

An exploratory study of co-production and its outcomes in the South African do-it-yourself hardware market

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ABSTRACT

Customer retention has become a vital contributor to profitability in firms, with the impact thereof over the long term being acknowledged as carrying great weight. The co-production process offers numerous interactions that are valuable for the development of relationships with customers. Co-production offers various benefits to both customers and firms. The purpose of this study was to investigate whether customer information and skills, firm information and participation as well as risk relievers had a relationship with benefits and customer satisfaction, and whether customer satisfaction had a relationship with word-of-mouth (WOM) recommendations. Ruddock's Role Theory (Ruddock 1969) was beneficial in shedding light on the roles adopted by customers and suppliers to undertake co-production. The Partial Least Squares (PLS) technique was used to estimate the strength of the relationships between the variables in the study. The study found a strong positive relationship between the benefits offered by co-production and customer satisfaction. This finding highlights the importance that a firm plays in co-production. Customer satisfaction also had a strong relationship with positive WOM.

Key words: co-production, DIY hardware, benefits, customer satisfaction, word-of-mouth

Introduction

In 1986, Philip Kotler commented on prosumers and marketing. It took almost two decades for co-creation or co-production, the foundations of prosumption behaviour, to feature substantially in academic journals again. Global developments such as technology improvements, an increasing demand for sustainable business practices, changing customer needs, competition, information technology and globalisation have led to an increase in more participative business practices that improve customer satisfaction and the competitive advantages of firms (Prahalad & Ramaswamy 2004). Market trends and market unpredictability suggest that the ability to offer customers more value is an important competitive advantage (Gurau 2009). When products and services are co-produced with the customer, the customer's exact needs can be identified and satisfied with offerings customised to their specific needs (Zhang & Chen 2008). This process is known as co-production and takes place when a customer and a supplier jointly participate in producing the final product or service. Co-production involves joint problem definition and joint problem solving (Prahalad & Ramaswamy 2004). The customer and the supplier both contribute knowledge, skills and resources to jointly create value (Vargo, Maglio & Akaka 2008). The purpose of this paper is to report on a study on co-production in the do-it-yourself (DIY) hardware market.

Background

This background section deals with the focus of service-dominant logic in co-production and the parties involved in co-production.

Service-dominant logic

Vargo and Lusch (2004) propose that emerging thoughts on marketing are converging in such a way that a new dominant logic for marketing has emerged, which they term the service-dominant (S-D) logic. Traditionally, marketing adopted a goods-dominant (G-D) logic, where the focus was on tangible resources, entrenched value and the transaction, where the operand resource formed the primary unit-of-exchange. Value was created by the supplier and transferred to the customer in the exchange. However, marketing's focus has shifted over time away from tangible goods, embedded value and the transaction, and towards the customer, relationships and intangible resources, where the operand resource is the primary unit-of-exchange. S-D logic has several underlying principles that define it. Three principles are of particular importance to this study: (1) the customer is always a co-creator of value;

(2) the firm cannot transfer value but only offer value propositions; and (3) value is always determined by the recipient – the customer (Vargo & Lusch 2004).

Customer and supplier roles in co-production

Role Theory suggests that individuals adopt specific roles when they are in situations that call for them, which are influenced by other peoples' expectations and the individual's role in society (Ruddock 1969). Role Theory explains co-production by expounding why customers and suppliers adopt certain roles to achieve their objectives in a buying situation.

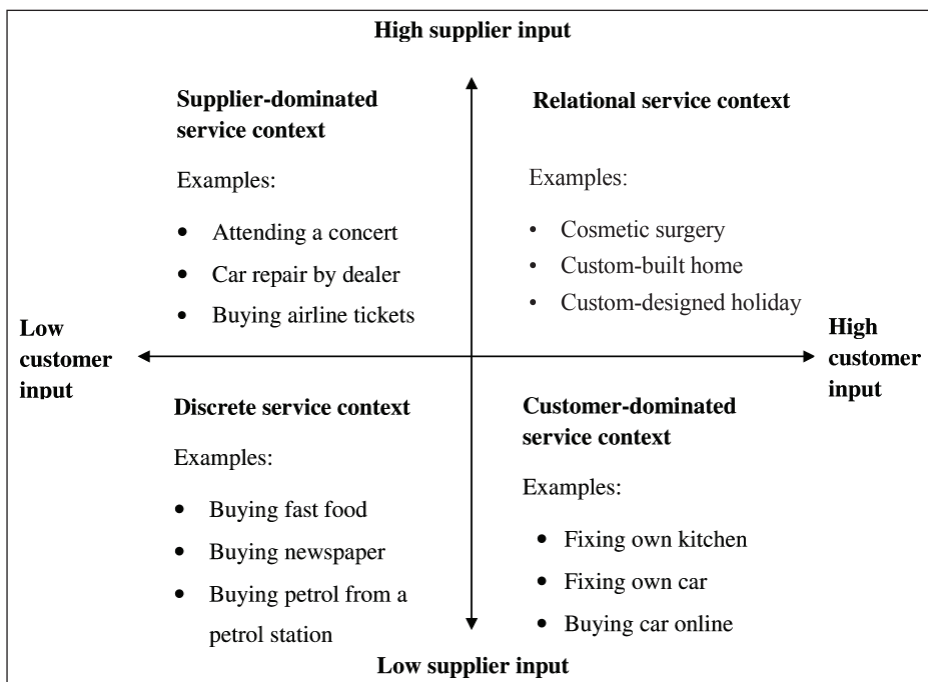
A role is a set of cues people follow to behave appropriately in certain situations (Solomon, Suprenant, Czepiel & Gutman 1985). Individuals assume roles that will help them achieve specific goals (Banton 1965). Role conflict results from different role expectations (Ruddock 1969), and role change occurs when roles no longer enable individuals to achieve their objectives (Fein 1990). Customers and suppliers assume a variety of roles when they co-create value. Customers used to be passive actors in the purchase experience, thus adopting a passive role to achieve their goals. However, supplier expectations about the customer's involvement in the purchase experience, as well as the customer's expectations of their own involvement, are changing. As customers become more expressive and seek customised experiences and products, their roles as well as those of suppliers change. Role flexibility is necessary to achieve personalised experiences that are enabled by a clear of understanding of expectations. Both the customer and the supplier have expectations about each other's roles, yet these may or may not be congruent (Solomon et al. 1985). The better the customer and the supplier understand each other's roles, the better they can be predicted, identified and responded to, minimising role conflict and negative outcomes of the co-production experience.

Today, customers are more empowered in their purchase transactions (Prahalad & Ramaswamy 2004) and have adopted more active roles in the purchase experience. They have limited time and therefore place more value on time, demand more personalised attention and more control over their personal information regarding their purchase behaviour, and look for experiences that are life-enhancing (Gurau 2009). Customers can adopt a variety of different roles such as an information inquirer, information provider, co-producer, decision-maker and consumer. The degree to which customers are involved in co-production depends on their information and on the complexity of the co-production task, and these will affect the outcomes of the transaction (Andreu, Sanchez & Mele 2010). The amount of customer participation also affects the amount and types of roles that customers assume. While low involvement tends to require fewer roles from customers, high involvement will place higher demands on customers, often requiring multiple roles. Customers decide on

their level of involvement by typically assessing their own information, technical ability and the costs of participating (Gurau 2009).

Suppliers need to provide services and goods that render service to facilitate customer involvement in value co-production (Ballantyne & Varey 2006). Suppliers offer customers the value proposition, which customers then accept in order to co-create value (Vargo & Lusch 2004). Suppliers need to provide the opportunity for the customer to co-create and provide an environment that facilitates co-production. They need to provide information, skills and resources to share with customers. Suppliers must also be able to gather and use customer inputs in the development of the product or service, and share these insights across the firm.

The typology of service contexts by Zhuang (2010) illustrates different combinations of customer and supplier participation and explains the characteristics of each of these situations. This framework (Figure 1) can be used to determine the ideal amount of customer and supplier inputs based on the service context. However, successful co-production requires customers and suppliers to adopt the necessary roles in order to share their information, skills and resources with a clear understanding of each other's expectations.



Source: Adapted from Zhuang (2010)

Figure 1: A typology of co-production service contexts

Purpose of the paper

The principal purpose of this article is to report on the findings of an exploratory study that was undertaken to investigate relationships between customers and staff of a hardware firm involved in co-production in the DIY market. The purpose of this study was to investigate whether customer information and skills, firm information and participation as well as risk relievers (constituting the components of co-production) had a relationship with benefits and customer satisfaction, and whether customer satisfaction had a relationship with word-of-mouth (WOM) recommendations. A further purpose was to assess the strengths of the relationships between various dimensions in the conceptual model. In particular, the study aimed to investigate whether customer information and skills, firm information and participation, benefits and risk relievers had a relationship with customer satisfaction, and whether customer satisfaction had a relationship with WOM recommendations. The findings are of value for hardware store managers, enabling them to gain insight into what drives co-production and what the outcomes of co-production are.

Antecedents of co-production

This section attends to selected antecedents of co-production in the DIY hardware market. In this study, customer information and skills; firm information and participation; and risk relievers are studied as antecedents of co-production.

Customer information and skills in co-production

Customers choose which firms they want to co-create with, based on their needs and how well a firm satisfies their needs (Prahalad & Ramaswamy 2004). This illustrates the principle of Role Theory, where an actor enters a relationship with another actor that best satisfies his needs (Ruddock 1969). Customers assume various roles when actively participating in co-production (Gurau 2009). They assume the role of information inquirer when searching for a partner to co-create with, and when searching for information related to their problem. Customers need to assume the role of information provider when discussing the problem with the supplier to jointly define a problem. The role of a user is assumed when the customer uses the supplier's resources to co-create the end product. The role of a decision-maker is assumed when the customer needs to make decisions about how to proceed with the product development, as well as product or service characteristics with which to customise the final offering. Finally, the customer assumes the role of the consumer when using the final product. This discussion of the customer's role in the co-production experience

emphasises the link between the skills, information and knowledge of the customer in the co-production experience.

Firm information and participation in co-production

The supplier needs to create a shopping environment that enhances the opportunities for customers to participate in co-production as well as providing the information, skills and resources that customers need to utilise in co-production (Prahalad & Ramaswamy 2004). Generating new and interactive experiences for customers requires designing better experiences for firm employees (Ramaswamy & Gouillart 2010). The entire firm needs to be geared towards providing value propositions and co-creative opportunities to the customer. This ranges from having adequately trained and skilled contact employees, information infrastructure and the correct material resources in place (Ramaswamy, in Frigo 2010). Firms need to create environments in which customers can create their own experiences (Prahalad & Ramaswamy 2004). The major roles of the supplier's staff are to provide information and skills in order to facilitate the customer's participation in value creation (Ballantyne & Varey 2006). It is also important that the customer perceives the firm's participation as attending to the possible risks inherent to co-production.

Risk relievers in co-production

Co-production poses a series of risks to both the customer and the supplier and can even lead to value co-destruction (Plé & Cáceres 2010). More active customer involvement introduces a higher level of uncertainty for the firm, as active customer participation is harder for the supplier to control than passive customer participation. The customer may not have the necessary skills to participate in the purchase experience, and customer and supplier expectations could conflict, resulting in role conflict and an unsuccessful and unsatisfying final product or service. Furthermore, some potential customers may be unable to accept the supplier's value proposition, and their needs may go unmet (Etgar 2008).

Another major risk of co-production is that it may result in value co-destruction. If value can be co-created, it can inherently be co-destroyed. This can occur when customers and suppliers either intentionally or unintentionally misuse each other's resources. In such an instance, the transaction will not meet the customer's or the supplier's value expectations, and value may have been created for one party but destroyed for the other party (Plé & Cáceres 2010). Therefore not all customer participation has positive outcomes; only customer participation under circumstances

of clear and understandable expectations will produce a successful co-production encounter.

Payne, Storbacka and Frow (2008) developed a conceptual framework for value co-production that shows what processes are involved in co-production that need to be managed to ensure a successful co-production experience. Firms need to manage customer value-creation processes, firm value-creation processes, and interaction processes for a successful co-production outcome to emerge.

Effective co-production has the advantage of reducing risks with the purchase experience. Co-production reduces the supplier's risk of developing an incorrect product or service for the customer. Successful co-production allows firms to manage customer relationships and enhance the lifetime value of desirable customers. Co-production allows firms to focus on contact points with customers and obtain information from the customers' perspective on how to provide more efficient and relevant products, services and experiences (Payne et al. 2008). In this way, the firm can provide competitively superior products, services and experiences to customers, so that customers can get exactly what they want. Etgar (2008) noted that customer participation in the development of products reduces the risk of receiving the wrong product. Therefore co-production is a way of facilitating trust and confidence between the customer and the supplier, and reducing or eliminating the risk of the wrong outcome.

Outcomes of co-production

This section addresses the possible outcomes of co-production in the DIY hardware market. In this study, the benefits of co-production, customer satisfaction and WOM are studied as outcomes of co-production.

Benefits of co-production

Consumers will only take part in co-production if the process produces appropriate benefits. Customers typically perform a cost-benefit analysis before participating in co-production; in the analysis, the benefits of participation are weighed against the costs of participation. Financial costs that customers may incur are the use of their own material resources as well as their own time when participating. Non-financial costs include psychological and social costs such as the loss of freedom when choosing a co-production partner, and underperformance by unskilled customers (Etgar 2008).

Individuals undertake DIY activities for a variety of reasons. Customers' tendency to engage in DIY activities depends on how complex the task is to accomplish.

If customers lack the necessary skills to complete the task, they are compelled to outsource the entire task to a specialist, but this also depends on whether the customer has the finances to outsource the task. People also undertake DIY activities because of the satisfaction and enjoyment of completing the activities themselves. The act of doing-it-yourself allows customers to customise the end product to suit their individual needs and tastes (Williams 2004). Customers want to keep abreast of trends and participate in producing an end product that is a reflection of their individual personality (Williams 2004).

A link can also be found between a customer's tendency to engage in DIY activities and their level of disposable income (Williams 2004). Although customers opt to participate in DIY activities for lifestyle reasons, economic reasons are also prominent. Wealthier customers engage in DIY activities primarily for the option of having choice, but this decision is also influenced by economic considerations of how many activities they can afford to outsource to specialists and how much needs to be completed on a DIY basis. Low income customers primarily undertake DIY activities to achieve cost advantages and ease. However, they also undertake DIY activities as a treat for themselves. Therefore customers do not participate in DIY activities for either lifestyle reasons or for economic benefits alone, but rather for both. The customer's income bracket determines whether the lifestyle or economic dimension is the bigger drive for his or her participation in DIY activities (Williams 2004). Producing an end product by means of DIY activities has multiple cost advantages, but people have a need to do things themselves, which has led to customers increasingly preferring to design products themselves. People do not want a standard product that everyone else has; they want to choose a product that suits their specific needs (Hoftjizer 2009). This leads to the question of whether there is a link between the possible benefits that can be obtained from the DIY activity that the customer co-creates with the supplier, and the resulting customer satisfaction.

Customer satisfaction and word-of-mouth as outcomes of co-production

A relationship needs to be developed between the customer and the supplier for co-production to take place. By involving customer participation in value creation, the firm can offer more value, increase satisfaction and create closer relationships with customers. Co-production is rooted in emotional attachment, and it affects customer trust and commitment (Randall, Gravier & Prybutok 2011). The firm needs to use its information, knowledge and skills to deliver value propositions that will suit customers' unique needs, because customer satisfaction is personal and subjective. Each person's individuality affects the outcomes of the co-production process (Etgar

2008). Cumulative customer satisfaction includes all the customer's experiences with a supplier over time (Johnson & Fornell 1991). This study uses cumulative satisfaction, because it is a better predictor of the future behaviour of customers (Fornell, Johnson, Anderson, Cha & Bryant 1996; Johnson, Gustafson, Andreasen, Lervik & Cha 2001). Researchers have generally found a positive relationship between cumulative customer satisfaction and word-of-mouth (WOM) (Olsen & Johnson 2003; Bolton & Drew 1991). A WOM recommendation from a trusted source is often the biggest motivator in customer decision-making, as WOM is generally more credible than other communication sources such as advertising (Bughin, Doogan & Vetvik 2010). A multitude of studies have confirmed the positive link between customer satisfaction and WOM (e.g. Hennig-Thurau, Gwinner & Gremler 2002; Brown, Barry, Dacin & Gunst 2005; Söderlund & Rosengren 2007; Heitmann, Lehmann & Herrmann 2007; Wangenheim & Bayón 2007), but whether this link exists in a co-production context has not yet been reported. In this study, WOM is operationalised as recommendations to others or making positive statements to other people (De Matos and Rossi 2008).

The DIY consumer and hardware

Wolf & McQuitty (2011: 154) define DIY as "activities in which individuals engage raw and semi-raw materials and component parts to produce, transform, or reconstruct material possessions, including those drawn from the natural environment (e.g. landscaping)". DIY is also defined as the activity of decorating, building and making fixtures and repairs at home by oneself rather than employing a professional (Oxford Dictionaries 2012). People who carry out DIY projects go further than the construction of meaning of a commodity, since these consumers fulfil dual roles, namely that of the designer of the functional specifications as well as that of the builder (Wolf & McQuitty 2011). The extent to which customers become involved in DIY activities sets it apart from other self-servicing forms of do-it-yourself, where the principal benefit is time and the convenience of service delivery (e.g. ATM or fast food). A further distinction to be drawn between self service and DIY is that "there is nothing convenient about remodelling one's home or landscaping one's yard" (Wolf & McQuitty 2011: 152). When purchasing DIY tools and materials, customers interact with the DIY retailer to obtain the information, skills and resources to fulfill their DIY objectives. Therefore co-production is an inherent dimension of a DIY customer's interaction with a DIY supplier. The customer accepts the supplier's value proposition and they share resources in order to create value-in-use. Hoftjizer (2009) argues that co-production could be regarded as a new type of DIY, as both the customer and the supplier participate in the development of the final product.

Individuals undertake DIY activities for a variety of reasons. Customers' tendency to engage in DIY activities depends on how complex the task is to accomplish. If a customer does not have the necessary skills to complete the task, they are compelled to outsource the entire task to a specialist. However, this also depends on whether the customer has the finances to outsource the task. People also undertake DIY activities because of the satisfaction and enjoyment of completing the activities themselves. The act of doing-it-yourself allows the customer to customise the end product to suit their individual needs and tastes (Williams 2004). The official South African statistics on hardware, paint and glass retail sales figures, which could serve as a gauge of the potential of the DIY market, increased from R41.37 billion in 2010 to R49.66 billion in 2012 (Statistics South Africa 2012).

Significance of the study

The emergence of S-D logic as a new dominant logic for marketing supports the notion of co-production to execute value creation in a marketing exchange. The supplier and the customer have different roles to play in the exchange. The customer's role is to supply the provider with knowledge and information that will enable the supplier to offer value propositions. The supplier needs to provide the customer with knowledge, skills and customised products or components to enable the customer to use her or his own resources. Little empirical research has been published that explains the nature of co-production in different purchase contexts. Furthermore, the available literature does not indicate how different levels of co-production affect customer satisfaction, WOM, risk perception or how customers perceive benefits resulting in a co-production experience. Despite being considered a new type of DIY, minimal literature is available on co-production in the DIY market.

The conceptual model of co-production

A conceptual model of co-production, based on the findings of the studies dealt with in the literature review, directed the research. This model is illustrated in Figure 2. The strengths of various relationships in the model, such as, for instance, the relationship between customer satisfaction and WOM, and the relationship between benefits of co-production and customer satisfaction, were examined. Positive WOM is the ultimate dependent variable in this model. It is anticipated that benefits have five antecedents, namely customer information, customer skills, firm information, firm participation and addressed risks. It was anticipated that the findings of this study would enhance the understanding of the relationships between the dimensions

of the benefits of co-production, customer satisfaction and word-of-mouth in the DIY hardware industry.

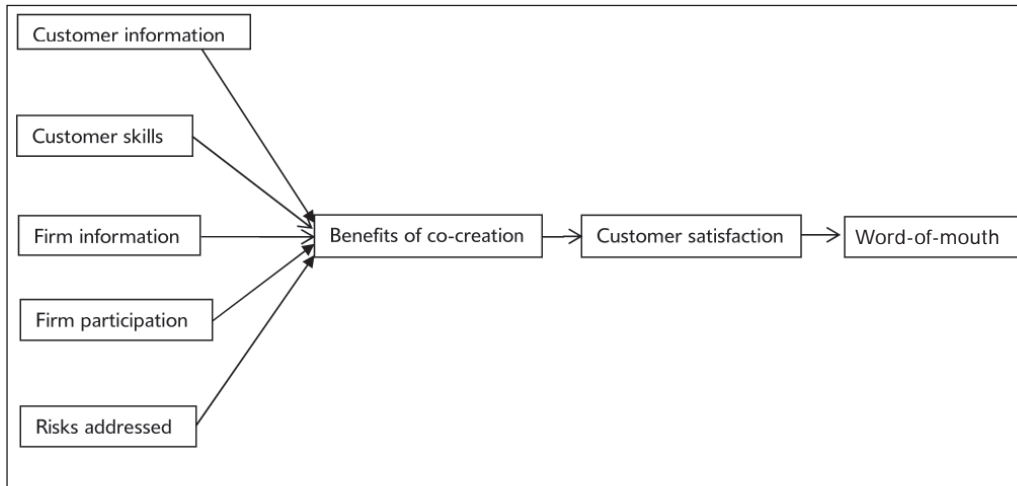


Figure 2: Conceptual model

Methodology

This methodology section attends to the sampling, data collection, questionnaire used in the survey as well as the analysis of the data.

Sampling

The study was conducted at the Brackenfell branch of a major South African hardware retail group. The population included all DIY customers that shopped at the store. Non-probability convenience sampling was used to identify respondents. DIY customers were approached as they left the store after shopping. The sample size was 75 customers in order to obtain sufficient data for statistical analyses. The sample size was restricted due to time and budget constraints, and the exploratory nature of the research.

Data collection

Interviews were conducted on Saturday mornings, because that was when most DIY customers frequented the store. A mall-intercept type data collection procedure was

used, in which customers were intercepted as they left the store and asked to fill in the questionnaire. Due to a lack of willing customers to complete the questionnaire and time constraints, additional data collection had to be conducted on weekdays as well. The store is part of a national franchise chain. In meetings with the owner and management staff, it was confirmed that no differences exist among customers that shop on different days of the week, and that it would be possible to interview customers on different days without introducing bias into the sample. The following sentences were read out and explained to the customers that were approached for the survey: "Co-production is when a customer and the staff at a firm jointly participate in producing the product or service. Co-production requires collaboration between the customer and the staff where they exchange information and skills to produce the most desirable outcome. This study is part of a marketing study to investigate the role of co-production in the DIY market. Thank you for your participation." Examples of typical DIY co-production activities, such as advice on painting, plumbing, etc., were given to ensure that the respondent understood the meaning of co-production. The respondents were thus all responding to a set of items that they understood.

Questionnaire

The survey was a self-administered structured questionnaire with 32 questions in a seven-point Likert-scale format. The questions were adapted from previously developed scales with proven reliability and validity. The items measuring the skills provided by the customer as well as the items measuring the information and knowledge provided by the customer were adapted from scales used by Zhuang (2010). The items measuring the benefits received by the customer were adapted from a scale developed by Reynolds and Beatty (1999). The items measuring the customer's perception of information provided by the firm were adapted from a scale developed by Gilly, Graham, Wolfenbarger and Yale (1998); the items measuring the firm's participation as perceived by customers were adapted from a scale developed by Saxe and Weitz (1982); and the items measuring customer perception of risk relievers were adapted from a scale developed by Gwinner, Gremler and Bitner (1998). The items measuring customer satisfaction were adapted from a scale developed by Garbarino and Johnson (1999). The items measuring WOM were from Harrison-Walker (2001) and Jones, Reynolds and Arnold (2006). Table 1 is a summary of the dimensions studied, the reliability of the scales (as measured in the current study) and the sources of the items.

Table 1: Particulars of the scales and items used

| Dimension | Items | Cronbach's alpha | Source |
|------------------------------------|---|------------------|---|
| Customer information/ knowledge | I shared information with the staff at XXX | .622 | Zhuang (2010) |
| | I explained to the XXX staff what I needed | | |
| | I shared information with the XXX staff to solve my problem | | |
| | I explained my needs fully to the XXX staff | | |
| Firm information/ knowledge | The opinion of XXX staff will influence my choice of product or service | .804 | Gilly, Graham, Wolfenbarger & Yale (1998) |
| | The staff at XXX mentioned things that I had not considered | | |
| | The staff at XXX provided me with ideas different to those I was aware of | | |
| | The staff at XXX helped me to make a decision about which product or service to buy | | |
| Customer skills | I played a very important role in the completion of this co-production experience | .706 | Zhuang (2010) |
| | My input contributed largely to the eventual product/service | | |
| | My involvement as a co-producer of the outcome was significant | | |
| | I made a substantial contribution to the co-production experience | | |
| Firm participation | The XXX staff's participation in co-production helped me to achieve my goals | .792 | Saxe & Weitz (1982) |
| | The XXX staff's participation in co-production demonstrated that they had my best interests in mind | | |
| | XXX staff influenced me with information rather than pressure | | |
| | XXX staff helped me to find the best options to suit my needs | | |
| Benefits | I benefit from the convenience that co-production provides me with | .751 | Reynolds & Beatty (1999) |
| | I benefit from the time saving that co-production provides me with | | |
| | I benefit from the advice I receive from XXX staff | | |
| | I benefit from better decision making because of what XXX staff offer me | | |
| Risk | I co-produce with XXX because I believe there is less risk that something will go wrong | .853 | Gwinner, Gremler & Bitner (1998) |
| | I feel I can trust the staff at XXX when we co-produce the product/service | | |
| | I have more confidence that the product or service will be produced correctly if it is co-produced | | |
| | I know what to expect when I co-produce a product/service with XXX | | |

Table 1 continued

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Table 1 continued

| Dimension | Items | Cronbach's alpha | Source |
|-----------------------|--|------------------|---|
| Customer satisfaction | My overall satisfaction with XXX is high | .841 | Garbarino & Johnson (1999) |
| | When I leave XXX I am usually satisfied | | |
| | When I consider my experience at XXX I am satisfied with the outcome | | |
| | I am generally satisfied with XXX | | |
| Word-of-mouth | I seldom miss an opportunity to tell others about XXX | .833 | Harrison-Walker (2001); Jones, Reynolds & Arnold (2006) |
| | I only say good things about XXX | | |
| | I regularly recommend XXX to other people | | |
| | I will encourage friends and relatives to visit XXX | | |

Data analysis

Partial least squares (PLS) were used to estimate the relationships in the conceptual model. PLS is an iterative estimation procedure that integrates aspects of principal-components analysis with multiple regressions and is well suited to predict the relationships in the conceptual model (Steenkamp & Van Trijp 1996; Wold 1982). Research undertaken earlier also suggests that PLS is suitable for explaining complex relationships and predicting empirical and/or theoretical variables (Fornell & Bookstein 1982). PLS requires each dimension to be measured by using interval scale measures; each dimension in this study was therefore measured using the semantic differential scale items set out in Table 1. PLS is typically recommended in a situation where the sample size is small (Haenlein & Kaplan 2004). Chin and Newsted (1999) state that PLS can be executed with a sample size as small as 50.

Results

The primary objective of this study was to consider what drives satisfaction and positive WOM in co-production in the DIY market. A secondary objective was to assess the strengths of the relationships between various dimensions in the conceptual model. In particular, the study aimed to investigate whether customer information and skills, firm information and participation, benefits and risk relievers had a relationship with customer satisfaction, and whether customer satisfaction had a relationship with WOM recommendations.

Conceptual model

The customers of a hardware store, where the provision of service and products for DIY activities is a major activity, were the focus of this study. The major relationship

investigated in the conceptual model was the prediction of WOM, where WOM is based on customer satisfaction; and customer satisfaction is the outcome of benefits received, customer information and skills, and information and participation provided by the firm as well as the risks addressed. As can be seen from Figure 3 and Table 2, the results indicate that 57.5% of the variance in WOM is explained by customer satisfaction. The balance, 42.5%, can be ascribed to measurement errors in customer satisfaction and WOM, together with the influence of other unknown factors. A further meaningful result is the 72.84% of variance that is explained by the benefits that customers experienced.

Table 2 contains the R^2 values for the individual dimensions. These values range from 44.8% for customer satisfaction to 72.8% for benefits received. It is debatable what an ideal R^2 for a dimension should be. It can, however, be stated that the amount of variance in WOM explained by a single factor such as customer satisfaction is meaningful. Customer satisfaction thus seems to be important for positive WOM in the DIY hardware market. The AVE value of .4674 for customer information is below .5, which indicates that the items used to measure customer information are not suitable to measure customer information. This state of affairs is confirmed by the low Cronbach's alpha value of .622 for customer information in Table 1.

Table 2: Average variance extracted, composite reliability and R^2 of the conceptual model

| | AVE | Composite reliability | R^2 |
|-----------------------|--------|-----------------------|--------|
| Benefits | 0.5740 | 0.8421 | 0.7284 |
| Customer information | 0.4674 | 0.7755 | 0.0000 |
| Customer satisfaction | 0.6777 | 0.8935 | 0.4479 |
| Customer skills | 0.5296 | 0.8114 | 0.0000 |
| Firm information | 0.6283 | 0.8711 | 0.0000 |
| Firm participation | 0.6157 | 0.8649 | 0.0000 |
| Word-of-mouth | 0.6617 | 0.8860 | 0.5749 |
| Risk | 0.7098 | 0.9071 | 0.0000 |

Figure 3 shows that all the relationships between the various dimensions are in the expected direction, but not all the relationships are significant. Table 3 contains the path coefficients of all the relationships in the model. The relationships between customer skills and benefits, as well as between firm information and benefits, are not significant. The relationships between benefits and customer satisfaction, firm

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participation and benefits, as well as between customer satisfaction and WOM, are significant.

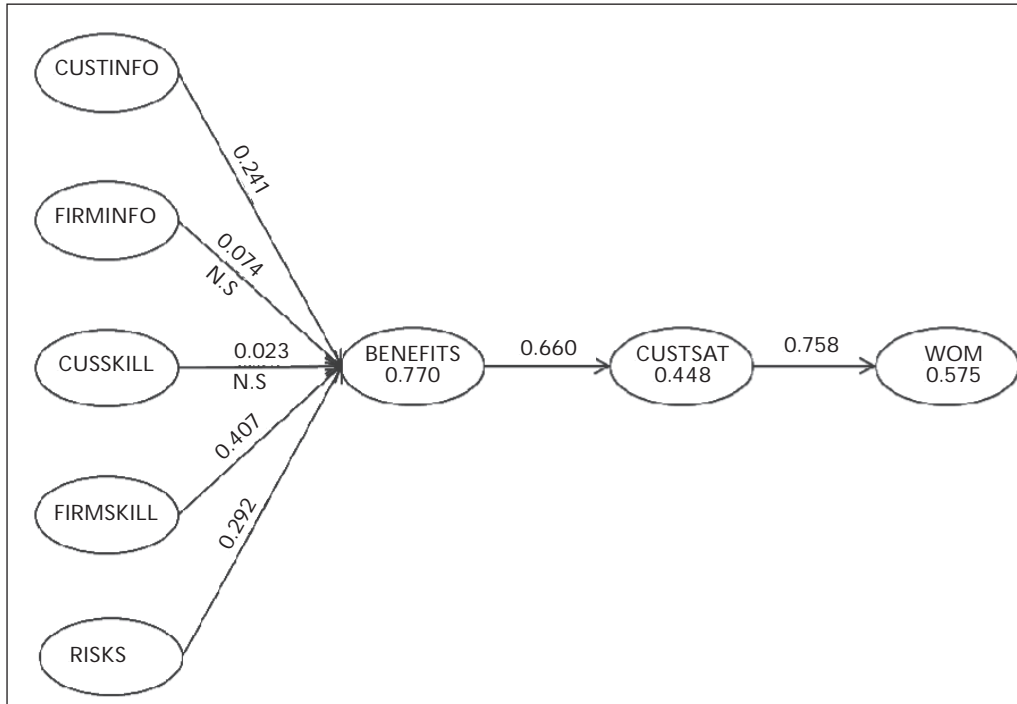


Figure 3: PLS path model of the conceptual model

Table 3: Path coefficients of the conceptual model

| Path | Path coefficient | Significance |
|-----------------------------|------------------|-----------------|
| Benefits→Custsat | 0.67 | Significant |
| Custinfo→Benefits | 0.24 | Significant |
| Custsat→WOM | 0.76 | Significant |
| Cusskill→Benefits | 0.02 | Not significant |
| Firm participation→Benefits | 0.07 | Not significant |
| Firmskill→Benefits | 0.41 | Significant |
| Risk→Benefits | 0.29 | Significant |

Discussion and conclusions

The findings reported in this study are of value from both a theoretical and a managerial perspective. From a theoretical viewpoint, the study indicates the usefulness of Role Theory to explain the roles that are assumed in co-production. Customer satisfaction, which drives WOM in the conceptual model, seems to be a good predictor of positive customer WOM in the DIY market. The strong positive relationship between the benefits experienced and customer satisfaction is indicative of the extent to which customers perceive the firm's ability to partner in co-production as beneficial. The paths that were significant in the conceptual model are:

- Customer satisfaction→WOM
- Customer information→Benefits
- Benefits→Customer satisfaction
- Firm skills→Benefits
- Risks→Benefits.

The dimensions that warrant rethinking are related to customer roles in co-production. It seems that the items used to measure customer knowledge are not able to capture that dimension. Customer skills did not feature as a contributor to the co-production benefits, perhaps because customers do not believe in their own ability to contribute meaningfully to co-production. The mere fact that they visit a DIY hardware store for advice confirms this.

Managerial implications

Customers undertake co-production with hardware DIY for various reasons. In times of economic hardship such as during a recession, customers tend to do more work for themselves than under normal economic circumstances. Because customers do not seem to trust their own abilities to make a meaningful contribution in the co-production process, firms should ensure that their contact staff are trained to attend to this. Staff should create an atmosphere that is conducive to the exchange of needs and solutions without making the customer feel inferior. If a firm succeeds in creating such an atmosphere of exchange, the outcomes (namely, the benefits that customers experience, customer satisfaction and positive word-of-mouth) are of great value in financial terms.

A hardware retailer should focus on the factors that will enable DIY customers to co-produce. To overcome the knowledge or skills barrier, a hardware retailer could provide classes on how to, for example, prepare surfaces for tiling. In some instances, DVDs could be prepared for a range of activities typically undertaken by DIY

customers. A hardware retailer could even consider an arrangement with a tool rental business to reduce the impact of a customer's not having the necessary equipment. Managers should be aware of the possibility that as DIY customers acquire more experience, they may also be prospective candidates for further DIY products and services.

It is important for hardware retailers to realise that customers have various pre-interaction expectations, which they will weigh up against their in-store experiences, and confirm whether the expectations were met or not, with consequences for repurchase decisions and possibilities for the development of future relationships. The strategic role of the retailer is to deliver assistance in the customer's value-generating processes by offering both service activities and goods that provide a service. In essence, the strategic imperative of a retailer is to interact as a service contributor in every instance, wherever and whenever worthwhile opportunities appear. Co-production offers the opportunity for retailers to involve customers in new and innovative ways, because of the potentially unlimited roles that the parties can assume.

Lastly, it is advisable to remember that "the growth in DIY home improvement has led to the development of goods that support self-service, thus bypassing the traditional professional and trade skills markets. These market bifurcations have been well under way now for a generation" (Ballantyne & Varey 2008: 13).

Limitations of the study

Although the paper contributes to the understanding of what is relevant in DIY co-production, care should be exercised in the interpretation and utilisation of the results. The study is exploratory by nature and will therefore suffer from limitations, because the sample was drawn from among the customers of a single DIY hardware store in a particular geographical area. It is also important to note that the findings are limited to the DIY hardware market. The behaviour of consumers in other industries that undertake co-production activities might be very different from that reported here. Finally, it should be reiterated that the items for measuring customer knowledge should be revisited.

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