Customer Learning Processes, Strategy Selection, and Performance in Business-to-Business Service Firms*

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ABSTRACT

Learning about customers takes place through relevant dialogues with those customers, also known as customer relationship management (CRM). As relationships develop, information about the customer is gathered in the firm's customer information systems (CIS): the content, processes, and assets associated with gathering and moving customer information throughout the firm. This research develops a measure of CIS management capabilities based on learning organization theory and measured by the ability to get, store, move, and use information throughout the business unit. This measure is then used to analyze customer learning processes and associated performance in the context of marketing strategic decision making.

This study of 209 business services firms finds that generic marketing strategy positioning (low-cost and differentiation) and the marketing tactics of personalization and customization are related to CIS development. Customer information systems development in turn is associated with higher levels of customer-based performance, which in turn is associated with increased business growth.

Since the strongest association with customer-based performance is strategy selection, the long-term benefits of the knowledge gained from the CIS may be in the ability to assist in measuring customer-based performance, rather than in the ability to immediately contribute to performance. Finally, for these firms, customization and personalization are not directly associated with performance and thus may not be necessary to support every firm's marketing strategy.

Subject Areas: Business-to-Business Marketing, Customer Information Management, Customer Relationship Management, Database Marketing, Generic Positioning Strategy, and Services Marketing.

INTRODUCTION

Organizational learning to create competitive advantage has evolved from the resource-based view of the firm, which contends that firm growth can be explained through the management of difficult-to-imitate resources (Barney, 1991; Itami & Roehl, 1987). Because learning processes are difficult to develop, specific, and intangible, these particular assets are difficult for others to imitate, creating advantage for those firms with effective learning processes. In fact, because of difficulty in imitating this capability, the firm's ability to learn may be the only true source of long-term competitive advantage (Sinkula, Baker, & Noordewier, 1997; Slater & Narver, 1995).

Research in the area of organizational learning in the marketing context has evolved from investigating the relationship between marketing and learning orientation and performance to understanding more of the specific capabilities, learning activities, and cultural antecedents that are the means by which firms learn. While Kohli and Jaworski (1990) focused on market orientation in general, Slater & Narver (1995) suggested examining specific learning orientations or capabilities and their role in creating competitive advantage. Hult, in a series of studies, has examined the role of learning activities in creating competitive advantage specifically in the supply chain context, investigating cultural antecedents such as learning climate, as well as learning capabilities (Hurley & Hult, 1998; Hult, Hurley, Giunipero, & Nichols, 2000; Hult, Ketchen, & Slater, 2002).

However, because of the nascent stage of this research, significant gaps in the literature on organizational learning activities exist. Our research contributes by addressing three of these gaps. First, the paper integrates and adapts organizational learning theories specifically to the customer information management context. We adapt the organizational learning activities from the supply chain and other research areas to develop a measure of how well companies manage their customer information. This research theoretically and empirically examines what *specific* types of customer information are most meaningful in creating competitive advantage. This contribution is important given the trend toward acquiring and storing more information about customers, sometimes with little or no clear understanding of the benefits of this information.

Second, we develop an empirical model that incorporates performance variables. We use a sample of 209 managers in business-to-business service industries to empirically test the relationship between both business growth and customer-based performance and learning about the customer. Thus, our research further clarifies the relationship between learning activities and performance, but does so in the context of customer information management. This contribution is important, as there has been little empirical support for the link between customer information learning activities and performance. To date, evidence of competitive advantage from customer information management, as measured by superior performance, is documented anecdotally on a case-by-case basis.

Third, our research puts the organizational learning capabilities of customer information management into a strategic context. While the customer information management context for organizational learning has been overlooked in an empirical sense, even less attention has been paid to the relationship between

organizational learning and its strategic context. Rather than looking at customer information management capabilities in isolation, we examine these capabilities in the context of other strategic decisions firms, and specifically marketers within those firms, must make. In the customer information context, we integrate into our model these hitherto overlooked elements of marketing strategy.

CONCEPTUAL FRAMEWORK AND RESEARCH HYPOTHESES

A Model for Understanding Customer Information Systems (CIS)

Implementing database and software systems for customer information management can be costly, difficult, and time-consuming. Research is needed to understand whether and how managing customer information in a particular strategic marketing context provides a sustainable competitive advantage. Figure 1 presents the model that is tested empirically. We first develop a set of antecedents and consequences from relevant theory, then integrate these concepts into empirically testable hypotheses. This problem requires integrating theory from several literatures, including organizational learning, information technology, strategy, and marketing communications.

The first literature stream considered is organizational learning, which is relevant for two reasons. Research shows that organizations that stress learning activities indeed are able to learn (Garvin, 1993; Hult et al., 2000). Since customer information management is predicated on the concept of the "learning relationship" between the firm and the customer, learning organization theory provides a way to understand how to evaluate customer information management practices. Second, when combined with the resource-based view, the learning process can be a source of strategic competitive advantage, providing a vital link to the strategic considerations of the organization.

Many voices have urged developing customer-data intensive systems and applications, without a theory to provide an organizing context. For example, customer relationship management (CRM), the process of segmenting customers and tailoring relevant offerings to them to create value for the firm (Day, 2000; Parasuraman, Berry, & Zeithaml, 1991), involves not only storing large amounts of customer information, but using that information to develop a "learning relationship" to engage customers in an interactive dialogue for the benefit of both parties (Sinkula et al., 1997). Organizational learning theory provides both the context and vocabulary with which to investigate, in an academic context, customer information management capabilities in organizations. The ability of the organization to learn about its customers can be measured by the sophistication of their customer information systems (CIS).

Organizational learning is enabled by learning processes (Sinkula et al., 1997; Slater & Narver, 1995; Day, 1994) as well as structural and cultural organizational capabilities. Structural capabilities include having a team and systems orientation, while cultural aspects of the organization's ability to learn derive from how open the culture is and various qualities of its leadership (Hult et al., 2000; Deshpande, Farley, & Webster, 1993; Deshpande & Webster, 1989).

Although cultural and structural capabilities undoubtedly influence an organization's ability to manage customer information, we focus here on learning processes as the core enabling CIS capabilities because these processes are the aspects of organizational learning theory most directly related to information management. Learning processes are essentially information processing capabilities, which already have been shown to be related to overall organizational learning in the supply chain context (Hult et al., 2000). Customer information systems are learning process capabilities for gaining customer understanding (Zahay & Griffin, 2002). The theory of CIS is based on four behaviors that learning organization theory has identified as associated with developing knowledge systems (Sinkula et al., 1997; Slater & Narver, 1995; Day, 1994):

- *Generation (get or acquire):* processes and systems to collect customer information.
- *Memory (store):* processes and systems to store customer information for future use.
- *Dissemination (move):* processes and systems for diffusing customer information horizontally and vertically throughout the organization.
- *Interpretation (use):* processes that give customer information one or more commonly understood (shared) meanings that are used in that organization.

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.

CIS and Competitive Advantage

The resource-based view (RBV) of the firm integrates learning organizations and competitive advantage. In the RBV, firms achieve competitive advantage through heterogeneous, specific, and difficult-to-imitate resources that include intangible assets such as customer information (Barney, 1991; Itami & Roehl, 1987). Combining unique resources and capabilities that create value for customers and profits for the firm results in learning (De Castro & Chrisman, 1995).

In spite of examples of companies that use customer information management to achieve competitive advantage (Zeithaml & Bitner, 1996), not all companies are able to develop and implement a strategy to manage customer information effectively and profitably. Quaker Oats and Citicorp, among others, claim failed database marketing projects (Hughes, 1994), which soaked up management time and proved quite costly.

In fact, research on customer information and its management in a strategic context is in the formative stages (Parasuraman & Grewal, 2000), with emphasis still on anecdotal outcomes. We use the theoretical framework that customer information management can provide a competitive advantage as a difficult-to-imitate asset that can be understood in the context of the learning organization and move next to develop a framework that integrates customer information with strategic decision making and performance.

Effects of Marketing Strategy on CIS
Positioning and CIS

Examining the link between tactical marketing decisions, such as CIS, and strategic choice requires understanding marketing's specific responsibilities within the broader strategy dialogue. The strategic decision most important to the marketing function is positioning, or how the business unit delivers value to customers and wants its customers to think of its products and services. Positioning decisions are basic to the operation of all businesses (Porter, 1980, 1985). In Porter's positioning framework, the two fundamental ways to increase profits are to position the firm to lower costs or increase revenues. Low-cost companies minimize costs and pass those savings on to customers in the form of lower prices. Differentiators position themselves to have something unique to offer (product, service component, geographic location) for which they charge a price premium. In qualitative interviews that preceded this large empirical study, the Porter positioning framework appeared repeatedly in the language of the interview participants. Using the Porter framework thus appeared to be a clear way to capture how these businesses in this study make strategic decisions.

While most firms choose to be either low-cost *or* differentiated (Porter, 1980, 1985), there are companies that try to deliver value by being both low-cost *and* differentiated, a "both" or, "strategically excellent" (SE), strategy (Treacy & Wiersema, 1993). Again, in the qualitative interviews before the quantitative study, many firms told us they needed to be both operationally excellent and provide value along an additional differentiating dimension to succeed in the current business environment. In fact, one of the participants invited us to attend a strategy kick-off meeting for the entire division in which the strategy of delivering superior service at the lowest cost in the industry was unveiled.

Finally, some companies never make a clear positioning choice (or lose their former position as the environment changes) and are "stuck-in-the-middle" (SIM), failing to reap the benefits (or profits) of either strategy. The example of retail firms can illustrate these categories. Wal-Mart is low cost ("Low Prices Everyday"), Nordstrom is differentiated on service, Target is both or SE ("Expect More, Pay Less") and K-Mart is stuck-in-the-middle.

The theoretical framework for these different types of strategy comes from economic theory, with different costs associated with selecting each positioning strategy. Research on Porter's framework has focused primarily on whether or not the strategic choices of differentiation and low-cost exist, rather than on whether the two positioning strategies can act in conjunction as the "both" strategy. Porter himself suggested that these policies of cost leadership and differentiation could be "combined," but went no further in the analysis (Porter, 1980, p. 41).

We found the graphic developed by Treacy and Wiersema (1993) to be useful in terms of capturing our qualitative respondents' language about how they selected their strategies. The graphical approach that most closely matched the categories referred to by managers in the qualitative research that preceded the quantitative study integrates, as no one else has, several strategic concepts from the academic literature.

As CIS development incurs transaction costs (collecting information on each interaction) and production costs (providing storage and dissemination capabilities), CIS development is expected to vary according to the firm's strategic position. The value chain for differentiators emphasizes sales and service functions. A CIS for differentiators should help them understand customer needs in more detail and allow them to produce and track individualized marketing programs to individual customers. Therefore, a highly developed CIS would be critical to the functioning of the differentiated firm. Low-cost (LC) firms focus more on operational aspects of the value chain, such as inventory management and production control. Focusing more on efficiencies, low-cost firms would be expected to target their marketing programs and outcomes at an aggregate rather than an individual level, and would be expected to have a less well-developed CIS than differentiators. Strategically excellent firms (SE) need to analyze both individual needs and aggregate information. We thus expect that SE firms would be higher in CIS development than either differentiators (DF) or low-cost since they need both aggregate and individual-level information. Stuck-in-the-middle firms, with no clear positioning strategy, are less likely than other firms to have developed a coherent customer information management system.

> H1: CIS development for strategically excellent firms is greater than for differentiators, which in turn is greater than for low-cost firms, which in turn is greater than for firms stuck-in-the-middle ($CIS_{SE} > CIS_{DF} > CIS_{LC} > CIS_{SIM}$).

Personalization, customization, and CIS

Customization and personalization are tactical marketing decisions distinct from the basic positioning decision (Bonoma & Crittenden, 1988). We now turn to their relationships with CIS.

Personalization, the ability to individualize customer communications, includes both responding individually to customer-initiated communications and providing only the information desired about the firm and its products (Alba et al., 1997; Hoffman & Novak, 1996). It also has been referred to as interactive marketing, or "the use of information from the customer rather than about the customer" (Day, 1999) and the ability to address an individual "in a way that takes into account his or her unique response" (Deighton, 1996, 1997). Although it usually is believed that small-firm commercial relationships have always been highly personalized, most large firms have believed personalization costs more than the resulting increased profits. However, the technologies underlying sophisticated databases and the Internet fundamentally change the economics of personalization, and thus its potential importance to marketing.

We expect that undertaking a marketing strategy to customize products or personalize communications is related to CIS development, since the CIS is where information about the customer used to develop these actions is stored and managed. However, we also expect only some strategies to rely on personalization and customization as marketing decisions. For example, strategically excellent and differentiation strategies, which deliver value by a unique position in the marketplace

relying on a unique understanding of the customer, would be more likely to employ personalization and customization. These relationships can be summarized as:

H2a: CIS development increases as business unit customization increases.

H2b: CIS development increases as business unit personalization increases.

H3: Differentiators have higher levels of customization and personalization than do firms following low-cost strategies.

Relating CIS and Strategy to Performance

Customer information systems implementation is a tactical marketing decision. Its purpose is to allow the firm to develop and maintain better customer relationships. Determining how to measure the success of these relationships and their outcomes has proven problematic. Services marketing has focused on the tactical measures of customer satisfaction (Reichheld & Teal, 1996). Managing customer information effectively also should lead to improved customer-based performance outcomes such as increased customer retention (Reichheld & Teal, 1996; Sheth & Parvatiyar, 1995), lifetime customer value (Reinartz & Kumar, 2003; Berger & Nasr, 1998), and share of wallet for a particular customer (Reinartz & Kumar, 2003; Rust, Zeithaml, & Lemon, 2000). Recent research suggests that these measures should be considered as a whole, since, in a noncontractual setting, the length of time a customer has remained with the firm does not necessarily ensure business growth and that these measures can be used by firms simultaneously (Reinartz & Kumar, 2000, 2003).

A business unit's strategic choices also should impact performance: customer-based performance levels should be associated with marketing positioning strategic decisions. However, many of the studies after Porter do not examine performance differences or look at different performance measures as a dependent variable. On the one hand, there is no economic reason that pursing either cost leadership or differentiation individually would result in superior performance over the other. On the other hand, with the "both" strategy there is reason to believe that a firm pursuing such a strategy would be able to perform better than single-strategy firms or the SIM firm (Treacy & Wiersema, 1993). A firm able to lower its costs of operation (production costs) as well as charge a price premium for a differentiated offering (transaction costs) could, at least theoretically, be able to use the revenue from both of those activities to contribute to firm profitability.

Porter (1980) suggests that the SIM firm would have a more difficult time performing well versus other strategies. Whereas the "strategically excellent" firm is able to pursue both cost leadership and differentiation strategies simultaneously, the SIM firm is unable to recoup financial benefits from its investments. Few studies have looked for evidence of the SIM strategy, however, several have somewhat unexpectedly uncovered SIM groups and business units and found that they do perform less well than companies with a clear strategy (Kim & Lim, 1988; Farrell, Hitchens, & Moffat, 1993). On the other hand, a small meta-analysis of just 17

studies on strategy and performance claims support for the idea that SIM firms do not perform less well than others (Campbell-Hunt, 2000).

As the evidence is hardly clear in supporting differences in traditional methods of performance based on strategic positioning selection, this study will lend some additional insight to this area, based on the following hypotheses:

H4:   Customer-based performance increases with higher CIS development.

H5:   Customer-based performance increases as business units move toward strategic excellence.

$$(CP_{SE} > CP_{DF} = CP_{LC} > CP_{SIM})$$

Performance can be analyzed at strategic as well as tactical levels in the firm. Business growth metrics, such as profit and sales growth, measure overall strategic performance. These metrics are suggested by the RBV as a natural outgrowth of the effective use of firm resources. Performance measures capture outcomes resulting from the set of tactical decisions made across all the functions of the firm, of which marketing is only one. As the balanced scorecard research suggests, there are interim steps to profitability, which themselves can be managed (Kaplan & Norton, 2001). Thus, it is not likely that CIS management by itself will lead to increased business growth. For these tactical decisions, the interim step between CIS and business growth is customer-based performance. Therefore:

H6:   Business growth increases with increases in customer-based performance.

The theoretical model represented by these relationships is illustrated in Figure 1. Initial strategic marketing decisions are generic positions at the business unit level, while customization and personalization are specific marketing

Figure 1: Hypothesized model.
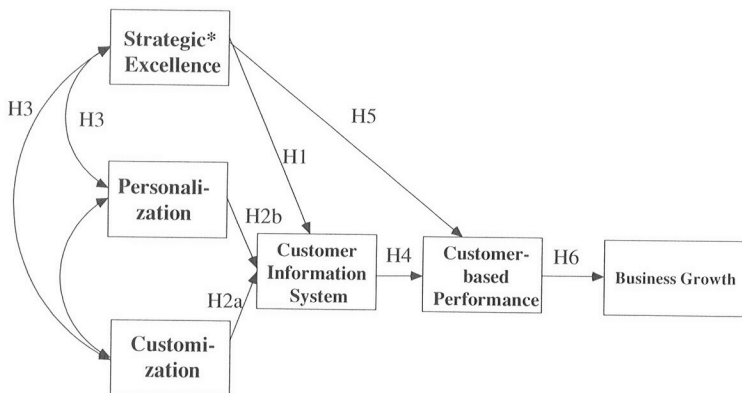
*Pursuing both low-cost and differentiation.

strategies that support business unit strategy. These strategies lead to CIS development, which, together with position, relates to customer-based performance. Customer-based performance in turn is related to business growth. We predict no direct relationship between CIS, personalization or customization, and business growth.

METHODOLOGY

Data for this research came from a large sample telephone survey (209 respondents). Hypotheses were tested using structural equation modeling and various other statistical tests.

Survey Development

Managers responsible for business-to-business product and market decisions in the software and insurance industries were used in all phases of scale and survey development. First, thirty managers were interviewed to understand how business units manage customer information and with what success. This phase resulted in concepts that were operationalized into constructs and developed into specific survey items (Zahay & Griffin, 2003) and also validated using the Porter typology for discussing strategic choices. An exhaustive literature review identified potential items to augment items coded from the interviews. Where possible, existing scales were used. Table 1 summarizes the conceptual origins of the constructs and scales of this research.

The initial survey was pretested with 3 marketing managers in the target industries for item clarification. A modified instrument was then paper-and-pencil pretested by 47 managers (Sudman, 1976). The pretest results were analyzed by exploratory factor analysis (principal components method, Varimax rotation), supporting scale validity and reliability. Items that did not load onto factors were eliminated from the final survey. Although the sample size for the pretest is small, it is consistent with sample sizes in other business-to-business research.

Survey Administration

A marketing research company contacted firms from the sample to prescreen for the person in the division with the most knowledge of three areas of the firm: customer information management practices, strategic concerns, and performance. Interview requests were mailed to that person. Within one week, the research firm scheduled telephone appointments. A copy of the survey was mailed or faxed to respondents so they could see the scales and questions during the interview. Although the research company set up most of the interviews, we collected the data ourselves. Our first author administered the survey by telephone to 209 marketing executives in the software (109) and insurance (100) industries. Although careful screening was performed to find those in the organization with this necessary combination of organizational knowledge to answer these questions, in several cases multiple informants in the same business unit were used to complete the questionnaire. On average, the survey took half an hour to complete.

Table 1: Sources of electronic marketing, strategy and performance constructs.

Construct	Brief Description	Literature Source(S)
CIS:		
Generate	**Get:**	
Acquisition	**How:** Sources of customer information	Direct and interactive marketing literature
Quality	**How Good:** Accuracy, Timeliness, Consistency, Relevance	Sampler (1998), Blattberg & Deighton (1991)
Specificity	**What:** Person or time specific	Wand & Wang (1996)
Remember (Addressability)	**Store:** Locating customer uniquely in time and space	Kohli, Jaworski, & Kumar (1993)
Disseminate	**Move:** Transport information across the firm	Slater & Narver (1995)
Interpret (Shareability)	**Use:** Ability to process and share an interpretation or "picture" about a customer	
Customization	Use information to create products for individual customers	Glazer (1991), Pine (1993), Milne & Boza (1998)
Personalization	Respond to customer by taking into account customer's individual response to prior communication	Blattberg & Deighton (1991), Deighton (1996)
Positioning: Low-cost *vs.* Differentiation	Generic positioning strategies as defined by Porter	Porter (1985), Zahra & Covin (1993), Kohli & Jaworksi (1990)
Customer-based Performance	Retention, Lifetime Customer Value, Share of Wallet, ROI	Reichheld & Teal (1996), Deighton (1996), Reinartz & Kumar (2003)
Business growth	Increases in Sales and Net Income, self-reports	Porter (1985), De Castro & Chrisman (1995)

Table 2: Respondent and firm profiles.

Respondents	Insurance	Software	All
Respondent Age**	45 (8.5)[a]	39 (8.4)	42 (9.0)
Years Worked**	20 (8.0)	13 (6.9)	16 (8.2)
% Graduate School**	31.2%	59.6%	46.0%
Firms			
Sales, M**	$501	$97	
Employees**	1,381	542	
Year Started**	1961	1989	

[a]Numbers in parentheses are standard deviations.
**Differences between industries in means significant at $p < .01$.

Sampling, Response Rate, and Sample

Respondents were selected from stratified random samples of business-to-business property and casualty insurers (SIC Code 6331, NAICS Code 524126) and software companies (SIC code 7372, NAICS code 51121) from Dun & Bradstreet and Ward's *Business Directory of U.S. Private & Public Companies* (Ward's 1999a and 1999b). These two industries were chosen because they were business-to-business services firms that should benefit from managing customer information. By choosing one mature and one growing industry, the robustness of the model could be tested.

The response rate to the survey was 48% on a company basis (209 of 433 companies) and 31% on a per contact basis (209 of 684 mailed contacts), with nearly identical results by industry. For scale development and construct testing the full sample (209) was used in the analysis. For testing the hypotheses, three surveys were eliminated from the analysis as outliers, for a final sample size of 206. Outliers had greater than three standard deviations from the CIS to customer-based performance relationship.

Average respondent age was 42 with 16 years of business experience. Insurance executives were slightly older than software executives and had worked longer, but had lower levels of education (Table 2). Firms were nearly identical in number of customers but the software firms were younger, with lower sales and fewer employees. There were no differences between those who responded and those who did not based on year of firm start, total employees or sales ($p < .05$). This result was the same by industry and for the pooled data.

Construct Development

All variables contained less than 5% missing information. Variables were recoded to eliminate missing data, which CFA modeling programs cannot accommodate with ease. Recoding missing data with ones allowed use of the full sample while avoiding biasing the correlation matrix upward, which might occur by replacing missing data with means. As all interviews were conducted via telephone interview to maximize response compliance, this practice was deemed preferable over the more standard coding of missing data at the mean of the sample, as we deemed it unlikely that the firm implemented the item if our very knowledgeable respondents

Figure 2: Generic competitive strategies by mean break differentiation.

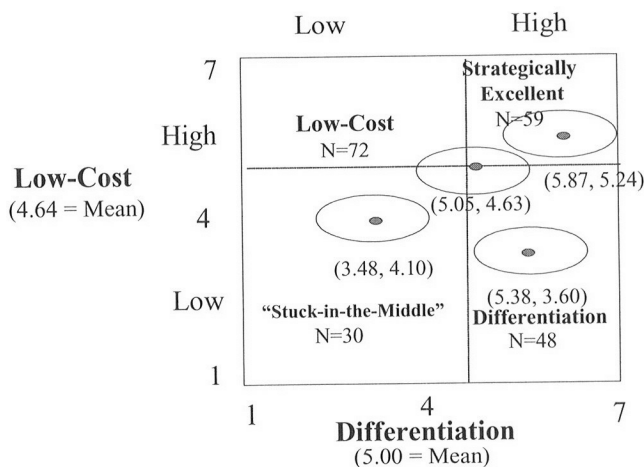From Porter (1985), Treacy and Wiersema (1993); N = 209.

could not answer the question. (A "1" meant that the business unit did not engage in a certain activity or possess a particular capability, thus producing a downward bias in the analysis, if any.) Final constructs were developed through correlation analysis and exploratory and confirmatory factor analysis (see Appendix 1 for detailed methods and statistics) following McDonald (1999).

The strategic excellence variable used in testing Hypotheses 1 and 5 was a summed mean of the differentiation and low-cost variables, indicating a progression toward the "both" strategy. Dividing the sample at the means (LC = 4.64 and DF = 5.01) resulted in four strategic groups of at least forty each for comparison testing from the full sample of 209 (Figure 2). Means were superior to the midscale "4" due to respondent tendencies to inflate their answers in answering these types of questions (Sudman & Schwartz, 1996).

The sample also was divided into strategic categories using cluster analysis for testing Hypotheses 1, 3, and 5, following traditional analytic methods in strategy research (Campbell-Hunt, 2000). While several different cluster procedures were explored as recommended by Ketchen and Shook (1996), the K-means procedure for four clusters produced the best result in terms of group size equivalency and minimizing chaining effects. K-means provides groups of responses or items, rather than groups of variables (Johnson & Wichern, 1988).

The K-means clusters, shown in Figure 3, reveal a set of strategic categories similar to those of the Porter typology. Across the sample, there were firms who clearly focused on differentiating themselves, those who strove for a low-cost position, as we indicated before, those who strove for both, and unfortunately, those who just did not have a coherent positioning strategy. One group is clearly strategically excellent (DF = 5.87, LC = 5.24), pursuing both low-cost and differentiation, as the scores for both strategies are well above the mean, one group is clearly stuck-in-the-middle (DF = 3.48, LC = 4.10), with scores for both strategies below the

Figure 3: Cluster means of strategic categories.

mean, and one is clearly a differentiator (DF = 5.38, LC = 3.60), with the low-cost score below the mean, the differentiation score above. However, these results suggest that there is no true "low-cost," strategic group in the data. This final group is not stuck-in-the-middle, which means pursuing neither strategy, nor having an absence of strategy. Rather, the fourth group is almost exactly on the mean of both differentiation (5.05) and low-cost (4.63). Low-cost is the hardest strategy to maintain because it requires the company to be *the* single low-cost leader in a particular market. Given the nature of service industries, where individuals and companies typically purchase on other than price, and that most companies today seek operational efficiency, it is not surprising that a true low-cost group was difficult to identify using clustering. For a group of service industry companies, the group appears to be closer to the low-cost classification than any group in the sample and is therefore designated by us as low-cost. The companies here clearly are not differentiators, yet they are spending more effort to lower their production costs, increasing operational efficiency, than either differentiators or the SIM group.

Cronbach's α was computed to test scale reliability for all scales. All construct items met the criteria of $\alpha > .6$ for exploratory research and most items are well above .70 (Nunnally, 1978, 1967; Hair, Anderson, Tathan, & Black, 1998; Hair, 1979). The exceptions were the final customization scale ($\alpha = .66$), which was retained because the scale had been developed and used in prior research (Milne & Boza, 1998), and the low-cost ($\alpha = .60$) and differentiation ($\alpha = .66$) scales, retained also because of validation in prior research (Zahra & Covin, 1993). In fact, the lack of a clear low-cost cluster as mentioned above could also be due to these measurement issues, since the strategy scales had some of the lowest reliability statistics of all the scales used in this research. We suggest later how these scales might be improved for future research in this area.

Descriptive statistics for all final constructs used in hypothesis testing and the SEM model are reported in Tables 3 and 4.

RESULTS

The CIS Variable

The final CIS measure was a summed model with eight separate subconstructs (Figure 4 and Appendix 1). The final structure had more items and subconstructs coming from the more fundamental tasks of customer information management, such as generation and storage. Indeed, four of eight subconstructs come from "generation," the most basic task of information management. The EFA and CFA process simplified the CIS concept to a thirty-item scale of CIS capabilities. Importantly for practice, this analysis supported creating a single CIS "score" that can be used to distinguish across business units in terms of customer information management (Zahay & Griffin, 2002, 2003). This thirty-item scale provides a picture of the customer information capabilities of a business unit, which then can be compared to the capabilities of other business units within the company or other similar organizations.

In a day and age where managers often are urged to acquire more data from more sources, these findings suggest which management factors may be more key in improving customer information management. In fact, the highest-loading CIS subconstruct is Quality (.63), one of the processes associated theoretically with

Figure 4: Final CIS construct.
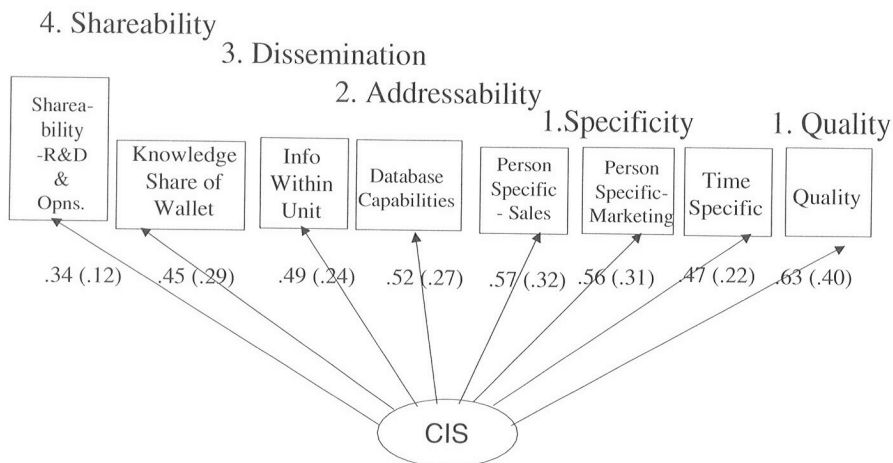
Path weight listed underneath variable name, with squared multiple correlation in parentheses. Numbers by sub-constructs indicate levels on CIS hierarchy, with 1 the most basic capability, 4 the most sophisticated.

Fit Statistics: RMR = .043, RMSEA = .044, GFI = .967, AGFI = .941, CFI = .965. χ^2 (df) = 27.987 (20), p = .110, α = .70.

Table 3: CIS subconstruct descriptive statistics.

	Quality	Sales Specificity	Marketing Specificity	Time Spec. Purch. History	Database	Dissemination	Shareability, R&D, Operations	Knowledge of Share of Wallet
Information Quality	3.51 (.76)							
Person Specificity, Sales	.31**	3.86 (.84)						
Person Specificity, Marketing	.30**	.43**	3.14 (1.04)					
Time-Specific Purchase History	.28**	.24**	.29**	4.10 (1.04)				
Addressability, Database Capabilities	.37**	.35**	.28**	.26**	3.70 (.97)			
Dissemination	.39**	.25**	.29**	.15*	.16*	3.43 (.81)		
Shareability, R&D and Operations	.22**	.12	.19**	.20**	.14*	.23**	2.90 (1.24)	
Knowledge-Share of Wallet	.32**	.20**	.19**	.27**	.22**	.25**	.17*	2.67 (1.45)
Cronbach α	.87	.80	.80	.79	.80	.67	.81	.92

$N = 209$; Correlations: two-tailed significance, $*$ = $p < .05$ level, $**$ = $p < .01$ level. Numbers on the diagonal are means and (σ). All variable ranges are 1–5, where 5 is highest level.

Table 4: Variable correlations and descriptive statistics, N = 209.

	CIS	Business Growth	Customer Performance	Personalization	Customization	Low Cost	Differentiation	SE
CIS[a]	3.41 (.60)							
Business growth[b]	.05	4.00 (.48)						
Customer-based Performance[c]	.22**	.25**	5.00 (1.00)					
Personalization[a]	.36**	.08	.05	3.20 (1.02)				
Customization[a]	.27**	.05	−.002	.18*	3.52 (.86)			
Low-cost[c]	.27**	.09	.21**	.22**	.17**	4.64 (.91)		
Differentiation[c]	.16*	.04	.42**	.02	.04	.14	5.00 (.92)	
Strategic Excellence[c]	.28**	.09	.42**	.16*	.14*	.75**	.76**	4.82 (.70)
Cronbach α	.70	.79	.74	.75	.66	.60	.66	n/a

Correlations: two-tailed significance; $* = p < .05$ level, $** = p < .01$ level. Numbers on the diagonal are means (σ). In all cases, higher numbers are higher levels of the variables.

[a] The range is 1–5 for CIS, personalization and customization.
[b] The range for business growth is 0–6.38.
[c] For Customer-based performance and all strategy variables (LC, DF, and SE), the range is 1–7.

the generation of information. The importance of data quality in CIS development is not surprising, since good quality data are necessary for enabling interactions. Functional aspects of information generation also seem consistently important in discriminating across CIS capabilities. Associated with the generation of information are three kinds of specific information necessary to measure CIS. These information types are Time-Specific Purchase History, Marketing-Specific information, and Sales-Specific information.

For dissemination of information, the ability to spread knowledge within the marketing unit accounts for variability in the data and helped distinguish among business units. For addressability, the practical capabilities of the database itself account for variability in CIS in the data. The learning organization idea of information use is operationalized as information "shareability." Shareability's two subconstructs are Sharing with R&D and Operations and Knowledge-Share of Wallet (knowledge of share of wallet and the business unit's percentage of a customer's total business) (Rust et al., 2000).

Overall, the results of the survey suggest that capabilities in customer information management are fairly crudely developed. Data collection occurred during late 1999 and early 2000. Although over 90% of the sample had a web site and a customer database, only 24% processed sales transactions over the web, even though 80% used other forms of direct selling. The mean CIS score for the sample is 3.41, just above the midpoint of the scale (maximum possible 5), indicating room for improvement. An analysis of the subconstructs of the CIS reveals that the lowest means are those associated with the most sophisticated aspects of CIS, such as shareability. In fact, one reason that the standardized path weightings are higher in the CIS for the less-sophisticated aspects of information management may be because these capabilities are easier to implement, as well as measure. This result supports previous suggestions of the difficulty of measuring sophisticated learning activities such as sharing, interpretation, and use (Hurley & Hult, 1998).

Hypothesis Testing

Prior to hypothesis testing, the normality assumptions of the data were analyzed. Only business growth differed slightly from normality. A log transformation improved variable normality. Variable correlations (Table 4) indicated relationships between the variables strong enough to warrant further testing, but not so high ($>.6$) as to indicate that testing would not be valid due to a lack of discriminant validity. Correlation analysis supported the structure of the initial model (Figure 1), in which personalization and customization are hypothesized as marketing decisions that by themselves do not necessarily lead to performance; in fact, both of these variables were uncorrelated with both customer-based performance and business growth (Table 4). In addition, CIS and business growth also were not correlated, again supporting the model in general: CIS builds customer relationships, which in turn are related to business growth (Table 4).

The model of Figure 1 was fit using summed mean variables (McDonald, 1996) in a structural equation model. Figure 5 provides fit statistics and standardized regression weights for each path. Each path loading was significant at

Figure 5: Strategy and CIS model.
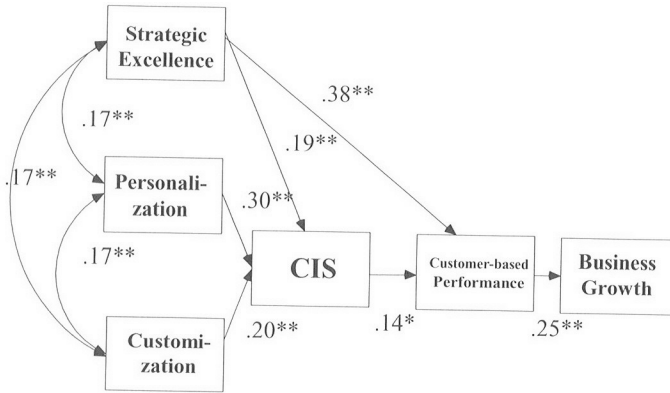
N = 206.
*Significant at p < .05, 2-tailed, **Significant at p < .01, 2-tailed.

Fit Statistics:
RMR = .011, RMSEA = .000, GFI = .996, AGFI = .986, CFI = 1.00.
χ^2 (df) = 2.416 (6), p = .88.

p < .05. The model relationships posited in H2a, H2b, H4, H5, and H6 were all supported. In addition, the structural equation model, which tests not only individual relationships between variables but also the relationships between them as a group, supports the overall relationships as hypothesized. Overall, the fit statistics of the model were good, and within guidelines for marketing research using SEM, especially considering the exploratory nature of this research (Bagozzi & Yi, 1988; Baumgartner & Homburg, 1996; Steenkamp & Baumgartner, 2000). The model p-value at .88 is greater than .05 ($\chi^2_{(6)} = 2.416$), indicating significance at <.001. Both the Goodness of Fit Index (GFI) and adjusted Goodness of Fit Index (AGFI), which measure the fit of the combined measurement and structural model to data (unadjusted and adjusted for degrees of freedom), were greater than .90 (.966 and .986, respectively) (Bollen, 1989; Baumgartner & Homburg, 1996). The root mean residual (RMR), which assesses the correlations between the residual variance of the model items and should be less than .05 for a close fit, is .011 (Jöreskog & Sorbom, 1993; Bagozzi & Yi, 1988). The Steiger-Lind root mean square error of approximation (RMSEA) (Browne & Cudeck, 1993), a noncentrality measure of the square root of an estimate of the population discrepancy divided by the degrees of freedom that should be as close to zero as possible, is .000. The CFI, a normed comparative fit index that should be as close to 1 as possible, was 1.00 (Bentler, 1990).

As with any structural equation model, identification issues are a concern. In this particular model the orthogonality assumption is implied by the presence of only directed paths (arrows pointing in one direction) that lead back to the exogenous variables (McDonald, 1997). The model also meets the order rules

condition for nonrecursive models, that each equation of the model should contain no more coefficients than the number of exogenous variables.

Several alternative models were tested, including industry-based models, but none produced superior fit statistics or a superior theoretical contribution than the posited model. Specifically, the alternate hypothesis that personalization and customization might be related directly to customer-based performance was considered, especially since these marketing decisions are receiving so much attention in the popular press as anecdotally related to performance. However, as personalization and customization are not correlated with customer-based performance ($\rho = .05, -.002$, respectively, Table 4), this alternate model did not obtain superior fit.

A final model was fit (Figure 6) to understand further the relationships for the specific components of strategic positioning choice. This second model was tested because using SE as the summed mean score of low-cost and differentiation does not capture in detail what we need to understand about the positioning-CIS development interaction. Since a business unit with a differentiation level of 6 and a low-cost of 1 mathematically has the identical summed strategic excellence score (7) as a business unit with the opposite response, further analysis is necessary to parse out differences attributable to each strategy individually. The model in Figure 6 illustrates how low-cost and differentiation decisions relate to CIS and performance. This model also had good fit statistics and all paths except one were significant at p < .05 (differentiation to CIS, p < .10). In spite of the smaller sample size, we also fit individual industry models to these data and both models fit well,

Figure 6: Relationship between generic positioning choices, CIS and performance.
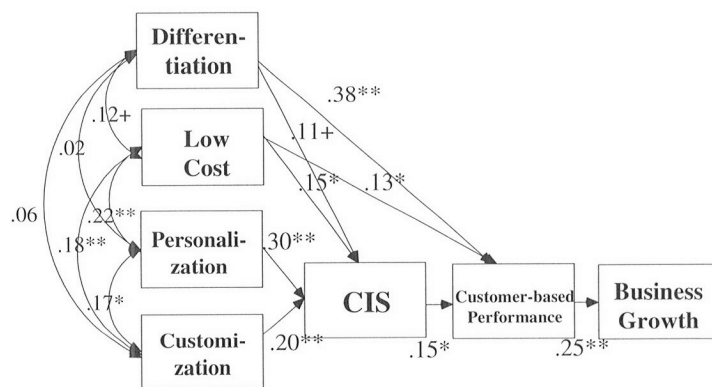
N = 206.
*Significant at p < .05, 2-tailed, **Significant at p < .01, 2-tailed, +Significant at p < .10, 2-tailed.

Fit Statistics:
RMR = .010, RMSEA = .000, GFI = .996, AGFI = .983, CFI = 1.00.
χ^2 (df) = 3.182 (7), p = .868.

with differentiation clearly a major strategy component in the insurance industry (Insurance: $p = .68$, RMR $= .02$, RMSEA $= .00$, GFI $= .99$, N $= 98$, Software: $p = .363$, RMR $= .03$, RMSEA $= .03$, GFI $= .98$, N $= 108$).

The empirical models support the theory-driven hypotheses that personalization and customization are separate marketing strategy choices that lead to CIS development, but not directly to profitability, that customer-based performance is associated more strongly with strategy than with CIS and that there is no direct link between CIS development and business growth. These models also illustrate that differentiation is not necessarily associated with personalization and customization, a result that will be commented on later.

Strategy Selection and CIS Relationships

Hypotheses 1 and 3 address the overall relationship between strategy selection and CIS development. Relationships tested between the variables using cluster-derived strategic categories are in Table 5. Similar tests using strategic categories created by splitting the data at the mean as in Figure 2 showed similar results. Hypothesis 1, the proposition that CIS development differs by strategy ($CIS_{SE} > CIS_{DF} > CIS_{LC} > CIS_{SIM}$), is only partially supported (Table 5, column 2). Although business units with different strategies do vary in terms of CIS development, the differences are not large. Strategically excellent firms may be a bit more developed in CIS; SIM firms may be a bit less developed.

Hypothesis 3, which predicted that customization and personalization would be greater for differentiators than for low-cost firms, was not supported (Table 5, columns 3 and 4). Customization and personalization are equally high for strategically excellent and low-cost firms. Both marketing strategies are statistically higher for SE firms than for differentiators and in addition are correlated not with differentiation, but with a low-cost position (Table 4). These marketing strategies do not seem to be associated with positioning a firm as a differentiator.

However, the overriding importance of strategy selection in creating competitive advantage is evident in these data. As suggested by Porter (1985), in these data, not having a positioning strategy (being "stuck-in-the-middle") is not likely to allow firms to achieve competitive advantage. Also as suggested by Porter (1985), we found no difference in performance between differentiators and low-cost firms. Achieving strategic excellence is associated with higher customer-based performance, which in turn is associated with increased business growth. The hypothesized relationships in this research and the results of hypothesis testing are summarized in Table 6.

DISCUSSION

The first objective of this research was to create a theoretically sound measure of customer information management capabilities in organizations based on learning organization processes. This objective was achieved in the form of the CIS measure, a general construct, and highly specific subconstructs for measuring customer learning activities that can be refined further and used in other research in customer information management and customer learning for verification of utility. Overall,

Table 5: Comparing means by strategic category (by cluster grouping), N = 209.

	CIS	Customization	Personalization	Customer-Based Performance	Business Growth
Strategically Excellent (N = 59)	**3.60**	**3.76**	3.36	**5.39**	4.00
Low-cost (N = 72)	3.44	3.49	3.30	**4.92**	4.01
Differentiators (N = 48)	3.29	3.22	2.93	**5.03**	3.89
SIM (N = 30)	3.19	3.56	3.13	4.14	3.94
Overall Mean	3.41	3.52	3.20	4.97	3.98
ANOVA: F Statistic (df)	4.23 (206)	3.58 (206)	1.89 (206)	12.15 (206)	1.07 (206)
p	.006	.015	.133	.000	.361
Post-hoc Scheffé	SE > SIM*	SE > DF*		SE > LC*, SIM**; LC, DF > SIM**	

Significance level, * .05 level, ** .01 level, bold is significantly different from any one other category.

Table 6: Summary of hypothesis testing.

Hypothesis	Results	Support
Hypothesis 1: $CIS_{SE} > CIS_{DF} >$ $CIS_{LC} > CIS_{SIM}$	Partially Supported	Table 5
Hypothesis 2a: CIS development increases as business unit customization increases	Supported	SEM, Figures 5, 6
Hypothesis 2b: CIS development increases as business unit personalization increases	Supported	SEM, Figures 5, 6
Hypothesis 3: Differentiators have higher levels of customization and personalization than do firms following low-cost strategies.	Not Supported	Tables 4, 5
Hypothesis 4: Customer-based performance increases with higher CIS development	Supported	SEM, Figures 5, 6
Hypothesis 5: Customer-based performance increases as business units move toward strategic excellence	Supported	Figure 5
Hypothesis 6: Business growth increases with increases in Customer-based performance	Supported	SEM, Figures 5, 6

the mean CIS of the business units in this sample was average, 3.41 out of 5, just above the midpoint of the scale. If firms were excellent in this area we would have expected the mean to be closer to 5 and for firms to emphasize more sophisticated CIS capabilities such as dissemination and shareability. One difficulty in identifying performance differences based on strategy could result from the fact that these more sophisticated capabilities have not been developed by the sample measured in this exploratory research.

The second objective of this research was to explore the relationship between customer learning processes as embodied in the CIS and overall firm performance in an empirical context. Although this work must be considered exploratory, these results provide further support for the relationship between learning processes and performance as suggested by the RBV. These processes are presented in a new context, that of customer information management. In addition, this research extends previous empirical evidence by exploring the intermediary variable, customer-based performance, between business growth and CIS. Customer-based performance measures, as hypothesized, appear to be one missing link between positioning strategy, CIS, and business growth. This mediation suggests that customer understanding and knowledge contributes to organizational performance, albeit indirectly.

The third objective of this research was to place customer information management decisions in a strategic context, particularly a strategic marketing context. While value creation is considered important in organizations (Wilson, 1995), the

specific mechanisms by which value is created are not well understood (Anderson, 1995). This research suggests that one way customer value may be created in these business-to-business service markets is through positioning strategy selection and customer information management, but that strategy is more highly associated with performance than are the learning activities embodied in the CIS. This finding is counter to claims for customer information management made in the popular press that primary marketing efforts must be put into database development and data mining, but helps us understand some of the value-creation mechanisms in business-to-business services markets. This research also supports the view that personalization and customization in and of themselves may not create value that results in performance advantage, but rather are likely to be independent marketing decisions that also are associated with CIS development.

However, these data do support differentiation positioning as being significantly related to customer-based performance. In fact, differentiation looks like it has a more compelling association with customer-based performance than the more data-driven aspects of the CIS. As shown in Figure 6, the path weight for differentiation is almost three times that of low-cost in terms of relationship to customer-based performance. However, in these data strategically excellent (both) firms do not exhibit higher customer-based performance than the differentiators (Table 5).

Although CIS development overall is associated with customer-based performance, strategically excellent firms in particular seem to undertake CIS development on their path to achieving excellence. However, all strategic categories emphasize CIS development to some degree, suggesting that customer learning may be important to these service organizations regardless of strategic category. In spite of the difficulties and costs involved in full-scale CRM and implementing 1-to-1 marketing throughout the organization, these systems appear to be here to stay.

It appears that implementing an effective strategy by itself helps the business unit achieve a marketing competitive advantage as measured by customer-based performance to a degree greater than all the other variables studied in this research. Rather than suggesting that organizations emphasize strategy selection as opposed to organizational learning, we conclude that learning about the customer plays a vital role in contributing to performance. Strategic excellence, particularly differentiation, works in accordance with learning processes associated with customer information management to create competitive advantage in business-to-business services markets. In addition, the decisions to engage in personalization and customization work in conjunction with the strategic positioning decision. The decisions to be customized and personalized appear to occur first; these actions are then associated with a deeper and more sophisticated customer system as measured by the CIS variable.

Limitations

Several limitations should be kept in mind with regard to this research. With only two industries and 206 observations in the final model, additional empirical testing is required to further support the relationships suggested here, and to test their

generalizability. Given the exploratory nature of the work, other industries should be studied to further refine the measures and scales.

In spite of research that indicates that self-reports of managerial performance, if the managers are at the right level in the organization, are highly consistent with actual performance (Dess & Robinson, 1984; Robinson & Pearce, 1988), the self-reports used here mean that the research cannot be triangulated by an outside source. We also conclude, using Harman's one-factor test and other methods of analysis (Podsakoff & Organ, 1986; MacKenzie, Podsakoff, & Paine, 1999), that common method variance is not a substantial risk in these data.

In addition, in retrospect, the strategy variables should have been adapted more specifically to this study. It is interesting that these variables had the lowest coefficient α's, lower than the scales created specifically for this study. In particular, the differentiation scale could have been adapted more closely to the services marketing setting. Possible additional sources of differentiation include an in-person sales force, quality of offering, and a service dimension. These changes might allow us in future research to more clearly identify the strategic positioning categories to analyze differences in CIS development and performance.

Carefully selecting informants who could answer questions across organizational boundaries helped minimize concerns about single informants. Since organizational learning works by breaking down barriers in the organization, many of those interviewed were employees with appropriate new titles, such as "Knowledge Manager," and others with an organization-wide view. However, because of the length of the survey, variables related to organizational structure were not included in the survey; these additions are planned for the next research phase to begin the summer of 2004.

Managerial Implications

For the manager, these results put organizational learning into perspective. Marketing database and interactive technologies that collect customer information represent significant investments for business marketers. These investments are made in the hope of improved relationships with customers, and ultimately business growth. This research suggests that the CIS learning processes may not be ignored, since CIS is associated with customer-based performance, but must be put into perspective as managers evaluate where to spend their crucial resources. Additionally, managers should develop a sound positioning strategy and decide if personalization and customization make sense as marketing strategies for the company, since these specific marketing decisions are not associated with customer-based performance but instead are associated with the CIS.

The true benefit of the CIS may not be in terms of customer-based performance but in helping a company be able to measure customer-based performance as defined by higher retention rates, a greater share of wallet, and greater customer lifetime value and return on investment for the business unit. Perhaps one value of the CIS will be the ability to provide the crucial metrics for evaluating customer-based performance. In other words, these learning processes may lead to the ability to measure what previously could not be measured. With the ability to measure, managers can begin to grow and improve their processes and their organizations.

The good news for managers is that all of these elements are to some degree under their control. Strategy selection and the development of the CIS are managerial decisions. By focusing more on the "big" picture, positioning and delivering value in a general way and developing customer information management capabilities, managers can make the most of current customer information systems and develop other learning processes as needed.

Many business units are at the very beginning of the process of developing a sophisticated CIS. While these systems may be seen as "table stakes" to achieving performance, managers also might be advised as a result of this research to consider the type and quality of available information used in their organizations rather than force the broad adoption of a specific system or database. While it appears a deep and sophisticated CIS goes hand in hand with customer-based performance, a good CIS alone without a good strategy will not lead to superior performance.

The Future

This model, although a start to understanding the complex relationships between customer learning, strategy, and performance, also indicates a need for future research to understand these variables and their relationships. First, the factors in addition to strategy selection and CIS that contribute to customer-based performance should be included in this research. While a number of control variables, including Porter's Five Forces, size of firm, and size of customer, were included in the study, only two scale items were significant and provided only incremental understanding of customer-based performance. Factors that place CIS and strategy development in an organizational context will greatly enhance future research.

In addition, positioning, particularly a differentiation positioning, appears to require learning processes not embodied in the CIS. In considering future research directions, we must also ask why the positioning decision might be the more important decision for customer-based performance. Whether to be low-cost or differentiated is the decision that must be made before the business unit can move forward in its decision making on tactical issues. In addition, positioning is a decision that has broad-reaching operational implications throughout the organization and thus is directly related to the organizational activities of the value chain (Anderson, 1995). The decision to follow the effective "both" strategy in most cases requires a deep and broad knowledge of the customer and capabilities for coordinating information throughout the business unit. In other words, positioning strategy implementation also requires the organization to learn, but in ways not directly captured or measured in this research. These learning capabilities in strategy formation and implementation offer future research potential with both theoretical and managerial implications. [Received: February 2002. Accepted: January 2004.]

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APPENDIX 1

Construct Development Details and Statistics

The Exploratory Factor Analysis (EFA) used principal components analysis with Varimax rotation and a cutoff of .5 for individual item factor loadings (Hair, 1979; Nunnally, 1978) and 1 for factor eigenvalues. The confirmatory factor analyses (CFA) was guided by EFA results. All the EFA results with a percent of variance explained of at least 6% were examined in 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. Items not contributing to overall fit were identified through examining the residual matrices. Where constructs with fewer than four items could not be analyzed by CFA (insufficient degrees of freedom), interitem correlations of greater than .6 were required.

The CIS scale, which was newly conceptualized in this research (see Figure 2), was tested separately. Separate EFA analyses were conducted for each part of the CIS subconstructs (Generate, Address, Disseminate, and Share). Because of the complexity of the initial analytical framework, it was not expected that every subconstruct of CIS from the EFA would pass the additional rigor of the CFA analysis. Indeed, not all CIS subconstructs had good CFA fit statistics, due primarily to a lack of degrees of freedom in fitting these small models (Table A2.1). CIS subconstructs were retained in the measure based on their contribution to the overall model fit. Importantly, the CIS construct itself had good overall fit statistics (RMR = .043, RMSEA = .044, GFI = .967, AGFI = .941, CFI = .965, χ^2 (df) = 27.987 (20), p = .110). In addition, Table A2.2 presents a posthoc principal components analysis, which illustrates the discriminant validity of the constructs as they were used in the final analysis. An additional post hoc CFA (not shown here) on the final 51 items in the analysis also supports their use in the scales as used here.

Of the non-CIS constructs, where CFA was applicable (items greater than 2), the constructs exhibited good fit statistics from the CFA. Customization exhibited the weakest set of fit statistics (Table A2.3). When subset analysis on pairs of appropriate constructs were conducted, the models fit reasonably well but less well than the individual constructs.

Table A2.1: CFA results: CIS subconstructs and items, N = 209.

	No. of Items	RMR	RMSEA	GFI	AGFI	CFI	χ^2 (df)	p	α
Information Quality	4	.007	.000	.998	.989	1.00	.91 (2)	.63	.87
Person Specificity, Sales	4	.030	.110	.985	.923	.982	7.03 (2)	.03	.80
Person Specificity, Marketing	4	.025	.000	.997	.987	1.00	1.10 (2)	.57	.80
Time-Specific Purchase History	4	.102	.243	.937	.685	.908	26.46 (2)	.19	.79
Database Capabilities	4	27.04	.097	.986	.931	.988	5.90 (2)	.05	.80
Dissemination	4	.014	.000	.999	.995	1.00	.45 (2)	.74	.67
Shareability, R&D, and Operations	4	105.67	.352	.909	.547	.838	53.64 (2)	.00	.81
Knowledge—Share of Wallet ($\rho = .86$, p < .05)	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	.92

Overall CIS Fit Statistics: $\alpha = .70$; RMR = .043, RMSEA = .044; GFI = .967; AGFI = .941; CFI = .965, χ^2 (df) = 27.987 (20); p = .110.

Table A2.2: Summary PCA table CIS subconstructs, (N = 209).

	Quality	Database Capabilities	Shareability—R&D/Ops.	Sales Specificity	Marketing Specificity	Time-Specific Purchase History	Dissemination	Knwldge Share of Wallet
Accuracy	**.792**	.097	.037	.042	.139	.097	.140	.075
Consistency	**.786**	.170	.180	.112	.090	.005	.124	.109
Timeliness	**.788**	.091	−.001	.110	.050	.127	.150	.058
Overall Quality	**.823**	.146	.083	.114	.103	.141	.123	.107
First purchase date	.186	.087	.143	.090	.057	**.756**	−.074	.015
Contract renewal date	.008	.054	.008	−.002	.096	**.708**	−.000	.132
Purchase history	.150	.162	.090	.165	.055	**.720**	.180	.150
Last purchase date	.052	.056	.043	.042	.164	**.835**	.029	−.019
Have contact name	.035	.153	.096	**.829**	−.013	.120	.023	−.002
Have contact type	.125	.032	−.022	**.862**	.102	.031	.076	−.058
Have response to contact	.166	.142	−.001	**.731**	.263	−.023	.127	.112
Names of others in purchase	.006	.167	.046	**.586**	.282	.180	.053	.144
Marketing offers made	.103	.117	.039	.226	**.804**	.126	.068	.068
Offers responded to	.060	.067	.080	.137	**.843**	.075	.056	.002
Method of contact	.032	.284	.062	.240	**.606**	.060	.194	−.098
Response time for offers	.176	−.045	.075	−.021	**.702**	.151	.046	.160

Table A2.2: (continued) Summary PCA table CIS subconstructs, (N = 209).

	Quality	Database Capabilities	Shareability—R&D/Ops.	Sales Specificity	Marketing Specificity	Time-Specific Purchase History	Dissemination	Knwldge Share of Wallet
Basic contact info available	.356	**.610**	.104	.065	.025	.244	.060	.047
Basic info, no purchase last yr.	-.076	**.886**	-.000	.089	.050	.142	.014	.041
Extend info, no purchase last yr.	.163	**.828**	.060	.125	.070	.047	-.059	.107
Basic info, contact in 3 months	.049	**.666**	.025	.151	.136	-.039	.111	.028
Circulate customer documents	.122	-.016	.051	-.037	.073	.085	**.775**	-.164
Spread important info on major customers	.075	.169	.113	.141	.034	-.017	**.656**	.112
Disseminate customer purchase patterns	.253	.007	.102	.064	.233	.082	**.557**	.199
Exchange customer info across units	.115	-.027	.045	.080	.030	-.026	**.709**	.116
Know share of wallet-unit	.172	.078	.056	.052	.124	.119	.084	**.913**
Know share of wallet-company	.140	.116	.089	.061	.024	.147	.115	**.907**
R&D access customer info	.108	.082	**.770**	.062	.047	.087	.093	-.006
Operations access customer info	.174	.079	**.795**	-.001	-.004	.088	.151	.098
R&D modify customer info	.000	.085	**.747**	-.004	.204	.042	.008	-.048
Operations modify customer info	-.001	-.087	**.826**	.046	-.011	.040	.044	.115
Eigenvalue	7.004	2.516	2.164	2.116	1.946	1.539	1.512	1.352
% variance explained	23.3%	8.4%	7.2%	7.0%	6.5%	5.1%	5.0%	4.5%
Cumulative	23.3%	31.7%	38.9%	45.9%	52.4%	57.5%	62.5%	67.5%
α	.87	.80	.81	.80	.80	.79	.67	.92

Table A2.3: CFA Summary: Strategy and performance variables and subsets, N = 209.

	No. of Items	RMR	RMSEA	GFI	AGFI	CFI	χ^2 (df)	P-Value
Low-cost Strategy ($\alpha = .60$)	4	.036	.000	.996	.950	.837	1.78 (2)	.41
Differentiation Strategy ($\alpha = .66$)	4	.027	.000	.997	.987	1.00	1.11 (2)	.58
Strategy (Low-cost and Differentiation)	8	.087	.020	.976	.955	.992	20.63 (19)	.36
Customer-based performance ($\alpha = .74$)	4	.009	.000	1.00	.998	1.00	.15 (2)	.93
Business growth ($\alpha = .79$, $\rho = .65$, $p < .01$)	2	NA	NA	NA	NA	NA	NA	NA
Performance (Customer-based performance and Business Growth)	6	.034	.087	.969	.918	.959	20.67 (8)	.01
Customization ($\alpha = .66$)	4	.073	.121	.980	.901	.956	8.12 (2)	.66
Personalization ($\alpha = .75$)	4	.031	.000	.996	.982	1.00	1.15 (2)	.48
Marketing strategy (Customization and Personalization)	7	.073	.059	.970	.936	.971	22.30 (13)	.05

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