An Analysis of the Effects of Sales Force Automation on Salesperson Perceptions of Performance

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Investments in sales force automation (SFA) are huge, yet the effects of SFA on salesperson performance are not well established. This study investigates SFA's effect on salesperson performance through its effect on two intervening variables: account management outcomes and sales process effectiveness. Sales force automation comprehensiveness of use was found to positively influence salespeople's account management and sales process effectiveness, leading to an increased ability to work smarter while making work effort more efficient. In turn, improved account management and sales process effectiveness resulting from the use of SFA led to increased job performance and job satisfaction. Results suggest that sales managers should focus on adopting technologies that improve sales people's account management abilities such as those that support pricing and order placement, and technologies that help sales people to handle more accounts and enhance their ability to assess their customer's needs. Additional focus should be on technologies that have the capability to analyze reasons for won and lost opportunities and provide the communications capabilities to enhance teamwork with other people in the sales organization.

U.S. Companies have invested over $3 trillion dollars into information technology (i.e., computer hardware and software and telecommunications equipment) in the last twenty years (Stiroh 2002). Customer relationship management (CRM) technology is an important form of IT that assists sales organizations in managing sales processes with the objective of developing and maintaining long-term customer relationships (Ingram, LaForge, and Leigh, 2002). Worldwide, the CRM industry is forecasted to reach $45.5 billion in 2006, a compound annual growth rate of 18.6 percent. The U.S. CRM market is expected to exceed $18 billion that same year (McCausland 2002). Sales force automation (SFA) is the most widely used subset of customer relationship management technology. Sales force automation (SFA) is broadly defined as the conversion of manual sales activities into electronic processes via the use of software and/or hardware (Rivers and Dart 1999). These rapidly emerging technologies are having a major impact on the nature of the sales job. For example, one computer software company was able to show their sales force that three complaints (or problems) in less than six months typically lead to a lost customer. This directly led to lost commissions for the salesperson. Their sales force automation software was set so that after two complaints from an account, the salesperson was alerted about the unhappy account. The salesperson could then be proactive and take care of the problems. This system reduced lost accounts by 53% during the first year.

The potential benefits deriving from SFA are many. As the example above highlights, SFA can be an important tool for managing account relationships, and improving customer retention and overall sales performance. The possibility of increasing customer retention is important, since the cost of finding new customers is estimated to be five times the cost of keeping existing customers (Kotler 1997), and a customer's lifetime value (the net present value of the future stream of profits from an individual customer) increases markedly with customer retention (Peppers and Rogers, 1997).

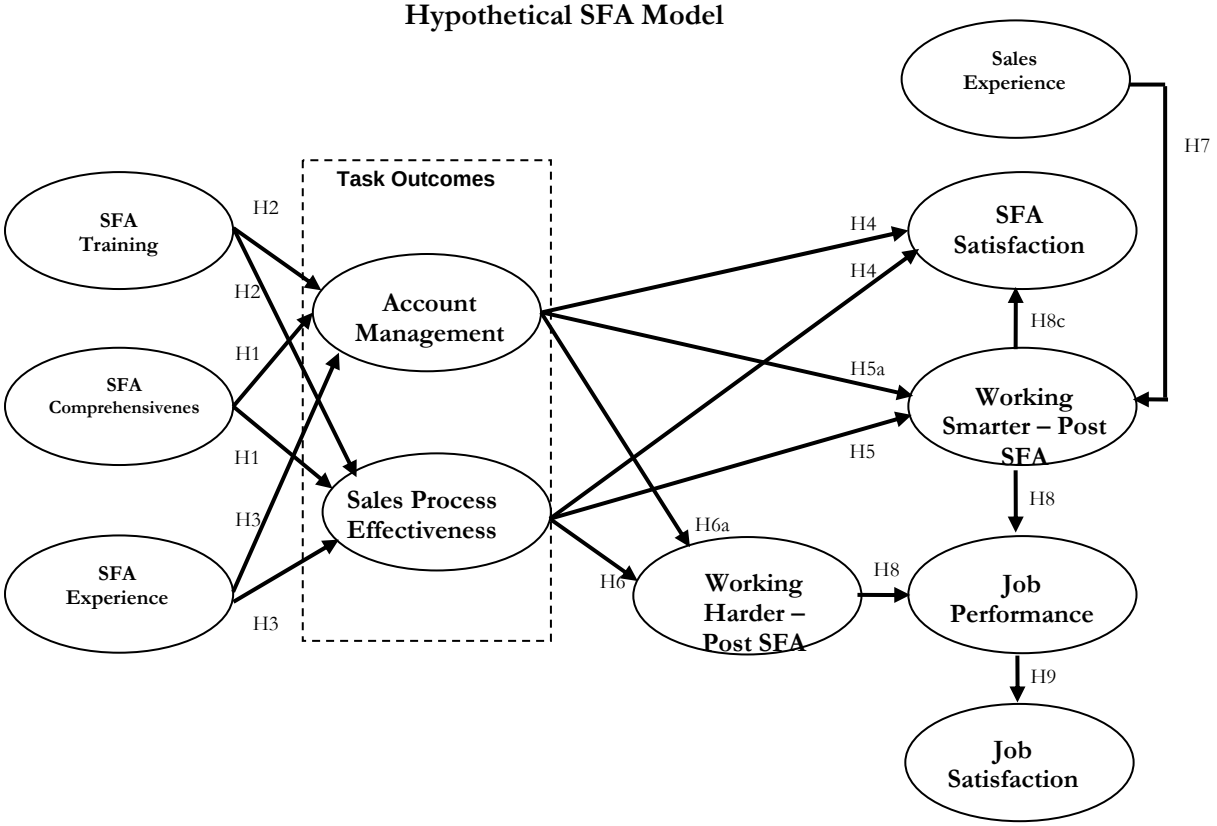
Evidence in the business press also indicates that a sales force's use of SFA can facilitate communication with sales people, reduce manual error rates, enhance time and territory management (e.g., a reduction in time preparing for customer presentations and follow-up when more information is requested), give sales people

faster access to timely information, and provide enhanced customer service (e.g., Lorge 1999, Orenstein and Leung 1997, Gentilcore 1996, Schottmiller 1996, Hanover 2000, Thetgyi 2000). However, other research indicates that not all companies experience positive gains, in part due to resistance to adopting the technology on the part of the sales force (Rivers and Dart 1999; Speier and Venkatesh 2002). The question of the impact of SFA on sales performance is an important one. Intuitively, successful adoption and continued usage ultimately depends on sales performance gains. Moreover, huge investments have been, and are being made in SFA, and as many as 75% of SFA projects fail (Blodgett 1995).

While scholarly research has focused on aspects of SFA adoption, there has been surprisingly little academic research focused on explaining how SFA affects sales performance. In a recent article (Tanner, Ahearne, Leigh, Mason and Moncrief 2005), the authors argue that future research needs to address the mechanisms through which sales technologies like SFA influence salesperson performance. The present study seeks to contribute to our knowledge in this area by developing and testing a conceptual model of the effects of SFA on select sales task outcomes that are viewed as key mechanisms through which SFA affects salesperson performance and job satisfaction. The study also examines SFA-specific measures of working smarter and harder and salesperson satisfaction with SFA. The issues addressed should provide important insights to both managers and sales researchers regarding the mechanisms though which SFA usage impacts performance.

Figure 1

Hypothetical SFA Model



The Model

The conceptual model is presented in Figure 1. As the model indicates, a salesperson's performance and job satisfaction are posited to be a function of the salesperson's ability to work smarter instead of harder using SFA. In turn, the ability to work smarter and the salesperson's level of work effort are posited to be reliant on how well the salesperson can accomplish two key sales tasks associated with the job – account management and sales process effectiveness, which depend on their training and experience with SFA and the comprehensiveness of the SFA implementation. The model also postulates that a salesperson's satisfaction with SFA is dependent on improvements in account management and increased sales process effectiveness. Finally, a salesperson's ability to work smarter is anticipated to be related to the person's level of sales experience. The following sections will describe these relationships in further detail. Since the basic premise of this research is that SFA's effect on job performance is through improved sales task outcomes, we first discuss the task outcome constructs. Next, we develop the logic and hypotheses for the antecedent variables, then the expected consequences of improved task outcomes.

Sales Task Outcomes

This research proposes that SFA usage affects sales performance through its ability to enhance the outcomes of key sales tasks. This is consistent with recent research calling for studies that investigate intervening variables in the sales technology – sales performance relationship (Tanner et al. 2005).

Walker, Churchill and Ford (1977) developed one of the first conceptual frameworks to recognize that sales performance was contingent on the amount and quality of effort the salesperson exerted on the various tasks associated with the job. Weitz (1981) also emphasized the importance of salesperson tasks by proposing that salesperson performance was contingent on how efficiently and effectively tasks are carried out. Salesperson activities and behaviors include those tasks required in the sales process and tasks related to the development of ongoing relationships with customers and buyers (Boles, Brashear, Bellenger, and Barksdale (2000). Moncrief (1986) identified over 120 salesperson tasks, which he empirically associated with selling, working with orders, servicing the product, information management, servicing the account, attending conferences and meetings, training and recruiting, entertaining, travel, and working with resellers. Obviously, not all of these tasks are directly related to sales performance, nor are they all facilitated by SFA. This research focuses on a reduced set of tasks that previous research indicates should be facilitated by SFA and should relate to improved sales performance.

SFA and Salesperson Tasks

The sales force automation literature suggests that some salesperson tasks are facilitated by SFA (Lorge 1999, Orenstein and Leung 1997, Gentilcore 1996, Schottmiller 1996). With respect to information technologies such as SFA, research suggests that task-technology fit is important. Task-technology fit is the ability of a technology to facilitate an individual's job activities, and is the correspondence between the job requirements and the functionality of the technology (e.g., Goodhue and Thompson 1995). This research focuses on those sales job tasks that the literature indicates and we believe to be facilitated by SFA (i.e., activities that should have a high task-technology fit). While there are potentially many sales tasks facilitated by SFA, and many different ways to think about and organize those tasks, our focus is on two higher-order task outcome constructs we believe are facilitated by SFA: Account Management and Sales Process Effectiveness. While SFA can facilitate internal administrative tasks, time management, contact management, and the like, it seems intuitive that ultimately SFA must improve customer relationships and boost the effectiveness of the selling process for it to truly be worthwhile.

Account Management

The account management construct includes task outcomes that deal with the salesperson's ability to accurately and effectively manage account relationships.

For example, Lorge (1999) reported that SFA helps sales reps sell more consultatively by being better able to assess customer needs. Orenstein and Leung (1997) found that SFA facilitates providing the customer with more accurate pricing information and results in more accurate ordering processes. Gentilcore (1996) also reported that SFA assists with order processing. Schottmiller (1996) reported that SFA enabled the salesperson to commit fewer costly mistakes based on incorrect information, and to handle more accounts**,** and improve call productivity**.** These various issues all represent specific task outcomes that together constitute improved account management.

Sales Process Effectiveness

In addition to improved account management, SFA should also enable salespeople to be more effective in terms of specific short-term outcomes of the sales process. For example, users of SFA appear to be able to do a better job of analyzing reasons for won and lost account opportunities (Gentilcore 1996). Schottmiller (1996) reported that SFA helps salespeople to improve their closing rates. A report by Microsoft Corporation (1998) claims that SFA usage can lead to improved customer retention rates. That report also indicates that SFA usage can facilitate teamwork, a claim also supported by Gentilcore (1996). Erffmeyer and Johnson (2001) reported that salespeople in their study felt that SFA increased their effectiveness, and that SFA allowed for faster revenue generation. Dellecave (1996) found that the vast majority of sales executives surveyed reported that their companies were generating more revenue because of sales technologies.

Given the premise that these salesperson task outcomes are indeed facilitated by SFA, a logical issue would be to determine which antecedent variables lead to these improved task outcomes, as well as the effects these improved task outcomes have on important overall measures such as salesperson job performance and satisfaction. The following sections seek to address these issues.

Antecedents to Salesperson Task Outcomes

Models of salesperson performance (Walker, Churchill and Ford 1977, Churchill, Ford, Walker, Johnston, and Tanner 2000, Weitz, Sujan and Sujan 1986) posit salesperson performance to be a function of a salesperson's personal characteristics as well as organizational variables. Weitz, Sujan and Sujan's (1986) model suggests that one factor affecting salesperson performance consists of the capabilities of the salesperson, which are a function of the salesperson's knowledge and information acquisition skills. Sales force automation should both enhance salespeople's' knowledge and increase their ability to acquire timely information. However, the ability of a sales force automation system to enhance knowledge and increase information acquisition should be contingent on the comprehensiveness of the SFA components used by the salesperson.

Comprehensiveness of SFA Use

Sales force automation systems can vary from the simple (e.g., electronic organizers and other personal information management systems) to more extensive systems (e.g., computer systems and software that integrates with corporate systems). For purposes of this research, sales force automation comprehensiveness is the breadth of SFA use, both hardware and software. The more comprehensive the technology use, the more the SFA system may assist salespeople with their selling tasks. As more components of a SFA system are employed by the salesperson the more the salesperson's tasks should be assisted, since the technology has a better capability to overcome inherent human weaknesses such as information

processing limitations and bounded rationality (Simon 1955, 1974). This increased task-technology fit should result in increased efficiency for the salesperson (DeSanctis and Poole, 1994). For example, more comprehensive use might be expected to help salespeople complete their selling tasks faster (e.g., a decreased sales cycle), cheaper (e.g., improved order accuracy) or better (e.g., the ability to better assess customer needs). Moreover, new tasks (e.g., greater synergy between inside and outside sales through improved communication) might be accomplished that were not previously possible without a more comprehensive use of the technology (Erffmeyer and Johnson 2001, Taylor 1994, Verity 1993), thereby increasing both information accuracy and ease of information management.

Finally, more comprehensive sales automation system use may also increase sales process effectiveness. For example, Thetgyi (2000) reported that Dow Chemical closed its sales offices, cut administration costs by 50%, and boosted sales force productivity by 32.5% with reduced order cycle time. Dellecave (1996) found that SFA increased the efficiency of the sales force by more than 85 percent for the 300 respondents reporting. In that study, sixty-two percent of respondents said that their companies were generating more revenue because of sales technologies.

Therefore, the first hypothesis is:

H_1: Increased sales force automation comprehensiveness of use improves a salesperson's

a. account management.
b. sales process effectiveness.

Training and Experience With SFA

Any given information technology, such as sales force automation, can be thought of as a set of capabilities. These capabilities can be implemented by salespeople in many different ways. Adaptive structuration theory proposes that salespeople choose which features of a sales force automation system to use based, in part, on their degree of knowledge and experience with the technology (e.g., DeSanctis and Poole 1994). As salespeople spend more time training *and* using their sales force automation systems, they should become more proficient with the system, and have a better understanding of the benefits and pitfalls of the system. Therefore, salespeople that are better trained and more experienced with SFA should be more skillful with its use, which should result in improved account management and increased sales process effectiveness.

Previous sales technology research shows a positive relationship between company training and SFA use (Jones, Sundaram and Chin 2002). Evidence to support the positive value of experience comes from Czaja and Sharit (1993) who found that computer experience was negatively related to the time it took to perform data entry, file modification, and inventory management tasks. They also found that more computer experience resulted in fewer data entry and inventory management errors. Research also suggests that lack of adequate training is one factor related to negative SFA outcomes (Erffmeyer and Johnson 2001). Therefore, the expectation is:

H_2: Increased salesperson training in sales force automation should result in improved

a. account management.
b. sales process effectiveness.

H_3: Increased salesperson experience with sales force automation should result in improved

a. account management.
b. sales process effectiveness.

Consequences of Improved Salesperson Task Outcomes

Sales Task Outcomes and SFA Satisfaction

Improved account management and sales process effectiveness are expected to be related to the salesperson's satisfaction with SFA. Consistent with models of technology acceptance and use (e.g., Davis 1989, Venkatesh, Morris, Davis, and Davis 2003), it logically follows that this improvement in task accomplishment should result in higher levels of satisfaction with the SFA system.

H_4: Increased salesperson satisfaction with SFA should result from improved

a. account management.
b. sales process effectiveness.

Sales Task Outcomes and Post-SFA Working Smarter and Harder

Better task outcomes are proposed to have a positive impact on the salesperson's ability to work smarter while simultaneously reducing their necessity to work harder as a result of SFA use. As Weitz (1981) has proposed, working smarter is the altering of sales behaviors based on differences between selling situations. Following Sujan, Weitz, and Kumar (1994), working smart is defined as behaviors directed toward developing knowledge about sales situations and utilizing this knowledge in sales presentations.

A salesperson's *use* of "smart-selling" has been postulated to be related to its associated benefits and costs. The benefits of smart-selling behavior accrue through large potential orders or when information gained to engage in smart-selling can be used in future sales interactions. The costs of smart-selling primarily stem from the cost of information collection (e.g., market research on the customer), which should be facilitated by more comprehensive use of SFA. Finally, a salesperson's information acquisition skills (which may be enhanced through SFA) should facilitate their ability to practice smart-selling. The purported benefits of SFA also should increase the efficiency of the salesperson's time use. Thus, for any given level of task accomplishment, the time required for effective task completion should be reduced. Dellacave (1996) found that about 80 percent of the sales professionals surveyed reported that technology was making their jobs easier; and more than 90 percent expected technology to make their jobs easier in the future.

H_5: A salesperson's ability to work smarter is positively related to improved

a. account management.
b. sales process effectiveness.

H_6: A salesperson's reduced necessity to work harder should result from improved

a. account management.
b. sales process effectiveness.

Sales Experience and Smart Selling

A salesperson's overall job experience is expected to affect his/her ability to work smarter. As Szymanski (1988) points out, salespeople must process much information to sell effectively. To aid in the processing of this information, salespeople rely on selling categories stored in long-term memory. Associated with these categories are attributes or characteristics of the category. Salespeople can then use these attributes to classify customers in order to quickly identify their requirements.

Accordingly, experienced salespeople might be expected to have (1) developed a greater number of selling-related categories and (2) learned the attributes that describe sales categories to a greater extent than their less experienced counterparts. As a result, salespeople with more experience may have a higher propensity to correctly classify a selling situation and then use the correct selling strategy for that selling situation. Therefore,

H_7: Increased sales experience should result in an increased ability to work smarter.

Sales Performance, Smart Selling, Working Harder, and SFA Satisfaction

In a series of studies including over 2000 salespeople and incorporating over 200 companies, Weitz Sujan, and Sujan (1986) have found that salespeople's performance is more strongly related to what they do rather than to how hard they work. Salespeople with a greater ability to engage in smart-selling should execute sales presentations that are more effective and persuasive, resulting in increased sales performance (Boorom, Goolsby and Ramsey, 1998). Spiro and Weitz (1990) found that smart-selling was positively related to salespeople's self-assessment of performance. Sujan, Weitz and Kumar (1994) found that smart-selling led to increased sales performance. Finally, Boorom, Goolsby and Ramsey (1998) found that smart-selling was positively associated with percent of quota achieved. While previous research has found that both selling smarter and selling harder are positively related to increased sales performance (Sujan, Weitz and Kumar 1994), much of the focus of this stream of research is on the trade-off between working harder or working smarter, with working smarter the more efficient choice. As hypothesized above (H6a&b), SFA usage that improves account management and sales process effectiveness will cause salespeople to feel less need to work harder. In the context of SFA usage, we postulate a *negative* relationship between job performance and working harder. In other words, through SFA use, salespeople will more efficiently generate a given level of job performance, i.e., they will generate better performance for a given level effort.

H_{8a}: Working smarter is positively related to sales performance.

H_{8b}: Required job effort is negatively related to sales performance.

Based on the same logic as hypothesis 4 above and based on models of technology acceptance and use (e.g., Davis 1989, Venkatesh, Morris, Davis, and Davis 2003), it logically follows that the ability to work smarter through SFA should have a positive effect on salespeople's reported satisfaction with SFA. Therefore, it is hypothesized that

H_{8c}: Working smarter leads to increased levels of salesperson satisfaction with SFA.

Job Satisfaction

The logic behind the notion that a salesperson's

Table 1

Descriptive Statistics of Salespeople Included in the Sample

Descriptor	Mean	N (Percent)
Sales Experience	11.10 years	91 (100%)
Age	36.64 years	91 (100%)
Education	High School	3 (3.3%)
	Some College	11 (12.1%)
	Bachelor's Degree	66 (72.5%)
	Some Graduate	6 (6.6%)
	Graduate Degree	5 (5.5%)
Industry	Mining	1 (1.1%)
	Health Care	12 (13.2%)
	Manufacturing	24 (26.4%)
	Wholesale Trade	7 (7.7%)
	Transportation	1 (1.1%)
	Retail Trade	2 (2.2%)
	Information	2 (2.2%)
	Finance and Insurance	27 (29.7%)
	Real Estate	1 (1.1%)
	Professional Services	12 (13.2%)
	Other Services	2 (2.2%)

job performance leads to satisfaction with the job is that the salesperson is able to compare his/her actual job performance with expected job performance when estimating rewards. Then the salesperson is able to form positive or negative feelings based on this discrepancy. Bagozzi (1980) was the first in marketing to apply the causal modeling technique to delineate the positive directional relationship between a salesperson's performance and job satisfaction. This result has been supported by other sales research (e.g., Behrman and Perreault 1984).

H_9: Salespeople's performance is positively related to their job satisfaction.

Research Method

These hypothesized relationships were tested on a cross-sectional sample of salespeople. The following sections will discuss the questionnaire and the data collection procedure.

Survey Questionnaire

Questions included in the survey were drawn from previous studies or developed specifically for this study. The questionnaire first asked respondents whether or not they used SFA. If not, respondents were asked to indicate their reasons for not using SFA. Users were then asked to indicate how long they had used SFA, what type of hardware and software they used, the degree of training they received, and their level of satisfaction with SFA. Users were also asked to evaluate whether certain aspects of their job (e.g., hours worked, the ways they approach their customers) had improved as a result of using SFA. Additional items queried respondents as to how helpful SFA has been in performing the selling function. The following discussion explains the measures used in the study.

Measures

Comprehensiveness of SFA use was measured as the breadth of SFA implementation summing all of the software and hardware components used by the respondent (see the Appendix). This formative measure, adapted from Hunter, Perreault and Armstrong (1998), consisted of 23 SFA software and hardware tools, for which the salesperson simply checked those he/she currently used.

A sales professional's *experience with SFA* and *SFA training* were assessed via two questions, one asking how long (years, months) the sales professional had used SFA., and the other asking how much training (months, days, hours) s/he had with SFA.

Account management and *sales process effectiveness* were composite measures. These items were measured by asking respondents to indicate the degree to which SFA helped them with each sales task using a seven point Likert scale anchored by "Very Helpful" (7) and "Not Very Helpful (1)" (see the Appendix).

Job experience was measured by asking salespeople directly how long they have been in professional sales (years and months).

A salesperson's *satisfaction with SFA* was measured with one seven point Likert scale that read "How satisfied are you with your sales automation tools?" anchored by "Very Satisfied" (7) and "Not Very Satisfied" (1).

Salespeople's ability to *work smart* and necessity to *work hard* were assessed using a scale developed by Sujan (1986) in which working smarter consisted of two components: a sales professional's adaptations to customers, and their repertoire of selling techniques. The working harder components related to persistence and intensity of selling behavior (see the Appendix). Both measures tapped the salesperson's perceptions that (s)he worked smarter or less hard *after* SFA usage than before.

Finally, *sales performance* was assessed using several self-report measures. Each of these measures asked the respondent to compare their performance *after* using SFA to their *pre*-SFA performance. Seven-point categorical scales

were used to measure sales volume increases (decreases), selling time gained (lost), and productivity increases (decreases). For example, on a scale that read "On average what best describes what happened to your sales volume?" the mid-point of the sales volume scale was "no change," and the end-points were "decreased more than 20%" and "increased more than 20%." The ease (difficulty) of the selling job was measured on a seven point Likert scale where 1 = much more difficult and 7 = much easier (see the Appendix).

Data Collection Procedure

The survey was sent to the sales managers of 200 companies in the Midwestern United States. All 200 companies were contacted by telephone and informed that the survey was on the way and asked for their cooperation. Each of the managers was asked to distribute a questionnaire to one of their salespeople. One hundred and one salesperson surveys were returned. The high response rate is attributed to two factors: first the researchers' telephone calls alerted the participants to the survey and allowed them to answer the managers' questions. Second, the issues surrounding SFA are clearly timely and relevant to both sales managers and salespeople.

To test for possible non-response bias, respondents were compared with non-respondents with respect to company sales revenue and number of employees. The results of this comparison suggest no differences between the two groups on sales revenue ($t = .224$, $df = 195$, $p = .823$) or on number of employees ($t = .246$, $df = 197$, $p = ,806$). These results provide some evidence that non-response bias was not a concern in this study. An analysis of early versus late responders also was conducted. Two exogenous variables (SFA comprehensiveness of use and sales experience) and the task outcome variables were included in the analysis. No significant differences were found between early and late responders. These results provide further support that non-

Table 2

Confirmatory Factor Analysis Results for Account Management, Sales Process Effectiveness and Job Performance

Constructs & Indicators	Standardized Loading	Composite Reliability	Indicator Reliability	Error Variance	Variance Extracted
Account Management		.9074			.6252
Pricing	.7126		.5078	.4922	
Placement	.7531		.5672	.4384	
Mistakes	.7994		.6390	.3610	
More Accounts	.8819		.7777	.2222	
Productivity	.8744		.7646	.2354	
Assess Cust. Needs	.6908		.4772	.5228	
Sales Process		.8224			.5373
Opportunity	.7090		.5027	.4973	
Close Rates	.8485		.7199	.2800	
Cust. Retention	.7846		.6156	.3844	
Teamwork	.5722		.3274	.6726	
Job Performance		.8755			.6411
Sales Volume	.6613		.4373	.5469	
Selling Time	.7391		.5462	.4466	
Productivity	.9171		.8410	.1651	
Ease of Job	.8600		.7396	.2523	

response bias was not a concern.

Analysis

Only 7 salespeople indicated that they did not use sales force automation. Of those, 4 reported that the reason for not using SFA was that the benefits of using SFA were unclear.

Descriptive Statistics

Thirty-one percent of the responding salespeople reported that they were in the manufacturing industry, 27% in finance and insurance, and 12% in health care and social assistance and professional, scientific, and technical services respectively.

Structural Equations With Manifest Variables

The analysis followed a two-step procedure. First, measurement models were specified for factors measured by reflective indicators, and convergent and discriminant validity were then assessed. Next, the structural model was estimated to test the hypotheses. The structural relationships were tested by using structural equations with manifest variables, where the manifest variables included single-item measures, a formative measure, or composites of multiple measures (MacKenzie, Podsakoff and Ahearne 1998). Structural equations with manifest variables was preferred over other approaches (e.g., latent variables) since one of the measures used in the study was formative, several of the other measures were single-item, and the large number of theoretical constructs compared to the sample size would make confidence in the results of a latent variable analysis tenuous (Behrman and Perreault 1984).

For those constructs having multiple measures, composite scales were constructed. For example, working smarter was a composite of two items, which were significantly correlated ($r = .571$, $p < .01$). Similarly, working harder was a composite of two items, which also were

Figure 2

Final SFA Model Standardized Coefficients and Explained Variance

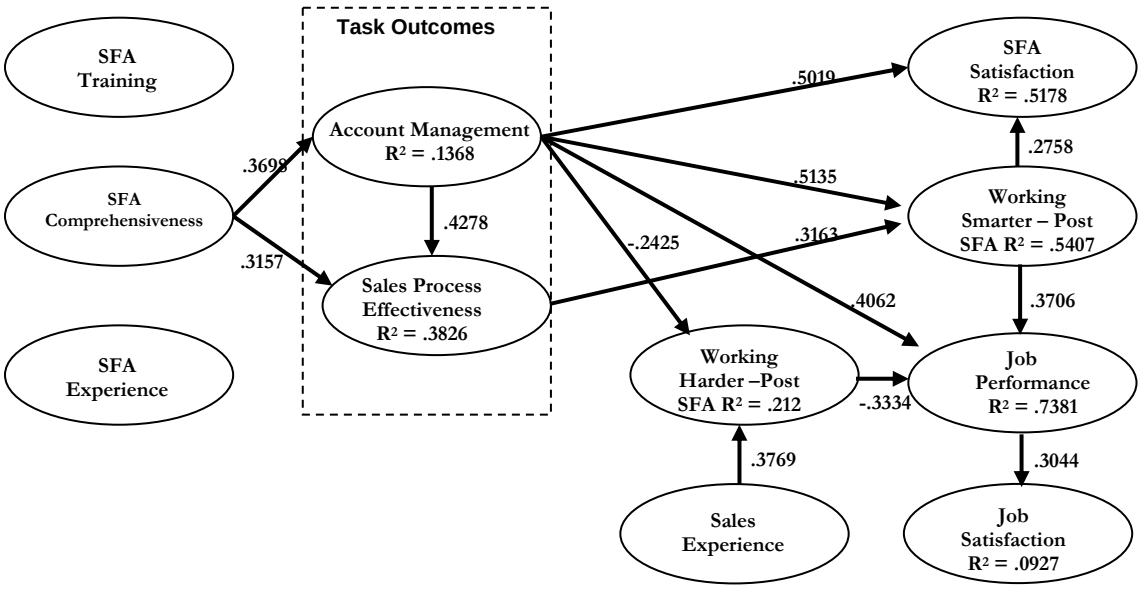


Table 3

Correlations, Means and Standard Deviations for Variables in the Model

	SFA Comprehensiveness	Account Management	Sales Process Effectiveness	SFA Satisfaction	Working Smart	Working Hard	Sales Experience	Job Performance	Job Satisfaction
SFA Comprehensiveness									
Account Management	.384**								
Sales Process Effectiveness	.488**	.554**							
SFA Satisfaction	.189	.697**	.483**						
Working Smart	.440**	.685**	.595**	.619**					
Working Hard	-.063	-.316**	-.172	-.136	-.177				
Sales Experience	-.158	-.157	-.038	.027	-.184	.403**			
Job Performance	.421**	.768**[1]	.572**	.593**	.684**	-.518**	-.228**		
Job Satisfaction	.067	.238*	.080	.153	.170	-.181	-.067	.308**	
Mean	11.39	4.54	3.54	4.2	4.66	4.46	11.10	4.61	5.35
Standard Deviation	3.51	1.31	1.30	1.32	0.80	0.86	8.08	1.02	1.24
Scale	1 – 23	1 – 7	1 – 7	1 – 7	1 – 7	1 – 7	Years	1 – 7	1 - 7

*p < .05 (two-tailed)

** p< .01 (two-tailed)

[1] The discrininant validity between the account management, sales process effectiveness, and job performance constructs was assessed using the chi-square difference test and the variance extracted test. In order to establish discriminant validity, the constructs were entered into a series of confirmatory factory analyses. The first analysis estimated the fit of a model where the three factors were allowed to covary freely. The second, third and fourth analyses fixed one of the covariances to be 1.0. All analyses suggested that model fit significantly deteriorated when the covariances were fixed at 1.0 (Δc^2 = 64.68, df = 1, p < .001 for account management and sales process effectiveness, Δc^2 = 22.35, df = 1, p < .001 for account management and sales performance, and Δc^2 = 65.67, df = 1, p < .001 for sales process effectiveness and sales performance) providing evidence of discriminant validity. The second test involved comparing the variance extracted by the three factors to the correlations between the three factors. The average variance extracted by account management was .6252 and the average variance extracted for sales performance was .6411 while the squared correlation between the two factors was .5898. Similarly, the average variance extracted by sales process effectiveness was .5373 where the squared correlation between sales process effectiveness and sales performance was .3272. The results of these tests suggest discriminant validity between account management, sales process effectiveness and sales performance.

significantly correlated (r = .683, p < .01).

The account management outcomes and sales process effectiveness measures were subjected to a confirmatory factor analysis. Results from the confirmatory factor analysis are presented in Table 2. The confirmatory factor analysis substantiated the two factor solution (c^2 = 46.49, df = 34, p = .075, GFI = .9076, CFI = .9743, NNFI = .9659, NFI = .9124, RMSEA = 0.0676). Convergent validity was established as all remaining factor loadings were significant (T > 2.0) (Anderson and Gerbing 1988). Discriminant validity between the two factors was established in three ways, through the chi-square difference test (Bagozzi and Phillips 1982), the confidence interval test (Anderson and Gerbing 1988), and the variance extracted test (Fornell and Larcker 1981).

Sales performance was measured using a composite of four measures which asked

salespeople to compare their productivity, sales volume, ease of the selling job and amount of selling time *after* implementing sales force automation, compared to *before* they had sales force automation. A confirmatory factor analysis was conducted to determine the extent to which these items loaded on a single construct (c^2 = 9.09, df = 2, p = .0106, GFI = .9495, CFI = .9634, NNFI = .8902, NFI = .9545, RMSEA = 0.1744) (Table 2). Convergent validity was established since all factor loadings were significant (T > 2.0). Composite reliability for the job performance factor was .8755. The average percentage of variance extracted by the factor was 64.11%. The discriminant validity among the two task outcome constructs and the sales performance construct is presented in Table 3.

Finally, SFA comprehensiveness was a formative composite of the 23 possible SFA software and hardware tools (Hunter, Perreault and Armstrong 1998) (please see the Appendix).

Results

Model Fit

The initial model provided a poor fit to the data (c^2 = 94.58, df = 31, p < .001, GFI= .8528, CFI = .8242, NNFI = .6880, RMSEA = .1518). Therefore, model modifications were necessary. Model modification began by first eliminating non-significant paths up to the point where model fit significantly deteriorated (i.e., c^2 would have become significantly larger). This resulted in a more parsimonious model with about the same explanatory power as the initial conceptual model. Next, constraints were relaxed between some factors by adding three paths when appropriate. The final model provided a reasonable fit to the data (c^2 = 49.22, df = 36, p = .14, GFI = .9124, CFI = .9634, NNFI = .9442, RMSEA = .0706). Figure 2 shows the significant paths remaining in the modified model. Table 3 shows the correlations between the variables in the model.

Since the final model provided a reasonable fit to the data, results for the hypothesis tests are based on the final model. Several criteria were used to test the hypotheses. First, the absolute value of the T-values associated with the path coefficients had to be greater than 2.0 to be considered significantly different from zero (p < .05). Second, the standard errors could not be abnormally small (i.e., close to zero). Third, the standardized path coefficients' absolute values had to exceed .05. Finally, the amount of variance of the endogeneous variables explained by the independent variables (i.e., R^2) had to be relatively large (Hatcher 1994). Overall, the R^2 values in Figure 2 indicate that the model did a good job of explaining the variance in the endogenous variables.

Hypothesis Tests

H1a and H1b proposed that the comprehensiveness of use of SFA would be positively related to salespeople's account management and sales process task outcomes. These hypotheses were supported by the data. Increased SFA comprehensiveness of use was found to be related to improved account management and sales process effectiveness.

H2a and H2b proposed that increased salesperson training on sales force automation would be related to improved account management and sales process effectiveness. H3a and H3b proposed that increased experience with sales force automation would be related to improved account management and sales process effectiveness task outcomes. These hypotheses were not supported.

H4a and H4b proposed that a salesperson's improved account management and sales process effectiveness would be related to increased satisfaction with sales force automation. While H4a was supported for account management, H4b was not supported for sales process effectiveness.

H5a and H5b proposed that a salesperson's task outcomes would be positively related to working smarter. Both improved account management

and sales process effectiveness were found to be positively related to working smarter. Therefore, the relationships were supported.

H6a and H6b posited that a salesperson's necessity to work harder – post SFA should be negatively related to account management and sales process effectiveness task outcomes. H6a was supported for account management, but was not supported for sales process effectiveness (H6b).

H7 proposed that a salesperson's sales experience would be positively related to their ability to work smarter. This hypothesis was not supported.

H8a proposed that a salesperson's ability to work smarter – post SFA would be positively related to sales performance. H8b proposed that a salesperson's necessity to work harder – post SFA would be negatively related to sales performance. Both relationships were supported by the data.

H8c proposed that working smarter would lead to a salesperson's increased satisfaction with SFA. This hypothesis was supported.

H9, which proposed that a salesperson's performance would be positively related to their job satisfaction, was supported. Salespeople in this sample reported that increased job performance led to increased job satisfaction.

Post Hoc Results

As a result of modifying the initial conceptual model to achieve acceptable model fit, three significant paths were added. These paths represent significant relationships between variables in the model which were not anticipated in the initial conceptual development, but which have logical bases for inclusion. Therefore, they are considered post hoc results.

The first additional path indicates a significant effect of improved account management on sales process effectiveness. Our focus was on the separate effects of these task outcome measures. However, in retrospect, this relationship is logical since improved account management should be positively related to sales process effectiveness.

Second, the final model contains a path for the direct effect of improved account management on job performance. Initially, we thought that the effects of SFA comprehensiveness on performance would only be mediated by a salesperson's ability to work smarter with SFA, however, this additional direct effect makes sense since a salesperson's improved account management capabilities should result in increased job performance.

Last, the final model indicates that sales experience is positively related to working harder with SFA. While somewhat surprising on its face, this path makes sense in the context of SFA comprehensiveness of use. It is possible that older, more experienced salespeople worked harder when integrating automation into their jobs. Previous work on age differences in the performance of computer-based work suggests that age (which was highly correlated with sales experience in this study) increases the time necessary to enter data, increases keystroke, format and data input errors as well as incorrect solutions (Czaja and Sharit 1993, 1998). This result is also consistent with Speier and Venkatesh (2002) who found that older salespeople had a less positive perception of SFA's ease of use.

Discussion and Managerial Implications

The premise of this paper was that sales force automation improves salesperson performance by facilitating the accomplishment of key sales tasks. Indeed, the results from the research support this contention. Comprehensiveness of SFA use was found to positively influence salesperson task outcomes. Specifically, increased comprehensiveness of use of SFA improved salespeople's ability to manage their accounts and the effectiveness of their sales process. These results are consistent with other

research that suggests that increased SFA utilization (i.e., frequency of SFA use) leads to increased productivity (Brunjolfsson and Hitt 1996).

Several sales management implications derive from these results. First, more comprehensive SFA systems appear to be preferable to less comprehensive systems in facilitating account management and sales process effectiveness. Sales managers should focus on adopting technologies that improve sales people's account management abilities such as those that support pricing and order placement, allow for the reduction of mistakes by providing real time, correct information, and technologies that help sales people to handle more accounts and enhance their ability to assess their customer's needs. Sales managers should also concentrate on adopting technologies that have the capability to analyze reasons for won and lost opportunities and provide the communications capabilities to enhance teamwork with other people in the sales organization.

In addition, sales managers should focus on adopting technologies that are user friendly. Assuming that user friendliness of the SFA system is positively related to number of SFA features used, user friendliness of the SFA system may be of paramount importance. Increased user friendliness should lead to a wider breadth of SFA use, which in turn, should lead to improved account management and sales process effectiveness. A salesperson's improved account management and sales process effectiveness were found to be positively related to their ability to work smarter. Managerially, this is an important finding. Working smarter during their interactions with customers has been found to be a key factor for increasing sales force productivity (Sujan, Weitz, and Sujan 1988). Sales managers should consider automation approaches that increase a salesperson's ability to work smarter, such as those that provide salespeople with timely access to market research information, those that allow salespeople to organize information around typical sales situations and customer types that they normally encounter, and those that capture and disseminate company-specific knowledge of best selling practices for training purposes.

Other sales force productivity gains accrue by providing salespeople quick feedback on how they are doing on the job, by encouraging salespeople to analyze their won and lost opportunities, and enhancing their ability to manage accounts and the selling process. The present research results suggest that more effective sales force automation systems should have these capabilities.

Salespeople's improved account management ability resulting from the use of SFA was found to be negatively related to their necessity to work harder. This implies that SFA systems should have the capability to enhance the ability of salespeople to handle more accounts, increasing the efficiency of the sales organization. This implication is further bolstered by the finding that a given level of sales performance could be achieved with less effort through more comprehensive SFA usage.

Salespeople's improved ability to manage their accounts was also found to be directly related to increased job performance. This finding is in line with others' who contend that salespeople's performance is more strongly related to what they do rather than to how hard they work (Sujan, Weitz, and Sujan 1988).

Finally, salespeople's increased job performance led to increased job satisfaction. Overall, the generally high levels of explained variance found in this study indicate sales force automation success among the salespeople in this sample.

Several of the hypotheses were not supported. For example, it was surprising that two factors, SFA experience and SFA training were not found to be related to the task outcome variables in this study. The lack of demonstrated relationships between SFA experience or SFA training and sales task outcomes in this study does *not* suggest that these variables are not

important predictors of sales task outcomes *generally*. The present research only explored two composite measures of sales task outcomes. Therefore, it is plausible that SFA training and experience could have a positive impact on other salesperson tasks not included in this study.

This research did not find a relationship between sales experience and working smarter – post SFA as initially hypothesized. The increased ability of salespeople to work smarter *as a result of sales force automation* was independent of their job experience. However, the post hoc results revealed that more experienced salespeople reported that they worked harder using SFA. One explanation of this is that older, more experienced salespeople must work harder to integrate automation into their jobs. If this is true, sales managers must provide these sales people with extra assistance through enhanced training on the use of SFA hardware and software. In addition, SFA user friendliness becomes even more important for this group of sales people.

Limitations and Future Research

There are several limitations associated with this study that suggest avenues for future research. First, while the sample for the study provides a picture of the effect of SFA's comprehensiveness of use on sales performance across a broad cross section of firms, the sample size is relatively small and confined to respondents from one region of the United States. However, there is little reason to believe that the variables and relationships in our model should be region or industry specific. Moreover, there is value to looking beyond data collected within one or a few firms only. While the limited sample size in this study did not appear to jeopardize the internal validity of the study's findings, it does have a negative impact on the ability of the final model to generalize to larger populations of salespeople (e.g., MacCallum, Roznowski, and Necowitz 1992). Thus, any generalizations should be made with that caveat in mind. Additional studies will be required to develop a more thorough understanding of the performance benefits of SFA.

Second, this study was also confined to single-item measures of certain variables, and relied on self-report measures of salespeople's perceptions. Future research should focus on improved measures of SFA, its antecedents, and its consequences, including sales effectiveness measures such as actual dollar sales volume increases.

The focus of this research was on two specific sales task outcome constructs. Future research should examine additional task outcome measures. An alternative approach for future research might involve changing the focus to the development of a taxonomy of SFA users based on task outcome profiles, which could then be related to select situational and job outcome measures.

This study is an initial attempt to examine the relationship of SFA comprehensiveness of use to sales performance. As additional studies investigate SFA issues among salesperson samples, attention also should be focused on sales manager's perceptions of SFA's impact on the sales job and on the sales manager's job. Moreover, future studies could productively focus more attention on the potential customer benefits deriving from SFA. Finally, with respect to issues of training, comprehensiveness of use, and sales force satisfaction with SFA, studies relying on longitudinal panel data would be a potentially productive approach to examining the evolutionary aspects of SFA implementation and usage.

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APPENDIX
Multi-Item Measures Used in the Study

I. *Sales Force Comprehensiveness* (adapted from Hunter, Perreault, and Armstrong 1998) (Formative Scale).
Please tell us the type of sales force automation components you are using (check all that apply).

Software:
a. Word processing
b. Order status
c. Promotion funds
d. Spreadsheet
e. Graphics
f. Order entry
g. Sales forecasting
h. Data management
i. Contact management
j. Time management
k. Shelf space management

Hardware:
a. Laptop
b. Email
c. Computer based presentations
d. Fax
e. Color printer
f. Black & white printer
g. Teleconferencing
h. Mobile phone
i. LCD project presentations
j. Personal digital assistant
k. TV/Video conferencing
l. Web

II. *Account Management* (Composite Reliability = .9074).

Please tell us the degree to which sales force automation helps you in the following areas (Not Very Helpful = 1, Very Helpful = 7).
a. Providing more accurate pricing information.
b. More accurate order placement.
c. Making fewer costly mistakes based on incorrect information.
d. Enhances productivity.
e. To sell more consultatively by helping you assess customer needs. Please tell us the degree to which sales force automation helps you in the following areas (Not Very Helpful = 1, Very Helpful = 7).
a. Providing more accurate pricing information.
b. More accurate order placement.
c. Making fewer costly mistakes based on incorrect information.
d. Enhances productivity.
e. To sell more consultatively by helping you assess customer needs.

III. *Sales Process Effectiveness* (Composite Reliability = .8224).
Please tell us the degree to which sales force automation helps you in the following areas (Not Very Helpful = 1, Very Helpful = 7).
a. Ability to analyze reasons for won and lost opportunities.
b. Improves closing rates.
c. Improves customer retention.
d. Enhances teamwork.

IV. *Working Hard – After Versus Before SFA* (Adapted from Sujan 1986) (r = .571).
a. The number of hours per week that you work are: 1 = Much Fewer, 7 = Much Greater.
b. How hard you work during these hours is: 1 = Much Less, 7 = Much Greater.

V. *Working Smart – After Versus Before SFA* (Adapted from Sujan 1986) (r = .683).
a. The way in which you approach your customers is: 1 = Much Less Effective, 7 = Much More Effective.
b. The number of different approaches you use with your customers has: 1 = decreased, 7 = increased.

VI. *Job Performance* (Composite Reliability = .8755)
Please tell us about your productivity after implementing sales force automation compared to before you had sales force automation.
a. What best describes what happened to your sales volume? (Decreased more than 20% = 1, Increased more than 20% = 7).
b. How much selling time do you think you gained (lost) per month? (Lost more than 4 days = 1, Gained more than 4 days = 7).
c. How much did sales force automation increase (decrease) your productivity? (Decreased productivity by 31% or more = 1, Increased productivity by 31% or more = 7).
d. How much more difficult did sales force automation make your job? (Much more difficult = 1, Much easier = 7).

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