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New Service Development and Digitalization: Synergies of Personal Interaction and IT Integration

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ABSTRACT

This study investigates the effects of personal interaction and information technology integration (IT integration) on new service development in business-to-business (B2B) service firms' relationships. Personal interaction, IT integration and new service development are latent variables in a structural model tested with LISREL ($N = 138$). The relationship between personal interaction and IT integration is strong and indicates that both these constructs are drivers for new service development. Although both these constructs represent diverse ways of interacting, they both positively impact new service development. Hence, managers should not expect IT to replace personal interaction to a great extent in B2B-service contexts.

KEYWORDS

Business-to-business; personal interaction; IT integration; new service development

Communication is changing

In this era of digitalization, communication mannerisms are in a state of change, which affects industrial firms' abilities to continuously offer new and improved service content to customers. The launch of new products and services in combination with well-functioning interfirm collaboration structures are crucial success factors for many industrial enterprises. In the realm of service marketing, the phenomenon of digitalization often is conceived as being particularly important for nurturing collaboration structures between business actors (Li, Merenda, & Venkatchalam, 2009; Makkonen & Vuori, 2014). This is because successful service delivery often involves service adaptations to buyers to continuously add value and remain competitive (Anderson, Fornell, & Rust, 1997; Grönroos & Voima, 2013; Zeithaml, Parasuraman, & Berry, 1985). The era of digitalization may be perceived as relatively new, but research has long stressed its importance in studies about the need for firms to use information technologies (e.g., the Internet and other technology-based information systems) to improve their business (Ekman, Erixon, & Thilenius, 2014; Makkonen & Vuori, 2014; Ryssel, Ritter, & Gemünden, 2004; Stump & Sriram, 1997). For business-to-business (B2B) relationships to be fruitful

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in the first place, traditional interaction-oriented literature has long highlighted the importance of personal interaction for establishing trust between business partners (McAllister, 1995), which in its turn can lead to beneficial outcomes such as new services. Gounaris and Venetis (2002), for example, emphasized the need for industrial business partners to participate in bonding activities to enable trust building. In a similar vein, Meuter, McCabe, and Curran (2013) compared personal word-of-mouth (WOM) with E-WOM and find that they both impact the adoption of new services, although the personal WOM is more influential. Building on the results of these studies, we argue that it is highly relevant to investigate whether interaction is contingent on digital or personal forms of interaction further.

In industrial B2B markets, information technologies have been perceived as a force that is on the verge of “taking over” as the most important communication means (Heath, Knoblauch, & Luff, 2000). Essentially, information technologies have been integrated in the business between firms to the extent that they can be assumed to have replaced some of the more traditional (i.e., face-to-face) communication means (Trainor, Andzulis, Rapp, & Agnihotri, 2014). An industry-manager (interviewed in a prestudy for this study) also supported this idea, saying: “There will be no more socializing with the customers once IT has taken over.” In this quote from the early 2000s, the manager offers support for the contemporary idea that the enormous potential of information exchange that IT gave access to would introduce a new way of doing business. Since then, companies have had the time to integrate technologies into the information exchanges of their business relationships. This integration has highlighted the need to scrutinize the relationship between technology-based interaction and personal interaction on a more profound level, particularly in a service-relationship setting.

In order to scrutinize the manager’s statement, this study investigates the potential effect of personal interaction (defined as the intensiveness of personal contacts in business relationships) and IT integration (defined as the purposeful use of IT pertaining to IT adaptations, IT importance, and IT investments) on new service development in the customer relationships of service firms. New service development is here regarded as an innovative activity that leads to services that are either radically new or perceived as new by their developers (cf. Van de Ven, 1986) and may contribute to co-creating value in business relationships (Grönroos & Voima, 2013). New services, however, often tend to be materialized in the shape of service improvements or service line extensions (Syson & Perks, 2004).

The research problem

In B2B-services markets, interaction is of utmost importance because services are intangible and also often produced (at least in part) in the interaction between buyer and seller (Gummesson, 2017; Zeithaml et al., 1985). Moreover, they often involve complex marketing and advertising (Maurya & Medhavi, 2016), which requires cooperation between different business counterparts. In strong business relationships, interactions can nurture the development of new products/services, and are thus important for a firm’s innovative capacity (Rovira Nordman, 2012). In the

cooperative environments provided by strong relationships, interactions often take place to exchange information about how services should be paid for and delivered (Anderson et al., 1997; Mauryra & Medhavi, 2016), but also how they can be improved. The term interaction implies mutuality, suggesting that a business relationship perspective is suitable for studying service development. Incorporating coexisting measures of personal interaction and IT integration in business relationships, this study proposes a novel perspective on interaction requirements for industrial B2B-firms. The underlying idea for this study is that IT that is integrated in a specific business relationship can strengthen personal interaction patterns, and thus create a synergy effect that is beneficial for the innovativeness that new service developments often require. To evaluate the interrelatedness between personal interaction, IT integration and new service development, a structural model is suggested.

The research gap

To stay in the forefront of technological development and create a competitive advantage towards competitors, industrial firms often need to co-create new services together with their most important customers (Hillebrand, Kemp, & Nijssen, 2011; Shostack, 1987). In this manner, many services are produced to some extent during delivery (Berry, 2016; Zeithaml et al., 1985), thus requiring personal interrelationships. The fundamental assumption in this article is that personal interaction still is necessary for continuous development of trust in business relationships, (trust being defined as the willingness to rely on an exchange partner in whom one has confidence (Moorman, Zaltman, & Deshpande, 1992). Even though IT use also is important for the commencement of business relationships in most firms, it cannot necessarily replace personal interaction in every situation (Rovira Nordman & Tolstoy, 2011). Within marketing research, the importance of IT means for communication is relatively well-researched. There are, however, a lack of studies focusing on the social dimensions of how IT affects business relationships (Makko-nen & Vuori, 2014). In industrial relationship marketing (defined as marketing efforts oriented towards accomplishing strong lasting relationships with individual accounts (cf. Jackson, 1985) there is need for more investigations about how IT affects business relationships.

Another reason for conducting this study is that service innovation literature still is a limited research strand (Hillebrand et al., 2011; Stevens & Dimitriadis, 2005), particularly when it comes to new service development stages and their interface with customers (Alam & Perry, 2002). Customer-interaction processes need more research, as expressed by Carlborg, Kindström, and Kowalkowski (2014). By investigating the antecedents (personal interaction and IT integration) of new service development processes in business relationships, and analyzing how they affect each other, this study contributes to industrial relationship marketing and services marketing literature (Jackson, 1985; Syson & Perks, 2004). This study also highlights how industrial firms can act to accomplish new service development, which in its turn can enable them to perform better.

Conceptual framework of business relationships and IT

In their day-to-day operations, industrial companies often have to engage in close interaction with their customers. Business exchange can thus be viewed as an intricate and on-going process between parties (which are neither anonymous nor faceless) in which personal relationships and adaptations are intertwined (Grönroos, 1984; Håkansson & Waluszewski, 2013). The importance of interaction with customers in business relationships has, therefore, long been emphasized in relationship-oriented research, just as the importance of IT for enhancing business relationships (Ekman et al., 2014; Stump & Sriram, 1997, Ryssel et al., 2004). Whether cooperation emerges as a result of personal relationships or via IT means, cooperation is important for any firm that wishes to develop new products and services together with customers (Rovira Nordman, 2012).

In marketing literature, relationships are often regarded to be built on a series of transactions, which generate trust and commitment among other factors (Morgan & Hunt, 1994). Firms that understand their customers can create superior value for them (Hillebrand et al., 2011; Narver & Slater, 1990). For service firms, close customer relationships can be perceived as being particularly important, which has to do with the long-recognized differences between the intrinsic natures of services versus goods (Hu & McLoughlin, 2012), in specific, intangibility, inseparability, perishability, and heterogeneity (Alam & Perry, 2002; Syson & Perks, 2004). Because of these characteristics, the focus on customers tends to play a more important role in service firms than in product-oriented firms (Alam & Perry, 2002; Hartline, Maxham, & McKee, 2000). Because service firms often involve their customers directly in their service delivery, service purchases often lead to increased commitment and intimate relationships with customers (Alam & Perry, 2002). In a similar vein, customers are traditionally more often involved in service-development processes than in other product-development processes (Alam & Perry, 2002). One effect of this is that service-oriented firms which are close to their customers can use them to receive feedback and learn more about their needs, enabling the firms to meet these (Hillebrand et al., 2011). Hence, customer co-creation for developing new products/services is common among service firms (Hillebrand et al., 2011; Shostack, 1987).

Many scholars also regard IT as important for enabling information exchange between business partners in a fast, accurate, and reliable manner (e.g., Kaplan & Peterson, 1998; Lancioni, Smith, & Olivia, 2000). By encompassing these characteristics, IT deployment is regarded as a factor that can cement relationships (Roberts & Mackay, 1998) and even lead to mutual trust development between a buyer and a seller (Stump & Sriram, 1997). IT communication, however, still involves the automation of information exchange and thus may also influence the personal exchange in business relationships in a negative direction. In comparison to IT-aided communication such as e-mail, more personalized forms of interaction provide business relationships with higher quality of exchange cues, including body language (in face-to-face encounters) and tone of voice (in both face-to-face and

telephone conversations). Both face-to-face and telephone encounters also have a personal focus and enable the use of natural language (Daft & Lengel, 1986). They also allow for real-time feedback, inflection and timing of response (Murray & Peyrefitte, 2007). Hence, face-to-face meetings can still be seen as irreplaceable for building strong bonds between firms because they convey emotional context that are impossible in text-only technologies, like e-mail (Ekman et al, 2014; Rovira Nordman & Tolstoy, 2008). Face-to-face meetings are particularly important in the formation stage of a relationship, because they are effective in building personal relationships, and give individuals the opportunity to understand each other's communication styles and personal and professional motivations (Horton & Pawar, 2002; Pauleen & Yoong, 2001).

Building on this idea, IT is in this study perceived as a method of transferring and storing information and data between companies. When IT is studied on an aggregated level it is, however, less important which specific technology that it encompasses, and more important to focus on the possibilities (e.g., methods of transferring and storing information) and limitations (e.g., that emotional content is hampered by IT) that IT provides. The definition of IT integration used in this study (i.e., the purposeful use of IT pertaining to IT adaptations, IT importance, and IT investments) draws upon research by Lawrence and Lorsch (1967, p. 11), where integration was defined as "the quality of the state of collaboration that exists among departments that are required to achieve unity of effort." Building on the ideas of Lawrence and Lorsch (1967), the IT integration construct encompasses the quality of the state of collaboration between business partners that strive to achieve a mutual unity of effort. Hence, IT is considered to make a difference when it is integrated in business relationships and given a specific purpose (Ekman et al., 2014). When IT is integrated in an industrial business relationship, IT extends beyond information transfer and data storing to a situation in which adaptations are made to implement the technology, which is a strategically important part of a firm's operations (Lindh & Ekman, 2016).

Hypotheses

Even though information technologies may be important for enhancing business relationships, their use does not automatically create value in them (Ryssel et al., 2004). Scholars have therefore highlighted that there may be a need for complementing pure-technology solutions with more personal relationships (Nonaka, 1994; Soo, Devinney, Midgley, & Deering, 2002). Interacting on a personal basis is argued to be particularly necessary in business situations where feelings of uncertainty, ambiguity, and risk are involved (Nohira & Eccles, 1992). Therefore, the development of personal relationships is an important prerequisite in establishing and maintaining virtual working relationships (Horton & Pawar, 2002; Pauleen & Yoong, 2001). Not until personal interaction patterns have been established, IT integration becomes important for managing the relationship. Thus, Hypothesis 1 is suggested:

H1: Personal interaction proliferates information technology integration.

The interaction in business relationships (that may include the process of IT integration in the exchanges) often entails relationship enhancement (Ryssel et al., 2004; Stump & Sriram, 1997), which can cement the business relationships and create competitive advantages (Roberts & Mackay, 1998). Stump and Sriram (1997) have even shown that when IT becomes important the overall closeness of buyer and seller relationships is strengthened. One reason for this is the nature of the technology (i.e., that IT enables customers to get access to information in a fast, accurate, and reliable manner; e.g., Kaplan & Peterson, 1998; Lancioni et al., 2000). IT may also become important as it enables organizations to customize their services instead of standardizing them (Ives & Mason, 1990). Given these results, the second hypothesis is based on the argument that IT integration can lead to new service development.

H2: Increasing integration of information technology augments new service development.

Evidently there are positive effects of information technology, especially in the daily operations of organizations. However, personal interaction has some specific traits (such as accurate and immediate feedback) that can enable an efficient transfer of knowledge, especially so-called tacit knowledge (or know-how) that is hard to formalize and harder to communicate (Murray & Peyrefitte, 2007). Previous research has, furthermore, indicated that a relationship exists between tacit knowledge and innovation activities (Romijn & Albu, 2002), such as new service development. Personal meetings (e.g., face-to-face encounters), may, therefore, have an edge over IT when interacting with customers for the purposes of new services development. This may particularly be the case in situations when personal interaction is a necessary part of the service exchange due to the intangibility and heterogeneous nature of specific services (Zeithaml et al., 1985). Previous research has also indicated that personal relationships amongst firms' business units facilitates innovative activities via the exchange of new ideas that may not be readily relayed by the use of more formal mechanisms (Ghoshal, Korine, & Szulanski, 1994). By participating in personal exchange, the cognitive distance between interacting parties may be diminished, which in its turn make knowledge accessible and deployable for purposes of new idea generation (Noteboom, 1999; Rovira Nordman & Tolstoy, 2008). Based on the research indicating that personal interactions may enhance the development of new ideas and new services in business relationships, the third hypothesis is:

H3: Personal interaction strengthens new service development.

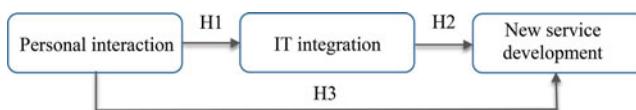


Figure 1. Conceptual model.

The combination of these hypotheses is depicted in a model (Figure 1), suggesting that personal interaction as well as IT integration proliferates new service development in service-oriented business relationships. When IT integration increases it becomes a vital and mediating factor for supporting new service development, even though the effect of personal interaction on new service development also may be direct. The ideas behind this model and its paths somewhat contradicts the conception that IT integration has made personal interaction obsolete. Building on studies that have reported positive links between IT and strengthened business relationships, the present model suggests that personal interaction and IT integration could correlate positively and (potentially) together increase new service development.

Methodology

The data and analysis are provided to measure the latent variables based on structural equation modeling. The method for computations is LISREL, because this method permits definitions and comparisons of latent variables as well as relationships in a way appropriate for a structural model (Jöreskog & Sörbom, 1993). Another benefit of LISREL modeling is that it evaluates model paths, and also calculates for variances for a model as a whole (i.e., the paths are evaluated as parts of a model and not separately). This is necessary for the purpose of this study, since the goal is to evaluate the paths as such, as well as the possible mediating effect of IT interaction on new service development.

The collection of data and measurements

To collect the data needed for the study, a standardized questionnaire was mailed to 836 randomly selected supplier-firms with limited liability in Sweden. This resulted in a sample of 353 responses from companies selling products on the B2B market. The sample contains a wide range of companies selling different industrial goods (66%), and B2B services (34%). The duration of the business relationships in the sample is 13 years on average and the longest relationship is 90 years. For the purpose of this study's focus, the service-industry, only the 34% of companies exchanging services (i.e., $N = 138$) are included in the analysis.

The questionnaire was designed to capture different characteristics of the investigated firms' business conduct, such as financial, managerial, operational, and technical issues. The main aim was, however, to assess aspects of a specific business relationships as well as the surrounding business network, important to the responding firm. One part of the questionnaire focused on one important customer (the respondent's choice), to permit an analysis of long-term oriented business relationships. The responding business managers were first approached by phone and received the questionnaire by mail after agreeing to answer the questionnaire.

The indicators for the latent variables (i.e., constructs) of personal interaction, IT integration, and new service development, have their roots in other studies.

Table 1. Indicators and values.

Latent variable	Indicator	Loading (λ)	R^2	t value
Personal interaction	How many persons from the customer are in contact with your company, on average each year?	0.62	0.48	6.13
	How many persons from your company are in contact with the customer company, on average each year?	0.61	0.70	6.77
IT integration	To what extent has your company made adaptations to this customer concerning the use of IT?	2.62	0.62	4.09
	To what extent is the use of IT important to your company in the business with this customer?	1.44	0.51	6.39
	There are great advantages in increasing the use of IT in the relationship with this customer.	2.40	0.37	5.87
New service development	How important is your company to this customer concerning product development?	2.11	0.42	4.26
	We often engage in product development projects with this customer.	2.18	0.53	3.49

Although validated by previous research, they are adapted to fit the survey of Swedish industrial firms and specifically established business relationships. This means that questions concerning, for example, IT integration are asked about a specific customer that the respondent chose when answering the questionnaire. All indicators for the latent variables are displayed in [Table 1](#).

Personal interaction

The latent variable of personal interaction captures the regularity element of interactions between individuals in business organizations, based on the quantity of contact surfaces between the investigated firms and their selected customers. Scholars have highlighted the need for firms to regard relationship management as a team effort that will allow them to work closely together with customers to be able to respond flexibly to their needs (Macaulay & Cook, 1995). Based on this idea, the indicator measures the number of persons from the customer company that are in contact with the investigated firms on a yearly basis, and vice versa. The idea to analyze personal interaction is recognized by many researchers, as for example Grönroos (1984) and Murray (1991), who highlights the necessity of participating in social exchanges in business relationships (i.e., that the parties meet). The personal interaction measurement is also used by Guonaris and Venetis (2002), who refer to the measure as personal relationships. In sum, the latent variable is indicative of the investigated firms' and their customers' time and resource investments in their mutual contact, which are needed to strengthen the quality of the interaction in their relationship.

IT integration

The concept of IT integration captures the collaborative feature of information exchange in the investigated business relationships and reflects more than the mere use of IT—it is essential for continued business as well. Building on research showing that IT infrastructures facilitate knowledge sharing with business partners (Liu, Ke, Wei, & Hua, 2013; Rai, Patnayakuni, & Seth, 2006), the importance connoted to IT integration for enhancing business relationships is highlighted. The latent variable, moreover, builds on ideas from Lindh and Ekman (2016), highlighting integration as

relevant for development of business relationships in industrial markets. The latent variable contains three different variables (see Table 1). The first question is based on the respondent's perception of the extent that the company has made adaptations to the customer concerning the use of IT. The second question indicates whether the respondent considers IT to be important for the business with this customer. The last question is constructed to measure whether the respondent can see the advantage of increasing the use of IT in the business relationship. All three questions can be answered on a 7-degree scale on which 1 corresponds to *not at all*, and 7 is *very much*.

New service development

New service development is used to capture the importance of business relationships for new service development between the investigated firms and their customers. These services can be either radically new or perceived as new by its developers (cf. Van de Ven, 1986). The first indicator in this latent variable is set to capture the perceived importance of the focal firm for the customers' new service development. The second indicator measures the actual outcome of new services being developed within the investigated relationships (Syson & Perks, 2004).

When testing the model, the concepts are latent variables and the hypotheses suggest the paths between them. To assess validity of the latent variables the loadings of their indicators are investigated. This resembles reliability testing of constructs (Cronbach & Meehl, 1955), but unlike the testing with Cronbach's alpha, other values (factor loadings, R^2 values and t values) are evaluated for each item. Dissimilar from testing with Cronbach's alpha, all values are also evaluated within the structural model that is tested. This means that if a single item is removed, the values of separate loadings may change for all items, and not just the single item in the latent variable that the item was a part of. (Blankenburg, Eriksson & Johanson, 1996; Jöreskog & Sörbom, 1993) Table 1 displays the relevant values for the indicators of the latent variables. Other measurements assessing the strength of the model as a whole are displayed in Table 2. The estimates and significance of the paths are displayed in Table 3.

LISREL has found many applications for tracing relationships between latent variables in social science research (Jöreskog & Sörbom, 1993). Its primary use is to confirm a hypothesized model and/or to explore relations without predefinitions.

Table 2. Fit measures ($N = 138$).

Fit measure	Fit guideline	Model
χ^2 (p value)	$p \geq .05$	17.76 (0.06)
χ^2/df	$p \leq 3.0$	1.77
GFI	$p \geq .90$	0.97
AGFI	$p \geq .80$	0.91
CFI	$p \geq .90$	0.97
TLI (NNFI)	$p \geq .90$	0.94
RMSEA	$p \leq .08$	0.075

GFI - goodness of fit index; AGFI - adjusted goodness of fit index; CFI - comparative fit index; TLI (NNFI), Tucker-Lewis coefficient; RMSEA root-mean-square error of approximation.

Table 3. The model's paths and significances ($N = 138$).

Paths	Estimate	t value
H1: Personal Interaction → IT integration	0.41	3.67 ^{***}
H2: IT Integration → New Service Development	0.38	2.52 ^{**}
H3: Personal Interaction → New Service Development	0.20	1.45 [†]

† $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$.

It is important to notice that with LISREL the validity measures concern the whole model (i.e., the nomological validity; as discussed by e.g., Cronbach & Meehl, 1955). The validity of separate relationships is evaluated within the model. Discrete interactions can be judged by the degree of separation between latent variables (discriminant validity) as well as the degree of homogeneity between them (convergent validity). Convergent and discriminant validity in this context is usually evaluated by the established values of factor loadings with standardized solutions: λ (cf. Bollen, 1989a; Brooke & Price, 1989; Schriesheim, Solomon, & Kopelman, 1989). The chi-square and probability measures determine the validity of the entire model (Blankenburg et al., 1996), and providing that these key measures are acceptable, each relationship within the model can be examined.

The relationships among the latent variables are evaluated in terms of level and significance. To ensure a satisfactory quality for the analysis, the model was evaluated through the examination of several model-fit indices, apart from the chi-square and the significance level. These are the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), the comparative fit index (CFI), the Tucker-Lewis coefficient (TLI/NNFI), and finally the root-mean-square error of approximation (RMSEA; Bollen, 1989b).

The fit measures are all in accordance with the criteria of the model fit indices, thus the analysis clearly supports the assertion for an adequate fit between the model and the data. As shown in Table 2, the chi-square measure of significance is acceptable in the model, along with the recommended complementary fit statistics. Together with these measures, the degrees of freedom that the sample ($N = 138$) contributes with is further assuring the model fit, as well as the validity of the model for the sample. The stated fit of the structured equation model on the observed data (based on the model statistics) implies that the significance of the paths between the latent variables, shown in Table 3, are adequate as analysis and further discussion.

Analysis

The model hypothesizes that personal interaction increases new service development in service-oriented business relationships and that IT integration mediates this effect. The results show that Hypothesis 1 (i.e., personal interaction proliferates information technology integration) is supported by the analysis (0.41; 3.67). Hypothesis 2, stating that increasing integration of information technology augments new service development in service-oriented business relationships, is also confirmed (0.38; 2.52). Hypotheses 3, stating that personal interaction strengthens

new service development in service-oriented business relationships, is however not supported in the analysis (the suggested path is nonsignificant: 0.20; 1.45). The lack of support should be interpreted within the model which implicates that when there is IT integration (i.e., extensive IT use that is of importance, personal interaction is not considered to be as important for new service development). A model that would test these hypotheses separately, or investigate the relationships without the inclusion of IT integration, might show a different result (i.e., indicate a positive effect of personal interaction on new service development). The lack of support for the last hypothesis interpreted within this model offers, interestingly enough, support for the idea that when IT becomes important for new service development, the need for personal interaction is lessened. Personal interaction is, however, still an important element in the continuance of business relationships, because it is necessary for creating synergetic effects together with IT integration to enhance new service development.

Discussion

The most interesting result of the analysis is that personal interaction seems to be rigorously enhanced by IT integration, which in its turn works as an important mediator for new service development to occur. This finding contradicts the assumption that IT could affect personal interaction negatively. Instead the result suggests that when IT is integrated in a relationship (i.e., when IT is considered to be important and purposeful for the relationship) it can lead to strengthened relationships in the shape of new service development. One explanation for this result may be that this study focuses on mature business relationships and the integration of IT in these. When services are exchanged within business relationships, interaction may be both extensive and intensive.

In accordance with the results of this study, we contradict the claim that “there will be no more socializing with the customers once IT has taken over.” IT may, in fact, boost socializing in service-based relationships under the circumstance that it has a clear purpose and is considered to be important. Under such circumstances, information technologies enhance interaction and increase new service development, thus strengthening them as a whole. In the long run, these processes are also important for general relationship development. The notion that there is a distinct difference between communication via Internet and personal communication as suggested by Meuter et al. (2013) is one reason for the synergy effects suggested.

Conclusion

Researchers and policy makers alike have highlighted that service-industries comprise an increasingly important segment of many economies (Bharadwaj, Fahy, & Varadarajan, 2015). The same actors also spend resources on outlining the effects of digitalization (i.e., on investigating the varying means of technology-based interaction forms that are well-functioning; Ekman et al., 2014). If B2B service providers

were to engage in more innovative activities that would lead to the generation of new service solutions, companies could become more competitive. The starting point for this article is that there is a need to investigate the predictors for new service development in B2B firms further (including the consequences of using information technologies for interaction). Even though IT previously has been shown to generate closeness in business relationships and that mutual trust can result from IT investments (Stump & Sriram, 1997), this study shows that personal interaction still plays a key role to support IT integration and enhance innovative activities such as new service development. Hence, by investigating the effects of personal interaction and IT integration on new service development processes in business relationships, this study has investigated the antecedents of new service development, as suggested by Carlborg et al. (2014).

The findings of the analysis provide evidence that B2B service providers use their customer relationships to strengthen their interaction and IT integration and acquire knowledge that can be used for new service development. These results support the findings of previous studies that have identified B2B-relationships with other firms as essential for the development of knowledge that can lead to the development of new products/services and technologies (Rovira Nordman & Tolstoy, 2008; 2011). A particularly interesting result of the data analysis concerns the role of IT integration, which turned out to be an important mediator between personal interaction and new service development. This relationship supports the idea that IT is highly important for enabling rapid, accurate and reliable information exchange between business partners (e.g., Kaplan & Peterson, 1998; Lancioni et al., 2000) and cementing business relationships (Roberts & Mackay, 1998).

In summary, the study shows that IT integration (the idea that IT is inseparable from the interactions and exchanges of its context) is a suitable construct for investigating the complex dichotomy between IT and personal interaction. Because the IT integration construct is not separated from relationship activities, it should not to be seen as increasing or decreasing other forms of interaction. Coming studies should, therefore, focus on the potential synergies between IT and other ways of interacting rather than the differences between them. The results of the study also indicate that the business relationship approach is suitable for capturing the strength of long-term collaborations with strong personal interaction patterns, which in their turn can nurture new service development. Thus, firms with strongly integrated IT relationships can achieve better development of their services, which may increase the business value for many digitalized firms.

Managerial implications

From a managerial perspective, this study shows that personal interaction and IT integration have synergetic effects that can lead to new service development. The results thus highlight the need for service-oriented B2B-firms to engage in both personal and IT interaction, for example by using common marketing tactics to create stronger interpersonal relationships between firms. One common way of doing

this is to try to infuse trust in customers by benevolent behavior, showing that the firm has the skills required to meet the customers' needs and solve the customers' problems (Reynolds & Beatty, 2000). Because most firms, however, have limited resources, managers in service-oriented B2B firms need to focus resources on building up relationships with only their most important customers.

Even though IT may replace some previous personal interaction strategies, new service development may be contingent on the synergy between both committing to IT and maintaining personal interaction with important customers. In a digitalized world, personal interaction will still be essential.

Limitations and suggestions for further research

Similar to many studies, this study could be re-made and enhanced by collecting new data from a larger sample. Although 138 responses are sufficient for a multivariate statistic's model to function well, a larger sample would strengthen the generalizability of the results. Developing this study further would include more observations and more question items to investigate personal interaction, varying aspects of information technology, and more specified question items about service development and innovativeness. In particular, such questions would include considerations regarding different aspects of personally based interaction and IT based interaction. They would also include considerations about how companies strategize in regards to IT and how this affects the counterparts in their various network relationships.

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