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Capabilities, Investments, and Sales**

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Address	Nijmegen School of Management University of Nijmegen Thomas van Aquinostraat 1 P.O. Box 9108 6500 HK Nijmegen, The Netherlands Phone: +31 (0)24 361 18 68 Fax: +31 (0)24 361 20 28

**New Service Development and Willingness to Cannibalize Capabilities,
Investments, and Sales.**

Edwin J. Nijssen*
Bas Hillebrand*
Patrick A.M. Vermeulen**
Ron Kemp***

* Nijmegen School of Management, University of Nijmegen, The Netherlands

** Rotterdam School of Management, Erasmus University Rotterdam, The Netherlands

*** EIM Small Business Research and Consultancy, Zoetermeer and Wageningen
University , The Netherlands

Correspondence to:

Nijmegen School of Management
Edwin J. Nijssen
P.O.Box 9108
6500 HK Nijmegen
The Netherlands

T: +31(0)24 3611868

F: +31(0)24 3612028

Email: e.nijssen@nsm.kun.nl

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Abstract

Although the importance of service innovation is widely recognized little effort has been done to develop a specific new service development model. The authors develop and test such a model. Building on the work of Chandy and Tellis (1998), the authors argue that a company's willingness to cannibalize on sales, capabilities, and prior investments is key to understanding new service development. Several antecedents of the three dimensions of willingness to cannibalize are distinguished and their effects on innovation outcomes and firm performance are hypothesized. The model was tested using data from 217 service SMEs in The Netherlands. The results support the model. Willingness to cannibalize sales and capabilities positively influence the level of radicalness of newly developed services. Willingness to cannibalize prior investments has a direct positive relationship with company performance. Directions for future research are discussed.

Introduction

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, 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, Johne and Storey 1998). In their extensive review of the service development literature, Johne 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 of service development rather than stress the similarities with new product development. 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) detailed the construct and distinguished three dimensions of cannibalization, i.e. a company’s reluctance to decrease (i) sales of existing products, (ii) current organizational capabilities, and (iii) prior investments in favor of future profits. This extension provides a better understanding of innovation in organizations and its underlying mechanism. As a result the concept may be very useful for developing 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), organizational inertia theory in organization psychology (Staw 1981, Barton et al. 1989), and dynamic capabilities in the strategic management literature (Henderson and Clark 1990, Leonard-Barton 1992, Tripsas 1997).

The objective of the present study is to develop a model 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 literatures relevant for our work. Second, we explain our conceptual model and develop hypotheses. Next, we report on the research method used and present empirical evidence from 217 service firms. We close with a discussion and implications for future research.

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 mainly focusses

on identifying determinants for the success or failure of new products and services (e.g. De Brentani 1989, 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, Johne 1993, Drew 1995, Alam and Perry 2002, Kandampully 2002, Vermeulen and Dankbaar 2002, De Jong and Kemp 2003). Both streams have contributed to the understanding of the NSD process and its key success factors.

The NSD literature shows that many factors for the successful development of new services and products are similar. Successful service companies show a commitment to service development and generally have aligned their culture and systems to support innovation efforts. 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 (Johne 1993, Edgett 1994, Drew 1995, Johne and Storey 1998).

However, because “NSD [requires] integrating the needs of new service operations and processes with those of existing business activities” (Johne and Storey 1998, p. 207) there are also important differences between new product development (NPD) and NSD. Fit between the new service and 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 McCafferey (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. The importance of the internal organizational factors is also reflected in the emphasis in the 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). Finally, Johne 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).

Top management is responsible for helping the organization overcome barriers and thus facilitate organizational change. As Johne (1993) argues, it should lead to “envisioning, energizing and enabling” a firm’s NSD program. It involves anticipating trends and enact changes in the market place (Colarelli O’Connor and Veryzer 2001), providing a formal NSD process, sound communication/coordination and adequate resources (Johne 1993, Johne and Storey 1998, Lievens and Moenaert 2000), and reducing intra-organizational conflicts and the struggle for power between departments (Edvardsson et al. 1995). As mentioned in the introduction of our paper, willingness to cannibalize seems to be a promising concept that is able of capturing this organizational complexity and may help to model NSD effectively. We discuss the concept in detail next.

Willingness to cannibalize

Building on the work of e.g. Schumpeter, Chandy and Tellis (1998) have developed a model of NPD. 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 only tested their model for new products it seems to hold promise for NSD because of its explicit attention for issues of inertia and the organizational embeddedness of innovation processes.

Recently, Vermeulen et al. (2003) detailed the construct drawing from the literatures of economics (Schumpeter 1934, 1942), organization psychology (Staw 1981, Barton et al. 1989), strategic management (Henderson and Clark 1990, Leonard-Barton 1992, Tripsas 1997), and marketing (Conner 1988, Copulsky 1976, Deleersnyder et al. 2002, Mason and Milne 1994, Moorthy and Png 1992). They identified three dimensions: (1) *Willingness to cannibalize on previous investments*, referring to the disposition of a firm to introduce new products that will make previous investments obsolete, (2) *Willingness to cannibalize on 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 on current sales* referring to the disposition of a firm to introduce new products that will diminish the sales of its current products. This extension-outcome seems to parallel the key organizational factors of NSD identified by e.g., Thwaites (1992), MacMillan and McCaffery (1984), de Brentani (1993), and Edgett and Parkinson (1994). This confirms the potential and applicability of the concept to the service context.

Model and hypotheses

Using the multidimensional conceptualization of willingness to cannibalize and responding to the call for higher sensitivity to the service context, 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 on NSD outcomes is mediated by the three dimensions of willingness to cannibalize. The antecedents in the model are drawn from the extant NSD literature and closely resemble those used by Chandy and Tellis (1998). Next to level of radicalness of the new service, company financial performance is also included as a dependent variable. The organization's R&D strength and product champion influence complement 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.

=== INSERT FIGURE 1 ABOUT HERE ===

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 of envisioning shifts in its industry, based on a broad awareness of trends in technology and stakeholder interest, will be more capable of 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 radical 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 a firm's future market orientation in a service context. Johne (1993) mentions that good service development and management involves "envisioning" new services. It refers to thinking up new service concepts. Moreover, Johne (1999) and Avlonitis and Papastahopoulou (2000) point out that service firms with a long term perspective are more innovative and outperform those that are focused on short term profits. Firms with a future market orientation are likely to be more focused on making explicit estimations of future returns which make them less vulnerable to the sunk cost fallacy (Tan and Yates 1995) and less inert. Due to their superior market information these firms are less concerned about ambiguity of future market developments in general and are better at dealing with market risk and making strategic decisions in particular (cf. Baz et al. 1999, Fox and Tversky 1995). Thus, we expect firms that are more future market oriented will be less reluctant to cannibalize sales, capabilities, and investments.

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

Customer-oriented culture

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 will to identify, analyze, understand, and answer customer needs (Saxe and Weitz 1982). They tend to develop close relationships with customers in order to gain a better understanding of their needs and desires (Kelley 1992). However, this high proximity to current customers is known to bias seller perceptions and actions in favor of developing solutions for larger customers rather than the market as a whole. Consequently, more incremental and less innovative new products will be turned out (Christensen and Bower 1996).

The service literature shows that customer information and understanding customer needs is also key to creating superior value by service firms (Edvardsson and Olsson 1996, Hartline et al. 2000). Service firms that involve customers in their NSD clearly outperform their less customer oriented counterparts by responding more effectively to customers' requests for improving service quality and delivery (Cooper and de Brentani 1991, Cooper et al. 1994, Storey and Easingwood 1996, Alam and Perry 2002). It mainly concerns improvement to existing solutions and capabilities rather than the introduction of completely new services based on new technologies (Christensen and Bower 1996). Therefore,

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.

Power of current technology

Resource dependency theory suggests that those functions in the organization that provide resources that are critical in providing a strategic response to market uncertainty will be the most powerful in the organization (Salancik and Pfeffer 1974). The resulting power structure may cause organizational inertia and hinder the adoption of new service technologies as the representatives of the current technology defend their turf, afraid of decreased personal and departmental power. The effect is enhanced by perceptual bias based on historic successes of the current technology, and a less favorable

evaluation of new, unproven technologies (MacMillan et al. 1985). As a result, resistance will be lower for incremental and higher for fundamental changes.

Edvardsson et al. (1995) confirm the critical role of intra-organizational conflicts and power struggles in NSD. Because service delivery capabilities, including front- and back office, are considered extremely important for service firms the custodians of these capabilities are among the most powerful in service organizations (Edvardsson and Olsson 1996, Heskett et al. 1997). These representatives will be most strongly opposing innovations that require behavioral change associated with the introduction of new service delivery systems and procedures. This is consistent with adoption theory and in particular the suggestions regarding "ideational" innovations, i.e. novel ideas that lack a material component (Rogers 1995, Rogers and Shoemaker 1971). 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.

Data gathering and dissemination

Gathering and disseminating information can help to make decisions more objective and less political thus facilitating decision-making processes (Dearborn and Simon 1958, Sutcliffe 1994, Weick 1987). It will also help reduce barriers to change. Although dissemination of customer information may affect all three dimensions of willingness to cannibalize we particularly expect an effect on firm attitude toward investments in new service operations. Such investments involve serious financial commitments for a longer period of time and affect the organization as a whole and service operation and delivery employees work in particular (Bitner et al. 2000). Information on customer effects of these investments can help to clarify financial consequences and dissemination of results will help create information equality between departments and decision makers, including those responsible for operations, i.e. working with hardware and procedures linked to prior investments. Therefore,

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

Consequences of willingness to cannibalize

A firm's willingness to cannibalize has been found to be an important driver of radical product innovation (Chandy and Tellis 1998). However, not all of its dimensions would appear to have the same consequences. We propose that willingness to cannibalize on capabilities has a positive effect on the radicalness of the new services introduced by the organization. Because the service delivery process is key to the service itself (e.g. Edvardsson and Olsson 1996, Shostack 1987) the introduction of a radical new service generally requires a new delivery process. Thus, the more willing a firm is to change its service delivery capabilities the more open it will be to developing radical new services. Therefore:

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

While organizations may decide to replace sales from an existing service by sales from a radical new service, they may also decide for incremental service innovation (Avlonitis et al. 2001, de Brentani 2001). Organizations that are more willing to cannibalize their current sales will probably develop and launch more radical new services because they are not biased by the nature and type of needs satisfied by current services. As a result radical new services often offer the same benefits as current services plus a serious extension (e.g., a gas station that converges from regular service to fully automated self-service). Organizations that prefer to hang on to their current sales will extend their services in an incremental rather than more radical way. Therefore:

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

Both incremental and radical service innovations may require investments in new equipment for improving processing and delivering. Consequently, we anticipate that the effect of willingness to cannibalize investments on the radicalness of new services will be undetermined. However, as investments in the administrative and delivery systems can provide the means to perform service operations faster, more efficient and at lower costs

(Bitner et al. 2000) a positive influence on financial performance is expected. This leads to the following hypothesis:

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

To complement our model we include and retest the positive relationship between radicalness and company performance (Avlonitis et al. 2001, Griffin 1997). We also include R&D strength as it has been found to also be a pivotal variable in explaining radical new services (De Brentani 2001, Drew 1995, Thomke 2003). It refers to a company's resources and capacity for new developments, i.e. the degree to which a firm has a highly innovative culture, which has been found to increase the chance of turning out innovations (Li and Calantone 1998, de Brentani 2001). R&D strength is influenced positively by product champions and future market orientation. Product champions are individuals who support new service initiatives, and can help to overcome delays and difficulties in the innovation process (cf. Thwaites 1992, Storey and Easingwood 1996, Markham and Griffin 1998) strengthening R&D (cf. Martin and Horne 1993, Markham and Griffin 1998). Future market focus helps an organization to appreciate long term vision and investment in the future by cherishing R&D capabilities. Thus, we propose:

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

H9: Firms with a 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

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 includes approximately 1,500 companies from nine major industries and forms a representative sample of the Dutch populations of small and medium sized organizations. Service firms make up about half of the panel. The panel is surveyed bi-annually using

CATI (Computer Aided Telephone Interviews). Consistent with this approach questionnaires are always short and interview time is 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 are included.

Of the service companies of the panel 405 met the criterion of having introduced new services or new services procedures in the last three years and 282 cooperated (68% response rate). Due to missing values in one or more of the constructs, 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.

=== INSERT TABLE 1 ABOUT HERE ===

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. Generally two items were used 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. Appendix A provides the operationalizations of the study constructs. A brief discussion of the measures used is next.

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 customer orientation literature (Desphandé and Farley 1998). The measure for *power of the current technology* in the organization was newly developed based on the extant power literature (e.g. Pfeffer 1981). The questions for *service R&D strength* of the company were based on Li and Calantone (1998). The items for measuring *new service radicalness* were based on Chandy and Tellis (1998). The measure of *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 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 α . The factor analysis showed acceptable levels of internal consistency. The α 's ranged between 0.68 for willingness to cannibalize sales to 0.92 for product champion influence indicating acceptable levels of internal consistency (Appendix B). 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 Appendix B. The correlations were low to moderate with highest correlation found between R&D strength and radical new products (0.65). In the second phase, the data were analyzed using Lisrel software (version 8.5). A spearman correlation matrix was used as input matrix.

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, e.g., the comparative fit index (CFI) and non-normed fit index (NNFI), were both 0.98 and the absolute indicators of fit, e.g. 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 sales ($R^2 = .23$). Taken together, these outcomes suggest that the hypothesized model is a reasonable fit to the data.

All relationships were in the hypothesized direction and significant, except for a non-significant relationship between the power of current technology and willingness to cannibalize investments. These findings are next discussed in more detail.

=== INSERT TABLE 3 ABOUT HERE ===

Future market orientation has a significant positive effect on all three dimensions of willingness to cannibalize, providing support for hypothesis 1. Particularly the influence on willingness to cannibalize sales and capabilities was strong. The effect of future market orientation on willingness to cannibalize investments is significant but relatively small. Maybe envisioning the future market works more through the mechanism of foreseeing new services and delivery systems than investment in hardware. 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. willingness to cannibalize investments and sales. This confirms hypothesis 2. Being in close proxy to customers makes service organizations marginally less reluctant modifying procedures. The power of current technology negatively affected willingness to cannibalize capabilities but had no effect on willingness to cannibalize investments. This suggests that supporters of the old technology are more concerned with and opposing changes in “software” and than “hardware”. There thus is support and no support for hypotheses 3a and 3b respectively. As anticipated gathering and disseminating information was positively related to the organization’s 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 positively influenced the level of radical new services developed by the firms in our sample. Willingness to cannibalize sales had a similar and significant effect on radical new services. Note that the latter effect is larger than the former . A possible explanation is that the construct of willingness to cannibalize sales is specified at the same level as the construct of radical new services whereas willingness to cannibalize capabilities is a somewhat more distant or more fundamental construct. These results support hypotheses 5 and 6, respectively.

Finally, willingness to cannibalize investments had a direct positive effect on company performance as was expected, providing support for hypothesis 7.

All remaining effects were also significant and in the hypothesized direction. We discuss them briefly. Product champion influence and future market orientation were positively related to R&D strength, lending support to hypothesis 8a and 8b, respectively. R&D strength had a positive influence on the level of radicalness of the new services developed which subsequently had a positive effect on company performance. These results are consistent with Li and Calantone (1998) and Griffin (1997) respectively and provide support for hypothesis 9 and 10.

Discussion

Although many authors have studied new service development and contributed to our understanding of the phenomenon, efforts to develop a specific service development model have been limited. Previous studies investigated the factors that lead to success and failure in a rather piece meal way or described the service development process. They conclude that new product and new service development processes have much in common. In contrast, we focused on understanding the underlying mechanisms driving the new service development process and output, and emphasized differences rather than similarities. We used a process and organizational change perspective. The objective was to better capture the unique aspects of service innovation identified in prior research.

Organizational renewal, i.e. creating the necessary pre-requisites for service delivery (Edvardsson and Olsson 1996), is more critical to service development than to product development. As such the concept of willingness to cannibalize was used as a starting point for developing our special service development model. The results supported the new model. Although future market orientation had a positive correlation with all three dimensions of willingness to cannibalize, the other antecedents (customer orientation, gathering and disseminating market information, and the power of current technology) had different and unique effects supporting the case for using three rather than one dimension for measuring an organization's willingness to cannibalize. Customer orientation, for instance, 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 in a firm's response to more fundamental changes in the market place. Customer focus hinders the adoption of new technologies but stimulates e.g., the willingness to adapt delivery processes to better address customer complaints. These results underscore the difference between a management that is focused on satisfying current customers' needs versus future market needs (cf. Slater and Narver 1998).

Gathering and disseminating customer information had a positive effect on willingness to cannibalize investments. Collecting and disseminating customer data improves decision making regarding investments in service delivery equipment as decisions become more objective and shared throughout the organization, thus reducing inertia. 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 of power of current technology on willingness to cannibalize investments was not found. It seems that supporters of the current technology safeguard their capabilities but are less concerned of the effects on investments in new machinery. The reason may be that new machinery does not necessarily make "old" capabilities redundant.

The results regarding the consequences of willingness to cannibalize were as anticipated. Both willingness to cannibalize sales and willingness to cannibalize capabilities influenced company performance via the level of radicalness of new services. Willingness to cannibalize investments had a direct positive effect on performance. As was suggested earlier, new investments decrease cost and increase efficiency. They thus directly contribute to a firm's bottom line. Although willingness to cannibalize sales and willingness to cannibalize capabilities have the same positive effect on the radicalness of new services, they are conceptually different as the factor analysis showed. Companies that are willing to cannibalize their current services often replace simple old services by new integrated solutions and thus use innovation as a tool for pruning or streamlining their service portfolios (cf. Day 1977). Willingness to cannibalize capabilities will facilitate the adoption of new technologies and skills that may be required to accomplish this portfolio renewal.

Although the results support our specific service innovation model the implications are more profound. They show that focusing on differences rather than similarities between new service and new product development has paid off. It has led to more attention for and emphasis on underlying organizational processes, capabilities, and delivery processes. It has made the model more relevant for services. However, this insight may also be used to complement current new product development models and help to broaden their perspectives. Such a development or modification is consistent with recent developments in marketing to integrate the product and service literatures rather than maintain them and treat them as isolated bodies of work (Vargo and Lusch 2004). It can also help to bridge the gap between the NPD literature and the resource based view.

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, it may affect results.

Fourth, the study is limited to a single country and pulls the data of several service industries. 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. Also research comparing the model for service versus product situations would be beneficial. While our model especially seems to work well for services we believe that it may also be beneficial for studying products as products may be regarded as tangible services and increasingly specialized skills and knowledge are the fundamental unit of exchange rather than goods itself (Vargo and Lusch 2004). Our

model may thus help explore and better understand the differences between products and services.

Finally, 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 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. It is important to note that where some readers and managers may feel that willingness to cannibalize of organizations should be maximized, optimal levels probably exist for different profiles and market environments. Exploring these issues will require large samples and multi-group comparisons, but will definitely provide a better understanding of the nature of a firm’s willingness to cannibalize and its role in explaining and predicting radically new products and services.

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Appendix A: Construct measurements

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

(R) = reversed

Appendix B

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	Radic'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 α reliabilities between brackets are on the diagonal

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

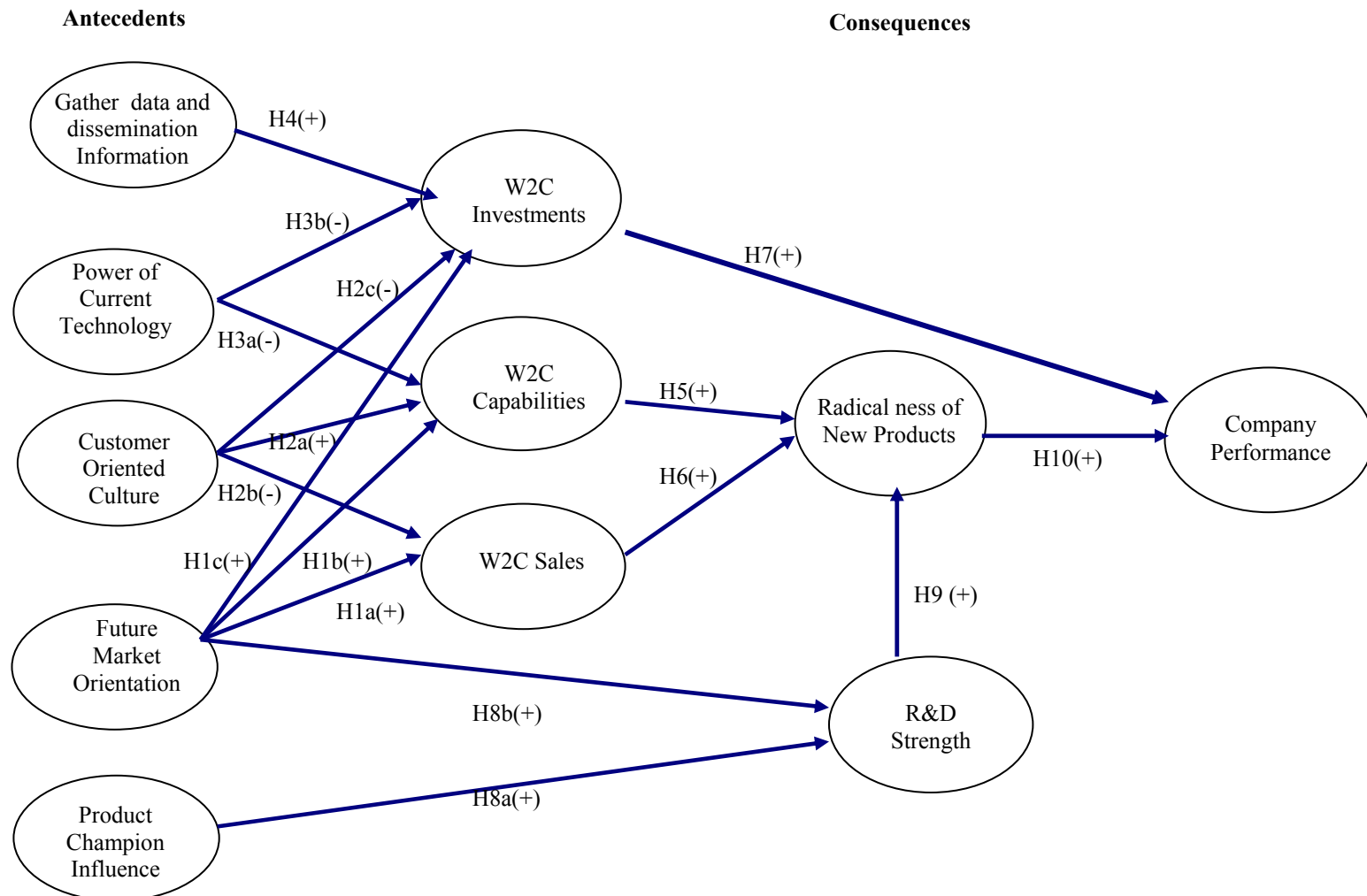


Table 1
Demographic profile of sample
(all numbers are in percentages)

Industry		Company Age		Company Size # Employees	
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		

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			W2C Capabilities			W2C Investments			W2C 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	B	(S.Err)	T-value
Radicalness of New Products	.29	(.09)	3.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R&D Strength	--	--	--	.55	(.10)	5.68	--	--	--	--	--	--	--	--	--	--	--	--
W2C Capabilities	--	--	--	.16	(.07)	2.10	--	--	--	--	--	--	--	--	--	--	--	--
W2C Investments	.22	(.10)	2.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
W2C Sales	--	--	--	.23	(.08)	3.02	--	--	--	--	--	--	--	--	--	--	--	--
Product Champion Influence	--	--	--	--	--	--	.20	(.09)	2.19	--	--	--	--	--	--	--	--	--
Future Market Orientation	--	--	--	--	--	--	.30	(.11)	2.80	.45	(.11)	4.15	.26	(.12)	2.24	.51	(.12)	4.15
Customer Orientated Culture	--	--	--	--	--	--	--	--	--	<i>.18</i>	<i>(.10)</i>	<i>1.84</i>	-.26	(.12)	-2.16	-.30	(.11)	-2.66
Dissemination Market Information	--	--	--	--	--	--	--	--	--	--	--	.28	(.11)	2.57	--	--	--	--
Power of Current Technology	--	--	--	--	--	--	--	--	--	-.33	(.09)	-3.54	.10	(.10)	1.00	--	--	--
R ²	.15			.52			.19			.41			.16			.23		

Model Fit: Chi² 207.17, df 180 (p≤0.09)

RMR = 0.06

NNFI = 0.98

RMSEA = 0.02 (CI 90% 0.00-0.04)

CFI = 0.98

Bold= p<0.05; *Italics*= p<0.10