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**Research Report H200308**

# **Understanding the Role of Willingness to Cannibalize in New Service Development**

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## **Abstract**

Although the importance of studying service innovation is widely recognized a specific service development model is lacking. This article aims to develop and test such a model of new service development behavior. Building on the work of Chandy and Tellis (1998), the authors argue that a company's willingness to cannibalize on its sales, its capabilities, and its prior investments is key to understanding new service development. The authors develop a conceptual model explaining the antecedents of the three dimensions of willingness to cannibalize as well as the consequences in terms of innovation behavior and firm performance. Data from 217 service SMEs was used to test the model. The results indicate that the model holds well.



# 1 Introduction

Services have moved to the heart of economic activities in modern societies and constitute a major part of total economic activity and employment in many Western economies. Both the commercial services and the non-profit/government sector have grown to the point that they now employ well over 70% of the working population in most western countries (Quinn et al. 1997). In the course of this growth process, many of these industries have changed beyond recognition, which is largely the result of innovative efforts. A large share of innovative efforts in business is related to the development of new services (OECD 2000, Howells 2000). The European Union has prioritized service research in order to be more aware of how these firms can be stimulated to further improve their innovative processes and performances (OECD 2000).

Although, the emphasis of innovation research has long been on physical products and systems (Meyer and DeTore 2001), the importance of studying service innovation is recognized by most academics. There is an important body of literature that has researched the critical success factors of new service development (e.g. De Brentani 1989, 1991, 2001, Cooper and De Brentani 1991, Cooper et al. 1994, Avlonitis et al. 2001). A recurring theme in the literature is that the development of services is different from the development of physical products (e.g. Easingwood 1986, Edvardsson et al. 1995, Johnes and Storey 1998). In their extensive review of the service development literature, Johnes and Storey (1998, p. 201) note that 'it is surprising that there has not been more effort to develop a specific service development model'. We propose that such a model should focus on the distinctive features rather than stress the similarities with the developing process for physical products. More specifically, the model should recognize that 'it is not the service itself that is produced but the pre-requisites for the service' (Edvardsson and Olsson 1996). Thus, more attention should be paid to organizational aspects in new service development (e.g. De Brentani 2001, Edgett 1994).

A promising new development, in this regard, is the concept of willingness to cannibalize, that refers to a company's inertia to replace existing operating systems and products in the interest of the introduction of new products and services in order to improve its competitive position (Chandy and Tellis 1998, MacMillan and McCaffery 1984, MacMillan et al. 1985). It concerns the disposition of an organization toward change in general and their attitude toward 'burning bridges that brought the organization across' in particular. Chandy and Tellis (1998) showed that this concept is a key variable for explaining why some companies develop more radically new products than others in their race with the competition, modeling it as a central, mediating construct between the relevant organizational and innovation variables, on the one hand, and innovation outcome on the other. While initially operationalized as one-dimensional Vermeulen et al. (2003) elaborated on the construct and distinguished three dimensions, i.e. a company's reluctance to decrease the sales of existing products, current organizational capabilities, and prior investments in favor of future profits. This modification helps to further the link between innovation and the organization. As a result the concept may be very useful for deriving the specific service development model Johnes and Storey called for. First, the new construct seems very appropriate to apply in a service context because of its high sensitivity to the organizational embeddedness of new



service development. Second, the concept is well rooted in theory, e.g. the notion of creative destruction in economics (Schumpeter 1934, 1942) and organizational inertia in organization psychology and strategic management (Henderson and Clark 1990, Leonard-Barton 1992, 1995, Tripsas 1997).

The objective of the present study is to develop a model of explaining new service development behavior using the concept of willingness to cannibalize existing sales, current capabilities and prior investments. The paper is structured as follows. First, we review the literature relevant for our work. Second, we explain our conceptual model. Next, we report on the research method used and present empirical evidence from 217 service firms. We close with a discussion and recommendations for future research.

## 2 Theoretical background

Two streams of research have studied new service development (NSD). The *first* stream is in the tradition of Cooper's (1979, 1985) NewProd studies. It focusses mainly on identifying determinants for the success or failure of new products and services (e.g. De Brentani 1989, 1991, 2001, Cooper and De Brentani 1991, Easingwood and Storey 1991, Storey and Easingwood 1993, 1996, Cooper et al. 1994, Edgett and Parkinson 1994, Edgett 1994, Avlonitis et al. 2001). The *second* stream has tried to increase the understanding of how service firms actually innovate by looking at e.g., the type of organizational structure, the people responsible for innovation, how the innovation process is managed, the presence of an explicit innovation strategy and the role of leaders in innovative efforts (Easingwood 1986, Scarbrough and Lannon 1989, Edgett and Jones 1991, John 1993, Drew 1995, Sundbo 1997, John and Davies 2000, McCabe 2000, Alam and Perry 2002, Kandampully 2002, Vermeulen and Dankbaar 2002, De Jong and Kemp 2003). Both streams have contributed to a much better understanding of the NSD process and its key success factors.

The NSD literature shows that many factors for the successful development of services and products are similar. Successful service companies show a commitment to product development and have aligned their culture and systems to support innovation. NSD programs in these organizations are more formalized, proactive and the whole process is better structured than that of their less successful counterparts. Moreover, they have high quality development staff and a clear strategy for new services as well as an aim beyond short-term financial objectives (John 1993, Edgett 1994, Drew 1995, John and Storey 1998).

However, because 'NSD [requires] integrating the needs of new service operations and processes with those of existing business activities' (John and Storey 1998, p. 207) there are also important differences between new product development (NPD) and NSD. Fit between the new service with e.g., existing systems, internal co-ordination, internal marketing and staff involvement are some of the factors that appear to be more important for creating new services than products. Moreover, research findings suggest that, particularly for radical new services, internal organizational factors are of prime importance (de Brentani 2001). Thus, more than NPD, NSD involves managing organizational change processes. For instance, Thwaites (1992) shows that successful service organizations are particularly good in mastering organizational structures and are able to create organizational climates to support innovation. Similarly, MacMillan and McCaffrey (1984) found that organizations that excel at NSD are less hindered by previous investments and that a lack of fit between the new service and the existing organizational structure and systems may be a huge barrier for successful NSD. In a similar fashion John and Storey (1998) note that less successful service organizations face 'multiple organizational hindrances, mainly because the predominant focus in them is running yesterday's business' (p. 223). Finally, the importance of the internal organizational factors is also reflected in the emphasis in service literature on the service delivery system (e.g. Shostack 1987), indicating that NSD is, for a large part, developing an organization to deliver the service (cf Edvardsson and Olsson 1996).

Top management should help to overcome barriers and facilitate organizational change, or as John (1993) argues, it should lead to 'envisioning, energizing and enabling' a firm's NSD

program. It involves anticipating trends and enacting changes in the market place (Colarelli O'Connor and Veryzer 2001), providing a formal NSD process, sound communication/coordination and adequate resources (Johns 1993, Johns and Storey 1998, Lievens and Moenaert 2000), and reducing intra-organizational conflicts and the struggle for power between departments (Edvardsson et al. 1995) respectively. As mentioned in the introduction to our paper, willingness to cannibalize seems to be a promising concept that is capable of capturing this organizational complexity and may help to model NSD more effectively. We discuss the concept in detail next.

## 2.1 Willingness to cannibalize

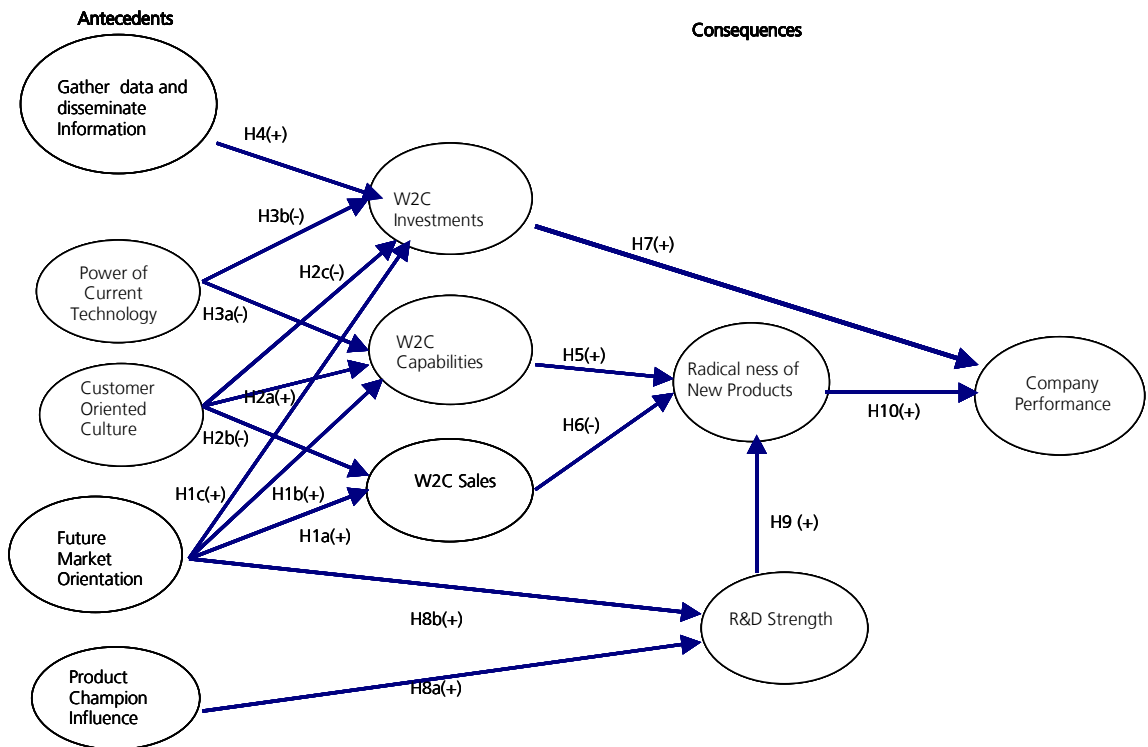
Building on the work of e.g. Schumpeter, Chandy and Tellis (1998) have developed an NPD model. They suggested that an organization's reluctance to change mediates the relationship between organizational characteristics and innovation outcomes and thus plays a pivotal role. In order to capture this in a model they introduced the concept of 'willingness to cannibalize' and defined it as '...the extent to which a firm is prepared to reduce the actual or potential value of its investments' (Chandy and Tellis 1998, p. 475). It was operationalized using multiple items that converged into a single factor, i.e. one dimension. Although they tested their model only for new products it seems to hold promise for NSD because of its explicit attention for issues of inertia and thus the organizational embeddedness of innovation processes.

Recently, Vermeulen et al. (2003) detailed the construct drawing from economics, organization psychology, strategic management and marketing. They identified three dimensions: (1) *Willingness to cannibalize previous investments*, referring to the disposition of a firm to introduce new products that will make previous investments obsolete, (2) *Willingness to cannibalize organizational capabilities*, referring to the disposition of a firm to introduce new products that make current organizational capabilities, skills, and routines obsolete, and (3) *Willingness to cannibalize current sales* referring to the disposition of a firm to introduce new products that will diminish the sales of its current products. This extension is important for two reasons. First, these new dimensions of willingness to cannibalize show close resemblance with key factors of NSD identified by for example, Thwaites (1992), MacMillan and McCaffery (1984), de Brentani (1993), and Edgett and Parkinson (1994). This confirms the applicability of willingness to cannibalize as well as its dimensions in the service context. Second, the extension resolves a potential limitation of Chandy and Tellis' conceptualization, in particular its bias toward radical innovations. With many new services being of an incremental nature (e.g. Avlonitis et al. 2001) a specific NSD model should best apply to both radically and incrementally new services. The three dimensions refer to fundamental and more incremental organizational change. For instance, the cannibalization of capabilities and investments refers to the adaptation of new technologies, whereas the cannibalization of current sales frequently involves simple line extensions that build on new and existing process and product technology.

### 3 Model and hypotheses

Using the expanded conceptualization of willingness to cannibalize and responding to the call for higher sensitivity to service context requirements, we have developed a new NSD model. The model is shown in Figure 1. Consistent with the work of Chandy and Tellis (1998) the effect of important organizational characteristics, which are at the discretion of a firm's top management, on NSD outcomes is mediated by the three dimensions of willingness to cannibalize. The antecedents are drawn from the extant NSD literature and closely resemble those used by Chandy and Tellis (1998). Rather than focusing only on the effects on the level of radicalness of the new service, we also included company financial performance as a final dependent variable. The organization's R&D strength and product champion influence are also included in the model. Prior research confirms their importance and the need to take their effects into account while studying innovation process outcomes (Li and Calantone 1998). The model will be discussed in detail and hypotheses will be formulated next.

Figure 1 The Model Utilized to Examine the Antecedents and Consequences of the Dimensions of Willingness to Cannibalize



### 3.1 Future market orientation

The importance of future market orientation is apparent in the work on market orientation in general (Slater and Narver 1998) and the innovation literature in particular (Christensen and Bower 1996, Chandy and Tellis 1998). An organization that is more able to envisage shifts in its industry, based on a broad awareness of trends in technology and stakeholder interest, will be better at anticipating new products and services. The orientation is affected by a firm's outside-in and inside-out capabilities (Day 1994), i.e. its ability to discover trends before they are actually there and to shape them. When a firm is more future oriented it is more likely to come up with radically new products and services that have the power to change the competition in the market place. Such 'visionary' firms are supposed to perform better and earn above average rents, especially in more turbulent environments (D'Aveni 1994).

Several authors confirm the importance of future market orientation in a service context. Johnes (1993) mentions that good service development and management involves 'envisioning' new services. It refers to thinking up new service concepts. De Brentani (2001) discusses the power of involving lead users in 'quasi beta-testing' in the early stages of the NSD process to help a firm in general and its service developers in particular adopt new technologies. Johnes (2001) and Avlonitis and Papastahopoulou (2000) point out that service firms with a broad time horizon are more innovative and outperform those that are focused on short term profits. Based on this we expect firms that are more future market oriented to be less reluctant to cannibalize sales, capabilities and investments. The effects may be particularly strong regarding the latter two dimensions, as these will be most under influence of a long-term vision. Therefore, we propose the following hypothesis:

*H1: A firm's future market orientation positively influences its willingness to cannibalize (a) existing services' sales, (b) current capabilities, and (c) prior investments.*

### 3.2 Customer-oriented culture

A firm's customer orientation will also seriously affect its innovation and NSD behavior. Whereas future market orientation refers to latent needs and potential customer groups customer orientation focuses on a firm's current customers (Slater and Narver 1998). Customer-oriented firms have the ability and the will to identify, analyze, understand, and answer customer needs (Weitz and XX 198X). They tend to develop close relations with customers in order to gain a better understanding of needs and desires (Kelley 1992), but may be biased in favor of developing solutions for larger customers (Christensen and Bower 1996).

Service literature shows that customer information and understanding customer needs is also the key to creating superior value by service firms (Edvardsson and Olsson 1996, Hartline et al. 2000). Service firms that involve customers in their innovative efforts and invest in understanding customer needs (and therefore display a customer-oriented culture) clearly outperform their less customer oriented counterparts (Cooper and de Brentani 1991, Cooper et al. 1994, Storey and Easingwood 1996, Alam and Perry 2002). Customer oriented organizations may be biased towards current needs of current customers (Christensen and

Bower 1996). These current customers are likely to voice their wishes regarding improving the quality of the service delivery rather than wishes for completely new services. As a result, customer oriented service organizations are more likely to modify their service delivery process and introduce small improvements rather than change their technology (Christensen and Bower 1996). In other words,

*H2: A firm's customer-orientation (a) positively influences its willingness to cannibalize its current capabilities, but negatively influences its willingness to cannibalize on (b) existing services' sales and, (c) prior investments.*

### 3.3 Power of current technology

Resource dependency theory suggests that those functions in the organization that provide resources that are critical to the organization will be the most powerful (Salancik and Pfeffer 1974). These power structures may cause organizational inertia in the case of innovation and NPD. The representatives of the current technology often resist the adoption of a new technology because they fear personal and departmental loss of power. However, their sentiment regarding the importance of the current technology based on firm historic success also plays a role as does potential overestimation of future potential of the old and underestimation of the new technology (MacMillan et al. 1985). The resistance will be low or even absent for incremental changes but is high for fundamental organization redirection, i.e. changes involving capabilities and investments.

That intra-organizational conflicts and power struggles are also part of NSD reality is confirmed by Edvardsson et al. (1995). Especially representatives of specific service delivery capabilities and major investments will be powerful within service organizations and thus be able to block new initiatives that may make their power base obsolete. Service delivery capabilities are considered extremely important for service firms as customers judge the quality of the delivered service on the basis of adequate organizational capabilities (Edvardsson and Olsson 1996, Heskett et al. 1997), giving the representatives of these capabilities a powerful position within the organization. Similarly, technology is increasingly seen as an important source of competitive advantage in the service industry (Bitner et al. 2000), and thus a source of power for representatives of investments previously done in these technologies. Thus,

*H3: The level of power of a firm's current technology negatively influences its willingness to cannibalize (a) current capabilities and (b) prior investments.*

### 3.4 Data gathering and dissemination

Disseminating information helps to make decisions more objective and this should facilitate decision-making and as such decrease reluctance to change (Dearborn and Simon 1958, Sutcliffe 1994, Weick 1987). Although dissemination of customer information may affect all three dimensions of willingness to cannibalize we particularly expect an effect on firm attitude toward investment. As was mentioned earlier, today technology is the key to most ser-

vice operations and as a result organizations can not ignore progress in this area (Morone and Berg 1993, Edvardsson et al. 2000, Bitner et al. 2000). However, decisions to invest in new service technology will be much easier when the decision is confirmed by customer data that is gathered, analyzed and disseminated. It makes the decision of investment much easier suggesting a direct effect on willingness to cannibalize investments. Thus,

*H4: A firm's level of data collection and dissemination of customer information in the organization positively influences its willingness to cannibalize previous investments.*

### 3.5 Consequences of willingness to cannibalize

A firm's willingness to cannibalize has been found an important driver of radical product innovation (Chandy and Tellis 1998). However, we expect that not all the dimensions of cannibalization have the same consequences. We propose that willingness to cannibalize capabilities mainly has a positive effect on the radicalness of the new services introduced by the organization. As noted before, the service delivery process is key to the service itself (e.g. Edvardsson and Olsson 1996, Shostack 1987). In order to introduce a radical new service an organization needs to develop a radical new delivery process and thus be willing to change its service delivery capabilities. More formally:

*H5: Willingness to cannibalize current capabilities positively influences radicalness of new services.*

However, cannibalization of sales does not have to lead to radical innovation. While organizations may decide to replace sales from an existing service by sales from radical innovation, they may also decide to replace them by introducing incremental service innovations, i.e. innovations that improve, adapt or extend the currently available service, such as service modifications, service line extensions or service repositionings (Avlonitis et al. 2001, de Brentani 2001). In line with the findings of Vermeulen et al. (2003) we expect that willingness to cannibalize on existing sales reflects the introduction of incremental innovations rather than radical innovations. More formally, we hypothesize:

*H6: Willingness to cannibalize existing sales negatively influences radicalness of new services.*

The third dimension of willingness to cannibalize is not related to radical new services, but instead directly to company performance. Investments in new equipment may be used for processing and delivering existing services as well as new services and these new services may be both radical and incremental. We thus feel that there is no logical reason why this dimension would be related to the radicalness of new products. However, investments in the administrative and delivery systems are essential for the survival and development of service firms (Edvardsson and Olsson 1996, Edvardsson et al. 2000, Bitner et al. 2000) and may result in better financial performance because they allow faster operation, more efficiency or lower costs. This leads to the following hypothesis:

*H7: Willingness to cannibalize previous investments positively influences company performance.*

To complement our model, and as suggested by Chandy and Tellis (1998), we include a performance measure to retest the widely studied relationship between radicalness and company performance (Avlonitis et al. 2001, Griffin 1997), which we expect to be positive, in line with the literature. We also include R&D strength as an additional variable as several authors have found it to explain radicalness (De Brentani 2001, Drew 1995, Thomke 2003). R&D strength refers to a company's resources and capacity for new developments, i.e. the degree to which a firm has a highly innovative culture, resulting in close attention to R&D and innovative activities (Li and Calantone 1998, de Brentani 2001). It is strongly influenced by product champions and future market orientation. Product champions are individuals who are prepared to support new service initiatives, and are able to overcome delays and difficulties in the innovation process (cf. Edgett and Jones 1991, Thwaites 1992, Storey and Easingwood 1996, Markham and Griffin 1998). They are crucial in initiating and stimulating an overall climate for innovation and as such contribute to increased R&D strength (cf. Martin and Horne 1993, Markham and Griffin 1998). Similarly, firms that are capable of envisioning the future are often better at anticipating new services and are able to react more quickly (cf. Johne 1993). These features contribute to more innovative outputs in particular and R&D strength in general. Thus, we propose:

*H8: A firm's R&D strength is positively influenced by (a) the presence of product champions, and (b) future market orientation.*

*H9: Firms with strong R&D are more likely to develop radical new services than other firms.*

*H10: The introduction of radical new services is positively related to a firm's financial performance.*





## 4 Method

### *Sample*

The model was tested in the Netherlands using the service companies of a semi-governmental agency's panel of small and medium sized firms. The overall panel included approximately 1,500 companies from nine major industries and formed a representative sample of the Dutch populations of small and medium sized organizations. Service firms made up about half of the panel. The panel was surveyed bi-annually using CATI (Computer Aided Telephone Interviews). Consistent with this approach questionnaires were always short and interview time was limited to 15 minutes. Next to standard questions regarding firm behavior (e.g., employment and innovation) and performance additional questions addressing one or more specific topics were included.

Of the companies approached 405 met the criterion of having introduced new services or new services procedures in the last three years and 282 cooperated (70% response rate). Due to missing values, 65 cases had to be deleted resulting in a final sample of 217 organizations. Table 1 shows the profile of the companies included in the sample. In accordance with the panel-structure five service industries dominated our sample, i.e. Trade/Repair, Financial services, Rental companies, Transportation and Hotel/Restaurant. Two thirds of the companies had been in business for over 10 years and over 90 percent had less than 100 employees.

**Table 1** Demographic profile of sample (all numbers are in percentages)

<i>Industry</i>	<i>Company Age</i>		<i>Company Size employees</i>		
Trade and repair	24.2	≤ 10 years	24.4	≤ 9	25.3
Hotel and catering	8.8	11 ≤ 25 years	32.3	10 ≤ 49	31.3
Transport	15.3	26 ≤ 50 years	17.5	50 ≤ 99	34.1
Rental	20.0	51 ≤ 75 years	5.1	> 100	9.2
Financial services	21.9	> 75 years	15.7		
Other services	9.8	unknown	5.1		

### *Measurements*

Given the constraints of the overall panel research we were limited in the number of items per construct. First, a careful evaluation was made limiting the number of items per construct. Next, a pretest of 60 companies was used to determine the final set of items. Respondents were asked to respond on a 5-point 'strongly agree'-'strongly disagree' scale. The annex provides the operationalizations of the study constructs. A brief discussion of the measures used follows.

The measure for the three dimensions of *willingness to cannibalize* was adapted from Vermeulen et al. (2003). Based on the work of Chandy and Tellis (1998) these authors developed measures for each facet. The measures for *customer orientated culture* and the *systematic gathering and dissemination of information* were drawn from the market and cus-

customer orientation literature (Desphande and Farley 1996, Kohli and Jaworski 1990, Narver and Slater 1990). The measure for *power of the current technology* in the organization was newly developed based on extant power literature (e.g. Pfeffer and Salancick 1978, Pfeffer 1981). The questions for *service R&D strength* of the company were borrowed from Li and Calantone (1998). The two-items to measure *New Service Radicalness* were based on Chandy and Tellis' (1998). The means to measure *product champion influence* and *future market orientation* were also adapted from Chandy and Tellis (1998). Finally, two items were used for measuring *firm performance*. The items focused on last year's performance and used the firm's main competitor as a point of reference.

#### *Method of Analysis*

The data were analyzed in two principal stages using SPSS and Lisrel. First, the internal consistency of the constructs was examined based on confirmatory factor analyses and Cronbach's  $\alpha$ . The factor analysis showed acceptable levels of internal consistency. The  $\alpha$ 's ranged between 0.68 for willingness to cannibalize sales to 0.92 for product champion influence indicating acceptable levels of internal consistency (Table 2). Moreover, an exploratory factor analysis with Oblimin rotation of the 6-items of the willingness to cannibalize scale resulted in three clean factors, all items loading on their anticipated factor and with minimal cross loadings (all smaller than 0.08). Next, the correlation coefficients for all the constructs in the study were examined for potential interrelationships among the variables. The correlation matrices for all constructs in the study are shown in Table 2. In the second phase, the data were analyzed using Lisrel software (version 8.5). A Spearman correlation matrix was used as input matrix.

Table 2 Correlation Matrix and Reliabilities of the Study Constructs

	Customer Orientation	Dissemi'n of Market info	W2C Capab's	W2C Sales	W2C Investm.	R&D Strength	Product Champion Influence	Future Market Orient'n	Power Current Techn'y	Radical's New Products	Firm Financial Perform.
Customer Orientation	(.72)										
Dissemi'n of Market info	.39	(.78)									
W2C Capabilities	.32	.20	(.73)								
W2C Sales	-.11	.13	.18	(.72)							
W2C Investments	-.04	.27	.08	.16	(.68)						
R&D Strength	.14	.13	.12	.18	.12	(.75)					
Product Champion Influence	.13	.13	.29	.20	.11	.36	(.92)				
Future Market Orient'n	.39	.32	.54	.39	.25	.44	.47	(.67)			
Power Current Technology	.10	.05	-.35	-.06	.07	.00	-.17	-.06	(.72)		
Radicalness of New Products	.11	.14	.29	.37	.12	.65	.31	.44	-.08	(.85)	
Firm Financial Performance	.03	.10	.11	.15	.26	.23	.12	.19	-.01	.34	(.73)

Cronbach's  $\alpha$  reliabilities between brackets are on the diagonal.



## 5 Results

Table 3 shows the results of the unconstrained model. The overall fit of the model was satisfactory ( $\chi^2 = 207.17$ ,  $df = 180$ ,  $p < 0.09$ ). The relative fit indices, i.e., the comparative fit index (CFI) and non-normed fit index (NNFI), were both 0.98 and the absolute indicators of fit, i.e. the Root Mean-Square Residual (RMR) and the Root Mean Square Error of Approximation (RMSEA) were .06 and .02, (90% CI = .00-.04), respectively. These also suggest that the proposed model was a good explanation of the observed covariances and variances among the study constructs. The proposed model also explained nontrivial variances in the dependent constructs including firm financial performance ( $R^2 = .15$ ), level of radicalness of new products ( $R^2 = .52$ ), R&D strength ( $R^2 = .19$ ) willingness to cannibalize capabilities ( $R^2 = .41$ ), willingness to cannibalize investments ( $R^2 = .16$ ), and willingness to cannibalize sale ( $R^2 = .23$ ). Taken together, these outcomes suggest that the hypothesized model is a reasonable fit to the data.

Relationships were in the direction hypothesized, except for the relationships between (i) willingness to cannibalize sales and radicalness, and (ii) the power of current technology and willingness to cannibalize investments, the latter being non significant. These findings are next discussed in more detail.

Future market orientation has a significant positive effect on all three dimensions of willingness to cannibalize as anticipated, thus supporting hypotheses 1a,b, and c. While customer orientation has a borderline positive influence on willingness to cannibalize capabilities it has significant negative influences on the other two dimensions of willingness to cannibalize, i.e. investments and sales, thus providing support for hypotheses 2. The power of current technology was negatively related to willingness to cannibalize capabilities but had no effect on willingness to cannibalize investments. This suggests that the resistance of old technology and its supporters is focused on 'software' and not 'hardware'. This provides partial support for hypotheses 3, i.e. support for 3a but not for 3b. As anticipated gathering and disseminating information was positively related to willingness to cannibalize investments, confirming hypothesis 4.

Moving from the antecedents to the consequences of willingness to cannibalize we find that willingness to cannibalize capabilities is positively related to the radicalness of new services developed. The empirical results thus support hypothesis 5. Unlike anticipated willingness to cannibalize sales that was negatively related to the developing of more radical new services, i.e. hypothesis 6 was not confirmed. Willingness to cannibalize investments had the direct positive effect on company performance that was expected, providing support for hypothesis 7. Product champion influence as well as future market orientation were positively related to R&D strength, lending support for hypothesis 8a and 8b, respectively. As expected, R&D strength had a positive effect on the level of radicalness of the new services developed and introduced. This confirmed hypotheses 9. Finally, the radicalness of the new services was positively related to company performance suggesting that more innovative new services are profitable, thus supporting hypothesis 10.

Table 3 Results of the Estimated Coefficients for the Antecedent and Consequences of Willingness to Cannibalize

Independent Constructs	Dependent Constructs										
	Company Performance		Radicalness of New Products		R&D	Strength	WZC Capabilities		WZC Investments	WZC Sales	
	B	(S.Err) T-value	B	(S.Err) T-value	B	(S.Err) T-value	B	(S.Err) T-value	B	(S.Err) T-value	
Radicalness of New Products	<b>.29</b>	<b>(.09)</b>	<b>3.32</b>	--	--	--	--	--	--	--	
R&D Strength	--	--	<b>.55</b>	<b>(.10)</b>	<b>5.68</b>	--	--	--	--	--	
WZC Capabilities	--	--	<b>.16</b>	<b>(.07)</b>	<b>2.10</b>	--	--	--	--	--	
WZC Investments	<b>.22</b>	<b>(.10)</b>	<b>2.28</b>	--	--	--	--	--	--	--	
WZC Sales	--	--	<b>.23</b>	<b>(.08)</b>	<b>3.02</b>	--	--	--	--	--	
Product Champion Influence	--	--	--	--	--	<b>.20</b>	<b>(.09)</b>	<b>2.19</b>	--	--	
Future Market Orientation	--	--	--	--	--	<b>.30</b>	<b>(.11)</b>	<b>2.80</b>	<b>.45</b>	<b>(.11)</b>	
Customer Orientated Culture	--	--	--	--	--	--	--	--	<b>.18</b>	<b>(.10)</b>	
Dissemination Market Information	--	--	--	--	--	--	--	--	--	--	
Power of Current Technology	--	--	--	--	--	--	--	--	<b>-.33</b>	<b>(.09)</b>	
R <sup>2</sup>	.15		.52		.19		.41		.16		
<b>Model Fit:</b>	Chi <sup>2</sup>	207.17,	df	180	(p≤0.09)	RMR	=	0.06	NFI	=	0.98
						RMSEA	=	0.02	(CI	90%	0.00-0.04)
									CFI	=	0.98

**Bold**= p<0.05; *italics*= p<0.10.

## 6 Discussion

Although many authors have studied new service development and contributed to our understanding of this phenomenon a specific service development model is still lacking in literature. A reason may be that many studies have emphasized, maybe over-emphasized, the similarities to new product development rather than trying to capture the unique aspects of service development. Compared to product development service development is more focused on organizational renewal, i.e. creating the necessary pre-requisites for service delivery (Edvardsson and Olsson 1996). Chandy and Tellis's (1998) concept of willingness to cannibalize (that builds on Schumpeter's idea of creative destruction) was adopted as a starting point for developing the service development model, i.e. a model specifically directed to the unique requirements of developing new services. The model used Vermeulen et al.'s (2003) extension of Chandy and Tellis work, i.e. a distinction between three facets of willingness to cannibalize, i.e. cannibalize sales, investments and capabilities. Although related to each other we suggested modelling the dimensions separately because antecedents and consequences were anticipated to be different.

The results support the model which also included some central constructs from the extant NPD literature such as product champion and service R&D strength. Although a similar positive correlation was found between the antecedent of future market orientation and the three dimensions of willingness to cannibalize, customer orientation, gathering and dissemination of information, and the power of current technology had different and sometimes unique effects. Customer orientation made companies more reluctant to cannibalize sales and investments, but more willing to cannibalize capabilities. This is in accordance with findings of Christensen and Bower (1996) who showed that a firm's bias toward current customers creates inertia. Customer focus hinders the adoption of new technologies but does tend to stimulate the willingness to adapt delivery processes to customer requirements. The gathering and dissemination of customer information has a positive effect on willingness to cannibalize investments. The data are probably used for better complaint handling and minor improvements. Finally, the level of power of the custodians and supporters of a firm's current technology increased the organization's reluctance to cannibalize its capabilities. The anticipated effect on willingness to cannibalize investments was not found. Two explanations come to mind regarding this differential effect. First, firms that have invested heavily in technology have generally become path-dependent over time (Nelson and Winter 1977, 1982, Dosi 1982). This refers more to capabilities than investments. Second, the higher resistance to changing capabilities over investment seems consistent with differences reported between innovation characteristics of ideation and product innovations (REF? Schoemaker 19XX). For ideation innovations intangibility is high and consequently soft adoption characteristics have a higher impact.

The consequences of the dimensions of willingness to cannibalize were partly as anticipated. Whereas we anticipated that willingness to cannibalize sales was negatively related to the level of radicalness of new services developed, it turned out to be positively related, as was willingness to cannibalize capabilities. It seems that willingness to cannibalize sales does not reflect incremental service innovations. When companies are less reluctant to cannibalize their product portfolio and capabilities they think up and develop more innovative



new services. It involves to a certain extent the positive spillover of, e.g. future market orientation, i.e. the positive antecedents located on the left hand side of the model. Willingness to cannibalize prior investments had a direct positive relationship with company performance. As was suggested new investments often help to increase efficiency which directly contributes to a firm's bottom line.

The advantage of the current model that unravels a company's disposition toward cannibalizing sales, capabilities and investments is that the model proves to be useful to services in general and small and medium sized companies in particular. The understanding of the different dimensions and their antecedents may help managers to direct their attention in an attempt to increase willingness to cannibalize. However, we do not suggest that efforts should focus on maximizing willingness to cannibalize. Probably there is an optimum between reluctance and willingness to cannibalize that management should look for.

## 7 Limitations and directions for future research

The study suffers from a number of limitations. In the first place, the cross-sectional nature of the data implies that inferences regarding causality should be interpreted with caution. Longitudinal data should be used to test whether the causality assumed here holds. Secondly, although the measurement properties of all constructs seemed satisfactory only a few items were used to measure the constructs. This is known to affect the external validity of the measures. Third, we used perceptions and single respondents rather than behavioral data and multiple respondents. Although CEO evaluations tend to be reliable and provide good estimates particularly for strategic issues, this may effect results. Finally, the study is limited to a single country and pulls the data from various service industries.

Further research is clearly needed. First, extension of the research to other countries and specific service industries would help to determine how far results can be generalized beyond the specific case of the Netherlands and for different service industries. Such research should also attempt to look at differences between small and large service providers as the current research is limited to small firms only. Research comparing the model for service versus product situations would also be beneficial. Although we argue that the model is more suitable for new service development than many existing models, the model may also help explore and detect and thus better understand the differences between products and services.

Secondly, studies that further develop and extend the model are needed. This would help to shed light on the extent to which other antecedents affect willingness to cannibalize. The same is true for the consequences of our construct. More qualitative and longitudinal studies are called for. Attention to better understanding of the nature of the construct of willingness to cannibalize is required. Law et al. (1998) argue that different types of multidimensional constructs exist and can be conceptualized. For example, firms with different NSD strategies may have different 'willingness to cannibalize'- profiles based on the three dimensions identified. Future research could try to establish and explore these profiles and the particular barriers to change that each archetype faces. This will require large samples and multi-group comparisons but will definitely provide further insights into the nature of firm's willingness to cannibalize and radically renew services.



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## Annex I Construct measurements

Antecedents	Mediating Constructs and Consequences
<p><b>Future market orientation:</b> In our company ...</p> <ul style="list-style-type: none"> <li>- the emphasis is on winning new customers with new needs</li> <li>- we constantly think about new products and services that will satisfy future market needs</li> </ul> <p><b>Customer orientated culture:</b> Our company ....</p> <ul style="list-style-type: none"> <li>- is more customer focused than its competitors</li> <li>- believes that it exists primarily to satisfy and serve customers</li> </ul>	<p><b>Willingness to cannibalize:</b> Our company ...</p> <p>1.1.1.1 (<i>Cannibalize sales</i>)</p> <ul style="list-style-type: none"> <li>- supports new projects even when they could potentially take away sales from existing products</li> <li>- is very willing to sacrifice sales of its existing products in order to increase sales of its new products</li> </ul>
<p><b>Gathering and disseminating information:</b> Our company ...</p> <ul style="list-style-type: none"> <li>- routinely and systematically measures customer satisfaction</li> <li>- disseminates data on customer satisfaction at all levels in the organization on a regular basis</li> </ul>	<p>1.1.1.2 (<i>Cannibalize investments</i>)</p> <ul style="list-style-type: none"> <li>- tends to invest in new, promising technologies even if it causes manufacturing facilities to become obsolete</li> <li>- has no problem replacing and thus writing off machinery quickly if it will help to create a competitive advantage in the market place</li> </ul> <p>1.1.1.3 (<i>Cannibalize capabilities</i>)</p> <ul style="list-style-type: none"> <li>- can easily change its organizational scheme and processes to fit the needs of a new product</li> <li>- quickly adopts new working procedures if this is required for developing and launching a new product</li> </ul>
<p><b>Power of current technology:</b> Within our company ...</p> <ul style="list-style-type: none"> <li>- supporters of our current technology seriously delay the introduction of new technologies</li> <li>- apostles of new technologies generally have a hard time getting things done in our organization (R)</li> </ul>	<p><b>Service R&amp;D strength:</b> Our company ...</p> <ul style="list-style-type: none"> <li>- has a much stronger technology base than our main competitor</li> <li>- is very strong in developing new technologies and products compared to its main competitor</li> </ul>
<p><b>Product champion influence:</b> Within our company ...</p> <ul style="list-style-type: none"> <li>- product champions play an important role</li> <li>- activities of product champions clearly impact new product development</li> </ul>	<p><b>Radicalness of new services:</b> Our company ...</p> <ul style="list-style-type: none"> <li>- is renowned in the industry for its innovative new products</li> <li>- leads the way in introducing radical product innovations</li> </ul>
	<p><b>Company performance:</b></p> <ul style="list-style-type: none"> <li>- compared to our main competitor our last year's overall performance was excellent</li> <li>- compared to our main competitor last year's profitability was very high</li> </ul>

(R) = reversed.

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