Knowledge Management for Competitive Advantage

Sharon Gleason and Laura Prietula

Dr. Chris Quinn Trank, Adviser

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1. Area Of Inquiry

1.1. Partner Organization

Our partner organization requested to remain anonymous. Therefore, we refer to them as "*The Company*." We have removed references to literature or materials that might identify *The Company*. We anonymized quotes and information that may lead to *The Company*'s identification.

Established in 2001, *The Company* is an organization focusing on customer and employee experiences through a software-as-a-service (SaaS) customer experience management (CEM) system. As the quintessential knowledge-economy company, *The Company* collects and analyzes data across the economy, from healthcare, hospitality, government, and financial to retail services. It is in the business of customer and employee knowledge management. In the words of one of their executives, "We help our customers understand the needs of their customers, their customer's journey. Our goal is to help organizations have customers who love them. We enable love. We help them listen better and understand their customers' experiences" (P3, personal communication, December 20, 2021).

As a startup, *The Company* grew rapidly, first in the hospitality industry with large companies, then expanded to retail. *The Company* founders credit their success to external market trends like total quality management, the growth of the internet, social media, and cloud computing, as well as internal organizational factors like their focus on culture and core organizational values.

In a document provided by *The Company*, the founders emphasized the organization's essence as a startup: "We have learned that culture is the dominant reason a company fails or succeeds." More specifically, *The Company* founders built it with the premise that companies that use knowledge effectively and learn and change from that experience tend to be industry leaders. *The Company* turns information on how their clients are doing and how their customers see them into actionable knowledge to help companies learn and improve. In other words, *The Company* is a knowledge company managing knowledge as an asset for its customers.

Today *The Company* has over three thousand employees in 15 offices worldwide (P3, personal communication, December 20, 2021), and as of 2021, it is an over $500 million company. With Artificial Intelligence (AI), the organization tracks digital assets, texts, emails, surveys, and customer-relevant behavioral analytics and helps organizations hear what even customers may not know. They aim to improve their customers' mission delivery by tracking and analyzing data. This customer information has implications for workflow, crisis management, organizational knowledge, and market strategy.

To respond to consumer difficulties, *The Company* provides market-actionable knowledge as it seeks to identify and help address their client organizations' impediments to getting services to recipients and help them look at their policies and processes that make delivering those services a challenge. *The Company* believes that nothing impacts how customers feel about an organization more than a positive or negative experience.

1.2. Phenomenon to Study

The Company was a pioneer and market leader in experience management (P3, personal communication, December 20, 2021). Over the last several years, *The Company* has faced many external and internal challenges, such as what they cite as the 2020 "Racial Reckoning", COVID market disruptions, and the organization going from private to public and back to private.

In 2021, a leading software investment firm, acquired *The Company*. Post a merger or an acquisition, an organization often goes through downsizing (Gaughan, 2005) or has difficulty integrating both organizations leading to staff attrition (Gibbs et al., 2016). *The Company* is adjusting to the significant leadership, organizational, and cultural changes. While *The Company* pivoted to new business strategies, their staff was putting in discretionary effort and time, over and above what was required, and the teams were facing burnout—a condition that was not sustainable. Furthermore, after they went public, many remaining founding members left the organization with retirement buy-outs (P10, personal conversation, May 2022).

As an organization managing knowledge for its clients, *The Company* now faced a knowledge management challenge of its own with increasing staff turnover and the exiting of most of their founding company staff, that is, those who had most of the operational knowledge. The loss of institutional knowledge is a common experience for founders and organizations transitioning from startups (Gaughan, 2005), but *The Company* hopes to avoid as much of that loss as possible.

Under private equity ownership, with a culture focused on increasing its market value (P6, personal communication, June 29, 2022), the organization can expect to face continuing uncertainty both from the external environment and from changes in internal management. To remain competitive during this transition period, *The Company* needs to capitalize on its expertise by preparing for the potential departure of knowledgeable individuals and finding ways to create new knowledge.

Our research focuses on *The Company*'s desire to systematize the norms, practices, and routines for retaining and creating knowledge, as well as cultivating a knowledge-sharing culture to fuel their value-creation, innovation, and competitive advantage.

1.3. Managing Knowledge Effectively

The Company's founders' original vision was from their "personal observations, experiences, and larger socio-economic trends at the time". They wanted to provide knowledge tools to improve service integration in the hospitality industry. More specifically, they envisioned companies accessing meaningful customer feedback, then using it to act and change in real-time by transforming information into knowledge and market intelligence. Tapping into the growing and widespread use of social media, the internet, and cloud technology, they planned to be like a better "Trip Advisor" for hotels by offering the basis for behavior change and more robust corporate performance.

One of *The Company*'s original four founders, attributes the organization's innovation and success, resiliency, and adaptability to their culture, and comfortable ease of staff sharing information throughout the organization. Although the founder has recently retired from *The Company*, the founder

ensured employees felt they were in a safe and secure working environment during their tenure. The founder stressed the importance of leaders listening to employees when making decisions (voice of the employee) and that the vision for the organizational culture was a deliberate and well-planned north star. Employees knew that *The Company* was there for them; it was not solely a profit-making company focused on only its customers.

In response to the COVID-19 pandemic, instead of dismissing employees, *The Company*'s leadership worked with employees and adapted. Leaders and employees designed plans, shared information freely, and ensured they could preserve their jobs, albeit with compromises. *The Company* grew out of a culture of creating and sharing knowledge. Two decades after being established, the culture is shifting.

1.4. Problem of Practice and Study Questions

The Company is a pioneer and market leader in experience management (P3, personal communication, December 20, 2021). Through the changes from being private to going public to being private again, *The Company*'s culture has changed. The nature of knowledge usage, sharing, creation, and retention has changed from its startup days. With this last leveraged buy-out and to remain competitive during this transition period, *The Company* must assess its knowledge management capabilities to minimize key intellectual capital loss, and sources of valuable knowledge, as people leave the organization.

Managing knowledge resources is a critical activity of competitive advantage (Argote & Ingram, 2000; Levitt & March, 1988; Levine & Prietula, 2012; March & Heath, 2009) and organizational learning (Argyris & Schon, 1996; Levitt & March, 1988; Thomas & Allen, 2006). We define knowledge resources as the people, processes, technologies, tools, and practices within an organization that enable a knowledge culture (Goffin et al., 2010; Intezari et al., 2017; Oliver & Reddy, 2006).

The phenomenon to study is: *How can The Company improve its knowledge management processes to remain competitive?*

We understand that currently *The Company* needs to manage knowledge as a competitive advantage strategically. This need leads to our study questions (SQ):

SQ1: How does *The Company* acquire knowledge?

SQ2: How does *The Company* represent knowledge?

SQ3: How does *The Company* ensure knowledge availability?

SQ4: How does *The Company*'s use of knowledge provide organizational value?

1.5. Research Relevance, Significance, and Approach

Organizations must learn to manage and share knowledge as a strategic asset to achieve their competitive advantage (Nonaka & Takeuchi, 1995). At the same time, they must create new knowledge structures and competencies (Bratianu et al., 2020) to maintain this competitive advantage. As the organization prepares for staff turnover due to current organizational changes or regular attrition, it must ensure mechanisms are in place to capture and transfer knowledge.

Nonaka and Takeuchi (1995) were pioneers in developing knowledge management conceptualization. They developed a model describing four phases: Socialization, Externalization, Combination, and Internalization (SECI). They postulated that knowledge flows into an organization and occurs at an individual, collective, and organizational level (Dalkir, 2011). They describe knowledge as being created or converted in various ways: from person to person (socialization), person to codification (externalization), explicit knowledge to explicit knowledge (combination), and explicit knowledge to individuals' understanding (internalization).

From the SECI conceptual model, the academic discussion around knowledge management has evolved. Easterby-Smith and Lyles (2011) note that knowledge management has a twin conceptual phenomenon in organizational learning. Both have changed as technology, the nature of information,

and knowledge have advanced. Through a systematic literature review, Castaneda et al. (2018) agree that the knowledge management domain has absorbed the organizational learning domain. Nevertheless, fundamentally both domains focus on how to add organizational value by facilitating the achievement of its goals. As such, we are leveraging evidence-based best practices from peer-reviewed research in the field of knowledge management for competitive results.

This study seeks to identify gaps in *The Company*'s knowledge resource management processes and to recommend ways to remediate them to support their competitive market position. This focus led us to the literature on knowledge management, competitive advantage, innovation, and performance.

2. Research Synthesis and Methods

2.1. Introduction

Knowledge is the currency and often the propriety market differentiator of today's businesses

– Jim March (2009)

Organizations increasingly rely on intellectual capital and knowledge as one of their core strategic assets and sources of competitive advantage (Argote & Ingram, 2000; Witherspoon et al., 2013). From this premise, we wanted to know what research literature says about managing and transferring knowledge over time, learning from the past, and supporting the organization's learning. Does managing knowledge provide any benefits to an organization?

We analyzed over 200 peer-reviewed articles, ranging from meta-analyses and systematic literature reviews to books and journals describing how to manage knowledge in organizations and transform knowledge into organizational value. We synthesized the following insights: organizational knowledge is fragile (Intezari et al., 2017; Bharadwaj et al., 2015), organizational knowledge can be lost (Brown & Duguid, 1998), organizations must manage knowledge (Gold, 2001; Nonaka & Takeuchi, 1995; Nonaka, 2008) and adequately invest in their learning capacity (Argyris & Schön, 1996; Levine & Prietula, 2012). Furthermore, organizations must establish a knowledge management infrastructure to facilitate

knowledge sharing, knowledge-creating, and learning (Giannakos et al., 2019; Roberts et al., 2017) to remain competitive (March and Heath, 2009).

2.2. Key Concepts

2.2.1. Defining Knowledge and Learning

To understand what knowledge management infrastructure is, we must first define knowledge and learning. While knowledge may be defined in many ways and is not a straightforward concept (Purvis et al., 2001.) Marhani et al. (2012) describe it as evolving in three interrelated steps: data to information to knowledge. In their view, data is a row of numbers, information is data in context, and knowledge is information that is accumulated and organized in a meaningful way. Drucker (1998) defined knowledge as information that causes change, creating the basis for different or more effective actions. Huber (2001) posited that knowledge is the transfer or sharing of information. From Nonaka and Takeuchi (1995), we understand knowledge as in the mind of individuals. It is tacit (person to person, subjective, not always conscious) and explicit (transmittable through codification). Synthesizing these definitions, we define knowledge as meaningful information that individuals accumulate over time that they can share with other individuals to effect change.

Cross and Sproull (2004) define learning as "the process of acquiring and putting to use information or knowledge that has been abstracted from one setting and moved to another" (p. 446). Brown and Duguid (1998) describe learning as a human activity to organize and activate knowledge. Lave and Wegner (1991) indicate that learning is participatory; one learns through doing or practice. Combining the above concepts from the literature, we define learning as the participatory process through which knowledge is actively shared and used to create new knowledge in an individual, group, or organization. Further, we define a knowledge management infrastructure as the components in an organization that provide the appropriate knowledge processes to enable knowledge sharing, creation, and learning.

2.2.2. Types of Knowledge

Most of the literature reviewed separates knowledge into two categories: tacit and explicit (Levy et al., 2021; Cross & Sproull, 2004; Eriksson & Karamehmedovic, 2016; Stevens, 2010; King, 2009; Schutt, 2003; Thomas & Allen, 2006; Nonaka & Takeuchi, 1995; Nonaka, 2008). These concepts are essential when defining an organization's knowledge management infrastructure to achieve its goals.

Tacit knowledge is personalized information generated from social interactions and is complex to codify (Nonaka & Takeuchi, 1995). According to Suppiah and Singh (2011), 90% of valuable knowledge – creating a competitive advantage – is tacit and resides in people's heads. Peet (2012) asserts that the most valuable intellectual capital resides in experts and leaders. These experts and leaders acquire tacit and unconscious knowledge through their experiences and continuous skill development.

However, these experts and leaders do not necessarily "know what they know" (Polanyi, 1966), making it challenging to identify knowledge that should be preserved and shared. In King's words (2009), "If one accepts the useful 'difficult-to-articulate' concept of tacit knowledge, a fundamental problem of KM [Knowledge Management] is to explicate tacit knowledge and then to make it available for use by others" (p. 4).

Explicit knowledge is structured knowledge that an organization can express, articulate, document, store, transmit digitally, and make readily available (Levy et al., 2021). Knowledge evolves within an environment and in a specific context. Much of its richness and applicability gets lost during the documentation process (Thomas & Allen, 2006). While there is much debate on these terms, the research literature resoundingly agrees that how knowledge is used and shared impacts the strategic capability of firms (Cassia et al., 2020).

Combining tacit and explicit knowledge supports an organization's strategic differentiation and competitive advantage (Argote & Greve, 2007; Stevens, 2010; Levitt & March, 1988). As intellectual

capital, knowledge becomes a strategic asset that organizations protect using laws and regulations (Erickson & Rothberg, 2000).

2.2.3. Levels of Knowledge

The literature discusses knowledge at three levels: individual, group, and organization (Abou-Zeid, 2002; King, 2009; Lave &Wegner, 1991; Levine & Prietula, 2012; Nonaka, 2008). Individual knowledge is that which a single person possesses. Group knowledge is found "locally" within a few individuals who share experiences and context. Knowledge within an organization is shared broadly and explicitly through socialization and experiential practices (e.g., apprenticeships, mentorships, team reflexivity, and internships). Considering these concepts when designing a knowledge management infrastructure is vital to ensure the environment facilitates knowledge exchanges at every level.

2.2.4. Knowledge Management

There are various descriptions and definitions of knowledge management. Antunes and Pinheiro (2020) define knowledge management as the processes followed to manage intellectual resources to create, store, and retrieve usable information. Gold et al. (2001) define it as processes necessary to store, transform, and transport knowledge throughout the organization. Most of the literature refers to processes for acquiring knowledge, representing it, methods to make it available, and the value of using it. These constructs are important in the design of our conceptual model.

2.2.5. Learning in Organizations

Thomas and Allen (2006) define the learning organization as using and applying knowledge to change and create a sustainable competitive advantage. Senge (1990) posits that the learning organization fosters systematic thinking, has an open culture and commitment to growth, supports ways to capture knowledge, and provides a learning culture. The challenge is that some of the most valuable organizational knowledge lies within people as tacit knowledge. Finding the tools and processes to share, transfer, make available and leverage this knowledge as a core corporate asset is complicated.

Thomas and Allen (2006) further describe that a learning organization can enhance its capacity to adapt to the environment and create new ways to innovate and be different.

The literature also differentiates between an organization's single and double-loop learning, where single-loop learning is adaptive, and double-loop learning is generative, creating actionable insight from reflection and experience (Thomas & Allen, 2006). Argyris and Schön (1996) further posit that there is a triple loop learning in which organizations learn about their learning processes. Organizations that build knowledge management infrastructures to further their employee's capacity to share their knowledge have seen lower turnover rates and profited through innovation.

While learning organizations is not the primary focus of our study, the paradigm highlights the importance of having knowledge sharing, creation, retention, and maintenance practices. We used these concepts in the design of our conceptual model.

2.2.6. Knowledge Management Infrastructure

Thomas and Allen (2006) define the learning organization as using and applying knowledge to change and create a sustainable competitive advantage. Senge (1990) posits that the learning organization fosters systematic thinking, has an open culture and commitment to growth, supports ways to capture knowledge, and provides a learning culture. The challenge is that some of the most valuable organizational knowledge lies within people as tacit knowledge. Finding the tools and processes to share, transfer, make available and leverage this knowledge as a core corporate asset is complicated. Thomas and Allen (2006) further describe that a learning organization can enhance its capacity to adapt and benefit from knowledge by integrating it into its daily routines while changing behaviors to facilitate learning (Bharadwaj et al., 2015; Nonaka, 2008). The literature defines knowledge assets as the people, processes, technologies, tools, and practices that provide organizations with their market differentiator (Goffin et al., 2010; Oliver & Reddy, 2006). Knowledge leads to definitive action. The infrastructure

needs to efficiently connect employees to knowledge assets and provide opportunities to exercise this knowledge.

Knowledge management infrastructure has three key components: knowledge culture, organizational structure, and knowledge technology. Knowledge culture is the organizational culture that enables people to create, share and utilize knowledge for its benefit, growth, and success (Botha, 2004; Dilmaghani et al., 2015). Knowledge requires human intellect and social interaction. An organizational structure outlines how to direct activities and perform work to achieve the goals of an organization (Rismyhr & Gjøby, 2019; Scarborough, 1998). Knowledge is sensitive to its context and environment. Knowledge technology is the technology that allows for the capturing, sharing, and transforming of knowledge. An organization must design technologies around its values, need for cooperation, and the leaders' vision (King, 2009; Lampel et al., 2009). We build each component of knowledge management infrastructure, a system of knowledge governance, into our model.

Based on the literature reviewed, we conclude that organizations need to establish systems, norms, and processes to support managing knowledge over time to ensure the preservation of critical knowledge and the creation of new knowledge (Büschgens et al., 2013; Chatterji & Fabrizio, 2013; Evenseth et al., 2022). Additionally, the effective use of knowledge promotes innovation and assists an organization in making sound technology investments (Levine & Prietula, 2012; Witherspoon et al., 2013). Furthermore, the lack of knowledge management may impede the organization's ability to succeed in the market and lose its competitive advantage (Nguyen et al., 2019; Osterloh & Frey, 2000; Reese, 2020; Senge, 1990).

2.3. Knowledge as a Competitive Advantage

Fonfara (2012) defined competitive advantage as creating value relative to competitors, with indicators being profit, ROI, and market share above-normal financial returns. If an organization bases its competitive advantage on readily available assets, competitors can access and replicate it, rendering

it no longer a competitive advantage (Dierickx & Cool, 1989). Tacit knowledge is challenging to transfer and is a critical factor in achieving competitive advantage, so it is fundamental to organizational performance to enable the transfer of this knowledge and leverage it in the marketplace.

In today's economy, to remain competitive, businesses must rapidly adapt to an increasingly volatile, uncertain, complex, and ambiguous environment where technology and intellectual capital move quickly. Advancing an organization's performance requires efficient and timely judgments in identifying, acquiring, developing, and utilizing knowledge (King, 2009). Market leaders and innovators know how to effectively create and manage knowledge as a resource (Jalali et al., 2014: Schutt, 2003). They also know how to ensure that knowledge, experience, and expertise are shared and utilized collectively (Gold, 2001).

According to the knowledge-based resource theory of Cahyadi Putra et al. (2021), for an organization to remain competitive in today's knowledge economy, it must turn tacit "sticky" knowledge into knowledge flows and create new knowledge. If knowledge is not shared, it cannot create value (Masrom et al., 2017). As such, an organization must provide the mechanisms to catalyze staff interaction, communication, and social connection (Tatachari et al., 2014). To underscore this point: research has shown that cultural and social factors are the primary cause of the lack of knowledge sharing (Chen & Huang, 2007).

Organizations must manage knowledge as a strategic asset to achieve their competitive advantage (Nonaka & Takeuchi, 1995) while creating new knowledge structures and competencies (Bratianu et al., 2020) to maintain this competitive edge. Matošková (2019) and Stevens (2010) highlight that knowledge requires intentional and efficient structures, processes, and capabilities to retain and develop it as a resource.

Knowledge creation capabilities must enhance organizational learning to become a source of competitive advantage (Kong &Farrell, 2010) so that organizational learning effectiveness becomes an

enabler of internal knowledge creation capacity. Crossan et al. (2009) discuss that organizational learning occurs when they encode experiences into routines and processes that guide behavior.

The literature shows that transferring valuable knowledge is difficult from person to person due to the lack of trusting relationships, limited time to learn and share, and overreliance on explicit knowledge (O'Dell & Grayson, 1998). In contrast, Edmunson and Schein (2012), Argote and Ingram (2000), and Bapuji and Crossan (2004) mention that when individuals on teams feel psychologically safe to share and create knowledge, the result can be innovation, fueling an organization's competitive advantage. This safety, in turn, leads to staff motivation, commitment to the organization, and the establishment of social networks that positively impact knowledge transfer efficacy. This engagement ultimately results in environments with participatory decision-making where supervisors care and support knowledge, thus creating a culture of trust and psychological safety with increased knowledge sharing.

The goal of knowledge management is to increase its flow through the organization to create new knowledge. Notably, Nonaka and Takeuchi (1995) explain knowledge management as managing the flow of information, acquisition, representation, and availability. They also emphasize leveraging this knowledge to innovate, improve operations, and transform organizations. Levitt and March (1988) discuss how organizations learn from direct experience, from the experience of others, and how they develop conceptual frameworks for interpreting this experience. They discuss processes for recording, conserving, retrieving, and diffusing experiences.

To summarize, organizations are systems that work more effectively when knowledge flow is enabled. Said another way, an organization's ability to remain competitive is directly related to its ability to manage, share, and create knowledge and effectively use it (Cross & Sproull, 2004; Farnese et al., 2019; Stevens, 2010; King, 2009; Nonaka, 1995).

2.4. Further Research to Inform Our Study

Sections 2.2 and 2.3 provide the foundational terms, understanding of knowledge management concepts, and leading thoughts around the topic of competitive advantage. We explored the processes involved in knowledge management and the need for organizations to use knowledge to power innovation, operational excellence, and transformation. As we focused on the model to use for our study, we conducted further research on knowledge management models and tools. We explored how to leverage knowledge to achieve organizational excellence. This section provides the highlights of that research.

2.4.1. Knowledge Management Process Concepts

We reviewed many models to understand how knowledge is acquired, represented, and made available. Nonaka and Takeuchi's (1995) seminal knowledge management theories are foundational to our study. As such, we focus on the flow of information—from acquisition to representation to dissemination—to transforming it into innovation and effective operations.

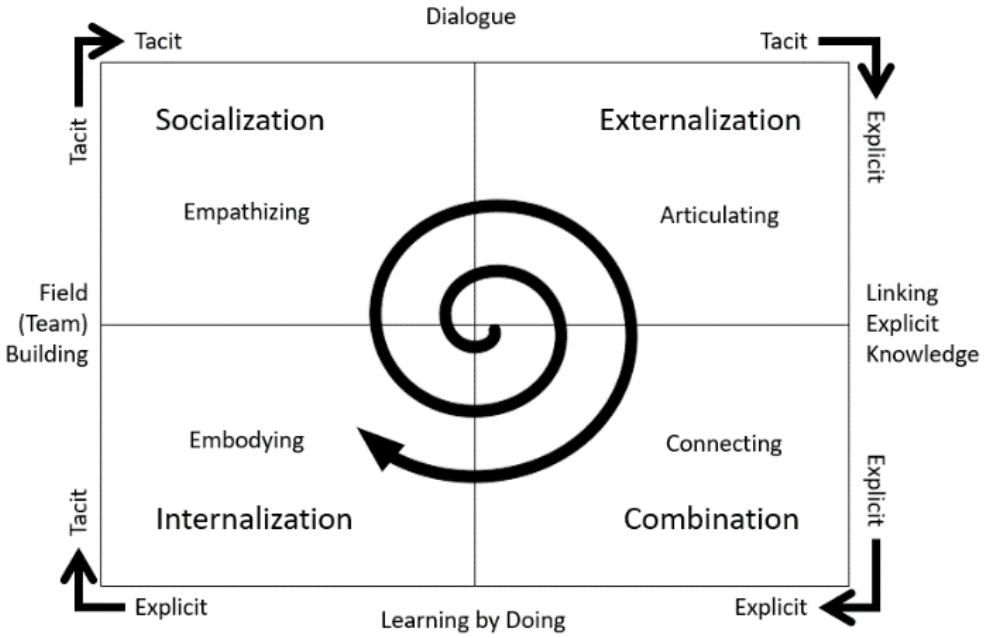
2.4.1.1. The SECI Model

Their SECI model uses four dynamic processes: Socialization, Externalization, Combination, and Internalization, as described in Figure 1. Socialization is the process that transfers tacit knowledge in one person to tacit knowledge in another (tacit-to-tacit). Individuals share knowledge through social interaction between individuals. Externalization is how individuals change tacit knowledge into explicit knowledge (tacit-to-explicit). Knowledge is captured through dialogue, articulated in a form understandable to others, and shared by individuals in a group setting. Combination is the process that transfers explicit knowledge to explicit knowledge (explicit-to-explicit). Individuals combine two or more pieces of explicit knowledge into a new whole, usually by leveraging technology. Internalization is the process of transferring explicit knowledge to tacit knowledge (explicit-to-tacit). Through experimentation, individuals use explicit knowledge to broaden, extend, and reframe their tacit

knowledge. As individuals move through the spiral of knowledge, they conduct activities such as dialogue, relating (or linking) explicit knowledge, using knowledge (doing), and sharing knowledge (teams). Reaching the internalization stage "starts the spiral of knowledge all over again, but this time at a higher level" (Nonaka, 2008, p. 21). We leverage these concepts when describing knowledge management processes in our study.

Figure 1

Nonaka's SECI Model



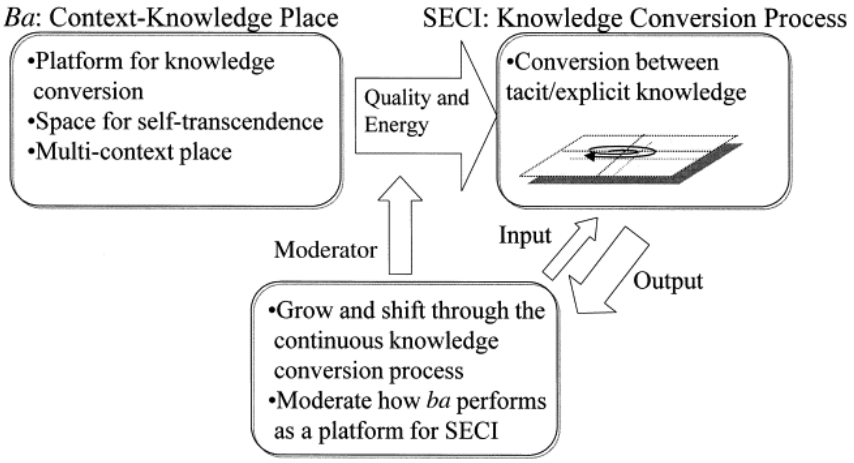
Nevertheless, the SECI model, though paradigm-shifting, is not without critics. For instance, Schutt (2003) describes its shortcomings by pointing out that "knowledge cannot be moved like a thing between two extremes [tacit and explicit knowledge]" (p. 2) and that there are not two distinct types of knowledge but rather a knowledge continuum. He asserts that the model should include other dimensions, such as social obligation and a sense of belonging, because knowledge practices and learning are processes that are interaction driven.

Nonaka et al. (1994) published a revision to the SECI model (Figure 2) to integrate constructs that reinforce the notion that knowledge processes go beyond the tacit and explicit labels by including

the need for a shared context and environment (known as Ba) and knowledge assets (inputs, outputs, and moderators). Schutt (2003) evaluated this model and concluded that integrating the SECI process, Ba, and knowledge assets was an improvement. After all, it integrated social considerations, such as beliefs, growth, and responsibility.

Figure 2

Nonaka's integrated SECI model, Ba, and knowledge assets.



Gourlay (2004) adds to Schutt's critique and states that the SECI model "never had a sound empirical grounding" (p. 8) and that "the processes in the model have never been validated." However, Farnese et al. (2019) were able to provide evidence to the contrary, as discussed below.

2.4.1.2. The KMSP-Q

To counter SECI critics, Farnese et al. (2019) undertook a study to validate Nonaka's theory around knowledge processes. They designed a multidimensional questionnaire called Knowledge Management SECI Processes Questionnaire (KMSP-Q), based on Nonaka's SECI model and knowledge process theory. They used this questionnaire to gather evidence supporting the use of Nonaka's model in organizations to monitor, quantify, and manage knowledge. The study combined the KMSP-Q outputs with a description of organizational processes that generate knowledge.

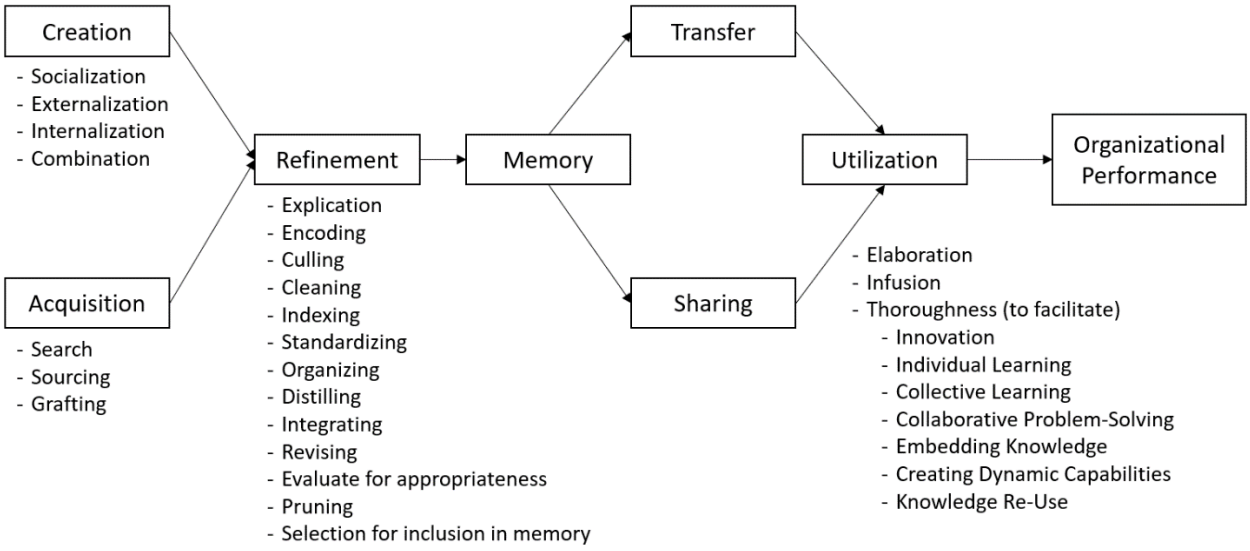
Their study demonstrates that Nonaka's model can indeed be operationalized and used to detect the strengths/weaknesses of KM-related policies and programs and, as such, provides sufficient evidence to incorporate the KMSP-Q questionnaire as one of our data collection methods.

2.4.1.3. The KM Process Cycle

King's (2009) research on the knowledge management process cycle leverages the SECI model and incorporates critical organizational outcomes such as innovation and collective learning. He includes intermediate outcomes, such as improved behaviors, that lead to improved organizational performance. His model has eight components through which knowledge flows to achieve organizational performance (Figure 3) – knowledge creation, acquisition, refinement, memory, transfer, sharing, creation, and utilization. When managed appropriately, they result in organizational performance. We use these concepts in our model.

Figure 3

King's Knowledge Management Process Cycle.



2.4.1.4. The Importance of Culture

In line with the knowledge management body of literature, Schutt (2003) asserts that when designing knowledge management models, one must consider an organization's existing culture. A

knowledge management infrastructure's success cannot be a prerequisite to changing the culture because "the culture of a company is the culture which has led to its success" (Schutt, 2003, p. 3). The success also speaks to the cultural and societal environment needed for knowledge to grow and develop. Knowledge is an ecosystem, with parts interrelating and impacting each other. The concepts of culture and an ecosystem became integral to our study.

2.4.1.5. Integrating KM Models and Tools

The SECI model, Ba, King's KM process cycle, and the KMSP-Q informed our selection of methods and tools to collect data to help answer our study questions. Additionally, the evidence-based KMSP-Q questionnaire helped us capture quantitative information on how exmployees experience knowledge as an asset. The literature reviewed suggested that combining these models and tools may provide insights into the organization's culture and information to determine if the environment supports knowledge generation, sharing, and creating knowledge for organizational excellence.

In essence, each of these models builds on the last, extending our understanding of the knowledge management process from initial propositions, including context and culture, to a complete KM model specifying intermediate processes and outcomes.

2.5. Organizational Excellence Concepts

The literature reviewed also describes that organizational excellence emanates from deliberate activities planned by leadership to promote interaction between individuals or groups, motivate people to share their expertise, and establish mechanisms for knowledge management. The following sections describe their importance to our study.

2.5.1. Social Interaction

The literature consistently points to the theme that knowledge transfer, sharing, and flow are central to knowledge creation and value. Osterlough and Frey's (2000) research describes how organizations can exploit, develop, and create knowledge to generate value through dynamic

interactions and proper knowledge management practices. As Chua (2002) demonstrated, the level of social interaction between individuals is directly proportional to the quality of the knowledge they create. He describes the importance of social ties as ways for individuals to access knowledge; "who you know affects what you know" (p. 3).

Along these lines, Nonaka (2008) suggests that an individual's contribution is valued based on the importance of the information contributed. Social interactions are one way for individuals to share experiences and knowledge. Organizational excellence emerges through dialogue, social interaction, and knowledge exchange. Our study looked for activities that support social interactions.

2.5.2. Leadership and Loops

Additionally, leaders must learn how to communicate their vision, establish an environment that promotes social interaction, and provide processes to enable and strengthen relationships. To this end, Sarayreh et al. (2012) identify five enablers of knowledge creation: vision, strategy, structure, system, and staff. These enablers work together to provide an efficient knowledge management infrastructure that supports organizational goals. These enablers are essential to our study because they describe the goals of managing knowledge (vision), set methods by which to achieve these goals (strategy), provide guidelines in which to manage knowledge (structure), articulate the components through which knowledge is baselined and converted (system). Like other systems-thinking knowledge management models (Senge, 1990), our study identified the criticality of feedback loops to promote social interaction and communication and assist individuals in their flow through the knowledge spiral (Nonaka, 2008).

2.5.3. Motivators

Witherspoon et al. (2013) also explain the complex picture of knowledge-sharing mechanisms and values. Their research shows that knowledge sharing occurs through motivators like intentions, attitude, culture, and rewards. As noted in Levine and Prietula (2012), the literature is unequivocal that the ability to increase an organization's capacity for capturing, sharing, and creating valuable knowledge

results in better organizational performance. As such, our study looked for reward systems that motivate knowledge sharing.

We understand from Philipson and Kjellström (2020) that organizational knowledge management grows from knowledge creation and development of people, skills, processes, and products and may not be easily transferable. Osterloh and Frey (2000) and Knight and Parker (2019) discuss the importance of staff motivation to share knowledge in achieving organizational excellence and developing individuals' knowledge and skills. Allowing for independent, autonomous control over their work activities also increases their motivation to share knowledge (Nguyen et al., 2019). Our study looked for mechanisms in place for staff to be motivated to learn and share their expertise.

2.5.4. Knowledge Flow and Creativity

At the heart of our study is understanding how to manage knowledge flow to create organizational and market value. Our research led us to Nonaka and Von Krogh (2009). They define knowledge creation as the "process of making available and amplifying knowledge created by individuals as well as crystallizing and connecting it" (p.635). Building on this definition, Chung et al. (2014) found that knowledge-creation capabilities and creativity positively impact organizational performance. Essentially, creativity enables an environment to grow. In turn, leaders must establish methods to enable staff creativity, creative thinking, and intrinsic motivation because this drives an organization's knowledge culture and sharing abilities, providing a competitive advantage.

Azeem et al. (2021) also demonstrated these findings when studying 294 industrial managers. They found a connection between a culture of knowledge sharing and workforce engagement in innovative activities, signaling that the level of knowledge sharing was a driver of competitive advantage. In a related meta-analysis, Liu and Kianto (2021) reinforced these results and found that a knowledge-friendly organizational culture positively impacted overall firm performance. We translate all the above factors and activities into a model which emphasizes how leaders must continuously support

a knowledge culture and enable organizational operations on the ability to identify, capture, share relevant experiences, learn, and generate knowledge. By knowledge sharing, creating, and learning, an organization can innovate, differentiate products and services and position itself competitively.

We combined the key concepts, models, and tools from sections 2.2, 2.3, and 2.4 to design a model best aligned to our phenomenon study: How can *The Company* improve its knowledge management processes to remain competitive? The following section describes the concept model.

2.6. The KMCA Concept Model

The literature indicates that an effective knowledge management strategy encompassing knowledge acquisition, creation, capture, and ease of sharing valuable knowledge tied to organizational goals, leads to improvements in innovation, performance, and transformation. We used these concepts to design activities to transform knowledge into organizational value to achieve excellence. Based on *The Company*'s needs and this literature review, we designed a Knowledge Management for Competitive Advantage (KMCA) model and mapped the four study questions, as shown in Table 1.

Table 1

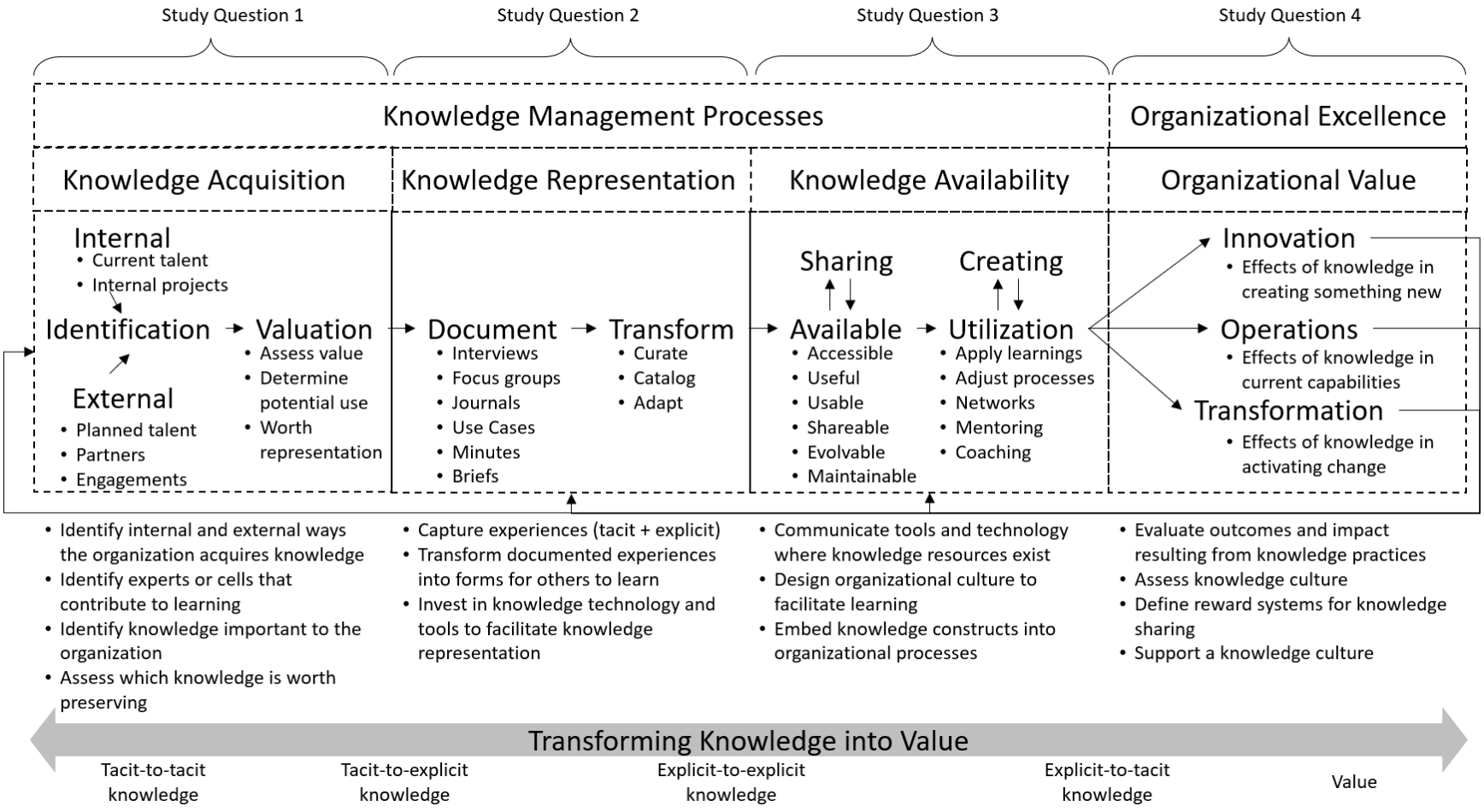
Study Questions Mapped to KMCA Model Sections

Question	KMCA Model Section
SQ1: How does *The Company* acquire knowledge?	Knowledge Acquisition
SQ2: How does *The Company* represent knowledge?	Knowledge Representation
SQ3: How does *The Company* ensure knowledge availability?	Knowledge Availability
SQ4: How does *The Company*'s use of knowledge provide organizational value?	Organizational Value

The KMCA model uses critical concepts from our literature review of knowledge management, knowledge creation, knowledge sharing infrastructure (Farnese et al., 2019; King, 2009; Nonaka, 2008; Osterlough & Frey, 2000; Sarayreh et al., 2012) and competitive advantage (Argote & Ingram, 2000; Levitt & March, 1988; Levine & Prietula, 2012; March & Heath, 2009). We define our model in two main components: knowledge management processes and organizational excellence (Figure 4).

Figure 4

Knowledge Management for Competitive Advantage (KMCA) Model.



KMCA's three sub-domains under knowledge management processes are knowledge acquisition (SQ. 1), knowledge representation (SQ. 2), and knowledge availability (SQ. 3). Organizational excellence (SQ. 4) translates directly to organizational value, as demonstrated by an organization's ability to innovate, achieve operational excellence, and thrive in transformations. As previously discussed, literature shows that by using, sharing, and creating knowledge, an organization develops value that leads to a stronger competitive position. The following sections elaborate on each model component and connect them to our study questions.

2.6.1. Study Question 1: Knowledge Acquisition

This section of the KMCA model answers the question: How does *The Company* acquire knowledge?

An organization creates knowledge with and acquires knowledge from individuals through sharing. These individuals are internal (e.g., staff, groups, or projects) or external sources (e.g., hiring, client engagements, or partners). An organization *identifies* the type of knowledge (tacit or explicit) and where it resides. The identified knowledge then goes through a *valuation* and prioritization process to determine why it is necessary, its value it represents and to whom, its potential use, and whether it is worth spending any resources to preserve it. For this process to be successful, it is imperative to understand the organizational structure and culture. Organizations make resource investment decisions in people, time, and money during this process. Therefore, identifying and prioritizing what knowledge should be captured, shared, and passed forward are critical decisions (Bharadwaj et al., 2015; Garavan et al., 2020; Ghosh, 2014; Levine & Prietula, 2012; March & Heath, 2009). Similarly, determining the methods and media to codify this knowledge requires deliberate planning.

2.6.2. Study Question 2: Knowledge Representation

This section of the KMCA model answers the question: How does *The Company* represent knowledge?

Once we determine that the knowledge is worth preserving, the process of representation begins, documenting and transforming knowledge to benefit the organization. Representation leverages the SECI processes of Socialization (tacit-to-tacit) and Externalization (tacit-to-explicit). It captures knowledge and experiences through interviews, videos, journaling, workshops, meeting minutes, and project briefs.

The knowledge is 'extracted' from individuals, groups, or organizations, given 'form,' and prioritized for strategic value. The documented information goes through a transformation process where it is curated, adapted, and cataloged based on its topics, audience, content, and goals. In short, the process prepares 'knowledge' for consumption.

How a firm structures its action around knowledge management impacts its competitive advantage. Inkinen's (2015) systemic literature review reinforced this argument and showed that the success of firms depends not only on their current knowledge but how they use and develop that knowledge. Knowledge management's most critical part for a firm's competitive market positioning is knowledge creation and sharing, which depends on availability, accessibility, and relevant usability. The literature cites that the best ways to support knowledge sharing are developing employees' skills, facilitating social interaction, and establishing communities of practice. Along these lines, Oliver and Kandadi (2006) provide ways to transfer best practices through mentorship, apprenticeship, and structured use of subject matter experts. Equally crucial to knowledge sharing is embedding knowledge management strategies into daily work processes, habits, and norms (Mitra et al., 2015).

The critical infrastructure components to facilitate knowledge acquisition are the tools and technologies available in the organization (Giannakos et al., 2019). Our model emphasizes making represented knowledge readily available.

2.6.3. Study Question 3: Knowledge Availability

This section of the KMCA model answers the question: How does *The Company* ensure knowledge availability?

For knowledge to be of value, it needs to be available in ways people can consume it. It must be accessible, useful, usable, shareable, evolvable, and maintainable. As people start accessing this knowledge and adding to their existing knowledge (SECI Combination process), they will begin to apply this 'new' knowledge to their environments and adjust as they go along (SECI Internalization process).

To avoid people getting overwhelmed with information, organization leaders must balance knowledge availability, focusing on mission-critical knowledge. Many factors support the effective transfer of knowledge: a collectivist culture versus an individualist one (Witherspoon et al., 2013), everyone's intrinsic (self-enjoyment) and extrinsic (goals and incentives) motivation (Nguyen et al., 2019), and Information Technology (IT) infrastructure (Garad & Qamari, 2021; Giannakos et al., 2019; Lange et al., 2020; Roberts et al., 2017).

In the KMCA model, the organization's structure and existing culture matter the most. The design of everyday activities and workflows must incorporate ways for individuals to effortlessly acquire, represent, access, share, and use these knowledge assets to generate new knowledge. Leaders must design and support an organizational culture that facilitates learning, i.e., rewarding apprenticeships, internships, mentoring, team reflexivity, and coaching (Jones, 2015). It is critical to have methods and mechanisms to communicate these knowledge assets' existence, location, access methods, and value.

2.6.4. Study Question 4: Organizational Value

This section of the KMCA model answers the question: How does *The Company*'s use of knowledge provide organizational value?

As previously discussed, we take a resource-based view that knowledge is a strategic asset leveraged for competitive advantage. We combined Nonanka's Ba (2008) with the Organizational Performance component from King's (2009) Knowledge Management Process to describe knowledge outcomes, impact, and value. Knowing *what* knowledge to use, *when*, *where*, and with *whom* – again, prioritizing mission-critical knowledge – drives organizational performance (Ihrig & MacMillan, 2015).

The outcomes and impact of the organization's knowledge practices can take time to quantify. We propose to measure the value of knowledge by identifying the effect it had in creating something new knowledge (innovation), improving current capabilities (operational efficiencies), or activating change (transformation).

Knowledge is a fast-moving economy commodity that organizations need to protect from losing to competitors. A careful balance of sharing or not sharing and creating new knowledge is required to ensure knowledge practices are adequate for the situation (moderators in Nonaka's [2008] unified model) and to avoid potential liabilities. Individuals must continuously learn and grow for the organization to realize the benefits of a knowledge management infrastructure promptly (e.g., time to market) and to create meaningful differentiators (e.g., competitive edge). The experiences that provide organizational value will re-enter the knowledge management cycle as "new" knowledge (Nonaka's [2008] knowledge spiral). We have used the KMCA model to assist our partner organization in identifying where there may be gaps in sharing, creating, and managing knowledge assets and capabilities to remain competitive.

2.7. Research Methodology/Design

We used a mixed methods approach to this study. In a way, this is a phenomenology study as defined by Ravitch and Carl (2021) and Adu (2019), as we are interested in the lived experiences of *The Company* employees as it relates to acquiring, representing, sharing, creating, and making knowledge available to deliver organizational value within *The Company*. We explored the experiences of a group of

individuals within one of smaller divisions and other department staff who directly influence this smaller division. Using this approach, we could discover and describe what and how employees experience knowledge management and value creation in their organization.

We examine the complex phenomenon of knowledge management for competitive advantage through knowledge management concepts (Farnese et al., 2019; Gold et al., 2001; King, 2009; Nonaka, 2008) and organizational learning (Gibbs, 2008; Intezari et al., 2017; King, 2009). However, we also collect quantitative data through Likert-scale surveys and use additional information from published and internal and external corporate marketing documents. Therefore, the study approach aligns with Babbie's (2017) mixed modes description.

3. Data Collection

3.1. Site, Participant Selection, and Other Criteria

3.1.1. Focal Study

We conducted our project at *The Company* because we have direct access to one of their senior executives. This relationship allows immediate access to resources and the ability to collaborate effectively and promptly. Additionally, they had a problem of practice aligned with our research interests: knowledge management and competitive advantage.

3.1.2. Timeline

We conducted data collection activities between May 25, 2022, and September 9, 2022. The data coding and analysis began in May 2022 after completing the first data collection activity and continued through the middle of September 2022. We completed the findings and recommendations report in October 2022.

3.1.3. Tools

For technical reasons and access considerations, we used Zoom and Microsoft TEAMS to schedule and record interviews. We requested permission to record every interview and selected

Otter.AI to record and transcribe them because we were familiar with the software. In line with standard study protocols, we anonymized data and ensured it was stored securely. We used *The Company*'s customer experience platform to analyze the interviews and documents, and for our surveys. We used the Microsoft SharePoint tool to manage and share our documents as appropriate.

3.1.4. Sampling Strategy

We issued a survey, conducted interviews, and performed documentation reviews. We chose to conduct interviews as they provide deep, rich, individualized, and contextualized data (Ravitch & Carl, 2021). They also help fill gaps in the survey instruments and the SECI process. As new themes emerged, we conducted additional literature reviews to ensure that scholarly literature supported changes to our model, analysis, methods, or processes. We describe the data collection plans in Table 2.

Table 2

Data Collection: Final Plan

Method	Audience	Purpose	Approach
Surveys	Various levels	***Answer Study Questions 1 – 4.*** Apply a known survey instrument for knowledge management to understand employee's perspectives on the organization's knowledge management processes.	Use KMSP-Q
Interviews	Founders, C-level, Leadership, and Others	***Answer Study Questions 1 – 4.*** Understand the knowledge culture, events that helped form the company and what is shaping the new direction. Understand how knowledge is acquired or preserved. Identify events setup for "learning". What do employees and leaders value most about knowledge? Are there KM projects?	18 interviews • 1 Founders • 1 C-Level • 3 Senior VPs/Leaders • 1 Director • 4 Enabling members Use KMML
Documents	Various levels	***Answer Study Questions 2 – 3.*** Collect information on communication channels, messages, content, activities, leadership engagement, and design/plans.	Documents for projects, marketing material, sales training, news articles, emails, and others.

3.2. Validity Strategies Addressed and Details

We leveraged the following concepts from Ravitch and Carl (2021) to help ensure proper qualitative research. To enhance the study's validity, we triangulated the findings with observations and qualitative data analysis of *The Company* documents. *Strategic sequencing of methods:* We interviewed

participants and leveraged technology tools (such as Mural) to create graphical representations of the interviews to identify any patterns within the participant's narratives.

Each methodological data collection strategy maps to and informs our four research questions and goals by identifying and disclosing any assumptions, biases, and interests we may have as an instrument of our research. These strategies also allow a repeatable process, with empirical indicators and minimal external influences -- meaning we seek to bracket and minimize potential biases, promote transparency, and ensure consistency of findings.

We are defining and documenting every activity performed through this study to ensure it is valid, repeatable, and reusable. For practical application relevant to *The Company*'s various customer segments, we have also researched the 2018 International Organization for Standardization (ISO) 30401 standards and requirements for KM, which inform our model and processes (Schmitt, 2022).

3.3. Threats to Validity and Rigor

We selected this organization due to easy access to one of their executives. However, this relationship may bring a responsibility bias to that person – meaning this executive's viewpoint might have weighted heavier in our analysis relative to the contributions of other team members. *The Company* is a service provider to one of the team members. As such, some responses to the interview questions may be biased to ensure a positive perception of the organization.

Furthermore, we conducted 90% of the interviews within one of *The Company*'s smaller divisions, representing 2% of the company (60 out of 3000 employees), representing only part of the organization. We issued the survey globally to *The Company*'s employees to limit biases from conducting interviews mainly in only one division, and the survey participants were selected randomly.

We selected 245 quotes from the 18 interviews and aligned them to the KMCA model to identify concentrations of comments around any theme. However, we did not see any significant difference, as shown in Table 3. We interpret this as a balanced data set for our study.

Table 3

Number of Quotes Recorded by Theme

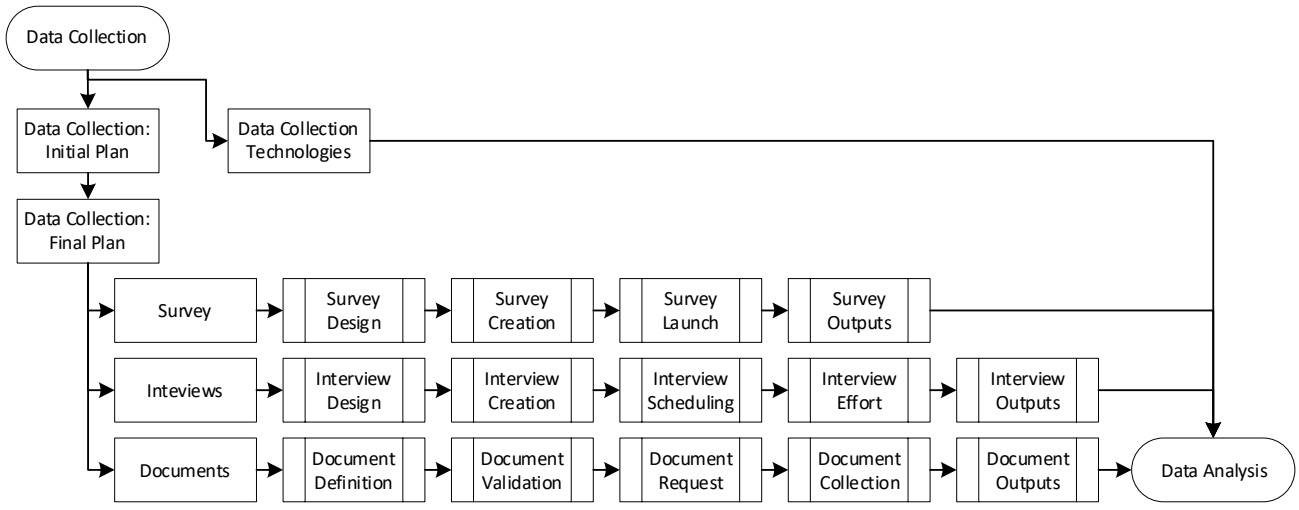
Study Question	KMCA Themes	# Quotes	% Quotes
1	Knowledge Acquisition	63	25.7%
2	Knowledge Representation	53	21.6%
3	Knowledge Availability	68	27.8%
4	Organizational Value	61	24.9%
	Total Selected Quotes	**245**	**100%**

3.4. Data Collection Conceptualization and Operationalization

We established a plan to collect data from various sources to gain the broadest possible perspectives of the organization, its people, process, and technologies, within the timeframe of this capstone study. We defined a structured, evidence-based research approach (Farnese et al., 2019) and a repeatable approach to data collection (Figure 5) described in the following sections to answer our study questions. We operationalized the data by focusing on processes and connecting them to organizational performance (Farnese et al., 2019).

Figure 5

Data Collection Process (High-Level)



3.4.1. Survey Instrument Definition

We researched various surveys to measure knowledge management and determined to use one based on the Socialization, Externalization, Combination, and Internalization (SECI) model of knowledge

dimensions (Nonaka, 1994). Farnese et al. (2019) created a survey instrument known as the Knowledge Management SECI Process Questionnaire (KMSP-Q). We used this KMSP-Q survey as Farnese et al. (2019) proved the validity of this instrument for measuring organizational knowledge management and knowledge generation processes.

This questionnaire provides empirical validity and consistency in evaluating an organization's capacity to create and manage knowledge effectively. It connects eight knowledge generation dimensions with organizational outcomes. These eight dimensions are human resources development, technological support, knowledge sharing, mentoring practices, team reflexivity, organizational memory, organizational communication, and human resources training.

We identified the following categories to include in our data analysis: tenure range, department, demographics (such as age range and gender), and management level within the organization. Additional survey criteria included: filtering out the executive team and only including employees with 60 or more days of employment with the organization (to eliminate those who might not have enough tenure to answer the questions). We left the survey open for seven days to account for those who may be on leave.

As noted, *The Company* has approximately 3,000 employees in over seven countries. To minimize demographic bias, we asked *The Company* to send the survey to a random selection of 1,000 employees across their 15 offices and every industry sector and to make the survey anonymous. Using their employee database to generate a participant list, we sought to include people with diverse cultural, ethnic, and social backgrounds. As such, the survey was stratified but random within each band. We drafted an introductory message outlining the purpose and duration of the survey, which *The Company* tailored to their internal language before issuing it. Based on our *The Company* contact's assessment of the potential survey response rate, our target was to get 100 survey responses.

We used *The Company*'s Customer Experience platform, which includes a survey mechanism and provides a standard link to the survey. We worked with *The Company* team to set it up exactly as the KMSP-Q to ensure repeatability and fidelity to the source literature. Via an internal email communication, *The Company* launched the survey worldwide on August 4, 2022, and closed on August 11, 2022, with 176 respondents. See Appendix A for survey material.

3.4.1.1. Measurement (survey)

We designed the surveys with a 1-5 Likert scale, following the KMSP-Q questionnaire. The reports are also aligned with the KMSP-Q and per the KMCA model, connected to each study question.

3.4.2. Interview Definition Process

We conducted interviews to capture deep, rich, individualized, and contextualized data (Ravitch & Carl, 2021). They also fill gaps in the survey instruments and the SECI process. We began interviews on May 25, 2022, and completed them by September 9, 2022. We created a list of questions aligned with the KMCA Model and Alazmi and Zairi's (2003) Knowledge Management Maturity Level (KMML). A KMML is a benchmark by which a firm may compare itself against others, create processes to determine what work gets done, where and by whom, and generate a culture of consistent processes and use (Szelagowski & Berniak-Woźny, J, 2020). Refer to Appendix B for a interview questions and timelines.

We had initially targeted eight interviews with a mix of C-level executives, middle management, and non-management staff to ensure we had a meaningful sample of participants. We were only able to have an initial unstructured interview with one C-level executive due to their availability. However, we completed 17 interviews with ten staff from various levels.

The interviews were structured to help us understand *The Company*'s founding culture (from 2001-2011), the new culture (post going public and private again 2011-present), events that helped form the organization, and activities that are shaping the new direction. We were also interested in identifying their communication channels, how the organization is "learning," defined as adapting to

change through social interaction, learning from past behavior, creating new knowledge (Dalkir, 2011), and what employees and leaders value most about knowledge. Additionally, the questions helped us determine if *The Company* has any projects geared toward harnessing knowledge for competitive advantage.

We requested permission to record every interview, using Zoom or Microsoft TEAMS to establish the video conference and Otter.Ai to record and transcribe them. We cleaned up each transcript to ensure accuracy, anonymized them to protect participants' identities, and prepared them for ingestion into the tools we selected to perform our analysis (refer to the Data Analysis section for information). To protect the confidentiality, we securely stored the curated transcriptions and the voice recordings in our Microsoft SharePoint drive. We referred to participants (P) according to identification codes from P1 to P10, as we had ten unique participants across the interviews (I). Since we had 18 interviews, their codes range from I1 to I18. If there were more than one participant per interview, the interview title would include each participant. For example, I1P1P2P3 would represent Interview 1 with Participants 1, 2, and 3.

We prepared and conducted the interviews through a five-step process. We designed the interview, created an introductory message, scheduled the sessions, conducted the interviews, and stored them in our repository.

3.4.2.1. Measurement (interviews)

To answer our four research questions on how *The Company* acquires and represents knowledge and makes it available to provide operational value, we aligned the interview questions protocol with the KMCA model. We used Alazmi and Zairi's (2003) KMML model to assess employees' discourse on the organization's maturity in knowledge management practices. This structured approach allowed us to group answers by themes, facilitate coding, and prepare the data for analysis.

3.4.3. Documentation Gathering Definition Process

We requested and collected materials from *The Company* on various topics and for different purposes. We performed internet and Vanderbilt library searches on *The Company*'s time as a start-up company, their transition into a public entity, and then back to private acquisition. We received training documentation and emails that showcased how leadership approaches different projects, such as COVID-19 and the company's transitions from private to public. Additionally, we received short white papers and case studies on how *The Company* engages with customers. We stored our documents in a SharePoint drive. We collected 43 documents and used them to fill information gaps on the type of communication channels, messages, content, and tone.

3.4.3.1. Measurement (documentation)

We leveraged *The Company*'s Customer Experience platform, which has a text analytics capability. We reviewed and discussed each document and determined that only 21 were related to our research questions. We made notes on keywords and phrases that we later used to define the rules to train the text analytics platform on knowledge management and competitive advantage themes. This tool also provides an initial report that we used to identify common themes and topics of interest.

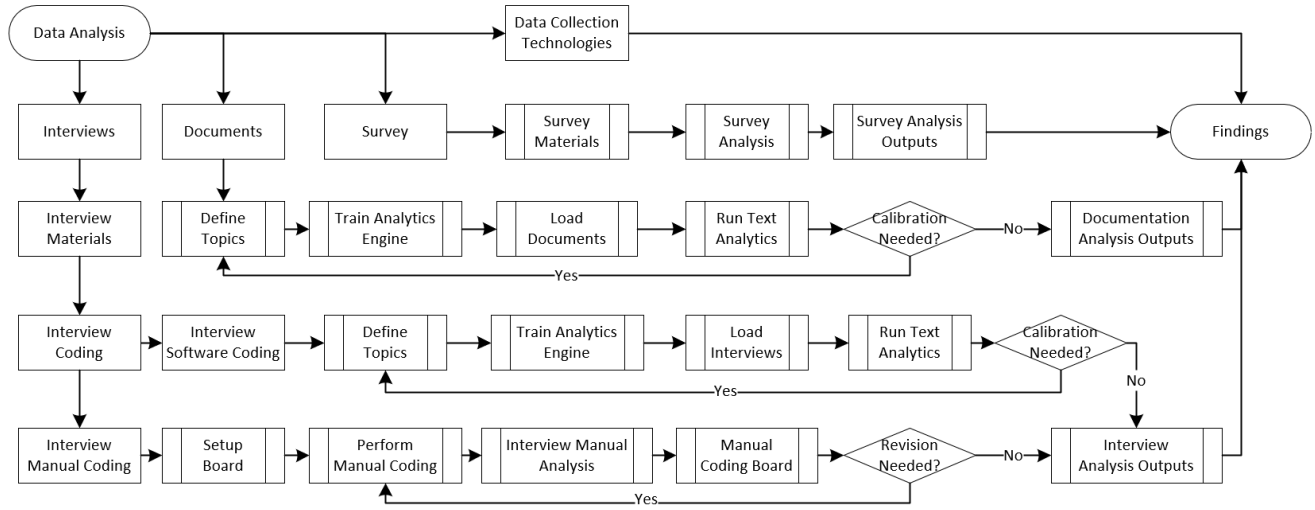
4. Data Analysis

4.1. Data Analysis Process

We designed and documented a repeatable process to analyze the data collected with three main components. The organization can reuse it to assess improvements once it implements our recommendations. It addresses the method for coding and analyzing interviews and documents, and the survey outputs. Figure 6 describes our high-level data analysis process.

Figure 6

Data Analysis Process (High Level)



4.1.1. Leveraging Technology

We leveraged *The Company*'s Customer Experience platform, which uses artificial intelligence (AI) and sophisticated Natural Language Programming (NLP) algorithms to parse text, perform categorization and sentiment analysis, and report on the results. *The Company*'s AI algorithm captures every signal and unifies what the employee thinks, feels, and does, using emotive logic and behavioral analysis. It makes sense of words, data, and theme signals and automatically codes and links all interactions.

We used the interviews, the KMCA concept model, and reference literature to create training rules for the text analyzer to identify themes, words, and topics aligned with our knowledge management, competitive advantage, and value management inquiry. These rules translated into words and phrases such as "learn," "help," and "how to," amongst others.

We used a Microsoft Excel file to document these definitions, where each entry has a theme name, a description, and the training rules to use with the text analyzer. Figure 7 provides an abbreviated example of the theme "Mentoring Practices." The complete list of KMCA training rules we created for this study may be available upon request.

Figure 7

Data Analysis: Training the Text Analytics Software on the KMCA Model

Theme	Description	Training Rules
Mentoring practices	Mentoring practices relate to tacit knowledge transfer from expert members (supervisors, tenured peers) to newcomers or less experienced members, through tactics designed to support better socialization at work. They allow the sharing of tacit knowledge by observation, modeling, and assimilation of the implicit and unconscious skills embedded in professional practice. Mentoring is a typical organizational socialization tactic to implement employees' learning, practical abilities, and personal growth in role transitions, enhancing a deep understanding of professional skills, organizational politics and values, as well as leads to several behavioral, attitudinal, and relational outcomes (Becerra-	#Help in proximity to "asking", "ask", "needed", "need", "get" (5 words) Helps Helped How_to Where_to Who_to Figure_out Find_out New Onboard, onboarded, or onboarding Prepare or prepared #Find or #Finding in proximity to "out", "where", "information", "who" (5 words) #What in proximity to "know", "do", "know", "knew" (5 words) Mentor Mentorship Coach Advise or Advisor

We worked with the *The Company* expert-tech team to train the text analyzer to recognize topics and to iterate on the tool configuration. The software has other "out-of-the-box" themes built in, which we used in conjunction with our newly established themes. The text analyzer parses the text provided, categorizes portions of it, and analyzes for sentiment such as "waited too long." Using Natural Language processing, it derives emotion and identifies themes.

The artificial intelligence engine provides insights and recommendations. Given the limited time, our study stopped short of leveraging the AI to its full potential (i.e., we did not incorporate Operational Results into behaviors and experiences).

4.2. Interview Coding and Analysis

We designed the interview questions to align to answer our four study questions. We defined two repeatable processes to analyze the interviews. One involved manual coding structured around the KMCA model and Alzami and Zairi's (2003) Knowledge Management Maturity Level, and another assisted by *The Company*'s text analyzer. We manually coded the interviews because *The Company* software was new to the team. We used an online MURAL tool to create a board to code each interview manually. The board captures our observations, participant quotes, key themes, and takeaways.

4.2.1. Interviews: Manual Coding and Analysis

To fully understand how *The Company* acquires, represents knowledge, and makes it available for competitive market positioning, we carefully structured each interview question to help answer our Study Questions. We listened to over eighteen hours of audio recordings to ensure we understood the interviews before analyzing the data, reviewing each recording and its transcript multiple times.

We performed open coding analysis on each interview, selecting quotes (yellow) or key quotes (purple) from participants, and identifying key takeaways (green). We then grouped these into one of four themes (axial coding) in alignment with the KMCA model: knowledge acquisition, knowledge representation, knowledge availability, and organizational value.

Every interview was assigned a maturity score using Alzami and Zairi's (2013) Knowledge Management Maturity Level to assess the participant's understanding of knowledge management. We assigned one point for each of the domain concepts. For example, the *Initial* domain has five main concepts, and therefore, the highest possible score for that domain is five.

If the interviewee mentioned three concepts out of the five, that interview section received three points. A higher score reflects a higher knowledge management maturity level.

Figure 8 shows an example of a manually coded interview.

Figure 8

Example of a Coded Interview

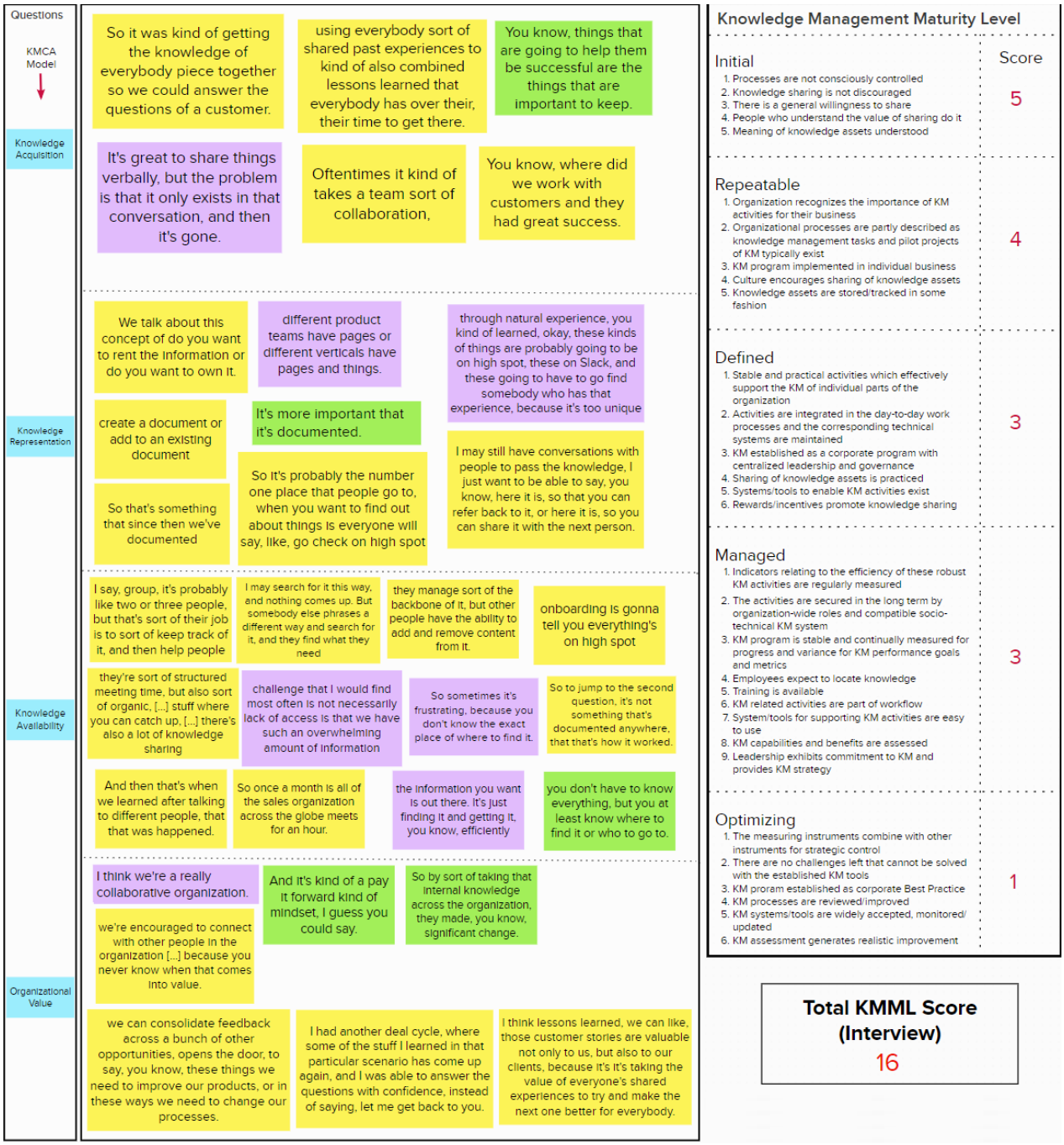


Table 4 provides this breakdown for each domain for the Knowledge Management Maturity Level with their highest possible score.

Table 4

Knowledge Maturity Model Level Scoring (Points) by Domain

Maturity	Max Score
INITIAL	
1. Processes are not consciously controlled 2. Knowledge sharing is not discouraged 3. There is a general willingness to share 4. People who understand the value of sharing do it 5. Meaning of knowledge assets understood	5
REPEATABLE	
1. Organization recognizes the importance of KM activities for their business 2. Organizational processes are partly described as knowledge management tasks and pilot projects of KM typically exist 3. KM program implemented in individual business 4. Culture encourages sharing of knowledge assets 5. Knowledge assets are stored/tracked in some fashion	5
DEFINED	
1. Stable and practical activities which effectively support the KM of individual parts of the organization 2. Activities are integrated in the day-to-day work processes and the corresponding technical systems are maintained 3. KM established as a corporate program with centralized leadership and governance 4. Sharing of knowledge assets is practiced 5. Systems/tools to enable KM activities exist 6. Rewards/incentives promote knowledge sharing	6
MANAGED	
1. Indicators relating to the efficiency of these robust KM activities are regularly measured 2. The activities are secured in the long term by organization-wide roles and compatible socio-technical KM system 3. KM program is stable and continually measured for progress and variance for KM performance goals and metrics 4. Employees expect to locate knowledge 5. Training is available 6. KM related activities are part of workflow 7. System/tools for supporting KM activities are easy to use 8. KM capabilities and benefits are assessed 9. Leadership exhibits commitment to KM and provides KM strategy	9
OPTIMIZING	
1. The measuring instruments combine with other instruments for strategic control 2. There are no challenges left that cannot be solved with the established KM tools 3. KM program established as corporate Best Practice 4. KM processes are reviewed/improved 5. KM systems/tools are widely accepted, monitored/updated 6. KM assessment generates realistic improvement	6
Total Max	**31**

The lowest-scoring interview received four points, and the highest received 21. Figure 9 describes the average scores for each KMML domain.

Figure 9

Data Collection: Average KMML Score for Each Interview

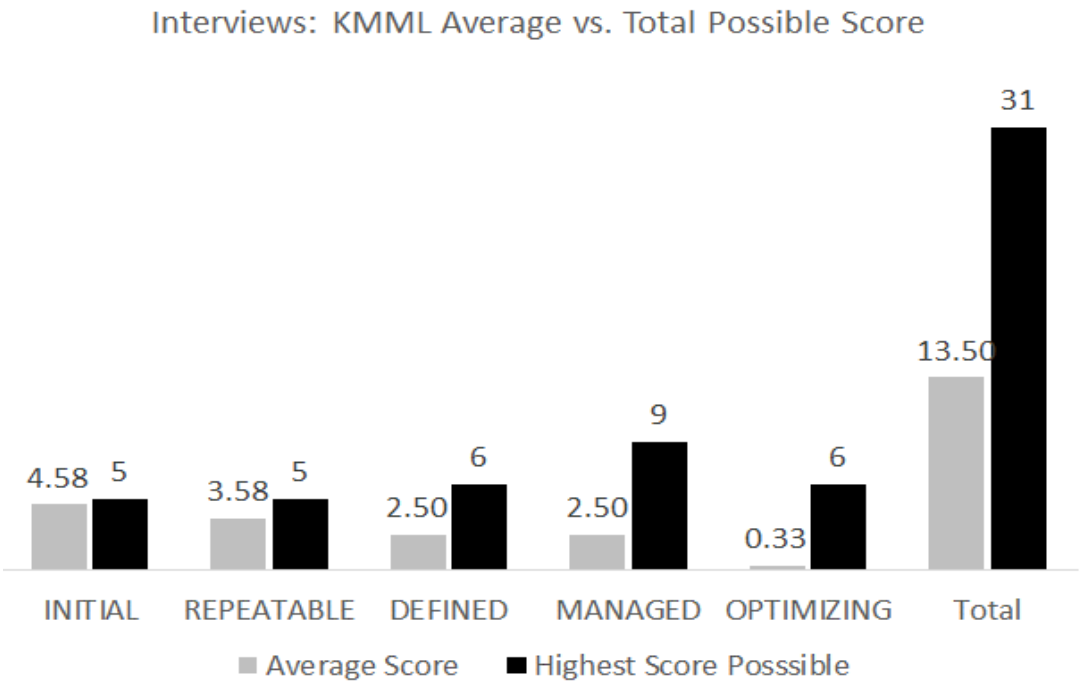
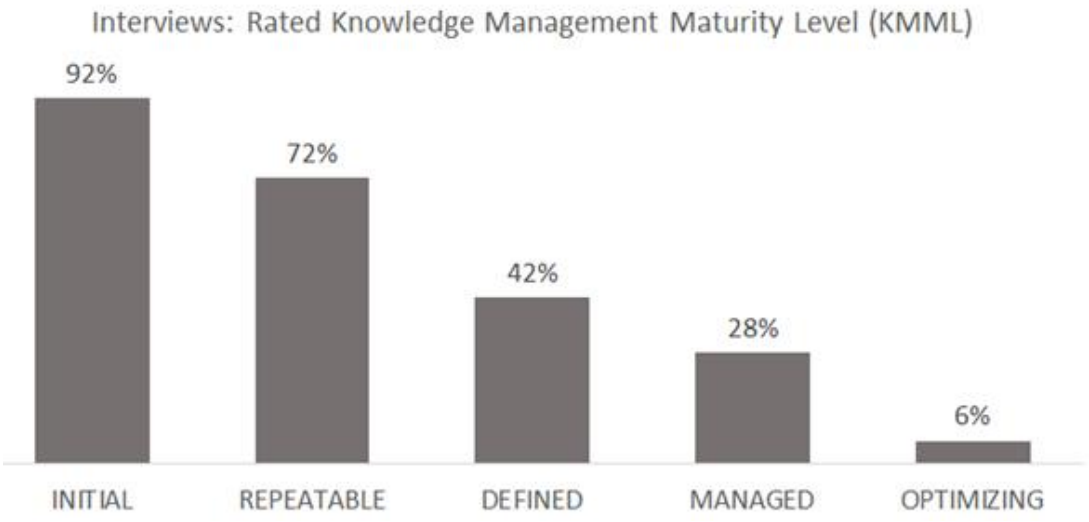


Figure 10 provides a percentage of the interview responses aligned with each KMML domain.

Figure 10

Data Collection: Assessing Maturity Level



Driven by our research questions, we overlayed the KMCA model and the KMML scores to ascertain alignment. Given an average score of 13.5 on the KMML and our manual analysis of the

interviews, we can partially quantify *The Company*'s maturity level as DEFINED based on the KMML (Alzami & Zairi, 2003). At this level, the organization has regular and practical activities that effectively support the KM of individual groups, such as onboarding activities for new employees. They also have activities integrated into the day-to-day work processes, such as weekly project management meetings, town halls, and global sales sessions. While employees have established some ways to share information and help each other, leadership needs to prioritize the importance of KM. Each group is creating its processes and assets, as P8 notes: "I feel like each team is kind of responsible for maintaining their own resources" (personal communication, August 10, 2022).

Though several interviewees said that " *The Company* has a culture of sharing," they also recognize and emphasize that there are no structured processes to ensure adequate maintenance, governance, and awareness of knowledge-sharing practices.

> "One of the things in our organization is there is a lot of knowledge that exists across, but it's not always accessible, or people don't know where to go to get it. And so, it doesn't do any good if we have it, but it's not available or accessible, or people don't know where to find it." (P4, personal communications, June 7, 2022)

Furthermore, *The Company* has multiple technology systems and off-the-shelf sales enablement technology platforms for people to informally practice sharing knowledge assets. However, interviewees note that "you have multiple knowledge management tools out there and everything, and what happens is it gets stale right fast" (P3, personal communication, June 20, 2022). Additionally, P8 commented that:

> "The challenges and the reason that teams kind of go from system to system are like, you know, materials become outdated, or there's not somebody responsible for kind of the overall maintenance of the system, and I think that's a really hard job" (personal communication, August 10, 2022).

Moreover, P4 also noted that:

> "But there's a dedicated group, that sort of, I mean, I say, group, it's probably like two or three people, but that's sort of their job is to sort of keep track of it, and then help people, I would say it's sort of like, they manage sort of the backbone of it, but other people have the ability to add and remove content from it" (personal communication, June 16, 2022).

We heard similar comments from most of the interviewees. As such, the study data highlights the organization's need to have a person responsible and accountable for managing knowledge, whose duties are clear, and who broadly communicates their efforts.

The KMML and the KMCA-aligned interview coding provided evidence to answer each of our study questions. The following section provides the highlights of that analysis.

4.2.2. Interview Coding: Analysis by Study Question

4.2.2.1. Study Question 1 – How Does *The Company* Acquire Knowledge?

Based on the interviews and our analysis, six Knowledge Acquisition themes emerged: 1) High willingness and interest in sharing knowledge, 2) A new culture has changed the nature of knowledge practices, 3) Executive leadership does not understand, value, or drive a knowledge culture, 4) Staff turnover exacerbates the knowledge gap, 5) Inefficient processes do not help continuously improve product or service delivery or help realize the total value of knowledge, and 6) Knowledge exploitation remains untapped.

In the original start-up culture of *The Company*, knowledge flowed and was acquired easily. "I would have to say like, I don't think we focused a whole lot on knowledge transfer because it happened very organically through a very small team where, yeah, people just kind of, we worked all together very closely, and most people were pretty connected." (P10, September 9, 2022).

The organization was small enough so that sharing and transferring knowledge with all employees happened naturally:

> "And so, when you're 50 people it's you know, everybody, if you have a question, you call them up, you understand what everybody's working on, there's kind of a natural way to people are brought in into the things that that they need to be involved in." (P10, personal communication, September 9, 2022)

The founders set up the organization to support new employee's capacity to acquire knowledge. They focused on hiring the best of the best and understood the value of expert knowledge, and they ensured all new employees were onboarded and learned company knowledge, "so every anyone we hired anywhere in the world came and spent the week in [main campus], and it meant that I was facilitating like, fully 50% of the time, you know, and just, it was 9 am to 5 pm." (P8, personal communication, August 10, 2022)

While some elements of knowledge sharing remain – there seems to be a high willingness and interest in sharing knowledge -- today, the culture is different in many ways, including the nature of its knowledge practices. Specifically, the organization currently does not readily support knowledge acquisition. The new culture processes are inefficient, so knowledge exploitation remains untapped. Further, leadership has not set up the organization to realize the full value of knowledge. Employees are unclear on how to acquire knowledge from internal resources, "Eventually you'll get to the right person that has the innate knowledge to help you with the answer." (P5, personal communication, June 29, 2022).

At the same time, the founding culture, which encouraged sharing knowledge, is still present to some degree, "in a lot of the ways that we operate here is relationship driven." (P8, personal communication, August 10, 2022). Fundamentally, however, *The Company*'s leaders do not intentionally acquire or structure knowledge, and there is no support or a clear path for knowledge sharing, transfer, or acquisition, "I don't know if there's a lot of other people that I would trust to help." (P2, personal communication, June 17, 2022)

Staff turnover exacerbates the knowledge gap, and when discussing knowledge acquisition, employees frequently mention frustration, such as P6:

> "So, the more new people we bring on, the more we need a system in place to reduce their frustration and burnout when they come in, and so that we can teach them so they can get up to speed as quick as possible." (personal communications, June 30, 2022)

Even more revealing, staff do not see leadership valuing knowledge acquisition. The current executive leadership is seen as not understanding, valuing, or driving a knowledge culture, as highlighted by P2:

> "So, like the people that organize people, the people that organize meetings, the people that communicate internally, like all these things that I know are the connective tissue of great organizations, it's not really named or lifted up as a role, and some people do and some people don't." (personal communication, June 17, 2022)

No one seems to champion knowledge acquisition, "And we are sharing bits of the feedback to the C-suite, but I am not in a C-suite, so I'm not entirely sure who's going to drive it." (P2, personal communication, June 17, 2022)

These comments align with the KMCA model and address how *The Company* experience acquiring, identifying, and valuing knowledge.

4.2.2.2. Study Question 2 – How Does *The Company* Represent Knowledge?

Based on the interviews and data analysis, eight Knowledge Representation themes emerged: 1) The business strategy and goals do not incorporate knowledge management practices, 2) The organization does not use knowledge management as a competitive differentiator, 3) Siloed expertise prevents optimum knowledge sharing and creation, 4) There is lack of enterprise-wide knowledge management processes and structure, 5)Staff do not have accountability for knowledge management practices, 6) There is not any evidence that *The Company* has a methodology to measure knowledge

assets, 7) Employees cannot track KM benefits against targets and goals, and 8) Knowledge encoding is not institutionalized.

The data showed that knowledge management needs to be incorporated into business strategy, goals, and norms and identified and used as a competitive differentiator. While *The Company* uses a variety of systems to store explicit knowledge, there is no process, prioritization, or structure around tacit, expert, and mission-critical knowledge. In other words, staff do not intentionally represent, store, or measure knowledge as an asset, and knowledge encoding is not institutionalized, "There's no way to really map or track this, so sometimes customers are working with almost entirely technical folks that don't provide that connective tissue to their experience." (P2, personal communication, June 17, 2022)

While knowledge representation systems exist at *The Company*, they do not seem to be connected, "But as far as technology that we're trying to use across the board, I haven't seen a lot of it." (P8, personal communication, August 10, 2022) "If you talk to other people, they'll tell you to have more systems that we know what to do with it." (I11P2 June 17, 2022)

The organization would benefit from enterprise-wide system support to efficiently manage assets, as discussed by P6:

> "you put a ticket in for everything much like most large organizations, but it doesn't tell you where to put the ticket in. So, it's just kind of put stuff in and hope someone helps you to get it where it is." (personal communications, June 30, 2022)

There are process inconsistencies, "repeatable processes are not codified," (P6, personal communication, June 30, 2022), and there are gaps in support systems. To some extent, staff and senior leadership are aware of the gaps in the system, "the senior leaders I've spoken to who I have asked about these things are starting to realize and they've already known since before I was here that systems gap is there." Staff practices and mechanisms for knowledge representation seem haphazard, "I

don't post a lot of my stuff in high spot I think that's a gap that could be discussed to creating a central repository for information sharing." (P9, personal communication, July 29, 2022)

The organization has seen significant staff turnover, taking with them their knowledge and potentially proprietary mechanisms/processes to do business that they learned while at *The Company*. They have left the building without this knowledge being represented, captured, and stored for future use, "And it's clear the generations of employees like those that have been here since the very beginning those and all the different generations like with our recent acquisition, we've lost generations of people." (P2, personal communication, June 17, 2022)

The data reveals that staff appears motivated to create effective knowledge representation systems, as P6 mentions:

> "If we can all start working on those things and take a little bit of time every day, we can create documentation or a few process flows so that we don't have to reinvent the process every time. So, us building specific processes and policies for [our division] stuff makes me very happy, and I think that's going to be the most valuable thing to do in the next year because our turnover rates right now are high." (personal communication, June 30, 2022)

There are also experts, but they appear siloed, which prevents optimum knowledge sharing and creation, as P5 describes:

> "But at three years here, I've... no one's explained to me the process that like… if I create this really crazy awesome perspective… like what we've been doing on the [client] stuff right, like I don't know how that would ever go back into there." (personal communication, July 29, 2022)

These comments align with the KMCA knowledge representation components to document and transform knowledge.

4.2.2.3. Study Question 3 – How Does *The Company* Make Knowledge Available?

Based on the interviews and data analysis, nine Knowledge Representation themes emerged: 1) There was no evidence of support mechanisms to enhance knowledge creation, 2) There are few ways to improve knowledge sharing mechanisms, structures, and capabilities, 3) Employees miss opportunities to enable expert knowledge transformation, 4) The organization has not integrated dynamic knowledge capabilities into their business, 5) Learning mechanisms are missing from day-to-day activities, 6) While there are experts, their expertise appears, 7) Organizational learning is slow-moving as KM sharing is ad-hoc, 8) There is costly and unmanageable growth of knowledge, and 9) Knowledge sharing and creation is encouraged but not rewarded.

The data showed the desire to share knowledge, yet it takes work, and in some cases, it needs to be clarified how to access it. There needs to be precise and maintained knowledge-sharing mechanisms, structures, and cultivated knowledge capabilities. Employees feel overwhelmed with information, as discussed by P4:

> "The challenge that I would find most often is not necessarily lack of access is that we have such an overwhelming amount of information. I may search for it this way, and nothing comes up. But somebody else phrases it a different way and searches for it, and they find what they need. The information you want is out there. It's just finding it and getting it, you know, efficiently. So sometimes it's frustrating because you don't know the exact place of where to find it." (personal communication, June 16, 2022)

While *The Company* may have multiple individual subject matter experts, their knowledge is not transferred effectively nor supported to enable expert knowledge transformation. In short, there is a lack of integration of core and dynamic knowledge capabilities, "There's so much clutter." (P3, personal communication, May 25, 2022)

The organization must embed learning mechanisms into day-to-day activities. Knowledge sharing is ad hoc, making organizational learning slow-moving,

> "I don't... I just... I keep them in stacks, and then I remember, I put a date on it, and then I go oh where is that thing? It's terrible, it is literally terrible, but I don't know how to fix the problem." (P2, personal communication, June 17, 2022)

Because processes are not intuitive, knowledge is difficult to access for regular use, "If someone says, I don't know the answer to that, almost every time that's occurred, they give me another resource to contact, or they give me some type of like resource where I can look it up." (P8, personal communication, August 10, 2022)

Indeed, while there may be a tremendous amount of knowledge and many tools at *The Company*, without use or efficiencies, the unmanageable growth of knowledge is likely costly to the company, "you have multiple knowledge management tools out there, and everything. What happens is it gets stale right fast." (P3, personal communication, June 20, 2022) As one P5 notes, "I think that there's a lot of knowledge that is being used on a day-to-day basis, but it's not being managed." (personal communication, June 29, 2022)

Procedures and protocols do not seem to exist to integrate expert knowledge,

> "But the actual process to get to that wasn't optimal, it was very much me asking people what they knew how to do this, and then just blindly sending a ticket in. It is a person-based thing which feels very much like government. It's not written down anywhere though. that I'm aware of like there's no policy or protocol written." (P6, personal communication June 30, 2022)

More to the point, P6 mentioned that "there's probably systems in place that I'm not aware of so I think that that's the other pieces of disconnection between all of our verticals, because we don't really know what the other people are doing." (personal communication, June 30, 2022)

While knowledge sharing and creation are encouraged, the organization does not reward them. As described by P3,

> "When you come here, do not be afraid to ask anyone of anything because that's just who we are and the culture we want to create and the people we want to hire, people we want to bring in are not people that sit behind desks and don't engage. I think knowledge has left the building and we didn't capture it, right." (personal communications, June 20, 2022)

This statement sums up the employees' experience accessing knowledge:

> "I think one of the things in our organization is there's a lot of knowledge that exists across but it's not always accessible or people don't know where to go to get it. And so, to your earlier point, it doesn't do any good if we have it but it's not available or accessible or people don't know where to find it." (P4, personal communication, June 7, 2022)

4.2.2.4. Study Question 4 – How Does *The Company*'s Use of Knowledge Provide Organizational Value?

Based on the interviews and data analysis, four Organizational Value themes emerged. There are 1) Various pressures to deliver quick results, 2) Sub-optimal integration of knowledge from acquired companies, 3) Barriers to sharing knowledge barriers, and 4) no identifiable ways to balance market penetration vs. innovation.

When *The Company* went public, the mentality changed from a growth mindset to an investment one. As P5 noted, "You had a lot of people that were focusing entirely on the stock price because they could see the price equaling compensation based upon what equity packages they had," and "the meetings were muted because there was a realization that we everyone had to be careful about what they said, because it might have an impact on a SEC perspective." (personal communication, July 29, 2022)

With the acquisition by an investment company, people no longer worried about the stock price but there was still pressure to deliver quick results to prove their and the organization's worth. While *The Company* is leveraging knowledge by acquiring companies, there does not seem to be time or space for integrating this new knowledge, "I think the challenge comes with tech is like you have all these different tech elements, you know, for your knowledge, infrastructure, and how do you make sure you integrate together?" (P3, personal communications, May 25, 2022)

Notably, there is employee attrition, and new employees are burning out, "But I think we've had some attrition because of some lack of information sharing on the back half of the acquisition." (P5, personal communications, July 29, 2022)

There is also a perception that *The Company* needs to be learning more effectively, "A learning organization, it's like, as we know, it requires you to have the right culture to enable that because if you don't have the right culture, it just... it just won't happen." (P3, personal communications, May 25, 2022)

Employees value collaborating to create new knowledge, "the lessons that I value the most are around the ideation of collaboration." (P5, personal communication, June 29, 2022) However, new ways to share knowledge encounter barriers, "But it seems like that changes because people in leadership don't want to support [a new product] which is fine, but they have to get us an alternative." (P6, personal communication, June 30, 2022)

The proprietary knowledge of the startup may have left to other customers, "Like, the world doesn't stand still around you and so I think that, you know, they got much better, our competitors, got much better at ***our*** messaging." (P10, personal communication, September 9, 2022)

A critical comment demonstrating the lack of executive understanding of the value of knowledge sharing came from an employee involved in sales,

> "We just acquired another company. Great. I have no idea what the hell it does. I have no idea whether or not it's a value to my customers. […] but I try… I know the executive team enough to

say, if they got a plan, they've thought it through then, then I'm going to trust them and then I'm going to… I will come back to them when I get a moment to understand what does that mean." (P5, personal communication, July 29, 2022)

As such, the data speaks to a lack of balance between market penetration vs. market innovation and the executives' understanding of monetizing and using knowledge for competitive advantage.

4.2.3. Interviews: Automated Coding and Analysis

We worked with *The Company* team to upload the interviews and initiate the analysis process with their artificial intelligence software, incrementally calibrating the rules to identify the topics accurately.

Initially, we uploaded the full interviews, which included our interview questions. We realized this was skewing results in some situations, so we decided to exclude most of our questions and comments as interviewers to provide better results for the analysis.

The text analyzer derives positive and negative constructs and can filter information to the specific interview. The analyzer also codes the text and establishes the sentiment based on the artificial intelligence analytics and the rules provided.

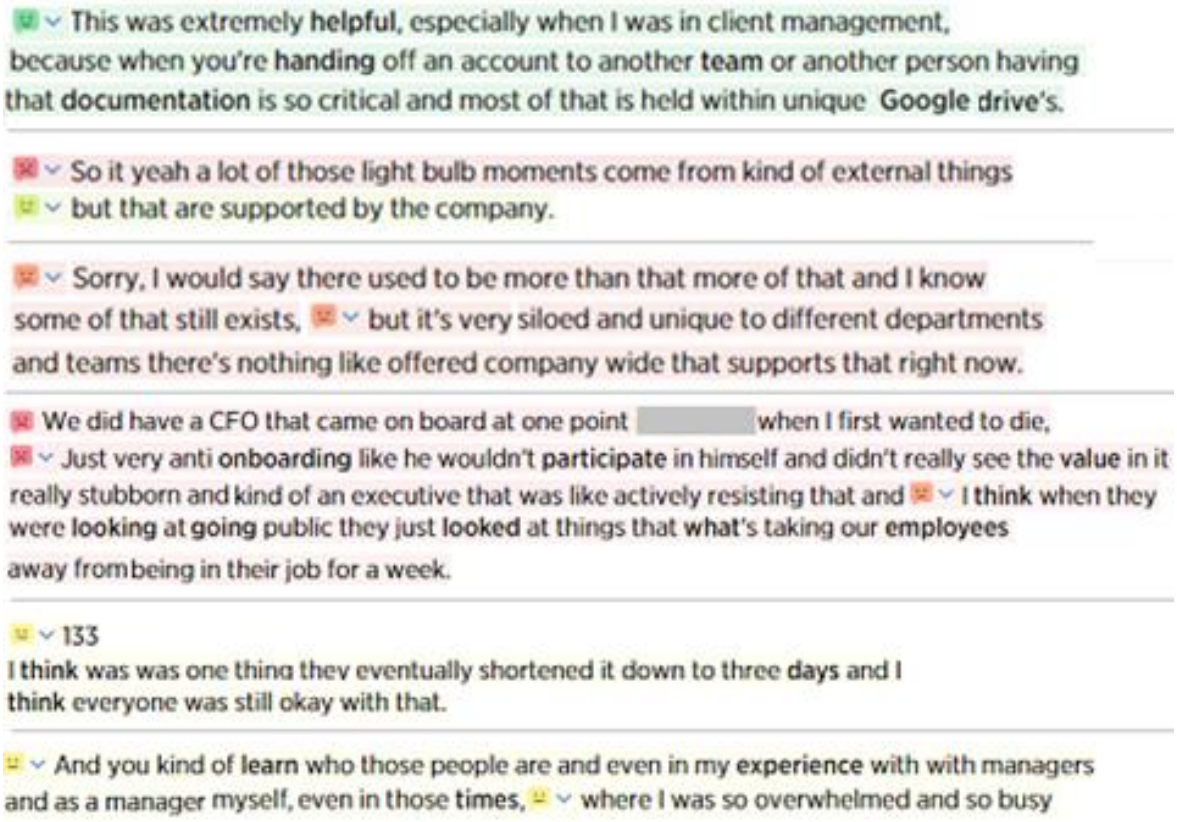
Figure 11 provides the sentiment categories, and Figure 12 provides examples of how the text analyzer codified our interviews and derived sentiment analysis.

Figure 11

Sentiment Categories

Figure 12

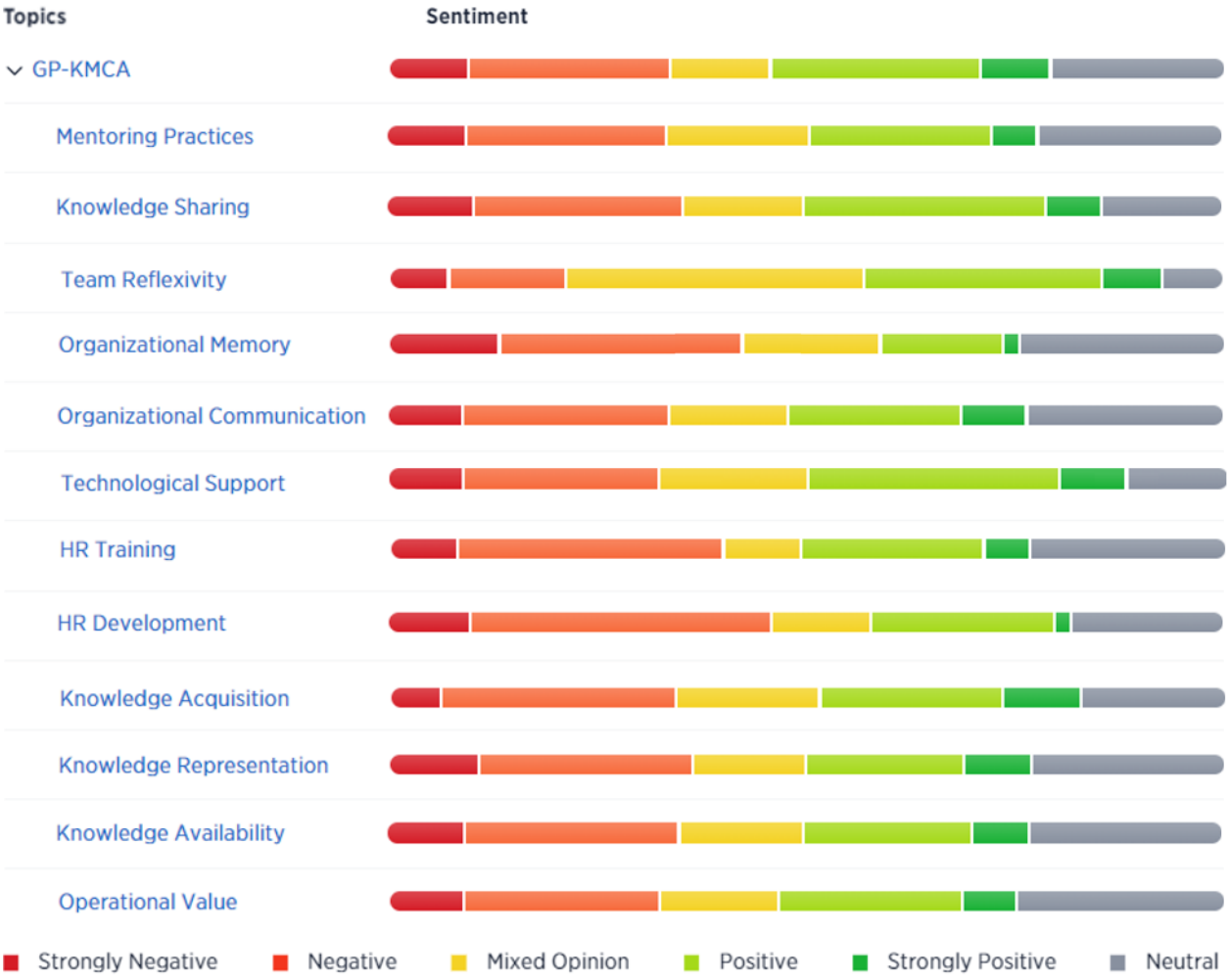
Sentiment Analysis (Interviews)



Given that we had established topics directly related to the KMCA model and in alignment with the study questions, we were able to evaluate the text analysis to gain insights. As shown in Figure 13, there were three topics that employees see as favorable: Knowledge Sharing, Team Reflexivity, and Technological Support. There were also three areas of opportunity for *The Company*: Organizational Memory, HR Development, and Knowledge Representation. These last three areas lead to a missed opportunity to monetize knowledge through Knowledge Availability and operationalize it for competitive advantage.

Figure 13

KMCAKMCA Topics Sentiment Analysis



These insights align with those from the manual coding, where employees are eager to share information and help each other, but they need more structure in the mechanisms available. Employees have multiple technologies but need help figuring out how to contribute to the enterprise's knowledge.

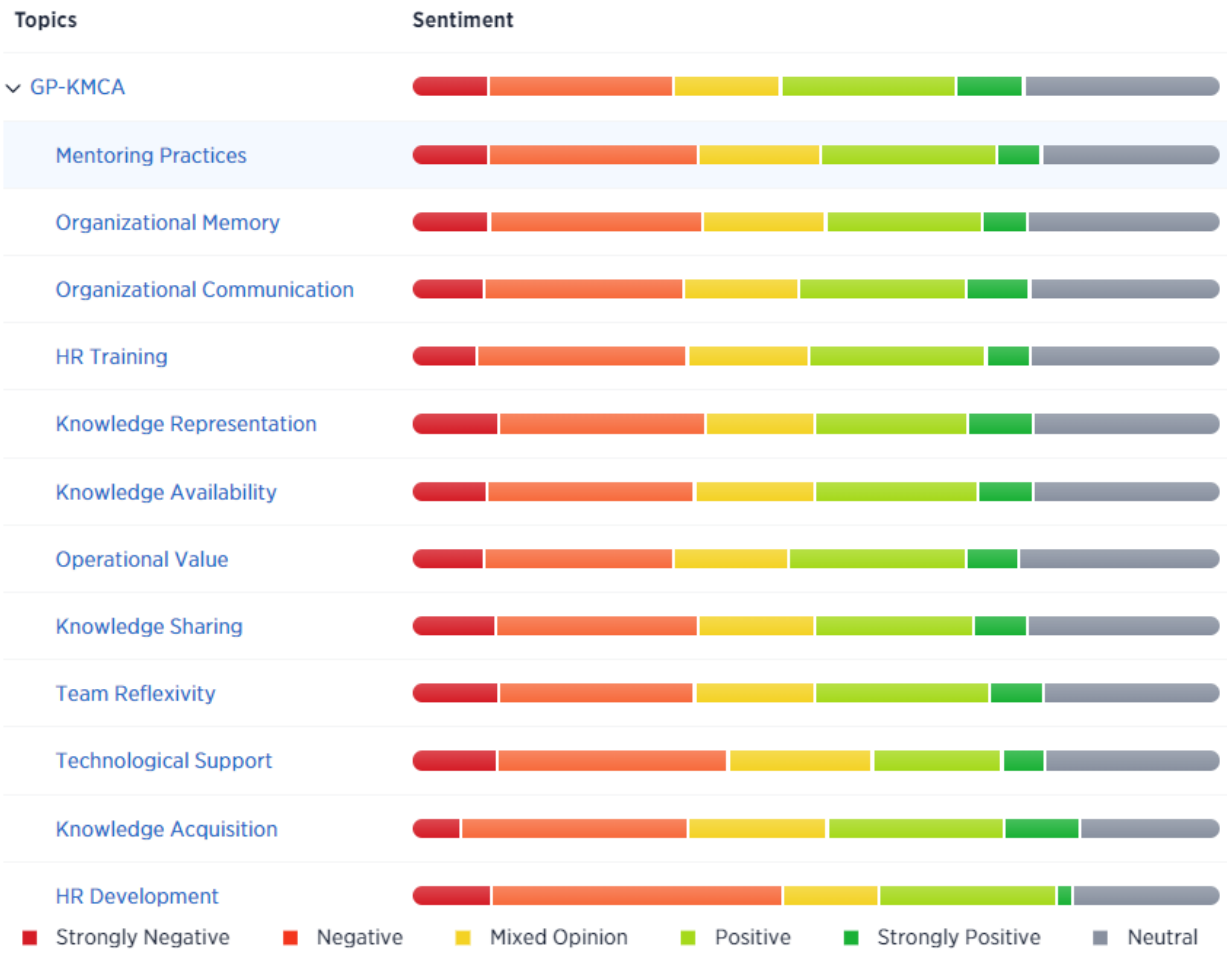
4.3. Documentation: Automated Analysis

We used the text analyzer to perform the documentation analysis (Figure 14). While the insights are more balanced between positive and negative sentiments, there were two areas of opportunity: HR Development and Technological Support, and two areas of strength: Knowledge Acquisition and

Organizational Communication. We attribute the balanced insights to the type of documents we received, such as marketing, onboarding, and training.

Figure 14

Documentation Sentiment Analysis



4.3.1. Glass Door Content Analysis – Triangulation

We conducted a content analysis of *The Company*'s Glassdoor employee review site to provide a baseline of how staff and interviewees see the company's culture and its approach to knowledge management over the last seven years. We wanted to triangulate current and potential employee feedback with other *Company* documents, news articles, internal documents, and interview data to review if data points reveal how the culture's knowledge sharing and creation may have changed over time. *The Company*'s Glassdoor site has an overall rating of 3.8 out of 5, based on over 669 reviews left

anonymously by employees, 66% of employees would recommend working at *The Company* to a friend, and 78% of employees approve of the CEO.

4.4. Surveys: Analysis

As previously mentioned, we leveraged *The Company*'s Customer Experience platform to create, issue, and perform survey analytics. Table 5 provides information on the surveys, and the following sections provide our key takeaways.

Table 5

Survey Instrument Details

Employees worldwide:	3000
Employees receiving the survey:	1000
Length of days survey was open:	7
Number of responses received:	179
Response rate:	17.9%
Distribution format:	Email with survey link

Survey Dimensions (based on KMSP-Q):

Human Resources Development, Technological Support, Sharing Knowledge, Mentoring Practices, Team Reflexivity, Organizational Memory, Organizational Communication, and Human Resources Training.

4.4.1. Surveys: Key Take-Aways

The survey data revealed that organizational memory needs better knowledge management (KM) practices in all categories. It also shows that *The Company* has some KM mechanisms and practices that are effective in team reflexivity and mentoring practices. The teams can reflect on their work to learn from mistakes and improve performance, and they interact constructively with their colleagues when facing problems. Furthermore, the data provide evidence that knowledge sharing is happening in the organization and that there is KM technological support.

However, the data also shows that employees share knowledge freely, ad hoc, and unstructured, without governance or organizational processes to support its representation and ensure its future and repeated use. The following areas of opportunity highlight this deficiency: Organizational Memory, Organizational Communication, HR Training, and HR Development. Table 6 provides the composite scores for the survey.

Table 6

Survey Composite Scores

	Composite Scores		
Mentoring Practices	3.83	Organizational Memory	3.31
Knowledge Sharing	3.93	Organizational Communication	3.39
Team Reflexivity	3.87	HR Training	3.24
Technological Support	3.78	HR Development	3.56

Results varied by age range, tenure, department, and management level, but there was no significant variation by gender, as shown in Table 7. There were 55% male and 45% female respondents.

Table 7

Survey Results by Gender (Composite)

GENDER	Mentoring Practices	Knowledge Sharing	Team Reflexivity	Tech. Support	Org, Memory	Org. Comms.	HR Training	HR Development
Female	3.74	3.89	3.90	3.72	3.29	3.30	3.25	3.51
Male	3.91	3.96	3.85	3.82	3.33	3.46	3.23	3.60
Grand Total	**3.83**	**3.93**	**3.87**	**3.78**	**3.31**	**3.39**	**3.24**	**3.56**

Table 8 shows how we aligned the KMSP-Q domains with the SECI model and its conversion modes, the KMCA model, and our study questions. The definition for each KMSP-Q domain is in Appendix C.

Table 8

Alignment of KMSP-Q, SECI, KMCA, and Study Questions

KMSP-Q Domain (Survey)	**SECI** model		**KMCA** model			
	Phase	Conversion mode	Knowledge Acquisition (**SQ1**)	Knowledge Representation (**SQ2**)	Knowledge Availability (**SQ3**)	Organizational Value (**SQ4**)
Mentoring Practices	Socialization	Tacit-to-tacit	X		X	X
Knowledge Sharing	Externalization	Tacit-to-explicit	X	X		X
Team Reflexivity	Combination	Explicit-to-explicit	X		X	X
Tech support	Externalization	Tacit-to-explicit		X	X	X
Org Memory	Internalization	Explicit-to-tacit		X	X	X
Org Communication	Combination	Explicit-to-explicit	X		X	X
HR Training	Socialization	Tacit-to-tacit	X	X		X
HR Development	Internalization	Explicit-to-tacit	X		X	X

4.4.1.1. Study Question 1 – Knowledge Acquisition

The survey domain KM concepts that inform this study question include mentoring practices, knowledge sharing, team reflexivity, organizational communication, HR training, and HR development.

Employees love to share information and help each other, with an average score of 4.29 out of 5 for the question "Colleagues are open to share knowledge and skills." Respondents rated mentoring practices, knowledge sharing, and team reflexivity activities as adequate and sufficient. However, the data shows few easy-to-use mechanisms for storing, transferring, and sharing knowledge for future use, scoring a 3.05 for the question "Good practices are collected in databases so that employees may consult them when needed." There are also minimal structured ways for capturing achievements, acquiring knowledge, and sharing them.

While employees rate the willingness and openness to share knowledge and provide mentorship for performance improvement as effective, organizational communication is a critical area for improving KM practices. The data showed that knowledge flow, dissemination, and sharing between units and throughout the organization is slow, sticky, and inadequate. The question "Employees are informed about the work of other units" scored 2.91.

Similarly, almost 64% of the respondents assigned a value of never (3.91%), almost never (18.99%), or sometimes (40.78%) to the question "We produce a lot of useful and informative documents regarding the results achieved." This result highlights a significant opportunity for *The Company* to understand the type, content, channels, and methods of providing actionable and meaningful information.

When analyzed by age range, younger employees between 20-25 years old felt a need for better knowledge management practices across the eight domains, as shown in Table 9.

There is an opportunity to strengthen organizational memory practices to ensure they know where to look for information, use lessons learned, access handbooks, share achievements, and find

ways to contribute to data gathering and knowledge representation. Additionally, the organization must identify ways to strengthen and communicate HR practices to this group.

Table 9

Survey Results by Age Range (Composite)

AGE RANGE	Mentoring Practices	Knowledge Sharing	Team Reflexivity	Tech. Support	Org. Memory	Org. Comms	HR Training	HR Development
20-25	3.58	3.33	3.50	2.67	2.50	3.08	2.25	2.83
25-30	3.81	3.96	3.88	3.84	3.38	3.36	3.25	3.53
30-35	3.71	3.82	3.77	3.71	3.17	3.30	2.91	3.36
35-40	3.72	3.89	3.78	3.80	3.05	3.33	3.04	3.44
40-45	3.89	3.88	3.99	3.75	3.58	3.44	3.55	3.78
45-50	4.02	4.12	3.95	3.94	3.36	3.48	3.40	3.67
50-55	3.60	3.90	3.81	3.70	3.39	3.29	3.24	3.47
55-60	3.94	3.89	3.80	3.78	3.29	3.40	3.38	3.66
60-65	4.37	4.53	4.37	3.90	3.73	4.10	3.97	4.33
Grand Total	**3.83**	**3.93**	**3.87**	**3.78**	**3.31**	**3.39**	**3.24**	**3.56**

While only 1.1% of the population is in the 20-25 age range, *The Company* needs to strengthen these practices if the organization wants to attract and retain young talent. Especially as 67% of their current talent have only been with *The Company* for two years or less, as shown in Table 9. Effecting change in organizational memory and HR practices will improve knowledge sharing and acquisition activities for the younger population and may improve their retention.

Table 10

Survey Respondents by Tenure

Tenure Range	Respondents	% Respondents	
<3 Months	5	2.8%	
3-6 Months	14	7.8%	= 67%
6 Mo - 1 Year	32	17.9%	
1-2 Years	69	38.5%	
2-3 Years	29	16.2%	
3-4 Years	6	3.4%	
4-5 Years	13	7.3%	
5-10 Years	9	5.0%	
10-15 Years	1	0.6%	
15+ Years	1	0.6%	
Total	**179**	**100.0%**	

When analyzed by tenure, employees with less than six months were satisfied with and believed that knowledge management support mechanisms were adequate. The onboarding activities and novelty of being a new employee could account for this perspective. In contrast, as highlighted in Table 11, employees with 3-10 years in the organization seek more organizational communications, and those with 3-15 years rate the HR training as deficient.

Table 11

Responses by Tenure

TENURE	Mentoring Practices	Knowledge Sharing	Team Reflexivity	Tech. Support	Org. Memory	Org. Comms	HR Training	HR Development
<3 Months	4.23	4.57	4.60	4.60	4.13	4.23	4.30	4.40
3-6 Months	4.30	4.29	4.35	4.26	3.87	3.94	3.85	4.24
6 Months - 1 Year	3.84	3.89	4.03	3.88	3.34	3.52	3.38	3.66
1-2 Years	3.80	3.97	3.82	3.76	3.35	3.37	3.22	3.53
2-3 Years	3.80	3.89	3.75	3.71	3.19	3.17	3.07	3.34
3-4 Years	3.53	3.61	3.83	3.58	2.92	2.89	2.94	3.22
4-5 Years	3.56	3.50	3.46	3.51	2.91	3.17	2.79	3.22
5-10 Years	3.76	3.78	3.46	3.22	2.78	3.11	2.85	3.35
10-15 Years	3.33	4.17	3.83	3.17	2.83	3.33	2.33	3.50
15+ Years	4.33	3.83	4.17	3.83	3.67	3.33	3.33	3.67
Grand Total	**3.83**	**3.93**	**3.87**	**3.78**	**3.31**	**3.39**	**3.24**	**3.56**

Further analysis of the surveys provided insights into the lack of flexibility in the way of thinking or ability to innovate. For example, responses from Senior Managers highlight inefficiencies when sharing helpful information to improve job results (scored 3.65). They encounter difficulties accessing the knowledge base needed to carry out their work (scored 3.23) and resistance from individuals when asked to change how they work to improve performance (scored 3.47).

Most of these divisions also signal a need to improve HR training designed to cultivate knowledge at an individual level and assist them in assimilating new knowledge. The Division10 team gave an average score of 3.47 to the question "newcomers are supported in their job for a specific period of time," highlighting an area of opportunity.

Employees rated HR training as less than optimal, with the lowest composite score of 3.24. The three sub-criteria with the highest opportunity for improvement are training related to job promotion, employee needs, and adequacy for job performance.

Employees who were less than six months on the job rated all areas of KM HR training as effective in supporting employee development for job performance. Those with 3-10 years reported a need for more support for their specific training needs around job promotion and cultural encouragement for HR training.

Employees under 40 rate HR training as suboptimal on the availability of training to improve work skills, supervisory mentoring, support for training, onboarding new employees, and training to meet the employees' needs. Contradicting this finding are those in the 40-45 age range who believe that HR training mechanisms support job promotion and training in line with employees' needs.

However, the Division2 and Division12 divisions rated the HR training as inadequate in developing work skills giving them a score of 3.0 and 2.5, respectively. Furthermore, the Division2 division points to a lack of supervisors encouraging skill development (scored 2.77), a lack of focus in training on employees' needs (scored 2.77), a lack of support for job promotions (scored 2.56), and the need for adequate training to develop the skills required for their role (scored 3.07).

Six other divisions share this sentiment: Division3, Division4, Division9, Division10, Division11, and Division12. This insight is concerning for a global organization that must continuously innovate its products and services and whose entire survival depends on its technology as a market differentiator.

Each of these data points demonstrates that employees are avid knowledge-sharers but that the organization must prioritize and establish a knowledge acquisition and transfer strategy.

4.4.1.2. Study Question 2 – Knowledge Representation

Knowledge sharing, technological support, organizational memory, and HR training are the survey concept domains which inform this study question.

Knowledge sharing and technological support is rated effective in all criteria by 98.9% of the respondents. They indicate that technology is available, helps improve communication, is broadly accessible and practical for updating information, and supports knowledge representation. The International Sales division finds that technology supporting knowledge sharing is valuable and accessible between units. Results reveal that lower-level management finds technology support adequate for increased knowledge sharing.

The data shows organizational memory as a priority area to improve. Lower-level managers rate organizational memory support mechanisms as effective in all areas measured. In contrast, more senior managers saw a need for better capturing and accessibility of knowledge to carry out activities.

Employees with less than six months of tenure at *The Company* rated organizational memory effective in the following activities: best practices availability, applying lessons learned to decisions, capturing and storying knowledge for later use, creating knowledge on results achieved, collecting and monitoring data for performance, and accessibility of knowledge. However, this is different for employees with 5-10 years of tenure. They believe there is a need for defined, structured, and corporate organizational memory practices.

In general, and as shown in Table 12, all divisions actively share knowledge. They can manage their team's activities around team reflexivity, perhaps even creating their own cultures and behaviors to succeed. However, the data indicates that organizational memory and HR training activities must improve for these critical knowledge assets to continue generating value for the organization and choose to remain with *The Company*. A closer look by division indicates that employees in divisions crucial to improving competitive advantages need better organizational memory processes to decrease forgetting past experiences and events.

Table 12

Survey Results by Division

DIVISION	Mentoring Practices	Knowledge Sharing	Team Reflexivity	Tech. Support	Org. Memory	Org. Comms	HR Training	HR Development
Division1	3.86	3.94	3.91	3.71	3.40	3.37	3.42	3.54
Division2	3.98	3.95	3.81	3.72	3.16	3.45	2.92	3.56
Division3	3.54	3.75	3.54	3.42	2.77	3.10	3.02	3.35
Division4	3.58	3.17	3.50	4.33	2.67	2.58	2.92	3.50
Division5	3.99	4.13	4.06	3.93	3.78	3.74	3.56	4.01
Division6	4.15	4.31	4.31	4.31	4.07	3.87	3.78	3.67
Division7	3.67	3.75	3.96	3.54	3.08	3.13	3.46	3.29
Division8	4.33	4.50	3.83	4.08	3.83	3.67	4.25	4.25
Division9	3.63	3.71	3.95	3.86	3.26	3.14	3.18	3.58
Division10	3.60	3.98	3.84	3.98	3.23	3.32	3.11	3.43
Division12	3.25	3.61	3.19	3.56	2.86	3.03	2.86	3.33
Division13	3.42	3.58	3.83	3.75	2.25	3.67	2.42	3.42
Grand Total	**3.83**	**3.93**	**3.87**	**3.78**	**3.31**	**3.39**	**3.24**	**3.56**

The perception of organizational memory efficacy varies significantly between divisions. Division5 believes the organization appropriately monitors activities to collect data and assist employees in transitioning into their roles. Division6 rates it as effective in archival processes, having good practices on relevant databases, informing resources on how to perform a job, and highlighting ways to improve. Nevertheless, half of the divisions perceive a need for organizational memory tools and practices around past successes and identifying failures to inform strategies.

Regarding HR Training, 58.3% of the divisions indicate they need access to data to facilitate how to do their job.

The data demonstrates that the organization has the technology infrastructure to support knowledge sharing but has some opportunity to improve knowledge representation through strategic, deliberate, structured, and institutionalized processes for knowledge management. This strategy must include processes to ensure knowledge relevance, viability, availability, and resources to continuously transform and maintain valuable knowledge into assets readily available to the organization.

4.4.1.3. Study Question 3 – Knowledge Availability

The survey domain concepts and results informing this study question include mentoring practices, team reflexivity, technological support, organizational memory, organizational communication, and HR development.

As with the previous two study questions, mentoring practices, team reflexivity, and technological support scored well on average. However, organizational memory, organizational communication, and HR development require further discussion regarding knowledge availability.

Table 13 provides the HR development breakdown by tenure, highlighting areas for discussion.

Table 13

Survey Responses on HR Development by Tenure

	TENURE										
HR Development	**<3 Mos**	**3-6 Mos**	**6 Mo - 1 Yr.**	**1-2 Years**	**2-3 Years**	**3-4 Years**	**4-5 Years**	**5-10 Years**	**10-15 Years**	**15+ Years**	**Grand Total**
1. We have time/resources to reflect upon how to improve our work	4.20	3.93	3.13	2.97	2.72	2.33	2.69	2.78	2.00	3.00	3.01
2. Employees' extra-work skills are valued	4.40	4.36	3.41	3.41	3.24	3.00	3.08	3.33	4.00	4.00	3.45
3. We are encouraged to propose new ideas or projects	4.60	4.43	4.19	3.93	3.83	3.83	3.69	3.89	5.00	4.00	4.00
4. Appropriate resources are available for developing new skills.	4.40	3.93	3.38	3.45	3.00	2.83	2.69	2.67	3.00	3.00	3.31
5. We are supported in tackling the complex challenges of our professional field	4.20	4.29	3.78	3.52	3.41	3.50	3.38	3.56	3.00	3.00	3.61
6. Talents are valued	4.60	4.50	4.09	3.93	3.83	3.83	3.77	3.89	4.00	5.00	3.99

Employees with less than six months in the organization rated HR Development as effective in most areas and had sufficient time and resources available to reflect on and improve their work and skills. They feel that their talents are valued and resources are available to develop their skills. However, there is a sharp decline with employees once they cross their first six months with the organization,

dropping from an initial 4.20 to 3.13 and declining yearly. Furthermore, those with 4-5 years in the organization have the lowest scores across the HR development domain. This decline signals a potential risk of losing these employees if they lack appropriate resources to perform their job or if they feel that extra-work skills are not valued. Knowledge availability becomes a critical need for these employees.

HR development was rated as inadequate in time or resources to reflect and develop new skills. The exception is those in the 45-50- and 60–65-year-old ranges who believe resources are available to develop skills. Furthermore, the 60–65-year-old range indicates there are time and resources available to reflect on ways to improve performance. HR is the only division that believes there are appropriate resources for developing new skills.

Analyzing this by management level, we find that employees in lower levels of the organization, for the most part, rated HR development resources adequate for reflecting on improving work. They feel that their talents are valued, and there is encouragement to tackle complex challenges. In contrast, mid-level management does not feel the organization values their extra-work or talent or that they have the appropriate resources to perform their job.

MANAGEMENT LEVEL	Mentoring Practices	Sharing Knowledge	Team Reflexivity	Tech. Support	Org. Memory	Org. Comms	HR Training	HR Development
Intern	4.33	4.67	5.00	3.67	3.50	4.00	3.83	3.67
Jr. Analyst	4.33	4.50	4.67	4.42	4.58	4.50	3.92	4.50
Analyst	4.15	4.26	4.27	4.36	3.91	3.90	3.68	4.08
Sr. Analyst	3.85	3.84	3.69	3.64	3.26	3.37	3.15	3.39
Manager	3.82	3.93	3.95	3.81	3.30	3.42	3.30	3.56
Sr. Manager	3.63	3.77	3.75	3.65	3.15	3.16	2.93	3.36
Director	3.86	4.02	3.79	3.79	3.23	3.34	3.25	3.60
Sr. Director	3.88	4.08	4.02	3.75	3.46	3.42	3.60	3.71
VP	3.82	3.82	3.77	3.55	2.91	3.29	3.33	3.68
Sr. VP	4.67	5.00	4.67	5.00	4.83	4.17	4.33	5.00
Grand Total	**3.83**	**3.93**	**3.87**	**3.78**	**3.31**	**3.39**	**3.24**	**3.56**

In organizational memory and organizational communications, the data shows that from the Senior Analyst role to the Vice President, there are impactful opportunities to improve. The organization

needs to capture the knowledge exchange at the organizational level and create and support knowledge management to make information accessible to all organizational members when needed. They need to define adequate processes for groups to shared language effectively, which gives meaning to their actions and builds a wealth of common and easily accessible knowledge. Creating these systematic and institutionalized processes to make knowledge available will enable knowledge sharing and creation and support organizational excellence.

4.4.1.4. Study Question 4 – Using Knowledge for Organizational Value

We analyzed every KMSP-Q domain from the survey to understand how *The Company* is using knowledge to gain organizational excellence. Employees express that there are effective mentoring practices, knowledge sharing, team reflexivity, and technological support (Table 6). These three topics scored the highest across all domains.

There were no significant results across age ranges on team reflexivity. However, there were two departments indicating a need for individuals to be willing and open to changing how they work to improve performance, change working methods, and reflect upon past experiences to improve methodologies. Leveraging lessons learned to examine mistakes made and prevent them from happening again must be tightened across all divisions, as it had the lowest score of 3.39 under team reflexivity. The extent to which group members can share knowledge and interpret the results of their actions to prepare for future decisions (Hoegl & Parboteeah, 2006) will lead to organizational excellence.

In organizational memory, the highest score (3.78) in that domain was in response to the question, "Managers believe that successes, failures, and past events should always be considered as examples for future decisions." However, in the same domain, collecting information for future use and having handbooks for internal use to assist in carrying on activities were significantly lower at 3.05 and

3.15, respectively. We interpret this as a desire to use lessons learned, but that there are deficiencies in the knowledge representation processes for this knowledge to be of benefit for competitive advantage.

Organizational communication is critical in every organization. It provides mechanisms to keep employees informed about the work of other units, update them on various activities or events, support sharing between supervisors and employees, share information within divisions, and methods to disseminate information effectively. These mechanisms create and maintain the organization's communication highway, establishing norms and formal practices around the information. It also provides the foundation for establishing cultural conditions for equitable knowledge sharing, leading to organizational excellence, innovation, transformation, and competitive advantage. This domain received a composite score of 3.39, ranking it as one of the bottom three scores.

The data indicate that *The Company* needs to manage knowledge effectively before it can leverage it for innovation and seize the benefits of knowledge management for competitive advantage.

5. Findings and Recommendations

5.1. Findings

Throughout this study, we sought to understand the answers to our four research questions of how *The Company* acquires, represents knowledge, and makes it available to use and manage for competitive advantage. We found that *The Company* is operating in an increasingly complex knowledge economy and must better manage its knowledge and position itself as a learning organization to maintain a competitive market advantage. Table 14 shows the findings we derived from our data analysis and their alignment with our study questions. These start to lay the foundation for the organization's steps to remain relevant in today's uncertain, ambiguous marketplace.

Table 14

Findings in Relation to the Study Questions

Study Question	Finding
SQ1: How does *The Company* acquire knowledge?	F1: Employees perceive knowledge acquisition and transfer as not an organizational priority.
SQ2: How does *The Company* represent knowledge?	F2: There needs to be an institutionalized set of practices around knowledge management.
SQ3: How does *The Company* ensure knowledge availability?	F3: Employees need an institutionalized and systematic way of sharing and creating knowledge.
SQ4: How does *The Company* use of knowledge provide organizational value?	F4: *The Company* needs to show evidence of leveraging knowledge for innovation.

5.1.1. Finding 1: *The Company* Must Recognize the Value of a Knowledge Culture

Based on the research, we identified the need for *The Company* to mature or further develop its knowledge management capacity. Our first finding is that employees perceive knowledge acquisition and transfer as something other than an organizational priority. Specifically, *The Company* needs a knowledge management roadmap where it can identify knowledge and establish a knowledge culture to seize knowledge's competitive and organizational value. The data shows that *The Company* needs an established knowledge management corporate program with centralized leadership and governance. We found no evidence of a rewards or incentives program to promote the acquisition and identification of new knowledge or for sharing it. The lack of rewards and incentives may prevent employees from wanting to learn more or share their experiences. It signals that knowledge is unimportant to the organization's practices and growth.

While there is a high willingness and interest in sharing knowledge, the new culture has changed the nature of knowledge practices. The new culture is leading away from the founder's mantra of a growth mindset focused on professional and personal growth and now favoring a product culture where sales, marketing, and product differentiation are core.

The literature indicates that knowledge acquisition and sharing are fundamental to building a knowledge management culture to improve an organization's performance. Specifically, Hansen et al. (2013) found that organizations must focus on sharing knowledge to have a competitive advantage and that unidirectional knowledge flow is a barrier to effective knowledge management. Increasing inter-departmental, inter-team, and supervisor-employee communication creates better knowledge sharing and flow and supports better firm-level performance outcomes. Treacy and Wiersema (1993) and Takhsha et al. (2020) also found that a knowledge management culture focused on knowledge acquisition and sharing is key to achieving competitive advantage.

As one employee states, "In general, people are very, very willing to help, very willing to help." (P6, personal communication, June 30, 2022) While there is a general willingness to share knowledge, the organization does not intentionally enable knowledge acquisition or sharing.

Mentoring is a proven way to acquire and share knowledge (Argote et al., 2000), and there are currently some barriers to mentoring practices within *The Company*. While there is a general willingness to share knowledge, employees, ages 20-35, feel they need access to know-how or tacit knowledge to help solve problems and do not see a culture of sharing knowledge to achieve better organizational results.

Triangulating the interview, survey, and AI data, we found a common theme that one employee summed up as: "The culture is very siloed and unique to different departments and teams. There's nothing offered company-wide that supports knowledge management right now." (P2, personal communication, June 17, 2022)

There were some notable exceptions, with employees between the ages of 60 and 65 who indicated that organizational know-how is available to help tackle problems. These are the more experienced employees with some of the firm's expert knowledge, who may know where to find

information and how to access it, and perhaps looking into retirement, but this is not the case for most employees.

Retirement and staff turnover are essential considerations when discussing knowledge management for competitive advantage. Without a knowledge management strategy, intellectual property and critical knowledge will continue to leave *The Company*. A strategy may also include recruitment and retention activities that reward knowledge so that employees choose to stay with the organization and structure succession planning activities to address promotions, retirements, and departures.

The sentiment analysis of interviews and documents indicates that employees view team reflexivity as practical, which the literature considers a pivotal way to create and acquire knowledge and learn (Philipson & Kjellström, 2020). Knowledge sharing and technological support scored a positive sentiment of over 67.9%.

Knowledge is shared freely but unstructured and unmanaged, and therefore its full potential and potential monetization remain untapped. Following the KMCA model for knowledge acquisition will aid *The Company* in identifying where the organization is acquiring knowledge, either internally or externally, and determining if it is valuable and worth preserving. We articulate this finding: " *The Company* must recognize the value of a knowledge culture."

5.1.2. Finding 2: *The Company* Needs to Institutionalize Knowledge Management Practices

Our second significant finding is that *The Company* needs to institutionalize knowledge management practices and integrate them into the organization's connective tissue, aligned with its business strategy and goals. Specifically, organizational memory is an area that requires attention and improvement, scoring over 69.2% negative sentiment. The lack of enterprise-wide knowledge management processes and structure creates a knowledge dependency on relationships. Employees seek knowledge through relationships rather than organized and disciplined knowledge management

practices. Survey data revealed that organizational memory is in the top three areas needing better knowledge management (KM) practices in all sub-criteria categories. Employees perceive that the mechanisms for storing, transferring, and sharing knowledge for future use, capturing achievements, and sharing these results still need to be improved.

Furthermore, staff turnover is high, which further exacerbates the knowledge gap. Sveiby (1997) notes that staff turnover impacts knowledge retention and utility. To reduce the impact of turnover and survive staff loss, an organization must have effective structures to capture, store and make information accessible.

North and Kumta (2020) emphasized that three conditions are necessary to represent, create and transfer knowledge effectively and support an organization's performance. These are: enabling conditions (values, guiding principles), rules of the game (access to experts or knowledge), and processes or structures (efficient ways to transfer knowledge). Our findings indicate that *The Company* needs to improve all three conditions to enable knowledge flow mechanisms.

The data revealed that the current lack of knowledge support processes creates a barrier to understanding how to represent knowledge and the value of the company's knowledge assets. The theme analysis found interviewees and documents rated "knowledge" as a theme negatively (43.8% of the time and positively only 25.3%). One interviewee noted, "We don't have anything that captures experiences from day to day." (P7, personal communication, August 5, 2022)

Employees in critical positions lack the knowledge management structures to represent knowledge and perform at optimal levels, and express the need for better knowledge-sharing, mentoring, and organizational memory mechanisms. These are all divisions central to improving *The Company*'s competitive market advantage. Mid-level managers also rated knowledge-sharing mechanisms as inadequate, particularly around organizational memory, knowledge representation, and handbooks for KM storage to carry knowledge forward.

The Company does not have staff accountable for knowledge management practices. While two or three people are responsible for some of the knowledge bases in the organization, it was unclear if they are accountable for the knowledge management practices and the scope of their responsibilities. Employees search in multiple places for information with the hope of finding it, leading us to the conclusion that there needs to be a methodology to assess knowledge assets or measure their benefit, importance, or effectiveness.

Every team creates its processes and behaviors around knowledge management with mixed results in its use for organizational value. Knowledge encoding must be institutionalized. We defined this finding as " *The Company* needs to institutionalize knowledge management practices."

5.1.3. Finding 3: Formalize Methods for Sharing and Creating Knowledge

When organizational knowledge is readily available and shared, it is easier to use to create new value. Our study found that at *The Company*, knowledge is neither easily accessible nor shared effectively. Therefore, our third finding is that *The Company* needs to formalize methods for sharing and creating knowledge. The literature emphasizes the importance of organizational leaders' intentionality to make knowledge available and enable mechanisms to ensure knowledge flow so it can be easily shared and used to create new knowledge. Cong and Pandya (2003) argue that knowledge sharing is not a natural behavior, and the culture must intentionally support it. Leaders must ensure systems support knowledge to use and encourage knowledge sharing to create change in behavior and attitude. In short, *The Company* must enable expert knowledge transformation and make it readily available.

The organization's siloed expertise prevents optimum knowledge availability for sharing and creation. Employees recognize the value of knowledge for their success and that knowledge can quickly get diffused when using multiple systems. In its start-up days, daily knowledge availability, sharing, and use seemed the norm as there were only 50 employees, and it was easier to share knowledge with all staff.

As the company went public and later was acquired, the culture changed, and the organization restructured its divisions. Sharing knowledge cross-industry might be minimal or lost. If knowledge is unavailable, people will be unable to use it and eventually be lost.

Nissen (2006) discusses that knowledge availability and the interchange of knowledge among individuals and teams are critical to sustaining competitive advantage. A higher level of current knowledge scaffolds the ability to learn new knowledge and to increase the knowledge level (knowledge inventory/assets) and learning rate (defined as knowledge flow). Knowledge is the only resource that grows when used.

The Company needs to embed learning mechanisms into day-to-day activities and norms to support knowledge availability further. While there is evidence of some knowledge exchange, most of this seems to be ad hoc. Information is not easily accessible or usable, impeding its efficacy for a knowledge advantage. *The Company* needs better organizational memory tools to capture, store and use knowledge from past successes and failures and mechanisms to support accessible data storage on how to carry out the job. Additionally, themes related to growth, organizational growth, documentation growth, and personal growth were rated negatively at 35.7% and positively at only 21.4%.

The Company must plan learning mechanisms and embed them in day-to-day activities. Without them, *The Company* faces a costly and unmanageable growth of knowledge. It will compound the existing silos of expertise and lack of integration of dynamic capabilities. Knowledge, in general, must be encouraged and rewarded to ensure its use for competitive advantage and organizational excellence. We identify this finding as " *The Company* must formalize methods for sharing and creating knowledge."

5.1.4. Finding 4: Need to Innovate to Remain Competitive

Our fourth and final key finding is that *The Company* needs to use knowledge more effectively to innovate, which we define as the "Need to innovate to remain competitive" by creating knowledge.

Specifically, *The Company*'s Division4 sees a need for mechanisms for knowledge sharing, particularly around a culture of openness to sharing, accessibility to know-how, and colleague support.

Knowledge needs to be transferred effectively throughout the organization to enable knowledge creation. When *The Company* went public, there was pressure to deliver quick results and to penetrate the market with its products and services. The long-term strategy around innovation, knowledge creation, growth mindset, and development was no longer an organizational priority.

Shin et al. (2017) and Ortenblad (2018) found that learning creation between departments, and networked learning, are vital factors in achieving organizational effectiveness. *The Company*'s organizational learning is slow-moving, and knowledge sharing is practiced, not institutionalized, and limited to those who know how to find it. New ways to share knowledge encounter barriers. P8 said, "I feel like often the first thing I do when I learn something, especially if it is something new or exciting, is to share it in one of my team channels." (personal communications, August 10, 2022) while another individual noted, "I don't post a lot of my stuff in [*The Company* technology database]. I think that's a gap that could be discussed." (P9, personal communications, July 29, 2022)

One method of creating knowledge and innovation is to acquire it, and *The Company* is doing so by acquiring companies. However, there is suboptimal integration of knowledge from these acquired companies. The surveys validate this sentiment. Staff believes organizational communication needs to be improved, particularly in sharing across units and by better transferring and disseminating information throughout the organization.

5.2. Recommendations

The findings provide a clear call for action: To innovate and remain competitive, *The Company* must learn how to manage knowledge and effectively acquire, transfer, share, store, and create knowledge. In turn, this could lead to financial benefits by monetizing this knowledge. Currently, *The Company*'s knowledge exploitation remains untapped. As Argyris (1999) found, an organization can only

learn to identify and correct errors with effective mechanisms to manage knowledge. One employee said about learning, "We will only succeed if we all understand how not to make the same mistakes."

Choo (1996) explains that a knowledge management strategy achieves improved performance through organizational learning. Based on the KMCA Model, knowledge management includes people, processes, and technology that enable performance, learning, and sustained growth. To become a learning organization, *The Company* needs to manage its knowledge to create value and start by implementing the four primary recommendations outlined below.

5.2.1. Recommendation 1: Appoint a Knowledge Management Officer (KMO)

Szulanski (1996) found that to overcome barriers to knowledge management, organizations need a person accountable for the process, which aligns knowledge management with organizational strategy. A Knowledge Management Officer (KMO) must be able to work with, if not be part of, executive leadership and needs to be trusted and empowered to drive a knowledge culture.

During our study, we found that *The Company* employees are willing and interested in being part of developing a knowledge culture. An interviewee stated this: "building specific processes and policies for the [small division] stuff makes me very happy, and I think that's going to be the most valuable thing to do in the next year because our turnover rates right now are high." However, building a KM enterprise is complex. First, there must be a champion that builds the business value proposition and case to install a KMO. The KMO will then establish the overall strategy, vision, mission, and goals to harness the power of knowledge and use it for competitive advantage.

5.2.2. Recommendation 2: Pilot a KM Project

Our second recommendation is to pilot a knowledge management project in *The Company*'s smaller division. A successful pilot will enable scalable approaches and replicable infrastructure and use a learning and experimentation approach (O'Dell & Hubert, 2011). This project should be well-resourced and have support from executive management. The knowledge management structure must encourage,

support, and increase knowledge sharing. A KM pilot needs to catalyze employees' autonomy and participation in decision-making (Chen & Huang, 2007). If knowledge is not accessible, people will not be able to find it or use it. By establishing a pilot, leadership will be able to identify which technology best supports knowledge sharing between units and which employees can access helpful technology to store and update information. The KMO must be empowered to lead this pilot with appropriate knowledge assets, resources, and investment. The KMO will track benefits against targets and goals and should use the KMCA model as a guide. The goal is to prevent knowledge from leaving the organization by operationalizing ways to capture it and represent it for future use.

5.2.3. Recommendation 3: Establish A Semi-Annual Knowledge Jam

The Company needs to improve its ability and structures to share data and capture knowledge creation. A positive relationship exists between knowledge creation and improved organizational performance (Lee & Choi, 2003). Our third recommendation is to build a knowledge culture to integrate systems, processes, and, most important, organizational norms and people to support knowledge sharing and creation. One way to achieve this is through a semi-annual knowledge jam.

To stimulate innovation and knowledge creation, we recommend that *The Company* establish a company-wide semi-annual knowledge jam to energize this cross-unit collaboration, infuse employees with creativity, and jointly solve a problem or a challenge or create something new. Many companies which manage knowledge effectively hold such convenings. Microsoft does hackathons, and BP, GE, and 3M also have similar ways, forums, and communities of practice to support ongoing knowledge creation (Collison et al., 2019).

This knowledge jam will provide employees with appropriate resources to develop new skills which form the basis of the individual, team, and organizational learning and creating knowledge. According to Foley et al. (2004), learning-oriented organizations can better create market sensing capability, a key for developing a more effective market orientation. Cross-unit collaboration and

adequate depth and breadth of learning market knowledge impacted product innovation (De Lucia & Atuahene-Gima, 2007). Researchers have found that a learning environment that promotes employees' continuous development combined with effective knowledge management is central to achieving a competitive advantage (Del Giudice & Della Peruta, 2016; Santora et al., 2019).

The heart of knowledge management is organizational learning effectiveness, which enables internally created knowledge. A good learning environment must catalyze employees' creativity and knowledge creation for an organization to realize the market value and capitalize on innovation. To put it another way, unless knowledge creation capabilities foster organizational learning, increases in knowledge creation for firm performance will not happen (Chung et al., 2014).

5.2.4. Recommendation 4: Incorporate the KMCA Model with *The Company*'s processes

The KMCA model incorporates various literature-supported and evidence-based tools and techniques that, when embedded adequately into *The Company*'s AI platform, could become a differentiator and service offering for their customers. In doing so, *The Company* will support its customers' capacity to build learning organizations and dynamic knowledge management capabilities. Thus, our fourth and final recommendation is to innovate by embedding the KMCA model and the tools into *The Company*'s institutionalized and governed processes and technologies to seize the value of knowledge management. Additionally, *The Company* could incorporate the training we performed in their AI into an out-of-the-box service offering or a new product capability. *The Company* can repeat this study internally (with more data) to improve the topic training and build out the AI components to derive operational insights.

In 2015, Knowledge Management became an ISO standard, ISO 30401 (Pawlowsky et al., 2021), and many of the world's manufacturing and high-tech companies use KM as a systems and process improvement tool (Wilson & Campbell, 2020). The KMCA model is structured to and may satisfy the ISO requirements.

Organizations create dynamic knowledge flow and drive competitive advantage with organized knowledge capability. Teece, Pisano, and Shuen (1997) found that market creators manage knowledge to increase dynamic capabilities and build capacity to integrate, build, and reorganize both internal/external competencies to adapt to changing environments.

By addressing its knowledge management gaps and implementing our recommendations, *The Company* builds its knowledge management strategy capacity, which North and Kumta (2020) cite as the aim of KM to use culture, people systems, and information systems to create knowledge.

6. Conclusion

The survey responses were from the entire organization and the interviews focused primarily on *The Company*'s smallest division employees, which is a potential selection bias and limitation to the study's findings and validity. Nonetheless, the findings through each method revealed similar recurring themes, possibly indicating that the culture in the smaller division is reflective of the larger organization. As such, this study's outcomes should provide actionable insights to *The Company* on improving its knowledge management practices and leveraging knowledge to remain competitive.

There are currently only 60 employees in the smaller division. Knowledge sharing is occurring organically but inefficiently. *The Company* needs to invest in structuring an approach to knowledge management to prevent the organization from finding itself with very few employees with the expertise to innovate, create, improve, and lead *The Company* into the future.

In today's complex, uncertain and unpredictable global knowledge economy, creating and supporting a learning organization is the optimum way to manage knowledge to achieve a competitive advantage (Edmunson & Schein, 2012). An organization that enables teaming, where individuals are encouraged to learn from mistakes, acquire, share, represent, make available, create, and reward new knowledge, will survive in this fast-paced knowledge economy.

6.1. Future Areas of Study

Future work could leverage this study to correlate learning and knowledge infrastructure and evaluate organizational learning and succession planning practices to establish a learning organization and avoid operational instability.

Furthermore, the study leveraged a sophisticated tool to code interviews and documents and provide sentiment analysis. This tool could be very beneficial for other correlative studies on learning and knowledge management, as well as ethnographic studies and social research in general.

Lastly, we created a Knowledge Maturity Model Level *measure* and used it with the interviews. We did not test the validity of this measure, and therefore conclusions based on this measure should be considered tentative. Further research could validate this measure.

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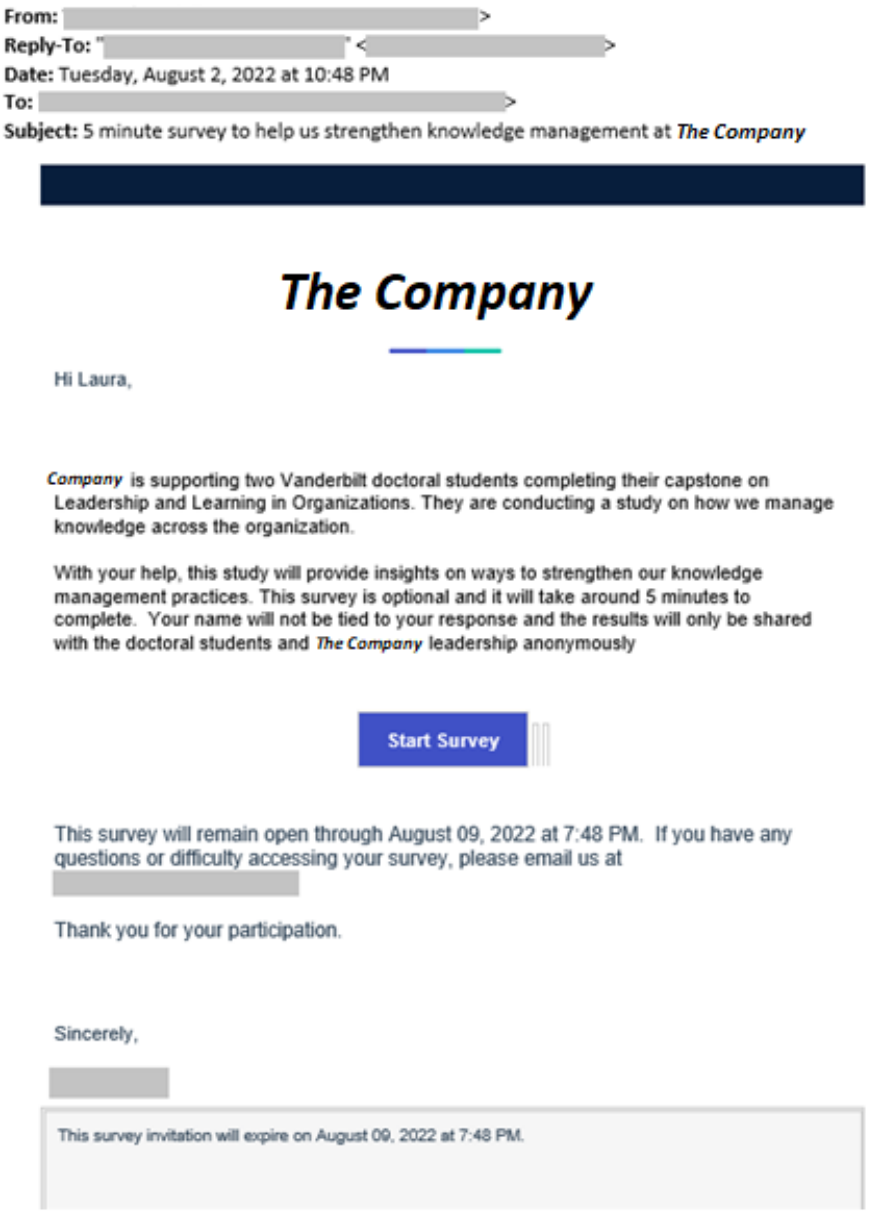
Appendix A

Survey Supporting Information.

Email introducing the survey, indicating it is anonymous, voluntary, would take approximately 5 minutes, and that it would remain open until August 9th. It was sent via internal email to 1000 employees.



From: [redacted]>
Reply-To: "[redacted]" <[redacted]>
Date: Tuesday, August 2, 2022 at 10:48 PM
To: [redacted]>
Subject: 5 minute survey to help us strengthen knowledge management at ***The Company***

The Company

Hi Laura,

Company is supporting two Vanderbilt doctoral students completing their capstone on Leadership and Learning in Organizations. They are conducting a study on how we manage knowledge across the organization.

With your help, this study will provide insights on ways to strengthen our knowledge management practices. This survey is optional and it will take around 5 minutes to complete. Your name will not be tied to your response and the results will only be shared with the doctoral students and ***The Company*** leadership anonymously

Start Survey

This survey will remain open through August 09, 2022 at 7:48 PM. If you have any questions or difficulty accessing your survey, please email us at [redacted]

Thank you for your participation.

Sincerely,

[redacted]

This survey invitation will expire on August 09, 2022 at 7:48 PM.

Knowledge Management SECI Process Questionnaire Used for the Surveys

A 5-point Likert-type response format, from 1 (*never or almost never*) to 5 (*very often or always*), is used. (SECI: Socialization, Externalization, Combination, and Internalization)

In this organization…

1. When employees start a new activity, they are supported by supervisors for a specific period of time.
2. When facing problems in their work, employees interact with their colleagues constructively.
3. Once hired, employees are trained by more experienced colleagues.
4. Newcomers are supported in their job for a specific period of time.
5. More experienced colleagues provide less experienced colleagues with constructive feedback about their work.
6. There are moments dedicated to the sharing of opinions between colleagues.
7. Colleagues are open to share knowledge and skills.
8. Each one's know-how is made available to colleagues to deal with the problems that may arise.
9. We share useful knowledge to improve job results.
10. Colleagues make their professional experiences available if someone has difficulty in completing their work.
11. The knowledge base needed to carry out one's work is always accessible.
12. Colleagues are willing to share their knowledge and skills.
13. Individuals are willing and open to changing the way they work to improve performance.
14. We can learn and acquire benefits from experience.
15. It is a good habit to change working methods considering the results achieved.
16. We monitor the effectiveness of our performance to plan future actions.
17. Reflecting upon past experiences allows us to improve the methodologies in use.
18. At the end of each project, we examine the mistakes made to prevent their repetition in the future.
19. Good practices are collected in databases so that employees may consult them when needed.
20. Managers believe that successes, failures and past events should always be considered as examples for future decisions.
21. Handbooks are produced for internal use on how to carry out activities.
22. We produce a lot of useful and informative documents regarding the results achieved.
23. Activities are monitored by collecting and processing relevant data.
24. We can consult handbooks or archives to improve our work.
25. Employees are informed about the work of other units.
26. We organize meetings in order to keep us updated.
27. Information is shared between supervisors and employees.
28. We are kept informed about what happens within the organization.
29. Information is shared between the different organizational units.
30. Useful information is effectively disseminated at work.
31. The technologies we use promote and support the circulation of ideas.
32. Technologies that improve information dissemination and communication between employees are used.
33. The use of information technology is guaranteed to all members of the organization.
34. We have invested in technologies that facilitate access to information sources and databases.
35. Technologies allow us to easily share knowledge and information between different units.
36. All employees have access to technologies that facilitate the updating of information.
37. Employees' work skills are developed through training.

38. Supervision is a typical tool used to enhance the professional knowledge of employees
39. We are encouraged to take training and professional development courses.
40. Job promotions are supported by training interventions.
41. Training activities are carried out on the basis of employees' needs.
42. New employees are provided with adequate training in order to develop the skills required for their role.
43. We have time/resources to reflect upon how to improve our work.
44. Employees' extra-work skills are valued.
45. We are encouraged to propose new ideas or projects.
46. Appropriate resources are available for developing new skills.
47. We are supported in tackling the complex challenges of our professional field.
48. Talents are valued.

Survey Reports

If interested in the survey reports, please contact Laura Prietula.

Appendix B

Interviews Supporting Information

Interview Questions non-Founders Aligned to KMCA and Study Questions.

Q1. How does *The Company* acquire knowledge?

1. Can you provide an example, at *The Company*, of a time when you needed help?
2. Did you ask for help? Who did you ask? Why?
3. Did you receive the help? How?
4. What did you learn?
5. Have you used that knowledge again?
6. How did you know that the person knew something that would help you?
7. When you think of something that employees are really good at, what is it? What makes you think so?
8. As an employee, what lessons or knowledge do you value the most and why?
9. As an employee, how would you describe knowledge that is worth keeping?
10. Is there any technology that helps you create or acquire knowledge?

Q2. How does *The Company* represent knowledge?

1. As an employee, can you provide an example of a time when you recognized that you had just learnt something (light bulb went on)?
2. Was that documented? Why? Where?
3. Do you have a place where you can write some of these experiences for others to watch or learn from it?
4. Are you aware of any knowledge management tools or projects within *The Company*?
5. Are you familiar with the technologies that *The Company* has for cataloging and codifying experiences? Can you describe one that has been important during your time at *The Company*?
6. Do you participate in any projects to curate knowledge or transform it to make it useful for others (like creating videos)?
7. Can you articulate some of the intangible ways knowledge is passed through the organization? Motivation, emotion, personality, affective aspects of learning?

Q3. How does *The Company* ensure knowledge availability?

1. As an employee, when you need to learn something, what is the first thing that you do? Why? Is there any technology involved?
2. When you want to share something, what do you do? Where do you go? What tools do you use? Who do you communicate with?
3. How often do you get communications about accomplishments, experiences, and lessons from the organization? And from other individuals?
4. What is the most important way for people to share knowledge?
5. What mechanisms helped you learn and pass that knowledge forward?
6. How did people interact and behave to share knowledge?
7. As an employee, what is the piece of knowledge that you have used the most and why?
8. Do you think *The Company* has a knowledge culture?

Q4. How does *The Company*'s use of knowledge provide organizational value?

1. Can you provide an example when you used knowledge to innovate?
2. Can you provide an example when you used knowledge to improve operations?
3. Can you provide an example when you used knowledge to change and transform?

Qualitative Interview Protocol Questions (Founders only)

1. How would you describe pivotable moments in the development of *The Company*, from conception to going public?
2. How do you categorize those moments?
3. What beliefs, perceptions, mental models did you have when developing the company?
4. How did people interact and behave to share knowledge?
5. How would you describe the organizational culture?
6. What values did you start with?
7. What beliefs did you start with and how did they evolve over time?
8. What made you so successful?
9. How would you characterize the culture's impact on company performance?
10. What supported learning?
11. How did the culture handle change?
12. What were the pain points and how did the organization handle/learn from those?
13. What were the cultural mechanisms that supported your success?
14. Can you articulate some of the intangible ways of how knowledge was passed through the organization? Motivation, emotion, personality, affective aspects of learning?
15. What assets led to your competitive advantage?
16. What were the expectations of the organization?
17. How did you interpret your environment? And how did you use internal resources to achieve, create and allocate resources.
18. Can you describe any learnings?
19. Were there structures that promoted innovativeness?
20. Describe any social/collaboratives processes and shared experiences?
21. What systems did you use to codify knowledge?

List of Interviews with Anonymized Participants and dates

- I1P1P2P3: Interview 1. Participants 1, 2, and 3. October 15, 2021
- I2P4: Interview 2. Participant 4. June 7, 2022
- I3P4: Interview 3. Participant 4. June 16, 2022
- I4P3: Interview 4. Participant 3. Dec 20, 2021
- I5P3: Interview 5. Participant 3. May 25, 2022
- I6P3: Interview 6. Participant 3. June 20, 2022
- I7P5: Interviews 7. Participant 5. June 8, 2022
- I8P5: Interview 8. Participant 5. June 29, 2022
- I9P2P3: Interview 9. Participants 2 and 3. April 2022
- I10P2: Interview 10. Participant 2. Jan 31, 2022
- I11P2: Interview 11. Participant 2. June 17, 2022
- I12P6: Interview 12. Participant 6. June 30, 2022
- I13P7: Interview 13. Participant 7. August 5, 2022
- I14P8: Interview 14. Participant 8. August 10, 2022
- I15P5: Interview 15. Participant 5. July 29, 2022
- I16P4P5P9: Interview 16. Participants 4, 5, and 9. July 29, 2022
- I17P10: Interview 17. Participant 10. Feb 24, 2022
- I18P10: Interview 18. Participant 10. September 9, 2022

Anonymized Interviews

If interested in the anonymized interviews, please contact Laura Prietula.

Notable Participant Quotes

If interested in the notable quotes, please contact Laura Prietula.

Manual Interview Coding

If interested in the manual coding interview MURAL, please contact Laura Prietula.

Automated Interview Coding

Automated Interview Coding is on *The Company*'s Customer Experience Platform.

These are considered proprietary and are not available to the public.

Appendix C

KMPS-Q Domains Abbreviated Definitions (Farnese et al., 2019)

KMSP-Q Theme	Description
Mentoring practices	**Mentoring practices** relate to tacit knowledge transfer from expert members (supervisors, tenured peers) to newcomers or less experienced members, through tactics designed to support better socialization at work. They allow the sharing of tacit knowledge by observation, modeling, and assimilation of the implicit and unconscious skills embedded in professional practice. Mentoring is a typical organizational socialization tactic to implement employees' learning, practical abilities, and personal growth in role transitions, enhancing a deep understanding of professional skills, organizational politics and values, as well as leads to several behavioral, attitudinal, and relational outcomes (Becerra-Fernandez and Sabherwal, 2001; Eby et al., 2008; Farnese et al., 2016a). **Example item is**: More experienced colleagues provide less experienced colleagues with constructive feedback about their work.
Knowledge sharing	***Knowledge sharing*** refers to the willingness to share one's own knowledge (e.g., experiences, best practices, skills) with colleagues, when needed or asked. The literature widely acknowledges the importance of knowledge sharing for organizational performance (van Wijk et al., 2008; Wang and Noe, 2010), but also highlights the difficulty of sharing the knowledge embedded in individuals (Szulanski, 2000). Thus, to promote "lateral communication" and access to individuals with relevant knowledge, social and motivational systems and human resource practices need to be implemented (Alavi and Leidner, 2001; Cabrera and Cabrera, 2005). **Example item is:** Each one's know-how is made available to colleagues to deal with problems that may arise.
Team reflexivity	**Team reflexivity** expresses the process of collective reflection on the way we work to critically revise goals, methods, practices, and the environment where they operate, accordingly planning changes to be more effective (West et al., 2000) and enhancing organizational performance and innovativeness (Schippers et al., 2015; Farnese and Livi, 2016). According to Nonaka, organizations continuously create new knowledge by reconstructing existing perspectives, frameworks, or premises on a day-to-day basis" (Nonaka et al., 1994, p. 341). Through dialog and discussion on experience, employees separate themselves from professional practice. Tacit knowledge is extracted and made explicit through processes of abstraction (e.g., maps) or symbolization (e.g., metaphors), generating higher awareness and a meta-level learning (Gherardi, 2000; West et al., 2000). **Example item is:** At the end of each project, we examine the mistakes made in order to prevent their repetition in the future.
Organizational memory	***Organizational memory*** includes the storage, organization, systematization, and retrieval of past experience and events, aimed to decrease forgetting. Through a disembedding process from individuals and from specific contexts, organizational memory reduces knowledge stickiness to individuals (Szulanski, 2000) and allows teammates to select relevant knowledge. At the same time, it makes experience accessible over time and to other colleagues through a crystallization process connecting it to the wider organizational knowledge system (Wexler, 2002; Nonaka et al., 2006). Practices for memory are based on formalization of experience, for instance, collecting good practices or producing manuals, reports, and other written documentation (Alavi and Leidner, 2001). Scholars have shown that stored knowledge may enhance organizational performance, helping to properly act routines, but also innovation, by supporting access to a stock of expertise and core capabilities (Moorman and Miner, 1997). **Example item is:** Activities are monitored by collecting and processing relevant data.

KMSP-Q Theme	Description
Organizational communication	***Organizational communication*** focuses on establishing norms and formal practices (e.g., meetings, internal communication tools) to share information and news, to keep all members updated and to overcome unit boundaries and hierarchical levels. Thus, a systemic view of the organization is enhanced. By managing the "politics of information" and making information available, the organization lays the cultural conditions for fair distribution of knowledge power and trustworthiness among people (Davenport and Prusak, 1998; Ipe, 2003). The literature has widely supported the relationship of organizational information sharing with performance and innovation (Collins and Smith, 2006; Mesmer-Magnus and DeChurch, 2009). **Example item is:** We are kept informed about what happens within the organization.
Technological support	***Technological support*** refers to the contribution of knowledge management systems and tools that boost quick and useful transfer and access to knowledge (Alavi and Leidner, 2001). It is a critical dimension for the success of the organization because it can be used to systematize, improve, and exchange intra- and inter-firm knowledge, enhancing its competitiveness (Melville et al., 2004). It expresses the willingness to use these tools and to encourage collaborative environments based on reciprocity and knowledge sharing, as well as to facilitate the management of information allowing its systematization, categorization, or reconfiguration (Nonaka, 1994; Goh, 2002). **Example item is:** Technologies allow us to easily share knowledge and information between different units.
HR training	The ***human resources training*** dimension is related to those learning processes designed to support employees to assimilate new knowledge and mold their maps, for decision-making and work processes or support role transitions (Salas et al., 2012). Training programs strengthen human and social capital, producing effective advantage for the organization and helping it to remain competitive (Arthur et al., 2003; Alvarez et al., 2004). **Example item is:** Employees' work skills are developed through training.
HR development	***Human resources development*** refers to all those policies and practices able to support the development of human resources and allowing people to make sense of what they do, to attribute meaning to their professional experience, and to value their extra-role behaviors. A learning organization "encourages continuous learning and knowledge creation at all levels [...], defines processes for facilitating the circulation of knowledge [...] translating this knowledge into changes in internal and external behavior" (Senge, 1990, p. 21). Overall, it expresses the organization's capability to be a context where all members are encouraged to learn and to develop their full potential, and human resource development is a core strategy (Argote et al., 2003). **Example item is:** We have time/resources to reflect upon how to improve our work.