From Motivation to Co-Creation: A Way for Innovation Enhancement

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Abstract: This research addresses what real incentives behind value co-creation to enhance innovation capability in SME companies in Vietnam context. The research method is a quantitative survey method, which applied Structural Equation Modelling (PLS-SEM) as the best statistical modelling tool for data analysis with small sample size of 113 respondents from SME firms. The study draws on interesting contributions both in theory and in practice. From theoretical perspective, it was indicated that proposed motivational determinants exerted positively significant associations on value co-creation. Specifically, management support imposes the most significant impact on value co-creation, followed by knowledge self-efficacy, enjoyment in helping others, reputation and organizational rewards. In addition, value co-creation actually imposes a considerably positive relationship to innovation capability. From practical perspective, the results assist managers in choosing key motivational elements for value co-creation in order to create a sustainable innovation in a SME company.

Keywords: Motivational Factors, Value Co-creation, Innovation Capability

I. INTRODUCTION

1.1. Background

As observed by Lee *et al.* (2012), there are several research and practical applications in business showing that innovation has been playing a crucial role for sustainable development of a company in such a highly competitive market. Most importantly, innovation is demonstrated to deliver the crucial benefit of constituting the competitive and long-term growth for any certain firms (Freeman & Soete, 1997; Robert, 1998; Hamel, 1998; Tidd, 2001). Specifically, the incredible benefits of innovation particularly are: enhancing greater productivity and creativity, reducing costs and employee turnover, and creating new sources of revenue and business models (Ramaswamy & Gouillart, 2010). Furthermore, Lin (2007) argues that when a firm has a certain level of organizational innovation, the ability to solve the problems has the tendency to

be much faster and the ability to respond to the latest information tends to be much quicker, as well. However, researchers have witnessed that there are not so many companies can truly understand and build successful innovation strategies for their companies (Christensen, 2003). The past decades have seen an outdated approach for a company to create value for innovation. The company just focuses on maximizing short-term revenues, while neglects figuring out what customers really need and neglects to build the long term success (Kramer & Porter, 2011). Therefore, the question arisen is that how firms can innovate more successfully and sustainably.

The solution for company innovation suggested by Adams *et al.* (1998) is to lie in collaboration among firm and its stakeholders. When firms co-create values with its stakeholders (customers, employees, vendors, partners), it is studied to generate greater efficiency and effectiveness comparing with lowest costs involved. This collaboration solution was firmly supported in several studies in the past decades (Hurley & Hurt, 1998; Han *et al.*, 1998; Moorman $ Rust, 1999).

Many research pay much attention on co-creating values between the firm and its customers; however, collaboration between the firm and its employees has not been emphasized much (Ramaswamy & Gouillart, 2010). Also, company currently is still operating based on its hierarchical management, which means that the creativity of the junior staff and others is usually ignored (Ramaswamy & Gouillart, 2010). In addition, several studies were conducted to investigate the impacts of several factors on the willingness for sharing knowledge of the employees (Van den Hooff *et al.*, 2004; Yeh *et al.*, 2006), while other research mainly focused on the impacts of several factors on enhancing the innovation capability in an organization (Calantone *et al.*, 2002; Omar Sharifuddin Syed-Ikhsan *et al.*, 2004). Since collaboration between individuals and the company rarely appears to be independent of incentives, it is critical to develop a novel model which integrates the antecedents and the outcomes of value co-creation. Particularly, the antecedents are key motivational determinants, while the outcome is innovation capability.

1.2. Problems and Objectives

The research problem is how key motivational determinants (reputation, enjoyment in helping others, knowledge self-efficacy, management support and organizational rewards) affect value co-creation, which in turn affects innovation capability. In line with the research problem, the main objective of this research is to identify the effects of key motivational determinants (reputation, enjoyment in helping others, knowledge self-efficacy, management support and organizational rewards) on value co-creation, which in turn affects innovation capability in SME companies in Vietnam.

1.3. Implementation Results

This paper provides novel contributions both in theory and in practice. From theoretical perspective, a conceptual model was proposed in order to examine key determinants for value co-creation, which then leads to enhance innovation capability in the context of intensive knowledge firms. More specifically, the theoretical application can be performed in the forms of: model estimates, publications, conferences and workshops on the innovation management for SME companies. Besides that, from the practical perspective, the research contributes for managers the strategic innovation solutions through value co-creation. More specifically, the practical application can be performed in the forms of: trainings, recruitments, improving the materials/infrastructure and incentive programs in a more efficient and effective way.

1.4. Outcomes and Contributions

The outcomes and contributions of this research consist of: (a) Document the results of the research in the forms of model estimates, publications, conferences and workshops on the innovation management; (b) Document the results of this research as a reference for developing innovation strategies in SME companies.

II. STUDY REFERENCES

2.1. Theoretical Basis

The theory which this study is mainly based on is the one proposed by Rajagopalan, Rasheed and Datta (1993). The authors presented the integrated model of strategic decision process in three important dimensions through reviewing several past literature during 1970s, 1980s and 1990s. More specifically, these three distinct aspects included determinant factors, decision processes and outcomes, which were considered as antecedents, processes and outcomes, respectively. Antecedents were indicated to have fostered the processes, which then resulted in the significant link with the outcomes of the processes. Therefore, assembling from the theory developed by Rajagopalan *et al.* (1993), this research is conducted for examining how value co-creation between company and its employees is enhanced through its key determinant factors, which fosters innovation capability for SME firms. Figure 1 below shows an overall conceptual ground for value co-creation research.
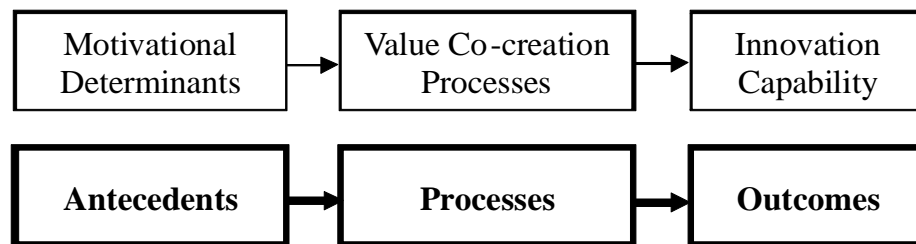
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┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐
│  Motivational   │ ──▶ │ Value Co-creation│ ──▶ │   Innovation    │
│  Determinants   │     │    Processes     │     │   Capability    │
└─────────────────┘     └─────────────────┘     └─────────────────┘

┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐
│   Antecedents   │ ──▶ │    Processes     │ ──▶ │    Outcomes     │
└─────────────────┘     └─────────────────┘     └─────────────────┘
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Figure 1: An Overall Conceptual Ground for Value Co-creation

2.2. Hypotheses Development

Reputation as a Key Determinant of Value Co-creation

Social exchange theory developed by Blau (1964) indicates that people only get involved into sharing their knowledge with one another only if they perceive that what they receive is worth with what they contribute. They think it is worth for their active participation in the value co-creation process when what they receive meet their expectation. It is discovered by social exchange theory that people want to obtain social rewards, especially their personal reputation. A number of studies yields the same conclusion as social exchange theory that reputation is one of the key factors determining the active collaboration within organization (Jones *et al.*, 1997; Donath, 1999; Constant *et al.*, 1996). Thus, employees tend to involve more in co-creation process to generate more values if they gain more reputation and status in the network, which results in the first hypothesis as follows.

H1: Higher levels of reputation achieved while sharing knowledge results in higher value co-creation

Enjoyment in Helping Others as a Key Determinant of Value Co-creation

An intrinsic reward that individuals prefer to gain when contributing their knowledge is their enjoyment in helping others. Individuals feel good to help people and find sharing their knowledge with one another is interesting and challenging (Kollock, 1999). Wasko and Faraj (2000) also claims that people tend to engage more in sharing their knowledge for more value creation because of intrinsic motives rather than extrinsic motives, since helping others in solving challenging problems is considered as very enjoyment activity. Therefore, it leads to the development of the second hypothesis in the conceptual model.

H2: Higher levels of enjoyment in helping others while sharing knowledge results in higher value co-creation

Knowledge Self-Efficacy as a Key Determinant of Value Co-creation

As a part of social cognitive theory developed by Bandura (1997), self-efficacy refers to the positive beliefs of people in their abilities to organize and execute actions in order to succeed in a specific circumstance. Individuals who have high levels of self-efficacy tend to participate more actively into value co-creation process, since they consider themselves as valuable resources when contributing their knowledge to the organization (Gist & Mitchell, 1992). Furthermore, a research conducted by Wasko and Faraj (2000) indicates that self-efficacy is one of motivational factors for employees to co-create values through their sharing knowledge (Wasko & Faraj, 2000; Jang *et al.*, 2002). As a result, the development of the third hypothesis in the conceptual model is presented below.

H3: Higher levels of knowledge self-efficacy achieved while sharing knowledge results in higher value co-creation

Management Support as a Key Determinant of Value Co-creation

As found in the research performed by Connelly *et al.* (2003), the support from managers results in more knowledge sharing within the organization. Senior managers supporting their employees as a facilitator of knowledge learning results in promoting employees to engage more in sharing their knowledge as well (Macneil, 2001). Furthermore, the authors also stated that when employees are supposed to see their managers freely share knowledge with one another, employees have the tendency to share their knowledge with their colleagues as well. In an empirical study carried out by Lin and Lee (2004), it was concluded that there was a significant positive relationship between management support and the knowledge sharing intention of employees. As a result, the fourth hypothesis was developed below.

H4: Higher levels of top management support results in higher value co-creation

Organizational Rewards as a Key Determinant of Value Co-creation

Employees, who have a tendency to engage more in value co-creation process in terms of sharing knowledge, not only depend on intrinsic motivational factors but also on extrinsic motivational factors. Organizational rewards are one of extrinsic rewards which are classified from non-monetary forms of promotion and job security to monetary forms of increasing bonus and salary (Hargadon, 1998; Bartol *et al.*, 2002). Research by Amabile (1993) argues that extrinsic motivational factors can be supplementary to intrinsic rewards so that individuals are more promoted to be creative and collaborative. When organizational rewards meet the

expectations of employees to some extent, employees are more motivated to share their knowledge with their colleagues. As a result, the fifth hypothesis was developed below.

H5: Higher levels of organizational rewards during value co-creation processes results in higher value co-creation

Value Co-creation and Firm Innovation Capability

Value co-creation was first mentioned by Kambil *et al.* (1999) to stress the important role of consumers in business strategy and marketing. Then, Vargo and Lusch (2008) altered the term 'value co-production' into 'value co-creation'. The authors also argued that value co-creation is indispensable for creating the relationship between the organization and its stakeholders. Furthermore, McColl-Kennedy *et al.* (2012) listed 27 different definitions of value co-creation, which can be conceptualized as two main drivers: co-production and value in use (Ranjan and Read, 2016). Ranjan and Read (2016) conducted a research of value co-creation concept and measurement, which identified value co-creation concept from 149 papers. From these papers, value co-creation is extracted into two primary conceptual dimensions of co-production and value-in-use to describe fully the definition of value co-creation. In particular, under co-production, there are three sub-elements including: knowledge (sharing), equity and interaction, while value in use is in the form of experience, personalization and relationship.

The traditional marketing just requires mostly the company in the process of value creation for their customers. However, it is asserted that if the company integrates their employees' ideas and resources, then the company can take advantage of having several products or services development and innovation as their competitive advantage against their competitors. It was further supported in the research performed by Tamer Cavusgil in 2003 that the transferring of knowledge among employees in the organization have a positively significant impact on innovation capability. Thus, co-creation with employees can generate more values in the present and especially in the future for both of them (Darroch & McNaughton, 2002). Therefore, the study proposes the sixth hypothesis as below.

H6: Higher levels of value co-creation within the company results in higher innovation capability

Based on the theoretical basis and previous research, the detailed theoretical framework of this study was proposed as Figure 2.

III. RESEARCH METHODS

3.1. Scope

The scope of the study is motivational determinants (reputation, enjoyment in helping others, knowledge self-efficacy, management support, organizational rewards), value co-creation and innovation capability. The unit of analysis is employees in SME companies in Ho Chi Minh city, Vietnam.

3.2. Sample and Data Collection

Firstly, pilot study was conducted with 20 MBA students working in knowledge-intensive organizations in order to pretest the content understanding, time and detect any variations arisen in the questionnaire (Aaker *et al.*, 2005). The survey was an online based questionnaire using Google Forms platform. After
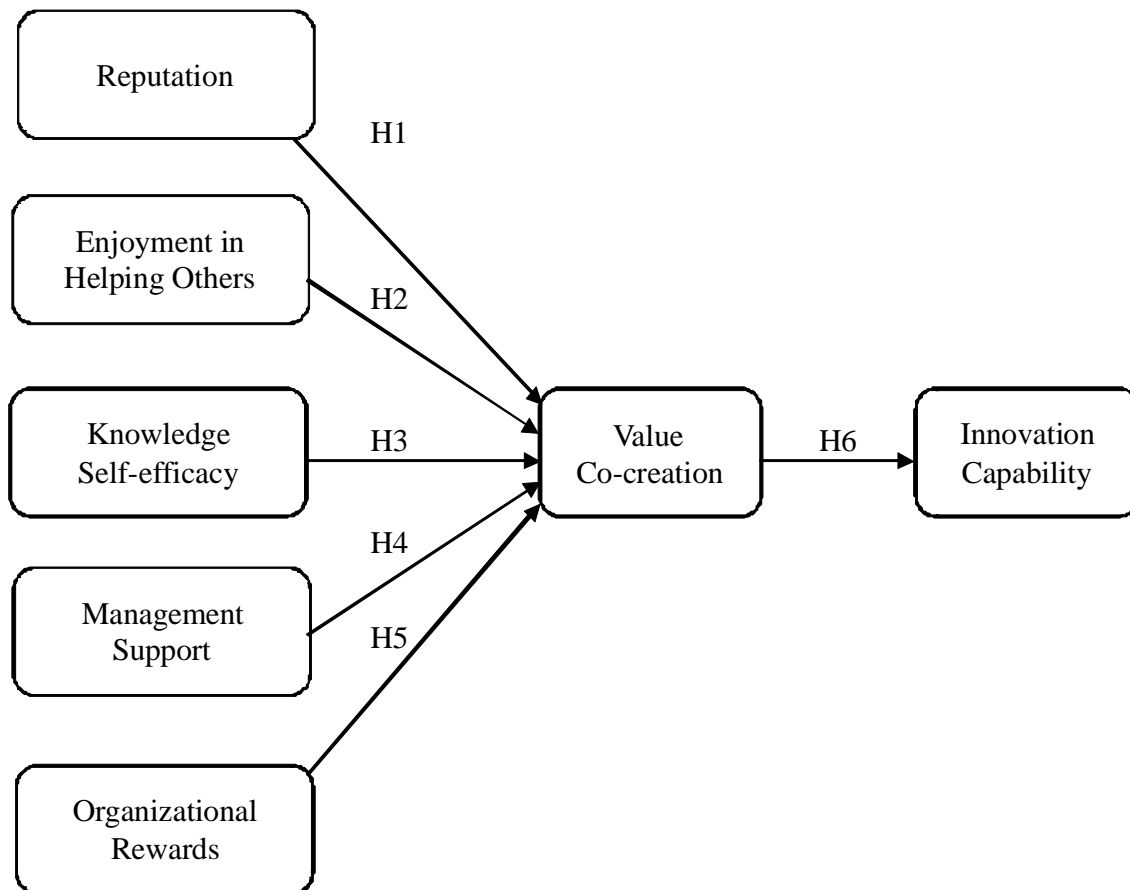
Figure 2: Theoretical Model for Enhancing Innovation through Value Co-creation

receiving suggestions and comments for draft questionnaire, the refined and final version of questionnaire was developed. A number of 450 respondents working in knowledge intensive firms were asked to participate in the survey through email and other social media platforms. The first page of the survey indicated the main objective of the research together with ensuring the information confidentiality for participants. The final sample size was totally completed and usable for evaluating the results of both measurement and structural models was 113 participants, which implies the response rate of 40 percent on average. Table 1 presents the demographic profile of respondents, including: gender, age, working experience, position.

3.3. Measurement Instruments

In this research, items having Cronbach's Alpha of at least 0.7 were adapted from previous studies. It is stated that the higher the value of Cronbach's alpha, the better internal consistency of the items in a measurement scale (Gliem, 2003). In addition, these items were assessed using a 7 - point Likert scale with the following categories: (1) Totally Disagree, (2) Mostly Disagree, (3) Somewhat Disagree, (4) Neutral, (5) Somewhat Agree, (6) Mostly Agree, and (7) Totally Agree. All constructs were measured by multiple indicators, which are either reflective indicators or formative indicators. Table 2 in the Appendix summarizes measurement items for each construct presented in the conceptual model. The measurement items of 7 variables in the model were modified based on the following studies.

Table 1
Demographic Profile

Demographic Characteristics	Number of Response	Percent (%)
Gender		
Male	30	26.5
Female	83	73.5
Age		
18-25	41	36.3
26-35	61	54.0
36-45	9	8.0
46-55	2	1.8
56-65	0	0
>65	0	0
Position		
CEO	10	8.8
Management	17	15.0
Senior Staff	27	23.9
Junior Staff	54	47.8
Others	5	4.4
Working Experience		
< 6 months	20	17.7
6 months – 1 year	19	16.8
1 – 3 years	48	42.5
3 – 5 years	14	12.4
> 5 years	12	10.6

In order to measure two reflective constructs of Reputation and Enjoyment in Helping Others, three reflective items and fours reflective items, respectively, were adapted from the research conducted by Wasko and Faraj (2000). The measurement items of Knowledge Self-Efficacy construct were adapted from Riggs *et al.* (1994), which were measured with totally four items: two reverse-coded items and two normal items. The measurements for Management Support were adapted from a study conducted by Tan and Zhao in 2003, which includes four reflective indicators. The measurement items of Organizational Rewards construct were originated and adapted from the study performed by Hargadon (1998). For Value Co-creation construct, all sixteen measurement items were adapted from Ranjan and Read (2016). According to the author, value co-creation is comprised of two different dimensions, including: co-service provider and value in use. Finally, Innovation Capability construct, which was derived from the study conducted by Calantone *et al.* (2002), was measured by five reflective items including one reverse-coded item out of five items.

3.4. Method of Analysis

Partial Least Squares - Structural Equation Modelling (PLS-SEM) was selected as a main statistical modelling tool for data analysis in this research. In order to evaluate the results of the study, a two-stage approach was

carried out, including: (1) evaluate the measurement models applying the approach of Confirmatory Factor Analysis (CFA) for identifying the relationship between the measured constructs and its indicators and (2) evaluate the structural model applying the approach of Structural Equation Modelling (SEM) for identifying the relationship between the exogenous and endogenous constructs (Hair *et al.*, 2016).

IV. RESEARCH RESULTS

4.1. Assessments of the Measurement Models

Since this study contains both reflective and formative variables, measurement models were assessed separately as reflective measurement models and formative measurement models. Chin (1998) argues that evaluating the construct reliability and validity for formative variables is not the same as those associated with reflective variables. In contrast with reflective construct, formative construct is stated to not be interchangeable (Hair *et al.*, 2016), the formative variables are not likely to highly correlate with one another. Further, the assumption of error free on formative variables leads to the inappropriate approach when assessing formative constructs for internal consistency reliability (Diamantopoulos, 2006). While reflective measurement models were assessed on their convergent validity, discriminant validity and internal consistency reliability, formative measurement models were assessed on their convergent validity, the significance of the corresponding indicator weights and multicollinearity issues among indicators (Hair *et al.*, 2016).

Assessments of Reflective Measurement models

In this study, the reliability and validity of the constructs in reflective measurement models were assessed on convergent validity, discriminant validity and internal consistency reliability (Henseler *et al.*, 2009). Depending on the nature and the previous literature, the reflective constructs in this paper were: Reputation (Rep), Knowledge Self-Efficacy (Kse), Enjoyment in Helping Others (Enj), Organizational Rewards (Rew), Management Support (Man) and Innovation Capability (InC).

Convergent validity is defined as an assessment to check whether the individual items are correlated positively with one another (Hair *et al.*, 2016). For reflective measurement models, convergent validity was measured in two different methods of factor loadings and average variance extracted (AVE). The study revealed that all factor loadings of reflective items except Inc4_r, Kse4_r, and Rew4 were above the suggested threshold value of 0.7, which means that the measures of reflective constructs have high levels of convergent validity (Hair *et al.*, 2016). With respect to average variance extracted (AVE), all reflective indicators except Inc4_r, Kse4_r, and Rew4 yielded the AVE values higher than the suggested threshold of 0.50 (Hair *et al.*, 2016). Thus, it was further confirmed that the measures for reflective constructs were valid in terms of convergent validity assessment.

Hair *et al.* (2016) defines discriminant validity as an assessment to check whether the individual variables are uniquely different from other variables in empirical research. The methods of cross loadings and HTMT (Heterotrait-monotrait ratio) confidence interval were applied to demonstrate the discriminant validity of the constructs in the measurement models. After assessing the model for cross-loadings, it was found that all outer loadings of reflective indicators on their associated constructs except Inc4_r, Kse4_r and Rew4 were higher than those on other constructs. These results pointed out that the discriminant validity issues did not exist in the measurement models, which means that every construct was distinct and

particular comparing with one another. Another method for discriminant validity is HTMT (Heterotrait-monotrait ratio) confidence interval, which requires the values of HTMT to fall within the range of 2.5 % and 9.5 % for assessing the discriminant validity. The results under HTMT confidence interval method strongly supported the approach of cross loadings. In particular, all reflective indicators except Inc4_r, Kse4_r and Rew4 satisfied with the requirements of discriminant validity, which means that every construct was empirically unique and different from other constructs. Thus, it was further confirmed that the discriminant validity was not an issue for these reflective measurement models.

Internal Consistency Reliability is suggested to be assessed in terms of Cronbach's alpha and composite reliability in order to generate the conclusion for the reliability of the measurement models. The reliability lying within the range of lower bound of Cronbach's alpha and upper bound of composite reliability is considered as the true internal consistency reliability (Hair *et al.*, 2016). In addition, both Cronbach's Alpha and composite reliability are recommended to be higher than 0.7 for a high internal consistency reliability.

Table 2
Assessments of Reflective Measurement Models

Reflective Constructs	Indicators	Convergent Validity		Discriminant Validity	Internal Consistency Reliability	
		Loadings	AVE (>0.5)	HTMT confidence interval does not include 1	Cronbach's Alpha (>0.6)	Composite Reliability (0.7)
INC(4)	INC1	0.832	0.682	YES	0.846	0.895
	INC2	0.881				
	INC3	0.823				
	INC5	0.764				
MAN(4)	MAN1	0.838	0.735	YES	0.880	0.917
	MAN2	0.884				
	MAN3	0.799				
	MAN4	0.905				
REW(3)	REW1	0.968	0.836	YES	0.912	0.939
	REW2	0.900				
	REW3	0.872				
ENJ(4)	ENJ1	0.771	0.720	YES	0.872	0.911
	ENJ2	0.888				
	ENJ3	0.892				
	ENJ4	0.837				
KSE(3)	KSE1	0.895	0.601	YES	0.643	0.813
	KSE2	0.835				
	KSE3_R	0.551				
REP(3)	REP1	0.808	0.562	YES	0.617	0.788
	REP2	0.858				
	REP3	0.543				

It was revealed after calculating for the values of composite reliability that all reflective constructs presented composite reliability higher than 0.7, which met the reliability criteria of the model. In particular, when calculating for the values of Cronbach's alpha, all reflective constructs except Reputation (Rep) construct and Knowledge Self-Efficacy (Kse) construct, achieved Cronbach's Alpha of higher than 0.7. Even though Reputation (Rep) construct and Knowledge Self-Efficacy (Kse) construct reported Cronbach's Alpha of 0.617 and 0.643, respectively, these two constructs also yielded high reliability and were acceptable for exploratory research (Hair *et al.*, 2016). Thus, by assessing both the values of Cronbach's Alpha and composite reliability, the reflective measurement models were indicated to have comparatively high and good internal consistency reliability.

In a nutshell, all reflective indicators except Inc4_r, Kse4_r and Rew4 were good in measurement quality in terms of convergent validity, discriminant validity and internal consistency. Therefore, all reflective indicators except Inc4_r, Kse4_r and Rew4 were retained in the reflective measurement models. Table 2 below summarizes the results for assessing the reflective measurement models.

Assessments of Formative Measurement Models

Since there are big differences between reflective and formative indicators, the analysis procedure of validity and reliability between these two kinds of indicators are not the same (Hair *et al.*, 2011). Until now, there is no universal approach for assessing the validity of formative constructs (Lowry & Gaskin, 2014). In this study, the reliability and validity of formative constructs were evaluated in terms of convergent validity and collinearity issues. The internal consistency reliability is suggested not to be meaningful and least important in assessing the reliability of formative constructs (Bagozzi & Heatherton, 1994), since each dimension is used to evaluate the multiple aspects of a specific formative construct (Petter *et al.*, 2007).

In this research, Value Co-creation was considered as third-order formative construct as identified in the study conducted by Ranjan and Read (2016). The author also identified Co-service Provider and Value in Use as two second-order formative constructs to form Value Co-creation. While Co-service Provider (CoSP) comprises of three first-order formative constructs: Knowledge Sharing (CoSP_K), Equity (CoSP_E) and Interaction (CoSP_I), Value in Use (ViU) includes three first-order formative constructs: Experience (ViU_E), Personalization (ViU_P) and Relationship (ViU_R). Because Value Co-creation is a high order construct, analysis of formative measurement models were evaluated according to two stage approach (Wilson & Henseler, 2007). Moreover, the approach of repeated indicators were used as well for all second order constructs and third order constructs. Figure 3 below summaries both low order constructs and high order constructs of Value Co-creation.

In order to evaluate the validity of formative constructs, the significance of outer weights was calculated (Hair *et al.*, 2012) as a first step in the two stage approach. As can be seen from Table 3 that all outer weights of low order constructs on its associated high order constructs were significant at a 1% level. Therefore, all formative indicators were retained in formative measurement models in terms of the significance of outer weights.

In addition, collinearity issues usually impose much more problematic in formative measurement models rather than in reflective measurement models (Hair *et al.*, 2016; Lowry & Gaskin, 2014), since formative indicators are not interchangeable and every indicator represents a unique and distinct item comparing with
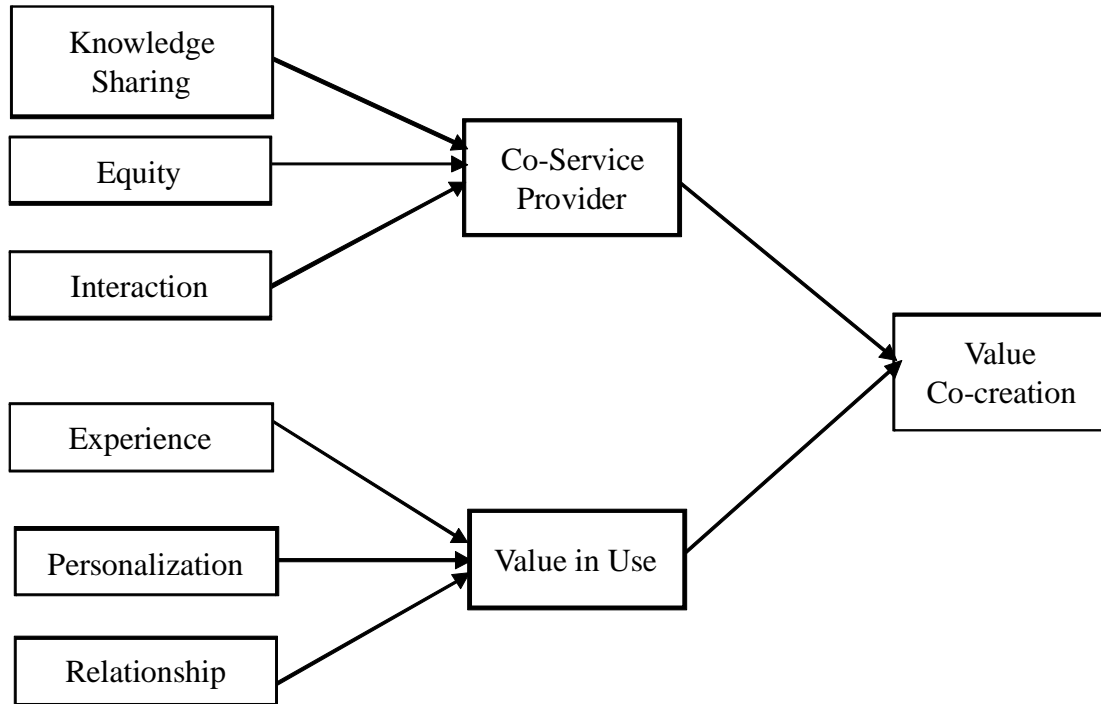
Figure 3: Third Order Value Co-creation Construct

one another (Hair *et al.*, 2016). VIF (variance inflation factor) statistics was recommended to be calculated in order for detecting collinearity issues in formative measurement models (Hair *et al.*, 2016; Petter *et al.*, 2007). From Table 3, it can be claimed that the formative measurement models did not potentially impose any collinearity issues, since all VIF values of formative indicators were below the threshold of 5 (Hair *et al.*, 2016). Thus, there were no formative indicators dropped out of formative measurement model in terms of variance inflation factor (VIF) statistics, which means that the third-order construct (Value Co-creation) was explained well by its associated second-order constructs and first-order constructs.

In summary, the analysis of significance of outer weights and VIF statistics have drawn on the conclusion that all formative constructs presented good levels of quality. As a result, all formative constructs were retained for the next step of evaluating the structural model.

Table 3
Assessments of Formative Measurement Models

	Weights	*VIF*
CoSP → VCC	0.538**	2.118
CoSP_E → CoSP	0.272**	2.230
CoSP_I → CoSP	0.474**	2.908
CoSP_K → CoSP	0.351**	3.043
ViU → VCC	0.538**	2.118
ViU_E → ViU	0.341**	2.205
ViU_P → ViU	0.322**	2.100
ViU_R → ViU	0.457**	2.580

**: p-value < 0.01

4.2. Assessments of the Structural Model

The structural model was intended to generate the inner relationships among the total of 7 main constructs, particularly: 5 reflective exogenous constructs (Rep, Enj, Kse, Man and Rew), 1 formative third-order endogenous construct (VCC) and 1 reflective endogenous construct (InC). Because the construct of Value Co-creation (VCC) was formative third-order endogenous construct, the approach of repeated indicators for higher-order constructs was applied first for purely explaining Value Co-creation variable (VCC) before running the whole structural model (Wilson & Hanseler, 2007).

The repeated indicators approach for third and second order constructs was visualized in Figure 4. In particular, after including all formative indicators into second-order constructs and third-order construct, firstly PLS Algorithm was run to generate the results of latent variable scores for all 7 constructs used in the model. Secondly, a new model using the scores of latent variables was created with the total of 7 constructs in the conceptual model, particularly: 5 exogenous variables (Rep, Enj, Kse, Man and Rew), 1 endogenous variable (Value Co-creation), and 1 endogenous variable (InC).

After all reflective and formative indicators were evaluated to be valid and reliable, structural model was then analyzed for identifying both the predictive capabilities and the relationships among constructs in
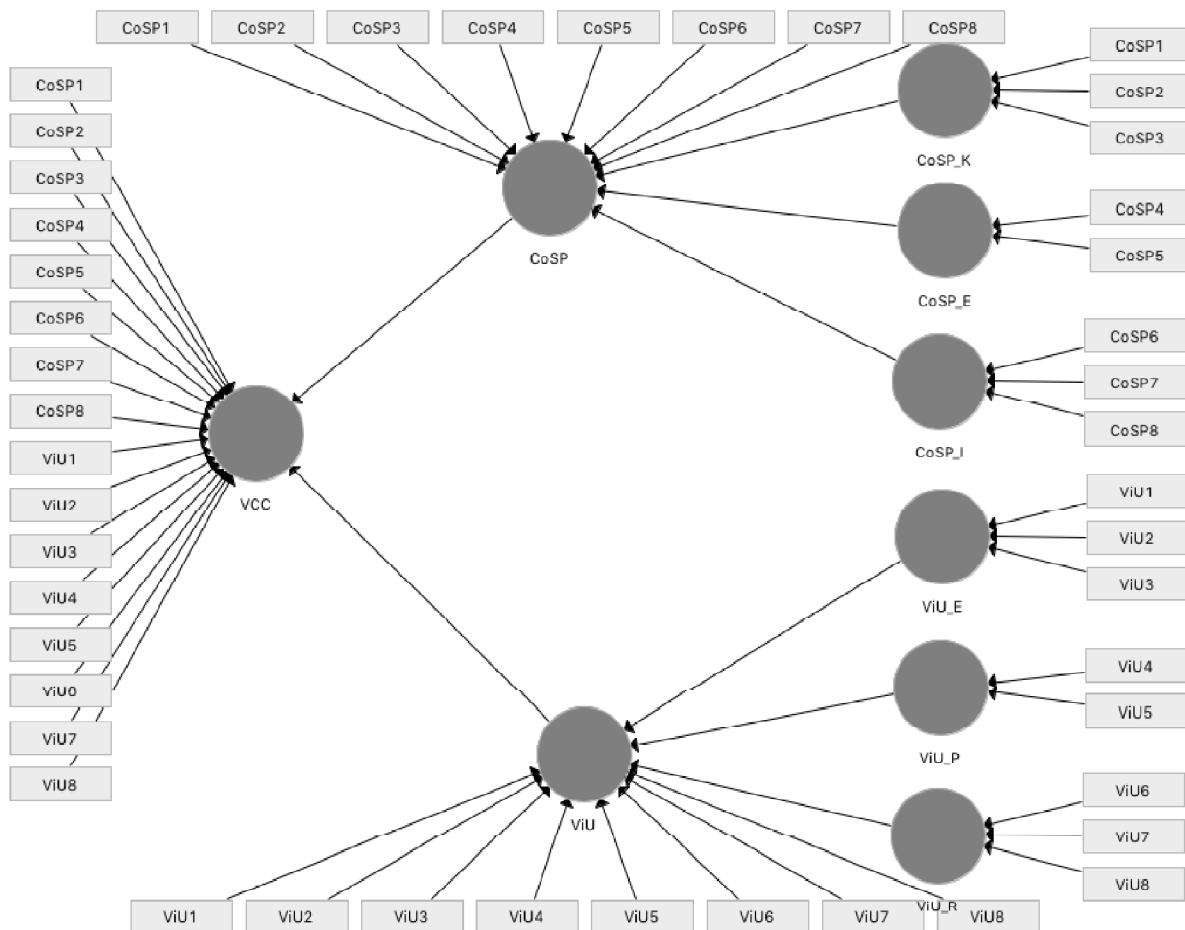

Figure 4: Repeated Indicators Approach for High Order Constructs

the theoretical path model (Hair *et al.*, 2016). In contrast to CB-SEM technique, the structural model in PLS-SEM is mainly evaluated for predictive capabilities of the model, which means that how well the model can predict the proposed endogenous constructs (Henseler *et al.*, 2009; Hair *et al.*, 2016). CB-SEM method is purely based on goodness-of-fit for assessing the structural model since it concentrates on how to minimize the difference between the covariance matrices (Hair *et al.*, 2016). On the other hand, PLS-SEM method mainly focuses on predictive capabilities for assessing the structural model since its main objective is to maximize the explained variance (Hair *et al.*, 2016). Therefore, Hair *et al.* (2016) has drawn on the key steps to assess the structural model when using PLS-SEM in assessment of the path model, including: (1) detect collinearity issues, (2) identify path coefficients and its significance, (3) analyze R-square value versus adjusted R-square value, (4) analyze f-square effect size and (5) analyze Q-square predictive relevance.

In order to detect the collinearity issues of the structural model, VIF (variance inflation factor) statistics was calculated (Hair *et al.*, 2016). From Table 4, it can be shown that all predictive constructs have the inner VIF values of significantly below 5, which is the tolerance of VIF values. More specifically, the VIF values of all predictor constructs were below 3.3, which is stated to be the good threshold for not implying any multicollinearity issues within the structural model (Petter *et al.*, 2007). Thus, the structural model was not imposed by any potential collinearity issues, which means next steps for structural model analysis could be well established.

Table 4
VIF Values of Predictive Constructs

Predictive Constructs	*Inner VIF values*	*The constructs do not imply collinearity issues*
Reputation (Rep)	2.019	Yes
Enjoyment in Helping Others (Enj)	2.069	Yes
Knowledge Self-Efficacy (Kse)	1.838	Yes
Management Support (Man)	1.958	Yes
Organizational Rewards (Rew)	1.137	Yes
Value Co-creation (VCC)	1.000	Yes

The second step to assess the conceptual model was identifying path coefficients and its significance. Since Value Co-creation is third order construct, in order to identify the correct relationship among Value Co-creation, its key determinants and innovation capability, latent variable scores were calculated for path analysis.

From Table 5, it can be found that all constructs presented significant correlations to Value Co-creation. These findings strongly supported for H1, H2, H3, H4 and H5, respectively. In particular, Management Support has the highest positive correlation to Value Co-creation, which obtained a path coefficient of 0.409 at a significant level of 0.01. Knowledge Self-Efficacy was found to be the second construct that indicated strongly positive association on Value Co-creation, which achieved the path coefficient of 0.245 at a significant level of 0.01. Even though the remaining three exogenous constructs (Enjoyment in Helping Others, Reputation and Organizational Rewards) showed weak relationships to Value Co-creation, these weak relationships were revealed to still have significant impacts on Value Co-

creation. The path coefficients of the remaining three variables were: 0.194 (p-value = 0.013), 0.151 (p-value = 0.028), 0.106 (p-value = 0.023), respectively. Furthermore, Value Co-creation actually imposed a highly positive relationship on Innovation Capability with the path coefficient of 0.641 at a significant level of 0.01, which greatly supported for H6. As a result, is is concluded that all of 6 hypotheses proposed in the conceptual model were significantly supported with the desired directions.

Table 5
Path Coefficients of the Structural Model

Hypothesis	Hypothesized Path	Path Coefficients	Results
H1	Reputation → Value Co-creation	0.151*	Support
H2	Enjoyment in Helping Others → Value Co-creation	0.194*	Support
H3	Knowledge Self-Efficacy → Value Co-creation	0.245**	Support
H4	Management Support → Value Co-creation	0.409**	Support
H5	Organizational Rewards → Value Co-creation	0.106*	Support
H6	Value Co-creation → Innovation Capability	0.641**	Support

**: p-value < 0.01

*: p-value <0.05

The path model was further assessed in terms of R^2 and adjusted R^2, f^2 effect size and Q^2 predictive relevance. Table 8 in the Appendix shows that both R^2 and adjusted R^2 of Value Co-creation construct are higher than 0.7, which means that Value Co-creation construct is good predicted in the structural model. Nevertheless, Innovation Capability only has R^2 and adjusted R^2 around 0.4, which indicates the slightly moderate effects in predictive model (Henseler *et al.*, 2009; Hair *et al.*, 2011). f^2 effect size is defined as a measure to evaluate how much impact an omitted exogenous construct has on endogenous constructs. As it can be seen from Table 8 in the Appendix that Enjoyment in Helping Others, Reputation and Organizational Rewards had small effects on Value Co-creation, which had values of f^2 effect size around 0.02 (Cohen, 1988). Knowledge Self-efficacy had medium effect size value of nearly 0.15 on Value Co-creation (Cohen, 1988). Management Support had a large effect size of 0.374 on Value Co-creation, which in turn had a large effect size of 0.696 on Innovation Capability. These two values of f^2 effect size were higher than 0.35, which was indicated as large effect (Cohen, 1988). Q^2 predictive relevance was used to examine the predictive power of the PLS path model (Hair *et al.*, 2016; Geisser, 1974). For evaluation of Q^2 values, it was calculated that both endogenous constructs of Value Co-creation and Innovation had Q^2 values significantly higher than 0, which were 0.716 and 0.375, respectively. Thus, it further confirmed the predictive relevance of the PLS structural model in this research.

In a nutshell, the predictive relevance of the structural model was significantly supported. All six proposed hypotheses were considerably supported as well. The structural model examined the effects of key motivational determinants on value co-creation, which results in enhancing the innovation capability of an organization. Figure 5 summaries the relationships among exogenous and endogenous constructs in structural model in more details.
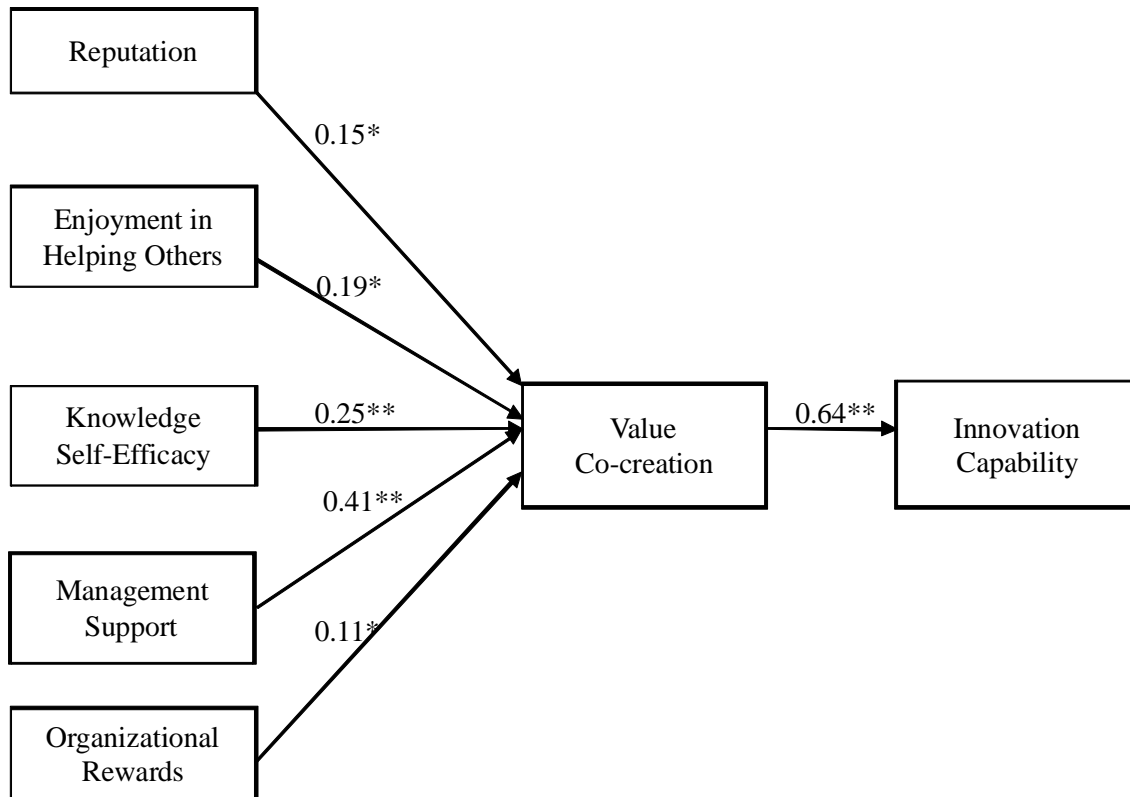
Figure 5: Testing Results by Using PLS-SEM (* p<0.05, ** p<0.01)

V. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

The research findings using the method of structural equation modelling with partial least square path modelling (PLS-SEM) reveal that relationships among exogenous and endogenous constructs in the theoretical model are highly supported, specifically:

- The influence of management support to value co-creation is positive and most significant. A staff that obtains the support from management is likely to collaborate more with the company.

- The influence of knowledge self-efficacy to value co-creation is positive and significant. Employees who are confident in their knowledge, skills, expertise have a tendency to co-create more values within the organization.

- The influence of enjoyment in helping others to value co-creation is positive and significant. Employees who feel more pleasure in sharing their ideas and knowledge with their colleagues tend to be motivated for value co-creation.

- The influence of reputation and organizational rewards to value co-creation are positive and least significant. Higher status and more monetary rewards tend to increase value co-creation activities.

- Value co-creation has a greatly positive impact on the innovation capability of an organization. Organization with high value co-creation among its staff has a high tendency to generate more innovation.

Table 6
Measurement Scales

Latent Variable (Type)	Items	Literature
Reputation (Reflective)	Rep1. I earn respect from others by participating in sharing my knowledge Rep2. I feel that participation improves my status in the profession Rep3. I participate in sharing my knowledge to improve my reputation in the profession	Wasko and Faraj (2000)
Enjoyment in Helping Others (Reflective)	Enj1. I enjoy sharing my knowledge with colleagues Enj2. I enjoy helping colleagues by sharing my knowledge Enj3. It feels good to help someone by sharing my knowledge Enj4. Sharing my knowledge with colleagues is pleasurable	Wasko and Faraj (2000)
Knowledge Self-efficacy (Reflective)	Kse1. I am confident in my ability to provide knowledge that others in my company consider valuable Kse2. I have the expertise required to provide valuable knowledge for my company *Kse3. It does not really make any difference whether I share my knowledge with colleagues (reverse coded) *Kse4. Most other employees can provide more valuable knowledge than I can (reversed coded)	Riggs et al. (1994)
Top Management Support (Reflective)	Man1. Top managers think that encouraging knowledge sharing with colleagues is beneficial Man2. Top managers always support and encourage employees to share their knowledge with colleagues Man3. Top managers provide most of the necessary help and resources to enable employees to share knowledge Man4. Top managers are keen to see that the employees are happy to share their knowledge with colleagues	Tan and Zhao (2003)
Organizational Rewards (Reflective)	Rew1. Sharing my knowledge with colleagues should be rewarded with a higher salary Rew2. Sharing my knowledge with colleagues should be rewarded with a higher bonus Rew3. Sharing my knowledge with colleagues should be rewarded with a promotion Rew4. Sharing my knowledge with colleagues should be rewarded with an increased job security	Hargadon (1998)
Value Co-creation (Third-order)	Subconstruct: Co-Service Provider (Formative) Sub-subconstruct: Knowledge (Formative) CoSP1. The company was open to my ideas and suggestions about its existing products/services or towards developing a new product/service CoSP2. I would willingly spend time and effort to share my ides and suggestions with the company in order to help it improve its products and processes further CoSP3. The company provided suitable environment and opportunity to me to offer suggestions and ideas	Ranjan and Read (2016)

Latent Variable (Type)	Items	Literature
	Sub-subconstruct: Equity (Formative) CoSP4. The processes at my company are aligned with my requirements (i.e. the way I wish them to be) CoSP5. The company considered my role to be as important as its own in the process Sub-subconstruct: Interaction (Formative) CoSP6. I could conveniently express my specific requirements CoSP7. The company allowed sufficient people interaction in its business processes (product development, marketing, assisting other customers, etc.) CoSP8. In order to get maximum benefit, I had to play a proactive role during my interaction (i.e., I have to apply my skill, knowledge, time, etc.) Subconstruct: Value in Use (Formative) Sub-subconstruct: Experience (Formative) ViU1. It was a memorable experience for me (i.e., the memory of the process lasted for quite a while) ViU2. Depending upon the nature of my own participation, my experiences in the process might be different from others ViU3. It was possible for a person to improve the process by experimenting and trying new things Sub-subconstruct: Personalization (Formative) ViU4. The benefit, value, or fun from the process (or the product) will be different for different person ViU5. Different people, depending on their taste, choice, or knowledge, involve themselves differently in the process (or, with the product) Sub-subconstruct: Relationship (Formative) ViU6. The company's extended facilitation is necessary for people to fully enjoy the process (or, the product) ViU7. I felt an attachment or relationship with the party ViU8. People in the company usually spread positive word about it (i.e., in their social networks)	
Innovation Capability (Reflective)	InC1. Our company frequently tries out new ideas InC2. Our company seeks new ways of doing things InC3. Our company is frequently the first to market new products and services *InC4. Innovation is perceived as too risky in our company and its resisted (reverse coded) InC5. Our new product introduction has increased during the last five years	Calantone *et al.* (2002)

Table 7
Cross-loadings

Cross-loadings	*inc*	*man*	*rew*	*enj*	*kse*	*rep*
InC1	**0.832**	0.480	-0.122	0.277	0.349	0.313
InC2	**0.881**	0.575	-0.015	0.433	0.420	0.383
InC3	**0.823**	0.373	0.027	0.247	0.259	0.281
InC5	**0.764**	0.322	0.093	0.332	0.355	0.267
Man1	0.354	**0.838**	-0.137	0.618	0.524	0.553
Man2	0.464	**0.884**	-0.160	0.529	0.419	0.548
Man3	0.504	**0.799**	-0.079	0.351	0.409	0.444
Man4	0.518	**0.905**	-0.168	0.560	0.522	0.527
Rew1	-0.016	-0.172	**0.968**	-0.031	-0.133	0.029
Rew2	-0.009	-0.135	**0.900**	-0.068	-0.135	0.018
Rew3	-0.004	-0.083	**0.872**	0.066	-0.141	0.182
enj1	0.227	0.357	-0.082	**0.771**	0.428	0.524
enj2	0.313	0.493	-0.046	**0.888**	0.515	0.531
enj3	0.411	0.588	-0.033	**0.892**	0.518	0.595
enj4	0.362	0.513	0.033	**0.837**	0.459	0.445
kse1	0.392	0.461	-0.026	0.538	**0.895**	0.447
kse2	0.317	0.486	0.083	0.558	**0.835**	0.504
kse3_r	0.267	0.296	-0.473	0.170	**0.551**	0.104
rep1	0.338	0.553	-0.050	0.590	0.453	**0.808**
rep2	0.327	0.505	0.028	0.477	0.369	**0.858**
rep3	0.151	0.195	0.267	0.237	0.188	**0.543**

Table 8
Assessments of R² and adjusted R², f² effect size and Q² predictive relevance

	R^2 / Adjusted R^2	Q^2 predictive relevance	F^2 Effect Size
VCC	0.772 / 0.761	0.716	
InC	0.410 / 0.415	0.375	
Enj → VCC			0.080
Kse → VCC			0.143
Man → VCC			0.374
Rep → VCC			0.049
Rew → VCC			0.043
VCC → InC			0.696

5.2. Recommendations

The above conclusions result in the following recommendations:

- Managers should concentrate more on providing employees with necessary tools, materials and infrastructure so that employees can freely share their knowledge with one another. For instance,

company can design and develop an online co-creation platform, where individuals can suggest new ideas and share their knowledge on facilitating innovation.

- Managers should conduct training courses, in which every individual is supposed to be the trainer sharing with their strongest expertise and skills.

- Managers should act as a good role model in an organization, because employees who have self-efficacy tend to behave in the same way as viewing their role models. For example, managers can provide useful feedbacks to the employees.

- Managers should increase the the pleasant state of employees through enhancing positive mood states so that employees are more willing to engage in value co-creation process.

- Managers should provide effective incentive programs, such as: give compliments and increasing monetary rewards.

- For the future research, leadership traits should be involved in order to extend the research model to different types of leadership.

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