

Integrating technology within the sales-service ecosystem: the emergent sales techno-ecosystem

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Abstract

Purpose – Sales organizations embrace technological innovation. However, salespeople's willingness to use new technology influences a firm's return on investment, representing a significant concern for the organization. These concerns highlight tensions regarding the tradeoffs associated with technology implementations. The purpose of this study is to offer insights that help reduce the complexities of sales technology (ST) by exploring the changing dynamics of contemporary business relationships.

Design/methodology/approach – This paper synthesizes the ST literature using the service ecosystem perspective to propose the sales techno-ecosystem (STE) framework, providing new insights into organizational decision-making related to the ongoing digital transformation of sales tasks.

Findings – This synthesis of the ST literature with the service ecosystem seeks to clarify the impact of technology within the evolving nature of buyer–seller relationships by providing four unique perspectives.



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Research limitations/implications – Perspective 1 reviews the sales-service ecosystem framework and develops the theoretical underpinnings and relevant terminologies. Perspective 2 summarizes critical aspects of the ST literature and provides foundations for future research in the STE. Perspective 3 offers a more granular view, explicating roles and contexts prevalent in buyer–seller–technology interactions. Perspective 4 provides a set of tenets and advances research questions related to each tenet.

Practical implications – The culmination of these four perspectives is the introduction of five key tenants designed to help guide strategy and research.

Originality/value – The paper advances Hartmann *et al.* (2018) service ecosystem paradigm by explicating critical aspects of its ST domain to generate insights for theory and practice.

Keywords Marketing strategy, Sales management, Sales performance

Paper type Conceptual paper

Introduction

Rapid technological advancements undeniably shape the modern landscape of sales practice. Despite the 25-year lapse since the widespread complications associated with implementing customer relationship management software, today's sales organizations are ready to embrace the next wave of technological innovations, including artificial intelligence (AI) (Berryhill, 2022). While selling firms stand to gain substantial advantages through strategic technological implementation, there are challenges. This research provides a framework for practicing sales managers and scholars embracing these challenges.

Integrating technology into sales processes creates an intricate balance between benefits and costs across numerous stakeholders. LinkedIn's Annual State of Sales Report reveals that over half (54%) of sales professionals believe technology enhances buyer relationships (LinkedIn, 2021). However, over one-third (33%) of technology specialists believe that the complexities associated with technology implementation can extend project timelines by four to seven months (Fadilpašić, 2022). Additionally, a critical concern arises from the willingness of sales personnel to adopt these innovations, directly impacting a firm's return on investment (Habel *et al.*, 2023; Hunter and Perreault, 2007).

This paper aims to help untangle the complexities of sales technology implementation by offering broad and granular examinations of the evolving dynamics within contemporary business relationships. This study synthesized the existing sales technology literature through the lens of structuration theory and the service-ecosystem perspective developed by Hartmann *et al.* (2018). The sales-service ecosystem sheds light on the intricate market dynamics with propositions that align with contemporary sales practice and, as shown here, can be extended to offer insights related to integrating AI, among other technological advances. The synthesis culminates in the proposal of four foundational perspectives encapsulating the sales techno-ecosystem (STE), defined as the technological domain within the broader sales-service ecosystem.

Drawing upon Hunter and Perreault's (2007) definition, sales technology (ST) encompasses the spectrum of information technology tools that facilitate or enable sales processes. This approach helps align the proposed framework seamlessly with impactful (Agnihotri *et al.*, 2012; Agnihotri *et al.*, 2017; Hunter and Panagopoulos, 2015; Ogilvie *et al.*, 2018; Onyemah *et al.*, 2010; Rapp *et al.*, 2012) and emergent ST research (Habel *et al.*, 2023; Kalra *et al.*, 2023; Kramer and Krafft, 2023). Semantically, the perspective on sales technology does not imply that using technology assures some outcome (e.g. efficiency, effectiveness or value) but relies on researchers to “empirically estimate the effect of technology uses on sales behaviors and aspects of sales performance [or other outcomes]” (Hunter and Perreault, 2007, p. 20). Thus, estimates of the effects on sales processes result

from research designs that do not convolute measures of use with other task or outcome measures.

The STE poses challenging decisions on sales technology use, including choosing between people and technology to complete sales processes. Automation refers to technology performing a task without human intervention (which could include completing an entire sales process). In contrast, augmentation requires a person to use technology to perform tasks (Hunter, 2019). This paper considers automated and augmented sales technology applications in the STE to inform decisions. This study adopts a holistic approach, drawing insights from sociology's structuration theory to evaluate how technology enhances mutual value creation between buyers and sellers. The flexibility of the proposed framework invites analysis of micro-level (e.g. individuals), meso-level (e.g. firms), macro-level (e.g. industries or society at large) and cross-level research.

Notably, the service ecosystem framework accounts for formal, dynamic and relational exchanges across "thin" (i.e. exchanges that ease sales–customer interactions) and "thick" (i.e. exchanges that may complicate sales–customer interactions) crossing points (Baldwin and Clark, 2000; Hartmann *et al.*, 2018). Based on its four critical perspectives developed later, the STE framework presented offers insights to leverage ST for mutual value creation (Hartmann *et al.*, 2018; Vargo and Lusch, 2004; Vargo and Lusch, 2016) across the emergent conceptualization of competition involving networks of business relationships (Håkansson *et al.*, 2009; Håkansson and Snehota, 1995).

This paper contributes significantly in three ways. First, it adds specificity to Hartmann *et al.*'s (2018) study by integrating a sales-technology perspective within the sales-service ecosystem. This viewpoint is constructive since information technology innovations are significant in many ongoing challenges facing sales professionals. Additionally, a growing number of papers by sales scholars aim to offer managerial insights on the most effective ways to incorporate new sales technology innovations. Emergent research will benefit from a synthesized framework detailing critical aspects of the all-encompassing ecosystem. Second, this paper reviews the relevant ST literature, connecting it to the sales-service ecosystem perspective, thus identifying foundational papers that provide a basis that informs future research. Using these referenced papers to advance new STE research can reduce the lag between scholarly publications and practical impact. In concert with unprecedented advances in sales technology innovations, buyer–seller relations are more dynamic, multifaceted and multi-actor. Third, the paper identifies five key tenets that emerge from the explication of the STE framework, guiding future research and applications. The tenets are as follows:

- be strategic with ST to develop and maintain crossing-point connections;
- examine the different networking levels of social interactions to guide ST decisions;
- structure ST innovation implementations to optimize actor roles that improve sales processes;
- complement short-term financial metrics with longer-term relationship-centric metrics to fully capture ST performance; and
- deploy diverse methodologies and integrate insights to connect STE research with practice.

As a preview and summary of the paper's organization, Figure 1 provides a visual overview of four foundational STE perspectives. *Perspective 1* reviews the sales-service ecosystem framework and develops the theoretical underpinning and relevant terminologies. *Perspective 2* summarizes vital aspects of the ST literature, its evolution and essential learnings that provide foundations for future research in the STE. *Perspective 3* provides a more granular view, explicating various roles and contexts prevalent in buyer–seller–technology interactions.

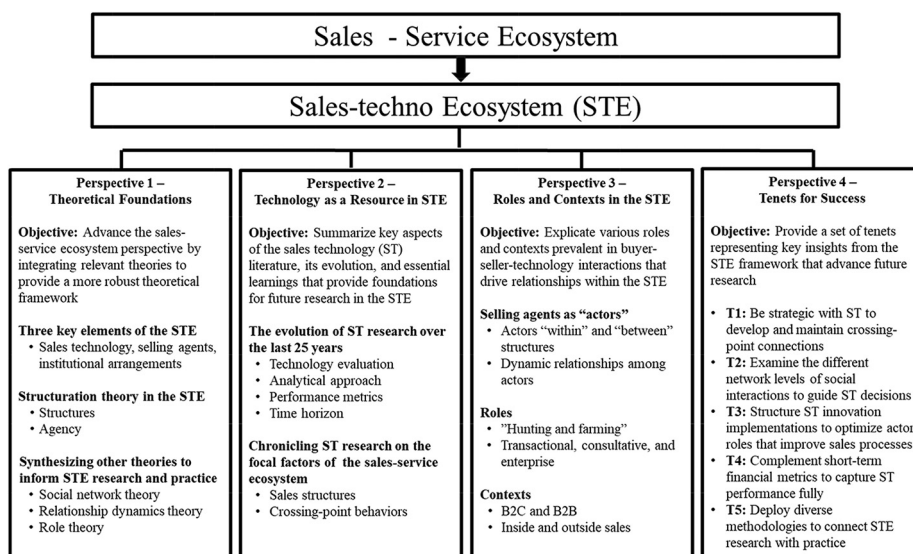


Figure 1. Summary of the sales techno-ecosystem perspectives

Source: Authors’ own work.

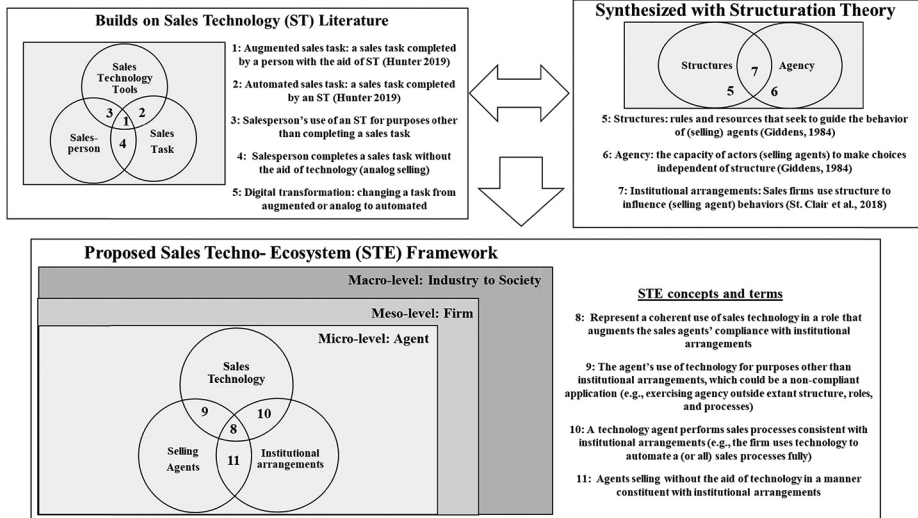
Finally, *Perspective 4* offers a set of tenets representing critical insights from the STE framework and then advances some research questions related to each tenet.

Perspective 1: the sales-service ecosystem and theoretical foundations for the sales techno-ecosystem

Hartmann *et al.*'s (2018) service ecosystem is a paradigm that redefines selling and sales activities to reflect modern practice. As the service ecosystem view on selling presents a fundamental shift in conceptualizing professional selling, ST scholarship should reflect on its application, mainly how firms use sales technology effectively. The following briefly reviews the service ecosystem perspective on selling, its fundamental principles and related theoretical foundations and integrates them with relevant ST research to develop the STE framework.

Sales-service ecosystem, foundational theories and institutional arrangements

Hartmann *et al.* (2018) proposed the sales-service ecosystem as a component of the service ecosystem. Vargo and Lusch (2016, p. 10–11) define the service ecosystem as “a relatively self-contained, self-adjusting system[s] of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange.” The sales-service ecosystem adopts service-dominant (S-D) logic, particularly its reliance on structuration theory, which examines how structures and agency influence individual actors’ behavior. Figure 2 visually represents the STE as a domain of the sales-service ecosystem, along with relevant terminology. The STE terms are rooted in the sales service ecosystem to help specify interactions among its three key elements (sales technology, selling agents and institutional arrangements) – each of which may be influenced by cascading levels. Figure 2 also illustrates how the STE builds from the ST literature by addressing augmentation, automation, use and influence on selling tasks, how STE integrates



Notes: (1) This figure uses Venn diagrams to add visual understanding to the STE framework and defines each element of those diagrams using numbers as standard references. (2) The STE framework builds on prior research in sales technology by focusing on how salespeople use sales technology tools to accomplish sales tasks, adopting standard terms from that literature. (3) It builds by proposing the synthesis of extant ST literature with two significant elements of structuration theory (structures and agents) to help synthesize and establish its foundations. It provides references in the ST literature for subsequent research

Source: Authors' own work

Figure 2.
Visual overview of terminology in the sales-techno ecosystem

structuration theory by addressing structure, agency and institutional arrangement, as each is interdependent and interactive with sales technology implementations and the proposed STE framework at the macro, meso and micro levels driven by those interactions.

As a central theory underlying the sales-service ecosystem (Hartmann *et al.*, 2018) and its STE domain, structuration theory examines the interplay between structure – rules and resources that seek to guide the behavior of actors – and agency – the capacity of actors to make choices independent of structure (Giddens, 1984). In sales contexts, the theory conceptualizes that sales firms implement institutional arrangements that form organizational rules and distribute resources that influence behaviors (St. Clair *et al.*, 2018). Sales service ecosystem theory views institutional work as occurring when “individuals actively engage in processes of institutional creation, maintenance, disruption, and change” (Lawrence *et al.*, 2011, p. 53). Specifically, Hartmann *et al.* (2018) build on S-D logic, envisioning a system of actors cocreating value by applying knowledge to benefit other actors (Vargo and Lusch, 2004; Vargo and Lusch, 2016). In the STE, firms develop sales processes to use structure to influence salesperson behavior. However, selling actors retain voluntary control over individual-level use decisions (i.e. to comply or not to comply).

Hartmann *et al.* (2018) delineate three components of the service ecosystem: actors, institutions and resources. Actors can be viewed at three discrete levels, micro-level, meso-level and macro-level, to understand the complex nature of interactions (Frow *et al.*, 2016). Institutions are social structures that efficiently and effectively guide actors' practices while

facilitating crossing points. These crossing points involve complex networks of actors who leverage available resources (Chaker *et al.*, 2021). These resources are elements such as information or technology that actors can use to create value.

The service ecosystem perspective of selling posits a recursive process between selling actors guided by structure. Hartmann *et al.* (2018) redefine selling as nonlinear interactions among actors representing buying and selling firms, creating crossing points by aligning buying and selling organizations to create mutual value. For the STE, sales technology is the focal resource, warranting emphasis beyond structuration theory's focus on actors and structure. A sales process refers to the steps used to achieve a sale comprised of sales tasks (e.g. prospecting or qualifying customers). Nonlinear and dynamic – occurring over time – sales processes are significant aspects of the sales-service ecosystem relevant to the STE. The framework's Venn diagram represents three key considerations: sales technology, selling agents (salespeople) and institutional arrangements (sales process, rules and structure). Complete integration of these components represents an augmented use of ST to perform a sales task (i.e. the partial fulfillment of a sales process in which ST augments the selling agent).

In addition, the STE framework adopts widely used definitions to help standardize terminology. For instance, the STE framework accepts that information technology use requires digitizing media (digital versus analog inputs). An augmented sales task involves a person using an ST, whereas an ST completes an automated sales task without human aid (Hunter, 2019). The digitization of a sales task is synonymous with automation, whereas a digital transformation refers to changing a task from augmented or analog to automated (or digitized). Thus, the “digitation of a sales process” refers to automating a sequence of sales tasks. By extension, AI-based ST tools can represent selling actors (e.g. avatars that can fully comply with extant institutional arrangements) in both automated and augmented roles. Each primary ecosystem element (selling agents, institutional arrangements and technology) provides unique information about the STE framework, as discussed in the following sections.

Synthesizing other relevant theories

In addition to structuration theory and the sales-service ecosystem, other theories are helpful for understanding and conducting research in the STE. Social network theory maps relationships among actors based on interagent relationships (Granovetter, 1973; Wasserman and Faust, 1994). In the STE context, actors (or nodes) represent individuals, while relationships are the ties that link actors together at different strengths/relational levels (Wasserman and Faust, 1994). The theory of relationship dynamics aligns with Hartmann *et al.*'s (2018) service ecosystems perspective, offering a relational and longitudinal view of buyer–seller interactions. It offers a starting point for answering what time horizons warrant consideration in research design by specifying critical events as turning points in a relationship, impacting the short- and long-term (Harmeling *et al.*, 2015; Palmatier *et al.*, 2013). The time horizon for evaluating ST performance depends on capturing how key exchange events impact the short- and long-term relationship. Finally, role theory (Katz and Kahn, 1978; Katz and Kahn, 1966) provides a framework for considering various roles people experience. It posits that sales jobs can be compartmentalized into tasks, noting unique aspects of serving at the firm's boundary. The sales role theoretic framework has been extensively used in sales research and remains applicable to STE research. For example, recent research in ST uses a role-theoretic perspective to show how an individual's information and communication technology orientation requires a nuanced understanding to accurately understand its effects on critical sales behaviors (Kramer and Krafft, 2023).

The STE framework integrates network, relational dynamics and role theory with structuration theory, focusing on three focal elements:

- (1) the agency of actors (salespeople);
- (2) institutional arrangements creating structure (roles, approaches and sales processes); and
- (3) sales technology (or portfolio of technologies) implemented by the sales organization.

Different levels of organization warrant distinct consideration as they may interact with other levels (Dopfer *et al.*, 2004; Serpa and Ferreira, 2019); the micro-, meso- and macro-levels comprised of relevant networks of actors influence each of the STE's foundational elements.

An individual actor's (e.g. selling agent's) ability to initiate and maintain complex business relationships is limited, as buying firms seek to leverage the knowledge and skills of the sales enterprise across a network of selling actors (Hartmann *et al.*, 2018). As stronger ties develop, these networks can be self-adjusting – and interorganizational relationships evolve as interdependent networks of firms (Håkansson *et al.*, 2009; Håkansson and Snehota, 1995). At the micro-level, selling actors employ resources using relationship-building skills to forge better relationships with their buying counterparts (Hunter and Perreault, 2007; Morgan *et al.*, 2022). Consistent with S-D logic, at points of exchange (“crossing points”), the overarching purpose of these networks is to create mutual value through service exchange (Vargo and Lusch, 2004; Vargo and Lusch, 2016). Thus, institutional arrangements guide actors within the ecosystem and govern the exchange of materials, energy and information. Scholars refer to these exchange points as “crossing points” (Baldwin, 2008; Hartmann *et al.*, 2018). Thin crossing points facilitate exchange through shallow and straightforward interactions, whereas thick crossing points necessitate actors to cultivate profound and intricate interactions to engage in exchange (Baldwin and Clark, 2000). Moreover, it is possible to simultaneously thin crossing points with customers while thickening them for competitors' solutions (Hartmann *et al.*, 2018, p. 7).

Perspective 2: technology as the focal resource in sales techno-ecosystem

While a comprehensive review of the ST literature is beyond the scope of the proposed framework, this section explores the evolution of ST research over the last 25 years as it relates to the STE. Prior work in the ST literature establishes the need and foundation for developing the STE perspective. Specifically, the extant ST literature pushes beyond the long-standing concern of motivating salespeople to adopt ST tools (Ahearne *et al.*, 2005; Hunter and Perreault, 2007) to include understanding relationship-building behaviors (Hunter and Perreault, 2007), cooperative norms (Hunter and Perreault, 2006; Kalra *et al.*, 2023) and technology applications [e.g. sales force automation (SFA) – Homburg *et al.*, 2010; social media – Marshall *et al.*, 2012; Bowen *et al.*, 2021, CRM – Agnihotri *et al.*, 2017; Hunter and Panagopoulos, 2015; AI – Luo *et al.*, 2021]. Additionally, the literature includes insights into the role of technology within the micro-level (Hunter and Perreault, 2007; Ahearne *et al.*, 2005; Chen and Zhou, 2022), meso-level (Kalra *et al.*, 2023; Luo *et al.*, 2021; Marshall *et al.*, 2012) and multiple levels (micro and meso) sales structures (Homburg *et al.*, 2010; Hunter and Panagopoulos, 2015; Weinstein and Mullins, 2012). Table 1 depicts selected empirical research on sales technology, showing its integration of actors, institutional arrangements, methods employed and contribution to the STE framework (see final column in Table 1). This section summarizes the ST literature's evolution and convergence with the STE framework. It addresses a brief history of ST research, topics of interest in prior literature and integration with the sales-service ecosystem perspective to inform STE development.

Reference	Technology evaluated	Analytical approach	Performance metrics	Sample context/ time horizon	Sales structures	Crossing points (teams/level)	Crossing point behaviors	Contributions to the service ecosystem and STE perspective
Ahearne <i>et al.</i> (2005); IMM	<ul style="list-style-type: none"> • Sales technology 	<ul style="list-style-type: none"> • Survey; moderated regression model 	<ul style="list-style-type: none"> • Efficiency • Effectiveness 	<ul style="list-style-type: none"> • One host firm; B2B sales; consumer packaged goods • Cross-sectional 	<ul style="list-style-type: none"> • Micro-level 	<ul style="list-style-type: none"> • Organization-salesperson-buyer 	<ul style="list-style-type: none"> • n/a 	Identifies the need for training and support for salespeople from other organizational actors to achieve improved performance, demonstrating the need for meso-level support to achieve micro-level success
Hunter and Perreault (2006); JPSSM	<ul style="list-style-type: none"> • Portfolio of ST tools 	<ul style="list-style-type: none"> • Survey; structural equation modeling; path model with fixed measurement error to test effects 	<ul style="list-style-type: none"> • Internal role performance (efficiency) • Performance with customers (effectiveness) 	<ul style="list-style-type: none"> • One host firm; B2B sales; consumer packaged goods • Cross-sectional 	<ul style="list-style-type: none"> • Micro-level 	<ul style="list-style-type: none"> • Salesperson-buyer 	<ul style="list-style-type: none"> • Adaptive behaviors • Cooperative norms 	Examines crossing point connectors of creating cooperative norms and making relationship-specific adaptations
Hunter and Perreault (2007); JM	<ul style="list-style-type: none"> • Portfolio of ST tools used for three higher-order purposes: access, analyze and communicate 	<ul style="list-style-type: none"> • Survey; Structural equation model with block-recursive effects 	<ul style="list-style-type: none"> • Customer business relationship performance 	<ul style="list-style-type: none"> • One host firm; B2B sales; consumer packaged goods • Cross-sectional 	<ul style="list-style-type: none"> • Micro-level 	<ul style="list-style-type: none"> • Salesperson-buyer 	<ul style="list-style-type: none"> • Integrative solutions • Knowledge sharing 	Studies the crossing-point connector of information exchange. Highlights that "how" ST is used matters (e.g. for accessing, analyzing or communicating information)

(continued)

Table 1. Illustrative review of sales technology's role in the ecosystem

Table 1.

Reference	Technology evaluated	Analytical approach	Performance metrics	Sample context/ time horizon	Sales structures	Crossing points (teams/level)	Crossing point behaviors	Contributions to the service ecosystem and STE perspective
Homburg <i>et al.</i> (2010); JAMS	<ul style="list-style-type: none"> • SFA adoption 	<ul style="list-style-type: none"> • Multiple data sources matching selling agent with two levels of management; HLM 	<ul style="list-style-type: none"> • Salesforce automation adoption 	<ul style="list-style-type: none"> • Multiple firms, B2C sales; travel agencies • Longitudinal over four months 	<ul style="list-style-type: none"> • Micro-level • Meso-level 	<ul style="list-style-type: none"> • n/a 	<ul style="list-style-type: none"> • n/a 	Improved understanding of the role of sales structures through exploring the influence of sales management at multiple hierarchical levels on the agent's SFA adoption
Marshall <i>et al.</i> (2012); JPSSM	<ul style="list-style-type: none"> • Social media technologies 	<ul style="list-style-type: none"> • Qualitative; focus groups; thematic analysis 	<ul style="list-style-type: none"> n/a 	<ul style="list-style-type: none"> • B2B sales; Multiple firms (35) representing different industries • Cross-sectional 	<ul style="list-style-type: none"> • Micro-level • Meso-level 	<ul style="list-style-type: none"> • Salesperson-buyer 	<ul style="list-style-type: none"> • Improved operational linkages with buyers 	Focuses on meso-level interactions such as sales-marketing interface; explored how social media could facilitate the crossing point connector of improved operational linkages
Hunter and Panagopoulos (2015); IMM	<ul style="list-style-type: none"> • CRM 	<ul style="list-style-type: none"> • Surveys; multilevel SEM with cross-level effects 	<ul style="list-style-type: none"> • Customer-oriented sales performance 	<ul style="list-style-type: none"> • Multiple firms (22); B2B sales; pharmaceuticals • Cross-sectional 	<ul style="list-style-type: none"> • Micro-level • Meso-level 	<ul style="list-style-type: none"> • Salesperson-buyer 	<ul style="list-style-type: none"> • Knowledge-sharing norms • Norms for analytical sales processes 	Studies cross-level (meso-level) effects on the crossing point connectors of information exchange and operational linkages
Agnihotri <i>et al.</i> (2017); JBR	<ul style="list-style-type: none"> • CRM • Social media technologies 	<ul style="list-style-type: none"> • Surveys; SEM 	<ul style="list-style-type: none"> • Post-sales service behaviors: 	<ul style="list-style-type: none"> • Dyadic matches for 122 pairs of buyer- 	<ul style="list-style-type: none"> • Micro-level 	<ul style="list-style-type: none"> • Salesperson-buyer 	<ul style="list-style-type: none"> • Empathy norms • Information 	Measures performance based on customer perceptions of crossing

(continued)

Reference	Technology evaluated	Analytical approach	Performance metrics	Sample context/ time horizon	Sales structures	Crossing points (teams/level)	Crossing point behaviors	Contributions to the service ecosystem and STE perspective
<i>Ogilvie et al. (2018); IMM</i>	<ul style="list-style-type: none"> • Social media technologies 	<ul style="list-style-type: none"> • Surveys; structural equation model 	diligence, communication, inducements, empathy, sportsmanship <ul style="list-style-type: none"> • Customer relationship performance: long-term orientation, loyalty, retention 	seller agents <ul style="list-style-type: none"> • Cross-sectional B2B sales • (1) Multiple firms across a broad spectrum • (2) 181 sales agents from multiple firms • Cross-sectional; two studies 	<ul style="list-style-type: none"> • Micro-level 	<ul style="list-style-type: none"> • Salesperson-buyer 	Exchange <ul style="list-style-type: none"> • Diligence • Inducements 	point connectors such as information exchange and seller adaptations
<i>Bowen et al. (2021); IMM</i>	<ul style="list-style-type: none"> • Social media technologies 	<ul style="list-style-type: none"> • Surveys; structural equation model 	<ul style="list-style-type: none"> • Salesperson performance: comparative sales, comparative orders, prospect identification • Average purchase rate 	<ul style="list-style-type: none"> • B2B sales: 171 sales agents from multiple firms and industries • Cross-sectional 	<ul style="list-style-type: none"> • Micro-level 	<ul style="list-style-type: none"> • Peers-salesperson-buyer 	<ul style="list-style-type: none"> • Adaptive behaviors 	Examines how the behavior of a broader network of actors within the sales organization (i.e., sales team) impacted technology usage
<i>Luo et al., 2021); JM</i>	<ul style="list-style-type: none"> • Artificial intelligence 	<ul style="list-style-type: none"> • Randomized field experiments 	<ul style="list-style-type: none"> • One firm; B2C; financial services • Longitudinal/three field experiments 	<ul style="list-style-type: none"> • Meso-level 	<ul style="list-style-type: none"> • Salesperson-buyer-sales coach 	<ul style="list-style-type: none"> • n/a 	Investigates using artificial intelligence as an organizational actor is changing how sales teams are viewed	

(continued)

Table 1.

Table 1.

Reference	Technology evaluated	Analytical approach	Performance metrics	Sample context/ time horizon	Sales structures	Crossing points (teams/level)	Crossing point behaviors	Contributions to the service ecosystem and STE perspective
Chen and Zhou (2022); JPSSM	• Artificial intelligence	• Surveys; structural equation model	• Adaptive selling	• 232 sales agents from multiple firms and five industries	• Micro-level	• Organization–salesperson–buyer	• Adaptive behaviors	Explores the use of artificial intelligence to help facilitate the crossing point connector of relationship-specific adaptations
Katra et al. (2023); JBR	• Social media technologies	• Surveys; structural equation model	• Empathetic behaviors • Sales performance	• Cross-sectional • One host firm; B2B sales; 221 sales agents from multiple firms	• Micro-level • Meso-level	• Organization–salesperson–buyer	• Empathetic behaviors	Examines how meso-level managerial decisions can impact micro-level technology usage (social media) and how that technological usage can influence the crossing point connector of cooperative norms (e.g. empathetic behavior)

Subsequent sections explore how these ecosystem elements have been integrated into ST research and opportunities for future STE research.

Sales technologies enhance and simplify selling (Homburg *et al.*, 2010). In what was perhaps the inaugural ST publication, research centered on discovering how the “talking picture machines” could displace “canned sales presentations” (Francisco, 1944). While only a few articles on ST were published in the following few decades, a focus on optimizing technology tools emerged. During the 1980s and 1990s, special sections on “Sales Technology” and “Microcomputer Applications” were published in the *Journal of Personal Selling and Sales Management* to provide insights into how sales organizations could achieve optimization of then-emergent information technology tools. Representing a range of innovations, these studies research both hardware tools – including personal computers (Collins, 1984b; Comer and Fall, 1981) and cell phones (Swenson and Adilson, 1992) – and software tools – ranging from presentation software (Collins, 1989) to spreadsheets (Collins, 1985) and early-generation AI applications (Collins, 1984a).

The technology acceptance model (Davis, 1989) emphasized gaining user adoption, focusing on two primary factors motivating adoption: ease of use and usefulness. Historically, by the time Rivers and Dart (1999) declared that the time for SFA was “here and now,” many sales managers and scholars used SFA as a term to refer to a range of tools, not just those that automated sales processes. Perhaps ironic in hindsight, that same year, Salesforce was founded and began its emergence as the dominant supplier of CRM tools. After SFA, CRM and other sales technologies realized acceptance and usage among salespeople (Ahearne *et al.*, 2004), sales scholars added depth to what “usefulness” meant for sales organizations. The focal concern for ST scholarship now hinged on the notion that different sales behaviors mediated the firm’s return on investment in sales technologies, thus calling for sales researchers to “get beyond adoption” (Ahearne *et al.*, 2004).

ST research added specificity and findings on specific sales tasks that moderated or mediated the relationship between ST use and performance (Ahearne *et al.*, 2005; Hunter and Perreault, 2006), shown in Table 1 under the “crossing point behaviors” column. By focusing on building customer relationships, ST research identified critical relationship-forging tasks (e.g. proposing integrative solutions or knowledge sharing) influenced by technology use, which, in turn, yielded better relationships with customer buying firms (Hunter and Perreault, 2007). Such indirect effects of ST use on relationship performance through other “crossing point” behaviors exemplify the micro-level foundation for STE.

With continuing innovation in ST, focal technologies for research follow the megatrends – from SFA to CRM to social media and AI. For an example of this adaptation and a foundational review of social media research, see Andzulis *et al.* (2012). ST scholars embrace “social selling” by centering on social media use (Itani *et al.*, 2023). Social media use at the micro-level refers to the use of any “social interaction-enhancing technology that sales professionals can deploy to generate content (e.g. blogs, microblogs and wikis) and develop networks (e.g. social networks, online communities)” (Agnihotri *et al.*, 2012, p. 334). Social media use can positively affect customer relationship performance (Agnihotri *et al.*, 2017; Trainor *et al.*, 2014), change interactions (Marshall *et al.*, 2012), build salesperson competency (Ogilvie *et al.*, 2018) and develop salesperson service proactivity (Bowen *et al.*, 2021). However, social media use creates new meso-level ethical challenges for sales managers (Kalra *et al.*, 2023).

ST research also includes exemplary network theory applications in a CRM and social media context. Trainor (2012, p. 319) conceptualized social CRM as “the integration of traditional customer-facing activities including processes, systems, and technologies with emergent social media applications to engage customers in collaborative conversations and enhance customer relationships.” Social CRM technologies alter traditional sales processes

by influencing salesperson interactions with customers and firm management of information from intra-firm and external interactions (Trainor, 2012).

ST scholars propose various types of ST use beyond the extent of use, which may alter the types of crossing point behaviors for the study (Hunter, 2019). Network theory offers insights into the quality of use or infusion (Jones *et al.*, 2002; Sundaram *et al.*, 2007) as well as all three major types of ST use: accessing, analyzing and communicating information (Hunter and Perreault, 2007). For example, while using ST for communication influences an agent's effectiveness in sharing knowledge with buying agents (Hunter and Perreault, 2007), more findings into the relationship dynamic underlying that effect ensued. Using network theory, Claro and Ramos (2018) show that CRM knowledge and information-sharing effectiveness are closely dependent on total ties (representing the number of ties the salesperson form with other individuals within the firm) and tie strength (accounting for the frequency, importance and closeness of these interactions). Interestingly, a salesperson's performance is enhanced by the strength of internal and external CRM-driven informational ties, but not necessarily by the number of them (Claro and Ramos, 2018).

A salesperson's use of information and communication technologies is crucial in contemporary sales settings (Kramer and Krafft, 2023). Hunter and Perreault (2007) found that using ST for analytical purposes was the most effective type for building relationships. Today, sales organizations prioritize AI-driven predictive analytics ST tools but face adoption challenges (Habel *et al.*, 2023). Advances in ST tools using AI act to supplement a range of agent behaviors, including adaptability to dynamic sales cycles (Chang, 2022) and improving the selling agent's adaptive behaviors (Chen and Zhou, 2022). Sales managers employ observational AI tools to help managers coach salespeople (Luo *et al.*, 2021) and inform agents about using facial expressions effectively (Bharadwaj *et al.*, 2022).

Extending ST findings beyond the micro-level is vital, considering influences from managers, sales teams or the firm. ST researchers use multilevel model specifications, like hierarchical linear modeling (HLM) and multilevel structural equation modeling (M-SEM), to understand the cascading levels of sales management on agent adoption (Homburg *et al.*, 2010), team-level influences on sales behaviors (Weinstein and Mullins, 2012) and moderating influences of organizational culture, including knowledge sharing and sales analytical norms (Hunter and Panagopoulos, 2015). Table 1 summarizes additional meso-level studies. In contrast to the aforementioned extant ST research at the micro- and meso-level, there is a notable gap in extant ST research at the macro-level. However, according to the emergent themes of a recent international study by McKinsey (Gavin *et al.*, 2020), significant macro-level shifts in business-to-business (B2B) digital sales spending, elevated emphasis on the importance of B2B digital interactions and increasing dependence on Web-based video selling platforms indicate pressing needs and opportunities for future research on the STE that adopts macro-level perspectives.

Crossing points in the sales techno-ecosystem

The service ecosystem recognizes that contemporary enterprise crossing points involve many actors in buying and selling organizations (Hartmann *et al.*, 2018). This view aligns with buyer-seller relationships forming a network of firms resembling a "rain forest" of interdependencies, contrasted with the traditional view of competitive dynamics akin to that of a "jungle" (Håkansson *et al.*, 2009; Håkansson and Snehota, 1995).

Similarly, Cannon and Perreault (1999) proposed six types of relationship connectors: information exchange, operational linkages, legal bonds, cooperative norms and relationship-specific adaptations by buyers and sellers, offering opportunities for ST to enhance enterprise relationships. Firms often structure around crossing points by employing strategic account

teams with specialized roles (Bradford *et al.*, 2012). While extant ST literature may not align with the STE framework proposed here, the point is that such work is malleable to recasting while providing foundations for future research. Here are a few additional examples to further illustrate how Cannon and Perreault's (1999) connectors apply to the STE framework.

First, the *information exchange* connector represents a focal relationship-forging task construct (measured as "sharing information") that mediates the effect of a salesperson's use of technology for analytic purposes and building better relationships with business customers (Hunter and Perreault, 2007). Second, initially part of the efficient consumer response initiative (Corsten and Kumar, 2005), *operational linkages* are of focal importance to sales automation (engaging in fully digital habitual rebuy contexts). They use point-of-sale data to reorder and redistribute packaged goods automatically. Digitized operational linkages automate routine supply replenishments, while modified rebuy contexts may require augmented processes. Third, *legal bond* connectors are vital for new product development and introduction (Ozdemir *et al.*, 2020). Motivating salespeople to sell new products is challenging for sales managers (Fu *et al.*, 2010). By leveraging CRM data, firms can formalize contractual agreements to streamline supply chain partnering processes (Selviaridis and Spring, 2018), facilitated by technology-automated back-office tasks, freeing up salespeople's time. Fourth, cooperative norms are integral for the progression of buyer-seller relationships from inception – as salespeople develop norms for using technology tools in ways responsive to their buyers' approval of such use (Hunter and Perreault, 2006). Finally, social media enables idiosyncratic adaptations by buyers and sellers. Salespeople leverage contagion and related network effects to influence consumer markets through intermediate retailers by adapting their social media activity (Rapp *et al.*, 2013). Collectively, firms can develop strategies to enhance strategic account team performance, using cross-functional sales teams to leverage diverse crossing points (Hunter, 2014).

Perspective 3: explicating roles and contexts in the sales-techno ecosystem

Sales agent behavior (i.e. developing insights and sharing market knowledge, using AI to develop more integrative solutions) interacts with structure (rules and processes). It is the final component of the STE. These behaviors create, grow or sustain mutual value in the relationship. This section provides more granular details to explicate various roles and contexts warranting consideration from scholars and managers using the STE framework.

Selling agents are the focal "actors" in the sales techno-ecosystem

Actors within and between structures. Vargo and Lusch (2004) define actors as participants involved in producing and exchanging service, creating mutual value through resource commitment (Vargo and Lusch, 2008). For STE, selling agents are the focal actors. Traditional sales literature viewed salespeople (actors) performing a linear, "arms-length" sales process (Adams, 1976), while the sales service ecosystem conceptualizes buyer-seller relationships as involving many actors interacting across organizations (Cannon and Perreault, 1999; Dixon and Tanner, 2012; Hartmann *et al.*, 2018; Moncrief and Marshall, 2005).

Nonetheless, some salespeople work individually in dyadic relationships with buyers. For example, inside sales roles may focus on the early sales cycle stages, such as qualifying leads. In more complex selling, field sales and team-selling roles rely on complex peer relationships (Guesalaga, 2016). Market shifts and opportunities emerge that can lead to changes in selling roles and opportunities. Such is the case when sellers anticipate pending shifts in an organizational buying context that may prompt changes in buyer power, leading to reconsideration of alternative suppliers (Hunter *et al.*, 2006). Team selling creates a

vertical structure within a sales organization, introducing meso-level opportunities to impact agent behavior. Moreover, to implement team architectures that employ various sales roles, meso-level actors may rely on increased integration (Bocconcelli *et al.*, 2020), ambidexterity (Mullins *et al.*, 2020) and support (Gessner and Scott, 2009).

Recent research on robots in customer service settings is innovative for its potential to automate service roles. Xiao and Kumar (2021) discuss wholly displacing a selling agent (automation) or using robots to augment task performance. Digital agents with conversational AI support are becoming more personal and humanlike than their ancestors. For simple sales processes (e.g. linear, dyadic), fully automated selling is currently a viable consideration.

Technology integration into day-to-day operations within and across firms can lead to macro-level effects, impacting the roles of micro- and meso-level actors. Managers and scholars should focus on evolving actors' roles and understand them to inform research. Thus, not only is specificity needed for understanding how technology is used (Hunter, 2019), but it also matters for role descriptions, which convey institutional arrangements.

Dynamic relationships among actors. Actor roles evolve as relationship expectations change within a service ecosystem (Hartmann *et al.*, 2018; Vargo and Lusch, 2004). Thus, "broad sets of actors dynamically integrate and apply resources through service-for-exchange to cocreate value" (Hartmann *et al.*, 2018, p. 1). Therefore, relationship expectations change based on the rate and direction of changes within many-to-many relationships (Hartmann *et al.*, 2018; Palmatier *et al.*, 2013), expediting the relationship lifecycle and forcing new actors and processes to emerge (Chang, 2022). For instance, COVID-19 accelerated technology adoption, forcing actors to pivot quickly to maintain and adapt to new relationship requirements. Therefore, relationship velocity and dynamics influence how and when institutional arrangements are developed.

Sales roles in the sales techno-ecosystem






Sales organizations should minimize role ambiguity in buyer–seller relationships by implementing unambiguous institutional arrangements for selling roles (Plouffe *et al.*, 2017). Institutional arrangements include explications and assignment of selling roles to selling actors. Selling agents' orientations and skills are crucial in the STE. Orientations, such as attitudes, can be more innate, while skills are subject to development within the selling organizations (Churchill *et al.*, 1985; Churchill *et al.*, 1979). Contemporary research focuses on ambidextrous skills for salespeople, handling "frontline" service roles and sales activities (Mihalache *et al.*, 2014; Rapp *et al.*, 2020; Rapp *et al.*, 2017). More broadly, ambidexterity in role performance includes both an orientation and a behavioral component – and selling activities in the STE may still include roles as hunters – of new accounts – and farmers – of established accounts (DeCarlo and Lam, 2016; Lam *et al.*, 2019). An agent's orientation toward ST tools, like information and communication technologies, affects behaviors that drive sales performance (Hunter and Perreault, 2006; Kramer and Krafft, 2023). Hochstein *et al.* (2021) suggest different customer engagement strategies based on sales ambidexterity, creating thin crossing points for the salesperson.

The general and shared ideas associated with compartmentalization and the subsequent assignment of roles inherent to ambidexterity and frontline research are particularly applicable in the STE. Application in the STE creates several notable concerns that include how ST can help create mutual value, influence purchase decisions, augment selling agents and be involved in the buyer–seller exchange. Based on Perspectives 1 and 2, Perspective 3 considers the varied role of ST based on the technology functionality, selling organization norms and customer relationship narratives for crossing point connections. Specifically,

hunting and transactional roles may become fully automated, with ST as the focal actor. Farming roles will likely become partially automated and implement a mix of ST as focal and supporting actors. However, consultative and enterprise selling roles will likely have limited automation and rely on ST as supporting actors. Figure 3 illustrates these roles and their use of advanced ST as independent or supporting actors.

Hunting and farming roles. Hunters are selling agents who find, sell, educate and inform new accounts (DeCarlo and Lam, 2016). Increasingly, buyers conduct product and information searches in the early stages and prefer to meet with salespeople later in the sales cycle. Subsequent leads are increasingly generated through inbound digital marketing and communications (Shankar et al., 2022) when new prospects are directed to a seller’s website. As these leads are digital at inception, it opens the door for digital selling (Mullins and Agnihotri, 2022), which can be a fully automated sales process.

Sales technology’s role can vary based on the selling process and the salesperson’s role within institutional arrangements (Vargo and Lusch, 2016). If technology performs as an agent, it follows institutional rules without agency or noncompliance (Lawrence and Suddaby, 2006). Some buyers are becoming comfortable using a fully digital selling process, including avatars that may act as selling agents, to complete a procurement process. For some markets, this trend may sustain itself. Gartner reports that 44% of all millennial B2B buyers (a growing category) prefer a fully automated buying process – with no in-person contact throughout the transaction (Gartner, 2020). However, preferences differ across segments; some buyers may seek to transition to an in-person process, and hunters may augment their sales efforts by using ST tools to improve conversion rates.

	Hunter	Farmer	Transactional	Consultative	Enterprise
Perception of sales technology (ST) value creation	ST supports selling firm. Selling firm delivers value to buyer	ST fosters value between the selling and buying firm	ST creates value and delivers it to buyer	ST supports selling and buying firm. Selling firm creates value	ST cocreates value between selling and buying firm (cooperation)
Perceived ability of sales technology to influence purchase	Medium	Medium to High	High	Medium to low	Medium
Support and crossing points between sales technology, sellers, and buyers	ST supports salespeople. Salespeople and buyers compete with one another to win at the expense of others	ST is shared between buying and selling actors to facilitate win-win exchange	ST, salespeople, and buyers compete with one another to win, at the expense of others	ST supports the selling and buying firm individually. Selling and buying actors collaborate with one another to facilitate win-win exchange	ST supports the selling and buying firm cohesively. Many selling and buying actors collaborate with one another to facilitate win-win exchange
Involvement in Exchange Sales technology role	ST helps find prospective buyers. Then salespeople deliver value propositions	ST becomes a focal actor to aid customer. Both salespeople and ST deliver value propositions	ST or salespeople find prospective buyers. Then they deliver value propositions	Salespeople and buyers develop trust-based, mutually beneficial relationships. ST supports the selling and buying actors	Salespeople and many other cross-functional actors develop trust-based relationships. ST collaborates with some buyers and systems to foster long term relationships
Automation potential	Full	Partial	Full	Limited	Limited
					

Notes: Elements of this table were adapted from the service ecosystem perspective of selling (Hartmann et al. 2018) ● = selling actor; ○ = buying actor; ◐ = sales technology role; = support; — = crossing points

Source: Authors’ own work

Figure 3. Sales roles and approaches

In contrast to the hunter role, farmers focus on maintaining and growing existing customer accounts (DeCarlo and Lam, 2016). Key account management has long prioritized crucial accounts (Wengler et al., 2006). Meaningful and frequent interactions at crossing points enhance loyalty, especially when tied to the salesperson (Palmatier et al., 2007). Thus, active salespeople who sell and grow accounts are more likely to employ consultative selling roles to build trust and better integration between firms.

Sales organizations should evolve alongside customer relationships, increasing their relationship velocity (Palmatier et al., 2013). Since relationships change, institutional arrangements must also evolve. When institutional disruptions occur, sales organizations must promote agility to change and adapt to new processes. In an emergent farming role, customer success managers “build” business within current accounts, acting as “benefactors” and “liaisons” between the customer and the firm (Hochstein et al., 2020).

Transactional, consultative and enterprise selling roles. Over the last century, sales roles have evolved based on composition, customer relationships and the configuration of sales organizations (Cuevas, 2018). Transactional, consultative and enterprise selling are among the most prominent. Figure 4 illustrates the sales context and the integration of advanced ST within the selling relationship.

Transactional selling roles represent the most linear and dyadic roles, presenting codifiable sales processes through which ST may create and deliver mutual value to the customer. These roles are more prone to presenting managers with an option between using lower-skilled salespeople augmented by technology tools or employing AI-supported technology agents to implement a fully automated sales process – from inception to closing deals.

	B2C	B2B	Inside Sales	Outside Sales
Perception of sales technology (ST) value creation	ST creates and delivers values to buyer	Supports selling firm in creating value	Supports selling firm in creating value, while also delivering value to buyer firm	Supports selling firm in creating value
Perceived ability of sales technology to influence purchase	High	Medium to Low	Medium to High	Medium to Low
Support and enablement between sales technology, sellers, and buyers	ST can act as a focal actor interacting with the buyer directly	ST supports the decision making but the buyer-seller crossing point maintains the relationship	ST supports the decision making of the buyer and seller but also holds acts as an actor crossing point to the buyer directly	ST supports the decision making but the buyer-seller crossing point maintains the relationship
Involvement in Exchange				
Sales technology role	Salespeople may support the ST while ST interacts directly with the consumer. Additionally, salespeople may intervene to provide a crossing point with the buyer.	ST is utilized within the decision-making process. Then the selling firm coordinates value to buying firm	ST takes on a more prominent role creating a direct crossing point between seller technology and buyer, while also supporting individual respective firms	ST is utilized within the decision-making process. Then the selling firm coordinates value to buying firm
Automation potential	Full	Partial	Partial	Limited

Figure 4.
How sales contexts can be embedded within a sales technology ecosystem

Notes: Elements of this table were adapted from the service ecosystem perspective of selling (Hartmann et al. 2018). ● = selling actor; ○ = buying actor; ◎ = sales technology role; = support; — = crossing points

Source: Authors’ own work.

Consultative selling roles use ST to educate salespeople and customers, promoting a learning orientation (Agnihotri *et al.*, 2009). Managers should strategize for information overload challenges for buyers and sellers that test current norms and perceptions of value (Plouffe *et al.*, 2017). Encouraging salespeople to adopt sophisticated ST tools, like predictive analytics for sales forecasting (Habel *et al.*, 2023), supports the focal actors (sellers and buyers). However, ST rarely acts independently in consultative roles, especially when involving tacit knowledge application (Polanyi, 1966).

Enterprise selling requires a many-to-many economic exchange to occur as a means to create mutual value (Hartmann *et al.*, 2018). At the enterprise level, crossing points are dynamic among selling and buying actors. Cross-functional sales teams work across various relationship connectors (Cannon and Perreault, 1999) and may even be embedded within the customer account (Bradford *et al.*, 2010). Moreover, such accounts are often strategically important to sales organizations drawing extensive investments in resources (Bradford *et al.*, 2012) and may represent the thinnest crossing points among various STE roles. As such, enterprise selling is a rich domain using automation tools (for more mundane, simple tasks) and the most sophisticated ST tools to augment aspects of these often more complex, team-based selling tasks.

Sales contexts in the sales techno-ecosystem

Most sales scholars and managers agree with a contingency theoretic axiom that context matters while acknowledging that not all sales contexts are the same. Although we outline distinctions for ST consideration, not all contexts are covered. This approach highlights concerns about ST's impact on mutual value, purchase decisions, selling agents and the buyer-seller exchange. Previous perspectives inform the section to promote an understanding of the role of technology as a focal actor or a supporting actor within selling contexts. The section suggests that Business-to-customer (B2C) selling contexts are likely fully automated, leading to ST becoming a focal actor within an exchange relationship. B2B and inside sales will partially automate, with ST as a mix of focal and supporting roles. Outside of sales, being relational will likely employ ST in supplemental ways. Figure 3 summarizes these concerns across different sales contexts.

B2C and B2B interactions. For routine sales tasks, ST provides an efficient automation process. B2C selling roles may adapt as customer participation increases, enabling meaningful crossing points. For instance, self-service offerings free up resources, allowing firms to redistribute personnel (Meuter *et al.*, 2000). The consideration of automated crossing points using self-service technology allows more time and resources for agents to engage in complex, interpersonal relationship-building with other buyers. As technology easily influences purchases in B2C settings, firms should consider technological innovations, such as chatbots and avatars, to automate the sales process fully.

B2B sales contexts vary widely, from simple to more sophisticated contexts with "thick crossing points" involving extensive resource commitments. Moreover, B2B procurement processes are typically more complex and involve many people from both sides (Hunter *et al.*, 2006). Technological innovations and social media enable agent interactions beyond the formal settings of their institutional arrangements (Andzulis *et al.*, 2012), enhancing value co-creation through learning. Thus, B2B and B2C firms use interactive social media content to create crossing points with potential customers.

Inside and outside sales. Inside and outside selling roles are influenced by technological changes driven by the STE. Inside sales teams are pivotal when global crises limit traditional field sales (Sleep *et al.*, 2020). These roles capitalize on online metrics, customer-driven data and real-time AI support to provide helpful learning insights. Predictive

analytics, data mining and intelligence tools aid cost management and sales generation (Gessner and Scott, 2009). Unique technologies facilitate effective inside sales as agents seek to develop meaningful relationships with more customer stakeholders (Rapp *et al.*, 2012). AI-supported tools automate prospecting and follow-up activities, creating more time for other activities (Jones *et al.*, 2002). Thus, outside sales agents can offload non-selling activities to focus on developing in-person crossing points.

Perspective 4: tenets for success. Previous sections provide insights that establish the STE framework based on its theoretical foundations, particularly as a domain within the sales-service ecosystem, implications for sales roles and contexts and challenges associated with methodological approaches and performance metrics. This section seeks to advance five tenets that emerge.

Tenet 1: be strategic with sales technology to develop and maintain crossing-point connections

The shift to the service ecosystem perspective involves multilevel interactions among many actors, creating crossing points for value exchange (Hartmann *et al.*, 2018). Selling firms may realize inherent advantages from attempting to create thicker crossing points between buyer–seller interactions in competitor organizations because thick crossing points require a deep investment of time, trust, energy and resources that buyers may be unwilling to allow. However, taking action to thicken another selling firm’s crossing points may be difficult. In contrast, creating thinner crossing points within a selling firm’s buyer–seller interactions is more direct since forging relationships, benefits and value deepens the interaction with customer accounts. As a result, by effectively thinning buyer–seller crossing points within customer relationships, selling firms may also begin to thicken the buyer–seller crossing points for their competitors’ solutions.

Technology can facilitate more efficient interactions at crossing points, helping to optimize the collaboration among actors to deepen the relationship (Hartmann *et al.*, 2018). Consistent with contemporary ST research (Itani *et al.*, 2022), the STE framework embraces swift technological evolution, including automation (displacing salespeople with technology), digitization (converting media from analog to digital to permit use by a technology) and digital transformation (the transfer of tasks from people to technologies for completion), influencing the sales process’s transition from the traditional to a nonlinear, multi-actor exchanges (Dixon and Tanner, 2012; Hartmann *et al.*, 2018). ST offers opportunities to thicken competitor crossing points and thin a focal firm’s crossing points as a competitive advantage, influencing exchange relationships positively.

This tenet suggests several vital questions that warrant future research. First, how do firms or relational actors maintain their crossing points as new technology is widely adopted and mainstream? Second, if a technology is deployed as a fully compliant actor, what are the implications for B2B relationships? Third, what ground rules should be established when nonhuman actors are involved? Fourth, what technology integration journey is required to maintain competitive advantages, and how does the plan influence strategic planning at relevant crossing points?

Tenet 2: examine the different networking levels of social interactions to guide sales technology decisions

ST research often concentrates on the micro-level focus, but exploring meso- and macro-level impacts in the STE framework is warranted. A meso-level perspective can highlight thick crossing points that hinder selling activities (Hartmann *et al.*, 2018). This awareness improves a firm’s market-sensing capability, enabling it to function more effectively in the

marketplace (Day, 1994). Recent AI innovations afford new opportunities for such outcomes (Manis and Madhavaram, 2023).

Eckhardt *et al.* (2019, p. 7) define the sharing economy as “a scalable socioeconomic system that employs technology-enabled platforms to provide users with temporary access to tangible and intangible resources that may be crowdsourced.” Examining ST’s influence on significant phenomena, such as the sharing economy (Eckhardt *et al.*, 2019), reveals co-creation practices in the STE and how technology influences institutionalization arrangements. A macro-level perspective provides insight into technology’s influence on regulative, normative and cultural-cognitive elements (Scott, 2013), shaping selling agents’ expectations (Hartmann *et al.*, 2018).

These insights suggest additional questions for future research. How do the expectations and demand for integrating ST into sales processes impact salespeople, firms and society? How will the inherent integration impact sales organizations at various levels to serve individual outcomes as technology evolves? As technology continues to infuse into the sales process and digital natives join (and advance in) the workforce, are there additional considerations or expectations for sales organizations (taking a macro/societal perspective on how technology innovation adoption infiltrates from personal use to professional use)? What is the relationship between sales structures and ST in the institutions, exchange or narrative process?

Tenet 3: structure sales technology innovation implementations to optimize actor roles that improve sales processes

The surge of AI technologies raises the question of not “if AI will be adopted” but “how.” As these technologies’ exponential growth and sophistication intensify, organizations are scrambling to find a mix between technological automation and complete self-governing AI sales applications within the STE. The ST research is replete with insights on how sales technology can impact sales performance, consistent with the long-standing “sales force technology-performance chain.” As growth and sophistication intensify, organizations scramble to find a mix between technological automation and self-governing sales. Thus, as with other innovations in ST, scholars and managers consider how a new ST will impact sales performance. This consideration is genuine for current concerns with innovations using AI.

AI can improve B2B performance with quicker, more consistent sales decisions (Dwivedi and Wang, 2022), but its use as an actor removes the human elements that impact institution processes. This results in uninterrupted agent actions at the crossing points. However, even advanced AI sales technologies require suitable institutional arrangements. Only adequate arrangements (executed through code) will produce good results. Moreover, some AI tools, such as those used for predictive analytics, are designed to augment sales processes, and motivating adoption remains a focus of sales managers (Habel *et al.*, 2023).

AI-based ST tools can fully automate the sales process for simplistic transactional selling. Thin crossing points (that promote more accessible interactions) in these transactions allow buyers to use self-service tools – and growing segments of buyers may prefer no human interaction. However, at large institutional arrangements, with consultative and enterprise-level selling, a fully automated sales process may introduce new confounds like technostress (Uysal *et al.*, 2022) or information security concerns (Paschen *et al.*, 2020). Additionally, the value of interpersonal relationships between agents remains crucial when integrating ST into buyer–seller relationships.

Little debate exists on *whether* AI-based ST tools will be adopted in the STE – the real questions center around *how* they will be adopted. Future research should focus on this

“how” question. For example, can AI be trained to implement human emotions, creative selling and adaptive selling techniques? How will such actions impact the buying actor? In what ways could these actions thicken or thin extant crossing points? Finally, much ST research focuses on how AI tools augment salespeople, but how can AI tools evolve into sales or buying agents? How should sales organizations adapt institutional arrangements in response to the emergence of AI-buying agents in the STE?

Tenet 4. complement short-term financial metrics with longer-term relationship-centric metrics to fully capture sales technology performance

Much of the existing literature focuses on short-term financial metrics – i.e. the percentage of salesperson quota achieved, as the primary outcome of ST use. [Hartmann et al. \(2018, p. 14\)](#) contend that:

Limiting selling actor evaluations to actors employed by a firm and evaluating these employees using only short-term sales goals (e.g., monthly or quarterly quotas) obscures the cause-effect relationships between selling actors’ behaviors and desired outcomes.

Thus, the STE framework underscores the importance of evaluating ST value and its impact on sales performance over time and across multiple actors and contexts.

Research often stresses capturing short- and long-term dynamics in business relationships ([Palmatier et al., 2013](#)). However, some longitudinal studies have focused on a narrow set of metrics, potentially creating wrong incentives for sales agents by prioritizing short-term economics over longer-term relationship-building. Alternative longitudinal metrics (i.e. measuring learning outcomes with new tools over time or agent engagement across a tool’s life cycle) may provide valuable insights. Additionally, the variation in ST adoption among business partners ([Arli et al., 2017](#)) requires the development of new scales and metrics to capture progress and regressions over multiple time points and across partners ([Lam et al., 2017](#); [Marinova et al., 2017](#)).

Archival data collected by firms can offer a balanced scorecard of sales performance, capturing relevant financial, relational and activity-focused metrics ([Bolander et al., 2021](#)). Outcome-based and performance-based measures are worth consideration. Other ST research has employed activity metrics to assess behavioral performance using archival data, including call productivity ([Ahearne et al., 2007](#)), service behaviors ([Agnihotri et al., 2017](#)) and empathetic behaviors ([Kalra et al., 2023](#)). Scholars have also examined ST’s implications on the buyer–seller relationship: customer satisfaction ([Agnihotri et al., 2016](#)) and other relationship-building performance metrics ([Hunter and Perreault, 2007](#); [Ogilvie et al., 2018](#); [Trainor et al., 2014](#)).

Future ST scholarship can integrate underutilized performance metrics related to the network of dynamic buyer–seller relationships, longer-horizon financial metrics and the degree to which longer-term meso-level initiatives and objectives are achieved. For example, when implementing ST to improve touch points for the buying team, useful metrics may include expectancy disconfirmation and relational trajectory measures. Next, firms could use customer lifetime value, buyer retention and shorter-term financial performance metrics to understand how technological initiatives impact profitability. Finally, the meso-level success of a technology initiative depends on the aggregated perceptions of the larger sales teams.

Positioning relational variables such as sales team turnover, satisfaction, burnout and managerial support as technology outcome metrics may explain why macro-level innovation sometimes fails to lead to meso-level success. Ultimately, when measuring the success of the

technology, it is critical to focus on how that technology contributes to the sales team, organizational health and productive relationships with the members of the buying firm.

Tenet 5: deploy diverse methodologies and integrate insights to connect sales technology ecosystem research with practice

An ever-present concern for sales research is contributing insights relevant to sales practice and rigorous scientific inquiry. Practice sales managers and agents have insights relevant to help scholars close the gap between academic research and practices. Qualitative, cross-sectional, longitudinal, mixed methods (or combinations of these approaches), experimental and other designs can contribute to a better understanding of the STE. These types of studies should also aid in evaluating sales agent performance. This tenet spotlights a few approaches.

Quantitative methods

Technology adoption research has a solid foundation in influential social science studies like the technology acceptance model (Davis, 1989; Davis *et al.*, 1989) and task-technology fit theory (Goodhue, 1998; Goodhue and Thompson, 1995). This well-established domain continues to capture the effects of multiple levels of influence, including sophisticated multilevel SEM specifications that capture cross-level interaction effects between meso-level and micro-level constructs, like those due to group (firm or sales team) culture and norms (Hunter and Panagopoulos, 2015).

As discussed in Tenet 4, research accounting for relational effects that occur over time and emergent concerns with evaluating selling agent performance is needed. Two promising longitudinal designs for the STE are latent growth models (LGMs, Bollen and Curran, 2006) and hidden Markov models (HMMs, Eddy, 1998). Bolander *et al.* (2017) emphasize LGM's potential to contribute insights to sales research. Markov models are particularly well-suited to measure pertinent variables that likely evolve from one state to another in a systematic fashion (Darmon, 1982). As exemplary work, Luo and Kumar (2013) use an HMM specification to test salespersons' efforts across buyer-seller relational stages.

Experimental methods

Relative to consumer research, sales researchers rarely use experimental designs. Dustin and Belasen (2013) employed an interrupted time-series design involving treatment and control groups to examine the effects of compensation reduction on salesperson performance. Schrock *et al.* (2021) used a field experiment to explore financial incentive structures across salespeople's other-oriented versus self-oriented competitiveness traits. A third example, Henderson *et al.* (2014) used a longitudinal field experiment to investigate customer engagement through three loyalty-related mechanisms: habit, dependence and relationship. Thus, experimental design in STE research can help determine salespersons' technology usage patterns, preference for capabilities and the effectiveness of AI-supported sales campaigns, among other topics.

Qualitative methods

Given widespread calls for indigenous theory development (Hunt, 2020), in-depth interviews of sales managers and agents confronting new ST innovations represent fertile ground for applying approaches like grounded theory in the STE (Johnson, 2015; St. Clair *et al.*, 2016). Using qualitative methods can help scholars to understand concerns in practice better. For example, learning how executives envision the future of AI in sales, make decisions

regarding “thickening” or “thinning” crossing points or navigate between automation and augmentation of sales tasks. A noteworthy method for the STE, qualitative longitudinal research encompasses investigative techniques (such as in-depth interviews) with repeated data collection to isolate the temporality of a phenomenon (Audulv *et al.*, 2022).

Conclusion

The STE framework allows for conceptualizing technology’s role in the sales-service ecosystem. It provides guidance and diverse opportunities for contributions to ST research using various research techniques. Researchers should consider micro-level effects across agents and the interplay between structure and agency. Model conceptualization may vary based on sales contexts and roles, with interactions within and across levels examining effects over time and space. The three elements of the STE (selling agents, institutional arrangements and technology) aid in developing confidence in model specifications, generate insights at all levels (macro-, meso- and micro-) and enhance a study’s generalizability. While no one study can capture all relevant STE measures, collectively engaging with practice, conceptualizing key research questions, embracing the extant ST literature and using the full range of methods and research philosophies, sales scholars can continue their rich tradition of adding valuable insights to sales practice.

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