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# Performance Implications of CRM Technology Use: A Multilevel Field Study of Business Customers and Their Providers in the Telecommunications Industry

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Extant research is equivocal about the organizational performance effects of customer relationship management (CRM) technology use, with some studies reporting positive effects and other studies reporting no effects at all. The present research effort posits that these mixed findings may potentially be explained by two factors: (1) CRM technology use may have different effects on different customers, and (2) different CRM tools may have different performance consequences. This study investigates this possibility by building on relationship marketing and management theory to propose and test a model of the customer- and firm-level consequences of the organizational use of CRM interaction support and customer prioritization tools. The results of data analysis of 295 customer firms nested within 10 provider firms reveal that firm use of CRM interaction support tools is positively related to customers' relationship perceptions, regardless of customer account size. In contrast, the data indicate that use of CRM prioritization tools appears to have positive effects on a firm's larger customers and negative effects on smaller customers. The results also suggest that when considered at an aggregate level, customer perceptions of the exchange relationship are predictive of organizational performance and that the association between these two variables is significant for larger customer accounts but insignificant for smaller accounts. Overall, the study's results help explain some of the inconsistent findings reported in the literature regarding the performance implications of CRM technology use and suggest that use of the technology may serve to enhance organizational performance, at least over the short term.

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## 1. Introduction

Improvements in communications and information technologies have led to the development and widespread commercialization of a set of marketing, sales, and customer support tools collectively referred to as customer relationship management (CRM) technology. Among other things, these tools link front (e.g., sales) and back office (e.g., logistics) functions with the goal of facilitating the coordination of the different types of customer-provider interactions that occur across a multitude of customer touch points (e.g., Internet, direct mail, sales call, etc.; Chen and Popovich 2003, Greenberg 2001, Jayachandran et al. 2005). Moreover, they enable firms to harness the power of database, data mining, and interactive technologies and to collect and store unprecedented amounts of customer data, build intelligence from that data, and respond to the resulting customer intelligence across the organization (Bose 2002, Crosby and Johnson 2001, Greenberg 2001).

Upon their arrival in the marketplace, CRM tools were quickly embraced worldwide (Winer 2001). Organizations viewed these new technologies as a promising investment that would allow them to more effectively and efficiently manage their interactions with heterogeneous customers (Brady et al. 2008, Crosby and Johnson 2001, Greenberg 2001, Verhoef and Donkers 2001, Winer 2001). Specifically, firms anticipated that CRM technologies would lead to superior organizational performance as a consequence of an increase in (1) desirable relationship outcomes stemming from improved interaction quality and (2) resource allocation efficiencies gained through enhanced customer prioritization capabilities (Homburg et al. 2008, Reinartz et al. 2004, Zablah et al. 2004b).

To date, however, empirical evidence regarding the organizational performance implications of CRM technology use has been mixed (Reinartz et al. 2004). Some studies suggest that CRM technology investments have no measurable effect on firm performance outcomes (e.g., Day and Van den Bulte 2002, Reinartz et al. 2004), whereas other studies suggest just the opposite (e.g., Coltman 2007, Mithas et al. 2005). These mixed findings have led academics and practitioners to question whether investments in CRM technology can truly enhance organizational relationship building and management efforts (Coltman 2007, Jayachandran et al. 2005).

We propose that the contradictory findings reported in the literature regarding the CRM technology use-firm performance relationship are, in part, a result of three important but related omissions. First, scholars have largely failed to consider whether CRM technology use has different effects on different customers within firms' relationship portfolio. Second, although researchers acknowledge that CRM tools vary widely in the functionality they offer (Jayachandran et al. 2005), extant studies have not considered the possibility that different CRM tools may have different performance consequences. Third, prior studies have not evaluated the effects of CRM technology use at the individual customer level.

These are critical oversights given that CRM technology includes tools intended not only to help firms maximize customer interaction quality (i.e., *CRM interaction support tools*) but also prioritize resources (i.e., *CRM prioritization tools*) destined for relationship building and management activities based on expected customer value (Reinartz et al. 2004, Zablah et al. 2004b). Given this dual functionality, organizational use of CRM tools may have both positive and negative effects on customer-perceived relationship investment (CPRI)—a critical relationship metric with important performance consequences—which broadly refers to a customer's assessment of the amount of resources and effort a provider has invested to develop and maintain the exchange relationship (De Wulf et al. 2001). Stated differently, organizational use of interaction support tools may enhance CPRI by providing for improved interaction quality, whereas use of CRM prioritization tools may have detrimental effects on CPRI by reducing the level of resources that are directed toward individual customers. This pattern of off-setting effects, which has not been previously considered in the literature, may explain some of the contradictory findings reported in the literature regarding the CRM technology-firm performance relationship.

The study reported here addresses these shortcomings in the literature by investigating whether the organizational use of CRM interaction support and CRM prioritization tools influences CPRI and, if so, the extent to which this influence varies across a firm's customer portfolio. In so doing, we propose and use multisource data to empirically test a multilevel conceptual model of the customer- and firm-level consequences of CRM technology use. Specifically, we posit that organizational use of CRM interaction support and prioritization tools influences CPRI, which, in turn, influences firm performance. Moreover, we propose that the effects of CRM tool use on CPRI are not consistent across customers serviced by a firm but vary as a function of customer account size.

In addressing these shortcomings, our study makes at least three important contributions to the CRM literature (see Table 1 for a more detailed preview). First, our study helps reconcile mixed findings regarding the CRM technology use–firm performance relationship by evaluating whether CRM technology use exerts different effects on different customers and considering whether CRM interaction support and

**Table 1 Preview of Study Contributions**

| No. | Contribution | State of the literature | Relevance: Theory | Relevance: Practice |
|---|---|---|---|---|
| 1. | Reconciles mixed findings regarding the relationship between CRM technology use and firm performance by considering differential effects across CRM tools and customer subgroups. | Equivocal findings of the effects of CRM technology use on firm performance have been reported, leading academics and practitioners to question the technology's value (Coltman 2007, Jayachandran et al. 2005). | | ✓ |
| 2. | Identifies customer-perceived relationship investment (CPRI), a critical relationship metric, as an important mediator of the CRM technology use–firm performance relationship. | Effects of CRM technology use on CPRI have not been previously considered. Prior studies have primarily focused on the aggregate or firm-level customer outcomes of CRM technology use (e.g., Jayachandran et al. 2005, Mithas et al. 2005). | ✓ | |
| 3. | Refines broad conceptualizations of CRM technology to account for the potentially differential effects of the use of CRM interaction support and CRM prioritization tools on customers' relationship perceptions. | CRM technology has been treated as a homogeneous set of tools that result in uniform performance outcomes (e.g., Reinartz et al. 2004). | ✓ | ✓ |

prioritization tools have contrasting performance consequences. Second, unlike prior studies that have focused on aggregate performance effects, this effort identifies CPRI—a customer-level outcome—as a critical mediator of the relationship between CRM technology use and firm performance. Third, our study is the first to propose a refined conceptualization of CRM technology use that explicitly accounts for firms using CRM tools to execute tasks that may have beneficial as well as detrimental effects on customers and their perceptions of the exchange relationship.

The balance of this manuscript is organized as follows. First, we offer a broad overview of relationship marketing and management theory and briefly discuss its relevance to the current application. Then we introduce the conceptual model and hypotheses. We then proceed with a discussion of the research methodology, analytical procedures used to analyze the data, and findings. Finally, we conclude with a discussion of the results, theoretical and managerial implications, and directions for future research.

## 2. Theoretical Background

### 2.1. Relevant Insights from the Relationship Marketing Literature

Before exploring the use of CRM technology in contemporary organizational practice, we need to review elements of marketing theory that best explain how these IT tools likely impact provider-customer relationships. The theory base that offers the strongest theoretical grounding for these effects is known as relationship marketing and management theory.

Over the last two decades, a significant amount of effort has been devoted to the study of relationship marketing, a phenomenon that is concerned with the activities providers undertake in an attempt to develop and maintain successful relational (i.e., highly collaborative) exchanges with their customers (Berry 2002, Morgan and Hunt 1994, Parvatiyar and Sheth 2000). Although the voluminous literature on relationship marketing has and continues to enhance understanding about the characteristics, antecedents, and consequences of relational exchange (e.g., Keep et al. 1998, Sirdeshmukh et al. 2002, Wathne et al. 2001), it has also provided the following insights regarding the management of exchange relationships that are particularly relevant to our current application:

1. Customer relationships are an important type of organizational asset that represents a potential source of sustainable competitive advantage (Dwyer et al. 1987; Hunt 1997, 2002; Hunt and Morgan 1995);

2. A provider's level of profitability is contingent upon the ability to develop a customer portfolio that contains an adequate mix of transactional, relational, and hybrid exchange relationships (Anderson and Narus 1990, Coviello et al. 2002, Day 2000, Frazier et al. 1988, Hunt 2002, Johnson and Selnes 2004, Sawhney and Zabin 2002);

3. Relationship development and maintenance activities require significant resource commitments (Dwyer et al. 1987). Consequently, a provider's level of profitability is partially determined by its ability to prioritize investments in customer relationships such that they are proportional to each customer's lifetime value to the firm (Jackson 1985; Reinartz et al. 2004; Ryals 2002, 2003);

4. Exchange relationships consist of a series of interrelated interactions,[1] and therefore a provider's ability to retain existing customer relationships is heavily influenced by how well it is able to manage these interrelated interactions (Cunningham 1980, Gronroos 2000a, Peppers et al. 1999, Turnbull et al. 1996).

The preceding theoretical insights have significant implications for the management of exchange relationships. First, they suggest that a provider's level of relationship management expertise is likely to affect its long-term performance in the marketplace (Day and Van den Bulte 2002, Webster 1992). Second, they reveal that a provider's level of profitability is influenced not by its ability to engage in relational exchange with its customers but by its capacity to build the *right type* of relationship with the *right type* of customer (Reinartz et al. 2004, Rigby et al. 2002, Sawhney and Zabin 2002). Finally, they indicate that in order to build the right type of relationship with the right type of customer, a provider must be able to discriminate between current and prospective customers based on their expected level of long-term profitability (Reinartz et al. 2004).

Given the foregoing discussion, it is not surprising that the extant literature also suggests that the effective and efficient management of customer relationships presents a difficult challenge for providers—a challenge that grows in complexity as the heterogeneity in a firm's customer base increases (Eriksson and Mattsson 2002, Reinartz et al. 2004, Sawhney and Zabin 2002). That is, when providers elect or are compelled (by market conditions) to pursue customers who differ in terms of their needs and preferences, it becomes significantly more difficult for them to build the right type of relationship with the right type of customer. This added difficulty arises from the inherent intricacies associated with distinguishing between "customer types" based

[1] The term "interaction" is used here to refer to any instance in which two active parties, which have the ability to exert influence upon each other, engage in the exchange of values (e.g., goods and services exchanged for money; Campbell 1985, Cunningham 1980, Ford 1980, Kalafatis 2002, Kotler 1972, Metcalf et al. 1992, Turnbull et al. 1996).

on their needs, preferences, and expected value to the firm and having to behave differently toward each individual customer (i.e., crafting relationship-appropriate interactions) given its particular "customer type" (Peppers et al. 1999, Ramani and Kumar 2008). As a consequence, relationship marketing theory suggests that the quality of a provider's customer portfolio is ultimately determined by how well the firm is able to balance two conflicting organizational needs: the need to market its products and services to heterogeneous customers who differ in terms of their needs and value to the firm versus the need to manage its exchange relationship with each individual member of its customer base (e.g., efficiency would be improved if all customers were sold the same products, whereas effectiveness would increase if product offerings were customized down to the individual account level).

An organizational desire to more effectively manage these two competing needs is largely responsible for the rapid, worldwide diffusion of CRM technology. CRM tools offer functionality intended to enable firms to maximize both customer interaction quality and the profitability of each individual customer relationship. Specifically, CRM tools are designed to allow firms to customize interactions based on customers' latent and expressed needs and to prioritize resources destined for each individual interaction, such that greater resource commitments are made to high-value customers (Reinartz et al. 2004, Zablah et al. 2004b). Consequently, in order to better understand the relationship between CRM technology use and organizational performance, it is critical to consider how the use of CRM technology is likely to influence individual customers' perceptions of the exchange relationship. Toward that end, we provide a brief overview of the relationship management literature—with particular emphasis on interaction management and customer prioritization—in §2.2, next.

### 2.2. Relevant Insights from the Relationship Management Literature

In recent years, a significant amount of research effort has been devoted to better understanding the customer relationship management process and its performance implications. In a very broad sense, the literature on relationship management has proceeded along two parallel paths: one focusing on customer interaction management and the other one on customer valuation and prioritization (a few studies have, implicitly or explicitly, dealt with both issues). Each of these literature streams offers insights and provides empirical findings that are valuable when attempting to understand the performance consequences of CRM technology use, and both streams are thus briefly reviewed in the paragraphs that follow.

Building on the seminal work of the industrial marketing and purchasing group (IMP; e.g., Cunningham 1980, Håkansson 1982), the literature has increasingly recognized the importance of interaction management as a critical element of building strong and mutually beneficial relationships (e.g., Ramani and Kumar 2008). As Narayandas and Rangan (2004) suggest, relationship attitudes and loyalty develop one interaction at a time, thus making interactions critical to the growth and ultimate survival of exchange relationships. Given the importance of interactions to relationship outcomes, significant research effort has been devoted in recent years to identifying the determinants of "high quality" interactions. Although construct labels differ across studies, extant research has identified three common elements of interactions that are conducive to desirable relationship and performance outcomes: appropriateness (in terms of interaction timing), relevancy (given customer needs), and consistency (across customer touch points; Kumar and Petersen 2005, Zablah et al. 2004b). Empirically, each of these elements or dimensions of interaction quality has been linked to important relationship and/or firm performance outcomes. For instance, field experiments conducted by Kumar et al. (2008) reveal that (1) timing sales calls such that they occur when customers are expected to make a purchase and (2) coordinating sales calls among salespeople who service the same customer firm but sell different product lines result in substantially higher levels of profitability and improved relationship quality perceptions. Likewise, a series of studies by Verhoef (2003) and his colleagues (Prins and Verhoef 2007) suggest that organizational use of direct marketing communications (as opposed to mass media communications) containing targeted, customer-relevant messages is positively related to growth in customer share and customer adoption of new service offerings.

In addition, in one of the most comprehensive studies to date on the role of interaction management, Ramani and Kumar (2008) advance the notion of an organizational "interaction orientation," which they define as a "firm's ability to interact with its individual customers and to take advantage of information obtained from them through successive interactions to achieve profitable customer relationships" (p. 27). In their treatment of interaction orientation, the authors argue that acquiring, sharing, and collectively responding to customer information is vital to facilitating high quality customer interactions. Specifically, they argue that firms must be able to "respond to heterogeneous customers differently and also to each individual customer differently at different points in time by pooling information from multiple sources and points in time" (p. 28). Ramani and Kumar's (2008) work hence underscores the critical role of shared, extensive, and up-to-date customer knowledge to the success of interaction management efforts.

Undoubtedly, interaction management is highly intertwined with customer valuation and prioritization decisions because a firm's level of profitability depends partially upon its ability to provide individual customers with interactions that not only maximize customer value delivered but also are consistent with each individual customer's value to the firm (Ramani and Kumar 2008, Zablah et al. 2004b). Prior research suggests that firms who utilize customer lifetime value (CLV) as a metric for selecting customers to target and allocating organizational resources enjoy higher levels of profitability (e.g., Rust and Verhoef 2005, Rust et al. 2004, Venkatesen and Kumar 2004). In addition, empirical evidence (from insurance and financial services industries) suggests that firms can achieve improved financial performance by allocating a greater proportion of resources for the acquisition and retention of larger or key (as opposed to smaller) customers (Ryals 2005, Yim et al. 2004).

To date, however, only one empirical study has examined the customer and financial performance effects of prioritization decisions across customers grouped into different priority levels. Based on a cross-industry sample that encompassed firms competing in business-to-business and business-to-consumer markets, Homburg et al. (2008) find that customer prioritization has a positive effect on customer satisfaction among top tier customers and no effect on customer satisfaction among bottom tier customers. When combined, these effects translate into higher levels of average sales per customer that ultimately lead to improved firm financial performance. It is important to note, nonetheless, that the researchers hypothesized but did not find a negative relationship between customer prioritization and average satisfaction among bottom tier customers—they explained this nonsignificant finding, in part, by suggesting that bottom tier customers are likely to have lower expectations, and thus their satisfaction is unaffected by firm resource allocation decisions.

In the preceding paragraphs, we have outlined critical arguments and findings from the relationship marketing and management literatures that are particularly relevant to our current research project. In the section that follows, we build on these insights to develop and propose a conceptual model that purports to explain how the organizational use of CRM technology influences individual customers' perceptions of the exchange relationship and, ultimately, firm performance.

# 3. Research Model and Hypotheses

## 3.1. Organizational CRM Technology Use

End-user resistance to CRM technology has been heavily researched and is said to be a consequence of numerous factors, including a lack of organization-wide commitment to the technology, inadequate end-user training, the absence of a CRM champion, incompatible compensation structures, poor change management practices, end users' failure to understand the benefits the technology affords, and inadequate financial commitment to the technology (Croteau and Li 2003, Fjermestad and Romano 2003, Morgan and Inks 2001, Parthasarathy and Sohi 1997, Pullig et al. 2002, Rigby et al. 2002, Rivers and Dart 1999, Ryals and Knox 2001, Ryals and Payne 2001, Shoemaker 2001, Speier and Venkatesh 2002, Wilson et al. 2002, Yu 2001, Zablah et al. 2004a). This well-documented end-user resistance to CRM technology is critically important to the objectives of the current research effort. It implies that in order to study the performance implications of CRM technology, it is necessary to consider not only whether an organization has adopted some sort of CRM tool but also whether the tool that has been adopted is being embraced by organizational users. Consequently, this study focuses on *CRM technology use*, which we formally define as the extent to which CRM tools are being utilized to support organizational work processes.

Prior research suggests that the specific CRM tools individual firms choose to deploy are likely to vary significantly and can be utilized to accomplish a wide variety of organizational tasks (e.g., Jayachandran et al. 2005). For instance, some CRM tools are designed to support sales (e.g., collateral delivery), marketing (e.g., campaign management), and service and support (e.g., case management) tasks. Other CRM tools are used to coordinate tasks within a process or across functions, automate routine tasks, provide detailed insight regarding organizational and individual employee performance, and standardize common tasks and processes (Adenbajo 2003, Bose 2002, Chen and Popovich 2003, Crosby and Johnson 2000, Davis 2002, Ebner et al. 2002, Fjermestad and Romano 2003, Greenberg 2001, Hirschowitz 2001, Light 2003, Mirani et al. 2001, Shoemaker 2001, Wilson et al. 2002). Given this wide range of functionality, it is possible to conceptually organize CRM tools in several different ways. We build on the relationship management literature (see §2.2 above) to propose that a particularly insightful grouping is one that organizes CRM tools based on whether they generally support either interaction management or customer prioritization tasks. Consistent with this proposal, our study evaluates the performance effects of the organizational use of *CRM* *interaction support tools* and *CRM customer prioritization tools*. We use the term CRM interaction support tools to refer to those technologies that support activities enhancing customer information gathering, customer information sharing between employees, and inter-functional employee coordination. In contrast, we use the term CRM customer prioritization tools to refer to those technologies that support activities involving marketing, sales, and service resource allocation decisions or activities used to determine the efficacy of those decisions.

### 3.2. Customer-Perceived Relationship Investment (CPRI) as a Mediator of the CRM Technology Use–Firm Performance Relationship

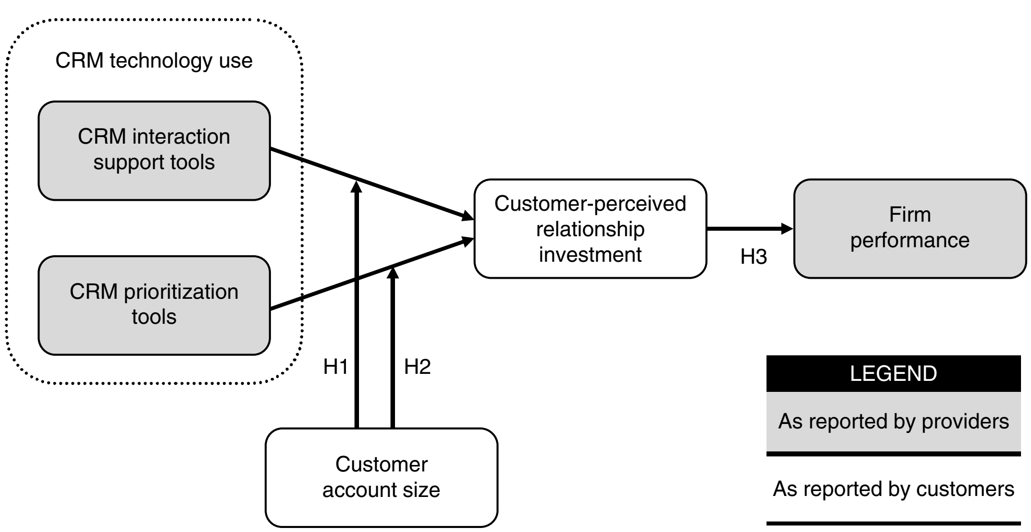
CPRI is used here to refer to the extent to which a customer perceives that a provider "devotes resources, efforts, and attention aimed at maintaining or enhancing [the exchange relationship]" (De Wulf et al. 2001, p. 35). This concept is similar to the idiosyncratic investment phenomenon often investigated in the marketing channels literature (e.g., Anderson and Weitz 1992, Jap 1999, Jap and Ganesan 2000) but is broader in the sense that it allows for the possibility that firms invest unrecoverable assets that are, at times, directed toward a group of customers rather than an individual customer.

As is illustrated in Figure 1, we posit that CPRI is a critical mediator of the influence of CRM technology use on organizational performance. CPRI has been modeled as a causally proximate outcome of relationship management efforts in previous studies (e.g., De Wulf et al. 2001, Palmatier et al. 2006) and is particularly well suited to the purposes of this study for two reasons. First, CRM interaction support and prioritization tools are designed to influence the content and form of customer-provider interactions. The (in)adequacy of those interactions is a signal to customers—first and foremost—of provider relationship investment. Thus, although other customer-level outcomes may follow (e.g., satisfaction), the most immediate outcome of CRM technology-driven interactions is a signal to customers of how much effort a provider has invested to understand their particular needs and of the relative importance a provider places on building a relationship with them. Second, recent meta-analytic and theoretically integrative work by Palmatier and colleagues (2006, 2007) supports our choice of CPRI as a mediator; the authors find that CPRI is strongly related—both directly and indirectly—to firm performance, our key outcome measure.

### 3.3. Interaction of CRM Interaction Support Tool Use with Customer Account Size to Predict CPRI

Relationship marketing and management theory suggests that a strong link exists between customized interactions and customer perceptions of providers' level of investment in the relationship. For instance, two separate studies by DeWulf and colleagues (2001, 2003) find that retailers' use of direct mail, preferential treatment programs, personalized communication, and tangible rewards has a positive impact on CPRI. Moreover, they propose that signaling (Boulding and Kirmani 1993, Dawar and Parker 1994, Kirmani and Rao 2000) explains the influence of these customized interactions on CPRI. That is, customized interactions provide customers with tangible evidence of providers' ability to understand their needs and preferences at an individual level, their willingness to accommodate their needs and preferences at an individual level, and the value they place on the exchange relationship. This view is consistent with communication-based perspectives on relationship marketing that suggest that the effective

**Figure 1** **Performance Implications of CRM Technology Use**



management of implicit and explicit interaction messages is critical to successful relationship building (Duncan 2002; Duncan and Moriarty 1997, 1998; Gronroos 2000a, b, 2004).

In their simulation-based work on customer portfolio management, Johnson and Selnes (2004) argue that customized interactions are critical to mutually beneficial, partner-like relationships and that information technology plays a critical role in the provision of such interactions. Although not all exchange relationships should or will reach partnership level, their views on this issue—which are summarized in the following excerpt—apply to all types of exchange relationship and are thus central to our current research question (p. 4):

> Suppliers must use customer knowledge and information systems to deliver highly personalized and customized offerings to create the highest level of congruence between the heterogeneity of demand and supply.... The key to profitability becomes a supplier's ability to organize and use information about individual customers more effectively than competitors. Customers benefit from suppliers whose customer knowledge and information systems enable them to deliver highly personalized and customized offerings.... However, customers must be willing to pay a price premium or to commit themselves to the supplier for an extended period of time.

Based on the preceding discussion, we propose that the organizational use of CRM interaction support tools better enables providers to deliver highly customized interactions that convey relationship-appropriate messages to each individual customer. Specifically, CRM interaction support tools offer functionality that improves provider ability to develop an organizationally shared understanding of its customers at an individual level and to deliver customized and coordinated interactions over time and across customer touch points (e.g., marketing, sales, and service) based on this enhanced understanding (Ramani and Kumar 2008). In so doing, providers strongly convey to customers that they have made irrecoverable resource commitments to the exchange relationship because such interactions are only possible when a concerted effort is made to understand each customer at an individual level (i.e., when a concerted effort is made to achieve a match between the heterogeneity of demand and supply). Consequently, the organizational use of CRM interaction support tools should have a positive influence on CPRI. Thus, we expect the following:

Hypothesis 1A (H1A). *The organizational use of CRM interaction support tools will be positively related to CPRI.*

However, we do not expect that the organizational use of CRM interaction support tools will affect all customer relationships equally. Rather, the effects will be most noticeable among larger (as opposed to smaller) customers because relationships with these customers involve a greater number of interactions, a greater number of touch points, and a greater number of people on both the customer and provider side (e.g., Homburg et al. 2002, Jones et al. 2005). Stated differently, greater complexity is involved in coordinating and customizing interactions for larger customers (vis-à-vis smaller customers), and thus the potential for improved relationship perceptions as a result of the organizational use of CRM interaction support tools is greater among this group of customers. More formally, we propose the following:

Hypothesis 1B (H1B). *The positive relationship between CRM interaction support tool use and CPRI will be stronger* (*weaker*) *among larger* (*smaller*) *customers.*

### 3.4. Interaction of CRM Prioritization Tool Use with Customer Account Size to Predict CPRI

As argued in the preceding section, the use of CRM interaction support tools should enhance firm's ability to manage heterogeneous customer relationships and to provide each customer, at an individual level, with interactions that are customized to its needs and preferences. However, it is important to underscore that CRM technologies enable firms not only to understand customers at an individual level but also to better assess their long-term value to the firm and prioritize relationship resource investments accordingly (Reinartz et al. 2004, Zablah et al. 2004b). Thus, the specific nature of customer-provider interactions will vary not only as a function of customer needs and preferences but also as a function of their value to the firm.

Use of CRM prioritization tools is likely to enhance a firm's ability to prioritize relationship resource investments through two distinct means. First, CRM prioritization tools enable providers to collect and analyze unprecedented amounts of the information that is critical to making assessments of customers' expected long-term value to the firm (e.g., Rust and Verhoef 2005, Venkatesan and Kumar 2004). These customer value assessments can, for instance, be used to increase or decrease the frequency of direct mail communication with customers based on their value-based prioritization level. Second, CRM prioritization tools offer functionality that enhances firms' ability to implement customer prioritization strategies. By way of example, CRM service and support modules allow firms to specify and trigger different problem resolution standards for low- and high-priority customers, such that a service call by a high-priority customer automatically gets routed to a case manager whose job is to personally contact and resolve the customer problem within the hour, whereas low-priority customer cases are handled by anonymous service representatives who email the customer a resolution to their problem within a 24- to 48-hour time window. Likewise, CRM tools enable salespeople to more effectively schedule and prioritize their customer visits, such that high-priority customers are visited personally on a more frequent basis. As a final example, CRM prioritization tools enable firms to assess the market performance effects of their resource allocation decisions such that adjustments to those decisions can be made depending on performance outcomes or as market conditions change.

Although it is an oversimplification to suggest that customer value varies directly as a function of customer size or that larger customers are generally more valuable than smaller customers, extant research reveals that firms tend to prioritize customers based on account size or sales volume expectations (e.g., Lacey et al. 2007, Zeithaml et al. 2001). In addition, customer account size is an often-used segmentation variable in business markets (see Rangan et al. 1992, for example) and is the dominant segmentation variable employed in the context selected for investigation in this study. For these reasons, we employ customer account size as a proxy[2] for customer priority level (with larger customers receiving higher priority levels) and propose that the use of CRM prioritization tools will interact with customer account size to predict CPRI.

In one of the more comprehensive studies to date on the performance effects of customer prioritization, Homburg et al. (2008) outline opposing viewpoints on the likely performance effects of prioritized resource allocation decisions. According to the authors, customer prioritization is "supposed to lead to higher firm profits because marketing efforts become more effective and efficient when concentrated on the top-tier customers" (p. 110). In contrast, they identify three common arguments against prioritization practices: (1) prioritization may lead to lower satisfaction levels among low-priority customers, which may result in higher attrition rates and negative word-of-mouth; (2) a focus on a select group of customers may limit firms' ability to benefit from economies of scale; and (3) an emphasis on top-tier customers might make providers more vulnerable to the demands of powerful top-tier customers.

Consistent with these opposing viewpoints, Homburg et al. (2008) hypothesize that customer prioritization is likely to be positively related to mean levels of customer satisfaction among top-tier (i.e., larger) customers and negatively related to mean levels of customer satisfaction among bottom-tier (i.e., smaller) customers. Their specific arguments are based on the notion that firms have limited resources and that shifting resources toward servicing high-value customers will lead to an inevitable reduction of resources aimed at servicing low value customers. Importantly, their empirical study offers mixed support for these expectations. Although prioritization had positive effects on top-tier customer satisfaction levels, it did not have any effect on bottom-tier customers. That is, the data did not support arguments regarding the potentially deleterious effects of customer prioritization efforts on bottom-tier customers.

Building on the preceding arguments, we propose that firms' use of CRM prioritization tools will interact with customer account size to predict CPRI. Specifically, we propose that use of CRM prioritization tools will result in a redistribution of organizational resources that will favor larger customers at the expense of smaller customers. This redistribution of resources will be empirically expressed as a positive relationship between CRM prioritization tool use and CPRI among larger customers and a negative relationship between CRM prioritization tool use and CPRI among smaller customers. It is worth underscoring that our expectations for the effects of CRM prioritization tool use on customer relationship perceptions are consistent with the theoretical (but empirically unsupported) arguments advanced by Homburg et al. (2008). Formally, our expectations can be summarized as follows:

Hypothesis 2 (H2). *Organizational use of CRM prioritization tools will be positively related to CPRI among larger customers and negatively related to CPRI among smaller customers.*

### 3.5. CPRI Influences Firm Performance

In their work in the retail sector, De Wulf and colleagues (2001, 2003) suggest that the norm of reciprocity explains the relationship between CPRI and desirable relationship outcomes, including trust, satisfaction, commitment, and behavioral loyalty. Specifically, they build on the work of Blau (1964) to suggest that perceived (irrecoverable) investments in a relationship create psychological ties between customers and providers that motivate customers to perform behaviors that ultimately serve to enhance organizational performance. Such behaviors might include extending the duration of the relationship, purchasing related products and services from the provider, and/or upgrading current products and services purchased from the provider (Bolton et al. 2004). Consistent with this view, we propose that CPRI will

[2] We recognize that customer account size is an appropriate but imperfect proxy for customer priority level. Obtaining provider-based measures of customer priority levels was not a possibility for this study, given the research design.

be positively related to firm performance, which we define as the extent to which a firm routinely meets its financial performance goals.

In their recent meta-analysis of the relationship marketing literature, Palmatier et al. (2006) find that CPRI has both a direct and indirect influence on firm performance. Specifically, their results suggest that when compared to all of the explanatory constructs evaluated within their model, CPRI exerts the strongest direct influence on seller objective performance. Much like Dewulf and colleagues (2001, 2003), they employ a reciprocity-based theoretical argument to explain this relatively strong, direct relationship. In addition, the results of the meta-analysis suggest that the effects of CPRI on objective measures of firm performance are also partially mediated by relational factors, including trust, commitment, satisfaction, and relationship quality. This finding is consistent with the notion that perceived investments in the relationship lead customers to evaluate the relationship more favorably and thus be more likely to reciprocate through behaviors that ultimately enhance firm performance.

Consistent with the preceding reciprocity-based arguments and empirical findings, we propose that firms that are able to achieve higher mean levels of CPRI will experience higher levels of performance. Specifically, we suggest that mean levels of CPRI will be positively related to firm performance because higher levels of CPRI are likely to yield higher mean levels of performance-enhancing customer behaviors across the relationship portfolio, including loyalty, cross-purchasing, and upgrading (Bolton et al. 2004). This expectation is formally expressed in the following hypothesis:

Hypothesis 3 (H3). *CPRI will be, overall, positively related to firm performance.*

## 4. Research Design and Methodology

The primary objective of this study was to empirically test a conceptual model examining the association between provider levels of CRM technology use and their customers' perceived level of relationship investment. A field study, thus, seemed to be the most appropriate methodology for reaching this objective. Testing of the proposed conceptual model required field study data from both providers and their customers. To achieve this objective, a nested research design was employed instead of a one-to-one dyadic design (for a discussion on nested designs, see Hox 2002, Muthen 1994, and Muthen and Satorra 1995). The nested research design involved limiting the number of providers in the sample to a manageable size (in this case 10); inviting multiple customers of each of these providers to report on their relationship with the firm; and obtaining measures of the use of CRM interaction support tools, use of CRM prioritization tools, and organizational performance for each of the providers. This one-to-many (i.e., one provider to many customers) design yielded matched customer-provider data in which several customers in the sample shared a common provider. Although the nested data design limited data analysis flexibility, it eliminated the problem of missing data inherent in fully matched dyadic designs (Anderson and Weitz 1992, Anderson and Narus 1990, Klein et al. 2007, Wareham et al. 2005).

### 4.1. Study Context, Sampling Procedures, and Survey Administration

The telecommunications industry is a good setting to test the proposed model. Because the study focuses on the relationship between real world providers of Internet access services (in this case, services such as dial-up, DSL, $T$-1 service, $T$-3 service, etc.) and their business customers, telecomm meets our design needs because it has relatively high levels of activity across the three customer-facing functions (marketing, sales, and service); an industry-wide focus on customer satisfaction and retention (as a way to overcome the detrimental effects of both customer churn because of intense competition and decreased revenues stemming from downward pricing pressures); and availability of multiple, relatively large providers of Internet access services that likely vary in terms of their levels of CRM technology use.

As a first step in the data collection process, a list of business Internet access service providers was drawn from two publicly available, industry-wide customer surveys. Based on the results of these two surveys, 10 providers of business Internet access services were identified as being relatively large players in the marketplace (based on the percentage of customers who identified them as their Internet access services provider) and likely different in terms of their level of CRM technology use (given widely different customer ratings on several customer-centric performance criteria). Several other secondary data sources (e.g., annual reports, Datamonitor® industry reports, etc.) were consulted in order to ensure that the providers identified by the industry surveys did, in fact, meet the critical requirements for inclusion in the study.

Once the study's focal providers had been identified, the customer sample was obtained via e-Rewards®, a research firm that specializes in the management and maintenance of online customer panels. In order to achieve a sample size appropriate for rigorous analytical testing, a target sample size of about 300 completed customer surveys was established (customers in the sample were limited to those who identified one of the 10 study providers as their purveyor of Internet access services). To obtain a suitable key informant within each of the customer firms, the potential panelist pool was also limited to those individuals who had indicated (in their membership profile) that they were decision makers or influencers within their firm regarding the purchase of Internet services. Once identified, qualified panelists were invited to complete a self-administered online survey that was developed and hosted by the researchers. The data collection process remained under the researchers' direct control and supervision at all times.

Computer-assisted telephone interviews (CATI) were then utilized to survey key informants within each provider firm. In order to minimize the potential of key informant bias, three qualified informants were sought for each of the provider firms. For the purposes of this effort, it was critical that key informants be knowledgeable about their firms' customer-facing (sales, marketing, and service) activities within the business market. The sampling frame of key informants—which included individuals who primarily perform either marketing, sales, or service activities within their firms—was compiled from four different sources: (1) key contact information provided by respondents who completed the customer survey; (2) the American Marketing Association's membership directory; (3) commercial lists purchased from online providers such as infoUSA®, Zapdata®, and Corptech®; and (4) referrals provided by employees in each of the 10 different provider firms (see Appendix OS1 in the online supplement, available at http://dx.doi.org.isre.1120.0419, for further details on sampling and survey administration procedures).

A total of 295 customer key informants and 29 provider key informants (three key informants for all of the provider firms except one) participated in the study. Table 2 offers a brief overview of key informant characteristics and firm attributes for both the customer and provider samples. Overall, the sample characteristics suggest that the sampling procedures yielded key informants well qualified to respond to study questions. In addition, the demographic data suggest significant variation in the type of customer firms that form part of the sample (refer to Appendix OS2 for additional details about the customer and provider samples, including response rate estimates).

**Table 2 Sample Characteristics**

| | |
|---|---|
| Customer sample | |
| Respondent title (%) | |
| IT manager/specialist | 32 |
| Non-IT manager | 20 |
| Director | 15 |
| Other | 33 |
| Business type | |
| Service provider | 39 |
| Manufacturer | 24 |
| Firm size | |
| Less than 250 employees | 27 |
| 250–4,999 employees | 39 |
| 5,000 or more employees | 34 |
| Provider sample | |
| Respondent title (%) | |
| Manager | 52 |
| Nonmanager/specialist | 48 |
| Division focus | |
| B2B markets only | 48 |
| B2B and consumer markets | 52 |
| Size of accounts managed | |
| Small accounts | 7 |
| Mid-sized accounts | 14 |
| Large accounts | 17 |
| Accounts of all sizes | 62 |

## 4.2. Analysis Strategy

The proposed conceptual model advances firm-level (H3) and cross-level (H1 and H2) hypotheses that require that data analyses be executed through two very different approaches. The firm-level ($n = 10$) hypothesis, which evaluated the relationship between an aggregate (i.e., mean) customer-level construct and a firm-level construct (H3: mean CPRI $\rightarrow$ firm performance), was tested by computing a bivariate nonparametric correlation for the relationship of interest. In particular, Kendall's Tau-b ($\tau_b$) was utilized to test the firm-level hypothesis given that nonparametric statistics are well suited for providing unbiased estimates of the association between two variables when sample sizes are small (Siegel 1957). For the interested reader, a description of $\tau_b$ and its estimation and a comparison of the $\tau_b$ coefficients to Pearson correlation coefficients (for our study) are offered in online Appendix OS3.

Testing of the cross-level hypotheses (H1: CRM interaction support tool use $x$ customer account size $\rightarrow$ CPRI; H2: CRM prioritization tool use $x$ customer account size $\rightarrow$ CPRI) required consideration of two important matters. First, customers in the sample share one of the 10 different providers selected for inclusion in the sample. Results of traditional data analysis techniques (e.g., regression) may be biased from this sharing of a common provider. Second, the proposed conceptual model involves constructs measured at different levels of aggregation: CRM interaction support and CRM prioritization tool use are evaluated at the firm level whereas CPRI and customer account size are measured at the customer level. Given these two features of the study design, the most appropriate approach for evaluating the cross-level hypotheses was via the specification and estimation of a multilevel (i.e., hierarchical linear) model. This task was accomplished in HLM 6.06 using a full maximum likelihood estimator. Regular

**Table 3 Multilevel Model Specification**

*Level 1 model*

$\text{CPRI}_{ij} = \beta_{0j} + \beta_{1j}\ (\text{SIZE}_{ij}) + r_{ij}$

*Level 2 model*

$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{IS-TOOLS}_j) + \gamma_{02}(\text{P-TOOLS}_j) + u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{IS-TOOLS}_j) + \gamma_{12}(\text{P-TOOLS}_j) + u_{1j}$

*Mixed model*

$$\text{CPRI}_{ij} = \gamma_{00} + \gamma_{01}(\text{IS-TOOLS}_j) + \gamma_{02}(\text{P-TOOLS}_j) + \gamma_{10}(\text{SIZE}_{ij}) + \gamma_{11}(\text{IS-TOOLS}_j)(\text{SIZE}_{ij}) + \gamma_{12}(\text{P-TOOLS}_j)(\text{SIZE}_{ij}) + u_{0j} + u_{1j}(\text{SIZE}_{ij}) + r_{ij}$$

*Notes.* $i$ and $j$ represent customers and service providers, respectively. CPRI = customer-perceived relationship investment; SIZE = customer account size; IS-TOOLS = CRM interaction support tools; P-TOOLS = CRM prioritization tools.

(i.e., nonrobust) standard errors were used to evaluate parameter significance (see online Appendix OS4 for details on multilevel sample size considerations as it relates to our study).

Table 3 provides a summary overview of the multilevel specification utilized to test the proposed conceptual model in HLM. As is indicated in the table, the level 1 model includes a random intercept term ($\beta_{0j}$) and a random predictor term ($\beta_{1j}$) used to model the effects of customer account size. The intercept and predictor terms are subsequently expressed as a function of the firm-level independent variables—CRM interaction support tool use and CRM prioritization tool use—in the level 2 model. As such, the interaction between customer account size and CRM interaction support tool use is captured by the coefficient $\gamma_{11}$, and the interaction between customer account size and CRM prioritization tool use is capture by the coefficient $\gamma_{12}$. The cross-level main effects of CRM interaction support tool use and CRM prioritization tool use on CPRI are captured by $\gamma_{01}$ and $\gamma_{02}$, respectively. All firm-level variables are grand-mean centered for model estimation purposes, and the individual-level error term ($r_{ij}$) and random effects ($u_{0j}$, $u_{1j}$, $u_{2j}$) are assumed to be normally distributed and multivariate normally distributed across firms, respectively.

# 5. Results

## 5.1. Provider Measures and Constructs[3]

Consistent with Jayachandran et al. (2005) and Mithas et al. (2005), we measured CRM interaction support tool use and CRM prioritization tool use via summative indexes[4] that asked respondents to indicate the extent to which their firms actively utilized a specified set of CRM tools. More precisely, *CRM interaction support tool use* was measured using a three-item index that captures the extent to which CRM tools are utilized to coordinate employee customer-facing activities across functions, centrally store customer information, and share customer information across intra-organizational boundaries. In contrast, a 15-item index was utilized to assess *CRM prioritization tool use*. The items developed for inclusion in the measure reflect commonly used CRM modules at the time of data collection and relate directly to the three critical customer-facing functional areas central to relationship management: marketing, sales, and service. Moreover, the tools included in the measure focus on activities that affect resource allocation decisions (e.g., sales planning activities, customer forecasting) or are utilized to assess the efficacy of resource allocation decisions (e.g., marketing performance analysis). Firm-level construct properties and correlations are presented in Table 4. A list of all of all of the measurement items is provided in online Appendix OS6.

*Firm performance* was measured using a three-item, Likert-type reflective scale developed for the purposes of this study. The items in the scale generally asked respondents to indicate the extent to which their firm was able to meet or exceed financial performance goals. The scale exhibits high levels of internal consistency reliability[5] ($\alpha = 0.87$; see Table 4 for further details).

## 5.2. Customer Measures and Constructs

*Customer-perceived relationship investment* (*CPRI*) was measured using a three-item, Likert-type reflective scale ($x = 4.52$; s.d. $= 1.35$; $n = 295$) adapted from the work of De Wulf and colleagues (2001, 2003) to the context of our study (see Appendix OS6 for a listing of all of the measures used to assess customer constructs). The three-item measure was subjected to a confirmatory factor analysis (CFA) using Mplus 5.1. Given that the CFA included only a single, three-item construct (and thus degrees of freedom = 0),

[3] As is detailed in §4.1 of the manuscript, multiple informants were utilized to assess each of the provider constructs. Hence, after establishing the adequacy of the measures, the responses of the multiple informants for each of the firms were utilized to compute a data-based, weighted mean score for each of the providers on all of the constructs of interest. The weighted mean score was developed utilizing the procedures outlined by Van Bruggen and his colleagues (2002). Moreover, as is reported in Section OS 5.1 of the online supplement, interrater agreement scores support the aggregation of the multiple key informant responses.

[4] Given the formative measurement structure that underlies these constructs, traditional measure validation procedures (e.g., CFA) were deemed inappropriate. Moreover, although methods for validating formative measures have not been fully determined yet, our measurement pretests are consistent with the need for formative measures to achieve content validity (Diamantopolous and Winklhofer 2001, Petter et al. 2007).

[5] The relatively small provider sample ($n = 29$) precluded the use of advanced techniques for the validation of this reflective measure. However, as is indicated in Table 1, the measure exhibits high levels of reliability. In addition, a large-scale pretest of the measure strongly confirmed its adequacy. Additional details about measure pretesting are available from the authors upon request.

**Table 4 Provider Constructs: Properties and Correlations**

| | M | S.D. | 1 | 2 | 3 |
|---|---|---|---|---|---|
| 1. *CRM Interaction Support Tool Use* | 5.30 | 0.67 | — | | |
| 2. *CRM Prioritization Tool Use* | 5.70 | 0.60 | 0.27 | — | |
| 3. *Firm Performance* | 5.22 | 1.04 | 0.08 | 0.18 | **0.87** |

*Notes.* M = mean, SD = standard deviation. Nonparametric construct correlations (Kendall's Tau-b) are presented below the diagonal ($n = 10$). Reliability estimates ($\alpha$) are reported in bold on the diagonal for reflective scales ($n = 29$ for reliability estimates). All correlations are nonsignificant ($p > 0.05$, one-tailed).

fit indexes were considered to be limited indicators of measurement quality (i.e., all indexes suggested the model fits the data perfectly). However, statistics derived from the CFA provide important evidence regarding reliability and validity. In particular, the measure has a high composite reliability (0.93) and high average variance extracted (82.1%), which suggest the measure is highly reliable (Fornell and Larcker 1981, Gerbing and Anderson 1988). Furthermore, evidence of convergent validity is provided because all factor loadings are significant ($p < 0.01$; $\lambda_{\text{standardized}} = 89, 0.92$ and 0.91) and the scales exhibit high levels of internal consistency (Anderson and Gerbing 1988, Fornell and Larcker 1981).

*Customer account size* was measured by asking respondents to indicate whether their firm was one of the focal providers' smallest, typical, or largest customers based on monthly expenditures (i.e., they were asked to indicate their relative account size). The scale was coded as $-1$ = small accounts, 0 = mid-sized accounts, and 1 = large accounts for model estimation purposes. About half of the sample (48%) indicated that it was a typical or mid-sized customer and the remaining half was almost evenly split among small customer (28%) and large customer (24%). The relative customer account size measure was positively associated ($\chi^2$ test of association, $p < 0.05$) with nominal measures of firms' number of employees and annual sales levels. In addition, it was positively correlated ($r_{xy} = 0.22$; $p < 0.01$, one-tailed) with CPRI.

### 5.3. Test of Hypotheses

As Table 5 indicates, the data offer support for H1A, do not support H1B, and provide support for H2. Specifically, consistent with H1A, the data suggest that the organizational use of CRM interaction support tools is positively related to CPRI ($b = 0.18$, $p < 0.05$, one-tailed); however, the organizational use of CRM interaction support tools does not interact, as predicted in H1B, with customer account size to influence CPRI ($p > 0.05$, one-tailed). Moreover, as is graphically illustrated in Figure 2, the results strongly support H2: customer account size and CRM prioritization tool use interact to predict CPRI ($b = 0.19$), such that the influence of CRM prioritization tool use

**Table 5 Results for Hypothesis 1 and 2**

| Predictor | Standardized coefficient | S.E. | $p$ |
|---|---|---|---|
| Intercept ($\gamma_{00}$) | 4.58 | 0.09 | 0.01* |
| Level 1 main effects | | | |
| SIZE ($\gamma_{10}$) | 0.26 | 0.10 | 0.01* |
| Cross-level main effects | | | |
| IS-TOOLS($\gamma_{01}$) | 0.18 | 0.09 | 0.05* |
| P-TOOLS($\gamma_{02}$) | −0.01 | 0.10 | 0.45 |
| Cross-level interactions | | | |
| SIZE × IS-Tools ($\gamma_{11}$) | 0.09 | 0.11 | 0.22 |
| SIZE × P-Tools ($\gamma_{12}$) | 0.19 | 0.10 | 0.04* |
| Model statistics | | | |
| Deviance (−2 log-likelihood) | 998.1 | | |
| Approximate variance explained | 14.4% | | |

*Notes.* The effects of IS-TOOLS and P-TOOLS on the dependent variable (CPRI) were also tested in separate models (i.e., each predictor was also evaluated separately). The results of those analyses are consistent with the results reported in Table 4; namely, IS-TOOLS increase mean levels of CPRI whereas P-TOOLS interacts with customer size to influence CPRI.

SIZE = customer account size; IS-TOOLS = CRM interaction support tools; P-TOOLS = CRM prioritization tools.

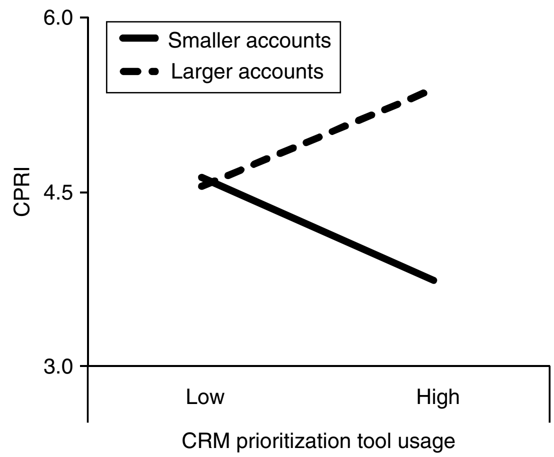
*Statistically significant, $p < 0.05$; all $p$-values are for one-sided tests.

on CPRI is positive among larger accounts and negative among smaller accounts. Finally, the results provide strong support for H3 because mean levels of CPRI[6] relate positively to firm performance ($\tau_b = 0.54$; $p < 0.05$, one-tailed).

In addition, two different post-hoc analyses were performed to further evaluate the relationship between mean CPRI and firm performance outcomes (H3). First, the association between CPRI and firm performance was evaluated with CPRI computed separately for each customer account size. The results of the analysis, which are reported in Table 6, reveal that mean CPRI for small accounts ($n = 82$) is unrelated to firm performance ($\text{H3A}_{\text{POST-HOC}}$: $\tau_b = 0.02$; $p > 0.05$, one-tailed); mean CPRI for mid-sized accounts ($n = 141$) is positively related to firm performance ($\text{H3B}_{\text{POST-HOC}}$: $\tau_b = 0.49$; $p < 0.05$, one-tailed); and mean CPRI for large accounts ($n = 72$) is positively related to firm performance ($\text{H3C}_{\text{POST-HOC}}$: $\tau_b = 0.45$; $p < 0.05$, one-tailed).

[6] Several aggregation indexes, including ICC(1), ICC(2), and $r_{wg}$, were estimated to assess the adequacy of computing a firm-level measure of CPRI (an aggregate CPRI measure is needed to estimate the firm-level relationship between CPRI and performance). Of particular importance is ICC(1), a type of intra-class correlation coefficient that is estimated as the ratio of the variance in the group means to the total variance in the measure (see Raudenbush and Bryk 2002, p. 36) and is interpreted as the total variance that is explained by group membership. We obtained an ICC(1) value of 0.11 for CPRI, which suggests that 11% of the variance in the measure is a result of group (i.e., firm) membership. This value is comparable to median values reported in the literature and is supportive of aggregation. Please refer to online Appendix OS 5.2 for further details on ICC(1) and on the other aggregation indexes estimated for the purposes of computing an aggregate CPRI score.

**Figure 2** **Customer-Perceived Relationship Investment (CPRI) as a Function of CRM Prioritization Tool Usage and Customer Account Size**




Second, in an attempt to triangulate our results, we searched the Compustat database to obtain segment-level sales data for the business units that are most likely to directly service customers in our sample. In total, our search yielded business segment sales data for six of the providers in the sample (the data points obtained were for providers of similar size). We used these data to test the overall relationship between business unit sales and CPRI computed separately for each customer account size.[7] The results of the analysis are consistent with our previous findings (see Table 6) because they suggest that mean CPRI for small accounts is unrelated to business unit sales ($H3D_{POST\text{-}HOC}$: $\tau_b = -0.47; p > 0.05$, one-tailed); mean CPRI for mid-sized accounts is positively related to business unit sales ($H3e_{POST\text{-}HOC}$: $\tau_b = 0.60; p < 0.05$, one-tailed); and mean CPRI for large accounts is positively related to business unit sales ($H3F_{POST\text{-}HOC}$: $\tau_b = 0.60; p < 0.05$, one-tailed). A detailed summary of the study's results is offered in Table 7.

## 6. Discussion, Implications, Future Research, and Limitations

Extant research is equivocal about the organizational performance implications of CRM technology use, with some studies reporting positive effects and other studies reporting no effects at all. The present research posits that these mixed findings are, in part, a result of past studies not considering (1) whether CRM technology use has different effects on different customers and (2) that different CRM tools may have different performance consequences. Given that CRM tools offer functionality intended to enable firms to both maximize customer interaction quality and prioritize resource allocation decisions at the level of individual customer relationships, it is possible that CRM technology use has positive effects on some customer relationships but no or negative effects on others. This study investigated this possibility by building on relationship marketing and management theory to propose and test a model of the customer- and firm-level consequences of CRM technology use.

The study results provide strong evidence in support of our general proposition that different CRM tools have different effects on customer relationship

[7] $\tau_b = 0.60$ ($p < 0.05$, one-tailed; $n = 6$) for the association between our subjective financial performance measure and the Compustat business unit sales measure.

**Table 6** **Follow-Up Analyses: Hypothesis 3**

| No. | Relationship | Kendall's Tau ($\tau_b$) |
|---|---|---|
| $H3A_{POST\text{-}HOC}$ | Mean $CPRI_{(Smaller\ Customers)} \rightarrow$ Firm Performance[a] | 0.02 |
| $H3B_{POST\text{-}HOC}$ | Mean $CPRI_{(Mid\text{-}Sized\ Customers)} \rightarrow$ Firm Performance[a] | 0.49* |
| $H3C_{POST\text{-}HOC}$ | Mean $CPRI_{(Larger\ Customers)} \rightarrow$ Firm Performance[a] | 0.45* |
| $H3D_{POST\text{-}HOC}$ | Mean $CPRI_{(Smaller\ Customers)} \rightarrow$ Business Unit Sales[b] | −0.47 |
| $H3E_{POST\text{-}HOC}$ | Mean $CPRI_{(Mid\text{-}Sized\ Customers)} \rightarrow$ Business Unit Sales[b] | 0.60* |
| $H3F_{POST\text{-}HOC}$ | Mean $CPRI_{(Larger\ Customers)} \rightarrow$ Business Unit Sales[b] | 0.60* |

[a] $n = 10$. [b] $n = 6$. $^{**}p < 0.05$, one-tailed.

**Table 7** **Results Summary**

| No. | Hypothesis | Support found? Yes | No |
|---|---|---|---|
| H1A | The organizational use of CRM interaction support tools will be positively related to CPRI. | ✓ | |
| H1B | The positive relationship between CRM interaction support tool use and CPRI will be stronger (weaker) among larger (smaller) customers. | | ✓ |
| H2 | Organizational use of CRM prioritization tools will be positively related to CPRI among larger customers and negatively related to CPRI among smaller customers. | ✓ | |
| H3 | CPRI will be, overall, positively related to firm performance. | ✓ | |
| $H3A_{POST\text{-}HOC}$ | $CPRI_{(small\ accounts)}$ will be positively related to firm performance. | | ✓ |
| $H3B_{POST\text{-}HOC}$ | $CPRI_{(mid-sized\ accounts)}$ will be positively related to firm performance. | ✓ | |
| $H3C_{POST\text{-}HOC}$ | $CPRI_{(large\ accounts)}$ will be positively related to firm performance. | ✓ | |
| $H3D_{POST\text{-}HOC}$ | $CPRI_{(small\ accounts)}$ will be positively related to business unit sales. | | ✓ |
| $H3E_{POST\text{-}HOC}$ | $CPRI_{(mid-sized\ accounts)}$ will be positively related to business unit sales. | ✓ | |
| $H3F_{POST\text{-}HOC}$ | $CPRI_{(large\ accounts)}$ will be positively related to business unit sales. | ✓ | |

perceptions and that the effects of CRM technology use may be unequal across customers in a firm's relationship portfolio. Specifically, the data reveal that the organizational use of CRM interaction support tools has a positive effect on CPRI and that this effect is consistent across customers who differ in terms of account size. However, our results also indicate that the organizational use of CRM prioritization tools has positive effects on the perceptions of mid-sized and large accounts but negative effects on the relationship perceptions of smaller customers. Considered together, these findings are consistent with the notion that CRM tools can help maximize customer interaction quality as well as the profitability of each individual relationship through targeted resource prioritization decisions.

Within the particular context of our study, organizational use of CRM prioritization tools appears to have led to a redistribution of resources that favored mid-sized and large accounts at the expense of smaller customers. This result is consistent with the empirically unsupported expectation of Homburg et al. (2008) that prioritization would negatively affect relationship perceptions and attitudes among low-priority customers. As detailed earlier (see §2.2), the researchers explain this unexpected finding by suggesting that prioritization did not negatively affect the perceptions of low-priority customers because these customers likely had lower relationship expectations than did high-priority customers. Although this explanation is interesting, it may under represent the potentially deleterious effects of prioritization strategies on customer relationships (as our data suggest, negative effects on customer relationship perceptions are possible). In particular, this explanation does not consider the possibility that low-priority customers may have defected to other providers as a result of their dissatisfaction with the exchange relationship (i.e., their results may be a reflection of survivor bias). To the extent that organizational business models depend on economies of scale, customer attrition as a result of prioritization may be detrimental to firm performance (Johnson and Selnes 2004). Moreover, consistent with this line of logic, customer switching costs may emerge as an important determinant of whether or not relationship prioritization decisions ultimately influence firm outcomes because attrition is more likely when low-priority customers are not "locked into" a particular provider. Thus, future research efforts should explicitly evaluate the relationship between CRM prioritization efforts, customer switching costs, and customer attrition rates—an examination of the interplay between these variables is critical to a better understanding of how relationship prioritization decisions are likely to influence customer relationship outcomes and ultimately firm performance.

It is worth noting that the study results affirm the important mediating role of customer relationship perceptions, in this case CPRI, in explaining the effects of CRM technology use on firm performance. In particular, the pattern of results obtained suggests that the inconclusive, contradictory, and nonsignificant findings reported in prior studies may be because different CRM tools have differential effects on customer relationship perceptions, with the effects of each set of CRM tools varying across customers in the portfolio. These findings have important implications for relationship management theory and future research in that they strongly suggest that a more refined conceptualization of CRM technology use, as proposed in this study, is necessary to uncover the technology's performance effects and that consideration of the technology's impact on customers' perceptions of the exchange relationship is ultimately critical to quantifying the technology's firm performance consequences.

Consistent with the results of a recent meta-analysis of the relationship marketing literature (Palmatier et al. 2006), our study also reifies a strong link between CPRI and organizational performance. This provides indirect support for the proposition that the norm of reciprocity is critical to the governance of exchange relationships (Blau 1964). Interestingly, our post-hoc analyses revealed that CPRI for mid-sized and large accounts was related to firm performance (both subjective and objective) but that CPRI for smaller accounts was not. This finding suggests that, within this industry, the mixed effects of CRM prioritization tool use on CPRI across customer subgroups was ultimately beneficial to short-term performance (i.e., the decrease in CPRI for smaller customers did not affect firm performance, whereas the increase in CPRI for mid-sized and large customers did have positive effects on performance).

What remains unclear, however, is whether this finding applies to other industries or whether it even holds across time. In their work on customer portfolio management, Johnson and Selnes (2004) suggest that bringing weaker relationships into the relationship portfolio is critical to long-term performance. Future research should thus investigate the long-term performance implications of relationship management practices that have detrimental effects on the relationship perceptions of low-priority customers. For instance, it is possible that lower relationship performance expectations limit the growth of low-priority customer relationships. That is, once low-priority customers are ready to take the relationship to "the next level," they may search for alternative providers because they have low expectations of their current provider and don't necessarily feel a strong sense of loyalty to it.

Our study also has important implications related to relationship marketing theory. Specifically, relationship marketing theory suggests that relationships are market-based assets that require substantial resource commitments (Dwyer et al. 1987) and have important performance implications (Hunt 1997, 2002). Although this proposition is generally well accepted in the literature, empirical evidence regarding the customer and firm performance effects of relationship building and management investments (e.g., information technology investments) is very limited (see Bowman and Narayandas 2004 for a notable exception). Rarely have researchers examined how or whether such investments influence customers and their disposition toward the exchange relationship. Thus, our study enhances relationship marketing theory by proposing and finding that organizational CRM technology investments have a measurable impact on customer relationship perceptions, particularly CPRI, that in turn influence firm performance. Importantly, our study reveals that relationship building investments may have desirable effects on high-priority customers and undesirable effects on low-priority customers. This finding is of great interest because theorists argue that a diverse customer portfolio, including low- and high-priority relationships, is most favorable for long-term performance (e.g., Coviello et al. 2002, Day 2000, Johnson and Selnes 2004, Sawhney and Zabin 2002). Once again, this line of reasoning strongly suggests that future theoretical and empirical work is needed to better understand the long-term relationship and firm performance implications of relationship building and management resource allocation decisions.

The results of this study point to several issues of managerial importance. First, use of CRM technology appears to exert measurable effects on customers' relationship perceptions. This is a critical finding because the promise of CRM technology is predicated upon the realization of customer-perceptible differences in interaction quality. Thus, prior to undertaking CRM technology initiatives, managers should map out a detailed answer to the following question: How will our use of CRM technology affect customers' perceptions of their interactions with our firm? Understanding the likely effects of CRM technology use on customers is critical to an adequate assessment of the technology's potential value to a firm. Second, managers should be aware that different CRM tools have different effects on customers and that these effects may not be consistent across customer subgroups, such that use of certain tools may actually have negative effects on some relationships. Regardless of customer priority level, managers should take great care to ensure that relationships are not damaged as a result of the organizational use of CRM technology. Greater consideration to high-priority customers identified by CRM tools would appear to be prudent. Completely ignoring the needs of smaller customers would appear to be foolish given that forging durable relationships with smaller (i.e., low-priority) customers may have important long-term performance consequences. Finally, our results suggest that managers should make an explicit attempt to proactively manage CPRI. Firms that are able to build CPRI appear to benefit from customers' reciprocation behaviors, such as loyalty and the expansion of the relationship through cross-buying and upgrading.

Our study results should be interpreted in light of two important limitations. First, the study considers the effects of CRM technology use only within the scope of one industry. Although this allowed for better-control of potential cross-industry confounds, it does limit the generalizability of our findings. Thus, cross-industry studies present a natural opportunity for the extension of this research. Second, despite collecting data from 295 customer firms, our provider firm sample size is relatively small ($n = 10$). Although the group-level sample size did not inhibit our ability to identify significant effects and did not bias parameter or significance estimates (see Appendix OS4 in the online supplement for further details), larger group-level sample sizes are typically preferred (Hox 2002). We note, however, that because of our smaller group-level sample size, we were able to collect data from multiple informants per provider firm and our group-level sample does cover a majority of the industry providers at the time of data collection, making the study's results generalizable within the industry. Future research efforts can circumvent the group-level sample size limitation by either employing a nonnested research design (which would require large-scale dyadic data collection) or by identifying a less concentrated industry such that collection of customer data becomes practically feasible within a multilevel study design.

## 7. Concluding Remarks

For some time now, academics and practitioners have questioned the performance benefits of CRM technology use (Coltman 2007, Jayachandran et al. 2005). In addition, empirical studies that have investigated the organizational performance consequences of the technology's use have provided mixed evidence, with some studies reporting positive effects and other studies reporting that CRM technology has no effects on organizational performance at all. Within this research study, we proposed that an examination of the impact of CRM technology use on customer relationship perceptions was critical to understanding the technology's true performance consequences and would partly serve to reconcile the mixed results reported in the literature. Our proposition was based on two basic premises: (1) CRM technology use may have different effects on different customers, and (2) different CRM tools may have different performance consequences. Overall, the study results confirm our expectations because they reveal that different CRM tools have different effects on customers' relationship perceptions and some CRM tools do, in fact, have differential effects across customer subgroups within a firm's relationship portfolio. Furthermore, consistent with relationship marketing and management theory, our results indicate that customers' perceptions of the exchange relationship mediate the effects of CRM technology use on firm performance and support the conclusion that CRM technology investments may serve to enhance organizational performance in the short term. Although this study is not likely to fully resolve the debate regarding CRM technology's true effects on the outcome of customer-provider relationships and organizational performance, it certainly brings to light some of the potential benefits and consequences of the organizational use of CRM technology.

## Electronic Companion

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## References

Adenbajo D (2003) Classifying and selecting e-CRM applications: An analysis-based proposal. *Management Decision* 41(6): 570–577.

Anderson JC, Gerbing D (1988) Structural equation modeling in practice: A review and recommended two-step approach. *Psych. Bull.* 103(3):411–423.

Anderson JC, Narus JA (1990) A model of distributor firm and manufacturer firm working partnerships. *J. Marketing* 54(January): 42–58.

Anderson E, Weitz B (1992) The use of pledges to build and sustain commitment in distribution channels. *J. Marketing Res.* 29(February):18–34.

Berry LL (2002) Relationship marketing of services—Perspectives from 1983 and 2000. *J. Relationship Marketing* 1(1):59–77.

Blau P (1964) *Exchange and Power in Social Life* (John Wiley and Sons, New York).

Bolton R, Lemon KN, Verhoef PC (2004) The theoretical underpinnings of customer asset management: A framework and propositions for future research. *J. Acad. Marketing Sci.* 32(3):271–292.

Bose R (2002) Customer relationship management: Key components for it success. *Indust. Management and Data Systems* 102(2): 89–97.

Boulding W, Kirmani A (1993) A consumer-side experimental examination of signaling theory: Do consumers perceive warranties as signals of quality? *J. Consumer Res.* 20(June): 111–123.

Bowman D, Narayandas D (2004) Linking customer management effort to customer profitability in business markets. *J. Marketing Res.* 41(November):433–447.

Brady M, Fellenz MR, Brookes R (2008) Researching the role of information and communications technology (ICT) in contemporary marketing practices. *J. Bus. Indust. Marketing* 23(2):108–114.

Campbell NCG (1985) Buyer/seller relationships in Japan and Germany: An interaction approach. *Eur. J. Marketing* 19(3):57–66.

Chen IJ, Popovich K (2003) Understanding customer relationship management (CRM): People, processes and technology. *Bus. Process Management J.* 9(5):672–688.

Coltman T (2007) Why build a customer relationship management capability? *J. Strategic Inform. Systems* 16(3): 301–320.

Coviello NE, Brodie RJ, Danaher PJ, Johnston WJ (2002) How firms relate to their markets: An empirical examination of contemporary marketing practices. *J. Marketing* 66(July):33–46.

Crosby LA, Johnson SL (2000) What to do before going 1-to-1. *Marketing Management* 9(4):15–21.

Crosby LA, Johnson SL (2001) Technology: Friend or foe to customer relationships? *Marketing Management* 10(4):10–11.

Croteau A-M, Li P (2003) Critical success factors of CRM technological initiatives. *Canadian J. Admin. Sci.* 20(1):21–34.

Cunningham M (1980) International marketing and purchasing of industrial goods—Features of a European research project. *Eur. J. Marketing* 14(5/6):322–338.

Davis R (2002) The Wizard of Oz in CRMLand: CRM's need for business process management. *Inform. Systems Management* (Fall):43–48.

Dawar N, Parker P (1994) Marketing universals: Consumers' use of brand name, price, physical appearance, and retailer reputation as signals of product quality. *J. Marketing* 58(April):81–95.

Day GS (2000) Managing market relationships. *J. Acad. Marketing Sci.* 28(Winter):24–30.

Day GS, Van den Bulte C (2002) Superiority in customer relationship management: Consequences for competitive advantage and performance. Report 02-123, Marketing Science Institute (MSI), Cambridge, MA.

De Wulf K, Odekerken-Schroder G, Iacobucci D (2001) Investments in consumer relationships: A cross-country and cross-industry exploration. *J. Marketing* 65(October):33–50.

De Wulf K, Odekerken-Schroder G, Patrick VK (2003) Investments in consumer relationships: A critical reassessment and model extension. *Internat. Rev. Retail, Distribution and Consumer Res.* 13(July):245–261.

Diamantopoulos A, Winklhofer HM (2001) Index construction with formative indicators: An alternative to scale development. *J. Marketing Res.* 38(2):269–277.

Duncan T (2002) *IMC: Using Advertising and Promotion to Build Brands* (McGraw-Hill, New York).

Duncan T, Moriarty S (1997) *Driving Brand Value* (McGraw-Hill, New York).

Duncan T, Moriarty S (1998) A communication-based marketing model for managing relationships. *J. Marketing* 62(April):1–13.

Dwyer RF, Schurr PH, Oh S (1987) Developing buyer-seller relationships. *J. Marketing* 51(April):11–27.

Ebner M, Hu A, Levitt D, McCrory J (2002) How to rescue CRM. *McKinsey Quart.* Special edn. Technology 10(4):49–57.

Eriksson K, Mattsson J (2002) Managers' perception of relationship management in heterogeneous markets. *Indust. Marketing Management* 31(September):535–543.

Fjermestad J, Romano NC (2003) Electronic customer relationship management: Revisiting the general principles of usability and resistance—an integrative framework. *Bus. Process Management J.* 9(5):572–591.

Ford D (1980) The development of buyer-seller relationships in industrial markets. *Eur. J. Marketing* 14(5/6):339–353.

Fornell C, Larcker DF (1981) Evaluating structural equation models with unobservable variables and measurement error. *J. Marketing Res.* 18(February):39–50.

Frazier GL, Spekman RE, O'Neal C (1988) Just-in-time exchange relationships in industrial markets. *J. Marketing* 52(October):52–67.

Gerbing D, Anderson JC (1988) An updated paradigm for scale development incorporating unidimensionality and its assessment. *J. Marketing Res.* 25(May):186–192.

Greenberg P (2001) *CRM at the Speed of Light* (McGraw-Hill, Berkeley, CA).

Gronroos C (2000a) Creating a relationship dialogue: Communication, interaction and value. *The Marketing Rev.* 1(Autumn):5–14.

Gronroos C (2000b) *Service Management and Marketing: A Customer Relationship Management Approach*, 2nd ed. (John Wiley and Sons, Ltd., West Sussex, UK).

Gronroos C (2004) The relationship marketing process: Communication, interaction, dialogue, value. *J. Bus. Indust. Marketing* 19(2):99–113.

Håkansson H, ed. (1982) *International Marketing and Purchasing of Industrial Goods: An Interaction Approach* (John Wiley and Sons, Chichester, UK).

Hirschowitz A (2001) Closing the CRM loop: The 21st century marketer's challenge: Transforming customer insight into customer value. *J. Database Marketing* 10(2):168–178.

Homburg C, Droll M, Totzek D (2008) Customer prioritization: Does it pay off, and how should it be implemented? *J. Marketing* 72(September):110–130.

Homburg C, Workman JP, Jr, Jensen O (2002) A configurational perspective on key account management. *J. Marketing* 66(April):38–60.

Hox J (2002) *Multilevel Analysis: Techniques and Applications* (Lawrence Erlbaum Associates, Mahwah, NJ).

Hunt SD (1997) Competing through relationships: Grounding relationship marketing in resource advantage theory. *J. Marketing Management* 13(4):431–445.

Hunt SD (2002) *Foundations of Marketing Theory: Toward a General Theory Of Marketing* (M.E. Sharpe, London).

Hunt SD, Morgan RM (1995) The comparative advantage theory of competition. *J. Marketing* 59(April):1–15.

Jackson BB (1985) *Winning and Keeping Industrial Customers* (D.C. Heath and Company, Lexington Books, Lexington, MA).

Jap SD (1999) Pie-expansion efforts: Collaboration processes in buyer-supplier relationships. *J. Marketing Res.* 36(November): 461–475.

Jap SD, Ganesan S (2000) Control mechanisms and the relationship life cycle: Implications for safeguarding specific investments and developing commitment. *J. Marketing Res.* 37(May): 227–245.

Jayachandran S, Sharma S, Kaufman P, Raman P (2005) The role of relational information processes and technology use in customer relationship management. *J. Marketing* 69(October): 177–192.

Johnson MD, Selnes F (2004) Customer portfolio management: Toward a dynamic theory of exchange relationships. *J. Marketing* 68(April):1–17.

Jones E, Dixon AL, Chonko LB, Cannon JP (2005) Key accounts and team selling: A review, framework and research agenda. *J. Personal Selling and Sales Management* 25(2):181–198.

Kalafatis SP (2002) Buyer-seller relationships along channels of distribution. *Indust. Marketing Management* 15(April):215–228.

Keep WW, Hollander SC, Dickinson R (1998) Forces impinging on long-term business-to-business relationships in the United States: An historical perspective. *J. Marketing* 62(April):31–45.

Kirmani A, Rao AR (2000) No pain, no gain: A critical review of the literature on signaling unobservable product quality. *J. Marketing* 64(April):66–79.

Klein R, Rai A, Straub D (2007) Competitive and cooperative positioning in supply chain logistics relationships. *Decision Sci. J.* 38(November):611–646.

Kotler P (1972) A generic concept of marketing. *J. Marketing* 36(April):46–54.

Kumar VJ, Petersen A (2005) Using a customer-level marketing strategy to enhance firm performance: A review of theoretical and empirical evidence. *J. Acad. Marketing Sci.* 33(4):504–519.

Kumar V, Rajkumar V, Reinartz W (2008) Performance implications of adopting a customer-focused sales campaign. *J. Marketing* 72(September):50–68.

Lacey R, Suh J, Morgan RM (2007) Differential effects of preferential treatment levels on relational outcomes. *J. Service Res.* 9(3):241–256.

Light B (2003) CRM packaged software: A study of organizational experiences. *Bus. Process Management J.* 9(5):603–616.

Metcalf LE, Frear CR, Krishnan R (1992) Buyer-seller relationships: An application of the IMP interaction model. *Eur. J. Marketing* 26(2):27–46.

Mirani R, Moore D, Weber JA (2001) Emerging technologies for enhancing supplier-reseller partnerships. *Indust. Marketing Management* 30(2):101–114.

Mithas S, Krishnan MS, Fornell C (2005) Why do customer relationship management applications affect customer satisfaction? *J. Marketing* 69(October):201–209.

Morgan AJ, Inks SA (2001) Technology and the sales force: Increasing acceptance of sales force automation. *Indust. Marketing Management* 30(5):463–472.

Morgan RM, Hunt SD (1994) The commitment-trust theory of relationship marketing. *J. Marketing* 58(July):20–38.

Muthen BO (1994) Multilevel covariance structure analysis. *Sociol. Methods Res.* 22(3):376–398.

Muthen BO, Satorra A (1995) Complex sample data in structural equation modeling. Marsden PV, ed. *Sociological Methodology* (American Sociological Association, Washington, DC), 267–316.

Narayandas D, Rangan KV (2004) Building and sustaining buyer-seller relationships in mature industrial markets. *J. Marketing* 68(July):63–77.

Palmatier RW, Dant RP, Grewal D (2007) A comparative longitudinal analysis of theoretical perspectives of interorganizational relationship performance. *J. Marketing* 71(October):172–194.

Palmatier RW, Dant RP, Grewal D, Evans KR (2006) Factors influencing the effectiveness of relationship marketing: A meta-analysis. *J. Marketing* 70(October):136–153.

Parthasarathy M, Sohi RS (1997) Salesforce automation and the adoption of technological innovations by salespeople: Theory and implications. *J. Bus. Indust. Marketing* 12(3):196–208.

Parvatiyar A, Sheth JN (2000) Conceptual foundations of relationship marketing. Sheth JN, Parvatiyar A, eds. *Handbook of Relationship Marketing* (Sage Publications, Inc., Thousand Oaks), 3–38.

Peppers D, Rogers M, Dorf B (1999) Is your company ready for one-to-one marketing? *Harvard Bus. Rev.* 77(1):101–109.

Petter S, Straub D, Rai A (2007) Specifying formative constructs in is research. *MIS Quart.* 31(4):623–656.

Prins R, Verhoef PC (2007) Marketing communication drivers of adoption timing of a new e-service among existing customers. *J. Marketing* 71(April):169–183.

Pullig C, Maxham III JG, Hair JF (2002) Salesforce automation systems: An exploratory examination of organizational factors associated with effective implementation and salesforce productivity. *J. Bus. Res.* 55(5):401–415.

Ramani G, Kumar V (2008) Interaction orientation and firm performance. *J. Marketing* 72(January):27–45.

Rangan KV, Moriarty RT, Swartz GS (1992) Segmenting customer in mature industrial markets. *J. Marketing* 56(October):72–82.

Raudenbush SW, Bryk AS (2002) *Hierarchical Linear Models: Applications and Data Analysis Methods* (Sage Publications, Thousand Oaks, CA).

Reinartz WJ, Krafft M, Hoyer WD (2004) The CRM process: Its measurement and impact on performance. *J. Marketing Res.* 41(August):293–305.

Rigby DK, Reichheld FF, Schefter P (2002) Avoid the four perils of CRM. *Harvard Bus. Rev.* 80(February):101–109.

Rivers LM, Dart J (1999) The acquisition and use of sales force automation by mid-sized manufacturers. *J. Personal Selling Sales Management* 29(2):59–73.

Rust RT, Verhoef PC (2005) Optimizing the marketing interventions mix in intermediate-term CRM. *Marketing Sci.* 24(3):477–489.

Rust RT, Lemon KN, Zeithaml VA (2004) Return on marketing: Using customer equity to focus marketing strategy. *J. Marketing* 68(January):109–127.

Ryals L (2002) Measuring risk and returns in the customer portfolio. *J. Database Marketing* 9(3):219–227.

Ryals L (2003) Making customers pay: Measuring and managing customer risk and returns. *J. Strategic Marketing* 11(September): 165–175.

Ryals L (2005) Making customer relationship management work: The measurement and profitable management of customer relationships. *J. Marketing* 69(October):252–261.

Ryals L, Knox S (2001) Cross-functional issues in the implementation of relationship marketing through customer relationship management. *Eur. Management J.* 19(5):534–542.

Ryals L, Payne A (2001) Customer relationship management in financial services: Towards information-enabled relationship marketing. *J. Strategic Marketing* 9(1):3–27.

Sawhney M, Zabin J (2002) Managing and measuring relational equity in the network economy. *J. Acad. Marketing Sci.* 30(Fall):313–332.

Shoemaker ME (2001) A framework for examining IT-enabled market relationships. *J. Personal Selling Sales Management* 21(2): 177–185.

Siegel S (1957) Nonparametric statistics. *The Amer. Statistician* 11(June):13–19.

Sirdeshmukh D, Singh J, Sabol B (2002) Consumer trust, value, and loyalty in relational exchanges. *J. Marketing* 66(January):15–37.

Speier C, Venkatesh V (2002) The hidden minefields in the adoption of sales force automation technologies. *J. Marketing* 66(July):98–111.

Turnbull P, Ford D, Cunningham M (1996) Interaction, relationships and networks in business markets: An evolving perspective. *J. Bus. Indust. Marketing* 11(3/4):44–62.

Van Bruggen GH, Lilien GL, Kacker M (2002) Informants in organizational research: Why use multiple informants and how to aggregate responses. *J. Marketing Res.* 39(November): 469–478.

Venkatesan R, Kumar V (2004) A customer lifetime value framework for customer selection and resource allocation strategy. *J. Marketing* 68(October):106–125.

Verhoef PC (2003) Understanding the effect of customer relationship management efforts on customer retention and customer share development. *J. Marketing* 67(October):30–45.

Verhoef PC, Donkers B (2001) Predicting customer potential value: An application in the insurance industry. *Decision Support Systems* 32(2):189–199.

Wareham J, Mathiassen L, Rai A, Straub DW, Klein R (2005) The business value of digital supply networks: A program of research on the impacts of globalization. *J. Internat. Management* 11(June):201–227.

Wathne KH, Biong H, Heide JB (2001) Choice of supplier in embedded markets: Relationship and marketing program effects. *J. Marketing* 65(April):54–66.

Webster FE (1992) The changing role of marketing in the corporation. *J. Marketing* 56(October):1–17.

Wilson H, Daniel E, McDonald M (2002) Factors for success in customer relationship management (CRM) systems. *J. Marketing Management* 18(1):193–219.

Winer RS (2001) A framework for customer relationship management. *Calif. Management Rev.* 43(4):89–105.

Yim FH-K, Anderson RE, Swaminathan S (2004) Customer relationship management: Its dimensions and effect on customer outcomes. *J. Personal Selling Sales Management* 24(4):263–287.

Yu L (2001) Successful customer relationship management. *MIT Sloan Management Rev.* 42(Summer):18–19.

Zablah AR, Bellenger DN, Johnston WJ (2004a) Customer relationship management implementation gaps. *J. Personal Selling Sales Management* 24(Fall):279–295.

Zablah AR, Bellenger DN, Johnston WJ (2004b) An evaluation of divergent perspectives on customer relationship management: Towards a common understanding of an emerging phenomenon. *Indust. Marketing Management* 33(6):475–489.

Zeithaml VA, Rust RT, Lemon KN (2001) The customer pyramid: Creating and serving profitable customers. *Calif. Management Rev.* 43(4):118–142.