

Research Article

Study of Value Co-Creation in CoPS

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Abstract: Value co-creation is associated with specific investment in the context of CoPS. The feature of CoPS decides that the study of co-creation cannot execute without regarding asset specificity. This study considers that value co-creation will be associated with specific value, which is outcome of relationship value and asset specificity. Supplier and customer have a close relation, which conducts to specific investment and then it turns to obstacle for competitors. Trust, commitment and satisfaction are involved in the process of value co-creation and the process of value co-creation leads to relationship expansion.

Keywords: Value co-creation, specific value, trust, commitment, satisfaction

INTRODUCTION

Since the early days of modern service marketing research customer participation in service production processes and the customers' role as co-producers of services have been recognized (Grönroos, 1982). The fact that customers participate as co-producers in firms' production processes means that customers engage themselves with the firms' work or processes (Auh *et al.*, 2007). Very often this participation is organized via a technological platform through the Internet enabling the opportunity for the customers to use their personal knowledge, experience and skills in affecting the nature of existing, modified or entirely new market offerings in accordance with their own preferences, needs and contexts (Sawhney *et al.*, 2005). In the process of value co-creation, value is created by experiences (Prahalad and Ramaswamy, 2004). Therefore, customers change from 'passive audiences' to 'active players' (Prahalad and Ramaswamy, 2000). Value creation, on the other hand, takes place in the customers' value-generating processes where goods and services are used (Grönroos, 2008).

Most of the academic research investigated the value co-creation between supplier and customer based on different background, such as different industry, subject, business environment, etc. However, value co-creation in Complex Products and Systems (CoPS) has long been neglected. Wuyts and Geyskens (2005) claimed that to a large extent CoPS manufacturers need to take the buyer-integrator-subcontractor triad into account, therefore, it's very important to study CoPS from the perspective of value co-creation. The feature of CoPS calls for establishing and maintaining a good internal relationship, among which value co-creation between supplier and customer is particularly important.

This study studies value co-creation between suppliers and customers in the context of CoPS. It aims to propose the theoretical model of value co-creation in context of CoPS and empirically test the theory based on the data from market research. It will shed some light on how to improve the efficiency, reduce production and transaction costs in context of CoPS.

LITERATURE REVIEW

Value co-creation: Value co-creation, is an emerging business 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 and Ramaswamy, 2004; Payne *et al.*, 2008). The existing value co-creation theory studies more concentrate in service-oriented logic and the research directions focus on: co-creating the voice of the customer (Jaworski and Kohli, 2006); satisfying expectations (Oliver 2006); a cost-function model for coproduction (Etgar, 2006); supply chain issues and value chain management (Flint and Mentzer, 2006); cross-functional processes (Lambert and Garcia-Dastugue, 2006); and marketing strategy effectiveness and operations efficiency (Kalaiganam and Varadarajan, 2006).

In co-creating value, researchers have proposed that firms do not really provide value, but merely value propositions (Vargo and Lusch, 2004) and it is the customer that determines value and co-creates it with the firm. Hence, a firm's product offering are merely value unrealized until the customer realizes it through co-creation and gains the benefit.

Most research has discussed value co-creation in terms such as interactions, relationships, reciprocity, bi-

directional and customer orientation. Value co-creation has also been described as “spontaneous, collaborative and dialogical interactions” (Ballantyne and Varey, 2006). As these interactions are dialogical situations, where both parties are active in a learning process and influence each other’s perceptions and actions (Ballantyne and Varey, 2006). In the process of interactions, suppliers and customers are both value co-creation persons.

CoPS and specific value: Value co-creation is more important for CoPS manufacturers. CoPS is a product or infrastructure with large R&D investment, complex structure and high technological level. They are usually highly integrated (Hobday, 1998). CoPS evolves from large technical system, including aerospace products, high-speed train, intelligent building and large-scale computer. CoPS is customized and produced in small quantity without scale effect, because they are technology intensive with strict maintenance requirements.

Jackson (1985) discussed that relationship-specific adaptations have little value outside a particular relationship: to the extent they create value, they contributed to building switching costs by their nature. Correspondingly, relationship-specific adaptations can be reciprocated as part of a trust building process and reflect an aspect of calculative commitment in business relationships (Aderson *et al.*, 1992). Also, Adaptations can provide value to one or both parties to the extent that these investments reduce costs, increase revenues, or create dependence (Cannon and Perreault, 1999).

Specific value is often argued with transaction cost theory, especially refer to asset specificity. Williamson (1979) argues that identifying the critical dimensions with respect to which transactions differ, of which asset specificity is especially important, has been crucial for explicating contractual complexity. And he states that asset specificity is an operational and encompassing concept (Williamson, 2002). From the perspective of asset specificity, specific value is more important for co-creation in the context of CoPS, because both sellers and buyers don’t want to take risks.

As against simple market exchange, governance is predominantly concerned with ongoing contractual relations for which continuity of the relationship is a source of value (Williamson, 2005). Transaction cost theory predicts that firms that invest in relationship-specific assets are likely to invoke formalized governance structures at the outset to prevent opportunistic exploitation.

Trust, commitment and satisfaction:

Trust: Trust has been embraced in business marketing as a fundamental cornerstone of co-operation. The literature has brought trust as one of the main factors which play an important role in influencing a customer to develop and maintain relationship with the service provider (Shekhar and Gupta, 2008).

In service marketing, trust is necessary simply because in most cases, customers must buy a service prior to experiencing it Berry and Parasuraman (1991). Trust is also found to have important linkages with building and enhancing long-term relationships with customers so that customers become long-term oriented (Ganesan, 1994). Customers are motivated to continue the relationship when they have confidence and trust in the competencies and abilities of the service providers, therefore reducing uncertainties (Sharma and Patterson, 1999). In a business-to-business relationship, the customer will attempt to reduce its perceived risk by selecting a supplier seen as capable of performing reliably (credibility) and demonstrate its interest in the buyer’s well being (benevolence) (Ulage, 2006).

Commitment: Some authors consider that commitment is the highest level of relational bond (Dwyer *et al.*, 1987). Moorman *et al.* (1993) define relationship commitment as an enduring desire to maintain a valued relationship. The essence of commitment between the parties is the adoption of a long-term orientation of the relationship, a desire to make short term sacrifices in order to obtain long term benefits (Dwyer *et al.*, 1987).

Indeed, commitment exceeds the framework of the favorable attitude towards the brand: commitment has a stronger solidity, robustness and stability than the general attitude towards the brand (Goala, 2003). Commitment also helps customers to develop positive intentions towards an extension of the brand to new categories of products (Gurviez, 1999) moderating the effects of negative information about the brand on the changes of consumers’ attitudes (Ahluwalia *et al.*, 2001).

Satisfaction: Customer satisfaction is important in maintaining healthy customer relationships. Customer satisfaction also provides an important linkage to future purchase intentions. Customer satisfaction will enable the dyadic members to stay in a stable relationship and carry out exchanges in the future because of the positive interaction experiences (Ramsey and Sohi, 1997).

Nowadays, customer satisfaction still represents an imperative cornerstone for customer-oriented business practices across a multitude of companies operating in diverse industries (Szymanski and Henard, 2001) and can be considered the essence of success in our highly competitive business world (Jamal and Naser, 2002).

Jap *et al.* (2001) described relationship satisfaction as a positive affective state resulting from the appraisal of all aspects of a working relationship. Satisfaction is a positive affective state resulting from the appraisal of all aspects of a working relationship in relation to the alternatives available (Anderson and Narus, 1990). Specifically, Wilson (1995) define satisfaction in terms of performance and the degree to which business dealings meet the expectations of the partner.

In summary, it may be hypothesized that specific value represents an antecedent of trust, commitment and satisfaction in buyer-seller relationships in the context of

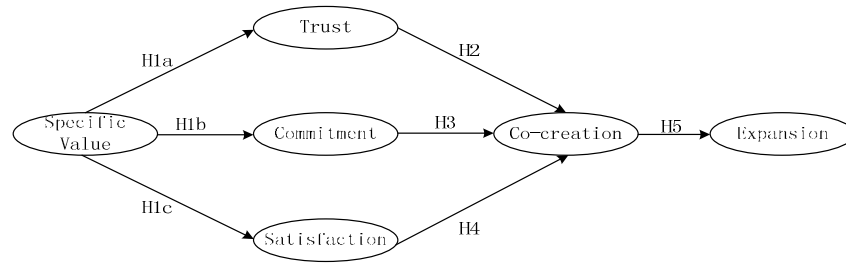


Fig. 1: Conceptual model

CoPS. Given the contradictory results of previous studies, our empirical research is investigating how special value relates to co-creation and behavioral outcome (expansion).

HYPOTHESES DEVELOPMENT

Specific value hypotheses: Relationship-specific adaptations can be reciprocated as part of a trust building process and reflect an aspect of calculative commitment in business relationships (Aderson *et al.*, 1992). Also, Adaptations can provide value to one or both parties to the extent that specific value can increase the extent of satisfaction.

So, we propose:

H1a : Specific value is positively related to trust in CoPS.

H1b : Specific value is positively related to commitment in CoPS.

H1c : Specific value is positively related to satisfaction in CoPS.

Trust hypotheses: Trust has been embraced in business marketing as a fundamental cornerstone of co-operation. So, we propose:

H2 : Trust is positively related to value co-creation in CoPS.

Commitment hypotheses: The essence of commitment between sellers and buyers is the adoption of a long-term orientation of co-creation, a desire to make short term sacrifices in order to obtain long term benefits. So, we propose:

H3 : Commitment is positively related to value co-creation in CoPS.

Satisfaction hypotheses: Satisfaction represents an imperative cornerstone for co-creation business practices across a multitude of companies operating. So, we propose:

H4 : Satisfaction is positively related to value co-creation in CoPS.

Hypotheses between value co-creation and expansion: Value co-creation, is an emerging business 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 (Payne *et al.*, 2008). So, we propose:

H5 : Value co-creation is positively related to Relationship expansion in CoPS. We have got eight hypotheses, all of them are shown in Fig. 1.

METHODS

Sample and data collection: A large-size CoPS company in China agreed to assist with data collection for this research, because most of the purchasing and technical experts are our schoolmates and keep close relations with our laboratory. The involved enterprises are distributed in the industries of electronics, electricity, industrial control and aeronautics, which are quite representative. Age of respondents is between 32 and 55, the average age is 36.4. Work experience is between 6 and 28, the average work experience is 11.9. Influence of purchase decisions of respondents is measured by 7 Likert scale table and the average is 5.92.

The formal investigation was conducted during September and December in 2011. We employed students in Beijing University of Aeronautics and Astronautics (BUAA) to survey the related enterprises. We contacted 392 enterprises and finally obtained 291 cases with valid information. The questionnaire recovery rate is 74.23%.

Measures: All measures were adopted or adapted from previous research. In all, 22 items capture each value co-creation elements (specific value, trust, commitment, satisfaction, value co-creation and expansion). The measurements of specific value, trust, commitment, satisfaction, value co-creation are based on Ulaga and Eggert (2006), Payne *et al.* (2008), Shekhar and Gupta (2008), Goala (2003), Jap *et al.* (2001) and Williamson (2005) respectively. We revise the measurements according to our industry background. The final questionnaire contains 22 items. All the items were measured using a seven point scale (1 = “strongly disagree”, 7 = “strongly agree”).

Table 1: Measurement model results

Constructs	Measures	Loadings	t-value	Cronbach's α	CR	AVE
Specific value	• The main supplier adds more specific value to the relationship overall	0.83	17.38	0.923	0.859	0.673
	• We gain more specially in our relationship with the main supplier	0.86	18.56			
	• The main supplier creates more specific value for us when comparing all costs and benefits in the relationship	0.79	20.13			
Trust	• The main supplier keeps promises it makes to our firm	0.71	19.79	0.821	0.913	0.682
	• Our firm trusts that the main supplier keeps our best interests in mind	0.75	18.91			
	• The main supplier is trustworthy	0.82	18.03			
Commitment	• The relationship with our main supplier is something to which we are very committed	0.89	17.78	0.937	0.909	0.719
	• The relationship with our main supplier is something our business really cares about	0.92	21.37			
	• The relationship with our main supplier is something our business intends to maintain indefinitely	0.91	20.01			
Satisfaction	• Our firm is very satisfied with our main supplier	0.83	22.86	0.855	0.927	0.708
	• Our firm is very pleased with what the main supplier does for us	0.87	16.75			
	• Our firm would still choose to use the main supplier if we had to do it all over again	0.92	19.55			
Value co-creation	• The main supplier can work together with us more joyfully	0.79	18.73	0.889	0.931	0.735
	• When we work with our main supplier, they are like working with my colleagues	0.76	18.40			
	• We enjoy finishing the job with our main supplier together	0.85	19.93			
	• It's often that both the main supplier and us get business growth together	0.84	22.19			
Relationship expansion	• Our firm expects to expand its business with the main supplier	0.79	18.74	0.901	0.941	0.692
	• The main supplier will receive a larger share of our business in the future	0.86	19.60			
	• The main supplier will be used more over the next few years than it is now	0.87	21.06			

Table 2: Correlations and standard errors

	1	2	3	4	5	6
Specific value	1					
Trust	0.92 (0.02)	1				
Commitment	0.87 (0.02)	0.95 (0.02)	1			
Satisfaction	0.83 (0.02)	0.86 (0.03)	0.86 (0.02)	1		
Value co-creation	0.85 (0.02)	0.91 (0.02)	0.91 (0.02)	0.84 (0.02)	1	
Relationship expansion	0.91 (0.02)	0.92 (0.02)	0.93 (0.01)	0.86 (0.02)	0.86 (0.02)	1

ANALYSIS AND RESULTS

Construct validity: The two-step procedure proposed by Anderson and Weitz (1992) was employed to ensure an adequate measurement and structural model. Composite Reliabilities (CR) and Averaged Variances Extracted (AVE) are shown in Table 1. The composite reliability of indicators of each construct is acceptable, ranging from 0.821 for corporate reputation to 0.937 for customer trust. Average Variances Extracted (AVE) are all above the recommended 0.5 level (Fornell and Larcker, 1981).

In addition, all indicators loaded significantly on the respective latent constructs ($p < 0.001$) with the values varying from 0.71 to 0.92. Thus, the convergent validity was confirmed. The confidence interval (\pm two standard errors) around the correlation estimate

between any two latent variables does not include 1.0 (Table 2), providing support for the discriminant validity.

HYPOTHESES TESTING

The analysis proceeds to examine the structural model. A LISREL procedure was used to estimate the model. The overall model fit (chi-square = 417.26, d.f. = 189, CFI = 0.93, NFI = 0.96, NNFI = 0.97, IFI = 0.97, GFI = 0.87, AGFI = 0.83, RMSEA = 0.082) provides an acceptable fit of the data.

Table 3 and Fig. 2 show the structural model results. The results show that specific value is significantly related to trust ($\beta = 0.35$, $t = 4.529$), which supports H1a. At the same time, both commitment ($\beta =$

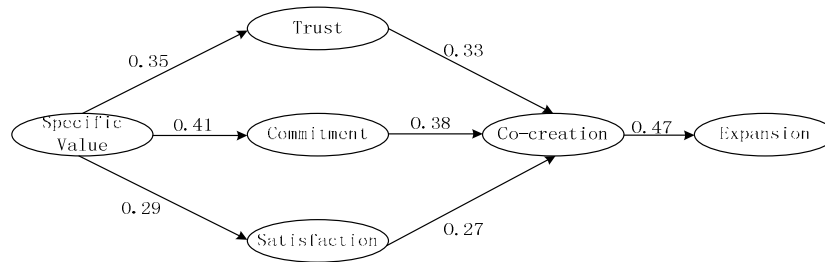


Fig. 2: Structural model results

Table 3: Hypotheses testing results

	Path	Coefficient	t-value	Estimate result
H1a	Specific value → trust	0.35	4.529***	Supported
H1b	Specific value → commitment	0.41	2.689**	Supported
H1c	Specific value →satisfaction	0.29	5.710***	Supported
H2	Trust →value co-creation	0.33	3.857***	Supported
H3	Commitment → value co-creation	0.38	4.092***	Supported
H4	Satisfaction → value co-creation	0.27	2.521**	Supported
H5	Value co-creation → relationship expansion	0.47	4.635***	Supported

0.41, $t = 2.689$) and satisfaction ($\beta = 0.29$, $t = 5.710$) are significant, H1b and H1c are supported. Trust is significantly associated with value co-creation ($\beta = 0.33$, $t = 3.857$), thus H2 is supported. Commitment is significantly associated with value co-creation ($\beta = 0.38$, $t = 4.092$) which supports H3 and satisfaction is significantly related to value co-creation ($\beta = 0.27$, $t = 2.521$), which supports H4. At last, value co-creation is found to be associated with relationship expansion ($\beta = 0.47$, $t = 4.635$). So, all of our hypotheses are supported.

CONCLUSION

In the context of CoPS, value co-creation is associated specific value. Our study shows that supplier and customer build reliable relationship through specific value creation. Specific value arises from specific investment and leads to trust, commitment and satisfaction and which are linked to value co-creation. All above are prove true by our study and good value co-creation conducts to relationship expansion.

This study refers to trust, commitment and satisfaction, which are the important components of relationship value, but we don't mention it and it will be our future research direction.

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