

Successful B2B customer database management

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Abstract

Purpose – The paper aims to present a study of the question of customer information management in business-to-business (B2B) firms, what distinguishes firms that manage customer information well, and what internal processes are necessary for success.

Design/methodology/approach – This paper summarizes the themes from several research studies using both qualitative and quantitative methods.

Findings – The study finds that companies that distinguish themselves from others in the area of customer information management practices pay attention first to their company's overall strategy, establish and/or enforce data quality standards, involve functional departments in the development of customer databases and their applications, and use both relational and transactional data in their data applications.

Practical implications – Managers in this area would do well to follow the precepts suggested in this work, especially in terms of developing quality databases before embarking on a customer marketing strategy.

Originality/value – The value of the paper is the consistent themes throughout research studies in various B2B contexts.

Keywords Customer information, Databases, Relational databases, Transactional analysis

Paper type Research paper

An executive summary for managers and executive readers can be found at the end of this issue.

Introduction and conceptual foundation

There is a paucity of conceptual and empirical research investigating the strategic use and implementation of customer information as an organizational resource. Managers seeking to understand how to effectively develop their customer databases need more details, particularly on the aspects of data quality and which data to collect and how to share it in the organization. A series of papers by this author over the past several years has focused on the assets and capabilities (such as learning and other processes) whereby business-to-business (B2B) firms create advantage through customer information management.

In terms of specifically defining how customer information can be used as an organizational asset, marketing orientation capabilities, with their emphasis on the generation, dissemination and utilization of market information as well as good cross-functional communication throughout the organization, can provide some guidance (Kohli and Jaworski, 1990). However, the marketing orientation literature is also somewhat vague in terms of specific types of customer information and customer information management activities that create advantage. We know performance differences exist between firms due to the implementation of customer relationship management systems which have a substantial customer database component (Reinartz *et al.*, 2003). However, these

performance differences are smaller than would be expected given the widespread acceptance of CRM as a customer information management practice.

Recent literature has indicated a process by which customer information as an intangible asset can be used in the organization to create capabilities that can lead to advantage (Hooley *et al.*, 2001). Using the concept of marketing orientation and the learning organization (Day, 1994), the research papers reported here have developed the idea of the customer information system (CIS) to measure the difficult-to-imitate asset of customer information. In this research, a customer information system is defined conceptually as the processes by which firms learn about their customers by collecting, storing, moving and using customer data throughout the organization (Zahay and Griffin, 2003). The CIS is above all a learning capability, and within the context of the resource-based view (RBV), is a potential source of firm advantage.

In contrast to an asset, a capability allows assets to be deployed effectively in the marketplace (Day, 1994; Hooley *et al.*, 1998). Customer management information advantage can be created both by the marketing database and those who maintain it, but also through strategic, functional and operational capabilities (Figure 1). Specifically in terms of customer information management, assets such as the customer database or marketing database and the people who maintain it can be used on a *strategic, functional and operational* level to create superior performance.

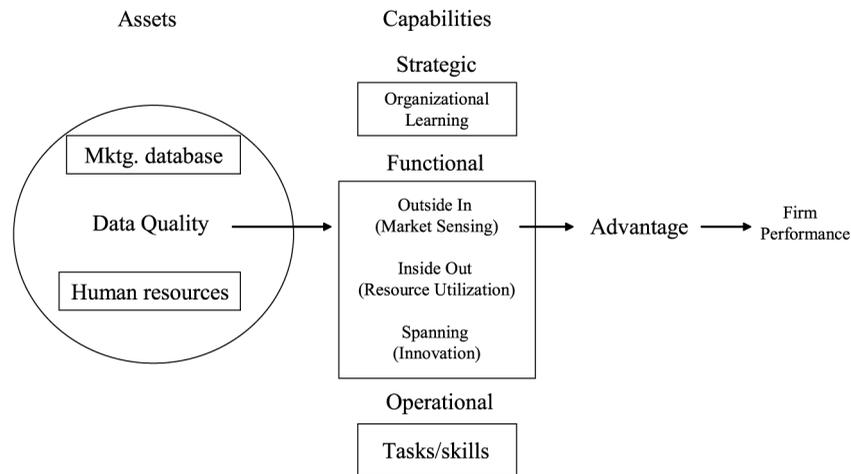
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Figure 1 Customer information firm management assets and capabilities in creating advantage in B2B services

Precept 1: Establish Quality Standards

Source: From Hooley *et al.* (2001, 1998)

Strategic capabilities such as organizational learning help firms to understand their customers and how to create value for those customers. Functional capabilities include the ability to take information from the outside and process in (market sensing) as well as to process the information through the organization though inside out capabilities (resource utilization) such as the different functional areas. In addition, functional capabilities include market-spanning activities such as innovation, which help create new products and offerings to maintain performance into the future. Finally, operational capabilities in marketing are implementation capabilities, such as the ability to create organizational units that function together as a whole. Figure 1 illustrates how the customer database and those who maintain it can be seen as assets can be turned into capabilities, which then can be used to create advantage in the marketplace and eventually superior performance (Hooley *et al.*, 1998, 2001).

Research conducted in this area indicates evidence that quality data is the underlying asset from which capabilities in customer information management can be developed. This paper will discuss first the implications of quality data as an asset and then how this quality data can be deployed by developing capabilities in each of the three areas outlined above, strategic, functional and operational. Figure 2 illustrates the managerial precept that can be derived from the development of each strategic capability from the conceptual model in Figure 1.

Methodology/approach

As stated previously, the studies reported here were intended to examine various aspects of customer information management, primarily in B2B services firms. These studies used to a greater or lesser degree the concept of the customer information system (CIS) as the organizing premise, and the studies and their samples, settings and methods are summarized in Table I. The research was conducted at the

level of the business unit since customer information practices vary by business unit and are not consistent across the different units in the firm.

Day and Van den Bulte (2002) suggest that success in customer information management involves not only storing customer information, but using it to develop a “learning relationship” to engage customers in an interactive dialogue for the benefit of both parties. Therefore, organizational learning theory provides both the context and vocabulary with which to investigate, in an academic context, customer information management capabilities in organizations. Customer information systems (CIS) are learning process capabilities for gaining customer understanding (Zahay and Griffin, 2002, 2003, 2004).

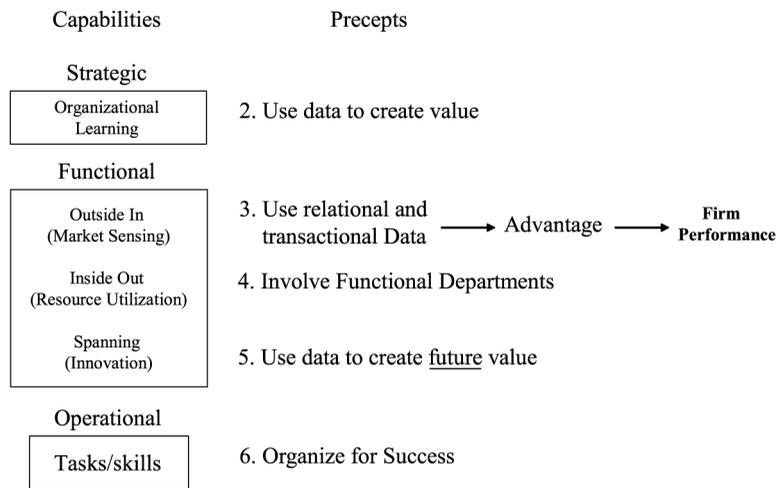
The construct of CIS is consequently based on four behaviors that learning organization theory has identified as associated with developing knowledge systems. These behaviors are:

- 1 generation (get or acquire);
- 2 memory (store);
- 3 dissemination (move); and
- 4 interpretation (use).

The dissemination scale used in the research was adapted from the marketing orientation literature, but the rest of the concepts were developed specifically for the customer information management context. The CIS captures the overall sophistication of customer information and the associated management processes and systems at the firm, and is used as a way to understand how well the firm learns about customers (Figure 3). The emphasis in the CIS is on data management and its organizational and strategic context.

CIS capabilities were examined in Study 1, a telephone survey of 209 software and insurance firms, the data from which was analyzed using multiple analytic techniques. Study 1 also analyzed the differences between relational and transactional data types and their relationship to ultimate

Figure 2 Customer information firm management capabilities in B2B services and corresponding managerial precepts



Source: From Hooley *et al.* (2001, 1998)

Table I Studies included in this paper

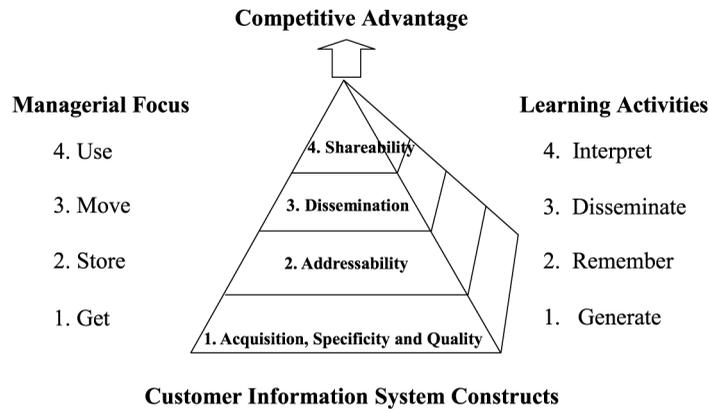
Study	Description	Sample/sample frame	Setting	Method
Study 1: CIS, strategy, and performance	Quantitative survey with insurance and software B2B marketers of customer information management practices and link to strategies and performance	209 insurance and software firms, B2B services. Stratified random sample from Dun and Bradstreet data	Quantitative survey	Confirmatory factor analysis, SEM, regression, other multivariate techniques
Study 2: qualitative organizational factors in CIS development	Follow-on qualitative study with respondents to Study 1 and one other firm, uncovered organizational factors in customer information management to test in Study 4	Sample from 209 respondents to Study 1, 17 managers in five firms	Depth interviews on site or via phone	Content analysis based on frequency of mention
Study 3: quantitative organizational factors in CIS development	Quantitative pre-test of important organizational factors in customer information management success in 43 firms across all industries	Convenience sample of 43 firms from B2B services contacts from Chicago area	Online survey	Exploratory factor analysis, regression, correlation
Study 4: Implementation factors for CDW	Series of focus groups in a single health care payor regarding implementation of a corporate data warehouse for marketing purposes	Single health-care payor, multiple departments, marketing, finance, sales, etc., five focus group sessions with 21 marketing, information systems and strategy managers	Case study using on-site focus groups	Independent data coding based on frequency of mention and inter-rater reliability reported
Study 5: Customer information in NPD context	Series of interviews with marketers in the new product area, primarily, software and chemical, on customer information management needs	Convenience sample of 20, i.e. 14 NPD practitioners and six vendors	Product Development and Management Association Conference, on-site interviews or phone follow-up	Content analysis based on frequency of mention

firm performance (Figure 3). This study indicated that more research needed to be conducted to determine differences in firm performance, so a qualitative follow-on study (Study 2) was conducted with participants from Study 1. This

qualitative follow-on study was analyzed using content analysis based on frequency of mention.

Study 2 suggested that organizational factors such as teamwork, vision, and functional integration play a key role in

Figure 3 Managing customer information: competitive advantage



effective customer information management, and hence, firm advantage. Therefore, another study, Study 3, was conducted to test these organizational factors quantitatively. A convenience sample of B2B services providers responded. Because of the small sample size of 43 respondents, exploratory factor analysis (EFA) as well as correlation and regression were used to analyze the data.

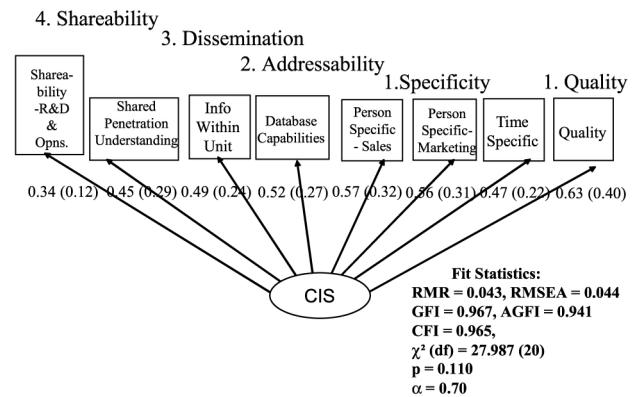
Additionally, Study 4 examined issues surrounding a customer data warehouse implementation at a major health care provider in a field setting using a case study methodology. Finally, Study 5 was also conducted in the field setting of interviews conducted at the Product Management and Development Association Annual Conference. Respondents were a convenience sample of conference attendees and their customers.

There is not sufficient space here to discuss in detail the methodologies of all five studies. For qualitative research, standard methods of qualitative research analysis were used to analyze the data, including the creation of coding sheets based on frequency of mention and the use of iterative processes of data analysis (Miles and Huberman, 1994). The analysis was also conducted in a manner consistent with the method of Yin (1994), whereby overall patterns in the data were identified and several rounds of analysis are necessary to achieve a complete picture. A detailed description of the coding schemes is available in the published papers referenced herein, or by request. Where quantitative methods were used, great care and rigor was taken with the quantitative results. Quantitative results for constructs discussed here for the most part met the standards set forth by Hu and Bentler (1998).

The CIS construct itself (see Figure 4) had good overall fit statistics from the CFA. Thurstone single-factor models using maximum likelihood methods were fit to the constructs, using AMOS 4.1 (from SPSS) and double-checking the results in PROC CALIS in SAS 6.12. Fit statistics as shown in Figure 4 indicate the model has a good fit (RMR = 0.043, RMSEA = 0.044, GFI = 0.967, AGFI = 0.941, CFI = 0.965, χ^2 (df) = 27.987 (20), $p = 0.110$) (Bollen, 1989; Baumgartner and Homberg, 1996; Jöreskog and Sorbom, 1993; Bagozzi and Yi, 1988; Browne and Cudeck, 1993; Bentler, 1990).

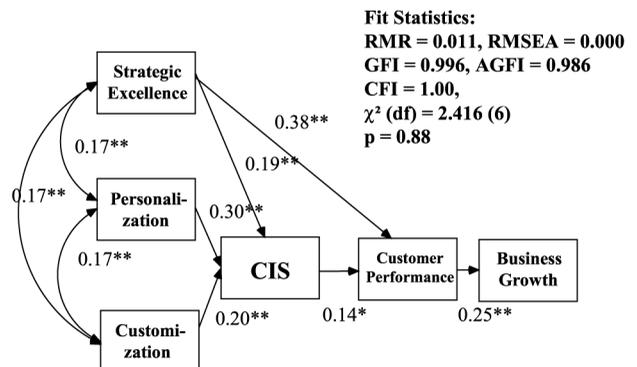
Overall, the fit statistics of the model incorporating CIS, strategy and performance model (Figure 5) discussed below

Figure 4 Final customer information system construct



Notes: Path weight listed underneath variable name, with squared multiple correlation in parentheses. N = 209

Figure 5 Strategy and CIS model



Notes: Customer performance: ROI, Retention, Share of Wallet, Customer Lifetime value. Business growth: Sales and net income growth. * $p < 0.05$, 2-tailed; ** $p < 0.01$, 2-tailed. N = 206

variables were also good (RMR = 0.011, RMSEA = 0.000, GFI = 0.996, AGFI = 0.986, CFI = 1.00, χ^2 (df) = 2.416 (6), $p = 0.878$) and within guidelines for marketing research using SEM, especially considering the exploratory nature of this research (Bagozzi and Yi, 1988; Baumgartner and Homburg, 1996). Other statistical methods used are noted under the appropriate study in Table II.

In most cases, the dependent variables to measure performance were both at the marketing or customer level and the firm level. In these studies customer performance is a summed measure of customer lifetime value, ROI, share of wallet and retention rate. Business unit performance is, as is consistent with the resource-based view and the emphasis on explaining firm growth, a growth measure that is the summed mean of both net income growth and sales growth.

Findings

Assets: quality data

Again, to achieve growth, the RBV focuses on managing tangible and intangible assets. The primary asset relevant to customer information management is the marketing or customer database. If marketing assets are resources that the firm has acquired that can contribute to firm advantage, then clearly a marketing database, in addition to other intangible assets, must be counted a resource that can convey advantage. Equally, the individuals who work on the databases and maintain their structure and content can also be considered to be assets to the firm. These human resources in the firm work to turn customer data into valuable information that can be processed internally (Figure 1). The success of this transformation process is in part a function of the quality of information available within the organization (Maltz *et al.*,

2001), how well the collected data draws from multiple functional areas (Griffin and Hauser, 1996), how well the organization communicates and shares information (Kahn and Mentzer, 1998), and overall information quality.

The measurement of quality relevant to customer information management in this research is based on the work of Parasuraman and Grewal (2000) in marketing and Wang and Strong (1996) in information systems, where quality is measured by perceptions of overall quality, accuracy, consistency and timeliness. In Study 1, the quantitative study of 209 B2B services companies, quality had the highest importance weight in the confirmatory factor analysis of the CIS constructs (Figure 4). Companies choosing strategies more likely to lead to performance had a greater emphasis on data quality. Data quality also played a role in several other studies discussed below. Boise Cascade Office Products (now known as Office Max) and Tri-Arc Manufacturing are examples of companies using quality data as the basis for customer information management and segmentation programs. This overall customer data quality theme across studies leads to the first managerial precept of this paper, Precept 1, “Establish quality standards”. The managerial precepts associated with each research trend are noted in Figure 2 and will be outlined below as each aspect of the conceptual model is delineated.

Strategic capabilities: organizational learning

Once quality data has been established, firms can begin to turn their valuable assets into capabilities, particularly to learn about their customers (Garvin, 1993; Hult *et al.*, 2000). Study 1, as noted above, used the sample of 209 firms to develop the actual measure of CIS management capabilities based on learning organization theory and measured by the

Table II Reality versus the ideal in managing customer information

Organizational capability	“Ideal” company	Reality
Precept 1. Establish quality standards (Information quality management processes are in place; Study 1, 2, 3, 4)	Organization speaks the language of data quality and quality data is an organizational priority, with processes in place to manage	Organization complains about data quality but has no processes to manage data and to create quality
Precept 2. Use data to create value (Strategy formation is important to the organization, data supports strategy; Study 1)	Selects strong competitive strategy and develops customer information management capability to support	Many firms have no strategy or an average customer information management capability
Precept 3. Involve functional departments (Functional areas are involved and work together; Study 2, 3, 4)	Functional areas, particularly marketing, are involved in the development of data warehouse and applications. Marketing and IT areas work together to manage customer information	Customer information management is responsibility of each functional area
Precept 4. Use relational and transactional data (Both relational and transactional data are collected and integrated; systems/data integration; Study 1)	Company is organized to integrate data, as the highest form of knowledge management, using appropriate systems; relational as well as transactional data is emphasized	Informational “silos” and multiple systems abound and not all systems can talk to each other; no central data repository or way to access data, emphasis is on integration of transactional data
Precept 5. Use data to create future value (New product development integration with customer information systems; Study 5)	Information about the customer from information systems as well as other sources is integrated into the NPD effort, often held in a single repository	Customer data is scattered throughout the organization and not integrated into NPD efforts
Precept 6. Organize for success (Organization includes teamwork, top management vision/support; Study 2, 3, 4)	Company uses a dedicated team, middle management plays a key role translator, top execs in turn support effort	Team may be established but is not dedicated; top management has little understanding of the need to manage customer information in the organization

Notes: Study 1: CIS, strategy and performance; Study 2: Organizational factors in CIS development (qualitative); Study 3: Organizational factors in CIS development (quantitative); Study 4: Implementation factors for CDW; Study 5: Customer information management in NPD context

ability to get, store, move and use information throughout the business unit (Zahay and Griffin, 2003). The research then looked at customer information management in a strategic context, particularly marketing positioning (Porter, 1980, 1985), and examined the question of performance, that is, to what extent customer information management conveys a competitive advantage. The results of the 209 surveys with managers in the insurance and software industries were analyzed in a structural equation model (SEM) (Zahay and Griffin, 2002, 2004).

This research is important because while value creation is considered important in organizations, the precise mechanisms by which value is created in business-to-business firms are not well understood (Hooley *et al.*, 2001). Ideally, firms should use customer information in conjunction with their generic positioning strategy, i.e. which target market the firm selects and how the firm will compete, matching resources to the needs of target markets (Hooley *et al.*, 2001). Such matching processes necessarily involve the use of customer databases and organizational capabilities.

The research in Study 1 therefore primarily focused on the two major generic marketing positionings (low-cost versus differentiation). The low-cost positioning requires information systems and quality processes; differentiation requires market sensing and segmentation capabilities (Hooley *et al.*, 1998), both of which are components of the CIS variable. The research found that generic marketing positioning (low-cost and differentiation) and more specifically marketing strategies (personalization and customization) are related to customer information systems development. CIS development is associated with higher levels of customer performance (a summed measure of customer lifetime value, share of customer, retention rate and ROI), and this variable is in turn associated with increased business growth (sales and net income growth), establishing a link between customer information management and performance (Figure 5).

However, strategy selection (particularly differentiation alone and strategic excellence – “both” low-cost and differentiation strategy) had a greater impact on customer performance than CIS. In other words, whereas a good strategy makes up for deficiencies in CIS, a strong CIS alone without a clear strategy may only in a more limited case lead to a performance advantage. This research also suggests that the greater long-term benefits of the knowledge gained from the CIS may be seen as “table stakes” to help with future measurement and not just as a means to create value. (Day and Van den Bulte, 2002; Zahay and Griffin, 2004). In addition, although CIS development overall was associated with customer performance, strategically excellent firms (those pursuing both differentiation and low-cost) in particular undertake CIS development on their path to achieving excellent performance in B2B services. CDW, the technology product provider, has created a number of marketing strategies that are data-driven. Therefore, Precept 2, “Use data to create value”, indicates that data can be used on the path to advantage but must be used in the context of strategic choice.

Functional capabilities: outside in (market sensing)

Once company strategy has been selected, the type of information collected is also critical in increasing the avenues

through which companies can interact with their customers. These capabilities can be seen as functional capabilities of the organization that are outside, in or market sensing capabilities. While the firm interacts with its customer through many methods, the collection and management of these data streams can be seen as functional capabilities whereby firms can gain advantage.

An extensive review of different types of transactional and relational data produced two different categories of transaction and relationship information. Information generated from “transactional-based” encounters (what the customer did) can be stored in the firm’s in-house database. Other buyer-seller interactions and data “touchpoints” are more relationship-oriented. Customer e-mails and phone calls, web-based contacts and information exchanges, satisfaction surveys, and other interactions or “moments of truth” from a service standpoint can provide relational information to enhance the nature and scope of desired relationships and the extent to which these relationships are evolving.

Quantitative results from the 209 B2B services firms in Study 1 indicated that although both types of data play a role, the more difficult to collect relational information, as opposed to transactional information, contributed more to firm performance. The (B2B) services firms in this sample focus on collecting relational data, the data most associated with both types of performance, and rely on data collected by both the marketing and sales functions equally. In industry, Database Marketing companies such as Acxiom and Experian facilitate merging data from many sources to meet the needs of marketing professionals. In addition, reinforcing Precept 1 that the first managerial task should be creating quality data, data quality played a role in contributing to firm performance in terms of an interaction effect when all variables were analyzed together (Zahay, Griffin and Fredericks, 2004). This research stream from Study 1 can be understood as supporting Precept 3, “Use relational *and* transactional data”, which suggests firms need to develop the capabilities to collect and manage data from customer interactions and transactions, as well as outside sources

Functional capabilities: inside out (resource utilization)

Another functional capability related to customer information management is the capability to manage from the inside out and use existing firm resources, particularly in concert, within the firm. In fact, for firms to manage customer information well, not only must marketing and sales work together but information technology (IT) and marketing must function together as well. Study 4 (Payton and Zahay, 2003) was a single-case study to investigate organizational factors explaining why a corporate data warehouse (CDW) that was implemented in a health care payor organization was not used by marketing to the extent that it was expected to be used for CRM and other marketing purposes.

The case study based on focus group analysis revealed additional organizational factors in the use of customer information by firms. The three primary factors relating to success in CDW implementation were as follows:

- 1 marketing’s lack of trust in the data in the CDW;
- 2 marketing’s low perceived quality of the data; and

3 marketing's perceived lack of incorporation of their unique needs in the design of the data warehouse and data warehouse interface.

In fact, focus group participants in this study reported "reconciling" mainframe reports to the information from the data warehouse. Recalling Precept 1, one aspect of data quality is the extent to which functional users trust in the quality of customer information, since, in marketing, trust is seen to enhance data quality (Moorman *et al.*, 1992). It appears that if trust can enhance the perception of data quality, lack of trust can negatively impact data quality perceptions as well. To manage this perception, Sun Microsystems and USAA among others have used a cross-functional approach to data-intensive web applications. Therefore, Precept 4, "Involve the functional departments", will act to further help firms develop organizational trust and the functional capabilities necessary to use high-quality data to customer information to advantage.

Functional capabilities: spanning (innovation)

Another functional capability related to customer information management is the ability to span across markets or innovate based on customer information. Study 5 involved a set of 20 in-depth interviews with product developers and product development software providers. The study uncovered eight basic types of information that are used throughout the new product development process (project management, customer, market, financial, etc.) needed in the NPD (new product development) process (Zahay, Peltier, Schultz and Griffin, 2004). Although some exemplary companies seem to do an outstanding job of collecting and disseminating information, the majority of firms struggled.

Qualitative analysis revealed that few firms had customer information management systems that were developed with an eye to the full set of uncertainties that need to be reduced throughout the product development process or to the different types of data storage devices necessary (databases versus documents). However, it is clear from this preliminary study that Precept 5, "Use data to create future value, new products and beyond", should be kept in mind by managers as they develop their new product management capabilities.

Operational capabilities: task/skills

Although the large-scale quantitative study of 209 firms described above (Study 1) indicated that CIS does contribute to customer performance and that data quality plays a role in that effort, the human factors in the corporate data warehouse study (Study 3) and the unexplained variance in that original quantitative study (Study 1) indicate that there are a number of additional factors that might contribute to the success of customer information management practices. Indeed, organizational learning would suggest that structural capabilities such as having a team and systems orientation, as well as the firm's ability to learn, are derived from the firm's culture and various qualities of its leadership (Hult *et al.*, 2000). From an organizational learning perspective, Day and Van den Bulte (2002) identified a number of potential antecedents deserving research attention, including organizational structure and how information is collected and utilized across the organization.

Therefore, the operational capability to organize to accomplish tasks and skills is another critical aspect of customer information management. A series of qualitative interviews with participants in Study 1 and another business-to-business marketing firm noted for its customer information management practices revealed significant differences in a number of organizational factors relating to customer information management (Study 2). The study results, although based on a relatively small sample, provide support for the hypothesized relationships between organizational and strategy factors and customer information management performance (Zahay and Peltier, 2008). For example, one of the organizational factors in the successful implementation of customer information management systems in the organizations from the qualitative study appeared to be an articulate middle-management that takes an active and interactive role in strategy formation, translating customer information management needs as articulated by others in the organization for upper management.

Study 3, a small-scale (43) quantitative pre-test study of firms across many industries (Zahay *et al.*, 2005) reinforced the qualitative findings, in that participativeness of middle management was associated with the ability to manage customer information well. It appears that in order to measure customer performance, the firm's middle management and upper management must have an open and communicative relationship.

Reinforcing the importance of quality data as articulated in Precept 1, the findings in this study also indicate a positive relationship between organizational and strategy formation factors such as teamwork/vision and the ability to collect good quality customer information and share that information throughout the organization. (From the original CIS variable, the ability to share information is also considered a distinguishing feature of firms that manage customer information well.) These organizational results are not surprising, since customer information management is a multi-disciplinary function. These results are also consistent with those we would expect to find according to the RBV, which states that it is not resources (i.e. information) themselves, but how that information is managed, such as organizational structures and factors, that contribute to firm performance. Recent work from the Gartner Group suggests that the building blocks of data-dependent CRM applications are management visions, strategy, organizational collaboration and internal processes. Working together with a shared vision and Teamwork is what is meant by Precept 6, "Organize for success". This precept may be the most important to the firm as these organizational practices may be the most difficult to implement.

Conclusion, limitations and practical implications

The fundamental principles derived from this research stream are summarized in Table II. The organization of Table II illustrates the principles employed by the ideal company versus the more typical firm studied as well as serving as a prescriptive guide to managers in B2B services firms for creating superior customer information management processes in their firms. For example, whereas the typical firm may complain about customer data quality, the superior company has processes in place to ensure data quality.

What should managers do as the result of these studies? As this research shows, managing customer information well to create value for customers is complex and should be an evolving task in the firm. Study 1 supported the existence of the learning processes that comprise customer information management practices, the role of strategy selection in customer information management and performance and the importance of the management of relational data and overall data quality processes. In fact, data quality processes were important across almost all studies. Study 2, together with Studies 3 and 4 added other piece of the puzzle in explaining marketing performance by suggesting organizational factors such as teamwork and vision and the overall trust/data quality relationship are necessary to manage customer information well in B2B firms. Study 5 focuses on the future and the importance of customer information in the new product development process.

Also interesting and worthy of future research is another observation not discussed here. One outstanding organization in the qualitative Study 3 spoke an entirely different language from the other firms studied. At all levels people in the organization referred to the terms such as “retention rate”, “lifetime customer value” and “customer knowledge” with ease and a shared understanding throughout the firm. The specific language of customer information management and the importance of shared meanings is another area of future research offering rich potential for researchers.

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