

## **Co-Creation Intention; Presenting a Model of Antecedents and its Impact on Attitude Toward the Product (Case Study in Shatel Company)**

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### **Abstract**

Virtual co-creation is a tool which assists marketers in better recognizing customers' needs and in increasing new products success rates. Despite the importance of co-creation in new product development, little empirical research is being conducted in order to clarify the concept. Studies are mostly company centric, overlooking consumer's value perception of co-creation and how it affects his behavior. Thus, this research intends to analyze the customers' value perceptions of virtual co-creation, considering the effect of self-efficacy on the correlation between their perceived value and co-creation intention, and eventually study the impact of co-creation intention on attitude toward the product. To do so, Shatel's voice of the customer website was selected as an example of virtual co-creation and a questionnaire was distributed among 446 customers of this company. Data were analyzed using Structural Equation Modeling and SPSS18 and Amos22 software. Results showed that customers perceived virtual co-creation valuable and self-efficacy had no significant impact on value perceptions of the participants regarding this process. Moreover, according to the findings, co-creation leads to positive attitudes toward the product.

### **Keywords**

Attitude toward the product, Self-efficacy, Value-based TAM, Virtual co-creation.

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## **Introduction**

The intricate surroundings of high-tech industries have obliged companies to develop sophisticated marketing. Nevertheless these companies proceed with underdeveloped expertise in discovering market needs (Mohr & Sarin, 2009), which is often the reason for most of the failures in introducing new products (Khajavi & Amiri, 2013; Hoyer et al., 2010). Currently, traditional market research is being used for defining these needs; but it cannot properly determine latent or even expressed needs (Mullins & Sutherland, 1998; Kristensson et al., 2008). Therefore, even though consumers today may choose from a wide spectrum of products and services like never before, it does not necessarily improve their experience (Pralhad & Ramaswamy, 2004). Owing to web-based technologies, customers are now informed, connected, networked, and empowered more than ever (Ramaswamy, 2008) and as a result they are looking for specific solutions to their personal preferences which go beyond the mass-market offerings (Weber, 2011). Indeed, consumers try to achieve products compatible with their preferences through communication with the firm and value co-creation. Albeit collaboration with customers can be carried out in various business processes, collaboration in value creation via product innovation is among the most principal ones (Sawhney et al., 2005). More and more, companies are involving consumers in their product and service innovation practices (Kristensson et al., 2008; Dijk et al., 2014) since neither the company nor the customers can achieve a pioneer product on their own; and this is the central idea in co-creation (Ngugi et al., 2010). Co-creation in new product development (NPD) alludes to firms and consumers working together in order to develop a product (Hoyer et al., 2010) during a process in which consumers play a more active role (Kristensson et al., 2008). Whereas customer interaction has always been evident in NPD, Internet has provided new tools for the integration of customers and has considerably strengthen firms to engage consumers in the product innovation activities (Sawhney et al., 2005). Thus, the focus of this study is on virtual co-creation in NPD.

This consumer co-creation demonstrates an appealing approach to companies for several reasons. Specifically, co-creation enables companies to effectively recognize market needs, and to offer products that are more compatible with them and better than competitors' (Zhang & Chen, 2008), which further leads to maintaining the customers and attaining sustainable competitive advantage (Sawhney et al., 2005). It is therefore not surprising that co-creation has been noted as a research priority by Marketing Science Institute for 2014-2016 (Marketing Science Institute, 2014).

However, it was not until recently that scholars paid attention to co-creation (Alam, 2002; Zhang & Chen, 2008). This novel enquiry domain has mainly been investigated in the B2B field but scarcely in consumer settings (Thomke & von Hippel, 2002; Hoyer et al., 2010). Thereby, the current research focuses on the B2C context because, according to Hoyer and his colleagues (2010, p. 284), due to the B2C characteristics such as "a large distance between firm and its consumers, a large number of potential consumers, lower consumer loyalty levels, and rapidly changing consumer preferences", interacting with consumers and involving them in the NPD practices can be more troublesome compared to a B2B market. This partially explains why new products in business to consumer settings show higher failure rates (Hoyer et al., 2010). Accordingly, many authors have emphasized the necessity of conducting empirical research in B2C arena for elucidating the way in which co-creation influences customers' thoughts and behaviors (Nambisan & Baron, 2009; van Doorn et al., 2010; Bijmolt et al., 2010; Jaakkol & Alexander, 2014). As it has been acknowledged, consumer behavior is better realized when examined through perceived value (Gallarza & Saura, 2006), thus, this article uses the Value-based Technology Acceptance Model to empirically investigate the consumers' perceived value of virtual co-creation. Because, in spite of the importance of co-creation for the companies, it should be mentioned that it is merely customers who are able to evaluate the worthiness of an offering in the market (Witell et al., 2011). Therefore, it can be expected that if consumers do not perceive co-creation valuable, they are less likely to accept it and the

explained benefits for the firm would not be acquired. Moreover, it should be assured that whether companies can benefit from changing customers' behavior through co-creation or not. Hence, the purpose of the present article is to empirically investigate the following queries: Do consumers perceive virtual co-creation valuable? Which factors have influence on this value perception? What are the related outcomes? Do consumers' co-creation intentions result in better attitudes toward the product? Our findings should help in understanding the theoretical antecedents of virtual co-creation adoption from consumers' perspective and in distinguishing the feasibility of presuming the co-creation phenomenon being a main power in business and marketing. Besides, Shatel is an Internet service provider company and its voice of the customer website is an online co-creation platform, thus our findings can lead to better realization of innovation and collaboration in developing new services and may help companies design better collaboration platforms, attain the benefits and succeed in the market.

### **Theoretical Background and Hypotheses**

The literature is organized as follows. Initially, the theoretical context of co-creation pertinent to the current research is discussed. Next, the Value-based Technology Acceptance Model and its relevance to this study is presented. Afterwards, the conceptual model and hypotheses development is proposed.

#### **Co-creation**

Customer participation has become one of the central themes in marketing (Mustak et al., 2013). Classic view of marketing puts customers outside the firm and supposes that they passively receive outputs resulted from the firm's value creation attempts (Bijmolt et al., 2010) but our perspective of value creation is changing from a company/product centric view to a more consumer focused one; this means that customers can and they must participate in company's innovation process for value creation (Leavy, 2004). In other words, innovation is a process of co-creating value with consumers. From this

point of view, innovation is not just an output (a new product or service), rather it is a process which requires customers to participate in determining how to co-create value (Witell et al., 2011). Since, customers are valuable resources for innovation (Füller et al., 2009) companies increasingly involve them in new product development activities; which leads to product creativity, reducing development costs, increasing development speed, and succeeding in the market (Ohern & Rindfleisch, 2008). The importance of customer role in developing new services has also been emphasized (Kristensson et al., 2008). Service attributes, such as intangibility, heterogeneity, perishability and inseparability, have made consumer engagement in the service development process more beneficial compared to goods. Besides, service provision intrinsically requires consumers to get engaged in the process of creating value. This notion suggests that customers are able to and do function as co-producers in the new service development activities (Weber, 2011).

There are numerous definitions of co-creation but one of the most comprehensive ones in the NPD context belongs to Ohern and Rindfleisch (2008, p. 4); they have defined co-creation as "a collaborative NPD activity in which customers actively contribute and/or select the content of a new product offering". Hence, there are two critical processes associated with this collaborative activity, namely "contribution that is submitting content", and "selection that is choosing which of these submissions will be retained" (Ohern & Rindfleisch, 2008, p. 4). However, since Shatel's voice of the customer website does not include a section for voting to submitted ideas, this study will only concentrate on the contribution process. This interaction with customers during early stages of the NPD process can lead to higher product success because consumers are sources of information and knowledge who can determine their specific needs and wants, therefore, enhance product effectiveness (Gruner & Homburg, 2000; Lundkvist & Yakhlef, 2004; Cooper & Edgett, 2008). As a result, customer co-creation in the ideation phase of NPD process can help companies to navigate their innovations to the right direction.

Moreover, even though companies always interacted with customers to some extent in the process of developing new products, yet this matter of interaction has been greatly affected by Internet; on the one hand, the number of people participating in online activities is growing every day, currently beyond three billion people around the globe use Internet (Internet World Stats, 2015), and on the other hand, interactivity, breadth, speed, richness, enhanced reach, flexibility, and persistence are among Internet features that support implementing co-creation methods (Sawhney et al., 2005). Thus, it can be stated that virtual co-creation is a supreme platform to broadly determine and create value alongside the vast majority of customers. Due to the participation opportunity virtual co-creation provides and its promising and comprehensive approach in value creation, it is a trend which cannot be overlooked. For this reason, the current research focuses on this type of co-creation and analyzes the actual attractiveness of virtual co-creation from consumers' point of view.

#### **Value-Based Technology Acceptance Model**

Most implementation failures of new technologies stem from the lack of user acceptance (Davis, 1993). The Technology Acceptance Model (TAM), first defined by Davis (1989), has been extensively used in the field of technology adoption. This model, which is based on the theory of reasoned action (Venkatesh, 2000), suggests two specific perceptions in determining user's intention to accept and use a system, namely perceived usefulness, that is an individual's perception regarding the degree to which a specific system utilization will improve his or her job performance, and perceived ease of use, that is an individual's perception regarding the degree to which a system utilization will be free of effort (Venkatesh & Davis, 2000). Prior research has validated this model across a wide spectrum of corporate information technologies (Moon & Kim, 2001).

However, Kim, Chan, and Gupta (2007) argued that TAM has been initially created for describing user acceptance of traditional systems in the workplace, therefore it might have constrained application in a personal use context. They used the theory of consumer choice and

decision making to propose a Value-based Technology Acceptance Model (VAM) for explaining consumers' adoption of mobile Internet service. The perceived value construct in this model is defined in accordance with Zeithaml (1988), as a consumer's general judgement regarding the utilization of a product based upon relevant gains and sacrifices. Perceived value is represented in VAM via two basic constructs namely perceived benefits and sacrifices. Perceived benefits include usefulness which reflects the personal tendency to get involved in a practice due to the exogenous reinforcement, and enjoyment that refers to a product utilization being intrinsically enjoyable without being affected by its probable performance consequences (Kim et al., 2007). Perceived sacrifices, which include both monetary and non-monetary sacrifices, cover technicality and perceived fee. The technicality is described through consumer's perception of ease of use, system reliability, connectivity, and efficiency, whereas, perceived fee indicates an individual's perception regarding the degree to which usage of mobile Internet service is expensive in comparison with internal reference prices. Kim, Chan, and Gupta (2007) empirically investigated VAM and found out that user's intention to adopt mobile Internet service is primarily determined by his or her perceived value of this technology, and the value perception mediates the effect of two cost beliefs and two benefit beliefs on adoption intention. This value-intention framework has been tested in different settings such as mobile Internet acceptance (Roostika, 2012), online music purchase (Chu & Lu, 2007), mobile fashion shopping (Ko et al., 2009), and adoption of mobile shopping mall apps (Keong, 2016). Since the results of these studies were similar to those of Kim and his colleagues (2007) thus, VAM's benefit-sacrifice framework can also be used to predict and explain consumers' virtual co-creation intention. Because this kind of co-creation is a consumer usage system which utilizes Internet mechanism and related communication technologies. Therefore, Technology Acceptance Model (TAM) can be an effective structure in studying consumers' intention to use virtual co-creation. However, since this research aims at using value concept for this investigation,

hence a Value-based Technology Acceptance Model (VAM) has been employed (Kim et al., 2007). But, as participating in Shatel's voice of the customer website does not require monetary sacrifices, this construct is not included in the model and only perceived ease of use makes the sacrifice component. Furthermore, co-creation relies on customers' knowledge of technology and product, and what they believe they are able to do with it. However, there are always customers who do not possess the sufficient and needed extent of knowledge and confidence to contribute in designing the products specific to their needs (Nambisan, 2002); this can further lead to their rejection of virtual co-creation. Thus, self-efficacy construct has also been considered in the conceptual framework. Likewise, since the present research aims at investigating the effects of co-creation on behavioral intentions and due to the role of attitude toward the product as an essential factor in ensuring the effectiveness of new product development strategies, attitude toward the product has been noted as the co-creation consequence at the end of the conceptual model.

So far, the literature in the field of co-creation and VAM has been introduced. The next section will be focused on explaining the assumed correlations among the constructs of the theoretical framework.

### **Hypotheses Development**

#### **Perceived ease of use and perceived value**

Co-creation requires customers' participation in idea generation as well as value creation. Therefore, consumers should be able to use requisite tools for this collaboration. Perceived ease of use (PEOU) refers to an individual's perception regarding the degree to which a system utilization will be free of effort (Davis, 1989). If a potential user perceives a system to be too difficult, he or she most probably will not accept it, thus, the system's failure possibility would be increased (Venkatesh, 2000). Moreover, scholars have proven the correlation between perceived ease of use and perceived value (Chu & Lu, 2007; Sotjijoso, 2012). Therefore, it is hypothesized that:

**H1:** Perceived ease of use influences perceived value.



**Perceived usefulness and perceived value**

Perceived usefulness (PU) is defined as an individual's perception regarding the degree to which a specific system utilization will improve his or her job performance (Davis, 1989). Even if a system is implemented meticulously, it presumably will not be adopted favorably unless it improves people's job performance. Davis referred to cost-benefit paradigm in order to explain that when people make decisions, they choose an alternative based on perceived usefulness and perceived ease of use. This paradigm considers personal decisions as being the outcome of a cognitive compromise among required attempt and quality of the resulting decision (Davis, 1989). Due to this view, perceived usefulness concept in the current theoretical framework represents the benefits people can receive from contributing in virtual co-creation which further leads to greater perceived value (Sotjiyoso, 2012). Therefore, it is hypothesized that:

**H2:** Perceived usefulness affects perceived value.

**Perceived enjoyment and perceived value**

It has been acknowledged that both instrumental and hedonic incentives are principal determinants of consumer behavior across consumption phenomena, in other words, consumers are either searching for answers to problems or looking for fun and fantasy (Childers et al., 2002). However, the hedonic constituent was not considered in the consumption experience studies until the early 1980s (Sanchez-Fernandez & Iniesta-Bonillo, 2007). Perceived enjoyment (PE) construct has been recently added to the TAM model and refers to a technology utilization being intrinsically enjoyable without being affected by its probable performance consequences (Kim et al., 2007; Childers et al., 2002). According to previous research, perceived enjoyment is an antecedent of perceived value (Chu & Lu, 2007). In virtual co-creation, it is not only the final product that generates value for the customer, but other factors related to the e-service quality are influential in this matter, too; including website usability, its friendly interface, and also the pleasure it provides (Overby & Lee, 2006; Chang & Wang, 2011). Thus, it is hypothesized that:

**H3:** Perceived enjoyment affects perceived value.

**Perceived value and co-creation intention**

Perceived value (PV) refers to a consumer's cognitive compromise among what is gained and what is sacrificed as a result of consuming one particular offering (Chang & Wang, 2011). Increasing expected benefits through attaining products more compatible with personal needs might constitute customer's incentive to participate in co-creation process (Woodall, 2003). Overall, involvement in virtual co-creation practices should bring customers intrinsic and extrinsic advantages. These benefits can encourage one to co-create value. "Intrinsic benefits imply that an experience is appreciated for its own sake, while extrinsic benefits serve as means to an end" (Jacob & Rettinger, 2011, p. 5). Research has also demonstrated the significant positive effect of consumers' perceived value on their co-creation intention (CI) in the future (Weber, 2011). Value perception, which is central to customer's satisfaction, loyalty and behavioral intention, ultimately leads to purchase behavior. Consumers who believe that a product is highly valuable would evaluate it more desirably and would be more inclined to accept or use it. Altogether, economically rational consumers, who seek the maximum utility with minimum resources, will choose those products with superior value compared to other competing alternatives (Chang & Wang, 2011). Hence, it is hypothesized that:

**H4:** Perceived value affects co-creation intention.

**Co-creation intention and attitude toward the product**

Attitude implies a composite of consumer's beliefs regarding an object or situation which is often used as a concept for guiding people's behavior (Joshi, 2003). It has been proven that involvement has a significant effect on consumer behavior, and possibly influences customer's attitude toward an activity, product or situation (Meng, 2006). Customer engagement in NPD practices may result in new product ideas which customers will probably appreciate more (Hoyer et al., 2010). Results from a study conducted to analyze how custom-made products affect attitudes toward them indicated that customers would value these products more positively because they show more

compatibility with individuals' needs and wants (Franke et al., 2009). Since co-creation is a sort of customers' active participation in product development and due to the fact that it can lead to development of products which are better fits to consumers' needs, it can be concluded that co-creation has an effect on attitude toward the product (ATP). Furthermore, attitudes toward a product will be more positive if the offering is resulted from co-creation attempts of customers and the organization (Dijk et al., 2014). Thus, it is hypothesized that:

**H5:** Co-creation intention affects attitude toward the product.

#### **Self-efficacy, perceived value, and co-creation intention**

Albert Bandura developed self-efficacy theory based on social cognitive theory and described it as "a personal judgment of how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p. 122; Davis, 1989). This judgment determines whether he or she initiates a particular task and persists enough to complete it successfully or not (Kim & Kim, 2005). In adopting a technology, such as virtual co-creation, self-efficacy is important and refers to how self-confident one is in him or her being able to use an innovative system for attaining a preferred goal (Venkatesh, 2000; Kulviwat et al., 2014). Accordingly, co-creation depends on people's ability to participate, which is restricted by their relevant resources like equipments, wisdom, proficiency, know-how, time, energy, endeavor, and wealth (Jacob & Rettinger, 2010). In the virtual co-creation setting, self-efficacy is strongly affiliated with the consumers' capabilities for using Internet-based tools in order to generate novel ideas for developing products or services most compatible with their needs and preferences. However, not every customer has the required abilities or self-confidence to get involved in co-creation (Piller et al, 2005). Those consumers, who do not believe in themselves to be capable of performing these collaborative practices, will not engage in such behaviors, even if they acknowledge them as better alternatives (Jacob & Rettinger, 2010). In other words, Self-efficacy is a direct predictor of people's behaviors and determines what activities they will engage in (Meuter et al., 2005).

Thus, it can be reasoned that without basic computer skills and a specific level of time, endeavor, knowledge, capacity, and confidence for utilizing collaborative platforms and generating effective ideas for product development, a customer will not be able to get involved in virtual co-creation. This can further affect consumers' intention to participate in such actions. Therefore, it is hypothesized that:

**H6:** Self-efficacy has a moderating effect on the correlation amongst value perception and co-creation intention.

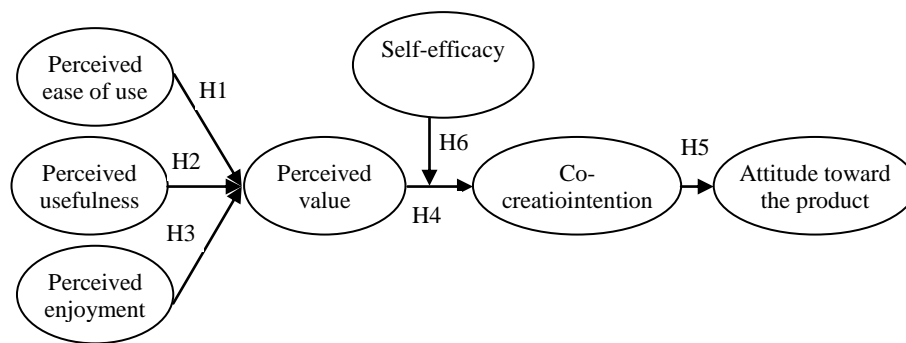


Fig. 1. Conceptual framework

## Research Methodology

### Research setting

Shatel Group is an Iranian Internet service provider, which currently owns the largest market share of Internet users and the supplementary services in Iran. This achievement owes to customer centricity as the fundamental discipline of all the company's activities, and its emphasis on the importance of understanding customers' needs and offering services compatible with them. The company tries to innovatively improve both the quality and diversity of the services it provides in order to make customers satisfied. Furthermore, Shatel's voice of the customer website is a means of communication with consumers and involving them in company's innovation process. Ideas generated through this mechanism are used in improving services or even designing new ones, especially in the Shatelland website which is an online platform to enrich Internet service

packages and improve consumers' online experiences ([www.shatel.ir](http://www.shatel.ir)). Due to Shatel's leading position in the quality of innovative services, its virtual system for capturing customers' ideas as new sources of innovation, and valorizing those ideas enough to make an effort to apply them, this company has been selected as the example of this research.

### **Data collection**

In order to collect the data, invitation letters were randomly sent to Shatel's Instagram page followers, through Instagram direct, explaining the purpose of the study and asking for their collaboration in filling out the online questionnaire through the provided website link. As the current research aims to analyze the factors influencing co-creation intention among Shatel's consumers using company's voice of the customer website, therefore, respondents should have been Shatel's customers and must have seen its voice of the customer website; from 446 gathered questionnaires 23 respondents (5.2%) stated that they were not Shatel's customers and thus were excluded. From the rest of respondents 103 (15.37% of 423) reported that, despite the emphasis in the questionnaire, they did not visit voice of the customer website, so they were also eliminated. Therefore, 358 questionnaires remained for further analysis from which 285 individuals (79.6%) were male and 73 of them (20.4%) were female. In terms of age, 68 individuals (19%) were 15 to 20, 134 individuals (37.4%) were 21 to 25, 107 individuals (29.9%) were 26 to 30, and 49 individuals (13.7%) were 31 and above. In terms of occupation, 29 respondents (8.1%) were students, 162 respondents (42.3%) were collegian, 60 respondents (16.8%) were employees, 14 respondents (3.9%) were college professors or researchers, 6 respondents (1.7%) were housewives, and 87 respondents (24.3%) were self-employed.

### **Measurement development**

The questionnaire constituted of two segments. The primary segment gathered some information regarding respondents' attributes such as gender, age, education, and job. The secondary segment was designed relative to the components included in the conceptual model and had

five-point Likert scales from strongly disagree to strongly agree. Ease of use perception was borrowed from the measurements defined by Davis (1993) as well as Chu and Lu (2007) containing three items. Perceived usefulness was adapted from the measures defined by Davis (1989) and Venkatesh (2000) containing five items. Perceived enjoyment was adopted from the measures developed by Kim, Chan, and Gupta (2007) and Chu and Lu (2007) including four questions. Perceived value was adopted from criteria specified by Kim, Chan, and Gupta (2007) containing four items. Co-creation intention was adapted from measures developed by Sweeney and Soutar (2001), and Kim, Chan, and Gupta (2007) containing three items. Attitude toward the product, borrowed from measurements defined by Davis (1993) besides Cortese (2014), contained four items. Self-efficacy was adapted from the measures defined by Sotjijoso (2012) containing three items. Former to carrying out the original study, content validity was approved by several marketing faculty members of Tehran University. Moreover, Cronbach's alpha scores demonstrated internal reliability of every construct (Table 1).

## **Results**

### **Analysis of the measurement model**

Structural Equation Modeling (SEM) was conducted in order to test the hypotheses and analyzing data. For doing that Amos22 and SPSS18 software were employed. To perform SEM one must ensure the data adequacy, which was done using  $(5q \leq n \leq 15q)$  formula ( $q$ = the number of questions,  $n$  = sample size). Due to 26 questions and 358 complete questionnaires, the sample adequacy was approved. In order to analyze the data gathered, first the normality of data distribution was confirmed through measuring skewness and kurtosis. Then, the measurement model was examined for affirming convergent and discriminant validity. Finally, the structural model was tested to analyze the strength and direction of the relationship among the components of conceptual framework. Byrne (2010) stated that the skewness for a normal distribution should be between +3 and -3, and

kurtosis should be less than 7. According to Table 1, skewness is between -0.87 and -0.027, while kurtosis is between 0.128 and 1.265; therefore, the normality of data distribution is approved. Then, we investigated the validity and reliability of the measurement instrument; primarily, for testing the validity, convergent validity were measured through factor loadings and Average Variance Extracted (AVE), then, because more than one latent variable existed in the conceptual model, discriminant validity was also analyzed. The factor loadings should be at least 0.5 (Hair et al., 2006). In this study, factor loadings ranged from 0.514 to 0.935 that shows validity. Also, since in confidence level of 99%, t-value is more than 1.96 for each item then factor loadings are significant. On the other hand, if AVE for each construct exceeds 0.5, construct validity is acceptable (Hair et al., 2006). According to Table 1, AVE index ranges from 0.709 to 0.801 which demonstrates acceptable and good validity. As for discriminant validity, if the correlation amongst items in each two construct is beneath the square root of AVE shared by items inside a construct, the measurement instrument will demonstrate discriminant validity (Fornell & Larcker, 1981). The results of this analysis in Table 2 confirms the discriminant validity of the questionnaire. Then, to analyze reliability, convergent reliability was assessed using Composite Reliability (CR). CRs of higher than 0.7 are satisfactory, and between 0.6 to 0.7 are acceptable (Hair et al., 2006). CRs of constructs ranged from 0.782 to 0.893 which indicate good and acceptable reliability.

Table 1. Normality test

Variable	Mean	Standard deviation	Skewness	Kurtosis	Factor loading	t-value	CR	AVE	Cronbach's alpha
PU							0.83	0.78	0.878
Item 1	3.78	0.85	-0.71	0.97	0.68	9.74			
Item 2	3.78	0.82	-0.64	0.85	0.71	9.22			
Item 3	3.73	0.89	-0.57	0.34	0.62	8.31			
Item 4	3.87	0.85	-0.52	0.19	0.81	10.3			
Item 5	3.83	0.85	-0.74	0.74	0.78	8.72			

Continue Table 1. Normality test

Variable	Mean	Standard deviation	Skewness	Kurtosis	Factor loading	t-value	CR	AVE	Cronbach's alpha
PV							0.80	0.79	0.826
Item 1	3.92	0.855	-0.89	1.27	0.8	9.3			
Item 2	3.85	0.823	-0.84	1.18	0.87	10.0			
Item 3	3.67	0.897	-0.72	0.55	0.74	8.6			
Item 4	3.80	0.962	-0.7	0.3	0.51	6.63			
PEOU							0.83	0.80	0.774
Item 1	3.56	0.919	-0.31	-0.22	0.71	9.1			
Item 2	3.30	1.012	-0.31	-0.38	0.56	8.0			
Item 3	3.70	0.861	-0.73	0.78	0.71	7.1			
PE							0.87	0.78	0.837
Item 1	3.21	1.004	-0.33	0.75	0.64	8.22			
Item 2	3.2	1.056	-0.15	-0.35	0.86	10.5			
Item 3	3.4	0.984	-0.41	-0.52	0.81	11.3			
Item 4	3.54	0.89	-0.58	0.69					
CI							0.88	0.79	0.873
Item 1	-0.37	-0.17	1.04	3.26	0.88	10.1			
Item 2	3.28	1.03	-0.18	-0.41	0.94	11.0			
Item 3	3.19	1.02	-0.3	-0.31	0.84	9.63			
SE							0.78	0.75	0.817
Item 1	3.66	0.84	-0.19	-0.31	0.69	8.59			
Item 2	3.5	0.96	-0.26	-0.35	0.88	9.29			
Item 3	3.23	1.006	-0.027	-0.57	0.75	8.25			
ATP							0.89	0.74	0.896
Item 1	3.91	0.88	-0.871	1.01	0.81	11.53			
Item 2	3.8	0.81	-0.564	0.79	0.80	8.21			
Item 3	3.62	0.92	-0.419	0.26	0.70	7.83			
Item 4	3.5	0.945	-0.281	0.13	0.67	7.59			

Table 2. Discriminant validity

Construct	PU	PV	PEOU	PE	CI	SE	ATP
PU	0.88*						
PV	0.8	0.89*					
PEOU	0.67	0.61	0.89*				
PE	0.47	0.46	0.51	0.88*			
CI	0.34	0.34	0.44	0.56	0.89*		
SE	0.27	0.31	0.3	0.38	0.42	0.87*	
ATP	0.57	0.55	0.54	0.51	0.47	0.38	0.86*

\*Square root of AVE



### Analysis of structural model

The overall goodness-of-fit was assessed through the chi-square test and other related fit indices. All in all, if fit statistics are greater than or equal to 0.9 for GFI, IFI, TLI, and CFI, the model will be an adequate fit. Besides, RMSEA and RMR values up to 0.08 are acceptable (Hair et al., 2006; Ho, 2006; Byrne, 2010). Figure 2 demonstrates fit indices and according to this figure, P value is less than 0.05 therefore CMIN is not significant. But other indices approve that current conceptual model indicates a good model fit. Eventually, due to goodness-of-fit, the structural model was used to test the research hypotheses.

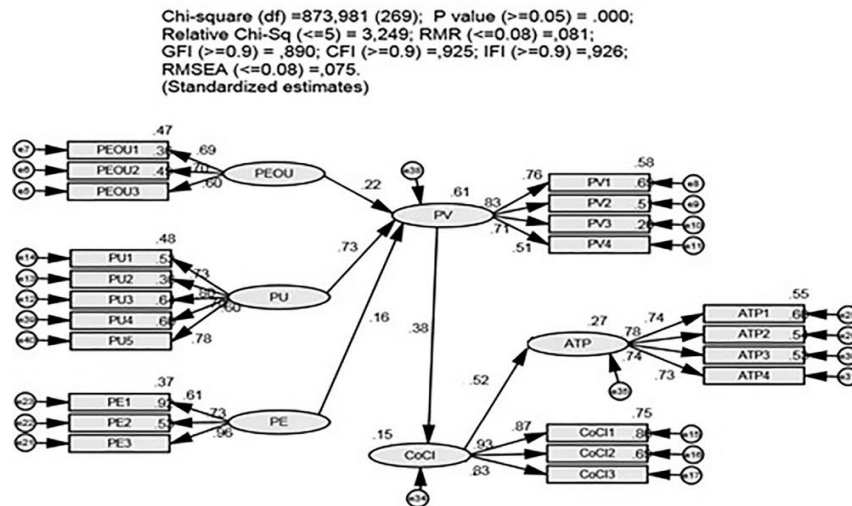


Fig. 2. Results of structural modeling analysis

### Investigating the moderating effect of self-efficacy

Moreover, for analyzing the effect of self-efficacy two models were developed. In the first model, we considered high self-efficacy and low self-efficacy simultaneously (identical correlations). In the second model, we assessed the correlation among perceived value and co-creation intention considering the effect of self-efficacy (Non-identical correlations); the results of this comparison are indicated in Table 3.

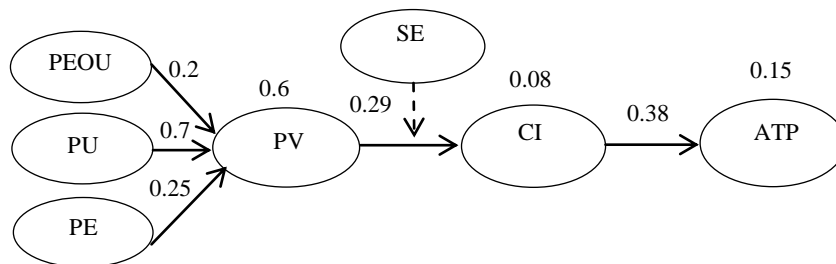
**Table 3. Fit indices of identical and non-identical correlations models for low and high self-efficacy groups**

Model	CMIN	P	CMIN/DF	GFI	AGFI	IFI	CFI	RMSEA	AIC
Identical correlations	873.98	0.00	3.249	0.89	0.846	0.93	0.925	0.075	1254.98
Non-identical correlations	1015.21	0.00	1.887	0.84	0.891	0.91	0.903	0.073	1007.21

As it is evident in Table 3, even though the two models are good fits and fit indices for two of them are in the acceptable range, Normed Chi-square (CMIN/DF) in the second model is lower and thus more desirable. Akaike Information Criterion (AIC), which is an index for comparing the two models, is lower and more desirable for the second model. Consequently, the non-identical model is more preferable. In addition, to ensure a more thorough evaluation of the results we compared the two groups when self-efficacy is high versus when it is low. Then hypothesis was tested.

**Table 4. Results summary for non-identical structural models**

Group	Hypotheses	Non-standard path coefficient	Standard path coefficient	t-value	Significance level
Low self-efficacy	Perceived value – co-creation intention	0.39	0.29	3.66	P < 0.01
High self-efficacy	Perceived value – co-creation intention	0.53	0.36	4.37	P < 0.01



**Fig. 3. Structural model based on non-identical model with low self-efficacy**

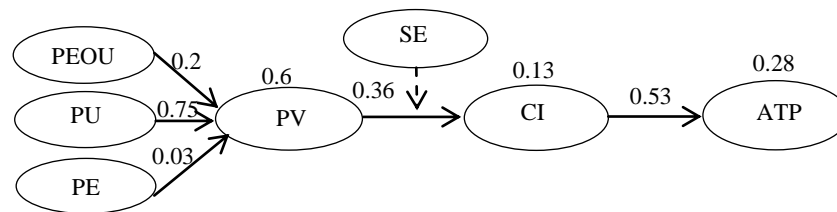


Fig. 4. Structural model based on non-identical model with high self-efficacy

Results show that 8% of changes in co-creation intention in the model of lower self-efficacy is explained by perceived value and 13% of changes in co-creation intention in the model of higher self-efficacy is explained by perceived value. This shows that the explanatory power of non-identical model with high self-efficacy is more than the explanatory power of non-identical model with low self-efficacy.

### Hypotheses testing

Figure 2 represents the results of the structural equation modeling. In the present research, perceived value was anticipated by PEOU ( $\beta=0.218$ ,  $P<0.01$ ), together with PU ( $\beta=0.731$ ,  $P<0.01$ ) and PE ( $\beta=0.158$ ,  $P<0.05$ ), and these variables were jointly responsible for 61% of the variance of perceived value ( $R^2=0.61$ , coefficient of determination). Since the path coefficient was higher than zero, then each of these three variables had positive and significant effect on PV. As a result, Hypotheses 1, 2, and 3 were all supported. Co-creation intention was predicted by PV ( $\beta=0.382$ ,  $P<0.01$ ), which explained about 15% of the co-creation intention variance. This finding validated Hypothesis 4 and indicated that PV had significant and positive effect on CI. Furthermore, Co-creation intention ( $\beta=0.519$ ,  $P<0.01$ ) positively and significantly influenced attitude toward the product and explained 27% of the total variance of ATP. As a consequence, Hypothesis 5 was confirmed.

Due to the path analysis results, the effect of perceived value on co-creation intention was significant in both low and high self-efficacy situations. According to the structural model, the model was significant without moderating effect of self-efficacy. Although, PV showed a stronger effect on CI when self-efficacy was high, since the

calculated critical ratio was less than 1.64 and equaled to zero, then in confidence level of 95%, self-efficacy was not moderating the effect of PV on CI. In other words, self-efficacy did not significantly affect the correlation amongst value perception and co-creation intention. Hence, Hypothesis 6 was not supported.

Finally, according to path analysis and hypotheses tests, PEOU, PU, and PE influenced PV and explained about 61% of its changes. Between these three variables, PU demonstrated a stronger effect (0.731). In addition, CI had positive significant effects on ATP. PV with the coefficient of 0.382 positively and significantly affected CI and explained 15% of its variance. The role of SE as a moderator in the correlation between PV and CI was not approved, even though this correlation was stronger when the SE was high. In addition, the level of PEOU, PU, and PE had significant indirect effects on ATP, suggesting the important mediating effect of PV and CI. These three variables also had significant indirect impacts on CI via mediating influence of PV.

## **Discussion**

The results of the present research confirmed the conceptual framework and the hypotheses relating to the directional connection between the mentioned variables; except for self-efficacy. These various insightful findings are summerized below.

PEOU, PU and PE all emerged as positive factors affecting the consumers' perceived value of virtual co-creation. Perceived value was influenced primarily by PU ( $\beta=0.731$ ,  $P<0.01$ ). Usefulness refers to the benefits customers can receive from participating in Shatel's voice of the customer website and has been defined as an external source of motivation (Moon & Kim, 2001). Results suggest that customers believe their participation in co-creation leads to more attractive services that fit to their special preferences. Economically rational consumers try to achieve most benefits with the least sacrifices. They tend to those products which offer them more value in comparison with other alternatives; this is compatible with previous studies about comparing the benefits of a decision with the benefits of

other alternatives and the importance of PU construct (Chu & Lu, 2007). Co-creation provides people with the chance to choose those offering components which are worthy and appropriate from their point of view, together with the opportunity to lead the company toward the products they really desire. Furthermore, co-creation is also critical in the design and development of those novel services which are rather intricate, enduring, or both (Weber, 2011). Since Internet services are long-lasting, then co-creation can be beneficial in developing these services. PU appears to be the most important encouraging factor to the perceived value of virtual co-creation; this can be due to the sample characteristics of this study; in the current research, 79.6% of respondents were male and 86.3% of them were under the age of 30. It has been proven that some individual difference variables (e.g., age and gender) have significant effects on TAM beliefs (Venkatesh & Moris, 2000; Legris et al., 2003). Men considerably emphasize on work, achievement, and greatness. They seem to be extremely inspired by factors relating to productivity, like usefulness. Young people are also strongly encouraged by PU (Morris & Venkatesh, 2000). Co-creation can make people, especially men and youth, feel more empowered, thus they consider the process of co-creation to be more useful and valuable.

Results demonstrated that Shatel customers believe the process of idea generation by company's voice of the customer website to be easy and therefore valuable. PEOU captures non-monetary costs and the associated instrumentality and forms a significant factor in predicting intentions to accept a technology (Chu & Lu, 2007). It has been acknowledged that an easily applicable technology is perceived more valuable by its users (Kim et al., 2007). The quality of e-services is principal in online buyers' value perceptions. From different aspects of e-service quality, website design is an important aspect which assures customers can browse the website without much difficulty; this affects consumers' perceived value (Chang & Wang, 2011). Shatel's voice of the customer website has been designed in a user-friendly manner which facilitates the process of generating new ideas.

Perceived enjoyment has a positive significant effect on PV, that is,

Shatel consumers have perceived the process of idea generation through voice of the customer website to be enjoyable which leads to higher value perceptions. Enjoyment illustrates an emotive and inherent advantage (Kim et al., 2007). When a technology usage is believed to be enjoyable, users perceive it more valuable and might show stronger motivations for using it (Chu & Lu, 2007; Kim et al., 2007). According to flow theory, positive emotion toward an activity is an important reason for performing it. An intrinsically motivating experience encourages individuals to replicate an activity because it is interesting and enjoyable, and not because they have or need to do it. (Moon & Kim, 2001). People who participate in co-creation and experience the resulting enjoyment will be more attracted to and interested in this process. Inherently, co-creation is not an activity that people are obliged to perform; rather, it is an activity they decide to get involved in as a hobby and in their spare time. Hence, it may further please them and influence the hedonic function (Cortese, 2014). It has been approved that when consumers believe using a technology to be enjoyable, they would also perceive it more valuable. This is consistent with previous studies (Kim et al., 2007; Chu & Lu, 2007; Turel et al., 2007; Overby & Lee, 2006).

It is merely customers, who are stimulated by value, that can evaluate the worthiness of a particular product in the market (Sweeney & Soutar, 2001). They select products based on their superior value, in comparison with competing alternatives (Chang & Wang, 2011). In the current study, customers assessed co-creation value considering non-monetary costs and the benefits of usefulness and enjoyment. Results indicated that consumers believe co-creation is beneficial, compared to standard products in the market, and consequently is perceived valuable. This value perspective toward co-creation positively affects people's intention to co-create in the future and further encourages them to take part. In assessing value of a product, customers tend to trade-off between receiving benefits, and monetary and non-monetary costs that should be spent (Chu & Lu, 2007). Thus, when a customer perceives the value of an offering to be high, he has a more positive judgment on and is more interested toward the

product. Accordingly, it is true to posit that people participate in activities that will have values for them. This is in line with the current literature (Turel et al., 2007; Chen & Chen, 2010).

It has been acknowledged that the correlation between co-creation intention and ATP is significant; the more consumers are inclined to participate in future collaborative activities through Shatel's voice of the customer website, the more improved attitude they would have towards Shatel's services. These results are in line with prior scholars' findings (Franke et al., 2009; Cortese, 2014; Dijk et al., 2014). According to Hoyer and his colleagues (2010), products or services derived from co-creation, fit consumers' preferences better therefore may enhance positive ATP. Franke and his colleagues (2009) also found that products tailored to customers' individual needs provoke higher advantages regarding attitude toward the product. Co-creation is a kind of customers' active participation in NPD which can lead to developing products more compatible with customers' needs, hence it also affects ATP. On the other hand, co-creation being an enjoyable process might have positively affected the attitude toward the product (Cortese, 2014).

Even though the impact of PV on CI is stronger when the self-efficacy is high, but this effect is not significant. This conclusion is not in consistent with previous studies that acknowledged this moderating effect (Kulviwat et al., 2014; Venkatesh, 2000). It might be due to the fact that self-efficacy is a determinant of PEOU (Mun & Hwang, 2003). Without previous system experience, one's self-assurance in his or her capabilities for utilizing a computer will affect the individual's judgment about the difficulty of using that new system (Venkatesh, 2000). If the PEOU construct was not considered in the conceptual model, it could have been expected that facilitating conditions (such as self-efficacy) would predict the behavioral intention. But, owing to the role of PEOU as a main construct in the structural model, self-efficacy had no significant influence on behavioral intention; in other words, this effect might have been included in the expected effort (perceived ease of use).

## **Conclusion**

From a theoretical perspective, the results of the present article have extended our comprehension of the antecedents and consequences of customer's intention to accept and adopt virtual co-creation; this research has been conducted as an answer to the request for investigating the virtual co-creation in the B2C context. Considering the importance of consumers' perceived value of virtual co-creation in their intention to participate in such activities, this study uses VAM and the previous literature to investigate these correlations. The results indicate that PEOU, PU, and PE directly affect perceived value of virtual co-creation, which in turn influences co-creation intention. In addition, co-creation intention directly affects attitude toward the product. The mediating effect of PV is consistent with the prior marketing research that has been conducted on the concept of value (Zeithaml, 1988) and it is also analogous to the VAM studies. Moreover, customers' beliefs have an indirect effect on the attitude toward the product. It was also specified that self-efficacy does not have a moderating effect on the correlation among PV and CI.

This survey has further led to practical implications in developing virtual co-creation platforms. Since both costs and benefits influence consumers' perceived value regarding virtual co-creation, this collaborative platform should be designed in a way that implies low costs and favorable benefits so that eventually customers consider virtual co-creation to be highly valuable. All in all, when using voice of the customer website, consumers should attain a general insight into the existing information, services and functions. First impressions may encourage or frighten the user. Web designers should try to design the participation-related websites sufficiently simple and user friendly, and to organize the website in a way that makes accessing the required information and instructions easy enough; so that the user would complete the co-creation process without much difficulty. It also should be assured that these co-creation websites are not only useful in the customers' perspective, but also enjoyable in its own sake. By considering these points, the company can be confident that



customer will attain a desirable experience from participating in virtual co-creation activities. Our suggested conceptual framework provides a clear insight regarding the antecedents of consumers' value perspective regarding co-creation and reveals that when their pertinent value perceptions are higher they have greater willingness to adopt the virtual co-creation. It has also become clear that, compared to PE, PU and PEOU respectively have more important roles in determining customer's value perspective. Neglecting the relative importance of these motivational variables can have a detrimental influence on consumers' acceptance of co-creation. On the other hand, non-significant effect of self-efficacy in this research may indicate that Shatel does not have to ensure the participants' level of knowledge and skills. Furthermore, co-creation consequence has also been investigated and results indicated that consumers participating in the company's process of co-creation would demonstrate higher positive attitudes toward the resulting co-created services. Therefore, by inviting customers to collaborate in NPD through co-creation, firms can develop products more compatible with consumers' needs, improve the process of accepting these products, and overcome market resistance. Results also revealed that even though co-creation is a relatively long process, compared to purchasing current standard products, consumers still perceive it valuable, enjoyable, and easy; and not even self-efficacy has any effects on their perspective regarding co-creation. Moreover, co-creation influence on shaping consumers' attitudes is an indication of co-creation valence as a new marketing strategy. Although the importance of co-creation method had been proven to marketing academics and practitioners but there still was skepticism regarding whether to consider co-creation as a modern marketing strategy or not. Due to the value of co-creation for companies and also customers, it can be stated that in the marketing domain co-creation plays such a key role which should be acknowledged and applied in innovation, product development and marketing strategies.

**Research limitations and suggestions for future research**

In interpreting the current findings, following restrictions should be considered. The current research has just focused on co-creation in idea generation phase of NPD. Since it is possible that participants' perceptions regarding co-creation would be different in the various stages of NPD, thus future studies should consider the other stages and compare the findings with the results of this study. Besides, as we have only emphasized on the co-creation phenomenon in service industry and conclusions might be dissimilar in various product classes and other industries, therefore, we recommend further research to address these variances. In fact, these findings should be tested beyond the specific circumstances of current research in order to ensure the generalizability of the results. Moreover, the present research has been cross-sectional but since consumers' perceptions and intentions will change over time, the following research should be conducted in a longitudinal manner so that a better understanding regarding these changes would be achieved. Just like other models of complex behavioral phenomena, our proposed model is not perfect so upcoming authors can further develop it by adding other motivational factors. Forasmuch as co-creation relies on the interactions between companies and customers, as well as between customers themselves, it can be stated that social interactions are among significant omissions of our structural model, thus other researchers can investigate the influence of these interactions on consumers' value perceptions regarding co-creation.

**Abbreviations**

PEOU: Perceived Ease of Use	CI: Co-Creation Intention
PU: Perceived Usefulness	ATP: Attitude Toward the Product
PE: Perceived Enjoyment	SE: Self-Efficacy
PV: Perceived Value	TAM: Technology Acceptance Model
NPD: New Product Development	VAM: Value-Based Technology Acceptance Model

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