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Knowledge Needs of Firms: The Know-X Framework For Marketing Strategy

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Abstract In today's knowledge-intensive economy, the acquisition, development, and management of knowledge are fundamental to the survival and growth of firms. Consequently, organizational knowledge has emerged as a potential source of competitive advantage for firms. Specific to the marketing context, research has long since recognized the role of knowledge in effective marketing. Therefore, through a systematic review of organizational knowledge research and the knowledge business environment, this paper (1) identifies different types of organizational knowledge required by firms and develops the know-x framework, (2) discusses exemplars of different types of marketing knowledge products that firms might require, (3) identifies and discusses critical issues and concerns with reference to each of the marketing knowledge types, and (4) discusses the implications of knowledge types (know-x framework) for marketing strategy in general and market orientation strategy in particular. The paper concludes with a discussion of contributions and directions for future research.

Keywords Organizational knowledge · Types of knowledge · Know-x framework · Knowledge needs of firms · Marketing strategy · Market orientation

Introduction

Firms' growing emphasis on knowledge instead of capital and labor coupled with the regenerative aspects of knowledge have contributed to the economy becoming more and more knowledge intensive (Glazer 1991). This implies that the acquisition, development, and management of knowledge for competitive advantages are fundamental to the survival and growth of firms. Given that knowledge is heterogeneously distributed in any competitive environment, some firms may be in a position to capitalize on unique knowledge for financial benefit (Hayek 1945; Hunt 2000). Consequently, knowledge is a source of competitive advantage in both business-oriented and consumer-oriented industries (Erickson and Rotheberg 2009). Accordingly, the timely development and/or acquisition and use of knowledge products could prove crucial for firms to achieve efficiency and/or effectiveness advantages in the marketplace.

Therefore, learning organizations continuously look for external knowledge to fill their gaps so as to remain nimble and competitive. Successful organizations are generally those that, through their development, acquisition, and management of knowledge, adapt to changes in the environment, so that they are able to capitalize on opportunities or defend against competitive threats, both realized and anticipated. In fact, research suggests that knowledge can (1) help sustain competitive advantages (Bauer and Griffiths 1988; Olavarrieta and Friedmann 2008), (2) enhance the quality of innovative products (Forrester 2000), (3) positively influence innovation (Chen and Jing-Wen 2009; Hall and Andriani 2003; Schulze and Hoegl 2008; Wu and Shanley 2009), (4) mediate the relationship between new venture strategy and firm performance (Tsai and Li 2007), and (5) help firms develop dynamic capabilities (Cepeda and Dusya 2007). It is this domain of *knowledge for competitive advantages* that the current research addresses.

As such, various knowledge-based marketing and business strategies have been the focus of researchers for a long time. Research streams in organizational learning (e.g., Hart et al. 2004; Huber 1991; Sinkula 1994), learning orientation (e.g., Baker and Sinkula 1999), market orientation (e.g., Kohli and Jaworski 1990; Narver and Slater 1990; Olavarrieta and Friedmann 2008), and absorptive capacity (e.g., Cohen and Levinthal 1990) focus on an organization's ability to acquire knowledge and to leverage that knowledge to gain competitive advantages. Given that knowledge is a major factor driving business-level capabilities, Ghingold and Jhonson (1997), Von Krogh and Roos (1995), and Gupta et al. (2009) argue that competence development and competitive advantage are closely related, emphasizing that knowledge is the underlying basis for forming competences. With the realization that knowledge is a fundamental source of competitive advantage, firms started investing more into securing knowledge that makes them, through competence development, more efficient and/or effective in the marketplace.

Specific to the marketing context, research has long since recognized the role of knowledge in effective marketing. In fact, even the earliest works (e.g., Shaw 1912; Weld 1916) in marketing emphasize the criticality of knowledge for marketing and call for the study of marketing to develop specialized knowledge. While Weld (1916) focuses on marketing process knowledge and calls for authenticity in the study of marketing, Shaw (1912) addresses the issues of knowledge of human nature and the psychology of individual consumers. In essence, noting the importance of different kinds of knowledge in marketing, Shaw (1912) and Weld (1916) sowed the seeds for the pursuit of market knowledge and marketing knowledge for effective marketing. Over the next century, several researchers explored issues related to the knowledge needed for marketing, and during the latter part, several noteworthy research contributions (e.g., Glazer 1991; Kohli and Jaworski 1990; Menon and Varadarajan 1992; Narver and Slater 1990) addressed the issues of market knowledge and marketing knowledge. Specifically, addressing the notion of knowledge as a source of competitive advantage in marketing, these researchers laid the foundations for how firms can go from market knowledge to marketing knowledge (Madhavaram 2014).

However, many questions still need to be addressed: What are the different types of knowledge required by firms? What are the different types of marketing knowledge products that are currently available? What are the critical issues that concern firms with reference to the different types of marketing knowledge products? What are the implications of knowledge needs of firms and related issues for marketing strategy? This paper attempts to answer these questions through a systematic review of organizational knowledge research and the knowledge business environment. The remainder of the paper is organized as follows. First, going back more than six decades,

we systematically review and summarize extant literature to identify specific types of knowledge required by organizations and develop the know-x framework. Second, we scan the business environment to identify exemplar marketing knowledge products that firms might need. Third, we identify specific issues and concerns of firms with reference to each knowledge type. Fourth, we discuss the implications of firms' knowledge needs and corresponding issues and concerns for marketing strategy in general and market orientation strategy in particular. Finally, we conclude with a discussion of the contributions of our research and future research directions.

Types of organizational knowledge

The sheer number of articles that have taken different viewpoints in their attempts to conceptualize the knowledge construct gives ample evidence that knowledge is an ambiguous concept. This necessitates research that can clarify the concept of knowledge, critically integrate the different perspectives, and facilitate the acquisition, development, management, and use of knowledge by firms. In fact, researchers from disciplines such as economics (e.g., Cohendet 2001; Fransman 1994) and corporate strategy (e.g., Baden-Fuller and Pitt 1996; Grant 1996; Nelson and Winter 1982) began to view a firm as a knowledge processor and as a body of knowledge, respectively. According to these perspectives, the firm is essentially used as a locus of creation, selection, usage, and management of knowledge. This has brought out the need to clarify the concept of knowledge and explore different types of knowledge that firms need.

Over a period of more than six decades, considerable amount of attention has been paid to different types of knowledge (Garud 1997; Hackley 1999; Inkpen and Dinur 1998; James 1950; Kogut and Zander 1992; Nelson and Winter 1982; NiCholls-Nixon 1997; Nonaka 1991, 1994; Polanyi 1962, 1966; Sanchez 1997, 2001; Sinkula 1994; Spender 1996). James (1950) suggests that human knowledge is primarily of two types: "knowledge of acquaintance" and "knowledge about." According to this conceptualization, experience provides immediate knowledge of acquaintance, while knowledge about is the result of the systematic thought that eliminates the subjective and contextual contingencies of experience and extracts the principles that lie behind the knowledge of acquaintance. On the foundations of James's (1950) work, Polanyi's writings (1962, 1966) distinguish between objective and tacit knowledge.

Polanyi (1962, 1966) suggests that an individual's knowledge may be impossible to convey linguistically as individuals may not be aware of their knowledge, nor possess an appropriate repertoire of words to express it (Gedo 1990). The objective knowledge that Polanyi (1962) refers to is the case of a subject (person or group) whose knowledge about a "true

reality," unbiased by personal interpretations, can be transferred to others through written text or speech (McCarthy 1981). On the other hand, Spender (1996) suggests that tacit knowledge could best be understood as knowledge that has not yet been abstracted from practice. Tacit knowledge can be considered to be highly context specific and has a personal quality, which makes it difficult to formalize and communicate (Nonaka 1994). Explicit or objective knowledge can be codified or articulated and hence becomes transmittable in formal, systematic language and includes explicit facts, axiomatic propositions, and symbols (Kogut and Zander 1992).

Nonaka (1990) proposes a further, four-way classification of organizational knowledge: tacit and individual, tacit and collective, explicit and individual, and explicit and collective. Using slightly different terminology, Badaracco (1991) refers to tacit knowledge as existing in individuals and social groups as embedded knowledge. In the marketing literature, Madhavan and Grover (1998) borrow the term "embedded knowledge" from Badaracco (1991) but refer to it as potential knowledge resulting from the combination of the individual team members' stores of tacit knowledge. Indeed, for Crossan et al. (1999, p. 529), knowledge is "embedded in the systems, structures, strategy, routines, prescribed practices of the organization, and in investments in information systems and infrastructure."

That is, as Polanyi's (1966) work notes, we can know more than we can tell. In fact, John et al. (1999, p. 79) note that "even today, violin makers are unable to replicate the Stradivarius violins made by a half-blind, virtually illiterate Italian craftsman more than 100 years ago." On a similar note, for Grant (1996, p. 379), "observation of any work team, whether it is a surgical team in a hospital operating room or a team of mechanics at a grand prix motor race, reveals closely-coordinated working arrangements where each team member applies his or her specialist knowledge, but where patterns of interaction appear automatic. The coordination relies heavily upon informal procedures in the form of commonly-understood roles and interactions established through training and repetition, supported by series of explicit and implicit signals." Accordingly, knowledge can be embedded in processes and organizational culture.

Though tacit knowledge and explicit knowledge both exist within the organization, are they mutually exclusive and collectively exhaustive types of knowledge? Can we organize and clearly divide all our organizational knowledge into tacit versus explicit types? Inkpen and Dinur (1998) argue that although the distinction between tacit and explicit is important, it does not allow for considering any gray areas between completely tacit knowledge and completely explicit knowledge. Therefore, knowledge types must be classified on a continuum that ranges from completely tacit knowledge to completely explicit knowledge (e.g., Hall and Andriani 2003).

Better yet, we propose that it is more valuable to treat tacit and explicit on a component basis.

All types of knowledge, both at the individual and organizational level, could have both tacit and explicit components to them. Also, it is possible for knowledge to have only explicit and only tacit components, to become completely explicit knowledge and completely tacit knowledge respectively. Furthermore, organizations will have to be highly discrete toward knowledge that is completely explicit or completely tacit, as there could be problems of imitability for competitive advantage in case of completely explicit knowledge and problems of communicability for internal knowledge transfer in the case of completely tacit knowledge. Hence, an organization should be careful about knowledge conversions and realize the importance of retaining tacitness of knowledge or explicitness of knowledge in a way that is consistent with its overall strategy.

While one group of researchers has looked at knowledge in terms of tacit versus explicit, another group of researchers has looked at the typology of knowledge with a different perspective (Garud 1997; NiCholls-Nixon 1997; Sanchez 1997, 2001; Sinkula 1994; Whitehill 1997). Sinkula (1994) is one of the first researchers to work on different types of knowledge in the market knowledge context with particular reference to market research information. In the late 1990s, a number of researchers (Garud 1997; NiCholls-Nixon 1997; Sanchez 1997; Whitehill 1997) simultaneously worked on addressing different types of knowledge. In a significant contribution, Garud (1997) distinguishes among *know-how*, *know-why*, and *know-what*, and indicates that they can result from "learning-by-doing," "learning-by-studying," and "learning-by-using" respectively. He also discusses *know-who*, which is subsumed in know-what. Once created, such knowledge may reside in different storage bins such as individuals, organizational routines, manufacturing processes, relationship nexus (connections idiosyncratic to specific relationships), and codified documents (Garud 1997).

Furthering Garud's (1997) research, NiCholls-Nixon (1997) introduces *know-where* and *know-when*, which are usually generated by the corresponding processes of "learning-by-networking" and "learning-by-forgetting." Concurrently, Sanchez (1997) introduced know-how, know-why, and know-what into the competence-based literature. Sanchez (2001) discusses these three different types of knowledge with reference to the learning cycles of a competent organization. Whitehill (1997) adds one more type of knowledge to the combined set of knowledge types that resulted from the works of Garud (1997) and NiCholls-Nixon (1997), *care-why*. This has been discussed as a higher level of knowledge that provides competitive advantage through the organization's shared culture. However, care-why knowledge can be considered a specific form of and can be subsumed under know-why.

Table 1 summarizes all the different types of knowledge and the types of learning that they often result from, along with several examples, and in the next section we describe these types more fully in the form of the know-x framework.

The know-x framework

Know-how

Know-how represents an understanding of the generative processes that constitute phenomena (Garud 1997). This essentially refers to knowledge about how to perform a task consistently. This knowledge is often a result of learning-by-doing, which implies that it is accumulated through experience over time. Know-how results from the kind of learning that creates the "repeatable pattern of action" that competence-based theory refers to as capabilities. This know-how is similar to what Sinkula (1994) describes as procedural knowledge and/or augmented knowledge. While the former corresponds to "here's what really happens," the latter corresponds to "here's what we should do to change it." Know-how developed within the organization usually becomes embedded in routines that organizations can perform on demand (Nelson and Winter 1982).

As know-how resides in organizational routines and individuals, some portion of it may remain tacit. In fact, Leonard (2005, p. 38) notes that, in the context of "deep smarts"—or "the contents in the heads of experts that enable them to make swift, wise decisions based on years of experiences" —walking out the door, firms need to identify, nurture, retain, and transfer know-how to remain competitive. For example, in the context of key account management for business-to-business offerings, if the sales managers leave, firms run the risk of losing major accounts.

Know-why

Know-why represents an understanding of the principles underlying phenomena (Garud 1997). As Sanchez (1997) points out, learning by analysis helps to develop more theoretical know-why, an understanding about why doing certain things enables a given task to be accomplished. Since know-why is usually stripped down to fundamental beliefs, the likelihood of know-why to leak out is usually inevitable. Know-why can easily be thought of as axiomatic knowledge and/or deutero knowledge that corresponds to "this is why it happens" and the ability of an organization to look inward, to learn, respectively. Organizations that develop know-why establish an additional "double-loop" learning routines for changing how they perform their tasks (Argyris and Schön 1978). If and when organizations establish this form of know-why, there could be some tacit component.

In addition to such scientific and technological know-why, research has also explored questions such as why some individuals in organizations are more committed to strategic goals than individuals in other organizations. Whitehill (1997) contends that a possible reason is "communal knowledge" that develops from organizational culture. Quite possibly, this care-why (a form of know-why) knowledge could develop from "learning-by-studying" organizational culture and "learning-by-being" an active participant in organizational activities that go beyond individual job descriptions. Moreover, knowledge shared by organizations at the levels of culture, beliefs, and values is powerful and difficult to duplicate. Whitehill (1997) subsequently proposes that this care-why knowledge eventually cascades down and influences all other types of knowledge. Anderson (2000) notes that it is more important for organizations to develop the "knower" than to develop what is known, and goes on to advise organizations not to over-invest in know-what, when care-why is what matters most.

Table 1 Different types of knowledge within an organization: the know-x framework

Types of knowledge (know-x)	Definition: Knowledge of …	Often, a result of learning by …	For example,
Know-how (Garud 1997; Sanchez 1997, 2001)	How to perform a task consistently	Doing	Procedural knowledge, Augmented knowledge, Deutero knowledge (Sinkula 1994)
Know-why (Garud 1997; Sanchez 1997, 2001; Whitehill 1997)	Principles underlying phenomena; why employees should care about their firm and the firm's communal goals	Studying Being	Axiomatic knowledge (Sinkula 1994); Communal knowledge (Whitehill 1997)
Know-what (Garud 1997; NiCholls-Nixon 1997; Sanchez 1997, 2001; Whitehill 1997)	Kinds of phenomena worth pursuing; Entities such as customers, competitors, suppliers, and/or channel partners for developing new knowledge	Using	Dictionary knowledge, Episodic knowledge, Endorsed knowledge (Sinkula 1994); Collaboration knowledge, Encoded knowledge (Whitehill 1997)
Know-where (NiCholls-Nixon 1997)	Where to look for supplementing existing knowledge base	Networking	Process knowledge (Whitehill 1997)
Know-when (NiCholls-Nixon 1997)	When to adopt emerging, new knowledge and entering new markets	Forgetting	Industry foresight (Hamel and Prahalad 1994)

Know-what

Know-what is a type of knowledge that represents an appreciation of the kinds of phenomena worth pursuing, and it usually results from "learning-by-using." For example, with complex business-to-business products, customers invariably use them in ways different from how they were produced (Garud 1997). Accordingly, learning occurs through interactions between customers and producers and can potentially result in improved products. This learning results in knowledge specific to the kinds of phenomena worth pursuing. Firms such as GE Healthcare have encouraged customers to alter their products so they can be made better. The concept of lead-user based innovation elaborates on how firms offer better products by allowing their lead users to provide usage-based feedback during the early stages of product development (Von Hippel 1984). This type of knowledge corresponds to endorsed knowledge, episodic knowledge, and dictionary knowledge as proposed by Sinkula (1994). While dictionary knowledge and episodic knowledge are characterized by "what is?" and "what has been?" respectively, endorsed knowledge is characterized by "this is what the organization says." This form of know-what learning that has relevance to "what is the espoused way of doing things?" must also be shared within the organization to gather support for the organization to undertake new kind of activities. As noted by Garud (1997), know-what often resides at the nexus of the relationship between producers and customers and is not just resident at either of these nodes. Since this knowledge is embedded in firm–customer relationships, it is likely that know-what has a tacit component.

As knowledge of what customers want implies a knowledge of who these customers are, Garud (1997) subsumes know-who under know-what. This also implies that know-who can be a result of "learning-by-using." Possible parallels of know-who are dictionary knowledge and episodic knowledge, which can be respectively characterized in questions such as "what is?" and "what has been?" with respect to descriptions of, for example, market segments. Know-who could be an essential part of know-where and know-when in order to gain comparative advantages. In short, organizations need knowledge such as know-who, know-where, and know-when to possess new know-how or to supplement existing know-how to address problems. Specifically, Wagner and Hansen (2004) note that analyzing the influence of substitute products, in terms of specific product attributes that a customer group considers, can surface previously hidden or latent customer needs.

Know-where

Know-where can be described as knowledge about activities of other firms, possibly competitors, who may serve as valuable alliance partners in the creation and development of the firm's internal stock of know-why and know-how (NiCholls-Nixon 1997). It is distinct from know-how and know-why because it is more about learning "who is doing what" and less about learning principles and procedures. Thus, the firm develops insights and can make appropriate choices about where to go to supplement its knowledge base. Accordingly, this know-where often is a base on which alliances can provide a comparative advantage. Furthermore, it is relevant even within the organization when cross-functional activities are taken into consideration. Whitehill (1997) suggests that process knowledge related to cross-functional and alliance activities and interactions leads to competitive advantages. The learning associated with development of know-where is facilitated through "learning-by-networking," for example, from participation in research consortia, conferences, trade shows, etc. (NiCholls-Nixon 1997). This kind of knowledge can also be internal to the firm if the firm has several strategic business units and/or operates in multiple markets. For example, for Hirunyawipapda et al. (2010), cross-functional integration teams involving workers with multiple forms of functional knowledge are critical for new product development. Overall, know-where involves learning about the universe of possible partners that could be used to access and/or co-develop new know-how and know-why, in terms of their capabilities and compatibility as strategic partners.

Know-when

Know-when corresponds to knowledge about the timing of firm actions. NiCholls-Nixon (1997) discusses know-when in the view of the emerging technological regime. That is, knowing when to adopt emerging technologies could provide firms with potential competitive advantages. In addition to the area of technological developments, know-when helps organizations make good decisions about market and competitor developments: *when* to (a) adopt a competing technology or new strategy and/or (b) enter an emerging market based on new technologies, new products, new marketing strategies. This type of knowledge is often an outcome of what Hamel and Prahalad (1994) term "industry foresight": the ability to visualize the direction of tomorrow's market. NiCholls-Nixon (1997) argues that know-when precedes the development of know-what and adds that know-when involves "learning to forget" or abandoning the managerial frames that bind individuals to an established way of doing things. Accumulation of know-when is also facilitated by the formation of strategic alliances as a means of opening windows on new technology and marketing strategy developments and creating "options" to exploit these developments (Hamilton 1986). Furthermore, Zhang et al. (2009) suggest how the enhanced use of customer, competition, and technology knowledge

can lead to market success of new products in multinational firms' subsidiaries in China.

Next, we turn our attention to identifying exemplar marketing knowledge products that firms might need. It should be noted that the list in Table 2 is for illustrative purposes and is not exhaustive.

Exemplar marketing knowledge products and related critical issues

In the previous section, based on extant research, we outlined the know-x framework in the context of firms' knowledge needs. Although the know-x framework is relevant to all kinds of organizational knowledge, we narrow our discussion to marketing knowledge from here on.

In today's hypercompetitive knowledge economy, it is critical for firms to constantly look for gaps in their knowledge to acquire and/or develop new knowledge, but it is often impossible for firms to possess all of the required knowledge for their survival and growth. As can be seen in Table 2, there is a wide variety of knowledge products available in the market to assist with the specific marketing knowledge needs of firms. In the next sections, we discuss examples of these products and related critical issues for each of the knowledge types in the know-x framework.

Know-how

In terms of marketing know-how, expert advice, capability building programs, and training programs are knowledge products that can prove invaluable for firms. Specifically, firms might need know-how in terms of marketing plans, marketing analytics, integrated marketing communication strategy, and enterprise resource planning (ERP) for marketing. Having helped many organizations with different needs and in different contexts, expert consultants can have valuable know-how to offer. As shown in Table 1, know-how is often a result of learning-by-doing and therefore is reflected in the knowledge products that require accumulated experience over time. For example, statistical software for marketing analytics and ERP know-how for marketing will require firms to learn-by-doing.

Along with the realization that knowledge can be a fundamental source of competitive advantage, firms have started

Table 2 Types of knowledge, exemplar knowledge products, and critical issues

Knowledge type	Exemplars of relevant knowledge products	Critical issues
Know-how	- Expert advice	- Complexity of requirements
	- Capability building programs	- Customization
	- Training programs	- Culture
	- Manuals	- Generalizability of normative recommendations
Know-why	- Books	- Validity
	- Articles in academic journals	- Generalizability
	- Consultation	- Applicability
	- Research reports	- Methodologies
	- Market orientation programs	- Organizational culture
	- Green marketing programs	- Internal market orientation
Know-what	- Best practices	- Sticky knowledge
	- Knowledge repositories	- Path dependency
	- Knowledge repository technologies	- Idiosyncratic learning
	- Infrastructure for knowledge sharing	- Consumer black box
	- Consumer expenditures	- Shortcomings of methods
	- Consumer panels	
Know-where	- Knowledge of competitors	- Non-exclusivity
	- Research consortia	- Causal ambiguity
	- Conferences	- Guarded display
	- Trade shows	- Should be updated and improved as a diagnostic tool
	- Industry Exhibitions	
Know-when	- New technologies	- Validity
	- Market development reports	- Resource commitment
	- Knowledge of competitor actions	

investing more resources into securing knowledge that makes them more efficient and/or effective in the marketplace. Subsequently, the *complexity* of firms' requirements has gone up. For instance, given the differences among firms in size, scope, context, and structure, knowledge requirements will widely vary. Often, the development of knowledge products that firms need requires the coordinated efforts of individuals with specialized knowledge and skills, and knowledge products have emergent properties during development, i.e., unpredictable and unexpected events and interactions often occur during development. That is, the complexity of firms' requirements is often reflected in the breadth of knowledge and skills required to produce such knowledge products.

In addition, given the dynamic and hypercompetitive nature of the economic environment, firms want knowledge offerings that are *customized* to their unique requirements. For example, if a firm requires a capability building program to become market oriented, the program requires customization to the specific firm needs in terms of market intelligence generation, dissemination, and organization-wide responsiveness. That is, different firms need different capabilities in their capability building programs, as some firms need more help with market intelligence generation aspects while others need more help with dissemination and responsiveness. Furthermore, firms' *cultures* could become critical to the success of capability building programs. For instance, culturally, it may be more challenging for some firms to be market oriented than others. Also, the know-how products available in the market could bring up the issue of the *generalizability of normative recommendations* for firms. For example, expert advice published in business journals often comes with broad, normative recommendations.

Know-why

As to know-why knowledge that concerns principles underlying phenomena, books, articles in academic journals, consultation, and research reports can provide marketing managers opportunities for learning-by-analysis. For example, a business-to-business firm exploring the adoption of customer lifetime value (CLV) framework could learn the principles underlying the CLV phenomenon through articles like Kumar (2006, 2008) and Kumar et al. (2008). In addition, products like market orientation programs, green marketing programs, and workplace spirituality programs could influence firms in terms of culture, values, and beliefs. For example, firms like Aetna International, Taco Bell, Wal-Mart, Southwest Airlines, Xerox, and Deloitte and Touche have already recognized the usefulness of spirituality in the workplace including its effect on firm practices such as customer service and inter-functional coordination. Specifically, Milliman et al. (1999) examine the spiritual-based values that guide organizational goals and practices, and note that

Southwest Airlines emphasizes a sense of community by encouraging "teamwork, serving others, and acting in the best interests of the company" (p. 221). As Anderson (2000) notes, care-why (a specific form of know-why) is a critical knowledge type that could prove more important than other types of knowledge.

Specific to know-why products, the critical issues for firms include the appropriateness of *methodologies* used, the *validity* and *generalizability* of the findings, and the *applicability* to specific contexts. Sometimes the methodology used for a particular research report could be faulty, such as inappropriate, qualitative methodology with very few respondents instead of an appropriate, quantitative methodology involving a large number of respondents. In such cases, the findings cannot be generalized. At other times, even when appropriate methodologies are used, the research instruments used and how well the research was done bring the validity of the findings into question. In addition, even in cases where the findings are generalizable, when know-why is used by specific firms, applicability to specific context should be under scrutiny.

With regards to care-why (a form of know-why) knowledge, for example, if a firm decides to implement a new, green marketing program, two issues could be highly relevant. First, organizational culture provides a foundation for such care-why knowledge and, perhaps, should be given serious consideration when using this knowledge. Second, *internal market orientation* refers to the strategies and programs that the firm implements in its internal market (employees at all levels) in order to attain its external market objectives. For example, although the competitive spirit among the employees of grocery retailer Giant Eagle seemed incompatible with the implementation of a new knowledge management system that required collaboration, the realization of bottom-line benefits of sharing knowledge propelled employees over their initial misgivings (Paul 2007). This can prove critical to firms' use of care-why knowledge.

Know-what

With reference to marketing know-what, knowledge products like marketing best practices in specific industries, market knowledge repositories, knowledge repository technologies, and infrastructure for marketing and market knowledge sharing are available. Best practices in specific industries can help firms focus on the kinds of (marketing) phenomena worth pursuing. For example, firms could decide on pursuing CLV framework and corresponding technologies based on best practices in the industry. Specific to market knowledge repositories and knowledge repository technologies, products might require firms to learn-by-using. Infrastructure for knowledge sharing that has human as well as technology components usually requires firms to learn by repeated use for achieving

efficiency and effectiveness. With regard to know-who (subsumed under know-what), details on consumer expenditures by the Bureau of Labor Statistics and access to consumer panels by market research firms like ACNielsen inform firms about what their customers want. Analyses of consumer expenditures could provide firms engaged in recreational travel, ideas with reference to the timing of their new product introductions. Similarly, analyses of data from consumer panels could give insights into timing of marketing communications. In fact, know-who helps firms in assessing and securing other types of organizational knowledge. For example, knowing customers could lead firms to acquire new kinds of know-how in the marketplace.

Specific to know-what products, firms face three critical issues. First, when knowledge of best practices is brought into firms, they could face challenges with reference to knowledge transfer, i.e., *sticky knowledge*. When there is an attempt to transfer knowledge, some knowledge sticks and some doesn't, depending on specific contexts of firms. Second, what firms do is a function of their history and the paths they have taken to their current, competitive positions in the marketplace. Such *path dependency* could hinder bringing in and using new knowledge. As Crossan et al. (1999, p. 530) note, such path dependency could lead to "tension between the embedded institutionalized learning from the past, which enables it to exploit learning, and the new learning that must be allowed to feed forward through the processes of intuiting, interpreting, and integrating." Third, learning is often *idiosyncratic*, i.e., unique to the individuals that are responsible for bringing in the new knowledge into the firms and, at times, to the firms.

Concerning know-who knowledge that involves understanding what customers want, firms often encounter issues such as consumer black box and shortcomings of methods. The issue of *consumer black box* concerns making inferences about consumer behavior based on consumers' exposure to various marketing strategies. This raises questions about consumer expenditures and buying behavior. Can these be linked to specific marketing strategies of firms, i.e., do marketing efforts account for the variance in consumer behavior? Furthermore, potential shortcomings with reference to the methods used for examining consumer panels and the validity of the panels themselves are critical to the usefulness of such knowledge. For example, several business-to-consumer and business-to-business panels, are online and there is no way to verify the credentials of the respondents.

Know-where

As noted in Table 1, know-where is a result of learning-by-networking. Accordingly, research consortia, conferences, trade shows, and industry exhibitions provide firms opportunities to network and learn. Such opportunities can prove extremely useful for firms seeking suppliers and partners for joint ventures and alliances. In fact, Hau and Evangelista (2007) and Hall and Andriani (2003) suggest that knowledge acquired from such networking can positively influence new product development. For example, Porsche collaborates with universities on projects for which it lacks the requisite knowledge (Harryson and Lorange 2005).

With regards to know-where, the issues that are critical to firms are: non-exclusivity, causal ambiguity, and guarded display. As know-where is a result of learning-by-networking, firms should be wary of the *non-exclusivity* issue, i.e., nothing is exclusive between the focal firm and the network participants. Furthermore, when firms go to trade shows, industry exhibitions, research consortia, and conferences, they can potentially learn about their competitors and suppliers and what they are doing. However, there can be issues with *causal ambiguity*. For example, there could be causal ambiguity with reference to how competitors put together resources for producing certain market offerings. In addition, the competitors could be resorting to *guarded display*. That is, firms exhibiting their products have control of what they display and what they do not display.

Know-when

As know-when is often a result of learning-to-forget (see Table 1), new technologies, market development reports, and knowledge of competitors' actions offer firms opportunities for adoption of new technologies, new product development, and new product introductions. For example, knowledge of competitors' acquisition of technology and other resources for adopting and implementing marketing analytics could help a firm in determining when it should go for similar strategies.

For know-when knowledge that concerns technological, market, and competitor developments, firms face challenges with reference to validity and resource commitment. Specifically, market development reports raise *validity* issues because they involve visualizing the direction of tomorrow's market. Furthermore, given that technological, market, and competitor developments require firms to change their strategic orientation based on new technologies, new products and new marketing strategies of competitors, firms are required to make substantial *resource commitments*.

Implications of the know-x framework for marketing strategy

Know-x framework and general marketing strategy

Drawing from Ramaswami et al. (1993), at a macro level, marketing strategy entails the following: breadth or diversity

of target markets, breadth and stability (frequency of addition/deletion/modification) of offerings, innovation strategy (degree and type of emphasis provided for innovation), speed of response to environmental opportunities, extent of environmental monitoring (about customers, competitors, and technological developments), and resources for environmental monitoring. Based on the preceding discussion of types of knowledge, it can be seen that different elements of marketing strategy require different types of knowledge. For example, (1) breadth and diversity of target markets requires know-what (knowledge of customers); (2) breadth and stability of offerings involve know-when (when to add/delete/modify) and know-how; (3) innovations strategy requires know-why (principles underlying phenomena), know-what (kinds of phenomena worth pursuing), know-where, and know-how; (4) speed of response to environmental opportunities requires know-when and know-how; (5) extent of environmental monitoring requires know-what (customers, competitors, and technological developments) and know-how; and (6) resources for environmental monitoring requires know-when (timing of resource commitments). However, the specifics of marketing strategies will vary widely based on the kinds of offerings that firms deal with. For example, consider two of the critical issues identified with firm needs: complexity of firms' requirements and customization. If firms require highly complex knowledge offerings for their marketing strategies, they may require highly customized knowledge products. For example, if a firm dealing with cloud computing services decides on entering a new market and would like to commission a market potential estimation report with recommendations for commercialization of their services, its requirements involve a high degree of customization.

Accordingly, product market strategy that concerns how firms intend to compete in the markets they choose to serve can have specific knowledge needs. For Yarbrough et al. (2011), product market strategy typically involves two fundamental decisions: (1) extent to which a firm wants to target broad groups of customers or to focus more narrowly on a smaller number of segments and (2) the value proposition to be delivered, which concerns the benefit/cost bundle by which a firm seeks to attract and retain target customers and achieve its strategic objectives. Furthermore, "Value propositions comprise two core product market strategy components: (1) the relative superiority of the business's product and/or service offerings … and (2) the cost of delivering its products and/or services to target customers" (Yarbrough et al. 2011, p. 557). Therefore, the two fundamental decisions require different kinds of knowledge. While the first decision of targeting groups of customers requires know-what (customers and competitors), the second decision regarding value proposition requires know-how of superior offerings development, resource deployment, and achieving efficiencies in delivering the offerings.

There are two issues relevant to marketing strategy in the context of multimarket competition: product line rivalry and market entry. When firms have similar product lines of similar breadth (number of products) targeted at similar market segments, product line rivalry in the context of multimarket competition emerges (Jayachandran et al. 1999). Product line rivalry is competitive actions and reactions taken by firms with one another using groups of products within a product class that are closely related because they function in a similar manner or are sold to the same customer groups or marketed similarly (Jayachandran et al. 1999). If firms with similar product lines come into greater contact with each other, product line rivalry may be influenced by multimarket competition and the product lines could evolve to become more similar and greater multimarket competition may reduce the competitive intensity. However, before this mutual forbearance takes effect, firms may extend their product lines to different markets in pursuit of growth or entry deterrence for competitors (Jayachandran et al. 1999). This could prove quite challenging as firms seek to avoid evolving similarities among competitors' product lines and pursue continuous growth through expansion. Therefore, firms need (1) know-what (customers, competitor actions) and know-how (effective marketing) with regards to product line rivalry and, as a result, (2) know-when for market entry.

In responding to the market environment, marketing should be positioned at the core of the firm's strategic planning (Vargo and Lusch 2004). That is, the most successful organizations are those whose core competence is marketing and all its market sensing processes (Day 1999). For Menon et al. (1998, p. 21), marketing strategy making involves "an interconnected set of activities, processes, and routines involved in the design and execution of marketing plans." Similarly, Slotegraaf and Dickson (2004, p. 373) define marketing planning capability as "the ability to anticipate and respond to the market environment in order to direct a firm's resources and actions in ways that align the firm with the environment and achieve the firm's financial goals." Marketing planning capability positively influences firm performance and involves competencies in market scanning, market situation/environment analysis, matching firm strengths to market opportunities, meshing programs to market realities, implementing marketing programs, marketing budgeting/allocating resources, and program performance tracking. Such a capability should be central to marketing strategy in the context of the dynamism of the market. However, market dynamism also necessitates firms being nimble in their strategies. Specifically, Johnson et al. (2003, p. 77) conceptualize and define market-focused strategic flexibility as "the firm's intent and capabilities to generate firm-specific real options for the configuration and reconfiguration of appreciably superior customer value propositions." That is, capabilities and intent are two components of market-focused strategic

flexibility. For them, firm capabilities involve the identification of resources, the acquisition of resources, the deployment of resources, and the identification of options. Both strategic planning for marketing and market-focused strategic flexibility focus on marketing know-how (capabilities).

In summary, the preceding discussion of marketing strategy, product market strategy, strategic planning for marketing, and market-focused strategic flexibility clearly demonstrates that firms require knowledge with reference to: (1) know-how (innovation capability, product development, marketing communication, segmentation, marketing planning, design and execution of marketing programs), (2) know-why (environmental scanning and market sensing), (3) know-what (target markets, marketing resource deployment practices), (4) know-where (knowledge of competitors and suppliers), and (5) know-when (knowledge of competitor actions and reactions, technological developments). Next, in addition to the implications of know-x framework for marketing strategy in general, we turn our attention specifically to market orientation strategy Table 3.

Know-x framework and market orientation strategy

The fundamental imperative of market orientation (MO) strategy is that, to achieve competitive advantage and superior financial performance, firms should systematically (1) gather information on present and potential markets and (2) use such information in a coordinated way to guide strategy recognition, understanding, creation, selection, implementation,

Table 3 Market orientation (MO) strategy and the know-x framework

Knowledge type	Exemplars of knowledge and corresponding sources
MO know-how	Market knowledge competence (Li and Calantone 1998)
	Customer response capability (Jayachandran et al. 2004)
MO know-why	MO culture (Narver and Slater 1990)
	MO and Entrepreneurial drive (Slater and Narver 1995)
	Customer, innovation, and employee consequences (Kirca, Jayachandran, and Bearden 2005)
MO know-what	Customer and competitor knowledge (Kohli and Jaworski 1990)
	External market factor knowledge (Matsuno et al. 2005)
	Context specific market participant knowledge (Homburg et al. 2009)
MO know-where	Inter-firm relational learning (Wind and Mahajan 1997)
	Co-creation related learning (Kroll 2006; Vargo and Lusch 2004) Stakeholder learning (Harryson and Lorange 2005)
MO know-when	Learning to forget (NiCholls-Nixon 1997)
	Industry foresight (Hamel and Prahalad 1994)
	Organization-wide responsiveness (Kohli and Jaworski 1990)

and modification. Essentially, MO strategy is a form of knowledge-based strategy that focuses on developing knowledge resources that can facilitate reactive as well as proactive innovations. Prominent among the several research articles that have conceptualized and measured MO are the ones by Narver and Slater (1990) and Kohli and Jaworski (1990). For Narver and Slater (1990), MO consists of three behavioral components: customer orientation, competitor orientation, and inter-functional coordination. While customer orientation and competitor orientation include all of the activities involved in acquiring information about the buyers and competitors in the target market and disseminating it throughout the business(es), the third behavioral component, interfunctional coordination, is based on the customer and competitor information and comprises the business's coordinated efforts. For Kohli and Jaworski (1990), the components of MO are: (1) organization-wide generation of market intelligence pertaining to current and future customer needs, (2) dissemination of the intelligence across departments, and (3) organization-wide responsiveness to it. We note that, for firms, such MO is a prerequisite for survival and growth.

Specifically, MO strategy refers to a strategic process that includes (1) identifying sources of market intelligence generation (internal and external), (2) gathering market intelligence, (3) developing infrastructure, technology, and policies for efficient and effective sharing and use of market intelligence, (4) coordinating the use of market intelligence in a manner that benefits the entire organization, (5) assessing the existing resource pool and ascertaining and securing the required resources based on the market intelligence, and (6) developing, implementing, and revising marketing mix strategies in response to the market intelligence (that is, strategies corresponding to products, marketing communication programs, distribution, and pricing). In the next few sections, we explicate MO strategy using the know-x framework.

MO and know-how How does a firm go about adopting and implementing an MO strategy? What kind of know-how does a firm need for MO strategy? Once the firm realizes the differences between how things are done within the firm and the market-oriented way of doing things, what kinds of know-how does a firm need? Extant research provides specific guidelines. For Shapiro (1988), in market-oriented firms, information on all important buying influences permeates every corporate function. Strategic and tactical decisions are made inter-functionally and inter-divisionally, and divisions and functions make well-coordinated decisions and execute them with a sense of commitment. Li and Calantone (1998, p. 14) refer to *market knowledge competence* as "the processes that generate and integrate market knowledge." *Processes* imply a series of activities that involves interconnected bundles of skills and collective learning. For Li and Calantone (1998),

market knowledge competence has three components: customer knowledge process, marketing-R&D interface, and competitor knowledge process. These processes and the corresponding strengthening of the marketing and product development interface can prove invaluable. Furthermore, for a firm's market-oriented success (Jayachandran et al. 2004), a competence in satisfying customer needs through effective and quick responses is critical. Therefore, they conceptualize customer response capability in terms of *customer response expertise* and *customer response speed*. While customer response expertise refers to the extent to which the responses of an organization effectively meet customer needs, customer response speed refers to the extent to which the organization's responses to customer needs are rapid. These provide specific directions on how to start thinking about MO. However, when firms do bring in know-how related expert advice, a detailed exploration with reference to generalizability of normative recommendations should be developed. Here, elaborating on firm situations and contexts where the know-how might work and where it will not is important.

MO and know-why For firms interested in MO strategy, it is critical to understand why certain processes and activities enable superior performance through MO. In fact, Narver and Slater's (1990) conceptualization of MO is perceived to be cultural in orientation that captures the fundamental beliefs undergirding MO as a set of behaviors involving customer orientation, competitor orientation, and inter-functional coordination. Subsequently, Slater and Narver (1995) find that MO, complemented by an entrepreneurial drive, provides the cultural foundation for organizational learning. In addition, it is also important to ensure employees in firms remain committed to MO goals. As Kirca, Jayachandran, and Bearden (2005) note, MO can have the following positive consequences for firms: customer consequences (quality, loyalty, satisfaction), innovation consequences (innovativeness, new product performance), and employee consequences (organizational commitment, team spirit, customer orientation, role conflict, job satisfaction). Any of these consequences can be used to encourage and bring together all of the employees to stay committed to MO. However, when know-why is brought in, the methodologies that were used and the validity and generalizability of the findings should be assessed through critical review of the limitations of the methodologies, sample relevance and appropriateness, validity of methods, and implications for firms. Accordingly, firms should be judicious in how they learn-by-analysis.

MO and know-what A critical component of MO is the knowledge of the market's preferences. Early on, much of the MO research focused primarily on customers and competitors. However, Matsuno et al. (2005) extended the scope of the market factors to include customers, competitors,

suppliers, regulatory factors, social/cultural trends, and macroeconomic environment. Among these market factors customers, competitors, and suppliers are market participants, while social, cultural, regulatory, and macroeconomic factors are influencing factors. Therefore, knowledge of market participants as well as of influencing factors can prove critical to a firm's MO strategy. While the accurate assessment of market participants and their needs and preferences can be central to MO strategy, firms need to pay particular attention to their contexts. For example, in service-oriented firms, customer need knowledge in frontline employees is critical to achieving firm objectives through customer satisfaction and value perceptions (Homburg et al. 2009).

With reference to know-what, firms often learn-by-using. In such cases, as noted earlier, sticky knowledge, path dependency, and idiosyncrasy can be critical. Firms can overcome these issues by explicitly addressing (1) the path dependency issue through careful assessment, adding and deleting certain components to the knowledge, and developing training programs for the employees, (2) the sticky knowledge issue through periodic knowledge transfer audits and by developing and providing supplemental knowledge to ensure the knowledge transfer, and (3) the idiosyncrasy issue through development of knowledge unique to employees and firms by using surveys of employees, orientation programs, and periodic reviews of the employees' knowledge to ensure learning through usage.

MO and know-where As know-where concerns knowledge of "who is doing what," it is very important for MO. Know-where involves learning about all possible partners that could be used for new product development or new marketing knowledge. Therefore, learning can occur from interactions and partnerships with customers, competitors, suppliers, and other stakeholders. For example, in the context of technology-intensive markets, interfirm collaborative relationships influence the marketing strategies firms use to develop and introduce new products (Wind and Mahajan 1997). For Vargo and Lusch (2004), one of the foundational propositions of the new dominant logic of marketing is that "the customer is always a co-creator." Therefore, if a firm is truly market oriented, then it should develop a co-creation capability for MO purposes. This potentially can help firms in their product development efforts. Consistent with this view, firms such as GE HealthCare have encouraged users to alter their products so that they can be made better (Kroll 2006). Hence, such co-creation processes involve close communication and joint problem solving and coordinating activities with customers. Going beyond the immediate stakeholders, as noted previously, Porsche routinely collaborates with universities on projects for which it lacks the requisite knowledge (Harryson and Lorange 2005).

Specific to know-where, which is often a result of learning-by-networking, firms should get involved in trade shows,

industry exhibitions, research consortia, and conferences while maintaining a very delicate balance between their knowledge needs and knowledge sharing. Often, in such contexts, competing firms want to learn from others while guarding their own knowledge. Consequently, the issues of non-exclusivity, causal ambiguity, and guarded display oftentimes need to be left alone to the discretion of participating firms. However, when it comes to non-competing firms, for example firms and potential suppliers, firms can address the issues of non-exclusivity, causal ambiguity, and guarded display by organizing special sessions in enclosed areas and facilitate free, uninhibited exchange of knowledge.

MO and know-when One of the biggest challenges of MO is to prompt *proactive innovation* by enabling firms to anticipate potential market segments, envision market offerings that might be attractive to such segments, and prompt the need to acquire, develop, or create the required resources to produce the offerings. Therefore, know-when can help firms in decisions regarding adoption of new technologies and strategies, development of radical new products, development of new marketing strategies, and entry into new markets. However, as noted previously, such knowledge involves abandoning the established ways of doing things, i.e., "learning–to-forget." Therefore, with regards to know-when related knowledge concerning technological, market, and competitor developments, firms will have to carefully address the issues of validity and resource commitment. Given that this kind of knowledge involves anticipating developments and acting on them, firms should ensure the validity of their knowledge products, i.e., the validity of the methods, samples, analyses, and inferences that went into the development of knowledge products. As such knowledge could require firms to change their strategic orientation and commit substantial resources to strategy development and execution, firms need to qualify such knowledge to gain confidence.

Discussion

Contributions

Since inception, research in marketing has recognized knowledge as source of competitive advantage (Shaw 1912; Weld 1916). As noted, during the latter part of the past century, several noteworthy research works on knowledge have emerged. Specifically, exploration of the consequences of increasing knowledge intensity for marketing (Glazer 1991) and research into marketing orientation as a knowledge-based strategy (e.g., Kohli and Jaworski 1990; Narver and Slater 1990) have made significant contributions to this stream of research. While Glazer (1991) develops a particular operationalization of

the value of knowledge in marketing contexts that is used to develop propositions examining the consequences of increasing knowledge intensity for firm strategy and organizational structure, with the exception of know-how, his work does not address the issue of different types of knowledge. In the context of market orientation, research has addressed the issue of how firms systematically gather information on present and potential customers and competitors and use such information in a coordinated way to guide marketing strategy. Complementing and building on marketing research that explores knowledge as source of competitive advantage, this paper makes several contributions.

First, to the authors' knowledge, this is the first paper to systematically review and integrate literature to provide a comprehensive typology of organizational knowledge: the know-x framework. Although several researchers have looked into different kinds of knowledge, the research still remains largely fragmented. This paper integrates previous research to bring clarity by specifying the domains of different types of organization knowledge, explicating what kind of knowledge can result from what kinds of learning, and providing an integrative set of examples of different kinds of knowledge from previous research. In marketing, Glazer (1991) has conceptualized knowledge intensity and developed a propositional inventory on the focal concept of knowledge intensity. While Glazer's (1991) is a seminal contribution on knowledge as a resource capable of providing competitive advantages to firms, it does not get into the specifics of knowledge types beyond noting that (1) knowledge is a resource to be managed and (2) increasing knowledge intensity levels can have positive consequences for some key components of firm strategy and organization structure. Our know-x framework provides further credence to Glazer's (1991) work and complements it by the explication of different knowledge types. That is, the know-x framework provides scope to examine intensities of different types of knowledge and, thus, affords potential specificity to Glazer's (1991) framework.

Second, this is the first paper to scan the knowledge business environment to provide exemplar marketing knowledge products that firms might require. Previous research that has explored types of knowledge provides few if any examples of knowledge products from the business world. Even in the few papers that provide examples, the focus is on individual examples of firms benefitting from a specific knowledge type. As the context of our paper, among other things, is to explore knowledge acquisition in search of potential competitive advantages, we scanned the business environment to identify classes of specific marketing knowledge products that are available.

Third, specific to the know-x framework and the corresponding exemplar marketing knowledge products, this paper identifies issues that are critical to firms that are acquiring the knowledge. For firms looking at specific types of marketing

knowledge products based on the know-x framework, we identify critical issues that are specific to knowledge types. That is, if a firm brings in any external knowledge in search of competitive advantages, the firm should be aware of the critical issues that could impede the integration of such knowledge into the embedded knowledge in its systems, structures, strategy, routines, and prescribed practices.

Fourth, we develop implications of knowledge types (know-x framework) for marketing strategy in general and market orientation strategy in particular. Specific to marketing strategy at a macro level, we discuss specific knowledge types required with reference to different components of marketing strategy. Similarly, we discuss knowledge types in the context of product market strategy, product line rivalry in the context of multimarket competition, and strategic planning for marketing. In the context of knowledge-based marketing, the emergence of marketing orientation has made a seminal contribution to the marketing strategy literature. Therefore, this paper develops a specific discussion of the relevance of the know-x framework for market orientation. Accordingly, we discuss the specifics of the implications of know-how, know-why, know-what, know-where, and know-when for market orientation and identify relevant research. Therefore, this paper complements and builds on market orientation research.

Finally, while we note that the exemplar marketing knowledge products identified in this paper and the corresponding critical issues for firms and the implications for marketing are not proposed to be collectively exhaustive, in preserving the cumulativity of research on organizational knowledge and its relevance to marketing, our framework offers strong implications for research and practice.

Implications for research and practice

Our paper provides several opportunities for future research. First, the know-x framework developed in this paper can be used as a foundation to explore inter-relationships among the different types of knowledge. That is, questions like whether know-why leads to more effective know-how and whether firms should develop a hierarchy of different types of knowledge in order to develop knowledge-based effectiveness and efficiency advantages can be conceptually (e.g., proposition development) and empirically (e.g., hypothesis testing) explored. Corresponding to the different types of knowledge, we also propose what kind of learning often leads to that knowledge. Though we do not claim that each type of knowledge results only from a specific kind of learning, future research could explore what kind of learning is effective for what kind of knowledge. Building on the know-x framework, future research could develop propositions and investigate how each knowledge type influences firm performance and what kinds of knowledge can lead to what kinds of outcomes.

Second, future research could explore further the exemplar products identified in this paper and explore specific issues with reference to different kinds of products. Also, future research could delve deeper into the critical issues identified in this paper for firms. Accordingly, it would be interesting to explore effective ways to integrate different kinds of knowledge into the organization when firms acquire different types of knowledge from the market.

Third, we developed implications of the know-x framework for marketing strategy in general. Future research could explore implications of different knowledge types in specific contexts of pricing, product development, marketing communications, and distribution strategies. Again, specific research propositions can be developed and tested.

Fourth, we also explored the implications of the know-x framework for MO strategy in particular. Here, future research could conceptually and empirically build on our implications. Future research could also explore the implications of the know-x framework for the other forms of marketing strategy: brand equity (BE) strategy, market segmentation (MS) strategy, and relationship marketing (RM) strategy.

Fifth, we approached the know-x framework and its implications for firms in need of different kinds of knowledge. Future research could explore the implications of the know-x framework from the perspective of knowledge providers (vendors) as to how they can develop (1) different kinds of knowledge, (2) different capabilities for effective product development, (3) marketing strategies, and (4) strategies for overcoming concerns of clients. Future research could empirically investigate what kinds of vendor capabilities can alleviate what kinds of critical issues for clients.

As to practitioner implications, firms could use the know-x framework as a starting point to think about their knowledge needs and how they develop, acquire, and manage knowledge for competitive advantage. There is evidence in prior literature of firms using question-based frameworks for managerial action. For example, the Japan Human Relations Association (1988) provides the 5W2H method as a framework that can be used for new idea generation by asking what, why, where, when, who, how, and how much questions with reference to subject matter, purpose, location, sequence, people, method, and cost respectively. However, there are no frameworks such as the know-x framework to guide firms to assess their knowledge portfolios. In addition, firms could also start thinking about different kinds of learning and associated strategies for knowledge and capability development. Second, firms could use our explorations of implications for marketing strategy and MO strategy for assessing internal knowledge and specific external knowledge they need to adopt, develop, and/or implement different strategies. Third, specific to firms' MO strategy, in this paper, we synthesized existing literature to provide specific guidelines for MO strategy as a process.

Overall, we hope that our paper initiates further conceptual and empirical research in the areas of organizational knowledge needs (know-x framework), implications of the know-x framework for marketing strategy, impact of different knowledge types on marketing outcomes, effective usage of knowledge types for marketing purposes, assessing effectiveness of knowledge products acquired by firms, and vendor strategies for knowledge product development and marketing.

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