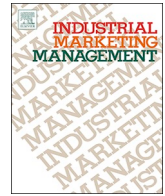




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Research paper

## Strategic enablement investments: Exploring differences in human and technological knowledge transfers to supply chain partners

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## ABSTRACT

Business-to-business firms have a long history of investing in training their supply chain partners using primarily salespeople. However, advances in technology now allow for elements of sales enablement programs to be automated and run without human involvement. This paper examines how human and technology enablers are suited to transfer tacit and explicit knowledge respectively. It constructs a strategic enablement investment framework that, depending on the mix of investments in human or technology enablers, results in four types of learning environments: self-directed, collaborative, adaptive, and complex. We close by discussing the implications for future research and offer guidance for industrial marketing managers.

### 1. Introduction

Business-to-Business (B2B) firms that strategically invest in enabling their supply chain partners often realize deeper, more profitable relationships with these partners (De Leon & Chatterjee, 2017; De Ruyter, Keeling, & Cox, 2019). Moreover, B2B firms that have existing strategic enablement investments are better prepared to support their supply chain partners and enjoy increased mutual sales performance and end-customer satisfaction across market conditions (Nyaga, Whipple, & Lynch, 2010). In light of the COVID-19 crisis, many recent strategic enablement investments are in augmenting or substituting current human-led training regimes with digital technologies to further advance knowledge acquisition and transfer (Diorio, 2020). However, compared to Business-to-Consumer (B2C), the B2B sector has a poor record in adopting digital technologies; yet, those B2B firms that McKinsey classifies as 'digital leaders' have outperformed 'digital laggards' in terms of revenue, operating profit, and returns to shareholders (Caitlin, Harrison, Plotkin, & Stanley, 2016). Technological enablement investments may offer opportunities for B2B firms to simplify relationships and empower their partners to better sell the firm's products and services (Bryan, 2019). However, there is a profound lack of understanding of the differential roles and benefits of human and technological enablement investments. Within this context, this paper provides a framework that can guide strategic enablement investment decisions by conceptualizing how these different types of enablement

investments allow for the more efficient and effective transfer or acquisition of explicit or tacit knowledge.

Strategic enablement involves knowledge transfer programs designed by B2B firms to assist supply chain partners in using and selling the firms' products and services (De Ruyter, Keeling, & Yu, 2020; Toman, Adamson, & Gomez, 2017). Enablement traditionally has taken the form of human-led training with positive consequences for productivity and process improvement (Bartel, 1994; De Ruyter et al., 2020; De Ruyter, Moorman, & Kemmink, 2001; Pelser et al., 2015; Salas et al., 2008). For example, carefully crafted strategic enablement investments in educational programs can create consistency and allow managers to motivate and upskill sales networks (Honeycutt, 2005). Furthermore, digital technologies may offer new opportunities for strategic growth by enabling supply chain partners differently and, in some instances, more effectively. Embedding technological enablement tools into supply chains can add to supply chain partners' ability to customize the firm's offerings, enhance service recovery efforts, and improve satisfaction levels with those partners and all along the supply chain (Bitner, Brown, & Meuter, 2000).

Investments in human or technological enablement create learning environments of practice sharing that may generate significant effects not only on knowledge acquisition, transfer, and dissemination between a firm and its supply chain partners, but also on partner employees' cognitive, affective, and performative outcomes (Arthur, Bennett, Edens, & Bell, 2003). Strategic enablement investments can empower

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these individuals, such as customer service employees or sales representatives, to become institutional adopters and powerful champions of a particular product or service solution (Li, Guo, Cao, & Li, 2018). Moreover, these investments are particularly critical for complex products or services that are made available via distributed sales networks.

However, while their effectiveness is not in doubt, there is little guidance on the best mix of human or technological enablement investments in effectively transferring and acquiring different types of knowledge. This paper provides this guidance by developing a framework that identifies different configurations of human and technological enablement investments depending on the type of knowledge required to be transferred and acquired to supply chain partners.

Following MacInnis (2011), this paper offers several contributions to conceptualize strategic enablement investments by exploring the unique knowledge transfer capabilities of human enablers and technological enablers. First, it deconstructs the knowledge management and acquisition functions of strategic enablement into two key knowledge types—explicit and tacit knowledge. Second, the paper delineates mixes of human and technological enablers depending on the required tacit knowledge or explicit knowledge to be transferred to supply chain partners. Third, it provides six propositions that offer insight into four learning environments—self-directed, adaptive, collaborative, and complex—that provide guidance for both B2B managers and researchers examining strategic enablement investments. With these three substantive contributions, we extend both the conceptual understanding and practical application of strategic enablement.

Before examining how human and technological enablers aid the acquisition of knowledge, we first discuss two important types of knowledge—tacit and explicit—gained through strategic enablement programs. Then, we develop six propositions and a framework that defines the deployment of strategic enablement investments for four types of learning environments. Next, we investigate how different learning experiences result from different strategic enablement investments in human and technological enablers. We close by suggesting important future research directions and offering guidance for B2B managers.

## 2. Managing knowledge

A firm's knowledge is costly to imitate and represents a critical competitive advantage factor for many firms (Barney, 1991). It is generated through a combination of information, experience, and interpretation of external and internal contexts (Davenport, 2009). Information technology has dramatically enhanced a firm's knowledge capabilities by allowing businesses to collect, store, and disseminate a huge amount of data more efficiently. For example, analytics provide several methodologies and tools to evaluate and interpret large and complex sets of structured and unstructured data (Erevelles, Fukawa, & Swayne, 2016). Artificial intelligence (AI), machine learning, and deep learning networks further extend these knowledge capabilities not only by automating the knowledge acquisition, generation, and interpretation, but also by extending these beyond the cognitive confines of human decision makers (Davenport, Guha, Grewal, & Bressgott, 2020). While much of this knowledge can be codified, recorded, and disseminated due to its explicit nature, the strategic knowledge which propels competitive advantage remains nevertheless often uncoded or tacit (Nonaka & von Krogh, 2009). As such, a firm's knowledge can be interpreted on an explicit to tacit continuum (Nonaka, 1994).

*Explicit knowledge* refers to factual knowledge that can be easily articulated, stored, and transferred to others (Nonaka & Takeuchi, 1995; Polanyi, 1966). Representing *what* is known (i.e., know-what; Moky, 2002), explicit knowledge entails mental models of the world (i.e., knowledge structures) that can be transferred through linguistic formats (Preston, 1993). For example, certification frameworks, such as ISO 9000, allow firms to map and systematize critical internal

procedures to guarantee the quality and consistency of their products and services, as well as enabling the transfer of explicit knowledge to employees and their supply chain partners. Serving primarily as a store of codified knowledge, explicit knowledge can essentially be understood as a tool that can be used to perform a particular task (Ballantyne & Varey, 2006; Purvis & Purvis, 2012). It is, therefore, independent of human interaction and can likewise be produced, used, and transmitted by non-human entities such as computers, AI, and other technology. AI, for instance, such as IBM Watson or Google AI, learn through the systematic and continuous update of explicit knowledge (Liebowitz, 2001). This may either happen through the comparison of millions of scenarios and the determination of a course of action on the basis of a given distance to a predetermined optimal result (Jarrahi, 2018; Pomeroy, 1997). Alternatively, AI may determine an optimal solution by the systematic iterative (re)combination of available explicit knowledge in a trial and error fashion (Bishop, 2006).

*Tacit knowledge* describes the 'know-how' of individuals (Koskinen & Vanharanta, 2002; Wagner & Sternberg, 1987). In contrast to explicit knowledge, tacit knowledge can be subjective and only known unconsciously, making it difficult to articulate and transfer (Dhanaraj, Lyles, Steensma, et al., 2004; Nonaka & Takeuchi, 1995; Polanyi, 1966). It is often understood as individuals' techniques, skills, or operational dispositions to react to dynamic situations (Dhanaraj et al., 2004; Merleau-Ponty, 1962; Moky, 2002; Purvis & Purvis, 2012). As a result, tacit knowledge is largely bound to human actors, such as employees and managers, and cannot easily be codified and exchanged as separate entities (e.g., written documents, audiovisual recordings) (Polanyi, 1966). Instead, it is acquired or transferred via the informal training of learned behavior and processed through physical observations, lived experiences, virtual simulations, or other rich communication media environments (Howells, 1996; Nadler, Thompson, & Boven, 2003). Tacit knowledge transfers are more successful when there are strong interpersonal ties between the transfer source and the transfer target that foster collaborative relationships (Uzzi, 1997) and shared norms of reciprocity and social cohesion (Reagans & McEvily, 2003). For example, luxury fashion producer, Brunello Cuccinelli, has invested in a school of craftsmanship to ensure that complex, critical skills of pattern making, cutting and tailoring are transferred from the "maestri" (experienced senior artisans) to new generations of apprentices (Brunello Cuccinelli, 2020).

Managing and transferring organizational knowledge to supply chain partners – whether it is explicit or tacit knowledge – is among the most challenging issues facing B2B companies. Firms create, disseminate, and retain knowledge by establishing formal and informal knowledge management systems (Allen, James, & Gamlen, 2007; Hwang, Lin, & Shin, 2018). These systems are designed to capture explicit and tacit knowledge that is either created by individual employees or embedded in organizational processes and routines (Nonaka & von Krogh, 2009). Yet, to effectively transfer organizational knowledge, managers must have insight into the nature of the knowledge they wish to transfer.

It is important to note that learning based on knowledge transfer nearly never happens exclusively through one type of knowledge; rather, it is often a combination of both explicit and tacit knowledge that is necessary for specific learning outcomes (Roberts, 2000). In fact, explicit and tacit knowledge are understood as "mutually complementary". That is, both knowledge forms dynamically interact with each other to create new knowledge and allow for creative individual responses or collective activities (Nonaka & von Krogh, 2009). For example, Procter & Gamble's Connect and Develop innovation platform brings together formalized research and development processes and a network of contributors who share experiences and ideas. This combination of explicit and tacit knowledge within the same environment has led to the development of several successful innovation projects (Larry & Sakkab, 2006; Ozkan, 2015).

The relative balance of explicit and tacit knowledge that is being

passed on to supply chain partners might indicate a different set of strategic enablement investments to achieve the most efficient outcome. If the knowledge required is primarily explicit, firms can transfer it relatively easily to their partners by using a wide range of methods that may include a variety or combination of human and technological knowledge sources. In contrast, if the knowledge required is mostly tacit, knowledge transfer to partners is generally more challenging and often necessitates the use of individuals to facilitate a successful dissemination through strong ties and relationships. In the next section, we explore how humans and technologies can assist in enabling partners by facilitating effective and efficient knowledge acquisition and transfer.

### 3. Strategic enablers

#### 3.1. Human enablers: social practices for the transfer of tacit knowledge

Supply chain partner enablement is often delivered by *human enablers* (a.k.a., trainers, instructors, teachers, or educators) that engage in transfer of explicit and tacit organizational knowledge. To transfer knowledge, human enablers often use courses, seminars, workshops, virtual conferences, telephone calls, or individual face-to-face meetings, as well as frequently providing written documents (Fast, Vosburgh, & Frisbee, 1989; Joia & Lemos, 2010; Xiao et al., 2004). By utilizing human enablers, businesses are able to provide tailored advanced support that is dynamic to the needs of the receiving individual of the knowledge transfer (Ben Oumlil & Williams, 2000). Human-led enablement programs appear crucial in order to train partners in “their ability, to understand, and contribute to, effective service delivery” (Bell & Eisingerich, 2007, p. 467).

Human enablers are particularly useful when exchanging explicit information or mere technical information of product or service features alone is not enough to ensure successful partner outcomes. This is particularly true for individualized, high-involvement, or highly complex products or services (Bonfanti & Brunetti, 2015). For example, consider a highly complex financial product, where partners dealing with end-customers require more than a simple script on how to support their customers. In cases like this, partners need to learn how to dynamically assess the level of information asymmetry that exists between them and the end-customer. Being able to respond to unfolding situations is, therefore, not only essential to sell the product but also to support end-customers in subsequently using the product appropriately.

As such, human enablers are particularly effective in transferring tacit knowledge to supply chain partners. Tacit knowledge transfer includes not only problem-solving methods or procedures (Dhanaraj et al., 2004; Grant & Gregory, 1997), but also implicit mental models that are essential to fully understand the wider contextual issues relevant to a firm's market offering – the unwritten rules or ‘tricks of the trade’ (Eapen & Krishnan, 2019). Importantly, tacit knowledge resides in social practices and is mainly acquired through one's participation in those practices under the guidance of other, more experienced, organizational mentors (Tsoukas, 2003). Referring to “routinized ways in which bodies are moved, objects are handled, subjects are treated, things are described and the world is understood” (Reckwitz, 2002, p. 250), practices represent ways of doing (that is, patterns of activities) that are linked together by social interactions grounded on individuals' perception of their own socially constructed world (Araujo, Kjellberg, & Spencer, 2008; Giddens, 1984). By engaging in social practices, human enablers therefore provide meaning to sets of otherwise trivial activities and interactions, transferring thus conscious but also unconscious “rules” (Cook & Brown, 1999) on how partners should use complex products in specific situations to obtain positive outcomes. Based on their own experiences, education, and interpretations of their own practices, human enablers can consequently transfer their tacit knowledge to the less experienced or inexperienced supply chain partner (Starbuck, 1992).

As tacit knowledge represents a constitutive element of social

practice (Nonaka & von Krogh, 2009), its transfer is best facilitated through close personal contact and strong relationship ties between human enablers and supply chain partners. Tailored enablement strategies that prioritize personal relationships such as coaching and mentoring are, therefore, best suited for tacit knowledge transfer (Disterer, 2003; Leonard & Sensiper, 1998). Even though human enablers might seem costly, converting tacit knowledge to explicit knowledge is time consuming and problematic if even successful (Davenport & Prusak, 2003). Instead of focusing in making tacit knowledge explicit, firms should rather invest in facilitating social practices through human enablers to enable tacit knowledge transfer to supply chain partners. Therefore, we propose that:

Proposition 1: Human enablers are particularly suitable for the transfer of tacit knowledge to supply chain partners through the facilitation of social practices.

#### 3.2. Technology enablers: efficient and effective transfer of explicit knowledge

Technology enablers are knowledge dissemination and training tools that a firm can provide to its employees and supply chain partners with the aim of increasing the sharing of codified knowledge, facilitate internal communications and improve relationships with key external partners (Prandelli, Sawhney, & Verona, 2006). These tools can range from simple how-to videos, frequently-asked-questions, search engines, and animated flowcharts, to more complex, integrated, training platforms, and interactive simulations. Transferring knowledge with means of such technologies not only saves the firm's human resources, but is also more efficient and effective for knowledge that can easily be codified, hence knowledge that is made explicit.

Thus, while human enablers promote an environment of tacit knowledge sharing across firms through the facilitation of social practices (Froehle, Roth, Chase, & Voss, 2000), technology enablers can accelerate the transfer of explicit organizational knowledge in more efficient and effective ways. While some technology enablers, such as virtual communities are specifically designed for knowledge sharing among peers and may help to foster interaction (Robson, Plangger, Kietzmann, McCarthy, & Pitt, 2015; Robson, Plangger, Kietzmann, McCarthy, & Pitt, 2016) and collaboration between the firm and its supply chain partners (Huang & Rust, 2013; Kietzmann et al., 2013), tacit knowledge transfer still requires deep immersion and ongoing engagement, guidance, and socialization in social practices that might be difficult, if not impossible, to achieve with technology enablers (Roberts, 2000).

Yet, technology enablers differ greatly in terms of flexibility, access, interaction, mobility, multimedia capability, participation, and degree of informality (Abbott, 2010). Given such a degree of diversity, the relationship between a partner's situational needs and the ability of technology enablers to support these needs must be carefully assessed. The specific design of a technology enabler, especially the user interface, can act as both driver or barrier for the learner to decode explicit information and create meaningful knowledge (Reihlen and Ringberg, 2006). However, interpretation and sense-making of the information provided by any type of technology enabler still depend on learners' individual capabilities. Different types of learners will impact how the same information will be interpreted, understood, utilized, or acted upon. For example, analytics systems become effective enablers only when these tools are able to reduce large amounts of structured and unstructured data and turn this data into meaningful signals that individuals can comprehend, interpret, and act upon (Wedel & Kannan, 2016).

Overall, technology enablers allow supply chain partners to store, access, and transform codified data into useful explicit knowledge more efficiently and effectively as compared to human enablers. Technology enablers have the potential to increase a partner employees' commitment, organizational identification, and championing behaviors by

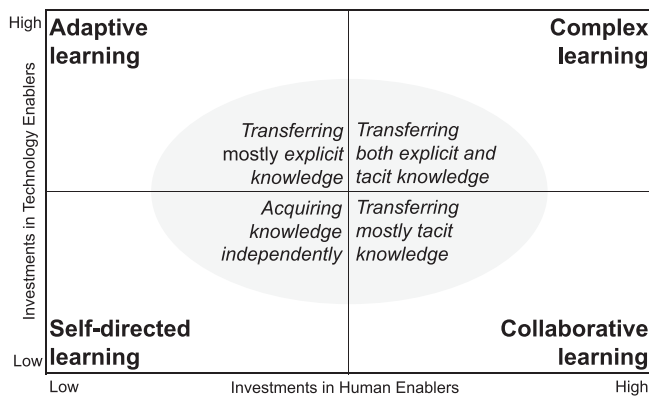


Fig. 1. Strategic enablement investment framework.

promoting a positive culture of sharing explicit knowledge (Li et al., 2018). Overall, we propose:

Proposition 2: Technology enablers are particularly suitable for the efficient and effective transfer of explicit knowledge to supply chain partners.

#### 4. Strategic enablement investments

Strategic investments in human and technological enablers provide different partner learning experiences that impact the resulting transfer of tacit or explicit knowledge. Firms decide on the level of investment in strategic enablement configurations depending on their own and their partners' requirements and industrial context. The resulting learning experiences should fit both the firm's strategic enablement goals and the education needs of partners to enhance the success of both parties. These investments can be either relatively low or high and can be focused on either human or technology enablers. Fig. 1 outlines how strategic enablement investments lead to one of four learning experiences: collaborative, adaptive, complex, or self-directed learning experiences. Although knowledge transfer often involves a combination of both explicit and tacit knowledge, the relative balance of these different forms of knowledge can result in different learning experiences. Each learning experience type is discussed in more detail in the following sections.

##### 4.1. Self-directed learning

*Self-directed learning* experiences are the result of low levels of investments in both technological and human enablers. This configuration of strategic enablement relies on the facilitation of self-directed learning and individual partners' independent acquisition and accumulation, rather than the transfer, of explicit knowledge or tacit knowledge. Self-directed learning refers to the "process in which individuals take the initiative, with or without the help from others, in diagnosing their learning needs, formulating goals, identifying human and material resources, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p18). This is characterized by a high degree of self-reliance as individuals take control and responsibility for the initiation, implementation, and evaluation of the entire learning process (Candy, 1991; Karakas & Manisaligil, 2012).

Previous research shows how self-directed learning is driven by individual determinants such as personal learning strategies and learning styles as well as one's cognition, motivation and self-efficacy beliefs (Farr & Middlebrooks, 1990; Merriam, Caffarella, & Baumgartner, 2007; Warr & Bunce, 1995). However, while individual determinants are found to influence one's intentions to undertake self-directed learning activities, it is the learning environment that triggers and has a stronger impact on the individuals' choice to engage, and also

the magnitude of that engagement, in self-directed learning (Candy, 1991; Hibbert, Winklhofer, & Temerak, 2012; Rager, 2003).

Firms seeking to facilitate self-directed learning should invest in providing favorable conditions for independent development in either online or offline learning environments (Hibbert et al., 2012). These conditions include the provision of learning opportunities, support structures, and learning resources (Confessore & Kops, 1998; Spear & Mocker, 1984) which can be afforded by both humans (e.g., written educational materials) and increasingly by technology (e.g., web-based learning tools, technological devices, or social media tutorials). Instead of relying on significant investments in technological or human enablers, firms interested in supporting self-directed learning should invest in the design of offline as well as digital learning environments. To do so, these environments—irrespective whether they are offline or online in nature—must adhere to several design principles: they need to be user-directed (i.e., in the control of users), extendable (i.e., must allow for considerable modification by users), and supportive to accommodate a wide range of users with different and progressively evolving expertise levels (Fischer & Scharff, 1998). The control system for a self-directed strategy investment will be the factual output by a system known form education.

This strategic enablement configuration is suitable for products and services which are primarily used independently, where the individual is largely in control of when and how they are used. Examples include on-demand, customizable cloud solutions such as Salesforce for customer relationship management purposes or Dropbox for file storage and document sharing, but also access to specialized libraries, offline communities, and online forums. In all cases, users' self-directed learning is facilitated through the provision of user-centered offline or digital environments where they can make independent use of a wide range of available learning resources to accumulate explicit as well as tacit knowledge through engagement in self-directed practices. Hence, we propose:

Proposition 3: Without significant investments in either human or technological strategic enablement, partners' learning environment will consist of independent, self-directed knowledge acquisition.

##### 4.2. Collaborative learning

Strategic enablement investments that focus on human enablers investments with a low level of investment in technology enablers result in *collaborative learning* experiences. Collaborative learning relies on firm employees physically or virtually traveling to supply chain partners to "engage in close interactions that allow them to observe and emulate each other." (Janowicz-Panjaitan & Noorderhaven, 2009, p. 1028). Collaborative learning provides the most benefit when the desired knowledge about a firm's products and services is difficult to codify and record; hence, when it is tacit. This learning is achieved when the firm's and their supply chain partners' employees engage in social practices to share experiences, narratives, stories, and observe each other to transfer tacit knowledge (Inkpen & Dinur, 1998). Even without language, by observing social practices, firms can transfer tacit knowledge to partners through the creation of mental models (Faust, 2007) that reflects the performance rules that underly the successful use of products and services (Nonaka & von Krogh, 2009). Thus, when the knowledge that needs to be transferred to supply chain partners is largely tacit, focusing on human enablers investments promotes social practices that provide "close and intense interaction between individual members of the concerned organizations" (Kale et al., 2000, p. 221).

Collaborative learning experiences are best applied when products and services are dynamic and less standardized, and more importantly, where the sociality for providing products and services is of great importance. For example, collaborative learning can become a valuable output of exchanged practices (i.e., tacit knowledge) among highly specialized partners' employees. Techniques such as real-life stories, case studies, and acted-out simulation from role-playing may



significantly foster social practices and enhance tacit knowledge transfer to partners. Through these and other techniques, human enablers create a learning environment that is characterized by proximity, direct exchange and observation that lends itself towards collaborative learning and tacit knowledge transfer. Such proximity between trainer and learner might also be created through technology, such as video-conferencing or virtual project rooms. However, much research into tacit knowledge transfer confirms that “technologically facilitated communication cannot at present replace the direct face-to-face contact that is often a prerequisite for the successful transfer of tacit knowledge” (Roberts, 2000, p. 434). In sum, we propose:

Proposition 4: When firms aim to transfer primarily tacit knowledge, they should invest in human enablers more than technology enablers to create learning environments that will support collaborative learning.

#### 4.3. Adaptive learning

*Adaptive learning* experiences are the consequence of significant investments in technology enablers and relatively low investments in human enablers. This strategic enablement configuration provides supply chain partners with an environment that supports the transfer of primarily explicit knowledge through automated machine learning, deep learning, or AI learning based on previous partners' experiences without human involvement (Bishop, 2006; Lecun, Bengio, & Hinton, 2015; Mitchell, 1997; Simonite, 2017). These technology enablers adapt the content and sometimes the approach to best suit each individual partner with the aim of bringing a variety of people with different levels of experience up to a high standard to enhance their sales performance.

With current technology, this type of learning is based on the systematic and ongoing adaptation of codified explicit knowledge either by automated self-learning machines in isolation or increasingly in interconnected networked AI systems (Huang & Rust, 2018; Wirtz et al., 2018). For example, consider two partner employees with equal cognitive abilities, one with considerable experience selling a firm's products and one who is new to the industry. A learning environment that promotes adaptive learning experiences could be a digital, AI-supported sales manual or an AR-enabled sales simulation training that constructs and adapts in real time unique combinations of codified learning resources that matches learners' knowledge and skill levels. So, experienced employees, the learning experience would skip some of the basics and display more advanced training materials; however, for new employees, it would take them through everything from the basics to unique combinations of advanced materials depending on each partners' individual learning needs, progress, and situational demands.

Thus, a high level of investments focused on technological enablers can catalyze the transfer, continuous upgrade, and dissemination of codified, explicit knowledge that may outperform the cognitive-analytical abilities of similar investments in human enablers. Formally, we propose:

Proposition 5: When firms aim to transfer primarily explicit knowledge, they should invest in technology enablers more than human enablers to create a learning environment that will support adaptive learning.

#### 4.4. Complex learning

Concurrent, strong investments in both technology enablers and human enablers allow the transfer of tacit and explicit knowledge to create learning environments that will support high degrees in *complex learning* experiences. While requiring costly investment in both human and technology enablers, this strategic enablement configuration can result in complex learning for highly complex products and services. Firms' highly complex offerings (e.g., robotic-assisted surgery, satellite launching services) often have advanced technical specifications and processes that can be codified in a detailed manner (i.e., explicit

knowledge), yet also require a level of use experience (i.e., tacit knowledge).

Research has repeatedly shown that the mere transfer of codified explicit knowledge related to highly complex products and services is not sufficient to enable partners to sell and support a firm's products (Nadler et al., 2003). Even when knowledge is codified, much of tacit elements remain uncoded and consequently “the transfer of codified knowledge alone may fail to facilitate the successful transfer of knowledge” (Andersen, 2000, p. 16). For example, during the First World War, needing an additional supply of their 75-mm guns, the French sent their blueprints to the US. However, the Americans could only produce guns of the required quality after a team of French workmen went to show them how (Roberts, 2000). Hence, it is that additional tacit knowledge transferred through social practices by face-to-face interactions, imitation, and repetition that is needed, combined with explicit knowledge, to fully sell, operate, and support complex products and services (Faust, 2007).

Technology enablers or human enablers alone often fail to capture fully the conditions required for the successful transferring of knowledge for highly complex products and services. For instance, Yates, Orlikowski, and Okamura (1999) report that the effectiveness of a computer conferencing system in a Japanese research and development project group was significantly influenced by the intervention of a few individuals who explicitly engaged in technology–user mediation. For example, consider robotic-led surgery sales representatives who must learn the technical specifications and sales procedures to be successful. However, this is not sufficient as hospital administrators expect not only demonstrations of the product, but also advanced training of their staff to enable the effective use of the product. Thus, even when the end-customer has some level of contact with the manufacturing firm, the sales representatives require a high degree of explicit and tacit knowledge that can only be transferred through complex learning experiences enabled by high investments in both human and technology enablers. Thus, we propose:

Proposition 6: When firms aim to transfer both explicit and tacit knowledge, they should invest in both human and technology enablers to create a learning environment that will support complex learning.

### 5. Developing strategic enablement investment research and practice

In light of the six conceptual propositions developed above, the remaining sections of this paper present a series of priorities for practitioners and academics involved in strategic enablement. Before offering our conclusions, we suggest a future research agenda and outline managerial guidelines based on six important enablement themes: learning environment design, partner motivations, co-creation with learners, customer relationships, performance and monitoring, and contextual factors (see Table 1 for a summary of related research questions and managerial guidelines).

#### 5.1. Towards a research agenda

Research into strategic enablement is rare, and rarer still are investigations regarding the specific investments in human or technology enablers. We identify six areas of inquiry that should be prioritized both by researchers and managers to understand how to best design and evaluate strategic enablement investments to optimize performance and establish effective and enduring relationships with supply chain partners (see Table 1 for a summary of research questions and managerial guidelines).

First, using the propositions developed above as a starting point, future research should consider the implications of learning environment design choices on partners' employees. For example, when designing investments to transfer primarily tacit knowledge (P1) to promote collaborative learning (P4), further studies could assess the

**Table 1**  
Future directions for strategic enablement investments research and practice.

Enablement themes	Related questions for future research	Managerial guidelines
Learning environment design	<ul style="list-style-type: none"> <li>• How can B2B firms optimize the design of self-directed learning environments?</li> <li>• What learning design elements are critical to support autonomous learning?</li> <li>• What types of educational support are best suited for self-directed learning?</li> <li>• How can B2B firms leverage autonomous algorithms to develop insights into optimal adaptive learning environments?</li> </ul>	Learning design for successful strategic enablement needs to reflect both knowledge transfer requirements and learners' preferences.
Partner motivations	<ul style="list-style-type: none"> <li>• What strategies are most effective in motivating partners to engage with technology enablers?</li> <li>• How can firms train human enablers to best support and nurture supply chain partner employee's engagement with strategic enablement investments?</li> </ul>	B2B firms should evaluate the learners' motivations and needs to maximize strategic enablement investments.
Co-creation with learners	<ul style="list-style-type: none"> <li>• To what extent should firms encourage or support communities of practice from their strategic enablement investments?</li> <li>• What are the benefits and costs of co-creating strategic enablement programs?</li> <li>• What capabilities and motivation do partners require to successfully navigate and make beneficial use of enablement programs?</li> </ul>	Depending on context, B2B firms should support or dissuade learners from sharing their new knowledge with other learners.
B2B relationships	<ul style="list-style-type: none"> <li>• What are the key characteristics of B2B relationships that foster collaborative learning?</li> <li>• When does physical human presence better improve learning outcomes and B2B relationships compared to virtual telepresence?</li> <li>• How do relationships with supply chain partners change and develop with different kinds of strategic enablement investments?</li> </ul>	Managers should plan for a change in their relationship with supply chain partners as they engage in strategic enablement investments.
Performance and monitoring	<ul style="list-style-type: none"> <li>• What are the key attributes that human enablers require for successful tacit knowledge transfer to supply chain partners?</li> <li>• How can firms leverage human enablers to efficiently transfer knowledge to supply chain partners?</li> <li>• How can B2B firms balance goal consistency with the dynamic features of adaptive learning platforms?</li> <li>• How would industry benchmarks or other standards improve the effectiveness of strategic enablement investments?</li> </ul>	Strategic enablement program managers need to establish performance targets that focus on knowledge transfer as well as revenue and profit goals.
Contextual factors	<ul style="list-style-type: none"> <li>• How could ethical standards be formed or adopted when deploying a strategic enablement program?</li> <li>• To what extent do contextual factors play in the required quantity of tacit or explicit knowledge for strategic enablement to occur?</li> <li>• What contextual conditions justify the deployment of investments in complex learning environments?</li> </ul>	B2B firms need to understand environmental factors with their partners' contexts to best design strategic enablement programs to maximize return on investment.

learning effectiveness of lesson length, training frequency, knowledge depth, number of lessons, style of learning, or media choices. Whereas, when designing investments to transfer explicit knowledge (P2) to promote adaptive learning (P5), additional investigations could yield important evidence of the learning effectiveness of interface' layout, versatility, adaptability, interactivity, and portability. Researchers could generate insights that would be useful for firms to tailor enablement programs to best support partners' employees in gaining knowledge. Building on existing knowledge transfer research (e.g., [Levallet and Chan, 2019](#)), additional studies would provide insights to direct firms in tailoring enablement programs to best support employees of a supply chain partner in gaining knowledge. For example, in complex learning environments (P6), a more bespoke hybrid approach that carefully balances human and technology enablers might produce a more effective and efficient means of knowledge transfer that is suited for employees where the outcomes are important (e.g., AI-assisted surgeries) or costly (e.g., satellite launches).

Second, research into understanding supply chain partners' and their employees' motivations to engage in strategic enablement programs would be key to their acceptance and commitment. For instance, in a self-directed (P3) or an adaptive learning environment (P5), employees learn without much aid of human involvement, therefore, further investigations into methods of incentivizing continuous learning could be fruitful. For example, this line of research could lead to the development of reward schemes or other types of gamification programs to increase the engagement of partners and their employees ([Robson et al., 2016](#)). These motivations may depend on the power dynamics between the firm and its partners, which may influence successful knowledge transfers ([Roberts, 2000](#)). This could be particularly important when a firm deals with powerful supply chain partners who may have little motivation to learn about the firm's products or services.

Third, future investigations could understand the benefits of co-creating enablement programs between the firm and its partners compared to programs that are solely developed by the firm. This co-creation would facilitate continuous feedback and empower partners to request missing knowledge from the firm. This could also result in the development of communities of practice surrounding the firm's products or services ([Kietzmann et al., 2013](#); [Wenger & Snyder, 2000](#)), especially in collaborative learning environments in which high degrees of tacit knowledge need to be transferred through the facilitation of social practices (P4) However, increased co-creation of enablement programs might likewise lead to heightened motivational and capability demands of supply chain partners, introduce variability, and ultimately discourage learners to acquire and share their knowledge with others ([Frei, 2006](#)). Future research could investigate what it takes for supply chain partners to be ready to effectively engage with suppliers and other partners to jointly design and subsequently use co-created enablement programs; particular those that are geared towards the transfer of tacit knowledge (P4 and P6).

Fourth, B2B relationships span often over considerable lengths of time, thus necessitating the need for continuing research into how strategic enablement program investments fair over long periods. For instance, the relationship with supply chain partners might change in nature with collaborative learning environments (P4) due to the physical collocation or virtual connection of human enablers. Moreover, future studies could identify latent issues with long-term enablement strategies including, for example, when programs need to be renewed, transitioned into a different type of enabler, or when the configuration of tacit or explicit knowledge that needs to be transferred changes.

Fifth, in order to understand the success of strategic enablement investments, comparative studies should be performed to evaluate the performance of different enablement programs. This research could not only assess the efficiency and effectiveness of enablement programs, but

also understand the perceived value of these programs to supply chain partners and the investing firms alike. Moreover, studies could empirically corroborate, compare, and contrast the effectiveness of transfer abilities of tacit knowledge using human enablers (P1) or explicit knowledge using technology enablers (P2) as well as the right mix of investment in human or technology enablers to transfer different configurations of tacit and explicit knowledge in complex learning environments (P6). Furthermore, future research could support firms to benchmark their strategic enablement investments' performances in order to inspire innovation depending on the level of investments in human or technology enablers (P3–P6); particularly in complex, interconnected setting spanning multiple partners (Chandler, Danatzis, Wernicke, Akaka, & Reynolds, 2019).

Finally, as with most other kinds of strategic investments, a host of contextual factors may impact the design and performance of strategic enablement investments. Future research could examine how various features of the industrial context change the nature of these investments, including ethics, norms, relative industry positions (i.e., leading or following), innovation pace, organizational or national culture, and personnel experiences. For example, extreme national conditions may necessitate substantial investments in both human and technology enablers for complex learning environments (P6) that might not be needed under other conditions elsewhere. Likewise, adaptive learning environments (P5) highly rely on an advanced digital infrastructure that might be missing in less developed regions.

### 5.2. Navigating enablement investment strategies

Many B2B firms realize the potential of partners enablement for creating successful, long-lasting relationships. However, investments in enablement have largely been focused on human enablers without capturing the core purpose of an effective enablement strategy, that is, effective and efficient partner learning (Bartel, 1994; De Ruyter et al., 2001; Pelser et al., 2015; Salas et al., 2008) that is enabled through the acquisition and transfer of different knowledge types. This paper argues that human and technological enablement are best suited for transferring either tacit or explicit knowledge, respectively. Then, we explore how investments of relative sizes create different learning environments that can promote four different learning experiences: self-directed, collaborative, adaptive, and complex. Thus, to efficiently and effectively use the firm's resources, enablement investments should be tailored to the specific combination of tacit or explicit knowledge that needs to be transferred to partners' employees.

To maximize expected returns on investments, guided by our conceptual framework, managers must consider a systematic approach to develop and implement effective enablement strategies. First, managers need to assess the educational needs of their partners to best prepare them to sell the firm's products or services. These assessments would highlight strategic priorities that require further enablement. For example, manufacturers that rely on dealer networks for the distribution of their products must ensure that these dealers are not only up to date with the latest product information, but also equipped with any knowledge (e.g., sustainability policies) needed to best serve different end-customers segments.

Second, once the educational needs are clear and shared, managers need to identify the required types of knowledge to be transferred to decide on whether they should rather invest in human or technological enablement. Firms that only invest in human enablement to create collaborative learning environments should question whether their partners' employees require tacit knowledge, or if that should be replaced by (i.e., adaptive learning), or augmented with (i.e., complex learning), technological enablement.

Third, managers should seek appropriate corporate buy-in to ensure they can effectively support strategic investments in either human or technological enablement in the long-term. Strong leadership support and organizational cultures that reward continuous learning and

development are critical to the success of any strategic enablement initiative.

Finally, managers need to support the deployment of human or technological enablement with continuous and dynamic monitoring of performances against set educational needs and organizational objectives. Our strategic enablement investment framework (see Fig. 1) can assist managers in continuously evaluating their current position, identifying evolving learning needs, and further calibrating their investment in strategic enablement.

### 5.3. Concluding thoughts

Strategic enablement of supply chain partners is a key success factor for B2B firms, but how these firms develop and invest in these programs depends on what kind of knowledge needs to be transferred. Specifically, investments in human or technology enablers will depend on the relative focus on explicit knowledge (i.e., know what) and tacit knowledge (i.e., know how). These investments lead to differences in learning environments that can be adjusted and tailored to suit the firm's and partners' needs. We illustrate this complex relationship between human and technology enablers not only to discuss how managers can strategically invest in enablement programs, but also to set a future research agenda. As technology advances in both its sophistication and capabilities, a successful enablement strategy will require managers to understand the balance of strategic investments in human and technology enablers.

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