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The impact of management commitment alignment on salespersons' adoption of sales force automation technologies: An empirical investigation

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ABSTRACT

Marketing and information systems scholars have explored several factors that affect sales force automation (SFA) technology adoption. In this study, we introduce a new antecedent to the SFA adoption model, management commitment alignment (MCA). We show that alignment between top management and immediate supervisors' commitment to the SFA technology is an important factor in influencing SFA adoption. Results show that while commitment from both leadership levels (perfect alignment) is the most conducive to SFA adoption, misaligned commitment conditions have differential effects on adoption. Specifically, even when supervisors are committed to sales technology, lack of top management commitment can hurt SFA adoption. Managerial implications of the findings and directions for future research are discussed.

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1. Introduction

In the last two decades, sales departments have increasingly implemented sales force automation (SFA) tools to facilitate customer relationship management processes (Speier & Venkatesh, 2002). SFA applications enable organizations to automate sales activities and administrative responsibilities for the sales professional, leading to a more productive agenda (Desisto & Rush, 2007). Worldwide spending on SFA tools has grown at an annual rate of 27% to reach $3.2 billion in 2007 (Kanaracus, 2008) and is forecast to reach almost $9 billion in 2012 (Wailgum, 2008). Reflecting the increasingly important role of SFA adoption, a growing stream of academic research has explored issues related to organizational adoption of sales technology (e.g., Gatignon & Robertson, 1989; Jones, Sundaram, & Chin, 2002; Schillewaert, Ahearne, Frambach, & Moenaert, 2005) or retrospectively, has examined salesperson failure to adopt technology and the consequences for organizational commitment, job satisfaction, and fit (Jelinek, Ahearne, Mathieu, & Schillewaert, 2006; Speier & Venkatesh, 2002). The importance of successful SFA adoption is highlighted through its effect on both SFA implementation and overall firm performance. Adoption of SFA systems by the sales force is an important determinant of a successful SFA system implementation (Keillor, Bashaw, & Pettijohn, 1997; Morgan & Inks, 2001; Speier & Venkatesh, 2002), and when adoption is successful, the use of SFA tools can help increase sales by 15 to 35% (Schafer, 1997). Stoneman and Kwon (1996) show that this value transfers to the organization's bottom line, finding that non-adopters experience reduced profits as other firms in the industry adopt new technologies.

Given SFA's positive effects on firm performance, a stream of literature has emerged investigating the antecedents of SFA adoption (Avlonitis & Panagopoulos, 2005; Schillewaert et al., 2005). In this study, we introduce a new antecedent to SFA adoption that we feel has been overlooked in the literature, namely management commitment alignment (MCA), defined as the alignment between the salesperson's immediate supervisor and the company's top management with regard to their commitment towards sales force automation (SFA) adoption. The main premise of this study resides in the notion that a substantial difference between top and immediate leadership commitment to sales technology might lead to lower salesperson adoption levels of SFA. While previous literature suggests a positive relationship between immediate supervisor commitment and salesperson's adoption of SFA (Barton, 1994; Cummings & Worley, 1993; Kristi, 1995; Morgan & Inks, 2001; Pitman, 1994; Robey, 1984), we qualify this argument and contend that MCA might be a better predictor of SFA adoption, and that misaligned MCA might lead to lower levels of SFA adoption even in the presence of high immediate supervisor commitment to the SFA technology.

This research makes insightful theoretical and managerial contributions. Theoretically, the study contributes to the growing body of literature investigating the factors influencing SFA adoption and

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introduces MCA as a critical antecedent to adoption. From a managerial perspective, our study brings to light the crucial role that commitment alignment between immediate supervisor and top management plays in successful SFA introduction and implementation, and offers prescriptions to sales, technology, and training managers with regard to achieving higher SFA adoption by the sales force.

The remainder of this paper is organized as follows: we first develop the conceptual model and the research hypotheses. We then discuss the research design and methodology used to test the model. A discussion of the findings, managerial implications, and limitations concludes the paper.

2. Literature review and hypotheses development

2.1. Models of SFA adoption

Models that have been advanced in the literature to explain SFA adoption include the Technology Acceptance Model (TAM) (Davis, 1989), and its extension TAM2 (Venkatesh & Davis, 2000), models based on the theory of reasoned action (Davis, Bagozzi, & Warshaw, 1989), innovation diffusion theory (Moore & Benbasat, 1991), the Triandis model (Thompson, Higgins, & Howell, 1991; Triandis 1980), motivation (Davis, Bagozzi, & Warshaw, 1992), theory of planned behavior (Taylor & Todd, 1995), social cognitive theory (Compeau & Higgins, 1995; Compeau, Higgins, & Huff, 1999), and more recently, the unified theory of acceptance and use of technology (Venkatesh, Morris, Davis, & Davis, 2003).[3] The early TAM model (Davis, 1989) posits that a person's attitude toward using a technology is jointly determined by perceived usefulness and perceived ease of use. According to this model, both beliefs directly determine technology adoption. Perceived ease of use also influences perceived usefulness because technologies that are easy to use can be more useful. Although the TAM has seen strong empirical support (e.g., Doll, Hendrickson, & Xiadong, 1998; Karahanna & Straub, 1999), researchers have pointed out that it remains incomplete from a sales and marketing perspective (e.g., Hu, Clark, & Ma, 2003; Schillewaert et al., 2005). Specifically, the TAM model, and even its extension TAM2 (Venkatesh & Davis, 2000) do not assess the role of facilitating conditions such as individual characteristics and organizational efforts as antecedents to technology adoption.

Two studies that extend the TAM model use similar nomenclature to categorize antecedents of SFA adoption (Avlonitis & Panagopoulos, 2005; Schillewaert et al., 2005): *social norms* such as supervisor influence, peer usage, customer interest, and competition influence (Jelinek et al., 2006; Jones et al., 2002; Schillewaert et al., 2005), *organizational facilitating factors* including training, user participation, technical user support, and accurate expectations (Hartwick & Barki, 1994; Jelinek et al., 2006; Venkatesh & Davis, 2000) and *individual salesperson factors* such as computer experience, computer self-efficacy, and innovativeness (Igbaria & Guimaraes, 1995; Rogers, 1995). The frameworks proposed by these two studies are regarded as being comprehensive, since they encompass several different variables that are repeatedly used in the literature and considered central to successful SFA adoption.

2.2. The role of social norms

Social norms (also called subjective norms or social influence) is defined as the extent to which members of a social network (e.g., peers, colleagues, family members, or other referents) influence another's behavior to conform to the community's behavioral patterns (Venkatesh & Brown, 2001). This implies that individuals' behavior is influenced by the way they believe others will view them as a result of engaging in the behavior. Research in psychology has found social norms to be an important determinant of intention and behavior (Ajzen, 1991). Kohlberg's (1981) theory of moral reasoning suggests that an individual's values with respect to a course of action might be influenced by a variety of factors, including the beliefs of salient referent groups, a desire to "abide with the law," and gain the approval of others. In a similar vein, Grube, Mayton, and Ball-Rokeach (1994) observe that values reflect individual needs and desires as well as societal demands. Brancheau and Wetherbe (1990) provide evidence that work colleagues are the greatest source of influence in all stages of adoption decision-making, the percentage of influence rising steadily as the stages progress from initial knowledge to persuasion to decision-making. Thus, in addition to one's value system, social norms, or the desire to comply, play an important role in an individual's decision to choose a course of action.

In the technology acceptance literature, the role of social norms has been shown to have an impact on individual behavior through three mechanisms: compliance, internalization, and identification (Venkatesh & Davis, 2000; Warshaw, 1980). While internalization and identification relate to altering an individual's belief structure, causing him to respond to potential social status gains, the compliance mechanism alters an individual's intention in response to the pressure to comply with the social influence (Venkatesh et al., 2003). Research shows that individuals are more likely to comply with others' expectations when 'referent' others have the ability to reward the desired behavior or punish non-behavior (French & Raven, 1959; Warshaw, 1980). Venkatesh and Davis (2000) included subjective norms in TAM2, and found that it has a positive direct effect on intention to use technology when the system's use is perceived to be mandatory. Subsequently, Schillewaert et al (2005) conceptualized social norms as managerial support, and showed that it had a positive effect on salesperson's perceived usefulness of the technology as well as on its adoption.

2.3. Management commitment

Past research shows that managerial commitment is key to successful implementation of an organizational change (e.g., Total Quality Management programs (Morgan & Inks, 2001), Information and Communication Technology programs (Fardal, 2007)). Both the roles of the immediate supervisor and top management have been independently investigated and have been shown to significantly impact employee behavior. Information systems studies have shown support for supervisors' impact on adoption through both their own usage (Igbaria, Parasuraman, & Baroudi, 1996; Karahanna & Straub, 1999) and persuasive communication (Leonard-Barton & Deschamps, 1988; Salancik & Pfeffer, 1978). Boone (1998) and Campbell (1998) show that sales managers who incorporate the new technology in their own sales management processes, make using the technology more enticing to subordinate sales representatives. Research shows that supervisor support, feedback, behavior, and control orientations affect the attitudes, learning, and behavior of salespeople (e.g. Jaworski & Kohli, 1991; Kohli, Shervani, & Challagalla, 1998; Singh, 1993; Singh, Verbeke, & Rhoads, 1996; Sujan, Weitz, & Kumar, 1994). Management's encouragement to use the SFA system has been shown to be the second most important factor in creating the required enabling conditions for system acceptance by the sales force (Pullig, Maxham, & Hair, 2002). Therefore, immediate supervisors are often an important internal influence on salespeople (Singh & Roads, 1991), and their position on sales technology significantly affects their adoption level (Speier & Venkatesh, 2002). Similarly, top management commitment is necessary to the adoption process (Bantel & Jackson, 1989; Speier & Venkatesh, 2002). Change implementation is more likely to be successful when commitment to the change is strong

[3] For a comprehensive review, see Ahearne, Srinivasan, & Weinstein (2004).

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at upper levels of the organization (Morgan & Inks, 2001). Salespeople want assurance that the organization is taking the right steps to compete and achieve long-term profitability, thus formal endorsement and routine communication about the importance of SFA from top management significantly influence adoption propensity (Bantel & Jackson, 1989; Bush, Moore, & Rocco, 2005).

2.3.1. Management commitment alignment (MCA)

While immediate and top management commitment to technology are undeniably important to adoption success, commitment to effective adoption of SFA by salespeople is also influenced by the perceived fit between the organization members' shared (common) values (Klein & Sorra, 1996). The extent to which values, beliefs, and norms are shared influences the level of commitment of organization members have towards desired behavior, such as the adoption of technology (Pullig et al., 2002). One such value is the level of commitment shared between top and immediate management towards SFA technology adoption.

We represent the four possible combinations of management commitment to technology as HH, HL, LH, and LL (the first letter refers to the high (H) or low (L) top management commitment level and the second letter refers to the immediate supervisor commitment level.) As shown in Table 1, HH is the situation where management commitment alignment is at its highest, that is, salespersons perceive high commitment from both levels of management. We refer to this situation as perfect alignment. Situations represented by "HL" and "LH" are environments where salespersons perceive differences in commitment towards technology adoption at the two management levels, that is, management commitment alignment is low. In these situations, one of the two levels of management has high commitment to technology adoption, while the other level has low commitment levels. We refer to this situation as misalignment. Finally, the "LL" condition is where the level of commitment to technology adoption for both management levels is perceived as being relatively low; we refer this condition as imperfect alignment.

The literature on organizational leadership and organizational climate suggests that perfect commitment alignment between immediate and upper management is most predictive of technology adoption and readiness for change (Churchill, Ford, & Walker, 1976; DeSanctis & Poole, 1994; Horsky & Simon, 1983; Rangarajan, Chonko, Jones, & Roberts, 2003; Tyagi, 1982). Research has documented the value of leadership alignment in creating environments for successful process innovations and technological deployments (Ambrose & Schminke, 2006; Jones, Brown, Zoltners, & Weitz, 2005; Rangarajan et al., 2003; Singh, 1998). Thus, leadership commitment alignment may be the key to the development of an environment that provides a welcome reception for sales force technology adoption (Bantel & Jackson, 1989; Schminke, Ambrose, & Neubaum, 2005; Tyagi, 1982; Williams & Anderson, 1991). Additionally, failure on the salespersons' part to adopt the technology might be construed unfavorably by both immediate and top management since both levels are committed to SFA technology adoption. This should enhance salesperson adoption of recommended technologies since it results in satisfaction at multiple levels of the organization's management team. High levels of congruence in commitment at both levels of management should convince salespeople that the whole organization is committed to and serious about prioritizing the adoption of the technology. We therefore expect different alignment conditions to have different effects on a salespersons' SFA adoption, with perfect alignment most positively associated with SFA adoption. Hence we hypothesize:

H1. Salespersons perceptions of management commitment alignment will have differential effects on salespersons' SFA adoption.

H2. Perfect alignment (HH) will have the greatest positive impact on SFA adoption compared to the other commitment alignment conditions.

2.3.2. Misalignment conditions

Management commitment misalignment can occur in two conditions: the LH condition (low top management commitment/high immediate supervisor commitment) can occur when top management is privy to information that lower levels of management do not have access to. Such information can pertain to strategic decisions like mergers, alliances, or divestments, which may have a direct impact on IT investment decisions, and hence IT implementation. Under such circumstances, top management may systematically withdraw from its commitment to SFA implementation. Salespeople in this case might perceive lackadaisical commitment from top management but strong commitment from immediate supervisors. The reverse condition (high top management commitment/low immediate supervisor commitment) can occur when an organizational change initiative is not completely inspirational to the workforce, and direct supervisors are required to endorse the change without fully committing to it (Nadler & Tushman, 1990). In this case, it would be hard for immediate supervisors to inspire employees on implementing a change that they do not fully endorse (Kavanagh & Ashkanasy, 2006). This condition (HL) causes salespeople to perceive high commitment from top management, but low commitment from immediate supervisors.

Management commitment misalignment might alter adoption behavior. Conflicting signals from upper management can be perceived as a lack of full commitment to the technology from the organization as a whole, which might lead to lower adoption. However, while misalignment might lead to confusion regarding technology implementation and adoption directives, salespeople should still be motivated to adopt the technology since the commitment level of one of the hierarchy levels is high. While misalignment might be less effective than perfect alignment, partial leadership commitment to the technology should still positively influence SFA adoption.

An important question at this juncture is "which condition (LH or HL) has a stronger impact on SFA technology adoption?" To answer this question, we turn to the leadership literature. Research suggests that supervisors are the means by which salespeople can obtain extrinsic rewards and recognition (Schillewaert et al., 2005). Salespeople are influenced by their supervisors, who often provide them with daily coaching, including direction, ideas, feedback, praise, and criticism (Brashear, Boles, Bellenger, & Brooks, 2003; Rich, 1997). Immediate supervisors' influence has been shown to be associated with the contribution as well as the performance of the workforce (Elving & Hansma, 2008) Michael, Leschinsky, & Gagnon, 2006).

However, studies in the management literature suggest that top management commitment may have an even more powerful impact on organizational practices. Top management commitment has been shown to be the main driver behind employee behaviors in the areas of service quality (Babakus, Yavas, Karatepe, & Avci, 2003), supply chain management (Bullington & Bullington, 2008), knowledge management (Keramati & Azadeh, 2007), TQM implementation (Njie, Fon, & Awomodu, 2008), e-commerce implementation (Zhuang & Lederer, 2004) and quality management (Ahire & O'Shaughnessy,

Table 1
Management commitment alignment (MCA) conditions.

		Immediate supervisor commitment	
		High	Low
Top management commitment	High	HH condition: perfect alignment	HL condition: misalignment
	Low	LH condition: misalignment	LL condition: imperfect alignment

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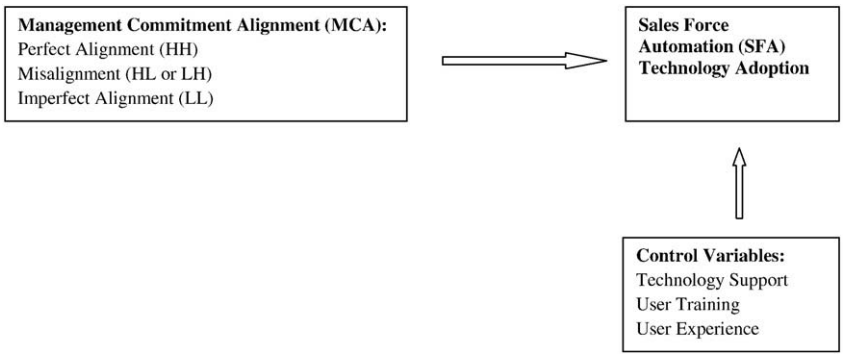

Fig. 1. The antecedent role of management commitment alignment (MCA) on SFA adoption.

1998). Ein-Dor and Segev (1978) argue that success of management information systems (MIS) greatly depends on the rank of the person in charge of the MIS implementation activity, the higher the rank the better. Research on information technology systems (IT) shows that top management support and commitment are critical to successful implementation (Anderson, Schroeder, Tupy, and White, 1981; Brenizer, 1981; Fisher, 1981; Hall, 1977), and a lack of top management support can substantially delay IT implementation in an organization (Ang, Sum, & Yeo, 2002). In sum, while immediate supervisor commitment is important to successful SFA adoption, the literature suggests that the role of top management commitment may be even more significant**.** We therefore hypothesize:

H3. Misaligned management commitment will have a positive impact on SFA adoption.

H3a. The HL condition of misaligned management commitment will have a greater impact on SFA adoption when compared to the LH condition.

3. Covariates

Based on past research, we include in our model an individual factor relating to salesperson experience and two organizational factors: technology support and user training. While inexperienced users are likely to be the largest users of an SFA system and rely on the SFA system to improve performance by seeking organizational, contextual, and domain knowledge (Ko & Dennis, 2004), workers with extensive experience already have a well developed knowledge base. They have more ingrained work patterns from longer time on the job. Hence, it is less likely that the knowledge they need to successfully conduct their sales tasks will be provided by the new SFA system (Ko & Dennis, 2004; Morris & Venkatesh, 2000). We therefore expect experience to be negatively associated with salesperson SFA adoption.

Several organizational facilitating conditions have been shown to impact SFA adoption. These include the type and extent of support provided to the individual. Specifically, technology training and technology support have been shown to be positively related to SFA adoption (Buehrer, Senecal, & Pullins, 2005; Colombo, 1994; Schillewaert et al., 2005; Siebel & Malone, 1996). Since the implementation of an SFA system requires salespeople (users) to learn how to use the system, some form of formalized, organization-sponsored SFA training is a necessary ingredient for effective adoption (Anderson & Robertson, 1995; Avlonitis & Panagopoulos, 2005; Schillewaert et al., 2005). Likewise, technology support refers to salesperson perceptions of the extent to which they receive support in case operational assistance is needed for use of the technology (Igbaria & Chakrabarti, 1990). Research has studied the role that support services can play in reducing resistance and increasing product utilization levels and found that the availability of support services leads to a better understanding of the technology's functionality and usefulness, which results in greater adoption levels (Conner & Rumelt, 1991; Parthasarathy & Hampton, 1993). We therefore expect both these organizational facilitating factors, technology training and technology support, to be positively associated with SFA adoption. Fig. 1 graphically illustrates our research model.

4. Methodology

4.1. Research design and data collection

We tested our model using data collected from a large U.S.-based medical device company in the biotechnology industry. The sample for this study was drawn from field sales representatives who were in charge of selling drug infusion systems to various clients such as hospitals, managed care facilities, and oncology clinics. Our data collection setting provides a rich context for testing our SFA adoption model. First, the focal firm had recently implemented a mobile SFA system. The new SFA system consisted of, among other things, seamlessly integrated wireless handheld devices (e.g. PDAs), contact management systems, easily accessible support databases, and advanced email systems. Second, prior research indicates that adoption should be considered as the complete use of an innovation and should go beyond the initial acceptance and use that usually follows an innovation introduction (Parthasarathy & Sohi, 1997; Rogers, 1995). At the time of our data collection, it was approximately 18 months after initial technology deployment in the company. Therefore, we were assured of obtaining measures that did not simply reflect mandated company usage, temporary usage spikes, or effort associated with initial rollout of the technology.

The biotechnology industry was also best suited to test our research hypotheses because it offered an environment rich with extensive training and employee development. All field salespeople within this company were required to manage a sales region, and therefore expected to maintain high organizational and communication skills. The SFA system included tools aimed at improving communication between salespersons, their colleagues, and the home office (e.g. email, groupware, routing tools), as well as assist them in performing day-to-day activities.

Data was collected through an online survey. An initial email from the company's executive level was sent to the field sales force to introduce the study and to solicit participation. A follow-up email was then sent by the authors. After two weeks, a phone call by members of the research team was made to those who had not responded to the survey to encourage participation. We received responses from 292 salespeople (response rate of 93%), 24 were removed because of incomplete data, resulting in a total of 268 usable questionnaires, representing 85% of the company's sales force. We then compared

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early and late respondents on key variables and did not find any indication of non-response bias[4].

4.2. Construct measures

The development of the research instrument was based on new scales or validated measures that have been previously applied. Scale development for all the variables progressed through several stages. First, we began with an extensive literature review combined with an exploratory qualitative study. The qualitative study consisted of four interviews with salespeople from the biotech industry as well as sales automation experts. The objectives of our preliminary investigation were multi-pronged: (1) to specify construct domains, (2) to generate sample items for new constructs, (3) to check the face validity of existing and adapted measures in the sales setting that we were using, and (4) to assess the nomological validity of our conceptual model (Churchill, 1979). Based on this study, a draft questionnaire was constructed and pretested with three academic colleagues and two industry experts.

Appendix A shows the scales and items used in our measurement instrument, the response cues, and the reliability coefficients. SFA technology adoption was measured using a composite score of salespeople's rated use of a battery of proprietary components of the SFA system. We asked salespeople to rate their perception of top management commitment towards adoption of the new technology using the single-item, seven-point Likert scale (strongly disagree to strongly agree), used by Dull (2008) to measure perceived commitment of agency leaders to "achieve results." We adapted the scale to measure salespersons' perception of immediate supervisor's commitment towards SFA adoption. We strived to keep the questionnaire from getting too lengthy by avoiding unnecessary similar items and ensuring clarity of wording. Though single-item measures can be criticized for certain undesirable properties, they have been shown to result in (a) reduced research costs (Wanous & Reichers, 1996), (b) decreased space requirements resulting in shorter survey questionnaires (Nagy, 2002), and (c) increased response rates (Gardner, Cummings, Dunham, & Pierce, 1998).

Following previous studies (Forehand & Deshpande, 2001; Heilman, Nakamoto, and Rao, 2002; Kivetz & Simonson, 2002), we ran median splits on both "commitment to SFA technology" variables (top management and immediate supervisor) and created dummy variables denoting the four types of commitment alignment conditions: high top management commitment–high supervisor commitment (HH, $N=100$), high top management commitment–low supervisor commitment (HL, $N=34$), low top management commitment–high supervisor commitment (LH, $N=54$), and low top management commitment–low supervisor commitment (LL, $N=80$).

Training was measured using a two-item, seven-point Likert scale (strongly disagree to strongly agree), asking respondents to rate the quality and quantity of the training associated with the new technology. User support was measured using a six-item, seven-point Likert scale (poor to excellent) asking about the amount of user support they had received. Experience was measured using salespeople's company tenure in the territory.

5. Data analysis and results

Table 2 reports the measures' descriptive statistics. The mean SFA adoption was 4.50 (SD = 1.32). An examination of the distribution of SFA adoption across salespeople shows that there is considerable variation in adoption in the sales force with a range of 1.24 to 7, on a seven-point continuous scale; this provided a rather complete spectrum of values for our dependent variable for effective analysis. Means for technology support and user training were 5.65 and 5.52, respectively. The average salesperson's experience was 6.78 years.

5.1. Construct validity

We assessed construct validity of all multi-item constructs by computing their composite reliabilities, and comparing the Average Variance Extracted (AVE) to the squared correlations between the latent variables. Our analyses show that all multi-item constructs exhibit composite reliabilities of .7 or more, indicating that their reliabilities are adequate (Hulland, 1999). As shown in Table 2, the average variance extracted in all multi-item constructs is .50 or greater, which is indicative of convergent validity (Barclay & Smith, 1997). We assessed discriminant validity by verifying that the squared correlation between any two latent variables is less than either of their individual AVE's, suggesting that each construct has more internal (extracted) variance than variance shared between them.

5.2. Hypothesis testing

To test our hypotheses, we used ANOVA and least squares dummy variable (LSDV) regression analysis. We examined the effects of different conditions of commitment alignment on SFA adoption, controlling for technology support, user experience, and user training. As indicated in Table 3, the regression analysis shows that the effects of all commitment alignment conditions on SFA adoption are statistically significant. The ANOVA results in Table 4 show that the F-statistic for the contrast tests is significant ($F_{(3,261)}=11.17$; $p<.01$), thus the commitment alignment conditions had differential impacts on SFA adoption. Table 5 shows tests of differences between the regression coefficients for the different alignment conditions. Results show that HH and HL conditions have a higher impact on SFA adoption than LH and LL conditions. Thus H_1 is partially supported. The regression results show that perfect alignment (HH condition) has the largest positive effect on SFA adoption ($\beta=.39$; $p<.01$), thus providing support for H_2. Both misaligned conditions (HL and LH) are positively related to SFA adoption, and their differential effects are statistically significant, thus H_3 is supported. Finally, of the two misaligned conditions, the HL condition has the largest positive effect on SFA adoption, providing support for H_{3a}.

Two of the covariates were significantly related to SFA adoption in the direction expected. Technology support is positively associated with SFA adoption ($\beta=.35$; $p<01$), and user experience is negatively associated with SFA adoption ($\beta=-.07$; $p<01$). The relationship between technology training and SFA adoption is not significant.

6. Discussion and research implications

This study adds to the growing body of research that examines the antecedents of sales force automation technology adoption by salespeople, and makes a unique contribution to the literature by examining alignment of commitment to technology by top management and immediate supervisors as one variable that helps explain SFA adoption in organizations. Our findings about the differential effects of the two misaligned commitment conditions also add to the knowledge about the relative importance of top management versus supervisors in influencing the workforce. While our results suggest that the commitment of top management and immediate supervisors to the technology matter individually, they also show that SFA adoption is influenced to a greater extent by salespeople's perception about the alignment between the two commitment variables.

[4] To evaluate non-response bias, we assumed that response/non-response differences might be manifested to some degree between early and late responses (Armstrong & Overton, 1977). We characterized late responses as those which resulted from our follow-up efforts. Specifically, 145 responses were early and 123 were late. We compared the mean values of the key study variables between early and late respondents and found no significant differences.

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Table 2
Descriptives of key variables.

	Mean	SD	Adoption	Commitment — top management	Commitment — supervisor	Technology support	User training	User experience
Adoption	4.50	1.14	.890					
Commitment — top management	4.88	1.16	.394**	NA				
Commitment — supervisor	5.30	1.40	.279**	.527**	NA			
Technology support	5.65	1.08	.337**	.353**	.290**	.870		
User training	5.52	1.29	−.003	.251**	.446**	.274**	.810	
User experience	6.78	5.17	−.159**	−.134*	−.050	.056	−.086	NA

Note: Diagonals indicate average variance extracted; $N=268$; $^{**}p<0.01$; $^{*}p<0.05$.

Given the four possible scenarios for commitment alignment between top management and supervisors (HH, HL, LH, and LL), we anticipated and found the greatest positive influences when both leadership bodies were perceived to exhibit higher levels of commitment to the technology adoption (HH). An analysis of the means of SFA adoption under the HH condition shows a 26% increase in adoption over the LL condition and a 17% increase in adoption over the LH condition. Thus, firm resources expended to reach the HH perception level by the sales force are dollars well spent. Examining the next-best scenario, our finding that top management holds more influence in SFA technology adoption is somewhat counterintuitive. Analysis of means shows that the HL condition results in 12% greater adoption levels than the LH condition. There is substantial emphasis in the extant sales literature on the predictive ability of the supervisor rather than top management due to the amount of daily influence they have on sales representatives (Brashear et al., 2003; Rich 1997) and their proximity to the sales force from an organizational hierarchy perspective. Nonetheless, it is top management commitment that has the stronger potential to enhance SFA adoption. Supervisor commitment cannot compensate for a lack of top management commitment to SFA adoption. The highest level of SFA adoption is achieved when sales representatives are convinced of top management's commitment to the technology (HH or HL).

The remaining LL condition is worthy of discussion as it is an important reference point regarding the influence on sales adoption from the other scenarios. It is important to remember that in our study the LL condition is really not, low-low, but rather lower-lower. This is also expected to re-occur in the event of a study replication given that there will always be observations above and below the mean in a normally distributed dataset. The argumentation shifts from simply involvement or even basic support of the SFA technology to the prioritization level assigned by the two leadership levels. It is not that the management parties fail to see the importance of technology adoption per se in the LL condition, but rather that they have failed to allow the technology adoption process to take priority over other organizational goals or tasks (i.e. new account prospecting, daily account contacting quotas, customer satisfaction escalations, etc.). Further, it is not that the organization is necessarily showing no commitment to the technology, but rather that the sales force perceives that management is showing no commitment. Thus, the behaviors and signals of supervisors and top managers that are readily observed by the sales force are important considerations for organizations going through the SFA adoption process because they can directly influence the perceived commitment to technology by the managerial team. This perceived commitment, as previously detailed, negatively or positively influences adoption at statistically and practically significant levels.

The results show that a salesperson's perception about top management's commitment to a technology deployment influences adoption behavior. That is not to say that supervisor commitment is not important. Salespeople know that their immediate supervisors hold the key to their reward system, and hence want to stay in their good graces. From a technology deployment perceptive, it can be argued that supervisors are the first line of defense the organization has to champion technology implementation (Jones et al., 2002). However, it is top management that sets the vision and overall strategic direction of the company, and when executives speak the representatives genuinely listen. Their messages are further amplified since the communication is often one-sided, with limited accessibility for dialogue and discussion. As a result, top management holds the key ingredient in the development of organizational faith, a feeling that leads salespeople to the conclusion that the company is striving to be successful in the long run, and that the organization is looking out for the interests of the employees at the same time it is making process improvements. It can be argued that such organizational faith is what enables employees to make significant changes to their work

Table 3
Results of LSDV regression analysis.

Variables	Unstandardized coefficients (Beta)	*t*-values
LL	2.529	5.046**
LH	2.848	5.516**
HL	3.356	6.347**
HH	3.545	6.472**
Technology support	.286	4.025**
User experience	−.040	−2.854**
User training	.015	.273

$R^2=.243$ (Adjusted $R^2=.226$); $^{**}p<0.01$.

Table 4
ANOVA results.

Source	Type III sum of squares	Df	*F*-statistic
Corrected model	113.190	6	13.963**
Intercept	49.782	1	36.847**
Alignment	45.289	3	11.174**
Training	.101	1	.075
Experience	11.005	1	8.146**
Support	21.891	1	16.203**
Error	352.624	261	
Total	5901.818	268	
Corrected total	465.815	267	

$R^2=.243$ (Adjusted $R^2=.226$); $^{**}p<0.01$.

Table 5
Results of difference tests between regression coefficients.

Baseline	*F* values (and significance)			
	LL	LH	HL	HH
LL	–			
LH	2.4 (.122)	–		
HL	11.89 (.000)**	3.96 (.047)*	–	
HH	29.33 (.000)**	11.78 (.000)**	0.62 (.431)	–

$^{**}p<0.01$; $^{*}p<0.05$.

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patterns and input the effort necessary to make a technology infusion successful. When salespeople feel that the technology is being adopted for the benefit of the entire organization and that the company is ready for the change (Rangarajan et al., 2003), they will get more comfortable with the new technology tools that are being put in place and become more inclined to use them in their daily routine.

This research fills the gap in extant management and marketing theory on alignment between organizational hierarchy levels in their support and commitment to information technology adoption. Literature on the relative influence of different levels in the management hierarchy on the workforce is scarce; this study adds to the knowledge on the relative importance of top management versus supervisors in influencing the workforce and lays the groundwork for further research on the effects of alignment between different levels in the organizational hierarchy.

7. Managerial implications

The results of this study have important implications for top managers and sales supervisors in organizations that implement IT or SFA systems. First, our findings suggest that salespeople perceive signals from the commitment of top management and immediate supervisors in tandem, rather than individually. A lower level of perceived commitment to the SFA system from either of the entities significantly hurts adoption. Sales managers must therefore work with top management to ensure that organizational communication to the sales force reflects joint commitment to SFA adoption. Second, our findings challenge the conventional wisdom that immediate supervisors wield the ultimate influence on salespeople in ensuring adoption, as top management sets the strategic direction and passively watches lower-level company changes unfold. Contrary to the findings of other related research, our results show that in spite of high supervisor commitment, a lack of top management commitment results in substantially lower adoption levels. Organizations should engage in internal marketing to the sales force, with the objective of communicating the support, commitment, and involvement from top management in the SFA implementation process. Finally, top management should conduct frequent internal research to measure salesperson perception of the alignment between senior managers and supervisors in their commitment to the SFA system. If misalignment is detected, corrective measures through training programs, executive-sponsored gatherings, or other initiatives could be implemented.

8. Limitations and future research

Like all research, ours has its limitations. First, our study does not examine whether there is a direct link between sales force satisfaction and sales performance as referenced in prior literature (Ahearne, Jelinek, & Rapp, 2005; Williams & Anderson, 1991). Answering this question could provide further support to organizations on the fence about whether to infuse technology into an existing sales department. Next, an actual and objective measure of technology usage would have been preferred to the self-report method employed herein. Although the use of a third-party vendor, assurance of confidentiality, and collection of data 18 months after rollout limited response bias and other measurement issues, sales data processed with the new technology or hours of systems usage would have been preferred. Lastly, the use of multiple items for the measurement of perceived commitment levels instead of two single-item measures would have been methodologically more robust (Bagozzi, 1994).

Additionally, more knowledge about individual salespersons personal commitment to the technology is of interest for possible interaction with their perceptions of leadership commitment. Further, combining the findings of this study with information about salesperson's interest, effort, and sales volume of new product offerings may provide additional variance explanation. Lastly, sophisticated methods of analysis such as advanced response surface methodology may lend additional value to the research and would be a worthwhile endeavor.

To conclude, organizational focus must emphasize the development of commitment in senior managers as well as immediate supervisors, as opposed to the two hierarchical levels working independently towards improving SFA adoption. While commitment from both levels is critical, the highest value is derived when a shared mental model committed to SFA adoption is clearly perceived by the sales force.

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Appendix A. Summary of measures

Measures	Items	Scale type	Response cues	Reliability (α)
DV: SFA adoption	The following statements relate to how frequently you use specific information technology (IT) applications in your sales job. Please rate how frequently you use specific information technology (IT) applications in your sales job. (*Note: This item refers to a battery of 17 technology applications.*)	7-point Likert	'I do not use this technology at all' to 'I use this technology to a great extent'	0.90
Top management commitment	Top management shows clear and visible commitment towards our usage of _____.	7-point Likert	'Strongly disagree' to 'strongly agree'	n/a
Immediate supervisor's commitment	My sales supervisor shows a clear and visible commitment towards usage of _____.			
Technology support	Please rate the quality of service for the following related to technology support for _____. (*Note: This item refers to a battery of 6 technology support dimensions.)*	7-point Likert	Poor to excellent	0.88
User experience	How long have you been working in your current territory?	Open-ended	_____ years _____ months	n/a
User training	Please rate your level of agreement with the following statements about technology training at _____. I was provided complete instructions and practice in using ____. I am getting the training I need to be able to use ____ effectively.	5-point Likert	'Strongly disagree' to 'strongly agree'	0.87

Note: References to the firm from which data were collected have been removed for reasons of anonymity; these include direct and indirect (specific SFA applications) references.

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