

## **Industrial Organization and Customer Relationship Management: The Impact on Customer Service Orientation in B-to-B Markets**

**Richard Lancioni<sup>\*</sup>, Michael Smith<sup>\*\*</sup> & Alex Stein<sup>\*\*\*</sup>**

*Despite the widespread adoption of customer relationship management (CRM) systems by firms operating in business-to-business markets, there is continued management skepticism concerning the effectiveness of these systems and their association with the firm's overall "customer information orientation." The research focuses on these topics by looking at the relationship of customer relationship management with overall firm performance in B-to-B settings across a range of traditional business performance measures. The researchers use an advanced statistical approach to determine the key variables for activating the model constructs. The findings of the research provide support for the result that a firm's customer orientation is indeed associated with relationships management system implementation in a firm.*

**Key Words:** CRM, B-to-B, Customer Service Orientation

### **Introduction**

The number of implemented customer relationship management (CRM) systems, generally in the form of IT databases and communications systems, has grown markedly during the past ten years. These implementations have generally taken the form of extended sales automation systems and enterprise resource planning (ERP) systems, in most cases replicating an existing process using modern database and networking technologies. In a survey conducted in 2004 in the northeastern United States, 60% of mid-sized companies indicated their intention to initiate or expand their CRM usage, while only 2% indicated they currently had no plans to implement a CRM system (Neuborne, 2005). More recently, such shared on-demand Internet services as NetSuite, RightNow Technologies, Salesforce.com and CRM OnDemand have given smaller firms an opportunity to develop CRM capabilities at significantly

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<sup>\*</sup> Professor (Marketing), Fox School of Business, Temple University, Philadelphia, USA  
E-mail:

<sup>\*\*</sup> Associate Professor, Fox School of Business, Temple University, Philadelphia, USA

<sup>\*\*\*</sup> Assistant Professor (Marketing), Gaucher College, Baltimore, MD, USA

lower capital outlays (Myron, 2005). The resulting solutions have improved efficiency within the narrow confines of traditional sales management, providing firms with real-time sales planning, sales team development, pipeline reporting and project tracking capabilities.

Critics have observed that the implementation of a CRM solution is not sufficient to create a true “learning organization.” Rather, organizations need to think across organizational functions to truly benefit from CRM. This requires “thinking across departmental boundaries in order to concentrate on adding value to the customer... [there is] the need for marketing to act as an integrating function in coordinating the organization’s interaction with the customer” (Wilson, Daniel and McDonald, 2002, p. 194-5). If properly implemented, the organization’s CRM system is uniquely well positioned as a knowledge management tool, able to serve as the value creating interface between the firm’s functional units (including those linked by an ERP) and its customers. However, there is no existing research to support the value of CRM in the broader context of the organization’s customer information orientation, and specifically in the business-to-business market space.

Along these lines, Day (2000) has proposed that successful customer relationship strategies are associated with three organizational characteristics: (1) an organizational relationship orientation, (2) developing and utilizing knowledge of the customer, and (3) effectively integrating and aligning internal and external processes. Each of these proposed constructs has a relatively well-developed body of literature: *customer relationship orientation* (Wyner, 1999; Simmons and Munch, 1996; Slater and Narver, 1994; Day and Wensley, 1988; Kotler, 1984); *customer knowledge orientation* (Shoemaker, 2001; Szulanski and Winter, 2000; Slater and Narver, 1995; Kohli and Jaworski, 1990); and *internal and external organizational alignment* (Crotts, Dickson and Ford, 2005; Bowditch and Buono, 2001; Nadler and Tushman, 1997; Burns and Stalker, 1961).

The focus of the present research is the operationalization and testing of the Day (2000) hypothetical construct as it relates to “customer knowledge orientation,” in the B-to-B space, and the link between CRM use and firm performance. For the purposes of the study, customer knowledge orientation will be operationalized as a set of data collection, data management and information dissemination functions rather than as the strictly sales support process traditionally associated with CRM solutions.

## **BACKGROUND**

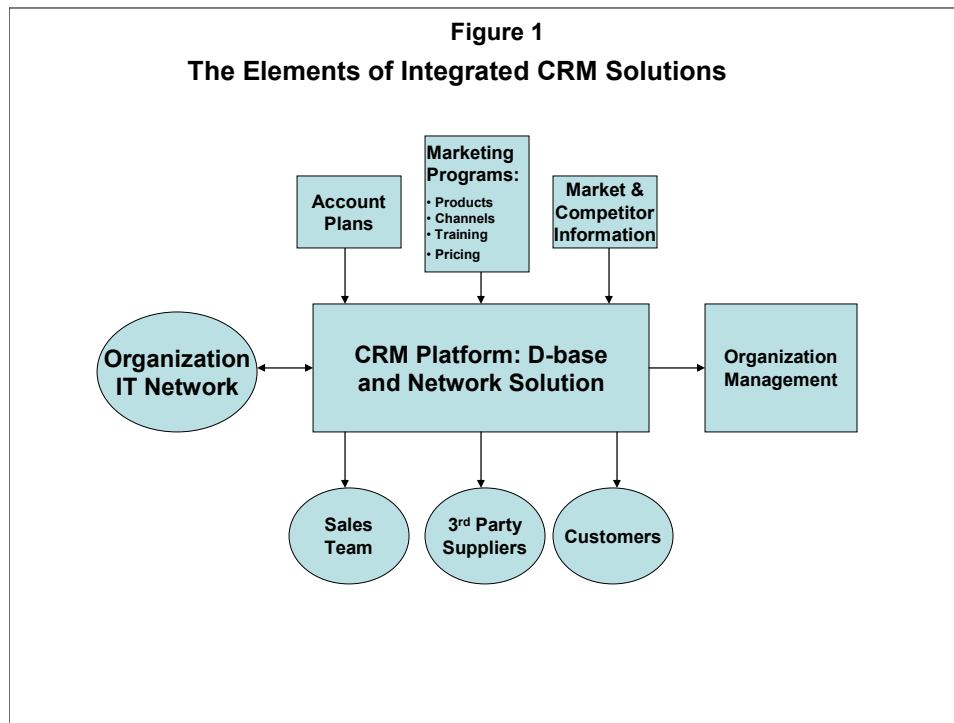
### **The Integrated CRM System as a Knowledge Resource**

According to Lemon, White and Winer (2002), “the trend in marketing toward building relationships with customers continues to grow, and marketers have become

increasingly interested in retaining customers over the long run” (p. 1). The large number of CRM implementations over the past decade can be seen “as a contemporary response to the emerging climate of customer churn, waning brand loyalty and lower profitability” (Agrawal, 2003, p. 151). Furthermore, “CRM is central to the task of making an organization customer-centric [and] is the surest symbol embracing information technology in business [and] the most certain way to increase value to the customers and profitability to the practicing organizations” (p. 151).

CRM systems run the gamut, from the old “sales systematics” which organize sales information and systematize sales processes, to full-blown systems that structure and integrate all sources of the firm’s customer and market information. Similarly, CRM may take the form of Salesforce.com’s Internet-enabled virtual solution or SAP’s hardware-intensive site networks. However, CRM as a discipline is regularly conducted in organizations of all sizes, including traditional “mom and pop” operations, where customer information is generally maintained in the consciousness and memory of current managers. In larger organizations, where institutional memory is fragmented and transitory, CRM has increasingly taken the form of complex IT systems. Users have a myriad of alternative technology frameworks available to them, now, to help them identify their specific solution.

Regardless of the technology platform selected by a firm, modern integrated CRMs typically combine various information sources: account plans, the company’s marketing programs, and competitive and market information. CRMs also have multiple users, those for whom the database provides continuous value in helping to formulate selling and buying strategies. These users include the sales team, third-party suppliers (including service organizations, component and sub-assembly providers), corporate managers and customers. Figure 1 summarizes the sources of CRM information and the users of that information.



An effective CRM system governs the organization's marketing and sales philosophy at all levels, including policies and processes, front-end customer service, employee training, marketing program development, and systems and information management. The most effective CRM systems are integrated end-to-end across marketing, sales, and customer service. Additionally, they provide generally indirect linkages to key operational activities, including product development, manufacturing, procurement and human resources.

The firm's CRM system should identify factors important to clients, promote a consumer-oriented philosophy, use customer-based measures, develop end-to-end customer management processes to serve customers, provide customer support (including handling complaints), and track all aspects of sales. In other words the system should create a holistic view of customers' sales and services information. Superior strategy development and implementation is "achieved through open-minded inquiry, synergistic information distribution, mutually informed interpretations, and accessible memories." "Accessible memory" is important because, as Day (1994) states, "market-driven inquiry, distribution, and interpretation will not have a lasting effect unless what is learned is lodged in the collective memory. Organizations without practical mechanisms to remember what has worked and why will have to repeat their failures and rediscover their success formulas over and over again" (p. 44).

Achrol and Kotler (1999) believe that such learning is best accomplished in the “network organizations [which is a] superior learning organization because it organizes functional components so that each fits better with its external knowledge environment” (p. 147). The emphasis is on diffusing knowledge through a *dynamic* integrated CRM system, not just on collecting customer and market information. The relationship between the firm’s knowledge base and its strategy is complex and multi-dimensional. Zack (1999) states “...the most important context for guiding knowledge management is the firm’s strategy. An organization’s strategic context helps to identify knowledge management initiatives that support its purpose or mission, strengthen its competitive position, and create shareholder value” (p. 128).

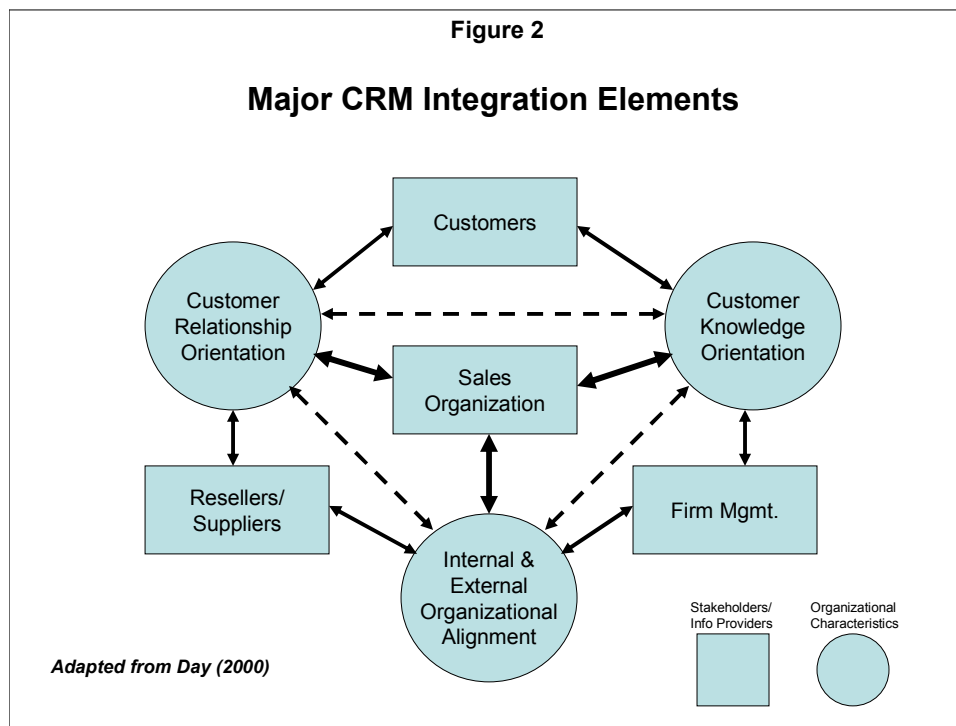
Properly organized and applied, information can become the knowledge that defines the mission, form and strategy of the firm. Achrol (1991) states that “with the coming of the age of information, the generic level of almost any kind of business and its core business strategy is intertwined with its knowledge environment.” In other words, the value of many firms’ information “is greater than [their] capital assets.” He defines these as “knowledge-rich environments” (p. 79). Knowledge that is available throughout the organization for use by key internal and external stakeholders leads to a more flexible and customer-responsive firm.

Zack (1999) argues that customer information orientation can significantly reduce competitive lead times. This is because a knowledge advantage can significantly accelerate product development, infrastructure upgrades and relationship-building with key entities. Research conducted by Deshpande, Farley and Webster (1993) supports the view that “firms with cultures that are relatively responsive ([to their] market) and flexible ([act as an] adhocracy) outperform more consensual (clan[nish]) and internally oriented, bureaucratic (hierarchical) cultures” (p. 31). As the repository of the firms’ sales history, customer profiles and on-going promotions activities, a comprehensive and integrated CRM may be a crucial element of the firms’ marketing strategy.

### **The Structure and Success Factors of the Dynamic CRM System**

A dynamic CRM system is often at the heart of the network organization’s knowledge management network and process. It is the repository of account plans, installed base information, customer requirements, purchase intentions, and sales leads. It is frequently the central “touchpoint” for customers, field, internal and contract sales personnel, suppliers and firm management seeking to add input or gain knowledge. Seybold (2001) defines the process that can result from the proper structuring and application of CRM information as “thinking in terms of customer scenarios” (p. 81). This means giving the customer the tools to make the right purchase decision – and providing the right incentives to select the solutions proffered by the firm. In this sense, an integrated CRM is a customer definition and strategy tool brought down to the level of the individual customer transaction.

Integrated CRM, however, is more than the tool and symbol of the new relationship marketing. It is, in fact, an integrated strategy solution intended to maximize synergies across all of the firm's existing programs targeting relevant customer communities. For example, "it [can] more precisely measure the impact of a particular promotion on sales and profits" for the firm and its channel partners (Rigby and Ledingham, 2004, p. 121). A comprehensive and integrated CRM capability must therefore at minimum store customer, competitor and general market information; organize the information for multiple uses; retrieve the information when and where it is needed; and update this information in real time for key constituencies of the firm. Figure 2 summarizes the integrated CRM framework.



Achrol and Kotler (1999) observe that "the classic hierarchical organization of the twentieth century is focused on the technologies of production. It is designed to economize on the bounded rationality of top management and minimize the governance costs of sequential adaptation to contingencies. But the challenge posed by knowledge-rich and dynamic industries is to create organizations that are maximally open to their environments and can approach a state of more or less continuous adaptation to fluid environments. This calls for organizations that are "focused on processing information and creating knowledge" (Achrol and Kotler, 1999, p. 148). The answer is to develop continuous information exchanges between the firm and its constituencies, and in particular the major customer groups that define the "dynamic markets" so critical to the survival and growth of the firm.

## **CRM and Customer Knowledge Orientation**

Sun, Li and Zhou (2006) define a primary purpose of CRM systems as “adaptive learning.” This is the process of “[extracting] hidden predictive information from large databases to identify valuable customers, learn about their preferences, predict future behaviors, and estimate customer value” (p. 83). In this sense, the CRM system is an integral part of the “learning organization” as described by Senge et al (1999). Learning organizations are continually adaptive to their environments, monitoring external changes and adapting their internal cultures and processes to the changes surrounding them. These changes are not only in the macro-environments of the firm, including the social and cultural, macroeconomic, political and regulatory, technological and competitive realms, but also in the microeconomic environment, which includes channel partners, suppliers and customer markets. The firm’s data warehouse is crucial for identifying new environmental patterns, and data mining is increasingly becoming standard practice in many firms (Hand, Mannila and Smyth, 2001).

The firm’s orientation toward this sort of “active learning” may be differentiated from its approach to “passive learning.” Sun, Li and Zhou (2006) define passive learning as the process of periodically reviewing the firm’s customer databases to undertake campaign-centric programs. The resulting “snapshots” should provide a better understanding of customers’ needs and wants – and their likely response to the firm’s value proposition, but consequent inferences are made in an ad hoc manner. Customer needs are identified on the basis of their historical purchases and progressive new product acceptance, which is in essence a retrospective viewpoint.

Firms that undertake “active learning” tend to approach the process in an entirely different way. Rather than utilizing a campaign-focused model of identifying customers with a potential need for the firm’s “next solution,” active learner firms seek to better understand customers’ needs in their latent form in order to operationalize an optimal solution in the form of the firm’s next value proposition (Edwards and Allenby, 2003). In order to serve this purpose, the CRM system must be more than a repository of transactional information. It must include in-depth account plans, customer survey results, customers’ self-reported consumption and applications information, and a detailed record of the firm’s interactions with customer personnel (Rust and Verhoef, 2005).

Rather than taking a retrospective view of their customer markets, active learners utilize their CRM systems for modeling customers’ self-perceived needs from direct and trace information stored in the data warehouse. The resulting “perceptual map” of customers’ wants and needs is general in its latency but specific in terms of the constellation of value proposition “ideal characteristics” (Moore and Pessemier, 1993). Sun, Li and Zhou (2006) point out that traditional market segmentation, which is an example of passive learning, is characterized by a search for heterogeneity.

*Differences* in the perceived needs of various customer clusters drive the development of a set of solutions for individual clusters, or groups of customers. By contrast, active learning organizations seek to find consistencies *within* individual accounts, providing specifically targeted solutions based on the firm's in-depth knowledge of these customers.

In contrast with the "snapshot" segmentation approach of passive learning, active learning involves the creation of a development path for each current and potential customer. The CRM data warehouse defines this path through a continually evolving re-definition of the customer's specific needs and wants. Shoemaker (2001) defines this as "customer knowledge orientation." CRM systems that promote active learning and the involvement of a learning organization may be expected to achieve a better performance than firms with a passive learning approach. Moreover, given the high costs associated with CRM implementation, including system development, system implementation and user training, successful CRM users frequently require these benefits in order to justify their investment (Marshak, 1999).

Smeds and Alvesalo (2003) point out that the active learning organization is particularly important in an increasingly global economy in which management is faced with "the development of global business processes...with the dilemma of local versus global designs, centralization versus decentralization, control versus autonomy" (p. 362). Adapting their processes to rapidly changing conditions is therefore crucial to maintaining competitiveness and a key factor in overall firm performance.

## **CONCEPTUAL FRAMEWORK AND HYPOTHESES**

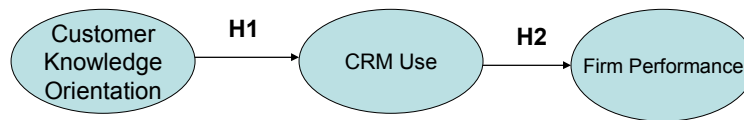
### **Conceptual Framework**

Based on the Day (2000) hypothetical construct and the literature on customer communities, we propose that (1) relationship orientation, knowledge orientation and aligned internal and external resources are related to the use of CRM systems in B-to-B markets; and (2) CRM implementation is related to the performance of the firm in the B-to-B market space. This model is shown in Figure 3.



Figure 3

**Conceptual Model: CRM Implementation and Customer Community Effect on Customer Relationships**



## Research Hypotheses

### *Customer Knowledge Orientation*

Knowledge management is the primary function of the CRM system, so it follows that knowledge orientation is a key characteristic of firms that successfully implement integrated CRM solutions in B-to-B markets. Kohli and Jaworski (1990) assert that “market intelligence is a broader concept than customers’ verbalized needs and preferences in that it includes an analysis of exogenous factors that influence those needs and preferences” (p. 3). Environmental factors, including the state of technology and the cyclical nature of the industry and the overall economy, must also be considered in evaluating the firm’s strategic options. Moreover, an integrated CRM must provide more than customer preference data, since the customer frequently knows only what s/he has seen or used. Possibilities outside the customer’s existing conceptual framework are often difficult if not impossible for him/her to understand, much less communicate.

The integrated CRM must therefore pick up patterns of use and recurring product/service/support issues that the customer may overlook or be unable to effectively communicate. This requires “organizational learning,” defined by Slater and Narver (1995) as “the development of new knowledge or insights that have the potential to influence behavior” (p. 63). Adaptive learning is “the most basic form of learning [which] occurs within a set of recognized and unrecognized constraints (i.e., the learning boundary) that reflect the organization’s assumptions about its

environment and itself” (p. 63). On the other hand, “generative learning occurs when the organization is willing to question long-held assumptions about its mission, customers, capabilities, or strategy. This requires a new way of looking at the world based on an understanding of the systems and the relationships that link key issues and events” (p. 63). This continuous learning process is supported by “knowledge management” (Shoemaker, 2001, p. 178).

The degree of a firm’s customer knowledge management is determined by: (1) the level of the sales managers’ understanding of reporting capabilities, and their encouragement of the use of knowledge management systems by sales personnel; (2) salespersons’ information gathering skills, including skills in the areas of (a) data gathering, (b) business data privacy handling, (c) questioning, and (d) data mining; (3) the degree of salesperson autonomy in decision making; and, (4) salespersons’ effectiveness in customer pre-approach and presentation (Shoemaker 2001).

CRM supports the process of adaptive, or active, learning by helping the sales organization, management, customers, resellers and suppliers to better understand the impact of new implementation and use patterns of products and services supplied by the firm. An effective CRM must facilitate the development of a knowledge orientation in each of the firm’s stakeholders. Organizational knowledge orientation means that (1) only best available practices are copied, (2) everyone works from the same active best practice template, (3) best practices are copied as closely as possible, (4) adopted practices are tested and adapted only after good results are achieved, and (5) best practice templates are kept in mind after their adoption by the organization (Szulanski and Winter, 2000).

**H1:** *The relationship of ‘customer knowledge orientation’ to ‘CRM use’ is positive in B-to-B markets.*

### ***Customer Relationship Management and Firm Performance***

The final test of an integrated CRM, as for any major capital outlay or operating expense, is its contribution to the viability and growth of the organization. Key measures of CRM performance therefore include profitability, account sales and account gross margins. As Agrawal (2003) points out: “The key dimensions of CRM that were largely ignored in the past are customer loyalty and customer profitability” (p. 153). Research shows that an increase in customer loyalty by five percent could increase profits in telecom by over 50 percent, and a study by ICL for a UK Telco showed that a ten percent churn in the top ten percent of profitable customers would reduce profits by more than 25 percent. In presenting their model of customer value, Gupta, Lehmann and Stewart (2004) observe that “Customer retention is one of the most critical variables that affect customers’ lifetime profit” (p. 12).

Nemati, Barko and Moosa (2003) support the view that “CRM has become a key process in strengthening of customer loyalty ... customers no longer guarantee their

loyal patronage, and this has resulted in organizations attempting to better understand them, predict their future needs, and to decrease response times in fulfilling their demands” (p. 74).

**H2:** *The relationship of ‘CRM use’ to ‘firm performance’ is positive in B-to-B markets.*

## **Research Methodology**

This study employs a multi-method approach, including small group in-depth interviews of organizational management teams and large sample CRM user and non-user surveys. The multi-method approach of this research incorporates a range of sources and data collection strategies to give depth and dimensionality to the research data. The group in-depth interviews serve as exploratory research in order to effectively frame the research problems. The user and non-user surveys provide the scaled data to test the resulting hypotheses.

## **Respondent Firm Characteristics**

The survey sample was drawn from a broad range of industries with generally high CRM system development and customer community presence. Although these industries are at varying levels of sophistication and advancement with regard to CRM technology, each has participants with significant experience with CRM development and use in B-to-B markets (Yu, 2001).

A further criterion for the selection of representatives from firms in these industries is the self-identified expertise of respondents concerning CRM usage and performance. In these industries, community members as well as management are knowledgeable and well informed concerning current and evolving technologies, new and innovative applications, value delivery networks, and related topics. In-depth group interviews were conducted within seven selected firms that volunteered to participate in the study. See Appendix A for a description of the firms and interviewees participating in the in-depth group interviews. These interviews lasted between one and three hours at the host firm’s offices and/or over the telephone. Subsequently, e-mail messages were exchanged with these respondents for the clarification and amplification of their comments and responses.

The in-depth group interviews were arranged by invitation. These voluntary participants were requested to provide the necessary access, on a strictly confidential basis, to company personnel, relevant records and current and historical activities. Group interview participants were selected based on their expertise as reported by the host firm. Participants were not compensated; rather, the firm will be provided with a summary report of the research findings. These interviews were conducted with a small number of managers (generally between three and five) from each firm. Whenever possible, participants were selected for a range of organizational functions

and expertise related to the specification, development, implementation and use of CRM systems in B-to-B settings.

The in-depth interviews were conducted for the purposes of determining whether the scale items derived from published sources were comprehensive and well understood. The interview guide that was employed for these discussions (see Exhibit B) was open-ended and designed to engender discussion to raise key issues for the large-scale user survey. A consistent set of questions was raised to each group and responses were recorded in the form of handwritten notes. These in-depth interviews provide a valuable context for CRM usage and performance across a range of organizations in the B-to-B setting, as well as providing the basis for a comprehensive set of survey questions.

### **Sample Structure**

Survey respondents that currently have CRM systems and those that do not currently have system implementations were sourced from the Vendor Compliance Federation (VCF), a Division of Trading Partners Collaboration, a not-for-profit organization dedicated to business-to-business customer relationship development. The organizational mission of VCF is to provide educational forums for exploring channel relationships, including the policies, practices and tools of business contracting. VCF membership is composed of middle and upper level managers in organizations involved in business-to-business strategy formulation and operations. These are the managers within the organization who would specify and use CRM systems as well as other business relationship tools. The membership of VCF represents a wide range of industries and industry roles. Based on available descriptions, this membership appears to be highly representative of the general population of CRM users.

The request to the VCF membership yielded 206 usable survey questionnaires from CRM users and non-users. 107 of these respondents indicated that their organization does not currently have a CRM system; 99 respondents indicated that their organization currently has an operational CRM system. Respondents were directed to complete the survey using an Internet-based instrument. Telephone calls to selected respondents were made by VCF officers to encourage a high response rate of the membership. In addition, those who were contacted concerning the survey were asked to pass the URL to other possible respondents. This “snowballing” technique was intended to increase the sample population and to extend the diversity of respondents in order to more closely reflect the overall population of CRM system users.

For the purposes of the CRM user survey, the VCF was asked to publish the URL for the Zoomerang Internet survey in various membership publications, including the quarterly newsletter, and to announce the same at major organization meetings. Requests for participation were directed to product managers, communications managers, division managers and general marketing heads, with one respondent (the

highest ranking) selected from each firm. VCF membership corresponds roughly with the overall CRM user population in terms of the key descriptors: sales volume, number of employees and industry classification. In consideration for the association's efforts, the author volunteered to make a presentation of the overall findings of this research.

There is substantial support for the use of key informants within organizations as reliable sources of organizational and industry information. John and Reve (1982) report the "results [of their research] indicates that key informants from different firms within channel dyads provided reliable and valid data about the structural form of the relationship" (p. 522). However, Phillips (1981) finds "support [for] the contention that the mono-method single-informant approach to the measurement of organizational characteristics should be abandoned" (p. 411). Instead, she recommends that researchers should utilize multiple sources and methods in order to corroborate and add richness to research data. In light of this admonition by Phillips, this study employed a multiple informant approach in the small group in-depth interviews. The value of key informants for the questionnaire survey was determined based on the convergence of multiple respondents from the same organization in the exploratory research. A general consensus among in-depth group interview participants was observed in the areas of system description, customer and vendor relationships, CRM benefits and overall organizational performance. This was the basis for the decision concerning the use of key informants for conclusive research.

All respondents, including those involved in group in-depth interviews or questionnaire surveys, were offered a brief summary of the final study report as incentive for their participation. Minimum sample size was determined by the demands of each specified method and subsequently used analysis technique.

### **Research Design, Questionnaire and Scale Development**

An interview guide for the exploratory small group in-depth interviews, involving multiple management teams responsible for CRM solutions in a range of organizations (Appendix B), served as the basis for broad-based conclusive research (survey questionnaire in Appendix C) concerning the success factors for CRM implementations. Because validated scales are not available for the defined latent construct, customer knowledge orientation, it was necessary to develop a range of questions for pre-testing. These scale items were derived from a search of the existing literature on the topics of customer knowledge orientation and firm performance. Several peer reviewed articles have addressed these constructs one dimensionally, and have published scale items for each dimension.

These questions were subjected to three rounds of questionnaire pre-testing by the management teams involved in the preliminary in-depth interviews, with the

participation of from three to five experienced managers from each team for each of the three rounds of revisions. Following each round of reviews, the proposed changes were presented to the original respondents from each team. At each round the questions were further refined and new questions were added based on these responses. Managers were asked to review the resulting questionnaire for (1) ambiguous wording, (2) double-barreled questions, (3) loaded questions, and (4) questionnaire structural and visual issues. At each revision, an attempt was made to eliminate biases and to expand or contract the scope of the questions, as appropriate.

Respondents were asked questions in five major areas: (1) the characteristics of the organization; (2) the form and extent of the firm's CRM implementation; (3) the perceived success of CRM system implementation with regard to customer retention and a range of other firm performance criteria; (4) the existence and form of the firm's customer communities; and (5) the relationship of the firm with its customers. Where appropriate, seven-point Likert-type scales were used (e.g., 1=strongly disagree to 7=strongly agree). Throughout the study, consistent with standard practice (Flora and Curran 2004), ordinal data has been treated as continuous data in order to facilitate interpretation. The survey data was subjected to factor analysis to identify any new factors which should be considered in the study.

### **Reliability and Validity**

Cronbach's alpha was used to evaluate reliability. For the purposes of exploratory research a Chronbach's alpha of .7 or .8, and sometimes as low as .6, is generally deemed adequate (Peterson 1994). A review of the literature did not identify existing validated scales directly associated with the latent construct, customer knowledge orientation. However, several peer reviewed articles have addressed this construct one dimensionally (as individual scale items rather than as related items) and have suggested scale items for operationalizing "customer knowledge orientation" (Shoemaker, 2001; Szulanski and Winter, 2000; Slater and Narver, 1995; Kohli and Jaworski, 1990).

This research is reliant on nomological validity to the extent to which predictions from the accepted network of theory are borne out in the new measures developed in this study (Bagozzi, 1994). The newly measured constructs "behave" in expected ways in relation to other well understood constructs, and this contributes to confidence in the new measures. From the earliest stages of this research, nomological and face validity were also the basis for selection and testing of the appropriate variables. "Nomological validity is a form of construct validity. It is the degree to which a construct behaves as it should within a system of related constructs called a nomological set" (Bagozzi 1980, p. 182). Face validity "is concerned with how a measure or procedure appears. Does it seem like a reasonable way to gain the information the researchers are attempting to obtain? Does it seem well designed? Does it seem as though it will work reliably?" (Fink 1995, p.261)

Furthermore, we rely on face validity, as described by Anastasi (1988): "[Face validity] is not validity in the technical sense; it refers, not to what the test actually measures, but to what it appears superficially to measure. Face validity pertains to whether the test 'looks valid' to the examinees who take it." (p.144).

This research meets these definitions of nomological and face validity. The multi-method approach of this study is intended to ensure face validity insofar as the measures were repeatedly reviewed by participants in the in-depth group interviews. These subject matter experts provided indirect input for the development of the scale items and were also requested to review these items as relevant and comprehensive measures of the constructs used in the study.

Data analysis proceeded in three stages in order to develop a measurement model and a confirmatory model. Factor analysis was employed to identify latent variables and to determine the relationships of individual items to their posited, underlying structures (Hunter and Gerbing 1982, Özsoy, Calantone and Di Benedetto 1997). Principal factor analysis (PFA or factor analysis) is used to verify the one dimensionality of the measures. Convergent validity is inferred from the significance of coefficient loadings and their magnitudes. This method is intended to assess and validate the descriptive and predictive value of the measurement model of CRM use and customer knowledge orientation. Item measures that pass the significance test but have a standardized factor loading of approximately less than 0.6 were eliminated from the model (Nunnally, 1978).

To the degree that the one dimensional latent variable identified in the literature is supported by the results of t-tests and analyses of variance (ANOVA), this research relied on a convergence of research findings to validate those findings. Differences of methodology and analytical schema have the effect of reducing the value of this approach, but it remains one factor in determining convergent validity.

## **Research Results**

Study findings were analyzed using factor analysis to determine the association of the scale items as a set of latent factors for all respondents and for only CRM users. This was followed by a set of independent-sample t-tests to determine the association of the reduced set of independent variables identified in the factor analysis, the scale items associated with customer knowledge orientation and the dependent variable "CRM use." Analyses of variance (ANOVA) were conducted to determine the relationship of CRM implementation with firm performance using a set of firm performance dimensions.

### ***Analysis of Data***

Factor analysis was used to verify the one dimensionality of the scale measures derived through the questionnaire survey. An inference of convergent validity can be

based on the significance of coefficient loadings and their magnitudes as a set of latent constructs. The factor analysis of all 206 respondents, including both CRM users and non-users, employing Varimax rotation, of the scaled items yielded four factors, which may be defined as “customer knowledge orientation” (Factor 1), “customer relationship orientation” (Factor 2), “customers’ community orientation” (Factor 3), and “internal and external organizational alignment” (Factor 4).

This result is suggestive of H1, “The relationship of ‘customer knowledge orientation’ to ‘CRM implementation’ is positive.” See Table 1a. Only scale items with significant loadings are reported; items with loadings approximately below 0.6 have been eliminated according to common practice (Nunnally 1978).

**Table 1a**  
**Factor Analysis: CRM Users and Non-Users**  
**Using Varimax Rotation**

	Factor 1 <i>Info. Orient.</i>	Factor 2 <i>Cust. Orient.</i>	Factor 3 <i>Cust. Comm. Orientation</i>	Factor 4 <i>Int. &amp; Ext. Alignment</i>
Q8e: The development of detailed account plans is a high priority.	.187	.872	.140	.232
Q8f: Marketing databases are kept up-to-date.	.745	.269	.162	.243
Q8g: Sharing information with customers is considered important.	.397	.624	.133	.238
Q8h: Important external vendors and service providers are treated as members of your firm's organization.	-.047	-.044	.190	.784
Q8i: Customers have a significant level of input to the firm's marketing strategy.	.321	.591	.166	.145
Q8j: Managers utilize marketing information from internal databases.	.743	.315	.412	-.095
Q8p: There are methods for resolving differences between your firm and its vendors and service providers.	.348	-.038	.075	.773
Q8q: The accuracy of information in the marketing databases is actively monitored.	.723	.445	.081	.348
Q8r: Performance-based vendor and service provider reward systems are utilized.	.660	.182	.121	.203
Q9h: Your firm's customers are willing to share sensitive operational information with the firm.	.038	.029	.002	.613
Q10a: Your firm's customers regularly keep in contact with one another.	.117	-.199	.833	.025
Q10b: Your firm's customers share purchase (price, availability, retailer, etc.) information with other customers.	.138	-.082	.887	.093
Q10c: Your firm's customers advise each other concerning the use of your firm's products.	-.175	.107	.826	.128

Factor analysis is generally used to “identify latent variables which contribute to the common variance of the set of measured variables, while excluding variable-specific (unique) variance. Factors are the dimensions, or latent variables, identified with clusters of variables, as computed using factor analysis. Factors represent the common variance of variables, excluding unique variance, and factor analysis is thus a correlation-focused approach seeking to reproduce the intercorrelation among the variables” (Bryant and Yarnold 1995, p. 119). “The purpose of factor analysis is to discover simple patterns in the pattern of relationships among the variables. In particular, it is applied for discovering if the observed variables can be explained largely or entirely in terms of a much smaller number of variables called ‘factors.’ A typical factor analysis suggests answers to four major questions: How many different factors are needed to explain the pattern of relationships among these variables? What



is the nature of those factors? How well do the hypothesized factors explain the observed data? How much purely random or unique variance does each observed variable include?” (Gorsuch, 1983, p. 238).

It is necessary to infer the existence of each factor from the covariance of the associated operationalized variables because the factors are not observable as such. The results of the factor analysis support the conclusion that the latent constructs “customer knowledge orientation,” has nomological and face validity as an independent construct, and is therefore one of four separate factors in the factor analysis.

This is further reflected in the results of a factor analysis, employing Varimax rotation, of the data from only those 99 respondents indicating current CRM use. The analysis of the proposed items yielded four factors, including “customer knowledge orientation” (Factor 1), “customer relationship orientation,” (Factor 2), “customers’ community orientation” (Factor 3), and “internal and external organizational alignment” (Factor 4). Factors 1, 2, and 4 are consistent with Day’s (1994) proposed hypothetical construct. This is suggestive of H1, “The relationship of ‘knowledge orientation’ to ‘CRM implementation’ is positive.” See Table 1b.

**Table 1b**  
**Factor Analysis: CRM Users Only**  
**Using Varimax Rotation**

	Factor 1	Factor 2	Factor 3	Factor 4
Q8e: The development of detailed account plans is a high priority	.225	.850	-.092	.324
Q8f: Marketing databases are kept up-to-date.	.753	.431	.349	.301
Q8h: Important external vendors and service providers are treated as members of your firm's organization.	-.127	-.085	-.063	.682
Q8i: Customers have a significant level of input to the firm's marketing strategy.	.201	.651	.041	.127
Q8j: Managers utilize marketing information from internal databases.	.684	.217	-.096	-.132
Q8l: Customer satisfaction is a high priority	.232	.741	.258	.019
Q8o: Customer retention is a High Priority	.241	.662	.278	.091
Q8p: There are methods for resolving differences between your firm and its vendors and service providers.	.282	-.097	-.052	.751
Q8q: The accuracy of information in the marketing databases is actively monitored.	.658	.426	.232	.248
Q8r: Performance-based vendor and service provider reward systems are utilized.	.668	.269	.074	.236
Q9b: Your firm's customers are an important source of planning information for your firm.	.327	.653	.297	.194
Q10a: Your firm's customers regularly keep in contact with one another.	.231	-.101	.785	.034
Q10b: Your firm's customers share purchase (price, availability, retailer, etc.) information with other customers.	.147	-.039	.868	.038
Q10c: Your firm's customers advise each other concerning the use of your firm's products.	-.104	.168	.775	.188

### ***Customer Knowledge Orientation***

Independent-samples t-tests of the variables associated with *customer knowledge orientation* supports the finding of a relationship with CRM use. See Table 2. A significant relationship between CRM use was found in the case of question 8f, “marketing databases are kept up-to-date,” 8j, “managers utilize market information from internal databases,” 8q, “the accuracy of information in the marketing databases is actively monitored” and 8r, “performance-based vendor and service provider reward systems are utilized.” This provides supports for H1, “the relationship of ‘customer knowledge orientation’ to ‘CRM implementation’ is positive in B-to-B markets.”

Table 2  
**T-test of “Customer Knowledge Orientation” Variables**

	N	Mean	S.D	T-stat	Sig. (2-tailed)
Q8f: Marketing databases are kept up-to-date.					
CRM No	<b>101</b>	<b>3.67</b>			
CRM Yes	<b>95</b>	<b>4.72</b>	<b>1.448</b>	<b>5.39</b>	<b>.000</b>
Q8j: Managers utilize market information from internal databases.					
CRM No					
CRM Yes	<b>104</b>	<b>3.85</b>			
Q8q: The accuracy of information in the marketing databases is actively monitored.	<b>97</b>	<b>4.77</b>	<b>1.363</b>	<b>5.11</b>	<b>.000</b>
CRM No	<b>103</b>	<b>3.73</b>			
CRM Yes	<b>97</b>	<b>4.73</b>	<b>1.497</b>	<b>5.02</b>	<b>.000</b>
Q8r: Performance-based vendor and service provider reward systems are utilized.					
CRM No	<b>75</b>	<b>3.39</b>			
CRM Yes	<b>76</b>	<b>3.89</b>	<b>1.638</b>	<b>1.92</b>	<b>.056</b>

This is reflected in the remarks of managers interviewed concerning their CRM systems. “Ours is a very complex and geographically challenging business. We have to reach hundreds of thousands of physicians and thousands of healthcare service providers and keep consistent records of their activities, inquiries and intentions. The CRM system data library is the repository for all that ... we rely on that information to make our decisions” (*Director of Marketing* for a mid-sized pharmaceuticals manufacturer).

Moreover, a number of those interviewed concerning the organizational and market characteristics associated with successful CRM implementation identified customer

knowledge orientation as critical for success. “Our CRM system is one of many tools we employ to better understand our customer needs and purchasing behavior. I can’t tell you the specific role of our CRM system, but it is significant in tying it all together” (*Vice President of Distribution* for a major electronics components distributor). “Our organization collects an enormous amount of information concerning our customers. That’s what we do ... we analyze our customers’ buying patterns, expenditure levels and their stated interests” (*Director of Marketing* for a multi-media consumer merchandiser). “Our customers feel that they have a close relationship with us. They rely on us for solutions and ... [our customers] give us as much help in developing the right solutions as they can” (*Director of Sales* for an information systems developer).

### ***CRM Use and Firm Performance***

Independent-samples t-test of the year-over-year change in firm performance and CRM use supports a relationship between CRM use and firm performance, as defined by survey respondent reported year-over-year firm performance improvement in overall profitability, sales force productivity, customer retention, average account sales and average account gross margins. See Table 3. Therefore, H4, “The relationship of ‘CRM use’ to ‘firm performance’ is positive in B-to-B markets” is supported.

Table 3  
**T-test of “Firm Performance” Variables with “CRM Use”**

	N	Mean	S.D.	T-stat	Sig. (2-tailed)
<b>Q6a: Overall profitability?</b>					
CRM No	46	4.15	.851	2.28	.024
CRM Yes	95	4.49			
<b>Q6b: Sales force productivity?</b>					
CRM No	45	3.98	.881	3.23	.002
CRM Yes	92	4.48			
<b>Q6c: Customer retention?</b>					
CRM No	45	3.67	1.009	4.25	.000
CRM Yes	92	4.40			
<b>Q6d: Average account sales?</b>					
CRM No	45	4.02	.880	2.46	.015
CRM Yes	93	4.41			
<b>Q6e: Average account gross margins?</b>					
CRM No	46	3.87	.892	3.51	.001
CRM Yes	95	4.41			

The relationship of CRM systems and organizational profitability was mentioned by managers in group interviews. “We could never be as profitable without our customer

databases... We continuously upgrade our customer information systems because it's what drives our business" (*Director of Marketing* for a multi-media consumer merchandiser). "Our CRM system is the heart of our sales and marketing activities... We make all of our product line and customer care decisions after analyzing our CRM data... We would be a lot less successful without it" (*Vice President of Distribution* for a major electronics components distributor).

This finding is further confirmed by the an analysis of variance (ANOVA) of the mean value of the scale items associated with customer knowledge orientation, which is found to be significant (f stat = 2.97; deg. of freedom = 15; sig. < .001)

### ***Firm Performance and CRM Implementation Level***

A significant relationship has been established for CRM use and the year-over-year change in firm performance in terms of overall profitability, sales force productivity, customer retention, average account sales and average account gross margins. This is further confirmed by the reported association of the latent construct, customer knowledge orientation, with the mean of the year-over-year organizational performance variables, questions 6a, "overall profitability?" 6b, "sales force productivity?" 6c, "customer retention?" 6d, "average account sales?" and 6e, "average account gross margins?"

An extension of these analyses is the determination of whether *the level* of CRM implementation is associated with the firm's performance. To answer this question, an analysis of variance (ANOVA) was performed for the full set of scale items posited to have an association with customer knowledge orientation, along with the set of scaled CRM performance variables.

The results indicate a limited relationship between these organizational performance variables and the level of CRM integration, including these classifications, from lowest to highest level of system implementation: *Level 1*: "we have a system which performs primarily as a sales support system;" *Level 2*: "we have a CRM system which serves as an integrated account planning and account management system;" and *Level 3*: "we have a system which serves as an integrated account planning and account management system and as a management reporting system." See Table 4.

Table 4  
ANOVA of "Firm Performance" by CRM Level

	TotalDeg. of Freedom	S.D.	F-stat	Sig.
Q6a: Overall profitability?	93	.851	3.19	.046
Q6d: Average account sales?	91	.880	3.93	.023
Q6e: Average account gross margins?	93	.892	2.69	.073
Q8h: Important external vendors and service providers are treated as members of your firm's organization.	92	1.449	2.49	.089

The results were significant for questions 6a, "overall profitability?" 6d, "average account sales?" 6e, "average account gross margins?" and 8h, "important external vendors and service providers are treated as members of the firm's organization." Higher level implementations of CRM systems, those with greater integration with the firm's strategic and resource planning functions, are therefore associated with the firm's sales productivity and profitability.

## DISCUSSION OF MANAGERIAL AND RESEARCH IMPLICATIONS

The present study has proposed a set of organizational characteristics, as represented by a set of "customer information orientation" scale items, associated with the implementation of CRM systems in business-to-business settings. The preliminary findings are suggestive and do not identify clearly causal relationships of the construct, customer knowledge orientation, with the organizational use of CRM systems. A number of factors make a clear determination of causation problematic, including the heterogeneity of firm organizations (and their CRM implementations) and the concomitant use of CRM and related resources for multiple organizational applications. Internal and external organizational environmental conditions further complicate a determination of causality in the factors leading to CRM use, as well as the resulting association of CRM with overall firm performance.

As the in-depth exploratory interviews suggest, the concept of a "CRM system" in B-to-B applications may be interpreted differently by both systems users and non-users. To some executives, the CRM system is a logical extension of the sales management

function, i.e., a better way to manage the sales organization. To other executives, CRM connotes a strategic marketing function, which is focused on the development of in-depth account plans and a team selling approach. To still others, CRM has achieved a high level of integration in the firm's enterprise resource planning (ERP), or highest level, information management platform. The Salesforce.com and Siebel applications are often identified with the first conception of CRM, while the highly integrated IBM and SAP applications may be thought of as embodying the latter conception of CRM.

The results of this research provide qualified support for a finding of a relationship of the latent construct "customer knowledge orientation" with CRM use in B-to-B markets. Although still vague, this construct, as operationalized in this and other studies, is identified in the proposed model as a characteristic of the organization. A contribution of this study is in presenting this organizational characteristic as an identifiable, albeit less than perfectly measurable, construct. Study results clearly demonstrate that the operational variables may be applied jointly as predictors of CRM use.

As many of the in-depth group interviewees made clear, the firm's customer-centeredness is closely associated with the breadth, depth and quality of customer information sought and collected by the firm. A number of respondents pointed out that firms are increasingly focused on understanding their business customers' needs and wants through empirical and inferential means. The CRM system may be viewed as an amorphous data management tool that serves the customer information requirements of a wide range of managers across a myriad of value-added functions. This is supported by the more than 60% of survey respondents who identified their system as serving more than a purely sales management function.

The multiple applications of CRM make it difficult to narrowly define organizational characteristics associated with CRM implementations. These implementations are highly customized to the organizational and even departmental levels. Therefore, the perceived functionality of one system may appear on paper – in terms of specifications – to mirror another system, but may, in fact, represent a completely different solution for the organization. Data warehouses are increasingly complex and multifaceted, providing applications undreamed of by their developers. This data mining takes on the characteristics of the client users, and provides "fuzzy boundaries" for individual applications.

There is no ambiguity concerning the potential value of a CRM system to the respondent population. There is clear support for the contention that CRM use, in B-to-B markets, is associated with firm performance improvement in overall profitability, sales force productivity, customer retention, average account sales and average account gross margins. Since these are the criteria most frequently emphasized by in-depth group interview participants, the survey results clearly present the value of CRM to the firm. Furthermore, this research clearly indicates the benefits of higher order CRM systems, those with integrated account planning, account management and management reporting

capabilities. Firms employing higher order CRM capabilities had a statistically significant performance improvement over users with less evolved systems.

## **RESEARCH LIMITATIONS AND FUTURE RESEARCH**

The present research utilizes both in-depth interviews and a large sample questionnaire survey to improve understanding of CRM and its association with the firm's customer information orientation. As is the case with most empirical research, the present survey research has several limitations associated with the identification of latent constructs, the operationalization of those constructs and the collection of survey data for testing those operationalized constructs. These limitations have implications for future research.

To develop an appropriate model, elements of the hypothetical construct proposed by Day (2000) were operationalized using scale items derived from existing literature. The selection of the items and the development of measurement scales had significant bearing on the course of the research. Naturally, there is a significant degree of subjectivity in this selection and development process, although an effort was made to limit bias to the extent possible.

The subject matter of this research is complex and fraught with misconceptions among CRM suppliers and their clients. A major objective of this research was therefore to disentangle these complexities and to present a simplified model of the organizational and customer community characteristics associated with B-to-B CRM use and related outcomes.

The research reported here uses self-reported measures for independent as well as dependent variables from individuals who represent firms. There are multiple biases that may have been introduced despite efforts to draw a representative sample from an informed and committed respondent population. The use of a structured survey questionnaire to collect reconstructive information concerning the decisions and actions associated with the implementation and use of a CRM system has significant limitations. A necessarily rigid response format, based largely on scaled responses, limits the specificity of respondent input. Moreover, a limited set of possible responses may have inadvertently presented a more time-compressed set of actions and outcomes than respondents intended. This may introduce some biases to the research.

One way that future research may avoid some resulting biases is to undertake longitudinal studies with a sufficiently large and representative B-to-B sample population. By staggering the collection of data related to independent and dependent variables, it may be possible to more effectively link user and non-user behaviors with organizational outcomes (Duchon and Kaplan, 1988).

Related to this time-lapse limitation, the present survey study utilizes a cross sectional design, which limits the extent to which causality can be inferred. The research

employed a targeted voluntary sampling procedure to conduct the survey. This may be a limitation depending on how well the sample approximated the population of current users and non-users of CRM. A possible related limitation is the sourcing of respondents from a single organization, the Vendor Compliance Federation, a voluntary membership organization composed of representatives from firms with business-to-business relationships. VCF membership corresponds roughly with the overall B-to-B CRM user population in terms of the key descriptors sales volume, number of employees and industry classification, but there is no assurance of the external validity of the respondent base. Furthermore, the snowballing technique used for respondent recruitment may have introduced a sampling bias that is difficult to detect in a confidential online interview context. Therefore, the external validity of the results of the present research will need to be tested in future research.

Every effort was made to determine that the demographic characteristics of the sample used in this study are the same as the current base of B-to-B CRM systems users. Since no previous studies of this population could be located, it isn't possible to approximate the extent of sampling bias, and this remains a concern.

A possible future test of the validity of the reported research is the study of well defined subsets of users, for example by industry or by system type, and of business-to-business CRM application contexts, for example by geographic coverage or market type, in order to identify boundary conditions, constraints and exceptions to the model. The use of different environmental contexts will aid in accounting more fully for the effect of environment on the relationships presented in the model.

Although an effort was made in the exploratory phase of this research to determine convergent validity both within and between organizations, sampling and time limitations made it difficult to rule out these sources of bias. The application of other research techniques to the questions addressed by the current research would be helpful in identifying any biases that may be present in the results reported here.

To aid in data collection from a diverse group of respondents representing a range of industries, the author adopted a set of standard metrics of firm performance, including overall profitability, sales force productivity, customer retention, average account sales and average account gross margins. These measures, while having the virtues of common usage and standard meaning, may not adequately capture the nuances of organizational performance in specific firms or industries.

In order to address these various shortcomings, future research should employ varied CRM and organizational contexts and research designs to determine whether the model provides a satisfactory, consistent explanation for the determinants of business-to-business CRM use and related performance outcomes. Additional research would also help to determine the conditions under which the various performance factors may vary, and the extent to which these factors are independent of other organizational, industry and other environmental factors. A replication of the



present study using other sample populations, definitions of CRM and organizational and performance criteria will serve to improve the external validity of the findings, and to validate the robustness of these relationships across different B-to-B CRM implementations and usage contexts.

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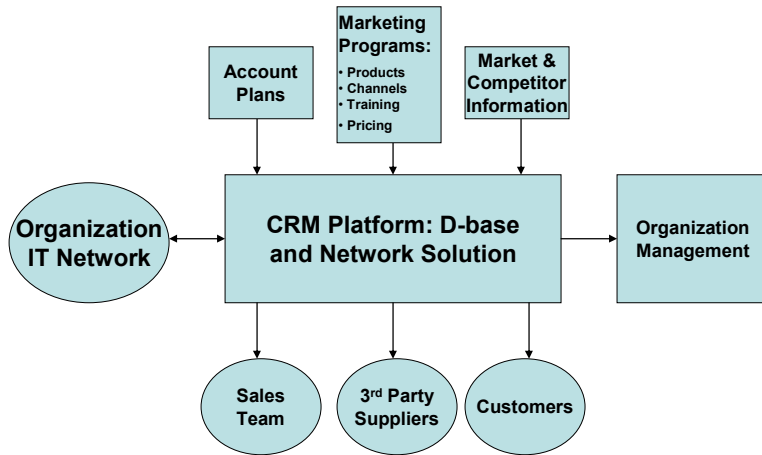
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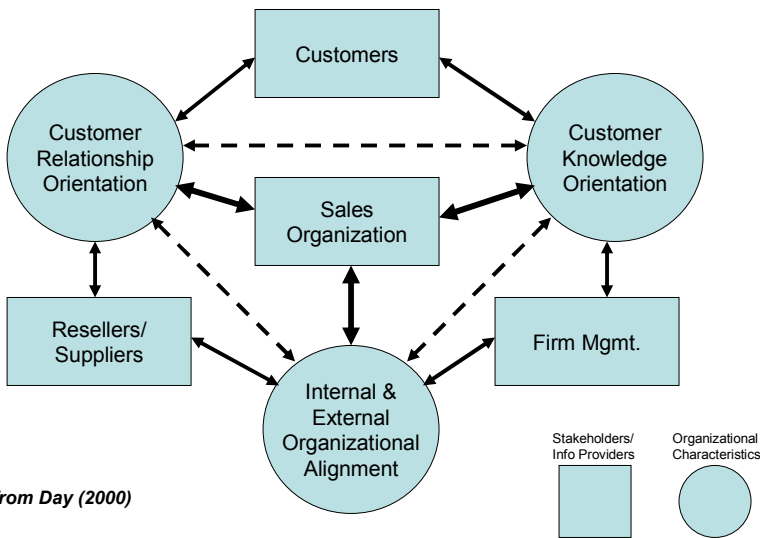
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ARTICLE EXHIBITS

**Figure 1**  
**The Elements of Integrated CRM Solutions**



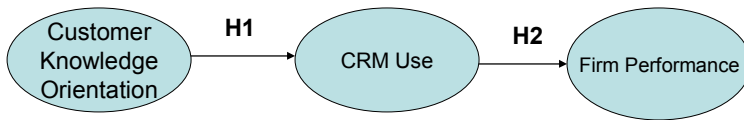
**Figure 2**  
**Major CRM Integration Elements**



Adapted from Day (2000)

Figure 3

**Conceptual Model: CRM Implementation and Customer Community Effect on Customer Relationships**



**Table 1a**  
**Factor Analysis: CRM Users and Non-Users**  
**Using Varimax Rotation**

	Factor 1 Info. Orient.	Factor 2 Cust. Orient.	Factor 3 Cust. Comm. Orientation	Factor 4 Int. & Ext. Alignment
Q8e: The development of detailed account plans is a high priority.	.187	.872	.140	.232
Q8f: Marketing databases are kept up-to-date.	.745	.289	.162	.243
Q8g: Sharing information with customers is considered important.	.397	.624	.133	.238
Q8h: Important external vendors and service providers are treated as members of your firm's organization.	-.047	-.044	.190	.784
Q8i: Customers have a significant level of input to the firm's marketing strategy.	.321	.591	.166	.145
Q8j: Managers utilize marketing information from internal databases.	.743	.315	.412	-.095
Q8p: There are methods for resolving differences between your firm and its vendors and service providers.	.348	-.038	.075	.773
Q8q: The accuracy of information in the marketing databases is actively monitored.	.723	.445	.081	.348
Q8r: Performance-based vendor and service provider reward systems are utilized.	.660	.182	.121	.203
Q9h: Your firm's customers are willing to share sensitive operational information with the firm.	.038	.029	.002	.613
Q10a: Your firm's customers regularly keep in contact with one another.	.117	-.199	.833	.025
Q10b: Your firm's customers share purchase (price, availability, retailer, etc.) information with other customers.	.138	-.082	.887	.093
Q10c: Your firm's customers advise each other concerning the use of your firm's products.	-.175	.107	.826	.128

**Table 1b**  
**Factor Analysis: CRM Users Only**  
**Using Varimax Rotation**

	Factor 1	Factor 2	Factor 3	Factor 4
Q8e: The development of detailed account plans is a high priority.	.225	.850	-.092	.324
Q8f: Marketing databases are kept up-to-date.	.753	.431	.349	.301
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Q9b: Your firm's customers are an important source of planning information for your firm.	.327	.653	.297	.194
Q10a: Your firm's customers regularly keep in contact with one another.	.231	-.101	.785	.034
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**Table 2**  
**T-test of "Customer Knowledge Orientation" Variables**

	N	Mean	S.D	T-stat	Sig. (2-tailed)
Q8f: Marketing databases are kept up-to-date.					
CRM No	<b>101</b>	<b>3.67</b>			
CRM Yes	<b>95</b>	<b>4.72</b>	<b>1.448</b>	<b>5.39</b>	<b>.000</b>
Q8j: Managers utilize market information from internal databases.					
CRM No	<b>104</b>	<b>3.85</b>			
CRM Yes	<b>97</b>	<b>4.77</b>	<b>1.363</b>	<b>5.11</b>	<b>.000</b>
Q8q: The accuracy of information in the marketing databases is actively monitored.					
CRM No	<b>103</b>	<b>3.73</b>			
CRM Yes	<b>97</b>	<b>4.73</b>	<b>1.497</b>	<b>5.02</b>	<b>.000</b>
Q8r: Performance-based vendor and service provider reward systems are utilized.					
CRM No	<b>75</b>	<b>3.39</b>			
CRM Yes	<b>76</b>	<b>3.89</b>	<b>1.638</b>	<b>1.92</b>	<b>.056</b>

Table 3

**T-test of "Firm Performance" Variables with "CRM Use"**

	N	Mean	S.D.	T-stat	Sig. (2-tailed)
<b>Q6a: Overall profitability?</b>					
<b>CRM No</b>	46	4.15			
<b>CRM Yes</b>	95	4.49	.851	2.28	.024
<b>Q6b: Sales force productivity?</b>					
<b>CRM No</b>	45	3.98			
<b>CRM Yes</b>	92	4.48	.881	3.23	.002
<b>Q6c: Customer retention?</b>					
<b>CRM No</b>	45	3.67			
<b>CRM Yes</b>	92	4.40	1.009	4.25	.000
<b>Q6d: Average account sales?</b>					
<b>CRM No</b>	45	4.02			
<b>CRM Yes</b>	93	4.41	.880	2.46	.015
<b>Q6e: Average account gross margins?</b>					
<b>CRM No</b>	46	3.87			
<b>CRM Yes</b>	95	4.41	.892	3.51	.001

Table 4

**ANOVA of "Firm Performance" by CRM Level**

	TotalDeg. of Freedom	S.D.	F-stat	Sig.
<b>Q6a: Overall profitability?</b>	<b>93</b>	<b>.851</b>	<b>3.19</b>	<b>.046</b>
<b>Q6d: Average account sales?</b>	<b>91</b>	<b>.880</b>	<b>3.93</b>	<b>.023</b>
<b>Q6e: Average account gross margins?</b>	<b>93</b>	<b>.892</b>	<b>2.69</b>	<b>.073</b>
<b>Q8h: Important external vendors and service providers are treated as members of your firm's organization.</b>	<b>92</b>	<b>1.449</b>	<b>2.49</b>	<b>.089</b>

## APPENDIX

### In-Depth Interview Participants

#### Firm

Medical equipment manufacturer  
and marketer

Multi-media consumer merchandiser

Pharmaceuticals manufacturer

Electronics components distributor

Information systems developer

Regional trucking services  
organization

CRM systems developer

#### Interviewees

Director of Services Marketing  
Director of CRM Solutions  
Director of Customer Programs  
Director of CRM software Development  
Senior Account Management Supervisor

Director of Marketing  
Director of Information Systems  
Manager of CRM Systems

Director of Marketing  
Manager of Regional Distribution  
Regional Sales Manager

Vice President of Distribution  
Corporate Accounts Manager  
Coordinator of Regional Logistics

Director of Sales  
Senior Software Development Manager  
Account Development Manager (1)  
Account Development Manager (2)

Vice President of Sales  
Director of Customer Accounts  
Services Manager

Vice President of Sales  
Vice President of Applications  
Senior Account Coordinator



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