

**The Role of Relational Information Processes and Technology Use in Customer  
Relationship Management**

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## **The Role of Relational Information Processes and Technology Use in Customer Relationship Management**

Drawing on the relationship marketing and market information processing literature streams, the authors conceptualize and measure relational information processes, organizational routines that are critical for customer relationship management. The drivers and performance outcomes of relational information processes as well as the role of technology in implementing customer relationship management are then examined using data collected from a diverse sample of businesses. The results show that relational information processes play a critical role in enhancing an organization's customer relationship performance. Technology use for customer relationship management, by moderating the influence of relational information processes on customer relationship performance, performs an important supportive role. The study provides insights into why the use of technology for customer relationship management might not always deliver the expected performance outcomes.

## **The Role of Relational Information Processes and Technology Use in Customer Relationship Management**

Relationship marketing theory advocates that firms should pursue long-term relationships with customers instead of adopting a short-term transaction oriented approach (e.g., Berry 1983; Dwyer, Schurr, and Oh 1987; Gronroos 1991; Morgan and Hunt 1994; Sheth and Parvatiyar 1995). Sustained relationships with customers are expected to lower costs, increase customer satisfaction and retention, and enhance revenues (Sheth and Parvatiyar 1995). Strength of customer relationships, as reflected in prior experience, allows firms to recover from occasional sub-optimal responses to customer needs (Bolton 1998). For customers, long-term relationships with businesses will provide economic and social benefits (Arnett, German, and Hunt 2003). Overall, there is broad acceptance of the benefits of relationship marketing, though some of its assumptions have been questioned by empirical research (e.g., Reinartz and Kumar 2000).

Customer relationship management is a core organizational process that focuses on establishing, maintaining, and enhancing long-term associations with customers as advocated by relationship marketing theory (Berry 1995; Morgan and Hunt 1994; Srivastava, Shervani, and Fahey 1999). The rapid advance in information technology (IT) has presented firms with new technology-based solutions, namely CRM technology, to manage customer relationships. CRM technology is a suite of information technology-based solutions designed to support the customer relationship management process (Rigby, Reichheld, and Schefter 2002). Many firms have invested in CRM technology (Day 2000), hoping to discriminate between profitable and unprofitable customers, provide customized service, and obtain higher customer retention (Peppers, Rogers, and Dorf 1999). The results from the use of CRM technology, however, have been mixed, and this has created substantial concern about its viability and effectiveness (Rigby et al. 2002). The business press also provides conflicting accounts about the performance of

CRM technology (see Agnew 2001; Whiting 2001), and research on this issue has been limited (Winer 2001).

The unease with CRM technology use is similar to the disillusionment that firms encountered in the late 1980s regarding the use of IT to automate business activities (see El Sawy 2001). The frustration with IT systems led to a focus on information process redesign in organizations to take advantage of the technology (El Sawy 2001; Kettinger, Teng, and Guha 1997). Akin to the situation with the use of IT systems in organizations, disappointing outcomes from CRM technology use could be the result of inappropriate information processes. Research exploring organizational information processes relevant to customer relationship management (hereafter, *relational information processes*), therefore, could help shed light on the role of CRM technology in businesses.

To address this need, the objectives of this study are to conceptualize and examine the roles of relational information processes and CRM technology in customer relationship management. We define *relational information processes* as encompassing the specific routines employed by an organization to manage customer information to establish long-term relationships with customers. The academic research on market information use (e.g., Menon and Varadarajan 1992; Moorman 1995), market orientation (e.g., Kohli and Jaworski 1990; Narver and Slater 1990), and organizational learning (e.g., Sinkula 1994; Slater and Narver 1995) have long highlighted the important role of organizational information processes (e.g., information acquisition, dissemination, and use) in shaping how businesses respond to their market environment. Our study follows this tradition. To conceptualize relational information processes, we draw on past research as well as feedback provided by managers. Then, using data collected from a diverse sample of businesses, we empirically examine the key drivers and performance outcomes of relational information processes. The role of CRM technology use in

customer relationship management is evaluated by testing its moderating impact on the association between relational information processes and customer relationship performance, the performance of the organization on customer satisfaction and retention.

The contributions of the manuscript are the following. First, relational information processes are conceptualized to consist of five aspects: information flow, information capture, information integration, information access, and information use. Relational information processes, we show, are crucial to the pursuit of customer relationship management and have a positive direct effect on customer relationship performance regardless of CRM technology use. Significantly, we draw a distinction between relational information processes, grounded in relationship marketing theory, and the use of technology for customer relationship management. Second, we demonstrate how motivational and ability factors drive relational information processes. Third, we conceptualize and measure CRM technology use by firms and show that it interacts with relational information processes to enhance customer relationship performance. The latter finding implies that CRM technology enables a more effective implementation of relational information processes. Thus, the manuscript addresses the role of CRM technology in organizations, an issue of critical importance to managers, by building on the theoretical foundations of relationship marketing and organizational information processing research. In doing so, the study emphasizes the vital role relational information processes play in leveraging CRM technology to improve customer relationship performance. Overall, the results from this study have significant managerial and research implications.

The manuscript is organized as follows. In the following section, we use past literature and managerial interviews to identify relational information processes that are critical for customer relationship management. Next, we develop hypotheses detailing how organizational culture, management systems, and transaction-related antecedents drive relational information

processes. Following this, hypotheses are proposed to examine how relational information processes and CRM technology use influence performance. Thereafter, we explain the research methodology including measure development, data collection, and analysis. Lastly, we discuss the results, implications for research and practice, and limitations and future research directions.

## **Relational Information Processes**

### ***The Need for Relational Information Processes***

Relationship marketing is based on the generation of a foundation of shared interests where firms and customers are committed to each other (Morgan and Hunt 1994). Firms strive to use interactions with customers to generate commitment, a lasting desire in customers to maintain a valued relationship, and trust, a readiness to rely on the exchange partner (Colgate and Danaher 2000; Morgan and Hunt 1994; Sheth and Parvatiyar 1995). Trust is considered especially critical for relational exchanges because it is a crucial determinant of commitment (Achrol 1991). An important antecedent of trust is communication (Anderson and Narus 1990; Morgan and Hunt 1994). Communication in the context of customer relationship management involves the sharing of information between a firm and its customers (De Wulf, Odeken-Schroder, and Iacobucci 2001). To maintain relationships, in addition to creating an environment that fosters the sharing of information between businesses and customers, it is imperative that organizations use the information to shape appropriate responses to customer needs. In essence, customer information plays a critical role in building and maintaining customer relationships (Day 2000). Therefore, relational information processes, the routines that shape how customer information is managed, assume significance in the context of customer relationship management.

### ***Distinction between Transactional and Relational Information Processes***

Customer information primarily serves the purpose of reducing uncertainty when firms plan and implement marketing actions. A relationship exists between a firm and a customer when an

individual transaction is considered, not in isolation, but in the context of shadows of past transactions and likely future transactions (Czepiel 1990). Therefore, relational information processes have to deal with two types of uncertainty: uncertainty involved in maintaining customer relationships in addition to meeting gaps in market demand. Transactional information processes, which support transactional marketing (Coviello, Brodie, Danaher, and Johnston 2002), have to meet only the latter type of uncertainty. In other words, to factor in the historical context and future consequences of interactions with customers in the process of every transaction, and thereby maintain relationships, firms need more information about their customers than they would when pursuing a transaction-oriented approach. As such, implementing relational information processes is more complex and resource-demanding than implementing information processes for transactional marketing.

In effect, a business that practices customer relationship management focuses on bi-directional flow of information, integrating information from all customer contact points, making this information available to customer contact employees, and using it to maintain customer relationships while exploiting gaps in market opportunity (Day 2000; Day and Van den Bulte 2002). Transactional information processes, on the other hand, will primarily involve acquisition, dissemination, and use of knowledge to identify and exploit market opportunity (e.g., Kohli and Jaworski 1990). Marschak and Radner (1972) state that the blue print or form of an organization has two functions: “an information function that describes the rules used in obtaining, processing, and transmitting information about the states of external environments, and an activity function that states the rules used in acting on received information so as to produce an organizational response” (Hannan and Freeman 1977, p. 935). Firms pursuing customer relationship management follow different rules for processing and using information

and, therefore, can be considered a different organizational form compared to those that follow a transaction-oriented approach to their customer interactions.

### ***Dimensions of Relational Information Processes***

Customer relationship management necessitates relational information processes that allow a firm to respond effectively and quickly to customer requirements, thereby solidifying the relationship in trust and commitment. Our approach to understanding relational information processes involved a review of extant academic and business literature on customer relationship management. In addition, we interviewed 15 managers and conducted a preliminary survey on a CRM-focused Website to glean insights into relational information processes, its drivers, and outcomes. Based on the literature review, interviews, and preliminary Web-based survey, we suggest that the relational information processes construct consists of five dimensions: information flow, information capture, information integration, information access, and information use. We describe these next.

*Information flow.* Reciprocity is a key defining characteristic of customer relationship management (De Wulf et al. 2001). Collaborative communication, established as a result of reciprocal information flow, helps develop an atmosphere of mutual support among relationship partners (Mohr, Fisher, and Nevin 1996). Reciprocal communications, therefore, are significant in the context of customer relationships because trust and commitment are unlikely to develop in the absence of sharing of information. Sharing of information implies enabling customers to communicate with the firm in addition to disseminating information from the firm to the customer. In the absence of firm efforts to establish reciprocal communications, customers would be unable to communicate their needs and problems to the firm, resulting in unmet or partially met customer needs, and lower customer satisfaction and retention. If the firm is unable to communicate effectively with its customers, its efforts to build and maintain relationships will



flounder. Emphasizing reciprocal firm-customer information flow is, therefore, critical for a business to effectively execute its relationship marketing strategy (Day 2000).

*Information capture.* Research in market orientation (e.g., Kohli and Jaworski 1990; Narver and Slater 1990), market information use (e.g., Menon and Varadarajan 1992; Moorman 1995), and organizational learning (e.g., Sinkula 1994; Slater and Narver 1995) have highlighted the importance of information acquisition. Customer data are the raw material used to provide insights and develop strategies to maintain and sustain relationships. Building customer relationships, therefore, requires detailed information regarding the tangible and intangible aspects of customer interactions with the products, services, and contact personnel of an organization. In effect, customer data collected by a firm enhances its ability to maintain long-term relationships with customers. Customers often have multiple channels to communicate with a firm and could interact with numerous departments such as sales, customer service, and marketing. Hence, businesses should focus on capturing information from customer interactions with various sources and channels (Peppers and Rogers 1997).

*Information integration.* As noted above, all interactions of a firm with its customers through different departments and contact points are sources of customer information. However, if this information exists in disparate form with the sources that interact with the customer, it can impede consistent and efficient communication. Development of trust is contingent on customers obtaining consistent and effective responses when they interact with the firm. Such responses are possible only when the history of a customer's relationship with the firm is available to support customer interactions. This necessitates not merely the capture, but also the integration, of customer information from all firm-customer interactions.

*Information access.* The market orientation literature (e.g., Kohli and Jaworski 1990; Narver and Slater 1990) considers information dissemination a crucial component of the

information processes that enhance the responsiveness of the firm. As noted earlier, customers may interact with various functional areas in the firm such as sales, marketing, and customer service. Consequently, providing access to updated and integrated customer information to relevant employees should be a priority for businesses practicing customer relationship management. While the market orientation literature focuses on information dissemination, the preliminary research we conducted suggested that employees responsible for managing customer interactions viewed the issue more from the perspective of information access when required than information dissemination on a continuous basis. Mere dissemination, which implies distribution, was perceived as likely to result in information overload due to the vast numbers of customer interactions with an organization. Hence, we consider information access to be more accurately descriptive of the information process required to sustain customer relationships.

*Information use.* Market information use has been classified into action oriented use, knowledge enhancing use, and affective use (see Menon and Varadarajan 1992). To build and sustain customer relationships, firms should deploy the acquired customer information in a manner consistent with the philosophy of relationship management. Doing so would imply that firms use the information to understand the needs and behaviors of their customer (knowledge enhancing use), and develop and offer customer-specific products and services (action oriented use). Relationship marketing also suggests that customers be treated in accordance with the value they offer to the firm (Parvatiyar and Sheth 2001). Therefore, customer information is also used to identify high-value customers.

Next, we examine the antecedents to relational information processes and the outcomes of these processes. We depict these relationships in Figure 1.

**(Insert Figure 1 About Here)**

### **Antecedents to Relational Information Processes**

As noted previously, customer relationship management is more complex and resource-intensive than a transaction-oriented approach. Therefore, relational information processes are likely to be deployed only when sufficient motivation to expend the resources required for the more complex routines exist, in addition to the ability to implement and maintain those routines. Traditionally, it was assumed that firms in the business-to-business sector, and those involved in marketing services, had greater motivation to build relationships with their customers. However, Coviello et al. (2002) found that firms compete using transactional, relational, or hybrid approaches regardless of whether they provide services or goods in the consumer or business-to-business arenas. More significantly, they suggest that opportunities may exist for firms to pursue relationship building strategies in most markets. Coviello et al.'s (2002) results imply that researchers need to examine motivating and enabling factors that are more specific than the broad services/goods and business-to-consumer/business-to-business classifications traditionally relied on to justify the need to build and sustain customer relationships.

Organizational learning theory provides an appropriate theoretical background to assess the motivation and ability antecedents to relational information processes. The marketing literature on organizational learning and knowledge use (e.g., Sinkula 1994; Slater and Narver 1995; Menon and Varadarajan 1992) suggests that four types of factors could be antecedents to information processes: organizational culture, organizational systems, task-related factors, and environmental factors. Based on the past marketing literature, and also motivated by the specific characteristics of information requirements for relationship marketing, we address three categories of antecedents to relational information processes: customer relationship orientation (organizational culture), customer-centric management system (organizational systems), and customer relationship potential (task-related factor). Environmental factors -- competitive

intensity and environmental dynamism -- form the general background in which the relationships are tested and will be used as control variables.

### ***Customer Relationship Orientation***

Past marketing literature supports the view that organizational culture impacts information processes (Menon and Varadarajan 1992; Sinkula 1994; Slater and Narver 1995). An organization's culture is the deeply embedded values and beliefs that establish the norms for appropriate behavior in the organization (Deshpande, Farley, and Webster 1993). Customer relationship orientation, rooted within the overall culture, guides the organization's attitude towards initiating, maintaining, and terminating customer relationships. In effect, customer relationship orientation establishes a "collective mind" (Weick and Roberts 1993) for the organization where employees enact their roles consistent with organizational demands that consider customer relationships to be an asset. Therefore, customer relationship orientation will instill a belief system that emphasizes the importance of long-term associations with customers and the criticality of retaining valuable customers (Day 2000). Senior management support is critical to developing a culture that promotes an effective CRM program (Grover 1993). Customer relationship orientation is similar to the long-term orientation examined by Ganesan (1994). Since customer relationship orientation guides organizational actions, it will provide the intrinsic motivation within an organization to establish relational information processes.

H1: Customer relationship orientation will have a positive association with relational information processes.

### ***Customer-Centric Management System***

An organizational management system consistent with the culture is necessary to drive organizational processes. In this regard, Moorman (1995) observes that information processes are likely to be influenced by organizational systems. These management systems are akin to the climate for organizational learning discussed by Slater and Narver (1995). As such, management

system or configuration (Day 2000), reflecting the design of the organization's structure and procedures, impacts the implementation of customer relationship management. Specifically, to effectively drive relational information processes, organizational configuration should involve a customer-centric management system (Wilson, Daniel, and McDonald 2002; Dutta 2000). A customer-centric management system will consist of structural and procedural aspects which ensure that organizational actions are driven by customer needs and not by the internal concerns of functional areas (Day 2000).<sup>1</sup> Customer-centric management system helps augment the organization's ability to focus on customer interactions and ensures that expertise from different functional areas is deployed to promote the quality of customer experience. In summary, a customer-centric management system provides organizations with the ability to initiate relational information processes by breaking down functional barriers to customer-centered actions.

H2: Customer-centric management system will have a positive association with relational information processes.

### ***Customer Relationship Potential***

Firms build relationships with customers by focusing on the interactions with them in the course of undertaking transactions. However, as stated previously, customer relationship management requires the use of more complex information processes than does transactional marketing. The motivation to seek and build customer relationships, therefore, might vary among firms (Day 2000). In this regard, characteristics of the interactions between firms and customers, by shaping customer relationship potential -- the economic and social benefits of customer relationships -- are likely to motivate the use of relational information processes.

Customer relationship potential is influenced by the "shadow of the future" (Parkhe 1993) – in this context, the possibility that the firm may interact with customers in the future. To

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<sup>1</sup> For example, a private investment banker in the Netherlands changed from an organizational structure which was organized around products and functions to a client team based structure. Each client team developed a customer strategy based on customer needs and had its own budget and was accountable for results based on the profitability of customer segments (Verhoef and Langerak 2002).

elaborate, shadow of the future implies that the firm perceives opportunities for future interaction with customers as would be the case in markets where the product is repeatedly purchased or where the firm sells multiple products that can meet customers' needs. The social benefits of a sustained relationship (see Arnett, German, and Hunt 2003) also become salient when repeat transactions are likely to occur in the future. Hence, the possibility of future transactions affords economic and social potential that might outweigh the costs and complexities involved in sustaining firm-customer relationships (Thomas and Walker 2001). However, to take advantage of the customer relationship potential of repeat transactions in the future, firms require intimate knowledge of customer needs and the ability to communicate with customers. Thus, the ease with which customer information can be obtained and customer communication accomplished enhances customer relationship potential.

Maintaining relationships with customers also becomes relevant in situations where there is value in the knowledge that might emerge from relationship learning (Selnes and Sallis 2003). Knowledge from relationship learning is particularly vital when products or services that are exchanged in the firm-customer interaction can be customized or are complex. This is so because customizable products require more information interchange between the customer and the firm (Rayport and Jaworski 2001), as do complex products. Therefore, when the product or service involved in the firm-customer interaction is customizable or complex, the effort and cost of maintaining a relationship is more justifiable. For example, customer desired value change, customer expectation of the extent to which value received from a supplier can be customized, was found to be a major motivator of buyer-supplier relationships in the automotive industry (Flint, Woodruff, and Gardial 2002).

In summary, task-related factors such as characteristics of the interactions between a business and its customers, to the extent they offer information that adds economic and social

value, enhance customer relationship potential. Customer relationship potential provides the extrinsic motivation for a business to establish relational information processes. Hence:

H3: Customer relationship potential will have a positive association with relational information processes.

Apart from the individual impact of customer relationship orientation, customer-centric management system, and customer relationship potential on relational information processes, the joint impact of these variables should be considered. Implementing customer relationship management is complex, and requires alignment of an organization's orientation and management system (Day 2000). Customer relationship potential, the extrinsic incentive for putting into practice the complex routines that drive customer relationship management, when combined with customer relationship orientation and customer-centric management system, will have a synergistic effect on relational information processes beyond the direct impact of each these variables. In other words, customer relationship potential and customer relationship orientation, the extrinsic and intrinsic motivators of relational information processes, and customer-centric management system that provide the ability to establish the processes, will jointly impact relational information processes, as suggested by the ability-motivation framework of organizational behavior (see Venkatraman, Chen, and MacMillan 1997).

H4: Customer relationship orientation, customer-centric management system, and customer relationship potential will have a joint positive association with relational information processes.

### **Performance Outcomes of Relational Information Processes and CRM Technology Use**

#### ***Relational Information Processes and Customer Relationship Performance***

In this study, customer relationship performance includes outcomes such as customer retention and satisfaction. Relational information processes, by driving quick and effective responses to customers through the use of relationship marketing instruments (Verhoef 2003), are likely to be positively associated with customer relationship performance. For example, quick and effective

responses enhance customer satisfaction by providing consumption-related fulfillment (Oliver 1996; Anderson and Sullivan 1993).

Apart from shaping responses to customers, relational information processes, by allowing customers to communicate easily with the organization, help register their complaints and provide feedback. In addition, the integration of customer information and its sharing with key customer contact employees allows customers to communicate with businesses relatively more effectively. Relational information processes will also boost customers' relationship learning (Selnes and Sallis 2003), providing them with a greater understanding of organizations' attempts to respond to their demands. Therefore, the ability to communicate easily with businesses, provided by relational information processes, will augment customer satisfaction and loyalty.

Besides the benefits from relationship learning and the complaint voicing advantages of the closer communications between customers and a firm engaged in relationship marketing, Cannon and Homburg (2001) found that frequent and open communications between a supplier and a customer boosts the customer's efficiency in using the firm's products or services. Augmenting customer efficiency, a customer desired value change (Flint, Woodruff, and Gardial 2002), in turn, could improve customer satisfaction and loyalty. Superior communication, made possible by relational information processes, may also lead to higher levels of relationship investment, enhancing relationship quality and loyalty (De Wulf et al. 2001). In summary:

H5: Relational information processes will have a positive association with customer relationship performance.

### ***CRM Technology Use and Customer Relationship Performance***

CRM technology essentially entails information technology designed for customer relationship management. The use of CRM technology is expected to boost the ability of an organization to sustain profitable customer relationships by speeding up processes, allowing information to be integrated and shared smoothly, enabling more efficient and effective firm-customer interaction,



analyzing customer data, and customizing responses (Day 2003). CRM technology components include front-office applications that support sales, marketing, and service, a data depository, and back-office applications that help integrate and analyze the data (Greenberg 2001).<sup>2</sup> Sales support is designed to aid the sales force acquire and retain customers, reduce administrative time, and allow efficient management of accounts (Speier and Venkatesh 2002). Sales support, therefore, will permit management of sales leads and provide competitor and customer information to the sales force. In addition, sales support will help manage sales through multiple channels by tracking product availability and delivery. Marketing support includes market planning, execution of campaigns, and measurement of campaign performance (Greenberg 2001). As such, marketing support comprises generating customized offers and communications, and assessing product profitability. Service support coordinates the request and delivery of service. Service support also helps customers serve themselves by providing ready access to a knowledge-base of solutions (Meuter, Ostrom, Roundtree, and Bitner 2000).

These front-office or customer interaction solutions will be supported by a customer data depository and software that will help integrate and analyze the data. Firms develop a central databank where all customer-related information is stored. Creating a database that is guided by market intelligence is a critical component of a firm's attempts to create customer assets through long-term relationships (Berger, Bolton, Bowman, Briggs, Kumar, Parasuraman, and Terry 2002). The database should be accessible to relevant functions such as sales, customer service, and marketing. The data are integrated and analyzed using software to understand customer preferences and estimate customer lifetime value, retention, and loyalty (Greenberg 2001).

For CRM technology to be effective, it must support the business processes that manage customer experiences (Greenberg 2001; Rigby et al. 2002). Therefore, CRM technology is not a

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<sup>2</sup> While there are different conceptualizations of CRM technology components, based on the interviews we conducted with CRM users, we decided to adapt the conceptualization found in Greenberg (2001; see pages 40-42).

substitute for effective relational information processes, but an enabler of their effectiveness. In conjunction with relational information processes, the use of CRM technology might allow more efficient firm-customer interactions and provide better insights into customer desired value change (Flint et al. 2002), thereby improving customer satisfaction and retention. Hence:

H6: The positive impact of relational information processes on customer relationship performance will be enhanced by the extent of CRM technology use.

### ***Customer Relationship Performance and Organizational Performance***

Customer relationship performance along dimensions such as customer satisfaction and retention influences organizational performance (Fornell 1992; Bolton and Drew 1991). Customer satisfaction may boost organizational performance through higher prices and lower customer acquisition and retention costs. Customer retention improves profitability because it is considered cheaper to retain an existing customer than acquire a new customer. High quality customer relationships create customer assets of high value that provide a steady stream of future revenues (Berger et al. 2002). Customer loyalty programs aimed at maintaining long-term customer relationships have a positive impact on organizational performance (Anderson, Fornell, and Lehmann 1994), partly because customers included in these programs discount negative information about the firm and evidence higher repurchase behavior (Bolton, Kannan, and Bramlett 2000). Bolton (1998) demonstrates the positive impact of longer duration customer relationships on financial performance. In a business-to-business context, Kalwani and Narayandas (1995) found that firms that used a relationship marketing approach enjoyed better profits than firms that employed a transactional approach. In effect:

H7: Customer relationship performance will have a positive association with organizational performance.

Some anecdotal evidence suggests dissatisfaction among CRM technology users because the cost of these systems may outweigh any improvement in performance (e.g., McEwen 2002).

If this is the case, a direct negative relationship between the use of CRM technology and organizational performance may exist. On the other hand, if the use of CRM systems augments the efficiency of marketing, sales, and customer service operations, it might have a direct positive influence on organizational performance. We treat this association, depicted with a dotted path in Figure 1, as an empirical issue.

***Control Variables: Competitive Intensity and Environmental Dynamism***

Institutional theory (DiMaggio and Powell 1983) suggests that environmental variables such as competitive intensity, the extent of interfirm rivalry, and environmental dynamism, the variability of customer needs and technology, will impact organizational actions. Competitive intensity might compel firms to institute relational information processes by emphasizing the need to retain customers, impact customer relationship performance negatively by reducing customer retention, and diminish financial performance by increasing the overall cost of competing. Environmental dynamism might motivate firms to institute relational information processes because relationship learning might be more critical in rapidly changing environments. Customer relationship performance might be lower in dynamic environments because the rapid changes in customer needs and technology opportunity might hurt customer retention. With respect to financial performance, the rapid changes in customer needs and technology, while resource-demanding in terms of appropriate responses, might allow firms to charge higher prices and reap richer financial rewards than stable market environments. In the context of this study, we use competitive intensity and environmental dynamism as control variables.

**Methodology**

***Measure Development***

The measures used were largely developed for this study by following procedures observed in the marketing literature (see Churchill 1979). Based on a review of the literature on relationship

marketing and information use, interviews with managers, and preliminary survey on a CRM-related Website, we developed a list of indicators to measure the constructs. These measures were pretested over two stages with samples of academics and managers. Three academics checked the scale indicators for face validity and provided comments that were used to revise the scales. Data were collected from 46 managers engaged in customer relationship management activities. Exploratory factor analysis was conducted on the data, the scales were revised, and the questionnaire was developed. The measures, shown in Table 1, are described next.

**(Insert Table 1 About Here)**

### ***Measures***

*Reflective Measures.* Reflective scales are used when the observed variables are manifestations of the underlying constructs (Diamantopoulos and Winklhofer 2001). Reflective scales were developed for customer relationship orientation, customer-centric management system, five dimensions of relational information processes, customer relationship performance, and organizational performance. These scales consisted of 7-point Likert type indicators.

Customer relationship orientation was measured using a scale that reflects the cultural propensity of the organization to undertake customer relationship management. In developing this scale, we focused on shared values of an organization that are consistent with customer relationship management such as considering customer relationships a valuable asset and an emphasis on customer retention, and senior management support for customer relationship management. Customer-centric management system refers to the structure and procedures within the organization that provide it with the ability to build and sustain customer relationships. Therefore, this measure assessed the organization and coordination of the business around customers rather than functional groups and specific procedures that enable focus on customer relationship management.

Information flow scale used indicators that focused on bi-directional communication between the firm and the customer. Information capture measure emphasized the acquisition of customer information on an ongoing basis from various sources including customer interactions. Information integration scale reflected the efforts of the organization to bring together, on a customer basis, information collected from various sources and functions. Information access measure focused on the extent to which relevant employees could gain access to integrated customer data in a timely manner. Information use scale assessed the extent to which the firm used customer information to undertake actions that are consistent with customer relationship management.

Customer relationship performance scale measures customer satisfaction and customer retention. Organizational performance refers to market share and financial performance. Environmental dynamism and competitive intensity were measured by adapting scales from Jaworski and Kohli (1993).

*Formative Measures.* Formative measures were developed for the customer relationship potential and CRM technology use constructs. In both cases, the use of formative measures is justified because the indicators cover different facets of a construct and a summary index of the observed variables forms the construct. For formative constructs, the different variables causing the construct may not necessarily have significant intercorrelations (Homburg, Workman, and Krohmer 1999; Diamantopoulos and Winklhofer 2001).

Customer relationship potential is determined by variables such as the complexity and customizability of products, and the ease of obtaining customer information. These items were measured as 7-point Likert type items. The measure for CRM technology was created, as noted earlier, based on literature review, managerial interviews, and a preliminary survey on a CRM-related Website where we obtained feedback from practitioners. CRM technology use measure

has six aspects: sales support, marketing support, customer service support, data analysis support, data integration and access support, and customer database. In the questionnaire, the respondents were asked to mark items from a list of CRM technology applications that their organization was using. The marked items from this list were aggregated to measure CRM technology use, similar to the measure of innovation in Han, Kim, and Srivastava (1998).

### **Sample Characteristics and Data Collection**

Firms pursue customer relationship programs in both services and goods businesses as well as in business-to-business and business-to-consumer markets (Coviello et al. 2002). Therefore, in the interest of generalizability of the results, we decided not to constrain our sample to specific industries. Based on the interviews and pre-testing, a competent key informant was identified as a marketing, sales, or customer service executive, typically at the level of Vice-President or General Manager in a strategic business unit (SBU). Furthermore, since we found in our preliminary research that implementing customer relationship management and relational information processes are feasible without complex CRM technology (also see Rigby et al. 2002), it was not essential that our sample include only businesses that had implemented CRM technology. In effect, we developed a contact list of senior marketing, sales, and customer service managers in 1105 businesses (based on sales revenue) in the United States using two commercial lists.

The first list was vetted using telephone calls and provided key informant names and/or e-mail addresses in 542 organizations. These informants were mailed the print questionnaire two times and, where the e-mail address was available, sent e-mails requesting participation. They were also given an option of filling out the questionnaire on a Website. The format of the online questionnaire was similar to that of the print questionnaire. The 563 contacts on the second list,

for all of whom we had e-mail addresses, were e-mailed a maximum of three times with a request to respond using the questionnaire on the Website.

A total of 172 key informants responded to the mail and web-survey, a response rate of 15.56%. Data for eighteen respondents were used only for measurement analysis due to missing information on a number of questions. The questionnaire was complex and long, and senior managers were targeted as key informants. Given these considerations, the response rate is consistent with that reported in previous organizational research (see Diamantopoulos and Schlegelmilch 1996; Homburg and Pflesser 2000).

Of the respondents, 27.9 percent answered the mail questionnaire while the remaining 72.1% responded on the Web. The first list generated 45.5 percent of the respondents while the remaining 55.5% were from the second list. Respondents from the two lists, and those who responded online and by mail, were compared on key variables such as whether they have implemented a CRM system, annual revenue, and how long the key informant has been with the firm. Based on chi-square and F-tests, data from different sources did not significantly differ with respect to each of the above factors. Therefore, the data were pooled for further analysis.

Twenty eight percent of the businesses that provided data had implemented CRM technology while another 28.2 % were planning to do so. On average, the key informant had been with the company for about 8 years. The average annual revenue for the businesses that responded was 1.5 billion dollars. Business-to-business SBUs comprised 69.5% of the respondents while 30.5% were predominantly business-to-consumer SBUs (about 50% of which also had some business-to-business transactions). Of the respondents, 49.7% were goods businesses while 50.3% were service businesses. A comparison of early and late-responders to the survey indicated no significant differences in the characteristics of these SBUs on the means

of constructs such as CRM technology use and relational information processes, leading us to conclude that the likelihood of non-response bias is minimal.

## **Results**

### ***Measurement Model Results***

Confirmatory Factor Analysis (CFA) was used to assess the measurement properties of the reflective latent constructs.<sup>3</sup> Since there were a large number of indicators for the latent constructs (46), CFA was performed on each construct. Table 2 presents the CFA results. The chi-square test-statistics were significant. However, due to its sensitivity to sample size, other recommended goodness-of-fit statistics were used to evaluate the fit of various models. As shown in Table 2, these goodness-of-fit indices suggest acceptable fit for all the constructs. The construct reliabilities, computed using the procedure suggested by Werts, Lynn and, Joreskog (1974), ranged from 0.84 to 0.92 and are well above the recommended values. As shown in Table 1, the loadings range from 0.50 to above 0.90 (with most exceeding 0.70), suggesting that the indicators of the construct are acceptable.

### **(Insert Table 2 About Here)**

Relational information processes was conceptualized as a second-order construct with five sub-factors or dimensions. The second-order factor structure was examined by conducting a one-factor CFA on the summed scores of the respective five first-order constructs. The model fit was good, lending support to the second-order factor conceptualization for relational information processes (Chi-square=17.127 with 5 df; GFI=.960; AGFI=.881; Bentler and Bonett's normed index =.956; Bollen's normed index=.912; TLI=.968; RNI=.936).

Discriminant validity was assessed using the procedures suggested by Bagozzi (1980) and Fornell and Larcker (1982). Scores for each of the reflective measures—information flow,

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<sup>3</sup> Formative constructs, being indices, are not subjected to tests of reliability and confirmatory factor analysis.



information capture, information integration, information access, information use, customer relationship orientation, customer-centric management system, environmental dynamism, competitive intensity, customer relationship performance, and organizational performance—were formed by summing the respective indicators. A seven-factor correlated model was fitted. The loadings of the single factor models were fixed at the square root of the reliability of the factor. The summed scores of each of the five information factors were used as indicators of the relational information processes construct. Table 3 presents the results. The goodness-of-fit indices suggest an acceptable fit for the correlated model.

**(Insert Table 3 About Here)**

To assess discriminant validity using Bagozzi's procedure, correlations between each pair of constructs were fixed at one and the differences in chi-square degrees of freedom were used to determine if these correlations were different from one. The chi-square difference tests for all pairs of constructs except one were significant at  $p < .05$  (the customer relationship orientation-customer centric management system pair was significant at  $p < .08$ ). In addition, as suggested by Fornell and Larcker (1981), the shared variance between the indicators of a construct and the construct was computed. Also computed was the shared variance between two constructs, which is equal to the square of their correlation. As evident from Table 4, the shared variances of all constructs and their indicators are greater than the shared variances between all pairs of constructs. Overall, the results from the two tests provide support for discriminant validity among the constructs.

**(Insert Table 4 About Here)**

***Hypotheses Testing***

We estimated the following equations using three-stage least squares regression to test hypotheses H1-H7.

$$RIP = \beta_0 + \beta_1 CRO + \beta_2 CCM + \beta_3 CRP + \beta_4 CRP \times CRO + \beta_5 CRP \times CCM + \beta_6 CRO \times CCM + \beta_7 CRP \times CRO \times CCM + \beta_8 CI + \beta_9 ED + \varepsilon_1 \quad (1)$$

$$CP = \beta_{01} + \beta_{11} RIP + \beta_{21} CTU + \beta_{31} RIP \times CTU + \beta_{41} CI + \beta_{51} ED + \varepsilon_{11} \quad (2)$$

$$OP = \beta_{02} + \beta_{12} CP + \beta_{22} CTU + \beta_{32} CI + \beta_{42} ED + \varepsilon_{12} \quad (3)$$

where RIP=Relational Information Processes, CRO=Customer Relationship Orientation, CCM=Customer-Centric Management System, CRP=Customer Relationship Potential, CI=Competitive Intensity, ED=Environmental Dynamism, CP=Customer Relationship Performance, CTU=CRM Technology Use, and OP=Organizational Performance.

The system of equations had an overall R-Square of .58 ( $p < .0001$ ). Tests of multicollinearity provided no evidence of the same as none of the variance inflation factors exceeded 10. The results from the estimation are provided in Table 5 and are explained next.

**(Insert Table 5 About Here)**

H1 and H2, which hypothesized positive associations for customer relationship orientation and customer-centric management system, respectively, with relational information processes, were supported (.355,  $t$ -value = 3.152 and .270,  $t$ -value = 3.314). H3, which proposed that customer relationship potential will positively impact relational information processes, was not supported (.132,  $t$ -value = 1.538). However, H4 which hypothesized a joint positive effect for customer relationship potential, customer relationship orientation, and customer-centric management system on relational information processes was supported (.363,  $t$ -value = 2.403). Therefore, these motivational and ability factors have a synergistic influence on relational information processes.

H5 was supported (.765,  $t$ -value = 6.214), confirming the expectation that relational information processes will be positively associated with customer relationship performance.<sup>4</sup> H6 was supported (.154,  $t$ -value = 2.089), thus supporting the prediction that the use of CRM technology will enhance the impact of relational information processes on customer relationship

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<sup>4</sup> We also found support for the mediating role of relational information processes on the association between the motivating and ability factors and customer relationship performance using the procedures recommended by Barron and Kenny (1986).

performance. The moderating impact of CRM technology use on the association between relational information processes and customer relationship performance is explained in detail later using slope analysis. H7, which proposed a positive association between customer relationship performance and financial performance, was supported (.337,  $t$ -value = 2.794).<sup>5</sup> In addition, though we did not state a directional hypothesis, the main effect of CRM technology use on organizational performance was assessed. No significant relationship was observed.

### **Discussion**

The regression analysis provided substantial support for the hypotheses. The results show how customer relationship orientation (intrinsic motivator) and customer-centric management system (ability) individually, and with customer relationship potential (extrinsic motivator), jointly influence relational information processes. While extant marketing literature has highlighted the importance of information processes (Moorman 1995; Jaworski and Kohli 1993), there has been no effort to examine the information processes relevant to customer relationship management. As noted previously, the organizational information processes required to manage customer relationships are different from those needed to manage a transactional orientation. Thus, an important contribution of this paper is in emphasizing relational information processes by conceptualizing and measuring them, and demonstrating their motivational and ability antecedents. In this regard, though not hypothesized, we examined and found no significant difference between business-to-business and business-to-consumer firms in the extent to which they employed relational information processes ( $p = .180$ ). We also did not observe any significant difference between goods and services businesses in the extent of their use of relational information processes ( $p = .250$ ). Relational information processes has a positive relationship with customer relationship performance. Overall, we conclude that

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<sup>5</sup> Test of mediation, as suggested by Barron and Kenny (1986), show that relational information processes influence organizational performance through customer relationship performance.

relational information processes play an important role in the implementation of customer relationship management.

We developed a measure to capture CRM technology use through a multi-stage process that included interviews with practitioners. The results show that using CRM technology augments the influence of relational information processes on customer relationship performance while having no direct impact on customer relationship performance (see Table 5). Simple slope analysis (Aiken and West 1991) was conducted to clarify the nature of this interaction. As shown in Figure 2, customer relationship performance is enhanced by relational information processes when CRM technology use is low as well as high. However, as relational information processes go from low to high, customer relationship performance improves more rapidly for a high level of CRM technology use than for a low level of CRM technology use. The slope of the association between relational information processes and customer relationship performance was .03 (t-value = 2.94) when CRM technology use was low. The slope for the same association was .06 (t-value = 6.03) when CRM technology use was high. In effect, CRM technology use boosts customer relationship performance in conjunction with relational information processes. Interestingly, customer relationship performance at low values of relational information processes is inferior when CRM technology use is higher than when it is lower (see Figure 2;  $M = 9.40$  vs.  $M = 10.41$ ). This finding suggests that when appropriate relational information processes are not implemented, the use of CRM technology might do more harm than good.

**(Insert Figure 2 About Here)**

Additionally, though not hypothesized, we examined whether the use of CRM technology provided differential customer relationship performance advantage for business-to-consumer and business-to-business SBUs and found no significant difference ( $p = .858$ ). Also no significant difference was found in the impact of CRM technology use on the customer relationship

performance of goods and services businesses ( $p = .139$ ). Thus, the results from this study provide no reason to conclude that business-to-business SBUs and services SBUs enjoy any advantage over their business-to-consumer and goods counterparts, respectively, as far as the impact of CRM technology use is concerned. In addition, while CRM technology use is of benefit only in the presence of relational information processes, the use of the technology does not hamper organizational performance, a concern raised in the business press recently.

### ***Managerial Implications***

*The importance of relational information processes.* The study identifies the key relational information processes that should be implemented by businesses that choose to pursue customer relationship management. Delineation of relational information processes allows managers to track and evaluate the information routines relevant for customer relationship management. Furthermore, the manuscript explores key motivators and enablers of relational information processes, helping businesses to assess whether their customer relationship orientation and customer-centric management system, both of which can be controlled by managers, are consistent with the demands of relationship management. The identification of the extrinsic motivator of customer relationship potential helps managers determine whether to implement relational information processes. If the extrinsic motivator of customer relationship potential indicates advantages in pursuing a customer relationship management strategy, organizations could benefit from cultivating customer relationship orientation and designing a customer-centric management system to foster relational information processes.

*The role of CRM technology.* We find that the use of CRM technology augments the impact of relational information processes on customer relationship performance. Essentially, businesses should deploy CRM technology systems as a means to enhance the effectiveness of relational information processes. While CRM technology use by itself is not a panacea to

customer relationship management problems (also see Rigby et al. 2002), in the presence of properly designed relational information processes, the technology promotes customer relationship performance. Significantly, when appropriate relational information processes are not employed, the use of CRM technology seems to hurt customer relationship performance. Therefore, it is important that businesses assess their relationship information needs and design appropriate routines before implementing CRM technology. Thus, the failure of CRM technology to improve a firm's customer relationship performance could, at least partially, be attributed to the lack of effective relational information processes in the firm.

*Assessment of customer relationship management strategy.* We demonstrate that relational information processes influence organizational performance through its customer relationship performance. This finding supports current managerial efforts to focus on intermediate process measures such as customer satisfaction and retention to evaluate strategic marketing efforts rather than rely solely on financial performance measures (see Kaplan and Norton 1993). In other words, since relational information processes influence organizational performance through customer relationship performance, the latter serves as a diagnostic process measure for evaluating the effectiveness of customer relationship management.

*Customer relationship management implementation.* Based on the findings from this study, we suggest that the key decision facing managers deliberating the use of customer relationship management is not whether to implement CRM technology, but whether their organization could benefit from relational information processes. If the organization's motivators and ability suggest a situation conducive to the use of relational information processes, and such processes are effectively implemented, CRM technology is likely to play a supportive role in enhancing customer relationship performance. As such, we recommend the following guidelines for CRM implementation:

1. Assess customer relationship potential to determine the need for customer relationship management.
2. Examine customer relationship orientation and customer–centric management system to verify the organization’s readiness for customer relationship management.
3. If ready, design and implement relational information process.
4. Use CRM technology to support relational information processes.
5. Measure the effectiveness of customer relationship management through customer relationship performance and organizational performance.

### ***Research Implications***

Prior research in customer relationship management has not outlined the information processes that help organizations develop sustained bonds with their customers. We address this issue by conceptualizing and measuring relational information processes. By doing so, this study extends and links the relationship marketing and market information processing literature streams. In addition, the present research draws an important distinction between customer relationship management, a process long advocated by marketing academics, and CRM technology, its narrower connotation, which has been widely deployed in organizations. Customer relationship management, as proposed in this study, is an organizational strategy rooted in relational information processes. CRM technology, as discussed previously, is a supportive enabler of the design and implementation of relational information processes. The illumination of the distinctive and important roles of relational information processes and CRM technology in the pursuit of customer relationship management strategy helps advance the relationship marketing research stream.

### ***Limitations and Future Research Directions***

Typical of much empirical strategy research, the results of this study are based on self-reported data and could be constrained by common method bias. Obtaining objective performance data could have ameliorated this potential problem. However, two study design characteristics, while providing important benefits, prevented us from obtaining objective performance data. First, as Day and Van den Bulte (2002) observe, the appropriate level of analysis for customer

relationship management is the SBU. The use of SBUs to collect data limits our ability to get secondary performance measures because SBU-level performance measures are not available from public sources. Second, Coviello et al.'s (2002) finding that customer relationship management is practiced by businesses across a broad spectrum of industries guided our decision to conduct the study with data from a diverse sample of SBUs. Thus, an advantage of our study is the greater generalizability that the diversity in the sample of SBUs confers on the results. However, this advantage came at the cost of not obtaining objective performance data that might have been more easily available through organizational cooperation had we selectively sampled organizations. Thus, it would be beneficial to replicate this study in samples of businesses where cooperation allows access to internal data on organizational performance.

Several of the CRM technology users among the respondents were in the early stages of adoption and, hence, possibly still learning to use the complex technology. Despite this, we found support for the ability of CRM technology to enhance customer relationship performance in conjunction with relational information processes. This result should be encouraging to businesses that plan on using CRM technology as well as to CRM technology service providers. We expect that as businesses gain greater familiarity with the use of CRM technology, their ability to exploit its potential is likely to improve, provided appropriate relational information processes are implemented. Interestingly, Day and Van den Bulte (2002), using a single-item measure, found that CRM deployment is unlikely to contribute to customer-relating capability once a minimum competency level is reached. We tested and found no support for the diminishing positive impact of CRM technology use on customer relationship performance. The use of a more comprehensive measure of CRM technology use in this study compared to the single-item measure in Day and Van den Bulte (2002) might explain the variation in findings. An alternative explanation for this finding is that most businesses using CRM technology in our



sample were still learning to use it, and had not reached the minimum competency level. A longitudinal study of the joint role of relational information processes and CRM technology use to assess the impact of experience and learning with the technology may clarify this issue.

Due to data limitations, we did not evaluate the differential impact of aspects of CRM technology use such as sales support, marketing support, and service support on customer relationship performance. Thus, research is required to examine the roles of different dimensions of CRM technology on customer relationship performance. Additionally, the impact of CRM technology use on operating efficiency could not be assessed because we lacked cost information. This is an important topic for research because, as Rust, Moorman, and Dickson (2002) note in the context of quality, CRM technology use could have revenue expansion and/or cost reduction motives.

Other opportunities for research are provided by the conceptualization and measurement of relational information processes offered in this study. Assessment of the role of relational information processes on relationship learning (Selnes and Sallis 2003) and customer relating capability (Day 2000) could potentially enrich the relationship marketing literature. In addition, examination of the customer consequences of relational information processes, such as trust and commitment, could also provide rich insights.

**TABLE 1**  
**Construct Measures and Loadings**

**A. Reflective Measures****Customer Relationship Orientation**

In our organization, retaining customers is considered to be a top priority.	.837
Our employees are encouraged to focus on customer relationships.	.915
In our organization, customer relationships are considered to be a valuable asset.	.912
Our senior management emphasizes the importance of customer relationships.	.914

**Customer-Centric Management System**

We focus on customer needs while designing business processes.	.820
In our organization, employees receive incentives based on customer satisfaction measures.	.578
A key criterion used to evaluate our customer contact employees is the quality of their customer relationships.	.695
In our organization, business processes are designed to enhance the quality of customer interactions.	.859
We organize our company around customer-based groups rather than product or function-based groups.	.503
In our organization, various functional areas coordinate their activities to enhance the quality of customer experience.	.801

**Relational Information Processes****Information Flow**

We enable our customers to have interactive communications with us.	.695
We provide our customers with multiple ways to contact the organization.	.990
We focus on communicating periodically with our customers.	.887
We maintain regular contact with our customers.	.803

**Information Capture**

We collect customer information on an ongoing basis.	.921
We capture customer information from internal sources within the organization.	.768
We collect customer information using external sources (such as market research agencies, syndicated data sources, and consultants).	.502
The information collected from customers is updated in a timely fashion.	.717
We use customer interactions to collect information.	.635

**Information Integration**

We integrate customer information from the various functions that interact with customers (such as marketing, sales, and customer service).	.820
We integrate internal customer information with customer information from external sources.	.711
We integrate customer information from different communication channels (such as phone, mail, e-mail, the Internet, fax, and personal contact).	.851
We merge information collected from various sources for each customer.	.864

**Information Access**

In our organization, relevant employees find it easy to access required customer information.	.884
In our organization, relevant employees can access required customer information even when other departments/functional areas have collected it.	.874
In our organization, relevant employees always have access to up-to-date customer information.	.876
In our organization, relevant employees are provided the information required to manage customer relationships.	.829

**Information Usage**

We use customer information to develop customer profiles.	.693
We use customer information to segment markets.	.710
We use customer information to assess customer retention behavior.	.666
We use customer information to identify appropriate channels to reach customers.	.776

**TABLE 2**  
**Measurement Model Results for Reflective Measures**

<b>Construct</b>	<b>Number of Indicators</b>	<b>Construct Reliability</b>	<b>Chi-Square (df)</b>	<b>GFI (AGFI)</b>	<b>Bentler's Normed Fit Index</b>	<b>Bollen's Normed Index</b>	<b>Rescaled Normed Index</b>	<b>Tucker Lewis Index</b>
<b>Customer Relationship Orientation</b>	4	.941	2.580 (2)	.992 (.959)	.997	.999	1.000	.993
<b>Customer-Centric Management System</b>	6	.863	35.906 (9)	.929 (.834)	.919	.938	.937	.895
<b>Information Flow</b>	4	.912	.927 (1)	.997 (.973)	.997	.979	1.000	1.000
<b>Information Capture</b>	5	.840	14.023 (5)	.968 (.904)	.960	.974	.973	.973
<b>Information Integration</b>	4	.886	6.178 (2)	.982 (.908)	.983	.948	.988	.964
<b>Information Access</b>	4	.923	8.215 (2)	.975 (.872)	.983	.983	.981	.940
<b>Information Use</b>	7	.803	49.869 (14)	.919 (.837)	.906	.931	.930	.895
<b>Customer Relationship Performance<sup>1</sup></b>	2	.795	--	--	--	--	--	--
<b>Organizational Performance<sup>1</sup></b>	2	.805	--	--	--	--	--	--
<b>Competitive Intensity<sup>1</sup></b>	3	.928	--	--	--	--	--	--
<b>Environmental Dynamism</b>	5	.889	13.653 (5)	.962 (.885)	.964	.977	.977	.953

<sup>1</sup>Goodness-of-fit indices for constructs with 3 or less indicators are not reported as they have a perfect fit.

**TABLE 3**  
**Discriminant Validity Results: Loadings and Construct Reliabilities**

Constructs	Loadings
Relational Information Processes (.875) <sup>1</sup>	
• Information Flow	.700
• Information Capture	.777
• Information Integration	.835
• Information Access	.699
• Information Usage	.803
Customer Relationship Orientation	.970 <sup>2</sup>
Customer-Centric Management System	.929 <sup>2</sup>
Environmental Dynamism	.943 <sup>2</sup>
Competitive Intensity	.963 <sup>2</sup>
Customer Relationship Performance	.892 <sup>2</sup>
Organizational Performance	.897 <sup>2</sup>

<sup>1</sup>Value in parenthesis is construct reliability.

<sup>2</sup>Loadings are fixed to square roots of respective reliabilities.

**Goodness-of-Fit Indices**

Chi-Square=64.154 with 29 df (p=.000); GFI=.931; AGFI=.837; Bentler & Bonett's Normed Fit Index = .896; Bollen's Normed Index = .949; Rescaled Normed Index=.948; Tucker-Lewis Index=.902.

**TABLE 4**  
**Correlations among Constructs and Discriminant Validity<sup>1</sup>**

Constructs <sup>2</sup>	Reflective Constructs									Formative Constructs	
	Mean	Std. Dev.	RIP	CRO	CCM	ED	CI	CP	OP	CRP	CTU
<b>RIP</b>	112.17	25.69	<b>.585</b>	.434	.441	.077	.101	.294	.078	---	---
<b>CRO</b>	28.23	6.32	.612	<b>.941</b>	.607	.064	.136	.423	.096	---	---
<b>CCM</b>	25.19	7.41	.596	.706	<b>.863</b>	.076	.117	.349	.078	---	---
<b>ED</b>	22.74	7.98	.249	.246	.253	<b>.889</b>	.050	.063	.047	---	---
<b>CI</b>	16.51	6.86	.301	.352	.315	.214	<b>.928</b>	.008	.003	---	---
<b>CP</b>	10.80	4.29	.461	.564	.492	.216	.081	<b>.796</b>	.319	---	---
<b>OP</b>	9.31	2.20	.236	.260	.223	.175	.043	.446	<b>.805</b>	---	---
<b>CRP</b>	36.11	2.49	.460	.537	.449	.501	.409	.424	.214	---	---
<b>CTU</b>	4.77	7.98	.126	.084	.110	.058	.032	.052	-.098	.010	---

<sup>1</sup>Diagonal entries are shared variances between the indicators and its respective constructs, entries below the diagonal are correlations, and entries above the diagonal are shared variance between the respective constructs obtained from CFA analysis.

<sup>2</sup>RIP=Relational Information Processes; CRO=Customer Relationship Orientation; CCM= Customer-Centric Management System; ED=Environmental Dynamism; CI=Competitive Intensity; CP=Customer Relationship Performance; OP=Organizational Performance; CRP=Customer Relationship Potential; CTU=CRM Technology Use.

**TABLE 5**  
**Result of Three-Stage Least Squares Regression**

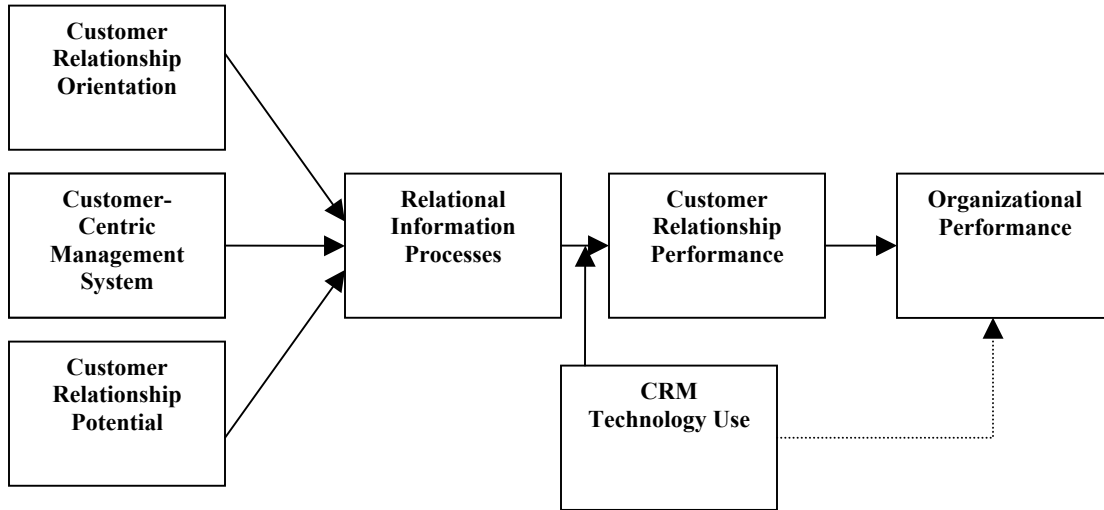
Predictor Variables	Hypotheses	Equation 1		Equation 2		Equation 3	
		Dependent Variable: Relational Information Processes	Dependent Variable: Customer Relationship Performance	Dependent Variable: Customer Relationship Performance	Dependent Variable: Organizational Performance	Dependent Variable: Organizational Performance	Dependent Variable: Organizational Performance
		Standardized Coefficient	t-value	Standardized Coefficient	t-value	Standardized Coefficient	t-value
Customer Relationship Orientation (CRO)	H1	.355	3.152**	---	---	---	---
Customer-Centric Management System (CCM)	H2	.270	3.314**	---	---	---	---
Customer Relationship Potential (CRP)	H3	.132	1.538	---	---	---	---
CRP×CRO		.282	1.726	---	---	---	---
CRP×CCM		.063	.527	---	---	---	---
CRO×CCM		.021	.204	---	---	---	---
CRP×CRO×CCM	H4	.363	2.403**	---	---	---	---
Relational Information Processes (RIP)	H5	---	---	.765	6.214**	---	---
CRM Technology Use (CTU)		---	---	-.036	-.502	-.121	-1.640
RIP×CTU	H6	---	---	.154	2.089**	---	---
Customer Relationship Performance (CP)	H7	---	---	---	---	.337	2.794**
Competitive Intensity (CI)		.021	.320	-.180	-2.150**	-.003	-.048
Environmental Dynamism (ED)		.006	.089	.045	.566	.110	1.383
		R <sup>2</sup> *	.47		.19		.21

\*System R<sup>2</sup> = .58 (p < .0001)

\*\*Significant at p < .05

**FIGURE 1**  
**Conceptual Framework**

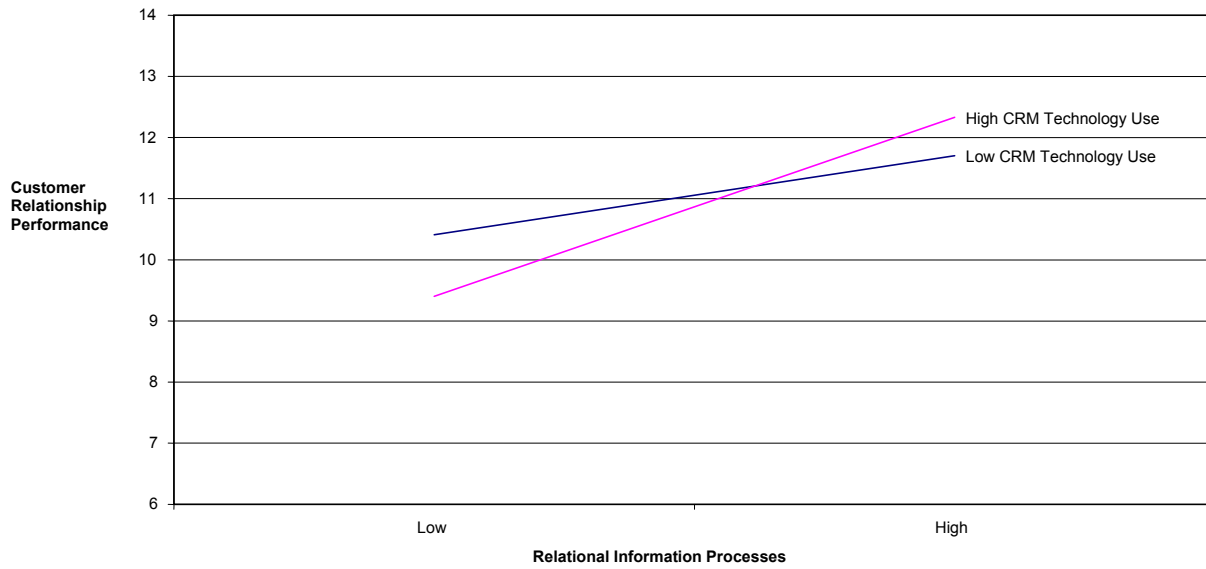
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**FIGURE 2**  
**Slope Analysis: Moderating Effect of CRM Technology Use on the Relational Information Processes-Customer Relationship Performance Association**

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