positively associated to the number of new services and, to a lesser extent, to the number of new products. All the models involving the number of new processes were found to be statistically insignificant. There were no statistically significant models found in the case of firms involved in OSS projects. The results suggest a weak positive association between the number of new products and the perception of firms' innovativeness (Tanev et al., 2010). This is an important finding indicating the opportunity for future research to use web search-based techniques to measure the innovative capacity of co-creative firms. It also indicates the necessity for future research to focus on designing online innovation metrics with a higher degree of correlation to more conventional innovation metrics.

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