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Making Sales Technology Effective

Firms invest billions of dollars in sales technologies (STs; e.g., customer relationship management, sales automation tools) to improve sales force effectiveness and efficiency. However, the results expected from ST investments are often not achieved. This article proposes relationship-forging tasks that are critical to the link between ST use and key aspects of salesperson performance (i.e., a salesperson's relationship-building performance with customers and administrative performance). The authors evaluate relationship-forging tasks in the context of a model that considers the antecedents and consequences of three different uses of ST: accessing, analyzing, and communicating information. In general, the results of a field study, which is analyzed using block-recursive structural equation modeling, support the relationship-forging theory and show that relationship-forging tasks predict 57% of the variance in a salesperson's relationship-building performance with customers. The findings also support hypotheses that using ST either to analyze or to communicate information has mediated positive effects on a salesperson's relationship-building performance with customers. However, a salesperson's use of ST to analyze information has negative influences on administrative performance, creating an unexpected trade-off for sales and marketing managers.

The nature of exchange processes between buyers and sellers in business markets has changed dramatically. Cooperative partnerships rather than competitive actions (Anderson and Narus 1984, 1990), a search for integrative rather than distributive (win–lose) outcomes (Clopton 1984), and long-term rather than short-term outlooks (Dwyer, Schurr, and Oh 1987; Ganesan 1994) better characterize buyer–seller relationships than does the traditional "arm's-length exchange" process. Over the past decade, sellers have placed increased strategic emphasis on building relationships with buyers (Cannon and Perreault 1999) and investing in information technology (IT) for sales force applications (Shoemaker 2001). However, many sales forces have preserved their primary responsibility of establishing, building, and maintaining relationships with business customers. Considering the current state of buyer–seller relationships, it is not surprising that in a recent worldwide study of 1300 companies, executives ranked sales force effectiveness second only to revenue generation as their top priority (Dickie 2004). Thus, the strategic importance of the sales force to the organization's success may be at an all-time high.

Concurrent with renewed strategic importance, sales organizations seek new ways to use IT. In today's relational selling role, the sales representative's job is no longer to protect the host organization from external dependencies and advance solely its internal objectives; rather, the purpose is often just the opposite. The salesperson's new imperative is to help forge relationships and heighten cooperation with customer firms. To do this, sales representatives must identify, create, develop, and propose ways to integrate the objectives of both buyers and sellers while reducing their differences. This places new demands on the salesperson's skills and abilities to create integrative buyer–seller solutions, convert increasing amounts of data into useful market knowledge, and discover innovative ways to use IT tools.

Although the new relational selling era often demands consultative selling processes, these processes are coupled with massive and often problematic investments in IT (Speier and Venkatesh 2002). Considering the high costs of sales technology (ST) implementations and their associated failure rates, it is not surprising that ST is a high priority in sales management research (Leigh and Marshall 2001).

Advances in IT have reshaped all aspects of marketing, but impacts on buyer–seller relationships in business markets are especially dramatic. At one extreme, some customer firms use Internet procurement hubs and reverse auctions to increase competition among sellers and help drive down procurement costs (Jap 2003). In other markets, sellers and their customers rely on technology to share information seamlessly and support operational linkages that are part of a close, cooperative, and continuing relationship (Cannon and Perreault 1999). From a seller's perspective, the former approach stresses competition on costs, and the latter presents an opportunity for revenue expansion strategy (e.g., investing in customer service, customer satisfaction, and customer retention). Specifically, firms can invest in their sales force to build better relationships with buying firms.

Recent research has shown that firms realize better financial returns by pursuing revenue expansion strategies (Rust, Moorman, and Dickson 2002). However, to implement such strategies within a sales organization, managers need a better understanding of how salespeople can use IT to perform selling tasks that improve the sales representative's relationship-building performance with customers.

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The purpose of this research is to develop and test a theoretical model that explains the mechanisms by which the uses of ST simultaneously influence relationship-building and administrative performance. Here, we propose that beyond the commonly sought returns on administrative performance offered through ST, salespeople can use IT to perform key tasks that help them build better business relationships with customers. A necessary condition for achieving mutually beneficial returns from a sales organization's perspective is sales representatives' performance on tasks that help integrate the buyer's and the seller's objectives.

Not surprisingly, sales organizations have an expanding interest in developing new relational selling processes to implement revenue expansion strategies, and these interests help catalyze ST industries. To clarify and frame this research, we briefly address several relevant terms—including customer relationship management (CRM), sales (force) automation (SFA), and ST. Then, we propose a formal model that describes how different uses of ST affect key aspects of sales performance in a relational context.

CRM, SFA, and ST

Customer relationship management has been so pervasive that it has evolved both as a business philosophy and as a technology (Johnston and Marshall 2006). As a business philosophy, Srivastava, Shervani, and Fahey (1999, p. 169) view CRM as one of three core macrolevel business processes and define it as "all aspects of identifying customers, creating customer knowledge, building customer relationships, and shaping their perspectives of the organization and its products." Others use the term CRM to refer to "the use of technology to manage customer interactions and transactions" (Zoltners, Sinha, and Zoltners 2001, p. 389), which explicitly recognizes technology's importance to CRM processes. Vendors of CRM technology have become a multibillion dollar industry. However, technologies alone often cannot perform the CRM business process that Srivastava, Shervani, and Fahey describe. Such a process often requires skills that only people have and that technology cannot replace. Yet those people often use technological tools to implement the CRM business process.

Sales-based CRM technology tools are specifically designed to help the sales organization meet its objectives in managing customer relationships. In addition, many SFA vendors offer tools that are intended to make repetitive (administrative) tasks more efficient. These vendors stress that sales representatives who complete routine tasks faster, easier, or better become more productive overall by reallocating time gains to more "face time" with buyers. For example, contact management software helps sales representatives manage leads, track all communications with customers, schedule follow-ups, or handle time management and planning tasks. In contrast to much of the extant literature, salespeople use an even broader range of technologies for managing relationships than those offered by sales-based CRM or SFA vendors, including general purpose hardware and software tools. For example, salespeople use cell phones for communications and spreadsheets for analysis, two technology tools that many sales managers consider critical to managing relationships with customers, yet few experts classify cell phones or spreadsheets as CRM or SFA technologies. In this article, ST represents the broad range of ITs that salespeople use; thus, we consider sales-based CRM a subset of ST tools.

Specifically, ST refers to ITs that can facilitate or enable the performance of sales tasks. Thus, ST tools include spreadsheets, relational database programs, Nielsen/Information Resources Inc. scanner data analytical programs, sales forecasting tools, inventory management systems, contact management programs, multimedia hardware, cell phones, graphics software, image projectors, computer-based presentations, e-mail, Web browsers, and so forth. Essentially, we view ST tools as spanning the entire gamut of ITs that salespeople use to perform their roles, not just the subset designed as sales CRM or SFA tools.

From Motivating ST Use to Sales Performance

Although vendor obsession with increasing ST use may represent sound marketing strategy, there has been a pervasive scholarly focus on motivating user acceptance (Venkatesh and Davis 2000). A common underlying assumption in both practice and academic research is that motivating use is *the* critical issue and panacea for implementation success from user acceptance of ST. Even if the positive returns exist in marketing and sales contexts, more theorizing and research is needed to further the understanding of the antecedents and consequences of technology uses. Importantly, there are different ways to use technology tools.

This research builds on the current literature, but it also represents a fundamental departure by arguing that implementation success requires more than user adoption or the supply of an ideal portfolio of ST tools. We argue that implementations benefit from an understanding of how different uses of technology influence the sales behaviors that drive sales performance. We propose a new way of thinking about different dimensions of use for accessing, analyzing, and communicating information. In essence, we argue that user acceptance of technology may be a necessary, but not a sufficient, condition for implementation success.

To provide a better understanding of ST success, we develop a model of how different uses of ST affect relationship-building behaviors, which drive key aspects of performance. This effort builds on recent research that has proposed and tested a "selling smart with technology" model and has found that an overall measure of ST use affects sales performance through adaptive selling and sales planning behaviors (Hunter, Perreault, and Armstrong 1998). In contrast, although salespeople and sales managers may hold idiosyncratic mental models that cognitively represent how sales behaviors influence sales performance (e.g., beyond adoption), mental models are useful only if they are accurate (Johnson-Liard 1983, p. 4). The empirical testing we use is one means for assessing the accuracy of such mental models.

Given the strategic importance of ST, managers can no longer be satisfied with motivating technology adoption, relying on untested mental models, or even knowing that

they have supplied representatives with the most promising ST tools. Although models of behaviors precede estimates on economic returns, managers need to advance and test models that link a salesperson's uses of technologies to his or her conduct of desirable tasks.

The current literature provides limited theorizing or empirical evidence on how different types or ST uses affect measures of sales performance (e.g., Hunter, Perreault, and Armstrong 1998), especially with respect to a representative's efforts to forge stronger relationships with customers. We do not suggest that there has not been attention to different types of ST (e.g., Wedell and Hempeck 1987) or to approaches for evaluating aggregate-level ST successes and failures (e.g., Speier and Venkatesh 2002). Although achieving increased administrative performance is an important objective, ST can also enable sales representatives to perform new tasks that result in better and more profitable relationships with and for customers. In addition, although one-dimensional conceptualizations of use provide enlightening theoretical and empirical results, a consideration of multiple dimensions of use may enrich the understanding of ST as well. In essence, there is a gap in the literature regarding how different uses of ST influence behaviors that can help representatives build stronger relationships with customers and improve administrative performance.

This research addresses this important knowledge gap by building on and integrating theories that originate from six literature streams: relationship marketing, buyer–seller relationships, organizational learning, cognitive selling, negotiations, and IT productivity. It contributes to this thinking by developing and testing the measures and mechanisms of a behavioral process model that shows how salespeople simultaneously complete a set of relationship-forging tasks, and it estimates effects on relationship-building and administrative performance. We conceptualize three basic uses of ST for accessing, analyzing, and communicating information, and we clarify the roles of each type in the relationship-building process. To obtain a more comprehensive understanding of the effects on sales performance, we control for sales experience and effort.

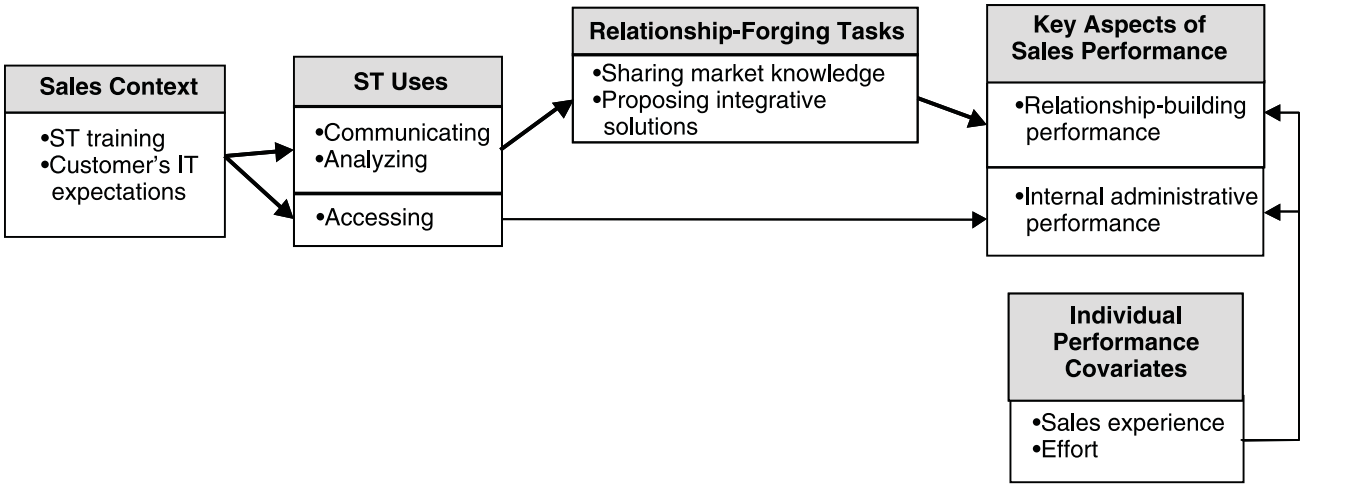
In the next section, we propose a parsimonious theoretical model. Then, we report the results of a field test of the model based on structural equation modeling (SEM) methods. Our results support this theorizing and highlight a trade-off in technology uses that we did not expect. Our conceptual and empirical contributions lead to a discussion of the managerial and research implications of this work.

Theoretical Model Development

Relationship-forging tasks are activities that an individual in an organization performs to help build relationships with external constituents. In sales organizations, representatives conduct these tasks to build better relationships with business customers.

The theoretical model that we summarize in Figure 1 takes these ideas further and develops them in the context of a more complete set of hypothesized relationships. It is useful to think of the constructs and paths shown in Figure 1 as a process model for evaluating the impact of different uses of ST on sales performance. Specifically, the model proposes that uses of ST influence relationship-building performance with customers indirectly through a mediated relationship-forging process. This behavioral process modeling approach integrates literature for evaluating the impact of IT and builds on the rich tradition of previous studies on boundary spanning and salesperson performance (see, e.g., Anderson and Robertson 1995; Behrman and Perreault 1984; Cravens et al. 1993; Oliver and Anderson 1994; Singh 1998; Sujan, Weitz, and Kumar 1994). This research recommends diagnosing ST implementation issues by first identifying the desired aspects of sales performance and then working backward to conceptualize the tasks that constitute the sales process, ST uses, and the antecedents that influence them.

FIGURE 1
Conceptual Model of Antecedents and Outcomes of Different Types of ST Use and Relationship-Forging Tasks



Key Dimensions of Sales Performance

Sales performance is defined as "*behavior* evaluated in terms of its contribution to the goals of the organization" (Johnston and Marshall 2006, p. 412, emphasis added). This definition is consistent with previous research on sales performance (Anderson and Robertson 1995; Behrman and Perreault 1982, 1984; Cravens et al. 1993; Oliver and Anderson 1994; Singh 1998; Sujan, Weitz, and Kumar 1994). Here, we focus on literature that is most relevant to this study, but Brown and Peterson (1993) provide a thorough meta-analysis of studies in the area of salesperson performance.

According to boundary role theory, salespeople represent the physical manifestation of the firm's boundaries and are the "linking pins" between buyers and sellers (Adams 1976). Although boundary role theory was conceived before the modern era of CRM, it is still useful in delineating a duality in roles for salespeople. Inherently, some sales tasks focus more internally on the sales organization, whereas others center more externally on market constituents.

With respect to more externally focused behaviors, though a quantitative outcome-based measure of sales performance (e.g., sales unit, dollar volume) may be an important aspect (or objective) of salesperson behavioral performance (Anderson and Oliver 1987), it can also be precisely the wrong measure in a relational selling context. As IBM found in the early 1990s, sales representatives produced high-volume sales when they pushed mainframes, but many customers were alienated when they realized that they had been sold the wrong product. This is one reason IBM moved to incorporate relational measures of sales performance that stress behaviors over outcomes. In addition, research has shown that sales territory characteristics and potential, not salesperson skill and effort, explain most of the variance in external measures of sales volume (Zoltners, Sinha, and Zoltners 2001). As an alternative to outcome-based measures of sales performance, a prominent stream of research on sales performance has shown that sales organizations may benefit from the use of behavior-based sales control systems (e.g., Anderson and Oliver 1987; Cravens et al. 1993). Collectively, these studies suggest examining a salesperson's behaviors toward building relationships with customers as a key aspect of externally oriented sales performance.

Specifically, relationship-building performance with customers is the extent to which the salesperson performs activities that cultivate a relationship that mutually benefits the selling and buying firms. A mutually beneficial relationship is not one that yields returns only to the sales firm. At the same time, we do not imply that the salesperson should abandon the needs of the seller. Finally, the distribution of outcomes does not necessarily result in an "even split." Examples of this approach include "building your customer's business with your products" and "working with buyers to develop a partnership that's profitable to both firms."

In contrast, a dominant internal concern for sales performance includes the salesperson's conduct regarding administrative behaviors. Administrative performance refers to the salesperson's ability to complete his or her required, non-selling-related activities in a timely manner (this often involves an internal focus). "Submitting required reports on time" is a behavior that represents this construct.

A widely accepted logic is that SFA tools yield increased administrative performance, and this frees up incremental personal selling time for customer contact and other relationship-building activities. Thus, we expect that there is covariance among these sales performance constructs.

Although it is desirable to advance and test a parsimonious explanation of the performance impact of different uses of ST, there is a trade-off with complete specification of other potentially relevant performance predictors. Therefore, the model explicitly recognizes individual differences in salesperson effort and experience as important (exogenous) drivers of sales performance (Brown and Peterson 1994).

Relationship-Forging Tasks

Research in relationship marketing stresses the important role of trust and commitment to interorganizational relationships (Atuahene-Gima and Li 2002; Doney and Cannon 1997; Dwyer, Schurr, and Oh 1987; Ganesan 1994). However, more research is needed on other factors that influence a salesperson's performance in a relational context.

March and Simon (1958) were early proponents of the use of interorganizational relationships as an important means for advancing organizational learning. In addition to inspiring research on trust and commitment, social exchange theory stresses information exchange (Thibaut and Kelley 1959) and the importance of bargaining and negotiating on buyer–seller relationships (Clopton 1984).

Regarding information exchange, Day's (1994) market-sensing model proposes that sharing information is an important part in the relationship-building process. Likewise, analytical and simulation researchers have devoted much attention to the role of information sharing in interorganizational relationships (e.g., Li 2002; Raghunathan 2001).

Negotiations have a long-standing history in personal selling. Strategically, sales organizations confront two fundamental alternatives between coordinative and competitive negotiation strategies across customer accounts. Competitive strategies have their basis in fixed outcomes, whereas a coordinative negotiation strategy calculates mutually beneficial returns (Pruitt 1981), including pie expansion (Jap 1999). Clopton (1984) highlights the potential benefits offered to business market salespeople who use integrative as opposed to distributive outcomes in buyer–seller relationships. Subsequent field studies have supported this general notion (e.g., Jap 1999). In addition, in a business-to-business (B2B) services selling environment, the buyer's perceptions of the salesperson's cooperative (versus competitive) negotiation strategies have been linked to buyer–seller relationship quality (Crosby, Evans, and Cowles 1990).

Clopton (1984) also notes that when presented with ambiguous information, buyers and sellers in a negotiation may not be aware of a means to arrive at an integrated, win–win outcome. For example, a salesperson might promise a

customer firm a higher-quality standard on component parts, but the customer may not recognize the seller's costs or complications in meeting that promise and thus may undervalue the concession. A less costly concession, such as providing more reliable order-cycle times, could have more impact on the customer's profits. The ambiguous nature of information does not need to be based on the salesperson's decision to withhold the information but rather on the salesperson's potential inability to distill market knowledge. Thus, Clopton's study suggests that sharing knowledge and pursuing integrative negotiation strategies are important to B2B relationships.

Building on this literature, as Figure 1 shows, we specify and develop measures for two key relationship-forging tasks: sharing market knowledge and proposing integrative solutions to customer problems. Links in the model reflect the hypotheses that sharing marketing knowledge and proposing integrative solutions improves the salesperson's relationship-building performance with customers. However, in Figure 1, there is no direct hypothesized link between the relationship-forging tasks and administrative performance.

Sujan, Sujan, and Bettman (1988) find that higher-performing salespeople do not necessarily have more knowledge categories, but rather better qualitative distinctions among categories. Similarly, Szymanski (1988) shows that declarative knowledge (how categories are organized in memory) and the accurate identification and classification of the categories distinguish effective salespeople from ineffective salespeople. Collectively, studies employing the cognitive sales paradigm show why an expert salesperson outperforms a novice at different stages of the selling process (see Macintosh et al. 1992).

Sharing market knowledge refers to the extent to which salespeople develop relevant market expertise and share their knowledge with their customers. Developing expertise that makes a sales representative a knowledgeable resource, even to his or her peers within the sales organization, provides the necessary foundation on which customer accounts may benefit. Converting data into knowledgeable insights that can be shared with customers helps distinguish the quality of the service provided by a sales representative from the sales services provided by the firm's competitors. Representatives with high levels of market expertise have a decisive advantage over their more novice competitors in sharing market knowledge with customers.

H_1: Salespeople who share market knowledge with customers are conducting an activity that forges relationships between the buying and the selling firms.

Proposing integrative solutions refers to the extent to which salespeople apply information and knowledge to construct and propose recommendations that are mutually beneficial to both the selling and the buying firms. Constructing such recommendations requires the salesperson to develop solutions that integrate the objectives of the selling firm into solutions that also work for the buying firm. For example, a sales representative combines knowledge of his or her own firm's capacities and costs with analysis of the customer's inventory costs to forecast alternative courses of actions. The representative may then propose mutually beneficial courses of action that help forge relationships between the firms.

H_2: Salespeople who propose integrative solutions to customers are conducting an activity that helps forge relationships between the buying and the selling firms.

It also makes sense that salespeople who share market knowledge with customers might also propose integrative solutions to them. Therefore, we expect covariance between the relationship-forging constructs.

Uses of ST and Their Impacts

Just as there are different ways to measure performance, researchers have examined IT from different perspectives. An approach that is popular in the IT literature is to model the return on total investment in IT (e.g., Bharadwaj, Bharadwaj, and Konsynski 1999). Although "black-box" approaches offer important strategic insights, they have routinely produced conflicting results, and these models are silent on the behavioral process through which technology influences sales performance (for a discussion, see Hitt and Brynjolfsson 1996).

During the early evolution of ST, marketing scholars (e.g., Collins 1989; Collins and Schibrowsky 1990) focused on normative prescriptions about potential uses of individual software and hardware innovations (spreadsheets, contact management software, and several others). Similarly, many companies rely on user evaluations and acceptance of individual STs, an approach recommended in the IT literature (Venkatesh and Davis 2000). This can be useful, but user evaluations of individual technology tools alone can result in misleading conclusions. The behavioral explanation is simple: Salespeople who do not rely on or use a particular technology report that it is not useful to them, but if they use the technology (e.g., because of better training), such use might improve their performance. This is the underlying logic for benchmarking behaviors or identifying best practices.

In contrast, the task–technology fit theory approach relies on user judgments (ratings) to evaluate individual technology tools or IT systems (see Goodhue 1995a, b, 1998). Although there are benefits to this approach, including ease of implementation, our approach relies on empirical evidence of technology effects rather than user judgments. Specifically, the salesperson (user) provides information about his or her performance of sales tasks and technology use. Then, we empirically estimate the effect of technology uses on sales behaviors and aspects of sales performance. This helps camouflage our hypotheses and thus reduces demand characteristics (cues) that increase the likelihood of bias in responses (Shimp, Hyatt, and Snyder 1991). Thus, if we simply provided representatives with our hypothesized model and asked them to rate the effects, we would increase the likelihood of demand artifacts that challenge the study's validity.

A concern with measuring technology use involves deciding on suitable aggregation. Building on Huber's (1991) work, Sinkula (1994) argues that consideration of multiple dimensions of information use is important in

understanding how firms (or individuals) process market information. Thus, our conceptualization of different dimensions for uses of ST adopts both Huber's and Sinkula's thinking.

Huber's (1991, p. 90) work on organizational learning defines four organizational learning processes. Knowledge acquisition is "the process by which knowledge is obtained." Information interpretation is "the process by which distributed information is given one or more commonly understood interpretations." Information distribution is "the process by which information from different sources is shared and thereby leads to new information or learning." Organizational memory is "*the means* by which knowledge is stored for future use" (emphasis added).

In this study, "accessing" information represents learning through knowledge acquisition, "analyzing and better understanding" information parallels Huber's (1991) information interpretation, and "communicating" represents Huber's information distribution. Except for organizational memory, Huber's conceptualizations define learning processes as opposed to learning means. Thus, our model does not explicitly incorporate organizational memory. However, this adaptation reflects a difference in the IT and salesperson (user) view that we want to advance; this was motivated, in part, on the basis of feedback from sales managers during qualitative interviews about uses of ST. They noted that though IT specialists often focus on the storage capacity of hardware and software, from a user's perspective, the issue is whether information can be accessed. A mass of data that is stored in organizational memory but is not accessible has no measurable influence on salesperson behavior. The salesperson may fill a role in inputting information into organizational memory, but it is the salesperson's next (temporally lagged) use of technology to access that information (and other sources) that we measure and model here.

Formally stated, "using ST for accessing information" refers to the extent to which salespeople use technology to obtain information relevant to performing their sales jobs. The sales representative might use different technologies to access information about products, sales calls, orders, sales, accounts, and the like. Sales representatives may vary with the frequency, emphasis, and confidence with which they use these tools. Similarly, "using ST for analyzing information" refers to the extent to which salespeople rely on IT to study or synthesize data and understand the implications of patterns of data relevant to the demands of their sales jobs. Finally, "using ST for communicating information" refers to the extent to which salespeople use technology to disseminate information and knowledge to others in performing their jobs. As these conceptualizations suggest, our focus is on different dimensions for uses of ST rather than on an individual application by itself.

The distinction between using ST for accessing information and using ST for analyzing or communicating information warrants elaboration. To analyze information, it must be accessible, and the content or value of communication improves when it is based on good information (perhaps supplemented by analysis). The sales representative's administrative performance improves if there is ready access to relevant information. Easy access reduces both search time and confusion that might arise from information gaps associated with information that is too difficult, time consuming, or costly to obtain. Conversely, analyzing and communicating are aspects of IT use that leverage available information and turn it into usable knowledge. However, we do not advance directional hypotheses for the relationships between the different uses of technology, because it is likely that the relationships are interactive and that there are potential feedback loops across the three categories of technology use.

H_3: Use of ST for communicating information increases the practice of sharing market knowledge.

Recent research on team dynamics has found that perceived experts are more likely than their novice counterparts to share knowledge (Thomas-Hunt, Ogden, and Neale 2003). In the context of buyer–seller relationships, expertise can provide a source of power and influence (French and Raven 1959) that encourages the salesperson to share that expertise with the buying firm. Using IT to analyze information helps salespeople gain declarative knowledge. The greater the salesperson's declarative knowledge, the more open he or she will be to sharing it.

H_4: Use of ST for analyzing information increases the practice of sharing market knowledge.

It is typically more difficult for a sales representative to identify integrative solutions than it is to develop distributive ones. As we detailed previously, identifying integrative solutions requires the understanding and alignment of objectives across firms, whereas a distributive approach requires only a focus on the seller's objectives. Sales technologies can help salespeople sort, summarize, or break down complex data that are relevant to calculating the costs and benefits of various recommendations from the perspective of the selling firm, the buying firm, and the end consumer. For example, a salesperson could take advantage of a user-friendly interface to a large database to access information about product markets. Indeed, demand for tools that ease access to information has led some leading vendors, including IBM, to develop portals for gathering market intelligence. However, simply accessing information usually does not lead to an integrative proposal. Often, information does not become usable knowledge without further value-adding activity. For example, a salesperson could use statistical analysis software to estimate outcomes of alternative proposals and prepare graphics to help communicate a recommendation.

The relationship marketing literature stresses the need for communications in building better buyer–seller relationships (Mohr, Fisher, and Nevin 1995; Mohr and Nevin 1990). In addition, the expanding literature on modeling scanner data shows the need for analysis in building better channel relationships (Raju and Roy 2000). Conversely, this implies that using technology to access information does not have a direct impact on relationship-forging tasks except to the extent that accessing information simplifies (or covaries with) use of technology for analyzing and communicating.

H_5: Use of ST for (a) analyzing and (b) communicating information increases the practice of proposing integrative solutions.

As previous work on the role of SFA highlights, use of IT should improve administrative performance (Hunter, Perreault, and Armstrong 1998). Although previous studies examine the aggregate effects of general technology use on administrative performance, we propose that administrative performance gains will be realized across all three dimensions of use (accessing, analyzing, and communicating information) examined here. As an example, using technology to access information should improve a salesperson's ability to be timely in completing administrative responsibilities. Thus:

H_6: Use of ST for (a) accessing, (b) analyzing, and (c) communicating information improves internal administrative performance.

Facilitating Conditions That Affect ST Uses

Jones, Sundaram, and Chin (2002) highlight the need for salespeople to adopt ST when forming customer alliances and find that personal innovativeness, attitude toward the new ST, and facilitating conditions influence ST infusion. Although our primary focus is on relationship-forging tasks, technology uses, and different aspects of performance, we consider two facilitating conditions pertaining to, or social system influences on (e.g., Fulk 1993), the uses of ST. "Sales technology training effectiveness" refers to the extent to which salespeople perceive the ST training provided by the selling organization to be effective. Training is an important part of internal company ST support (Hunter and Perreault 2006). At the same time, sales representatives respond to signals from their customers, so it is logical that customer IT expectations would result in greater use of ST by the salesperson. Although we hypothesize that customer IT expectations and ST training support both positively influence the three technology uses (accessing, analyzing, and communicating), we expect differential effects. Despite sellers' investments in ST training and regardless of what areas the training emphasizes, customers' IT expectations will be more influential in shaping technology uses by individual sales representatives. Extending this logic, we posit that customers will place more emphasis on analyzing and communicating than on accessing because these uses have the greatest impact on relationship-forging tasks and thus provide the greatest returns to the customer.

H_7: Customer IT expectations improve (a) accessing, (b) analyzing, and (c) communicating information.

H_8: ST training improves (a) accessing, (b) analyzing, and (c) communicating information.

Research Methods

Sample

To meet the objectives of this research, we needed to obtain details from sales representatives, which in turn required the cooperation of a firm's management. We selected a host firm using criteria and procedures that we developed on the basis of interviews with sales managers from different industries and a previous study of ST use in a different firm. Specifically, we focused on identifying a sales organization in which (1) salespeople conducted typical internal and external B2B sales tasks (e.g., they did not sell to final consumers), (2) ST was already implemented, (3) use of technology and technology skills varied across salespeople, (4) the sales force was large enough to support statistical tests of the hypothesized relationships, and (5) management would encourage participation in responses that would be kept confidential to researchers.

On the basis of these criteria, we approached managers at a well-known consumer packaged goods company (with which we had no prior connection). The managers were interested in the research questions and agreed to cooperate. They asked for (1) confidentiality, (2) limits on the time required from salespeople, and (3) inclusion of questions of interest to management (about the firm's ST training program). We pretested the questionnaire for clarity and completeness with the help of sales managers within the host firm and refined the directions and wording as appropriate. To ensure a high response rate, the firm's top sales executive sent each salesperson a prenotification letter that encouraged participation and a cover letter with the questionnaire. The letter and questionnaire guaranteed confidentiality to each salesperson. To signal anonymity of responses further, we sent questionnaires to the sales representatives' home-office addresses and asked them to return completed questionnaires directly to the researchers' university address. Of 196 questionnaires delivered, respondents returned 154 (79%). We subsequently dropped three questionnaires because of missing data, for an effective response rate of 77%.

The sample included both men (66%) and women. The average age was 42, but ages ranged from 23 to 63 (with sales experience ranging from new hires to 38 years). Respondents' annual salaries ranged from $24,000 to $139,000, and every respondent received some incentive or bonus income. On average, sales representatives worked 47 hours a week: 17 hours completing administrative and/or account coordinating responsibilities, 16 hours interacting with customers, 7 hours conducting data analyses, and the remaining 7 hours doing other activities.

A consumer packaged goods company provides a good context in which to test our model. As with most consumer packaged goods producers, the company's sales force is organized to handle efficient consumer response selling efforts and category management initiatives in the mass-merchandiser and supermarket channels. These efforts often involve the use of ST tools that help sales representatives harvest analytical "consumer insights," and many firms have in-house ST specialists who seek ways to use IT to improve selling functions. Sales representatives often make proposals pertaining to the retailer's category management decisions, including which stockkeeping unit to carry, shelf space allocations, promotion emphasis and timing, and so forth. Thus, within this context, an integrative solution proposed by a sales representative is one that considers the interests of both the retailer and the manufacturer.

Measures for Constructs

The questionnaire development relied on conventional procedures (DeVellis 1991) and employed SEM confirmatory factor analytic techniques to develop multi-item composite measures from a pool of items that represent the constructs in the conceptual model (Figure 1). Table 1 presents the scale items, response cues, and relevant statistics for each of the measures.

We developed the measures for the three types of ST use, the two relationship-forging tasks, customer expectations, and training effectiveness specifically for this study. To measure the key aspects of performance, we adapted scale items for administrative performance and relationship-building performance with customers from the rich literature on sales performance and blended them with new items to reflect the modern demands on salespeople.

The scale for relationship-building performance with customers comprises two items we took from Behrman and Perrault's (1982) scale that measures sales presentations and working well with customers. On the basis of consistency with our conceptualization and the resulting psychometric properties, we combined these two items with three new items. The two adopted items were "listening attentively to identify and understand the real concerns of your customers" and "working out solutions to a customer's questions or objections," and the three new items were "building your customer's business with your products," "working with customers to help them improve their profitability," and "working with buyers to develop a partner-

TABLE 1
Scale Items and Scale Statistics

Construct Name and Items	M	SD	Alpha Reliability	Construct Reliability	Item Reliability
Aspects of Sales Performance					
Relationship performance with customers[a]	5.36	.94	.82	.82	
Listening attentively to identify and understand the real concerns of your customers.					.62
Building your customer's business with your products.					.54
Working out solutions to a customer's questions or objections.					.53
Working with customers to help them improve their profitability.					.43
Working with buyers to develop a partnership that's profitable to both firms.					.28
Administrative performance[a]	5.80	1.09	.90	.90	
Getting required "paperwork" done.					.81
Addressing my administrative responsibilities in a timely manner.					.75
Submitting required reports on time.					.68
Categories of Sales Technology Use					
Using sales technology to access information[b]	4.80	1.35	.90	.90	
"Routine" to "sporadic"					.86
"Frequent" to "infrequent"					.75
"A major emphasis" to "not a major emphasis"					.73
"Hesitant" to "confident"[c]					.45
Using sales technology to analyze information[b]	4.34	1.42	.93	.93	
"Routine" to "sporadic"					.89
"Frequent" to "infrequent"					.86
"A major emphasis" to "not a major emphasis"					.88
"Hesitant" to "confident"[c]					.42
Using sales technology to communicate information[b]	5.14	1.36	.92	.92	
"Routine" to "sporadic"					.88
"Frequent" to "infrequent"					.88
"A major emphasis" to "not a major emphasis"					.77
"Hesitant" to "confident"[c]					.47
Relationship-Forging Tasks					
Proposing integrative solutions[d]	5.64	.86	.74	.74	
I'm good at finding opportunities that benefit both my firm and my customers.					.55
I try to solve customer problems in ways that also help my firm.					.46
I look for good ways to integrate my customer's goals with my company's needs.					.46
Sharing market knowledge[a]	4.88	1.03	.71	.71	
Others in my firm look to me for expert advice.					.55
Staying abreast of changes helps me keep my buyers informed.					.54
I keep my buyers aware of market changes.					.29
Compared to other salespeople, I'm not the most knowledgeable resource on our markets.[c]					.20

TABLE 1
Continued

Construct Name and Items	M	SD	Alpha Reliability	Construct Reliability	Item Reliability
Sales Context Conditions					
Customer's information technology expectation[d]	4.23	1.24	.83	.84	
The buyers I deal with use information technology and expect me to.					.70
The buyers I deal with encourage me to support my proposal with data.					.65
The buyers I deal with see value in using information technology to improve decisions.					.51
The buyers I deal with can't be satisfied unless I rely on information technology.					.40
The buyers I deal with don't expect me to use technology.[c]					.30
Sales technology training effectiveness[d]	3.87	1.26	.83	.83	
I have had effective training on sales technology tools.					.65
My sales technology training has been "world class."					.59
This firm needs to revamp its sales technology training programs.[c]					.50
Sales technology training in this firm is effective.					.47

[a]Respondents were directed, "On each of the following items, please rate how well you have performed relative to the average salesperson in similar selling situations," with seven-point response cues ranging from "needs improvement" (1) to "outstanding" (7).

[b]Respondents were asked, "Compared to other salespeople, my use of sales technology to (access, analyze or better understand, or communicate) information about products, sales calls, orders, sales, accounts, and the like, is best described as…." (1 indicated the leftmost descriptive response, and 7 indicated the rightmost response).

[c]Responses to this item were reverse scored.

[d]The seven-point response cues for each item ranged from "strongly disagree" (1) to "strongly agree" (7); note that fit statistics based on chi-square are not applicable for a construct with three indicators. For a more conservative test of convergent and discriminant validity, confirmatory factor analyses results for each of the blocks of constructs in the model appear in Table A1.

Notes: We measured work experience by asking respondents, "How many years of experience do you have at your company and others?" Its mean was 18.2 (SD = 8.6). We measured effort by asking, "On average, approximately how many hours per week do you spend, in total, working in your sales job?" Its mean was 46.0 (SD = 13.3). We calculated alpha reliabilities for the constructs using Cronbach's algorithm for estimating the scales internal consistency, and we estimated the construct reliabilities using Fornell and Larcker's (1981) recommendations.

ship that's profitable for both firms." Collectively, these five items capture the domain of the construct.

The scale for administrative performance combines two new items with one item that we adopted from Behrman and Perreault's (1982) scale for providing information. The adopted item is "submitting required reports on time," and the two new items are "getting required 'paperwork' done" and "addressing my administrative responsibilities in a timely manner."

Although many previous studies (see Leigh, Pullins, and Comer 2001; e.g., Oliver and Anderson 1994; Sujan, Weitz, and Kumar 1994) used or adapted items from Behrman and Perreault's (1982) scale to measure sales performance, it would have been desirable here to include customer evaluations of sales representatives' relationship-building performance. However, management would not allow us to contact customer accounts, among other reasons because many supermarket chains have policies that restrict buyers from responding to *any* request for evaluation by a vendor. Similarly, the firm did not have a formal system in place for evaluating the administrative performance of individual representatives. Such obstacles are common in research on sales performance.

Data Analysis Methods

Data analysis for this study is based on SEM with maximum likelihood parameter estimation. We used the two-step approach that involves evaluating measures and then estimating the proposed structural model (e.g., Anderson and Gerbing 1988). Specifically, we fit a separate confirmatory factor model for each of the proposed scales to assess reliability and convergent validity. Next, to assess discriminant validity, we fit confirmatory factor analysis models to items for sets of scales that were most susceptible to cross-loadings (i.e., sets of constructs within each block in the proposed model). We then extended the confirmatory factor analysis models to test items across sets of scales that constitute the proposed subsystems in the model (e.g., relationship-building performance with customers and administrative performance).

Because the number of items is large, we test the fit of the overall structural model and the statistical significance of the hypothesized effects by using scale scores (based on the average of the individual items) for the latent constructs. With this approach, the standardized effect of measurement error for a scale is equal to the square root of the reliability estimate. The error variances are equal to the product of the scale variance and one minus the scale reliability.

The structural model in Figure 1 is a block-recursive model. This means that it contains "conditions under which the endogenous variables that are determined by one subsystem are exogenous relative to those that are determined by another subsystem" (Bekker and Pollock 1986, p. 180). We formed the first block (subsystem) in the model by free-

ing covariance parameters across the three types of uses and the second block (subsystem) by freeing covariance parameters across the two relationship-forging tasks. Estimation of the effects for individual constructs (and fit) based on a block-recursive model requires model identification; yet some structural models published in marketing are not properly identified. To avoid this problem, we established that our proposed model is identifiable by using an algebraic approach recommended in the econometric literature (Bekker and Pollock 1986; Bollen 1989).

We propose single-, double-, and triple-mediated indirect effects, but it is important to emphasize that we are not proposing a saturated model. On the contrary, the model explicitly includes 30 direct effect relationships between constructs that are constrained to be zero. For example, there are 4 separate zero-constrained relationships between using technology for accessing information with the two relationship-forging tasks and the two aspects of performance. We do not discuss all the zero-constrained effects in detail in this article, but we test them all and report statistical results along with our tests for the formally presented hypotheses. Thus, the relationships we specify as involving no effect are logically part of our theoretical rational.

Results

Evaluation of Measures

It is useful to confirm the psychometric properties of the measures before we consider the fit of the overall structural model and tests of the hypothesized relationships. The constructs correlate with other study variables in expected directions, suggesting their content validity (Fornell and Larcker 1981). The construct reliability indexes in Table 1 are based on the shared variance between the (observed) items and the underlying latent construct (for computational details, see Fornell and Larcker 1981). Bagozzi and Yi (1988) suggest that it is desirable for this construct reliability index to be greater than .6, and the estimates for all the constructs here exceed .71. Similarly, the item reliability estimates in Table 1 are equal to the proportion of variance in an item explained by its proposed latent construct. Conventionally, in marketing research, item reliabilities lower than .15–.20 (or, equivalently, squared multiple correlation coefficients less than .38–.45) imply that an item may not be internally consistent (for a discussion, see Bollen 1989, Chap. 6; see also Bollen and Lennox 1991). In this study, in general, these items exceed these criteria. Here, the lowest item reliability is .20 (one of the reverse-scored items, which usually has lower reliabilities but is included to improve scale design). Anderson and Gerbing (1988) offer the guideline that there is convergent validity among items for a construct when their estimated factor coefficients are greater than two times the associated standard error. All our constructs and items exceed these criteria, providing evidence for construct reliability and convergent validity. Deleting items with low reliabilities would increase some of the scale reliability indexes. However, removing psychometrically acceptable items may weaken content validity and narrow the domain of the construct (Gerbing, Hamilton, and Freeman 1994).

We computed model comparisons to evaluate discriminant validity and the potential threat to validity because of common method bias. The results of these analyses appear in the Appendix. Evidence from all these analyses support the discriminant validity of the measures. In addition, the average extracted variances for all scales exceed each scale's squared correlations with other study constructs, in support of the discriminant validity of the constructs (Fornell and Larker 1981). Similarly, although method bias is always a potential problem with self-report (survey) data, evidence suggests that it does not affect the results of this study.

Overall Model Fit and Relationships Among Constructs

Figure 2 provides a summary of the maximum likelihood estimates (and associated probability levels) for all the hypothesized relationships. These estimates are based on an overall structural model that produces evidence of an excellent overall fit. The chi-square statistic is not significant ($\chi^2 = 37.1$, d.f. = 30, $p = .17$), and thus there is not evidence to reject the hypothesized relationships or model structure. Other fit statistics appropriate for this model (Bollen 1989) provide consistent evidence of a good fit: comparative fit index (CFI) = .98, root mean square error of approximation (RMSEA) = .04, goodness-of-fit index (GFI) = .96, and adjusted goodness-of-fit index (AGFI) = .91. Consistent with these overall fit statistics, the path coefficients for all but one of the hypothesized relationships specified in the model are statistically significant ($p < .05$), though one is in the opposite direction from our hypothesis. In addition, as the R-square values in Figure 2 show, the model provides good explanatory power for the individual endogenous variables.

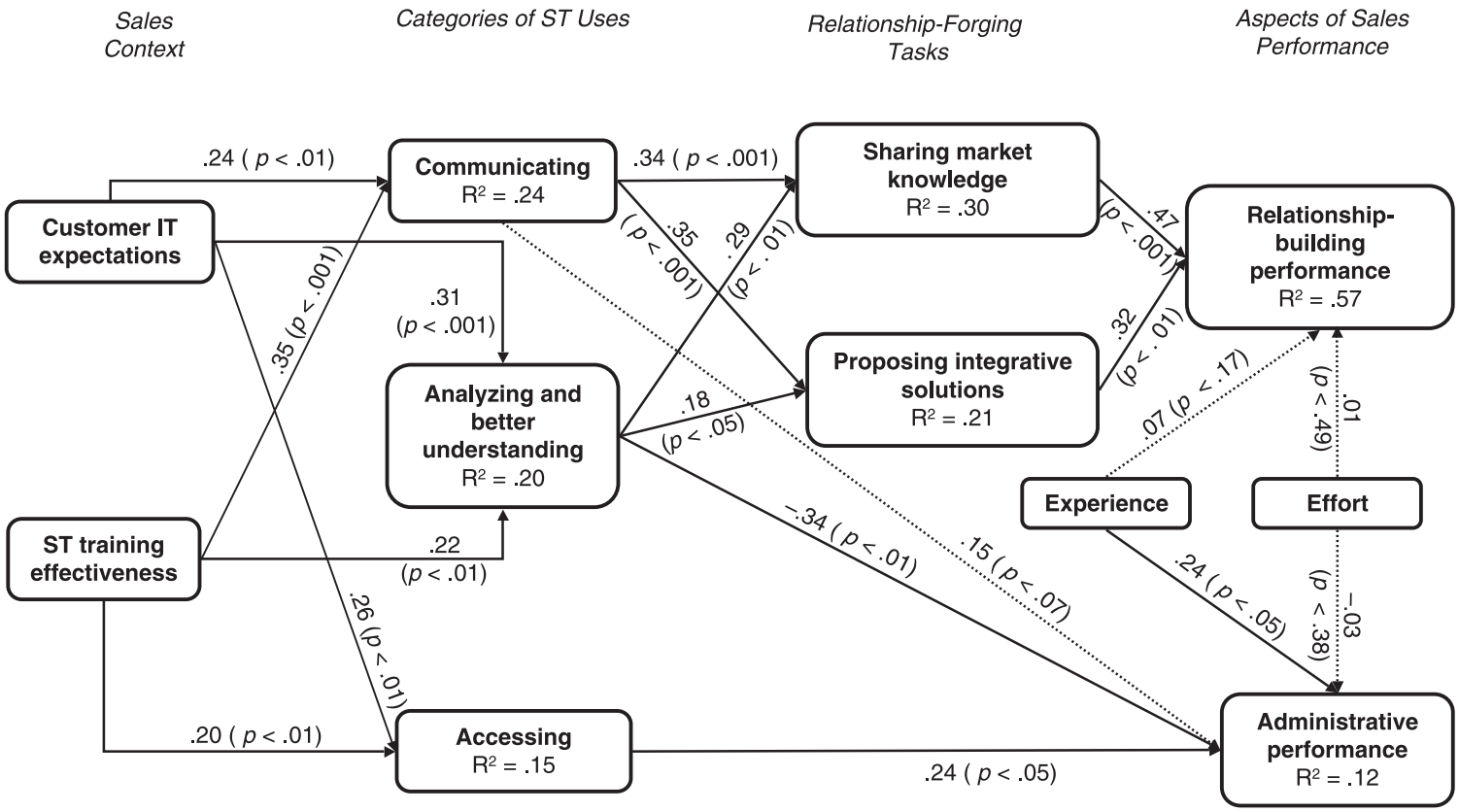
The estimates and overall fit statistics developed for the structural model are based on maximizing the fit between the covariance structure we predicted for the structural relations and the overall matrix of observed sample covariances. Thus, the (bivariate) product correlations between constructs in the model (see Table 2) are a useful supplement to the (multivariate) information in Figure 2. Subsequently, we review the results for individual hypotheses using the order we used to introduce them.

Relationship-Building Performance with Customers

The path coefficients for sharing market knowledge and proposing integrative solutions are each statistically significant ($p < .01$), and in combination, they explain more than half of the variance in relationship-building performance with customers. The larger path coefficient for sharing marketing knowledge (.47) suggests that it has a greater impact on relationship-building performance with customers than does proposing integrative solutions (.32). In combination, this is a strong prediction compared with previous studies that have considered other role-related factors that influence sales performance, and it confirms that relationship-forging tasks warrant managerial and scholarly attention.

Note that the model specifies that there is no direct relationships between the different uses of ST and relationship-

FIGURE 2
Maximum Likelihood Estimates (with Probability Levels) and R-Square Values for Paths in the Block-Recursive Structural Model



Notes: Fit statistics suggest an excellent fit for the overall model: (χ^2 = 37.1, p = .17, d.f. = 30; CFI = .98; RMSEA = .04; GFI = .96; and AGFI = .91). Solid lines indicate statistically significant effects, based on probability values for one-tailed significance effects on path coefficients. Although correlations across blocks are not shown in the diagram, the estimates are based on a block-recursive model, which estimates and accounts for correlations among constructs within blocks; the correlation estimates within blocks are .34 between customer IT expectations and ST training effectiveness, .31 between communicating and analyzing, .37 between communicating and accessing, .68 between analyzing and accessing, .71 between the relationship-forging tasks, and .48 between the two aspects of performance.

TABLE 2
Correlations Among Measures for Constructs in Model

Measures	Product Moment Correlations									
	1	2	3	4	5	6	7	8	9	10
1. Training effectiveness	1.00									
2. Customer's IT expectations	*.29*	1.00								
3. Using ST for accessing	*.25*	*.29*	1.00							
4. Using ST for analyzing	*.29*	*.34*	*.67*	1.00						
5. Using ST for communicating	*.38*	*.32*	*.44*	*.42*	1.00					
6. Proposing integrative solutions	*.29*	.12	*.21*	*.29*	*.36*	1.00				
7. Sharing market knowledge	*.24*	*.21*	*.30*	*.38*	*.39*	*.56*	1.00			
8. Sales experience	–.03	.04	–.03	–.03	.03	.12	.06	1.00		
9. Total work effort	–.06	*–.17*	.02	–.06	.11	.03	.01	.10	1.00	
10. Internal administrative performance	.01	–.10	.06	–.09	.09	*.20*	.13	*.23*	.01	1.00
11. Relationship-building performance with customers	.08	.03	*.21*	*.26*	*.26*	*.57*	*.57*	.13	.03	*.36*

Notes: Correlation coefficients with magnitudes greater than .16 result in a statistically significant t-test (probability less than or equal to .05) and appear in italics.

building performance with customers. This equates to constraining the value of these paths to zero in fitting the model. Thus, these results support the proposition that it is primarily through relationship-forging tasks that ST influences relationship-building performance with customers.

Relationship-Forging Tasks

The model proposes that STs used for analyzing and communicating information, but not for accessing information, affect relationship-forging tasks. The resulting estimates are consistent with this logic. Sales technologies for both communicating and analyzing are statistically significant in predicting each of the relationship-forging tasks. Prediction for sharing marketing knowledge is slightly stronger (30% of the variance versus 21% for proposing integrative solutions). The path coefficients suggest that communicating and analyzing have roughly equal impact on sharing market knowledge (coefficients of .34 and .29, respectively) but that STs for communicating (.35) are more important than analyzing (.18) in proposing integrative solutions.

The relationships in the model are based on the logic that accessing information is not a salient factor in relationship-forging tasks if communicating and analyzing technologies are considered. The overall model fit, which explicitly excludes the link between accessing and the relationship-forging tasks, supports this proposition. Furthermore, the SEM modification index for the hypothesized zero effect of using technology for accessing information is .03 for its effect on sharing market knowledge and .20 for its effect on proposing integrative solutions. Both indexes are well below Sörbom's (1989) suggested cutoff of 5 for statistical significance.

The strong effects among the relationship-forging tasks and the two categories of technology uses—communicating and analyzing—outline a prominent process through which sales representatives can leverage information to forge relationships with customers. Conversely, using technology to access information does not directly aid sales representatives' efforts in forging relationships, unless it occurs through a mediated process. Such a mediated effect can be represented through the block-recursive model specification. Specifically, the relationships among the three types of ST uses (within the block) represent a means through which such mediation might occur. However, we do not advance (or test) directional hypotheses about the relationships between the different uses of technology, because the block-recursive specification more accurately reflects the interactive and potential feedback loops across types of use.

Administrative Performance

The positive path coefficient (.24) for the effect of accessing information on administrative performance is statistically significant ($p < .05$) and consistent with the hypothesized logic. However, the path estimates for the other two uses of technology deviate from our hypothesis. First, the relationship between using ST for communicating and administrative performance (.15) is not statistically significant. Even more surprising is the statistically significant, negative effect (–.34, $p < .01$) of using ST for analyzing on administrative performance. This finding could mark a time tradeoff that may occur between conducting thorough data analyses and spending time on administrative matters (e.g., submitting required reports on time).

This pattern of results is provocative when we contrast it with the way that using technology for communicating and for analyzing affects the relationship-forging tasks and, in turn, the salesperson's relationship-building performance with customers. There is a positive, contemporaneous relationship (.48) between the different aspects of performance. Thus, consistent with the conventional argument for adopting SFA, using ST to increase administrative performance may contribute to increased relationship-building performance with customers. Conversely, there may be a time-use conflict pertaining to the use of ST for analyzing. Analyzing positively influences relationship forging, but because analyzing tends to be time consuming, it may distract the sales representative from administrative work. This also implies that transferring extra administrative work to the representative (even if it can be performed more efficiently with technology) tends to interfere with some aspects of the relationship-forging process.

Technology Uses

Although the focus of this research is on different uses of ST, relationship-forging tasks, and sales performance, the model also considers how the sales context influences sales representatives' use of ST. Consistent with the hypothesized model, each technology use is positively affected (encouraged) by both the firm's sales training effectiveness and customer IT expectations. It is informative that these two influences on sales representatives have differential effects. For example, in the structural model (Figure 2), antecedents explain 24% of the variance for using technology for communicating; training effectiveness has a path coefficient (.35) that is roughly 50% larger than the coefficient for customer IT expectations (.24). For use of ST for analyzing, the explained variance is slightly lower (15%). Customer IT expectations has the larger coefficient (.31 versus .22 for the firm's sales training effectiveness). Finally, the path coefficients for prediction of accessing information are more similar in size (.26 for customer IT expectations and .20 for ST training effectiveness), but the explained variance is lower.

The results of this model provide a means for estimating the technology–sales performance relationships. In SEM, the total effects of independent variables on a dependent variable can be estimated by summing its statistically significant indirect and direct effects (Bollen 1989). Table 3 summarizes the effects.

Finally, in mediated models, it is useful to test zero-constrained relationships in mediated models. Sörbom (1989) suggests the use of modification indexes for this purpose. The small modification indexes we observe in this study provide evidence that helps rule out several alternative models and increase confidence in the behavioral process that we propose and test. In addition, many of tests of "no relationship" among constructs in the model have never previously been tested or reported in the literature (in some cases, because the constructs are new to this study).

Discussion

This research provides managers and scholars with a better understanding of the important role of ST in helping salespeople forge relationships with business customers while considering its effects on administrative performance. Here, we contribute theory and evidence about new behavioral mechanisms (relationship-forging tasks) through which different dimensions of IT use (accessing, analyzing, and communicating information) influence key aspects of a salesperson's performance. Using SEM approaches to estimate a proposed block-recursive model, we evaluate the simultaneous (multivariate) relationships among different categories of ST uses and the mechanisms by which they are related to sales performance. In this section, we discuss this study's managerial implications, research implications, and limitations.

Managerial Implications

The sales force and ST represent important parts of a firm's value creation potential. Rackham and DeVincentis (1998) argue that the classic view of firm strategy posits that the value-creation function of marketing is through product and brand innovation but that the sales function's role is limited to value communication. Rackham and DeVincentis contrast that view with the realities of the new relational selling (and the vital role that sales people can play in value creation by providing services that differentiate the firm's offering), calling it "the new marketing myopia" (p. 9).

TABLE 3
Standardized Total Effect (Based on Sum of Direct and Indirect Effects) for Each Independent Variable on Each Dependent Variable

	Dependent Variable for Each Path Estimated in Overall Model						
Independent Variable	**Using ST for Accessing**	**Using ST for Analyzing**	**Using ST for Communicating**	**Proposing Integrative Solutions**	**Sharing Market Knowledge**	**Internal Administrative Performance**	**Relationship-Building Performance with Customers**
Training effectiveness	.20	.22	.35	.16	.19	.03	.13
Customer's IT expectations	.26	.31	.24	.14	.15	.00	.12
Using ST for accessing						.24	
Using ST for analyzing				.18	.29	–.31	.18
Using ST for communicating				.35	.34	.15	.24
Proposing integrative solutions							.29
Sharing market knowledge							.43
Sales experience						.24	.07
Total work effort						–.04	.01

This new value-creating aspect of a B2B sales representative's job often demands data-driven activities (e.g., proposing integrative solutions), which in turn alter the skills required of an effective salesperson. For example, salespeople in the channels use sophisticated analytical models and marketing research insights to compare forecasts from alternative marketing strategies for their customer accounts. Thus, the representative's capacity to use a portfolio of ST tools is tested over time as customer accounts monitor the results attained from the representative's recommendations. Salespeople whose recommendations are beneficial to both the producer and the retailer add incremental value and help forge the buyer–seller relationship. Thus, such relational selling processes create value and help differentiate the seller's offering.

Marketing and sales strategists should consider the new realities of relational selling in an information-intensive environment because it drives the importance of ST. A means for adapting strategic market plans to reconsider ST and relational selling tasks involves redefining the sales force not only as part of the promotion mix but also as an important part of the firm's product. When a product is viewed as the "need satisfying offering of a firm," customers evaluate the offering on the basis of the total satisfaction it provides (Perreault and McCarthy 2005, pp. 242–43). Thus, sales representatives represent an important means for achieving total satisfaction by differentiating the firm's offering. For example, Procter & Gamble, IBM, and several other firms rely on this sales service differentiation and consultative selling to provide superior value to their customers. An important precursor to delivering high-quality consultative sales services is the representative's relationship-building performance with customers. However, more theorizing and research is needed to evaluate how relationship-forging tasks and relationship-building performance influence customer value.

Broadly speaking, this study offers a flexible framework ("template") for diagnosing how different uses of technology affect sales performance through salesperson behaviors. Applied in other sales organizations, the model specification could be expanded to include other relevant antecedents, technologies, and criterion variables. For example, the specification might be broadened to include buyer reactions to specific salesperson behaviors and overall satisfaction with the services the sales representative provides.

Adopting ST requires thoughtful consideration of potential trade-offs. Our results raise a caveat about the widespread emphasis on adoption of SFA or CRM tools to make the sales force more efficient. Gains in efficiency will have a net positive effect only if they free sales representatives from time spent on nonselling activities and if the representative redirects that incremental time to tasks that improve relationship-building performance with customers (i.e., relationship-forging tasks). As firms begin to shift more administrative work (e.g., record keeping) to sales representatives, there is a risk of miscalibrating the opportunity cost. When the time spent on "efficient" administrative work is increased, it will still take time that sales representatives could use for customer-related responsibilities. Most people, sales representatives included, have a "time budget" that they devote to their jobs. In this study, representatives spent two-thirds of their 47 weekly hours on the job doing things other than interacting with customers (or "communicating value").

This research has a potential impact on organizational structure. The focus here is not on the functions of specific technologies but on the impact of different dimensions of technology use on the sales process. This is a simple, but important, distinction from the way managers and scholars traditionally think about the ST issue. The importance of this distinction rests in the manager's control over both investments in technology and design of work processes. That is, managers should not limit attention to technologies that influence existing work processes but rather should expand this consideration to uses of technology that enable sales representatives to provide value in new ways. This may require redesigning work processes and changing organizational structure, but it has the potential to help a firm realize strategic gains (including relationship building) through technological innovations. The different abilities required by sales representatives to make this work will obviously create new demands for hiring and training salespeople, which helps explain why hiring and training are currently two of the most important factors for sales force success (e.g., Zoltners, Sinha, and Zoltners 2001, p. 161).

Research Implications

The concept of relationship-forging tasks represents an important new theoretical perspective for future research in interorganizational contexts. We test relationships in terms of two key relationship-forging tasks that are influenced by ST uses: sharing market knowledge and proposing integrative solutions. However, a broader view suggests that theorizing about and evaluating other types of relationship-forging tasks would be useful for both scholars and managers. For example, our interviews with salespeople and sales managers suggest that relationship-oriented sales planning, coordinating activities across complex buyer–seller interfaces, and serving as a real advocate for the customer within the selling firm are other potentially important relationship-forging tasks.

The results from this research suggest that relationship-forging tasks represent new "smart-selling" behaviors in a relational context. There is a rich sales literature on working smarter versus working harder (Sujan, Weitz, and Kumar 1994) that shows the important effects of adaptive selling and sales planning on sales performance. Instead of testing traditional smart-selling behaviors (planning and adaptive selling), our model proposes relationship-forging tasks as predictors of sales performance while controlling for the effects of working harder (total effort). These new smart-selling behaviors (proposing integrative solutions and sharing market knowledge) explain more than half of the variance in relationship-building performance with customers; notably, working harder has no statistically significant effect. These findings suggest an alternative model of smart selling in relational contexts. Simply working harder (putting in more time at work) might not help a salesperson build better relationships with customers, unless the sales-

person devotes that incremental time to performing relationship-forging tasks. Although sales experience is positively related to administrative performance, its effect on relationship-building performance with customers is not statistically significant. One possible explanation for this that is consistent with our theorizing is that changes in the sales role are so dramatic that salespeople with pre-relational-selling-era experience realize minimal advantages over their less experienced counterparts, given equivalent practices of relationship-forging tasks. In other words, ST may serve as an experience multiplier for less experienced representatives.

Different uses of technology have differential effects on various aspects of performance. This study builds on Huber's (1991) and Sinkula's (1994) research on organizational learning by focusing on different dimensions of technology use, thus going beyond testing technology use as a one-dimensional construct. Moreover, consistent with the logic of Goodhue's (1995a, b, 1998) task–technology fit theory, we find differential effects across types of uses on different behavioral tasks (and aspects of performance). This evidence supports our logic that technology use influences relationship orientation through a mediated process—namely, the salesperson's conduct of relationship-forging tasks. Thus, how a sales representative uses technology and on which behavioral tasks (work processes) matters.

Without an understanding of the ST–performance relationship, sales managers may increase ST costs but decrease potential returns. Evidence from this study supports the view that using technology for analyzing and/or communicating information positively affects sharing marketing knowledge and proposing integrative solutions, but using technology for accessing information has no effect on relationship-building performance with customers. Similarly, using technology for accessing and analyzing information has direct effects on administrative performance, but the effect on administrative performance from using technology for communicating information is not statistically significant, and using technology for analyzing information has a negative impact on administrative performance.

Training and buyer encouragement represent relevant social influences on technology use that may be in conflict with each other. Building on social influence theory (Fulk 1993), we suggest that two important social players—buyers and managers—influence the salesperson's use of ITs. Our evidence suggests that sales representatives' technology use is responsive to encouragement from both their own firms and their customers. However, the two firms' priorities may differ. Specifically, the firm's training may put more emphasis on use of ST for communicating, whereas customers who have high IT expectations reinforce more use of ST for analyzing. Such differences represent a source of role conflict for B2B salespeople; this warrants further managerial and scholarly attention.

Limitations

This study has various limitations that should be considered. Although many published studies rely on self-reported measures of sales performance (e.g., Anderson and Robertson 1995; Behrman and Perreault 1982, 1984; Cravens et al. 1993; Jaramillo, Mulki, and Marshall 2005; Oliver and Anderson 1994; Singh 1998; Sujan, Weitz, and Kumar 1994), there is always a potential for common method bias. Here, we conduct and report an analysis (see the Appendix) that provides evidence that suggests that our estimates are not biased by our reliance on self-reported data. Nonetheless, it would have been desirable to include other reliable quantitative measures of sales performance or profit contribution provided by the company; however, management would not release propriety sales measures on individual accounts. Conversely, the solution is not as simple as using sales volume or other quantitative metrics when they are available. Although in contemporary sales performance research some scholars imply that quantitative measures are objective, Russell (1950) expressed concern about the true "objectivity" of quantitative measures when he proposed them for sales analysis more than a half century ago. For example, there are differences in territory and account potential unrelated to the efforts of the current sales representative (Behrman and Perrault 1982), including factors such as market potential, territory workload, and the company's reputation within the territory (Cravens, Woodruff, and Stamper 1972). Zoltners, Sinha, and Zoltners (2001) also outline how a selling organization's investments in other go-to-market participants (e.g., advertising and promotion, call centers and telesales, the Internet) influence company results. Nonetheless, in some situations, quantitative measures can be used (and adjusted, as appropriate, for factors beyond the control of the salesperson). Although quotas can be used to adjust quantitative measures and make them more objective, they are also imperfect. In our case, the host firm does not use them for this reason. Perhaps more important, there is a growing practice in relational selling contexts to emphasize long-term relationship-building performance measures over short-term quotas. Sales organizations often include self-evaluation or customer evaluation as a component for evaluating salesperson performance. Finally, the use of self-reports makes research easier to replicate within and across sales organizations, including international contexts (Atuahene-Gima and Li 2002). Thus, self-reported measures of performance have both advantages and limitations.

We evaluate a buyer–seller relationship on the basis of the seller's view, but this research could have benefited from additional measures based on buyer's inputs. Although the host firm in this research did not want to solicit inputs from buyers, it would be useful to have evidence of whether the seller and buyer share a common perspective.

Consumer packaged goods firms may be at the forefront of ST implementations. Consequently, the results from our host firm may reflect "best practices" in ST implementation rather than what a start-up would experience. However, the host firm's use of technology may foreshadow adoption and implementation issues that other firms may confront as information availability, category management practices, relational selling, and ST infuse across other industries and firms. Moreover, the process model approach we use, which focuses on evaluation of the intermediate outcomes of different aspects of ST, readily applies to other contexts in which IT influences how people work. In essence, the

approach provides a means for managers and scholars to supplement other examinations of the interrelationships among people, processes, and technologies in an integrative, holistic fashion.

Further Research

Additional research on ST and relationship-forging tasks is needed. Marketing scholars and managers have an important role to play in the ever-expanding domain of ST. To date, many key decisions about what technologies to develop (or buy) have been guided primarily by IT specialists rather than by marketing/sales experts. Although technologies must be properly implemented and support needs to be effective, it is also important that resources be put into solving the right problems and performing the right tasks. If marketing managers do not play an active role in the dialogue about which STs are needed, revenue generation opportunities may be lost. For example ST decisions benefit from marketing knowledge about organizational procurement processes (see Hunter, Bunn, and Perreault 2006) and how such buying tasks can best be integrated with sales processes. Research is needed to guide these decisions, which often have huge financial implications.

Research into the antecedents of effective ST use would improve the understanding of how best to recruit, motivate, and train salespeople for new relational selling roles. There is a pressing need for better understanding of salesperson preferences for various training methods, the effectiveness of those methods, and how best to support organizational learning for sales forces. Many companies yield to cost pressures (and IT "norms") when they rely primarily on online help systems to support new ST tools, but this seems to ignore Rogers's (1962) basic caveats about how compatibility affects adoption of innovations. With online help, it is likely that sales representatives who are least comfortable with software and who find it most incompatible with their sales style confront a training approach that is also incompatible with their established ways of learning. Similarly, a better understanding of factors that influence customer expectations about technology uses would be helpful.

Conclusion

Sales technology is an area in which scholarly guidance for management decisions has been sparse, even though it is expensive, difficult to manage, and fast changing. Despite the challenges associated with understanding relationship-forging tasks and ST, their importance to practice warrants additional research. There is a need for marketing scholars (not just researchers who take an information system perspective) to continue to improve conceptualization and theory in this arena. New ST tools are needed to help representatives develop solutions that meet customer needs, and technology should not be considered by managers as just another means for cutting selling costs (or displacing the sales force altogether). To evaluate such trade-offs, there is a need for better methods of evaluating and diagnosing what is (and is not) the best use of ST for achieving strategic objectives.

Appendix

Discriminant Validity of Measures

Our conceptual model includes subgroups of constructs (e.g., the different uses of ST or the different aspects of performance) that are expected to be empirically related. Nevertheless, these sets of constructs (and the items on which they are based) must exhibit discriminant validity, or interpreting results from the block-recursive structural model would be inappropriate. Therefore, to assess discriminant validity of the ST uses, relationship-forging tasks, and the aspects of sales performance constructs, we tested three sets of models. The models represent alternatives to the proposed blocks among the constructs and items.

The first set of tests compares the hypothesized multifactor structure for constructs within a block with a one-dimensional factor (i.e., all items in the block are related to a single factor). The second set of tests examines the fit of a higher-order factor (i.e., individual factors for constructs within a block also combine to form a second-order construct). The third set of tests compares a model with uncorrelated factors with the proposed model that assumes relationships among constructs in the block.

To test one-dimensional factor model alternatives, we compared the fit of a single-factor model with the proposed multidimensional model (Anderson and Gerbing 1988). Because this involves comparisons between nonnested models, we computed fit statistics for each model and then (as Bollen [1989] recommends) favored models with the highest CFI, an index designed to compare nonnested models. Because models for the higher-order factor comparison and the uncorrelated constructs comparison involve conventional tests of nested SEM models (i.e., constraints are imposed on the proposed models), we used the chi-square-difference test. In all cases, the statistical evidence supports the proposed models (for details, see Table A1).

To assess the discriminant validity of the items further, we compared each item's correlation with a composite of the remaining items that constitute its scale with that same item's correlations with all other scales in the proposed model. In only one case was an item's correlation with an unintended scale higher than its correlation with its composite. The item "staying abreast of changes helps me keep my buyers informed" had a correlation of .52 with its composite versus a .55 correlation with the proposing integrative solutions scale. We kept the item to preserve the construct's content validity. Furthermore, all item-to-scale composites were .40 or higher, and the average minimum absolute value between items to intended composite and items to unintended scales was .24. In combination, these statistics provide strong evidence in support of the discriminant validity of the constructs and, in general, to the use of the block-recursive modeling approach we presented.

Evaluation of Potential Common Method Bias

With SEM, it is possible to test for the effect of common method bias among measures. We used two different approaches to test method bias. First, we fit a model with all manifest items loading on a single factor, representing a

TABLE A1
Confirmatory Factor Analyses Results and Comparisons with Alternative Models for Proposed Blocks of Constructs

Block	Proposed Block Versus One-Dimensional Alternative			Proposed Block Versus Higher-Order Alternative			Proposed Block Versus Unrelated Constructs Alternative		
	CFI, AIC Proposed Block	CFI, AIC Alternative Model	ΔCFI, AIC	χ^2, d.f. Proposed Block	χ^2, d.f. Alternative Model	$\Delta\chi^2$ (*p* Value)	χ^2, d.f. Proposed Block	χ^2, d.f. Alternative Model	$\Delta\chi^2$ (*p* Value)
Sales Context $\chi^2 = 29.3$ ($p = .30$), d.f. = 26; RMSEA = .04; GFI = .98; and AGFI = .94	.99, 67.3	.22, 252	.37, –184	29.3, 26	45.2, 27	15.9 (<.001)	29.3, 26	50.0, 27	11.7 (<.001)
ST Uses[a] $\chi^2 = 66.2$ ($p = .00$), d.f. = 39; RMSEA = .07; GFI = .93; and AGFI = .86	.98, 144.1	.55, 817	.47, –583	66.2, 39	189.6, 42	114.1 (<.001)	66.2, 39	177.3, 42	111.1 (<.001)
Relationship-Forging Tasks $\chi^2 = 13.8$ ($p = .39$), d.f = 13; RMSEA = .02; GFI = .97; and AGFI = .94	1.00, 43.8	.89, 86.1	.11, –32.3	13.8, 13	25.5, 14	11.7 (<.001)	13.8, 13	79.2, 20	65.4 (<.001)
Aspects of Sales Performance $\chi^2 = 25.2$ ($p = .16$), d.f. = 19; RMSEA = .05; GFI = .96; and AGFI = .92	.98, 59.2	.70, 456	.22, –130	25.2, 19	38.6, 21	13.4 (<.001)	25.2, 19	50.5, 20	25.3 (<.001)

[a]We specified correlated errors across like adjective pairs in both the proposed and the alternative models.
Notes: Fit statistics for confirmatory factor analyses of each of the proposed structural subsystems (blocks) appear beneath each block's title. AIC = Akaike information criterion.

common method influence. This model produced an extremely poor fit ($\chi^2 = 2694.0$, $p < .001$, d.f. = 595; CFI = .36; RMSEA = .15; GFI = .42; and AGFI = .35), providing evidence against the potential biasing effect of a common factor. Second, we tested for same-source bias by reestimating the proposed structural model, after including a common method first-order factor that we allowed to covary across each of the self-report scales. By constraining loadings to be equivalent across scales, we identified the model, which represents the effects of a potential omitted latent construct across the scales. Using a chi-square-difference test between nested models, our findings suggest that a same-source factor did not influence the overall model fit statistics ($\chi^2 = 34.3$, $\Delta\chi^2 = 2.8$, Δd.f. = 2, $p = .25$). In addition, we compared the standardized parameter estimates for the alternative models and noted that the estimates were similar in both cases. Thus, although method bias is always a potential problem with survey data, these tests provide evidence that it did not significantly influence the results from this analysis.

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