

BI AND CRM FOR CUSTOMER INVOLVEMENT IN PRODUCT AND SERVICE DEVELOPMENT

Research-in-Progress

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Abstract

Customer involvement in product and service development (CIPS) is recognized as important for firms; yet the role of Information Technology (IT) in facilitating CIPS is understudied. We examine two enterprise technologies which improve knowledge available to decision makers: Business Intelligence (BI) and Customer Relationship Management (CRM). While CRM provides transactional information and knowledge about customers, BI provides market-sensing and analytics capabilities to leverage customer knowledge. Drawing on this theoretical basis, we posit that BI and CRM, individually and in combination, facilitate CIPS. Our large-sample empirical analysis of U.S. firms broadly supports our propositions. In supplementary analysis, we find that CIPS is associated with higher likelihood of benefits from customer-management systems in terms of development of new or improved products/services resulting from customer feedback. This suggests that customers can be effective contributors to innovation-related value from IT. Our study contributes by showing the role of BI and CRM in CIPS.

Keywords: Business intelligence (BI), Customer relationship management (CRM), Knowledge management capability, Customer-involvement

Introduction

Market orientation is widely acknowledged as important for firm performance (Narver and Slater 1990). Customer-orientation is one facet of market orientation (Narver and Slater 1990) and involvement of customers in product and service development is recognized as an important capability (Lin and Germain 2004) that has been linked to profitability and other performance measures (Jaworski and Kohli 1993). Customer orientation is evolving to become ingrained in business processes. For product and service development too, many firms utilize external sources of innovation and among them, customers are pivotal sources of knowledge and competence (Prahalad and Krishnan 2008). For example, Silicon Graphics Inc. integrates customer knowledge into its innovation processes (Li and Calantone 1998). Integrating customers helps translate their needs into new products and services (von Hippel 1998). Customers are invaluable for making contributions to value creation that are of mutual benefit for customers and firms, a concept acclaimed as 'co-creation of value' (Prahalad and Ramaswamy 2004). It is hence important for firms to leverage customers as assets. Firms are increasingly collaborating with customers to develop new products (Maklan et al. 2008). For example, Sony developed PlayStation2 in collaboration with customers (Prahalad and Ramaswamy 2004). More than 50% of product initiatives at Procter & Gamble (P&G) involve collaboration with outside innovators (Proctor and Gamble 2011).

Information Technology (IT) plays a major role in enabling capabilities of customer-orientation and collaborative development of products and services. Firms such as Adidas, BMW and P&G use IT-based platforms to imbibe customer insights into product development (Ogawa and Piller 2006). Starbucks (MyStarbucksIdea) uses IT-enabled engagement platforms to involve customers in product and service development (Ramaswamy and Gouillart 2010). Such examples suggest that knowledge about customers and sophisticated IT capabilities that leverage this knowledge can facilitate customer orientation and involvement in product and service development.

The marketing literature has also noted the importance of customer involvement for achieving various firm outcomes, in for example, cost efficiency (Auh et al. 2007), reduction of lead-times (Cooper 1995), and increased customer satisfaction (Bendapudi and Leone 2003). Despite recognition of the importance of customer involvement, there is scant empirical research on nexus between IT and customer involvement in product and service development. More broadly, research has noted that empirical research on customer participation is limited (Dong et al. 2008; Meuter et al 2005), at an early stage (Zhang and Chen 2008) and there is scant research on how customer involvement and collaboration are fostered (Balzevic and Lievens 2008; Ritter and Walter 2003). As Rapp et al. (2010, p. 1230) note, "despite the theoretical importance of customer-linking capabilities, few empirical studies have examined their antecedents or outcomes" and evidence of understanding of customer involvement is not unanimous (Brown and Eisenhardt 1995). Pertinently, in the Information Systems (IS) literature, though co-creation of value has been recently identified as an important theme moving forward (Kohli and Grover 2008), IT capabilities that facilitate customer involvement in product and service development are not well-studied. There is also scant empirical research on "how to operationalize and implement market-oriented innovation" (Matthing et al. 2004, p. 481). Our study helps bridge these gaps by asking, "*What is role of IT in customer-involvement in product and service development? Specifically, can IT, Business Intelligence (BI) and Customer Relationship Management (CRM) IT capabilities predict the extent to which firms involve customers in developing products and services?*"

Consistent with prior research, we refer to customer involvement as the extent to which "the customer is involved in producing and delivering" the product or service (Dabholkar 1990, p. 484) and the "attending to customer signals" (Lin and Germain 2004, p. 245). We argue that IT capabilities can help firms be more customer-oriented. Our empirical analysis on data collected from U.S. firms yields three main findings. First, we find that CRM and BI predict extent of customer-involvement. This finding rests on the theoretical argument that CRM enhances customer knowledge (Mithas et al. 2005) to identify and involve customers while BI provides firms with market sensing and analytics capabilities to better understand customers, facilitating their involvement. Second, we find that BI complements CRM in predicting customer involvement, suggesting that BI provides analytics capabilities to leverage customer information gained from CRM (Matthing et al. 2004) and provide actionable customer insights. Third, our supplementary analysis reveals that greater the extent of customer involvement, more likely are firms to

derive benefit from customer-management systems in form of new or improved products and services resulting from customer feedback. This suggests positive implications of customer involvement for innovation returns from IT.

Literature Overview

Prior research has suggested benefits of involving customers in product and service development. Much of this research has focused on operational benefits. Involving customers can improve cost efficiency (Auh et al. 2007), reduce development cost and marketability of products (Kohli and Jaworski 1990; Narver and Slater 1990) reduce lead-times (Cooper 1995), reduce cycle time (Matthing et al. 2004), increase customer satisfaction (Bendapudi and Leone 2003), influence originality of ideas (Kristensson et al. 2002) and influence service innovation (Blazevic and Lievens 2008). Gruner and Homburg (1999) suggest that customer characteristics can affect certain stages of innovation process. Despite such studies, research indicates that there is a “limited number of studies focusing primarily on customer involvement in the product or service innovation process” (Matthing et al. 2004, p. 487).

Regarding antecedents of customer involvement, as noted by prior research (Lin and Germain 2004; Ritter and Walter 2003), few studies have attempted to empirically document factors that foster customer involvement, barring notable exceptions. Analyzing customer-supplier relationships, Ritter and Walter (2003) find that mutual trust, commitment and adaptations predict customer involvement. Lin and Germain (2004) find that product complexity and organizational structure have implications for customer involvement. Research at the intersection of IT and marketing examines how IT tools can facilitate Internet-based strategies of involving customers to co-develop products (Fuller and Matzler 2007).

Several reviews of business innovation literature (e.g., Ahuja et al. 2008) identify innovation determinants including firm, industry and institutional factors. It is evident from these reviews that IS has been scantily studied as a driver of business innovation. The effect of IT on business innovation is captured recently in some studies. For example, it has been shown that IT investments can complement R&D investments (Kleis et al. forthcoming). Other studies show or suggest that IT can facilitate innovation via improved knowledge management (Joshi et al. 2010), co-ordination and collaboration (Gordon and Tarafdar 2007) and better management of product development (Pavlou and El Sawy 2006).

Our literature review reveals that while marketing research has recognized the importance of customer involvement for value creation, there is little attention to IT’s role in customer-involvement. Also, an empirical assessment of customer-involvement and customer-driven innovation-related returns from IT is, to our best knowledge, understudied in the extant IS literature. Our study helps bridge these gaps. We focus on three IT capabilities – overall IT investment, BI applications and CRM applications.

Hypotheses Development

We propose that IT provides the ability to tap customer knowledge and identify potential customers for involvement. IT capabilities help firms to develop their market orientation and customer focus (Chen and Ching 2004). Hence, we posit a baseline hypothesis that IT intensity (defined as IT investment normalized to the sales of the firm (Bharadwaj et al. 1999)) facilitates the organization’s market and customer orientation, as captured by the extent of customer involvement,

H1: IT intensity is positively associated with the extent of customer involvement in developing products and services.

Prior research suggests that the extent to which firms co-create with customers depends on how much firms can learn about customers (Sheth et al. 2000). CRM systems capture and track customer information in a centralized location and help firms gain improved knowledge about their customers (Mithas et al. 2005). CRM systems can be used to gather information from various sources and identify profitable customers for developing collaborative relationships (Chen and Ching 2004). By bringing together information from multiple touch-points CRM gives firms a holistic view of the customer. Using CRM, customers can be analyzed and prioritized based on their unique value potential. Accurate and up-

to-date information in CRM help firms pick and target better prospects for involvement in product and service development. CRM thus provides the ability to understand customers and co-create value with customers (Payne and Frow 2005). Hence,

H2: Use of CRM applications is positively associated with the extent of customer involvement in developing products and services.

Customer involvement requires ability to sense the market to identify potential customers (Kumar 2007). BI can help provide firms this external market sensing capability to identify industry trends and customer interests that align with a firm's product and service development strategy (Joshi et al. 2010). BI can also help firms integrate information about external factors such as customer demographics and internal factors of skills and new product positioning (Kumar 2007). BI tools such as OLAP and data mining facilitate discovery of new information and knowledge about markets and customers (Chen et al. 2004). They help in distribution of information about customers across the organization (Matthing et al. 2004). BI systems provide firms with analytics capabilities which are critical to firms' strategy of addressing unique needs of customers (Pralhad and Krishnan 2008). Analytical insights help firms make fact-based decisions about customer interactions. For example, Best Buy used an enterprise-wide business analytics approach to identify its most knowledgeable customers (SAS 2011). Hence,

H3: Use of BI applications is positively associated with the extent of customer involvement in developing products and services.

The theory of complementarity of resources is well recognized in IS (Melville et al. 2004). While CRM provides better customer knowledge through more transactional information from customer touch-points, CRM can be complemented by quantitative analyses of the market and customers. BI systems facilitate improved access to information for decision makers, providing actionable insights and a context for information about customers. Firms that have implemented BI systems are equipped with better insights to take advantage of CRM systems and incorporate the right customers into development processes (Ramamurthy et al. 2008). Business analytics helps to capture detailed information across the enterprise and merge it with customer demographic and other data for a complete and contextualized view of customers. For instance, Sony combines data-mining technologies with its customization strategy to enhance its customization process. Netflix combines BI with customer data providing a richer understanding of its customers and enhancing its ability to make individualized customer recommendations (Pralhad and Krishnan 2008, p.103). Analysis of contextualized information to generate new, micro-level insights unique to the business is critical in engaging customers. BI systems provides ability to slice and dice transaction-oriented data obtained from CRM helping employees make better use of customer knowledge and aiding them to interact, collaborate and co-ordinate with customers (Rapp et al. 2010). Thus, integration of BI and CRM can provide the customer intelligence that is required to improve the relevancy of the firm's communications with customers.

H4: Use of CRM and BI applications are complementary in their positive association with the extent of customer involvement in developing products and services.

Data and Variables

We obtain data from *InformationWeek (IWeek)*, a leading, widely circulated IT publication in the United States. IWeek collected this data by surveying top IT managers and CIOs at U.S. firms across industries during the 2002-2003 period. Similar to prior research, data collection from CIOs and senior IT managers is important because they are in a good position as key respondents to be knowledgeable and informed of their firm's IT practices (Grover et al. 1998). *IWeek* has been argued to be consistent with data from other sources like International Data Group and Bureau of Economic Analysis (Rai et al. 1997). *IWeek* surveys are thus considered a reliable source of data and are used in academic research (e.g., Bharadwaj et al. 1999; Mithas et al. 2005). We augment this data with firm-level variables from Standard & Poor's Compustat database and SEC filings and industry data from the U.S. Census Bureau.

Independent Variables and Dependent Variable

CRM Applications (*CRMAppI*): This captures legacy CRM applications and modern CRM applications. We constructed this measure following Mithas et al. (2005). The legacy component is a summative index which captures deployment of IT to support business processes such as IT systems for customer service and support, tracking customer loyalty, personalized market offerings, product marketing information, personalization, customer satisfaction tracking, dealer locator, online distribution, transactional systems, multilingual communications and product configuration. The second component (binary) indicates if modern CRM systems are widely deployed in the firm. Following Mithas et al. (2005), we created the *CRMAppI* variable by adding the modern CRM component to the standardized legacy CRM component. We obtained these variables from the *IWeek* survey.

Business Intelligence Applications (*BIAppI*): This is a composite measure comprising of ‘BITools’ (binary indicator of wide deployment of BI in the firm) and ‘BIDiffusion’ (percentage of knowledge workers in the firm that use BI tools). Analogous to the approach to measure CRM in Mithas et al. (2005), we created the *BIAppI* variable by adding the BITools component to the standardized measure of BIDiffusion. We obtained these variables from the *IWeek* survey.

IT Intensity (*ITIntensity*): Firm’s IT budget as share of revenue (Bharadwaj et al. 1999; Mithas et al. 2005). Source: *IWeek* survey.

Customer involvement (*CustInvolv*): This is a 4-level variable representing the extent to which customers are involved in development of the company’s products or services. It is created by summing four binary indicators, viz. “customers participate in focus groups or formal user feedback”, “customer opinion is solicited and analyzed”, “customers can custom configure products or services on the Web” and “key customers drive product and service development”. This operationalization is consistent with definition of customer participation as extent to which “the customer is involved in producing and delivering the service” (Dabholkar 1990, p. 484) and the “attending to customer signals” (Lin and Germain 2004, p. 245). It is also in line with the definition of co-production as engagement of “customers as active participants in the organization’s work” (Lengnick-Hall et al. 2000, p. 364). Source: *IWeek* survey.

Control Variables

We control for several variables which may influence the potential for customer involvement, based on prior literature. Table 1 provides the description of the variables, their sources and references to prior related literature.

Concept	Variable	Description	Related Reference	Source
Organization Size	<i>Size</i>	Logarithm of the annual revenue of the firm for its most recent fiscal year	Ritter and Walter 2003	InformationWeek
Corporate Culture	<i>CollabCult</i> , <i>SatisCult</i> , <i>InnovCult</i>	How important (on a scale of 0-9) customer collaboration, customer satisfaction and innovation are as elements of the company’s corporate culture	Deshpande and Webster 1989	InformationWeek
Industry Concentration Ratio	<i>Industry</i>	Four-firm concentration ratio	Melville et al. 2007	2007 U.S. Census
High-tech/Low tech	<i>Hightech Industry</i> , <i>Lowtech Industry</i>	Indicator of whether the firm’s industry is classified as high-tech, low-tech or neither, based on the classification scheme identified and used in prior research	Banker et al. 2011	U.S. Census Bureau
Prior Firm Performance	<i>ROA</i>	Ratio of Net income to Total Assets	Bharadwaj 2000	Compustat, SEC filings
R&D Intensity	<i>R&Dintensity</i>	ratio of R&D expenditure to sales of the firm	Ahuja et al. 2008	Compustat, SEC filings
IT R&D Intensity	<i>ITR&Dintensity</i>	Share (percentage) of the IT budget devoted to R&D.		InformationWeek
Industry Sector	<i>Indxx</i>	Dummy variables that represent the primary industry sector to which the firm belongs and account for potential industry-specific idiosyncrasies beyond those accounted	Veugellers and Cassiman 1999	U.S. Census Bureau
Industry	<i>Mfg</i>	whether the firm’s offering is primarily a good or a service (1 = Manufacturing, 0 = Service)	Mithas et al. 2005	U.S. Census Bureau
IT Intensity	<i>ITIntensity</i>	Firm’s IT budget as a percentage of its annual sales revenue	Bardhan et al. 2006	InformationWeek

Empirical Model and Results

Our empirical model employs *CustInvolv* (defined above) as the dependent variable. Since the dependent variable is ordinal, ordered regression models are appropriate (Greene 2003). We estimate the following ordered probit model:

$$\text{Ordered Probit (CustInvolv)} = \beta_{10} + \beta_{11}ITIntensity + \beta_{12}CRMAppl + \beta_{13}BIAppl + \beta_{14}(CRMAppl \times BIAppl) + \beta_{1c}X_{1c} + \varepsilon_1$$

where X_{1c} is vector of control variables and ε_1 is error term.

Our sample consists of 310 public firms across industries in United States. Table 2 shows summary statistics and correlations of the key variables.¹

Variables		Mean	SD	Min	Max	1	2	3	4
1	CustInvolv	2.61	1.32	0	4	1			
2	CRMAppl	0.76	1.20	-2.16	2.74	0.52*	1		
3	BIAppl	0.70	1.17	-1.03	3.26	0.40*	0.35*	1	
4	ITIntensity	4.56	8.84	0.10	84	0.11*	0.10	0.05	1
5	CustProdServDev	0.63	0.48	0	1	0.30*	0.35*	0.20*	0.03

N = 310. * indicates significance at $\alpha = 0.05$

Table 3 shows the preliminary results. We find support for H2 ($\beta_{12}=0.486$, $p<0.01$), H3 ($\beta_{13}=0.348$, $p<0.01$) and H4 ($\beta_{14}=0.269$, $p<0.01$), but no support for H1. One possible plausible reason for non-support of H1 is that our aggregate measure of IT intensity is inadequate for capturing nuances of IT investment that foster customer involvement. Also, the measure includes those IT investments that may have no role in customer involvement.

The control variables are largely in expected directions. For example, the coefficients on the customer collaboration culture variable and the customer satisfaction culture variable are positive and significant.

We performed several robustness tests to assess the robustness of the results. The routine tests for reliability of measures are not applicable because we use summative (formative) scales (Jarvis et al. 2003). Variance inflation factors indicate that multicollinearity is not an issue. A model specification test (linktest) suggests no specification errors. Harman’s one-factor test and marker variable test do not suggest common method bias.

¹ The pair-wise correlations of the remaining variables are along expected lines and omitted here for brevity. None of them are alarmingly high.

Table 3: Ordered Probit Estimation (Dep. Variable = CustInvolv)		
	(without interaction)	(with interaction)
<i>ITIntensity</i>	0.008 (0.011)	0.010 (0.011)
<i>CRMAppl</i>	0.486*** (0.076)	0.362*** (0.077)
<i>BIAppl</i>	0.348*** (0.069)	0.176** (0.077)
<i>CRMAppl X BIAppl</i>	n/a	0.269*** (0.066)
<i>R&DIntensity</i>	-0.785 (2.277)	-0.635 (2.361)
<i>ITR&Dintensity</i>	0.027* (0.014)	0.027* (0.014)
Organization Size	-0.075 (0.067)	-0.116* (0.070)
Culture of Innovation	0.009 (0.031)	0.009 (0.031)
<i>ROA</i>	-1.207 (0.830)	-1.076 (0.857)
Industry Concentration	-0.003 (0.003)	-0.004 (0.003)
High-tech Industry	1.047*** (0.339)	1.095*** (0.328)
Low-tech Industry	-0.271 (0.211)	-0.190 (0.227)
Culture of Customer Collaboration	0.055** (0.025)	0.060** (0.025)
Culture of Customer Satisfaction	0.083** (0.041)	0.105** (0.043)
<i>Mfg</i>	-0.031 (0.822)	-0.540 (0.536)
Log Pseudo-likelihood	-365.904	-355.689
Wald Chi-square	243.18	223.24
Prob > Chi-square	0.0000	0.0000
McKelvey & Zavoina Pseudo R-square	0.541	0.604
Observations (N)	310	310
Notes: (1) Robust Standard Errors in parentheses. (2) Significant at *10%, **5% and ***1% level for Chi-square tests. (3) Estimates for industry dummies and intercept are not shown. (4) 'n/a': Not Applicable.		

Supplementary Analysis

We now explore the implications of customer involvement. The marketing literature suggests that customers can be sources of innovation (Bendapudi and Leone 2003; Blazevic and Lievens 2008). Yet, the link between customer involvement and innovation-related returns from IT remains an empirical question and is, to our best knowledge, heretofore unexplored in the extant IS literature. We posit a positive relationship for several reasons. First, involving customers can be a useful way for firms to integrate and get external information on how IT can be used more innovatively (Sawhney and Prandelli 2000). Second, customer involvement can facilitate interactive learning which can help firms improve and innovate products and services enabled by IT. Third, customer participation enhances firms' ability to better understand and respond to customer needs, thus improving quality of products and services (Koufteros et al. 2005). Finally, customer involvement can provide access to resources and technological know-how of customers (Campbell and Cooper 1999). Hence, we posit that greater the customer involvement in developing products and services, greater is the likelihood that firms can derive benefits

from customer-related IT in the form of new or improved products or services. To test this proposition, we use the following dependent variable:

CustProdServDev: A binary variable indicating whether the firm benefits from its customer-related IT systems in the form of development of new or improved products and services resulting from customer feedback. This measure is related to the broader definition of IT-enabled firm-level innovation in the IS literature (Agarwal and Sambamurthy 2002; Ye and Agarwal 2003) as “new products or services developed by a firm through the application of IT”. Self-reported (and binary) innovation measures have been used in prior research (e.g., Leiponen and Helfat 2010; Molina-Morales and Martinez-Fernandez 2009). We obtain this variable from the *IWeek* survey.

Since this dependent variable is closely related to innovation, we control for variables that prior research argues to affect innovation. These include R&D intensity, firm size, industry concentration, industry sector, high-tech/low-tech industry, corporate culture and prior profitability (Ahuja et al. 2008). We also control for the share of IT investment in new (rather than maintenance) projects which may likely influence innovation. We estimate the probit model:

$$Probability(CustProdServDev=1) = \Phi(\beta_{20} + \beta_{21}CustInvolv + \beta_{2c}X_{2c} + \varepsilon_2)$$

where X_{2c} is vector of controls, Φ is standard normal cumulative distribution function and ε_2 is error term.²

We find support for our above proposition ($\beta_{21}=0.31, p<0.01$). The control variables are, in general, in expected directions and robustness tests indicated good model fit.

Discussion

Hypothesis		Finding
H1	IT intensity is positively associated with the extent of customer involvement in developing products and services.	Not supported
H2	Use of CRM applications is positively associated with the extent of customer involvement in developing products and services.	Supported
H3	Use of BI applications is positively associated with the extent of customer involvement in developing products and services.	Supported
H4	Use of CRM and BI applications are complementary in their positive association with the extent of customer involvement in developing products and services.	Supported

Table 4 provides a summary of the hypotheses findings. Our findings suggest that BI and CRM can facilitate customer-orientation of firms, specifically, the extent to which they involve customers in development of products and services. While BI and CRM are both positively associated with customer involvement, their complementarity suggests that analytical insights provided by BI can leverage rich and integrated customer transaction information provided by CRM. Moreover, customer involvement positively predicts likelihood that firms benefit from customer-related systems in the form of new or improved products and services using customer feedback, suggesting that customer involvement facilitates innovation-related benefits from IT. Taken together, our findings suggest the role of BI and CRM in customer involvement which is beneficial in terms of business innovation-related returns from IT using customer feedback.

² The detailed results of the supplementary analysis are omitted here for brevity, and are available in a longer version of the paper.

Potential Contributions to Research and Practice

Our study contributes to research by shedding light on the role of BI and CRM systems in broadening the scope for firms to involve customers in product and service development. It also helps towards explaining how IT could be one explanation for why firms differ in the way that innovation process is managed, a question that warrants research, as noted by Ahuja et al. (2008, p. 59). Second, our study potentially adds to the limited but growing literature on the role of IT in innovation-related benefits (Joshi et al. 2010; Kleis et al. forthcoming). Third, the results suggest how IT provides intermediate market orientation capability of customer-involvement and benefits in the form of new or improved products and services with help of customers. These capabilities are intangible in nature and our study is consistent with calls to examine IT's role in intangible and intermediate capabilities (Kohli and Grover 2008).

Our study contributes to practice by showing a link between IT and marketing capabilities; more specifically, how CRM and BI synergies may enhance firm capabilities to move towards a more open and market-focused model of innovation where customers are involved in developing products and services. In a competitive business environment, a key determinant of success is customer focus. Customers are not mere recipients of products and services but expect to be participants in developing and experiencing firm offerings (Ramaswamy and Gouillart 2010). In such a scenario, it is important for firms to have the capability to usefully integrate customer inputs. Our findings suggest a role of IT in these capabilities. The results of this study suggest that an important justification for investment in BI and CRM systems lies in their capacity to help firms increase customer involvement in product and service development, a capability recognized as important by prior research (Lin and Germain 2004; Ritter and Walter 2003).

Limitations and Suggestions for Future Research

First, we do not account for customers' capabilities that can influence involvement. Second, our sample may not be representative of the population, limiting generalizability. Third, the cross-sectional design does not permit us to establish causality. Fourth, our supplementary analysis uses a self-reported measure of innovation-related benefits. Though, as noted earlier, self-reported and binary measures of innovation are used in prior research, future work can use finer measures. Importantly, we explore business innovation-related benefits *driven by* IT and by customer feedback. These aspects are better captured by our self-reported measure. Finally, the data were collected from CIOs and senior IS managers, who, despite being key respondents could overrate IT benefits (Grover et al. 1998). Future studies can empirically explore mediating mechanisms and how IT overcomes barriers to customer involvement.

Conclusion

Customer involvement in product and service development is widely recognized as a key facet of market orientation in practice and in prior marketing literature. This study examined the role of IT in customer involvement. Findings indicate that though aggregate IT investment may not foster customer involvement, specific BI and CRM IT capabilities can positively predict customer involvement. We also found presence of complementarity between BI and CRM in customer involvement. Further, our supplementary analysis indicated that greater customer involvement is more likely to predict innovation-related value from IT resulting from customer feedback. The findings suggest that BI can complement other existing IT capabilities (CRM) in facilitating customer orientation, specifically in innovation-related processes. We hope this study spawns further research at the nexus of BI, IT and customer orientation.

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