COLLABORATION IN A DISTRIBUTED INFORMATION TECHNOLOGY ORGANIZATION: A DESCRIPTIVE CASE STUDY EXPLORING SENIOR INFORMATION TECHNOLOGY LEADERS’ KNOWLEDGE SHARING PRACTICES IN A LARGE PUBLIC HIGHER EDUCATION INSTITUTION IN THE NORTHEAST

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Abstract

The purpose of this doctoral thesis project was to explore how senior information technology leaders describe collaborative knowledge sharing practices in a distributed information technology system within a large public higher education institution in the Northeast. The following research question was explored: *How do senior information technology leaders describe their collaborative knowledge sharing practices?* A qualitative case study methodology was used, and the chosen study site was a distributed information technology organization’s community of practice, the Information Technology Leadership Council (ITLC). The theoretical framework for this study was the 4I framework by Crossan, Lane, and White (1999); of particular interest in this research was the movement of knowledge between the individual and group levels.

The conclusions identified three key insights into collaborative knowledge sharing practices in a distributed organization. First, ITLC members cited the informal aspects of the ITLC as best supporting collaborative knowledge sharing practices among IT leaders; they did not see the formal structure and actions of the ITLC as being conducive to collaborative knowledge sharing. Second, the distributed organizational structure of information technology at the university was a barrier to collaborative knowledge sharing practices among information technology leaders. Third, ITLC members identified with two to three groups, which impacted the collaborative knowledge sharing practices of information technology leaders. These conclusions are significant in that they support and build on the 4I framework and draw connections between theory and practice.

*Keywords*: collaborative knowledge sharing, organizational learning, 4I framework
Dedication

To my parents and my husband.

(Equally important, just listed in order of when we met.)

Thank you for supporting me in everything I do.
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Chapter 1: Introduction

Public institutions of higher education that receive state funding are facing budgetary challenges which require institutional leaders to think creatively about how to optimize resources. Since the Great Recession of 2008, almost every state has significantly reduced its funding for higher education; only two states (North Dakota and Alaska) have increased their appropriations for higher education above pre-2008 levels (Camera, 2016). Many states, including New Hampshire, Idaho, Arizona, South Carolina, Pennsylvania, Alabama, and Louisiana, have seen a reduction in state funding for higher education of one-third (33%) or more between 2008 and 2014 (Camera, 2016). While there was a slight recovery starting with the 2014-15 fiscal year, with 39 states increasing their state budget appropriations for public institutions, the increases were modest—ranging from 0.1% to 14.6%—with public higher education institute funding levels for most states still well below the pre-2008 levels (Kelderman, 2015).

During the 2015-16 fiscal and academic year, many state-funded colleges and universities faced declining enrollments and another round of reductions in state funding (Brown, 2016a; Huckabee, 2015; Kueppers, 2016; Zamudio-Suaréz, 2016c). These factors have directly impacted a number of institutions across the United States. While some institutions have already had to take drastic measures, such as laying off faculty and staff and shuttering programs (see Appendix A for a timeline and examples of this trend), others are at a stage in which they need to consider cost-savings measures.

Many universities are looking at their enrollments and reducing faculty, staff, and/or programs based, in part, on how many students are enrolled in the programs targeted for cutbacks. However, at least one university, the University of California at San Francisco, is also
looking at operational functions that support the institution as a whole. In 2016, this university opted to outsource approximately 17% of its information technology (IT) workforce to India; a university spokesperson cited the need for cost savings as the primary reason for the outsourcing (Hartnett, 2016).

It makes sense that IT would be a key area of consideration for cost reduction strategies. IT is one of the most significant areas of spending for many universities; it is estimated that most colleges and universities spend between 3.2% and 5.2% of their institutional budgets on central IT services (Lang, 2014, p. 5). Given this significant investment in IT, it is essential that IT leaders at public universities work collaboratively to optimize the use of their resources.

The process of optimizing IT operations can be extraordinarily complex when one considers large public research universities. These institutions are often distributed both in terms of organizational structure and geography, often resulting in many IT leaders across a number of locations and units within the overall organization. In these distributed organizations, IT leaders must work together collaboratively, so that efficiencies of scale and effort can be achieved.

Public higher education institutions are facing significant financial challenges and, increasingly, institutional leaders are being forced to make difficult decisions about how to keep their institutions afloat. In best-case scenarios, institutions are scaling back budgets, while in worst-case scenarios, budgetary cuts are so drastic that they result in cuts to faculty, staff, and programs. Information technology is a significant cost area for most colleges and universities. To address the changes in budgets and resources, information technology leaders, especially those in distributed organizations, must find ways to collaborate and share knowledge, in order to achieve economies of scale and, essentially, increase their capacity to do more with less.
Statement of the Problem

Large Northeast Research University (LNRU; a pseudonym for the study site), like many higher education institutions, relies heavily on technology services to support its core mission of teaching, research, and service. Everything from basic day-to-day operations to strategic long-term projects relies on a robust technology infrastructure and systems. As a result, LNRU invests over $250 million annually on its distributed technology operations (LNRU, 2011, p. 13); that is approximately 6.2% of its total $4 billion annual budget (LNRU, 2010). Given the significant investment of university resources into IT operations, it is essential for the university’s IT leaders to ensure that they utilize the resources available to them in an efficient, effective, and responsible manner.

To complicate this significant fiscal responsibility, IT leaders also have to contend with the fact that LNRU is a highly distributed university, both organizationally and geographically. LNRU is made up of a large, central campus (Central Campus, which is Carnegie-classified as a “very large research university”), over 20 smaller regional and/or professional (i.e., medical and law school) campuses (ranging in classification from “very small 4-year” to “medium 4-year,” as well as “special focus institutions”), and an online campus (Carnegie Classification, n.d.). The student population of LNRU is distributed across these units, with approximately 50% of the students matriculating at Central Campus and 50% at the regional, professional, and online campuses (LNRU, 2016a). These campuses are geographically dispersed throughout the state and operate, in many ways, independently of one another.

However, crossing these geographic and organizational chasms is the university’s unified mission, focused on teaching and research, with the most recent strategic plan highlighting a need for the university’s colleges, administrative units, and campuses to work collaboratively in
In order to leverage resources to support that mission (LNRU, 2016c). In line with that, IT leaders have made a concerted effort to build bridges among the disparate IT units to meet those goals through the creation of a variety of communities of practice. Most notable among these is the Information Technology Leadership Council (ITLC).

The ITLC was established in late 2010 and consists of approximately 80 members, each of whom is a senior leader within his or her respective unit (administrative unit, college, or campus). The ITLC is intended to provide a forum for the university’s senior IT leaders to work collaboratively; its charter states, in part, that “ITLC fosters collaboration, and . . . provides a forum for [LNRU] IT leaders to plan and collaborate on initiatives to implement policies, improve services, develop the workforce, and improve governance practices” (LNRU, 2015).

Based on average salaries for IT managers at LNRU and the number of meetings held in support of the ITLC (including general council meetings, board meetings, and committee meetings), it is estimated that LNRU spends approximately $300,000 annually in IT leader salaries to run the ITLC; over the 6-year history of the ITLC, over $1.8 million has been invested in salaries alone. This figure does not include support staff, facilities fees, travel costs (for those who do not work at the Central Campus), and costs of incidentals such as food and beverages (until early 2016, each full council meeting included lunch).

Given the stated goal of the ITLC to foster collaboration, the time investment of the ITLC members, and the financial investment of the university to support this community of practice, it is essential to determine if the ITLC is meeting its goals (LNRU, 2015). Thus far, there has been little formal analysis of the ITLC’s outcomes. This research began to shed light on this topic.

**Research problem.** Given the significant investment by the university in this community of practice, the objective of this research was to learn more about the collaborative
knowledge sharing practices of the ITLC members. The ITLC and LNRU will benefit from learning about the collaborative knowledge sharing practices among ITLC members, as this will help the ITLC leadership determine if its goal of fostering collaboration has been realized. Further, if LNRU successfully created an environment in which geographically and organizationally distributed IT leaders work collaboratively, the ITLC could serve as a replicable model for other large universities.

**Justification for the research problem.** LNRU’s strategic plan for 2009 through 2014 had seven core goals, one of which was to “use technology to expand access and opportunities” (LNRU, 2009, p. 39). This goal encompasses several concepts, including expanding the university’s online presence, becoming more efficient by examining and rebalancing the mix of centralized and distributed services, ensuring technology and data security, and creating a flexible infrastructure to help create new opportunities for teaching, learning, and research. The focus on technological innovation as a cornerstone of the university’s success was echoed in the 2016 through 2020 strategic plan, which cited the role of IT in “driving digital innovation” (LNRU, 2016c, p. 1). Further, the plan highlighted the need for a university-wide “digital infrastructure and culture that seamlessly facilitates and enhances collaboration across units on research and outreach initiatives aligned with our mission” (p. 13).

In 2010, the strategic plan goal was assigned to the vice provost for information technology, who determined that the first step in creating a university-wide technology strategy was to first understand how resources, including personnel and funding, were currently being allocated; as a result, he commissioned an outside consulting firm to perform an IT assessment (LNRU, 2011). According to the assessment, “[LNRU] invests nearly $250 million annually in personnel and non-personnel expenditures to provide and support IT. There are more than 1,600
FTE [full-time equivalent employees] providing IT support distributed across more than 52 organizations” (LNRU, 2011, p. 13). Given the importance of IT in the success of the university’s strategy, as well as this significant investment of university resources into IT functions, it was key to find a way for IT leaders from across the university’s distinct (and somewhat independently operating) units to collaborate and leverage the university’s collective IT resources.

Several years later, the IT landscape at LNRU has begun a transformation. (An overview of key changes from the past year can be found in Appendix A.) Throughout this change, the ITLC has been a consistent presence, and it will be a key factor in the university’s ability to meet the goals outlined in the strategic plans and the recommendations of the independent consultant’s report. The IT assessment determined that the ITLC has potential for engendering change; it recommended that LNRU “leverage the IT Leadership Council (ITLC) to bring together the University’s IT community to share best practices, seek expertise and input to improve solutions, and foster communication among IT units” as well as play a significant role in university-wide IT governance (LNRU, 2011, p. 31). As IT at the university changes, a key consideration is how these IT leaders have collaborated, and can continue to collaborate, to share knowledge.

Deficiencies in the evidence. Research by Bare (1986) and Austin (1994) provided evidence that, due to its mission and governance structure, higher education differs from other industries (e.g., privately held, for-profit entities). As a result, this research may help others in higher education when trying to manage a large, complex, and distributed function within the larger institution. Thus, the research question of how senior IT leaders in a higher education setting collaborate and share knowledge is significant.
Key audiences. The findings and conclusions of this doctoral thesis project will be useful to both practitioners in the IT field within higher education and researchers in the field of knowledge sharing. Others who work in IT in higher education may use the findings and conclusions from this research to help determine ways in which their organizations can create an environment that fosters collaborative knowledge sharing practices. Additionally, researchers in the fields of knowledge creation and knowledge sharing may find this study to be of interest, in particular for its focus on collaborative knowledge sharing practices in distributed teams.

Significance of the Research Problem

Wong and Tierney (2001) identified organizational culture, organizational structure, and political challenges as key issues when building a learning organization. Bak (2012) observed that, of the relatively limited amount of research on organizational learning in higher education that has been undertaken, most has analyzed the institution as a whole rather than the units within the larger organization. Bak contended that a learning organization in higher education may have different characteristics from what is observed in the private sector, due to the unique characteristics of higher education; specifically, higher education’s tradition of shared governance can create challenges not seen in corporate settings.

These concepts are applicable not only to the institution at hand, but to higher education in general, and should be of particular interest to larger institutions with distributed leadership structures, particularly large, research-focused schools. While each organization is different, higher education does have similar traits from institution to institution. By evaluating collaborative knowledge sharing practices in an organization, we can better understand the impact of organizational learning in a community of practice in a higher education setting. With this information, leaders in higher education may be able to adopt an approach that includes
proven methods based on communities of practice and organizational learning in order to build more effective organizational structures.

Organizational learning can be used as a lens to understand how organizations make decisions, adopt new ideas, and adapt to new circumstances. Examining the ITLC members’ collaborative knowledge sharing practices through the lens of Crossan, Lane, and White’s (1999) 4I framework—and in particular, the process of moving knowledge from the individual to the group—helps to explain if and how this process works in a distributed organizational structure.

**Research Question**

The purpose of this doctoral thesis project was to explore how senior IT leaders describe collaborative knowledge sharing practices in a distributed IT system within a large public higher education institution in the Northeast. Of particular interest in this research was the movement of knowledge from the individual to the group. One research question was explored: *How do senior IT leaders describe their collaborative knowledge sharing practices?* The study was addressed through a descriptive case study using qualitative methods.

**Theoretical Framework**

This study considered how a group of senior IT leaders collaboratively share knowledge while working in an organization that is highly distributed, both organizationally and geographically. The theoretical framework guiding this doctoral thesis project was the 4I framework of organizational learning put forth by Crossan, Lane, and White (1999). This framework addresses the role of organizational learning in organizational strategy and provides a method for understanding how information, ideas, and knowledge flow throughout an organization. The framework identifies organizational levels (individuals, groups, and the
overall organization) and the organizational learning processes (intuiting, interpreting, integrating, and institutionalizing) that happen as a result of what is described as a feed-forward and feedback process. As knowledge moves from one level to another, organizational learning takes shape.

Specifically, this project focused on the movement of knowledge from the individual to the group by exploring how senior IT leaders who are members of the ITLC engage in collaborative knowledge creation practices. At LNRU, a highly distributed research institution, many functions that have the potential to impact the larger institution are often managed independently at the administrative unit, college, or campus level. IT is one of these functions; however, as a direct result of the strategic planning efforts (which many IT leaders participated in at their unit level) and the recognition of current economic and budgetary constraints, IT leaders established the ITLC to address the need for greater collaboration across the university. Through the lens of the 4I framework, this research examined how the senior IT leaders who make up the ITLC collaborate and share knowledge.

Overview of Research

A qualitative case study approach was taken to address the research question. This approach allowed the researcher to use “well-grounded, rich descriptions and explanations of human processes” to study a “contemporary phenomenon . . . in a real-world context” (Miles, Huberman, & Saldaña, 2014, p. 4; Yin, 2014, p. 2). Creswell (2012) stated that a qualitative approach to research is appropriate when the researcher plans on “exploring a problem and developing a detailed understanding of a central phenomenon” (p. 16). Additionally, Creswell identified other characteristics of qualitative research that were appropriate for this study, including the reliance on participant views and opinions and the use of flexible evaluative criteria.
in interpreting the data. The researcher is a “key instrument” in qualitative research (Creswell, 2013, p. 45). The final product of qualitative research includes both the data collected from the subjects as well as “researchers’ subjective reflexivity and bias” (Creswell, 2012, p. 26).

The core question in this research study lent itself well to a descriptive case study, in that it focused on a “single issue or idea”—collaborative knowledge sharing practices—and utilized one bounded case to explore those concepts (Creswell, 2013, p. 99). In this study, the bounded case was the ITLC at a large, distributed research university. A case study approach “enables the researcher to gain a holistic view of a certain phenomenon or series of events” and can help to provide a full picture of the scenario because “many sources of evidence were used” (Noor, 2008, p. 1603).

The study was organized into four phases. (1) Documents addressing collaborative knowledge creation practices were collected, including the ITLC charter, the institution’s mission statement, and other relevant documentation. (2) A series of one-on-one semistructured interviews around collaborative knowledge creation practices were conducted with 12 individuals from the ITLC who represented a cross-section of the types of units (campuses, colleges, and administrative units) comprising the ITLC membership. (3) Data were gathered through the observation of four ITLC meetings: two full council meetings, a subcommittee meeting, and a board meeting. (4) Once all data were collected, data from each source were analyzed, with a focus on identifying salient phrases. An inductive analysis process was then performed on the salient phrases, and a cross-source analysis of insights from document reviews, meeting observations, and interviews was performed to explore collaborative knowledge sharing practices within a distributed IT system.
Assumptions. The researcher made several assumptions in establishing the context of this study:

- Organizations are social systems (Parsons, 1951/1991).
- Knowledge sharing within an organization is a social process (Brown & Duguid, 1991; Crossan et al., 1999; Schwandt, 1997).
- Communities of practice provide a setting for knowledge sharing (Brown & Duguid, 1991; Nonaka, 1994).
- The ITLC is a community of practice for the senior IT leaders within LNRU and serves as a group as defined in the 4I framework (Crossan et al., 1999).

Delimitations. A number of factors were considered and delimited the scope of this study. First, the study site was limited to a single, large, research-focused higher education institution in the northeastern United States. Further, participation in this study was limited to the senior IT leaders of LNRU, which was defined by the ITLC membership list provided by LNRU. This directed focus allowed for a concentrated examination on how this group of distributed IT leaders collaborate and share knowledge. Finally, only individuals identified as members of the ITLC as of January 2016 were eligible to participate in the interview portion of this study.

Limitations. The scope of this study was limited to the IT leaders within a single institution. This institution is just one example of many large higher education institutions across the United States, which could limit the generalizability of the study. Additionally, any ITLC member as of January 2016 was included in the pool of potential interview participants, regardless of length of time on the council. As a result, some interview participants had been members of the ITLC for a short time, while others had been members of the ITLC since its
inception. While this provided a variety of perspectives, some newer members were limited in their ability to address some questions, due to their relatively limited engagement with the council as of the interview date.

**Positionality Statement**

I have worked in the IT field for over 20 years, in both hands-on and leadership roles. For the past 17 years, I have worked in technology leadership roles in higher education, with a focus on strategic and organizational leadership. I presently serve as the chief information officer for one of the largest campuses within LNRU; as a result, I am a member of the ITLC.

When I first joined LNRU in early 2010, the ITLC did not yet exist. Instead, there was a monthly meeting of all IT leaders from across the university. During my first 6 months on the job, I attended each of the monthly meetings and found them to be, primarily, a one-way communication tool. The meeting agendas consisted of a series of speakers providing updates on various initiatives. However, the forum did not provide much of an opportunity to leverage the collective talent in the room. The associate provost for IT, who ran the meetings, recognized this problem; prior to his retirement in mid-2010, he challenged the IT leaders to revamp the organization to make it something more meaningful and useful to us. A small task force put together a proposal for the ITLC, which was envisioned as a more action-oriented group of IT leaders from across the university; the IT leaders group approved the proposal, and in October 2010, the ITLC became a reality.

Since that time, the ITLC has continued to evolve, but at the core is this idea that the university can and should leverage the collective knowledge and talents of its approximately 80 senior IT leaders. The ITLC includes a number of task forces and working groups, providing its members with an opportunity to tackle university-wide challenges and opportunities. I have
personally opted to leverage those opportunities, as they provide each member not only a chance to influence the decisions that impact IT across the university, but also a forum to meet colleagues and build professional networks.

Two key factors have allowed me to invest the time necessary to fully leverage the ITLC. One key factor is geography. As a campus IT leader, I benefit from the close proximity of my campus to Central Campus. Of all the campuses, my campus is the closest, being just an hour’s drive from Central Campus; the most distant campus is a 3½-hour drive to Central Campus. This relatively close proximity to Central Campus, where all ITLC meetings take place, has provided me a comparatively low barrier to entry (in terms of time commitment, travel costs, etc.) compared to my counterparts at other campuses. (It should be noted, however, that just one-quarter of the ITLC membership is made up of campus IT leaders. So, while proximity may be an issue for individuals at the campuses, IT leaders in colleges and administrative units at Central Campus do not have a similar challenge.)

Additionally, I enjoy the support of my direct supervisor, the chancellor and dean of my college. She recognizes the importance of participating in university-wide organizations and building professional networks; further, she recognizes that such participation is not only important to my position within the university, but also to the role our campus plays in impacting the overall direction and future of our university. Some of my colleagues, both at other campuses and within the colleges and administrative units at Central Campus, do not have the same level of support from their direct supervisors, which makes it difficult for them to justify to their superiors the time investment needed for active participation in the ITLC and its subgroups.

I personally believe that the ITLC has been a key part of my ability to build relationships across the university and has been essential to the success I have had in my role at LNRU. In
addition, as a board member of the ITLC (from 2012 through 2019), I have been a part of the ITLC’s leadership team, and I have helped to steer the direction of the ITLC. For these reasons, I had to be careful not to form any conclusions before I completed my research. Further, I had to be objective because, in order to honestly evaluate this organization through the lens of the 4I framework, I had to recognize and analyze both the successes and failures of the ITLC.

Summary

This chapter has provided an overview of the real-world scenario this research addressed, the research question and purpose of the study, and an overview of the research methodology, including its assumptions, limitations, and delimitations. Chapter 2, the literature review, delves more deeply into the concept of collaborative knowledge sharing, which was introduced in this chapter in the problem statement. The concept of collaborative knowledge sharing is addressed by the theoretical framework that is the foundation of this study, the 4I framework by Crossan et al. (1999), which is also discussed further in the next chapter.
Chapter 2: Literature Review

This literature review summarizes and analyzes the theoretical foundations of this doctoral thesis project. The chapter begins with a general discussion of knowledge, knowledge creation, and knowledge sharing and then discusses the connection of knowledge and organizational learning. Later sections highlight collaborative knowledge sharing, in particular the organizational features that affect it and the role of communities of practice (CoPs).

Knowledge

Epistemology, the theory of knowledge, has been studied since the time of the ancient Greeks. “Socrates, in Theaetetus by Plato (369 BC), conceptualized knowledge as a true belief with an account—commonly identified as the concept of justified true belief—but then indicated this definition remained inadequate” (Faucher, Everett, & Lawson, 2008). Modern-day researchers in the field of knowledge have continued to develop the concept with refinements and distinctions. Polanyi (1966/2009) distinguished between tacit and explicit knowledge; Nonaka (1994) built on that work; Wiig (2011) identified the concept of actionable and passive knowledge; and other scholars made distinctions among knowledge, information, data, and wisdom (Hicks, Dattero, & Galup, 2006; Nonaka & Takeuchi, 1995). Although some theorists have built upon others, many theorists have defined knowledge in vastly different ways. Table 2.1 lists the various definitions of the term knowledge as summarized by Hicks et al. (2006).
Table 2.1
Definitions of Knowledge

<table>
<thead>
<tr>
<th>Scholar</th>
<th>Year</th>
<th>Definition of knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alavi &amp; Leidner</td>
<td>1999</td>
<td>“Justified personal belief that increases an individual’s capacity to take effective action”</td>
</tr>
<tr>
<td>Bourdreau &amp; Couillard</td>
<td>1999</td>
<td>“Professional expertise appropriate for the domain”</td>
</tr>
<tr>
<td>Bourdreau &amp; Couillard</td>
<td>1999</td>
<td>“Things that are held to be true and drive people to action”</td>
</tr>
<tr>
<td>Davenport &amp; Prusak</td>
<td>1998</td>
<td>“Information in context coupled with an understanding of how to use it”</td>
</tr>
<tr>
<td>Galup, Dattero, &amp; Hicks</td>
<td>2002</td>
<td>“Integrated information in context”</td>
</tr>
<tr>
<td>Kantner</td>
<td>1999</td>
<td>“The power to act and make decisions”</td>
</tr>
<tr>
<td>Maglitta</td>
<td>1996</td>
<td>“Information made actionable”</td>
</tr>
<tr>
<td>Vail</td>
<td>1999</td>
<td>“Information made actionable in a way that adds value to the enterprise”</td>
</tr>
<tr>
<td>Vance</td>
<td>1997</td>
<td>“Information that has been authenticated and thought to be true”</td>
</tr>
</tbody>
</table>

Note. From Hicks et al. (2006).

From the concept of knowledge, more specific fields of thought and study have evolved.

The concept of knowledge sharing (“a set of behaviors that involves the exchange of information or provision of assistance to others”) is one of many interconnected bodies of literature under the larger umbrella of knowledge (Janz & Prasarnphanich, 2003). Under this umbrella, in addition to knowledge sharing, there are the concepts of knowledge creation (which “occurs when new knowledge is generated in organizations”), knowledge retention (“embedding knowledge in a repository so that it exhibits some persistence over time”), knowledge transfer (“evident when experience acquired in one unit affects another”), and knowledge management (“using the brain power of an organization in a systematic and organized manner in order to achieve efficiencies, ensure competitive advantage, and spur innovation”) (Argote, McEvily, & Reagans, 2003, p. 572; Serban & Luan, 2002, p. 5). Additionally, there is a related body of literature around the
idea of organizational learning (Crossan, Maurer, & White, 2011). Knowledge creation, knowledge sharing, and organizational learning are discussed in more detail in the sections below.

**Knowledge Creation**

Nonaka (1994) stated that “any organization that dynamically deals with a changing environment ought not only to process information efficiently but also create information and knowledge” (p. 14). Nonaka built on Polanyi’s (1966/2009) concepts of tacit and explicit knowledge to create his “spiral model of knowledge creation” (1994, p. 15). Polanyi’s analysis of knowledge types offers two categories of knowledge: one that can be codified and shared through training or instructions (explicit) and one that is “deeply rooted in action, commitment, and involvement in a specific context” (tacit) (Nonaka, 1994, p. 16; Polanyi, 1966/2009). However, Polanyi noted that there is an inherent connection between explicit and tacit knowledge; whereas “tacit knowledge can be possessed by itself, explicit knowledge must rely on being tacitly understood and applied” (Polanyi, 1966/2009, p. 7).

Nonaka’s (1994) spiral model of knowledge creation illustrates the need for individuals within a group to be engaged in dialogue around a concept in terms of both tacit and explicit knowledge. As more individuals within a group become involved with the process of “continual dialogue between tacit and explicit knowledge” around a single concept, the group engagement with the topic signals its value to the group. Over time, concepts of value become crystallized, which is “the process through which various departments within the organization test the reality and applicability of the concept created by the self-organizing team” (Nonaka, 1994, p. 25).

Nonaka proposed a paradigm for managing the process of knowledge creation. In this paradigm, individual learning and organizational learning are two concepts that, while distinct
from one another, also directly influence each other. While ideas must generate from
individuals, it is the organization’s capacity for creating interaction between the individuals—
what Nonaka termed “communities of interaction”—that allows for the “amplification and
development of new knowledge” (p. 15).

Nonaka (1994) articulated four modes of knowledge creation: socialization (from tacit
knowledge to tacit knowledge), combination (from explicit knowledge to explicit knowledge),
externalization (from tacit knowledge to explicit knowledge), and internalization (from explicit
knowledge to tacit knowledge) (p. 19). While each of these types of knowledge can theoretically
stand on its own, Nonaka stressed their importance to knowledge creation; these concepts—
coupled with the idea of knowledge moving from the individual to the group to the organization
and finally interorganizationally—create his spiral model.

These concepts create a foundation for how organizational knowledge can be created.
Nonaka (1994) further explained that the creation of organizational knowledge requires both
“individual commitment” to the process, as well as “organization-wide enabling conditions” (p.
27). While Nonaka explored distinct types of knowledge sharing and learning (which he termed
“conversion”), the key takeaway for this research was the theory that individuals and
organizations work symbiotically to create and share knowledge. A key concept in Nonaka’s
model is the interconnection between knowledge creation and knowledge sharing; he cited
phenomena such as “coexperience and creative dialogue” as integral to the sharing of knowledge
among members of an informal group, such as a CoP (Nonaka, 1994, p. 23).

Lichtenthaler (2016) stated that organizations are more proficient in utilizing explicit,
rather than tacit, knowledge. He cited the difficulties that individuals encounter in articulating,
capturing, sharing, and transferring tacit knowledge as a barrier to organizational knowledge
sharing (p. 3). However, he also noted that, because of the ease of replicating or imitating explicit knowledge, an organization may experience limited gains by relying on explicit knowledge. As a result, an organization should strive to optimize its use of both tacit and explicit knowledge.

**Knowledge Sharing**

Brown and Duguid (1991) made the case that knowledge sharing and learning are social constructions; “learning is built out of the materials to hand and in relation to the structuring resources of local conditions” (p. 47). Although the sharing of explicit knowledge, such as through training or written manuals, can help a worker understand the rote mechanics of a machine or system, Brown and Duguid (1991) contended that individuals will learn more about their job through “the authentic activity of their daily work” (p. 43). They cited the process of *storytelling* as a method through which a small group can go beyond the canonical information provided to them through manuals and guides in order to come up with innovative solutions. Further, they pointed out the shortcomings of documentation as a primary knowledge source, in that most documentation fails to capture the social implications of its instructions (Brown & Duguid, 1991, pp. 42-43).

Like Nonaka (1994), Brown and Duguid (1991) cited CoPs as fertile ground for knowledge sharing. They contended that learning is a function of “becoming a practitioner, not learning about the practice” (p. 48). As a result, Brown and Duguid focused on the process of establishing a culture of *learning-in-working*, in which individuals learn about the task at hand and their overall responsibilities by having access to the community that can best teach them—individuals who do similar work with a higher level of expertise (p. 49).
Senge (1990) identified five key features of a learning organization, which have been explored by a number of scholars:

- **Personal mastery:** The “individual employees, wherever they may be located in the hierarchical ladder, which are dedicated to self-improvement” (Bak, 2012, p. 164).

- **Team learning:** An extension of personal mastery. Bak (2012) summarized Confessore and Kops (1998), stating, “Without a participative organizational culture, it is difficult to create teamwork” (p. 165).

- **Building a shared value:** The process of the unit working together to create “a genuine vision developed by the people in an organization instead of mandated to them as in the typical ‘business mission statement’” (Dowd, 2000, p. 2).

- **Mental models:** The “deeply held assumptions and generalizations formed by individuals (internally and often implicitly) . . . [which] influence how people make sense of the world” (Davies & Nutley, 2000, p. 999).

- **Systems thinking:** An integration of “four characteristics under one umbrella, allowing the learning organization to provide the flexibility to create new ways of managing the four pillars under an organization’s roof” (Bak, 2012, p. 164).

The 4I framework of organizational learning put forth by Crossan et al. (1999) can help to address each of these characteristics by providing a structure and process for the sharing of knowledge. The framework focuses on four steps in the learning process—intuiting, interpreting, integrating, and institutionalizing—that occur over three levels of the organization, the individual, group, and organization (Crossan et al., 1999, p. 524).

Asrar-ul-Haq and Anwar (2016) indicated that knowledge sharing within an organization is a key factor in organizational success. They stated that “knowledge that is not . . . shared
corrodes easily” and that individuals need to share tacit knowledge to prevent it from being lost to the organization (p. 2). A number of factors that may impact knowledge sharing in organizations were identified, including individual and group characteristics such as organizational structure, social relationships, organizational culture, and organizational leadership.

Knowledge sharing is increasingly being studied in the context of how it impacts the effectiveness of an organization. Scholars have cited knowledge sharing as essential to an organization’s capacity to grow, be innovative, and remain competitive within its industry (Lai, Lui, & Tsang, 2016; Loebbecke, van Fenema, & Powell, 2016; Oyemomi, Liu, Neaga, & Alkhuraiji, 2016). Table 2.2 summarizes the key points of a number of recent studies around knowledge sharing and organizational impact.
Table 2.2  
*Recent Research Relating to Organizational Knowledge Sharing*

<table>
<thead>
<tr>
<th>Scholar</th>
<th>Year</th>
<th>Knowledge sharing area of focus</th>
</tr>
</thead>
</table>
| Argote & Hora                  | 2016 | • Identified three components of an organization ("members, tasks, and tools") and the networks created when these components intersect (n.p.).  
• Identified social networks as a factor in the "creation, retention, and transfer of knowledge" (n.p.). |
| Lai, Lui, & Tsang              | 2016 | • Examined the knowledge sharing process in terms of both knowledge inflows and outflows among units within an organization (intrafirm knowledge transfer) and its impact on innovation. |
| Loebbecke, van Fenema, & Powell| 2016 | • Noted that knowledge sharing in corporate settings requires collaboration with external partners (interorganizational knowledge sharing).  
• Identified the challenge of balancing knowledge sharing among strategic partners while allowing each firm to maintain competitive advantage. |
| Oyemomi, Liu, Neaga, & Alkhuraiji | 2016 | • Examined the impact of tacit and explicit knowledge sharing on business processes and overall organizational performance.  
• Identified business knowledge as residing, primarily, in individuals and cited the development of business processes as a way to “build organizational memory for performance” (p. 5223). |
| Szulanski, Ringov, & Jensen    | 2016 | • Identified the timing of transferring tacit knowledge as a key factor in effective knowledge transfer.  
• Found that the timing of when tacit knowledge is included in knowledge transfer can influence the effectiveness of the knowledge sharing process. |

**Knowledge and Organizational Learning**

The concept of organizational learning was first discussed in the 1960s by Cangelosi and Dill (1965). In the late 1980s, scholars began to refocus on the concept. Table 2.3 highlights key foundational research and the scholars’ primary contributions to the understanding of organizational learning. This research project focused on the 4I framework of organizational learning developed by Crossan et al. (1999).
Table 2.3  
Organizational Learning Scholars and Their Perspective on Organizational Learning

<table>
<thead>
<tr>
<th>Scholar</th>
<th>Year</th>
<th>Perspective on organizational learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>1991</td>
<td>• “Exploration and exploitation”&lt;br&gt;- Examined the balance between new ideas (exploration) and the leveraging of existing knowledge (exploitation).&lt;br&gt;- Addressed two scenarios: mutual learning and competitive advantage.</td>
</tr>
<tr>
<td>Nonaka</td>
<td>1994</td>
<td>• “Spiral model of knowledge creation”&lt;br&gt;- Established the concept of a looped, nonlinear approach to learning.&lt;br&gt;- Examined four interaction patterns, which stem from Polanyi’s (1966/2009) tacit and explicit knowledge types, and the process of knowledge creation and sharing from individual to interorganization.</td>
</tr>
<tr>
<td>Schwandt</td>
<td>1997</td>
<td>• “Social action learning model”&lt;br&gt;- Considered nonlinear subsystems of action: environmental interface, action and reflection, structuring, and meaning and memory.&lt;br&gt;- Viewed subsystems as interdependent, connected by 12 “interchange media.”</td>
</tr>
<tr>
<td>Crossan et al.</td>
<td>1999</td>
<td>• “4I framework”&lt;br&gt;- Viewed organizational learning as a function of four processes: intuiting, interpreting, integrating, and institutionalizing.&lt;br&gt;- Addressed feed-forward and feedback cycles.</td>
</tr>
</tbody>
</table>

Organizational learning examines the capacity of an organization to collectively adapt and learn. The terms learning organization and organizational learning are often used interchangeably, but they have distinct differences:

A learning organization is a best case or best practice: an organization that has both the infrastructure and the culture necessary to support the process of organizational learning. . . . Organizational learning, by contrast, refers to the capacity of an organization to transform its underlying structures, cultural values, and objectives in response to, or in anticipation of, changing environmental demands. (Perkins et al., 2007, p. 307)

In order to understand both organizational learning and learning organizations, one must examine the literature around knowledge creation and sharing and how key theorists then applied those knowledge-based ideas to organizational learning and learning organizations.
Like Senge, Watkins and Marsick (1993) created a framework for building the infrastructure necessary for a learning organization by focusing on the facilitation of organizational learning. Watkins and Marsick noted six key features of a learning organization: (1) creating continuous learning opportunities, (2) promoting inquiry and dialogue, (3) encouraging collaboration and team learning, (4) establishing systems to capture and share learning, (5) empowering people to have a collective vision, and (6) connecting the organization to the environment. Similarly, Senge’s (1990) five features of a learning organization, discussed above, help to create a framework focused on transformative social processes that facilitate organizational learning processes.

In particular, Senge focused on team learning as an organizational learning tactic through which an organization may evolve into a learning organization. Senge stated, “Individual learning, at some level, is irrelevant for organizational learning. Individuals learn all the time and yet there is no organizational learning. But if teams learn, they become a microcosm for learning throughout the organization” (1990, p. 219). Senge posited that an organization must create an environment conducive to team-based organizational learning. For a team to share knowledge, they must practice dialogue and discussion. In dialogue, participants explore concepts by listening to the views of others while suspending their own views and opinions; conversely, discussions aim to help the team find the best option among many by multiple team members participating and actively presenting and defending different options.

Schön (1983) made the case that individuals “often cannot say what it is we know” and that the “life of a professional depends on tacit knowing-in-action” (p. 49). As a result, we need a process to help us articulate and share that knowledge. Schön proposed the concept of “reflection-in-action,” a process in which individuals stop knowing-in-action to deconstruct what
they are doing and why. For example, professional practitioners can ask themselves questions
(such as “What are the criteria by which I make this judgment?” and “What procedures am I
enacting when I perform this skill?”) as they do their work, and that can help them get a better
understanding of the tacit knowledge underlying their actions (p. 50). This concept can be
applied to organizational learning, in that tacit knowledge is both invaluable to an organization
and also more difficult to capture and share than explicit knowledge. By coupling this concept
of reflection-in-action with methods of team learning, such as Senge’s dialogue approach,
individual tacit knowledge can be articulated and shared within an organization.

March (1991) examined the challenge surrounding organizational learning as it relates to
the trade-offs between the exploration (experimentation and innovation) of new ideas and the
exploitation (refinement and choice) of old ones. According to March, both exploration and
exploitation are crucial to an organization’s success; however, both compete for the same limited
resource pool, and as a result, organizations have to make choices on how to allocate resources
between the two strategies. This can be challenging to do effectively, where there is a balance
between exploration and exploitation, because the two strategies yield distinctly different results.
Exploration may result in new, better solutions but “compared to returns from exploitation,
returns from exploration are systemically less certain, more remote in time, and organizationally
more distant from the locus of action and adaption” (March, 1991, p. 73). As a result, an
organization may opt to refine ideas through exploitation, building on existing proven methods,
because exploitation can produce tangible results in a shorter timeframe. Eventually,
organizational exploration and exploitation may be out of balance, possibly to the detriment of
the organization.
Further, March identified “mutual learning” as a social side effect of the exploration-exploitation trade-off within an organization. An organization utilizes exploration and exploitation to build a store of knowledge (such as procedures or organizational norms and rules) gathered from members of the organization. At the same time, the individuals in the organization who help to inform the knowledge store also use that same store to become indoctrinated with the organization’s standards, while “the organizational code,” as he called it, is conversely impacted by the individuals within the organization.

In a stable environment (i.e., one with little personnel turnover), this can result in homogeneity between the accumulated organizational knowledge and individual knowledge; for each point in the organizational code, an equilibrium is reached between the code and the individual. “As individuals in the organization become more knowledgeable, they also become more homogeneous with respect to knowledge” (March, 1991, p. 75). Like the exploration-exploitation scenario, organizations must be careful to balance the learning cycle between the organization and individual. While organizations need individuals to understand and work within certain organizational mores and parameters, the organization also needs individuals who will bring diversity in the form of new ideas or the challenge of existing ideas.

Schwandt and Marquardt (2000) stressed the importance of a nonlinear approach in creating an effective organizational learning model; while a linear approach may make sense in theory, the learning process is too complex to capture in a linear model (p. 56). Schwandt’s (1997) answer to that was the social action learning model, which is a nonlinear system that reflects the complexity of organizational learning by highlighting four independent subsystems—environmental interface, action/reflection, structuring, and memory and meaning—connected by 12 types of interchange media (Schwandt, 1997). Schwandt’s model built upon Parsons’
general theory of action, which focuses on establishing a “systemic relationship between the ‘actions’ of the members of the social system (actors) and their collective ability to adapt to both their inside and outside environments” (Schwandt, 1997, p. 341).

Parsons’ theory views an organization as the product of its actors, objects, and norms; the organization is impacted by both its internal and external environments, including the actions of its own members. The general theory of action has four key elements: adaptation, goal attainment, integration, and pattern maintenance; these four elements can be mapped directly to the subsystems of the social action learning model (environmental interface, action/reflection, structuring, meaning and memory). Schwandt’s nonlinear model is important to the evolution of the concept of organizational learning because it highlights factors such as decision-making processes, organizational roles, organizational structure, and values and assumptions as variables that can impact how knowledge is shared (Schwandt, 1997).

Though organizational learning has been enjoying a renaissance among academic scholars, Crossan et al. (1999) noted that the theory lacks a cohesive vision. Crossan et al. pointed out that the scholars who have utilized the concept in their work tended to use it in different domains: Huber (1991) focused on information processing, Nonaka and Takeuchi (1995) considered its effect on product innovation, and March and Olsen (1975) studied the impact of cognitive limitations of managers on organizational learning. To address this, Crossan et al. (1999) proposed that “strategic renewal” was the common thread throughout organizational learning and the research around it (p. 522). With that in mind, Crossan et al. created a proposition, which included concepts such as creative tension, exploration and exploitation, multilevel learning, social and psychological processes, and a link between cognition and action. With those premises in place, the authors proposed that the systemic link among these concepts
was the idea that “the 4I’s are related in feed-forward and feedback processes across the levels” (p. 523). Figure 2.1 shows a graphical representation of the model and its feed-forward and feedback mechanisms.

![Figure 2.1. 4I framework (adapted from Crossan et al., 1999).](image)

The 4I framework of organizational learning of Crossan et al. (1999) attempts to address the issue of organizational learning as a tool for strategic renewal by putting forth the idea that “organizational learning contains four related (sub)processes—intuiting, interpreting, integrating, and institutionalizing—that occur over three levels: individual, group, and organization” (p. 524). Intuiting refers to the identification of a new idea, based on personal experience, which can help to improve the organization in some way. Interpreting takes place when the individual shares that idea, either through actions or words, with others. Integrating takes place when those
who work with the individual (for example, colleagues within a department) adopt the idea collectively. The final step, institutionalizing, takes place when the organization adopts the individual’s idea (for example, through a formal procedure or policy) to help “guide organizational action” (Schilling & Kluge, 2009, p. 340).

The term *feed-forward* describes assimilating new learning and the movement of that learning from the individual level to the group level (and, eventually, from the group to the whole organization). The movement from individual learning to group learning requires all of the individuals in the group to be able to deconstruct their “personally constructed cognitive maps” (Crossan et al., 1999, p. 532). This is similar to Schön’s concept of reflection-in-action; in both scenarios, individuals must think about how they comprehend a given concept in order to gain a better understanding of it. Once individuals have their own deconstructed map, group members must then integrate those deconstructed models with those of others. This presents a challenge to the learning process because not everyone will have the same deconstructed “pieces,” as each individual map differs and language is not precise enough to ensure shared understanding. A proposed solution to this challenge is to share knowledge through action (i.e., experiential learning) (Crossan et al., 1999, p. 533).

The term *feedback* in the context of the 4I framework is the process of using information that has already been learned. Information flows back from the organizational level to the group and individual levels, impacting individual and group cognition and behavior. This is analogous to the concepts of mutual learning and exploitation identified by March (1991). There are also challenges to knowledge transfer between the institutional and individual levels. Feedback, or the institutionalized learning that flows from the organization back to the individual, can inhibit how well individuals assimilate new learning. For example, if the feedback conveys a strict
organizational hierarchy, individuals may be limited in what ideas they share and with whom; as a result, the feed-forward process may be encumbered (Crossan et al., 1999, p. 533).

Crossan et al. (1999) recognized that the 4I framework is limited in that it does not provide a mechanism to determine which ideas should be adopted and institutionalized (p. 535). The need for knowledge sharing must be accepted and adopted in order to be effective. For example, if management uses a top-down model of leadership, ideas that do not make sense to frontline staff might be implemented; conversely, frontline staff may have great ideas that are not implemented because they do not have a way to move the idea into the group and organizational levels.

Rikkerink, Verbeeten, Simon, and Ritzen (2016) cited the dynamic features of the 4I framework as “perfectly suited to analyze and interpret . . . actions, situations, events, and learning processes” (p. 239). Notably, they used the 4I framework to study an organization with a distributed leadership structure, identifying implicit and explicit learning among individuals and groups, as well as specific behaviors of knowledge exploration and exploitation.

**Barriers to organizational learning.** In their literature review, Schilling and Kluge (2009) identified actional-personal, structural-organizational, and societal-environmental barriers to organizational learning. They were able to map each of these barriers to a stage of the 4I learning framework. Some examples of these barriers include “narrow job descriptions and high division of labor (‘not my job’-phenomenon)” as a structural-organizational barrier at the intuiting phase; a “perceived lack of relative advantage over existing practices” as an actional-personal barrier to organizational learning at the interpretation level; “inadequate communication between units” as a structural-organizational barrier to integration; and “rapid technological
change” as a societal-environmental barrier to institutionalization (Schilling & Kluge, 2009, p. 353).

**Status of a unified organizational learning theory.** Crossan, Maurer, and White (2011) were prompted to reflect on the 4I framework when, in 2009, the *Academy of Management Review* recognized Crossan et al.’s 1999 article as the most cited of the past decade. Crossan et al. (2011) revisited both the original 4I framework and the articles that cited it in an attempt to determine if the field of organizational learning had been able to create a unified theory since the publishing of the 4I framework. In particular, Crossan et al. (2011) focused on each of the four premises originally defined in the framework—strategic renewal, the multilevel nature of the model (individual, group, organization), the 4Is (intuiting, interpreting, integrating, and institutionalizing), and the link between cognition and behavior—and their use in subsequent literature (all of which cited Crossan et al.’s 1999 article) to determine how the organizational learning community has refined and/or expanded on the original ideas.

Crossan et al. (2011) found that, of those citing the 1999 article in any substantial way (measured by the frequency and location—introduction, body, and/or conclusion—of the citations in the work), “limited attention” was given to the strategic renewal aspect of the framework (p. 449). Further, many of the authors citing the 1999 article opted to use the 4I framework to evaluate single-level (i.e., individual, group, organization) learning, which in turn limited the analysis of the framework’s processes (intuiting, interpreting, integrating, institutionalizing) (Crossan et al., 2011, p. 450). Finally, the link between cognition and behavior was also somewhat neglected in citing works; those who did include the concepts separated them into the “what” and “how” of organizational learning and largely ignored the link between the two, which is at the core of the 4I framework (Crossan et al., 2011, p. 451).
However, Crossan et al. (2011) did find works that used the 4I framework more robustly. The work by Schilling and Kluge (2009), highlighting the barriers to organizational learning, was praised for its multilevel analysis and contribution to the framework in terms of gaining a better understanding of the processes (the “4Is”—intuiting, interpreting, integrating, and institutionalizing) in practice (p. 450). Additionally, Crossan et al. (2011) cited work done by Lawrence, Mauws, Dyck, and Kleyse (2005) to incorporate power and politics into the 4I framework as a meaningful addition to the model. The work of Lawrence et al. (2005) incorporated concepts such as negotiation and socialization and helped describe how and why learning moves (or does not move) from one level to another (p. 452).

In the end, Crossan et al. (2011) indicated that the 4I framework has provided a solid “trunk” from which others have been able to develop new “branches” relating to organizational learning. However, they conceded that no unified theory of organizational learning has emerged from the collective work done to date. The authors recommended that, in order to move toward a unified theory, future work in the field should focus on simplifying—not expanding—the concepts initially laid out in the 4I framework (Crossan et al., 2011, p. 458).

**The Impact of Organizational Features on Collaborative Knowledge Sharing**

Ipe (2003) identified four factors that influence knowledge sharing: the nature of the knowledge (tacit or explicit, value to the organization), motivation to share (perceived power, reciprocity, relationship with the recipient, rewards), the culture of the work environment (organizational norms and subcultures), and opportunities to share (formal and informal organizational structures and social networks—such as CoP—within the organization).

The nature of the knowledge held by individuals within an organization may be tacit or explicit. While tacit knowledge may be more difficult to codify than explicit knowledge, Ipe
contended that the perceived value of the knowledge, not its nature, may be more influential when an individual is making a determination on what knowledge to share. If certain knowledge is perceived by the holder to be valuable, the sharing of knowledge is influenced by decisions about what to share, when to share it, and with whom it should be shared (Andrews & Delahaye, 2000). If individuals feel that their position in the organization is dependent on their specialized knowledge, they may choose not to share knowledge in an effort to preserve their role in the organization (Alvesson, 1993; Empson, 2001).

Stenmark (2001) stated that people require strong personal motivation to share knowledge. Internal and external factors impact an individual’s decision on whether or not to share knowledge. Internal factors include the knowledge holders’ perception of the power associated with the knowledge and an expectation of reciprocity with those with whom they share the knowledge (Ipe, 2003). As discussed previously, individuals with specialized knowledge may have an idea (correct or not) about the value of the knowledge they possess; a belief that their power within the organization is related to the knowledge they hold may lead to “knowledge hording” (Davenport, 1997). Also, individuals consider the potential recipient of the shared knowledge and consider whether or not sharing knowledge will result in beneficial give-and-take of knowledge with the recipient (Ipe, 2003).

An external factor in motivation to share knowledge is the relationship between the sender and receiver of the knowledge. The relationship between the sender and receiver is defined by the level of trust the sender feels towards the receiver and the status and power of the recipient (as compared to the sender). Notably, people with lower status and power are likely to direct knowledge to those with more status and power, while those with more status and power tend to direct information to their peers (Huber, 1982).
Yoon and Kayes (2016) explored the social aspects of team learning behaviors. They noted that team learning can enhance organizational performance when the team can “engage in an ongoing process of reflection of why and how things are carried out” (p. 1048). Further, these behaviors transfer to individual behavior, as individuals who participate in a learning-focused team environment exhibit self-reflective behaviors themselves, which better allow them to “sharpen their knowledge” (p. 1048).

The remainder of this section focuses on the third factor in Ipe’s (2003) list: the culture of the work environment. After defining organizational culture, the specific factors discussed include psychological safety, politics, organizational structure, responsibilities of leaders, management structure, and leadership styles. The section that follows addresses opportunities to share through CoPs.

Organizational culture. Schein (1996) defined culture as the “shared norms, values, and assumptions” of an organization’s members (p. 229). De Long and Fahey (2000) similarly used the terms values (“embedded, tacit preferences about what the organization should strive to attain”), norms (“derived from values, but . . . more observable”), and practices (“most visible, . . . a way of understanding any widely understood set of repetitive behaviors”) to define culture; they contended that these three concepts (i.e., culture) inform the individual behaviors of group members, which in turn can impact the creation, sharing, and use of knowledge. As a result, they identified culture as a potential barrier to knowledge creation, sharing, and use.

According to De Long and Fahey (2000), culture can impact behaviors in four ways. First, it can help to shape the collective idea about what knowledge is important. In an organization that depends on more artistic knowledge (for example, a theater group), creative knowledge would be the most valuable; in an accounting firm, knowledge of financial
regulations and accounting principles would be more highly valued. Culture also determines what knowledge is viewed as belonging to the individual versus belonging to the organization. An organization’s culture may help to encourage or discourage sharing.

Additionally, culture creates the context and rules for social interaction. For example, individuals learn what type of information should be shared at a staff meeting and the tone they should use when addressing colleagues as opposed to supervisors. Finally, culture influences knowledge creation and adoption. The culture of an organization can either encourage new ideas or tamp them down; this concept hearkens back to March’s (1991) exploration-exploitation tension. Pentland (1995) noted that subcultures within an organization may have different perspectives on knowledge valuation; if there is not a strong overarching culture in place (for example, a strong emphasis on new research and development), opportunities to explore or exploit ideas may be missed.

Tierney (1988) examined organizational culture, particularly in higher education, and found that organizations that use both formal and informal methods of communication create a structure that better provides its decision-makers with information that will allow them to solve organizational issues. Further, the communications (whether formal or informal) make those impacted by the decisions believe that they are kept well informed (Tierney, 1988, pp. 17-18). Later, Kezar and Eckel built on the framework designed by Tierney to examine how an organization’s culture affects the use of various change strategies. They examined three types of higher education organizations—a large public doctoral university, a multicampus community college, and a private research university—and examined how each responded to five types of change strategies: senior administrative support, collaborative leadership, robust design, visible actions, and staff development (Kezar & Eckel, 2002). They found that each type of institution,
each with its own distinct organizational culture, responded better to certain types of change strategies; further, they found that a mismatch between organizational culture and the selected change strategy could not only stop people from supporting the change, but drive them to actively fight against it (Kezar & Eckel, 2002, pp. 456-457).

**Psychological safety.** Edmondson’s (2002) work on team learning revealed that the most influential factor in team learning is the concept of “psychological safety,” an environmental characteristic in which group members can learn by asking questions, making mistakes, and sharing knowledge. Carmeli, Brueller, and Dutton (2009) examined the correlation between the quality of interpersonal relationships among group members and psychological safety. Additionally, Carmeli et al. (2009) looked at the importance of the organization’s external environment and considered group dynamics through a systems theory lens.

Carmeli et al. (2009) expanded on research by Edmondson on psychological safety and examined “the dimensions of relationship quality that help researchers understand how and why interpersonal relationships foster psychological safety which in turn contributes to greater learning in organizations” (p. 82). They defined three characteristics of high-quality relationships that enhance psychological safety: “emotional carrying capacity,” the processing of positive and negative emotions; “tensility,” the capacity to withstand strain; and “degree of connectivity,” the relationship’s capacity to accept new ideas and influences and deflect those that are negative (p. 88). Carmeli et al.’s (2009) research extended and validated work on learning behaviors and identified the connection between group dynamics, interpersonal relationships, organizational learning, and organizational change.
**Politics.** One factor that may impact the cultivation of an environment that provides psychological safety for members is the organization’s politics. Cacciottolo (2013) found that organizational politics can have a direct impact on the individuals within the organization, which in turn can impact their ability to learn and/or contribute to learning within an organization. The impact of political behaviors on learning depends largely on two key factors: the type of political behavior (e.g., authority, power, or rivalry) and how the individual responds to that political behavior. In some cases, individuals may feel supported by their supervisor and/or team when the political behavior is us-versus-them, or “rival camps.” On the other hand, the same individuals may feel differently when a colleague undermines their authority in an “episodic power” play.

Cacciottolo (2013) also noted that an organization’s structure can directly impact political behaviors. Individuals generally do not respond well to organizational characteristics such as bureaucracy and poor communication; these characteristics result in feelings such as “frustration” with and “antipathy” toward the organization (Cacciottolo, 2013, p. 201). Additionally, Cacciottolo’s (2013) research provided evidence that these feelings of individuals directly impact their ability to learn through informal learning (that is, learning from and sharing with others within the organization) (p. 209).

**Organizational structure.** Zappa and Robins (2016) stated that “organizations are systems shaped by mechanisms of grouping and of interaction” (p. 296). Groupings may be a result of formal structures, such as the organization’s unit or departmental structure. Within these groups, individuals become linked to one another through relationships, such as “advice seeking, knowledge transfer, or friendship” (p. 296). Further, entire groups, such as departments, can have additional linkages; these links tend to be more formal, such as the hierarchical
structure of the organization. Within these structures, organizational learning can take place in the form of interpersonal knowledge sharing. Notably, Zappa and Robins cited individuals in “gatekeeper” roles (that is, individuals whose role in the organization affords them the opportunity to interact with and learn new knowledge from other groups) as key to the process of transferring knowledge throughout a multilevel organization.

Boulding (1956), when classifying various organizational system types, compared open system organizations to a living cell: To survive, the organization relies on the input of resources from its environment. Scott and Davis (2007), in turn, adapted Boulding’s general systems theory to apply to organizations (p. 89); just as a living cell is dependent upon both internal and external factors, so too are organizations. Organizational leaders are responsible for managing the outcomes of the organization. To do so, they must consider both internal and external organizational components.

Ipe (2003) cited organizational structure as a key component in creating opportunities to share knowledge. A structure that provides formal opportunities for knowledge sharing, including “training programs, structured work teams, and technology-based systems that facilitate the sharing of knowledge” is essential to creating a context in which knowledge can and should be shared, and provides the tools necessary for knowledge sharing (Ipe, 2003, p. 349). However, the type of knowledge shared through these channels is primarily explicit. Ipe contended that the “most amount of knowledge is shared in informal settings” through what she called “relational learning channels” (p. 349). Relational channels provide opportunities for organization members to interact personally, face-to-face, and informally; this results in trust relationships, which are essential to the knowledge sharing process. As discussed previously, Brown and Duguid (1991) highlighted the importance of these relational channels in their work.
on CoPs; they found that in CoPs, “shared learning is located in complex, collaborative practices involving informal networks within the community” (Ipe, 2003, p. 349).

**Responsibilities of leaders.** Pawlowsky (2001) identified four key responsibilities of organizational leaders in creating a culture in which organizational learning can flourish (pp. 78-80). First, leaders must understand the structure of the organization, not just in terms of its official organizational chart, but also in terms of its individuals, teams, and other groups. For leaders to be able to positively impact organizational learning, they must understand the interactions and interdependencies within the organization. Second, leaders must understand and address all modes of learning. It is not enough to simply provide information to the individuals to address their cognitive needs; leaders must also be able to speak to the emotional and behavioral needs of the individuals in their organization (for example, not only explaining the logistics of a reorganization, but also addressing the need for people to ask questions, understand how it will impact them, etc.). Third, leaders need to understand what types of learning should be addressed at a particular level of the organization; for example, simple behavioral adjustments can be delegated down the hierarchy, while changes with broad impact benefit from a more strategic high-level approach. Finally, an organization has to have clear parameters and processes to help cultivate learning, but leaders also need to “check and question these assumptions frequently” (Pawlowsky, 2001, p. 80). For example, there need to be standards for who (individuals and/or groups) is responsible for gathering information and synthesizing data. Further, there must be clear delineation on who in the organization has access to what data, with understanding of how that impacts the organization’s capacity for organizational learning. In an optimal situation, an organization’s leadership would consider these factors in their organizational learning strategy.
Management structure. Nonaka (1994) identified three types of management structure, each of which exists in different types of organizations: top-down (which exists primarily in organizations that have central headquarters), middle-up-down (which exists in team-oriented organizations that are subdivided into affiliated groups), and bottom-up (which is found in small, entrepreneurial organizations). In addition to identifying these management structures, Nonaka delved into how the leaders in each of these organizational management systems can influence organizational knowledge creation.

Of most interest to this study is the middle-up-down management structure, which aptly describes the structure of the study site. In this model, “the main job of top and middle managers . . . is to orient this chaotic situation toward purposeful knowledge creation” (Nonaka, 1994, p. 31). It is the responsibility of leaders in these types of organizations to be catalysts and help to set the course for the organization. In these organizations, “frontline staff and lower managers . . . know ‘what is’ . . .; the job of top management is to know ‘what ought to be’” (Nonaka, 1994, p. 31). Leaders can help to guide the direction of the organization by providing opportunities for intellectual growth, which allows organizational members to be open to change.

Additionally, leaders in the middle-up-down management structure should provide guidelines for success (for example, target metrics) without being too rigid about how to achieve those goals. This is key to a middle-up-down organization’s capacity for organizational knowledge creation. Goals that are too narrowly focused, or those that have a prescribed solution from senior management, are regarded by the organization’s employees as instructions to be followed; this results in a lack of engagement among employees. Instead, the role of top and middle managers in this structure should be to identify goals, clear obstacles, and prepare the path for self-organizing teams to address the task at hand.
Leadership styles. Vera and Crossan (2004) examined the leadership styles that might best complement the 4I framework. Notably, they found that a leader who can best support organizational learning is able to shift between transformational and transactional leadership styles as needed (p. 235). Transformational leaders are usually thought of as “charismatic” and “inspirational” leaders who inspire “intellectual stimulation” (p. 236). Conversely, transactional leaders are known to focus on maintaining and/or improving the status quo; they focus on rewarding individuals for their effort, providing feedback, and keeping the organization on task (p. 224).

While the concept of organizational learning—that is, individuals being open to new ideas and sharing their ideas with others—may seem to lend itself to transformational leadership, Vera and Crossan (2004) made the case that a leader who is able to tap into the qualities of both transformational and transactional leadership styles is best able to support an environment of organizational learning (p. 235). They noted that a transformational mode of leadership helps with the “feed-forward” action of the 4I model, but the “feedback” process (that is, extending “learning to the far reaches of the organization, and the need for leadership to refresh and reinforce institutionalized learning”) fares better when a transactional mode of leadership is employed (p. 235).

That being said, they were careful not to oversimplify the situation by distilling the leadership and action pairings to transformational equals feed-forward and transactional equals feedback. Rather, they identified a number of other conditions and scenarios in which a leader must be able to tap into aspects of one or both of the two leadership styles. Vera and Crossan’s work speaks to the need for organizational leaders to have a capacity for flexibility in how they
approach a new idea, problem, or situation so they can best support organizational learning within their organization.

Li, Mitchell, and Boyle (2016) further explored the influence of leadership on team innovation. They differentiated between transactional leadership (which they defined as “focused on performance in well-defined tasks and stable environments”) and transformational leadership (involving leaders who have a “positive influence on motivation” by “build[ing] confidence [and] allow[ing] autonomy”) (pp. 67-68). Further, they tied their research to the 4I framework by exploring individual versus group innovation and determined that transformational leaders actually have a negative impact on innovation in individuals but a positive impact on group innovation.

Communities of Practice and Collaborative Knowledge Sharing

Martinkenaite and Breunig (2016) submitted that the role of an organization in learning is to “mobilize its employees [and] facilitate their interactions,” and they cited efforts to “facilitate the sharing of knowledge across [organizational] boundaries” as one mechanism for an organization to empower its employees (p. 704). CoPs are “groups of people informally bound together by shared expertise and passion for a joint enterprise” (Wenger & Snyder, 2000, p. 139). CoP members may meet in person or online, with planned agendas or not; the key to a CoP is that there is a free flow of knowledge and creativity. Wenger and Snyder (2000) highlighted six activities that CoPs may help to support: strategy, new lines of business, quick problem solving, best practices, professional skill development, and talent recruitment and retention (pp. 140-141).

Lave and Wenger (1990) established the concept of legitimate peripheral participation to address the social aspect of knowledge sharing within a community and, in particular, how new members become enmeshed in a CoP. They submitted that a key part of this process is “the
learning of knowledgeable skills” (p. 29). The concept of legitimate peripheral participation “provides a way to speak about the relations between newcomers and old-timers, and about activities, identities, artifacts, and communities of knowledge and practice” (p. 29).

Given the participant-driven nature of CoPs, Wenger and Snyder (2000) encouraged organizational leaders to support CoPs, while also being careful to not overmanage them. According to Wenger and Snyder, an organization’s leader should “identify potential communities of practice that will enhance the company’s strategic capabilities; provide the infrastructure that will support such communities and enable them to apply their expertise effectively; [and] use nontraditional methods to assess the value of the company’s communities of practice” (p. 144). However, beyond these basic steps, management should stay away from the CoP’s day-to-day operations in order to allow the CoPs to self-manage and evolve (Wenger & Snyder, 2000, p. 143).

Wenger (2004) warned senior management against micromanaging CoPs, but also advised leaders to leverage CoPs as part of their knowledge management strategy. CoPs possess three key characteristics: domain (“the area of knowledge that brings the community together”), community (“the group of people for whom the domain is relevant”), and the practice (“the body of knowledge . . . which members share and develop together”) (Wenger, 2004, p. 3). Wenger suggested that it is this combination of characteristics that makes CoPs uniquely qualified to manage knowledge, as each of the characteristics provides focus, relationships, and anchors. Nagy and Burch (2009) distilled the CoP model into eight key characteristics:

- non-hierarchical;
- informal;
- there is no actual leader but a core group that takes on a leadership role for a particular agenda and then allows another to fulfill the role when the agenda has passed;
- membership is voluntary;
- agendas are not imposed or intentionally prescribed;
- tacit knowledge becomes articulated;
- legitimate peripheral participant who may just listen/observe and choose not to contribute; [and] involves social time for the community to build trust. (p. 237)
CoPs have been evaluated from a number of perspectives, including “their ability to increase learning capabilities, learning, organizational change, and innovation” (Iverson & McPhee, 2008, p. 178). Iverson and McPhee (2008) worked to “recenter CoP studies” on three core components, “mutual engagement, shared repertoire, and negotiation of a joint enterprise,” which they identified as the “main contributors to community creation and knowledge dynamics” (p. 179). Their empirical study confirmed the idea that CoP theory supports how CoPs behave in practice; however, Iverson and McPhee (2008) pointed out that the CoPs examined in their study demonstrate that CoPs can operate with a broader scope than previously thought (p. 195).

Along these lines, Otten (2009) discussed the use of CoPs to help address intercultural issues in education, making the argument that a community is better suited than an individual to “explore different views and arguments on a certain domain” (p. 415). Higher education is diverse, both in terms of international mobility and domestic multiculturalism (p. 409). Otten’s research supports his idea that a community of diverse members has a better capacity for providing “trust and a social climate to negotiate fair and unfair treatment about values and ethics in science, about merits and promotion and all the other issues that are not culture-free science, but deeply rooted in cultural worldviews and traditions” (p. 415).

**Organizational CoPs.** Wenger, McDermott, and Snyder (2002) differentiated between traditional CoPs and organizational CoPs, defining organizational CoPs as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (p. 4). Kirkman, Mathieu, Cordery, Rosen, and Kukenberger (2011) established a framework for evaluating the effectiveness of organizational CoPs by combining research on traditional CoPs with team theory. In particular, they utilized the theory of legitimate peripheral participation to measure
organizational CoP effectiveness. Legitimate peripheral participation examines three characteristics: legitimacy (i.e., the extent to which members feel their organization is capable of knowledge creation), peripherality (i.e., the degree to which members feel integrated into the community), and participation (i.e., member participation, driven by “a common understanding of a community’s purpose”) (Kirkman et al., 2011, p. 1235).

Kirkman et al. (2011) also highlighted as problematic the common practice of assuming that organizational CoPs should be managed the same way as CoPs, without considering what impact being integrated into the organization has on the operation of an organizational CoP. Their approach was to integrate CoP and team theory research to understand how organizational CoPs compare and contrast to CoPs and teams. They adopted McDermott and Archibald’s (2010) four factors to help characterize organizational CoPs: (1) longer time horizons for developing knowledge, (2) facilitative leadership, (3) permeable membership boundaries, and (4) knowledge and information sharing.

Kirkman et al. (2011) performed an empirical study of existing organizational CoPs, using a version of legitimate peripheral participation theory. In their research, they analyzed four organizational CoP characteristics that were mapped to legitimate peripheral participation characteristics: core status (legitimacy), task interdependence (peripherality), empowerment (participation), and external leadership (participation). They found that, indeed, organizational CoPs exhibit characteristics of both traditional CoPs and teams. For example, while traditional CoP theory discourages formal managerial influence over the CoP, Kirkman et al.’s research found that external leadership that takes a facilitatory role in the organizational CoP can “play an important role in helping [organizational CoP] members to become more focused and motivated and to experience a sense of community empowerment . . . [and] align the collective’s efforts
with broader organizational roles . . . and secure valuable resources” (2011, p. 1242). Kirkman et al.’s research provides some new perspectives on organizational CoPs and directly addresses some of the textbook characteristics of CoPs (for example, Wenger’s perspective on managerial influence on CoPs) that may differ when examining a CoP that exists within an organization.

**Criticism of the CoP model.** A number of researchers have criticized Wenger’s CoP model. Fuller, Hodkinson, Hodkinson, and Unwin (2005) identified two points that they considered to be weaknesses in Lave and Wenger’s (1991) social learning theory: (1) a “dismissal of formal education” and its impact on workplace learning, and (2) an acknowledgement, but no exploration, of “the significance of conflict and unequal power relations [as they relate to] the internal operation of communities of practice” (pp. 65-66). Fox (2000) contended that the social learning theory on which CoP is based is not a unified field and also indicated that the theory fails to adequately address power and its impact on the learning process. Roberts (2006) also identified issues around the concept of power, specifically citing trust and predispositions as concepts that are taken for granted in the CoP model; further, Roberts contended that the context in which a CoP exists is a major factor in how knowledge is transferred.

**Summary of the Literature: Collaborative Knowledge Sharing Practices**

“Learning organization theories highlight the interdependent relationship between individual and organizational learning viewing the individual as the agent of organizational learning” (Perkins et al., 2007, pp. 306-307). Knowledge can be created by an individual or among a group of people. We have to go back nearly 50 years, to Polanyi’s (1966/2009) classification of knowledge into two basic types—tacit and explicit—to start forming the foundation of many of our modern theories on knowledge creation. Nonaka’s spiral model of
knowledge creation, which relies heavily on the concept of two primary types of knowledge, highlights the nonlinear nature of knowledge creation and sharing.

To this end, modern organizational learning theories focus on the process by which knowledge held by an individual is shared with others in their sphere of influence. Each of the models highlights a tension between learning concepts: March noted the balance between exploration and exploitation, Nonaka examined tacit and explicit knowledge through the lens of four interaction patterns, and Schwandt’s social action learning model examined the interconnections among four subsystems. Finally, Crossan’s 4I framework utilizes a feed-forward and feedback loop to demonstrate the process of how knowledge moves from the individual to the group and then to the larger organization.

CoPs were referenced by Nonaka (1994) and Brown and Duguid (1991) as organizations that help create the structure needed for effective collaborative knowledge sharing. Research on CoPs and organizational CoPs highlights the opportunity that these organizations provide for members to create and share knowledge. However, critics have pointed out that the model does not take into account interpersonal power dynamics that could impact the knowledge creation and sharing process.

This chapter has examined the literature surrounding the concept of collaborative knowledge sharing. As detailed throughout this chapter, the scholarly work around collaborative knowledge sharing draws on and informs a number of concepts, including knowledge, organizational learning, and communities of practice. Chapter 3 details the research methodology used to examine collaborative knowledge sharing practices.
Chapter 3: Research Methodology

The purpose of this doctoral thesis project was to explore how senior information technology (IT) leaders describe collaborative knowledge sharing practices in a distributed IT system within a large public higher education institution in the Northeast. A single research question was explored: *How do senior IT leaders describe their collaborative knowledge sharing practices?* This chapter describes the research methodology used in this study. It begins by reviewing the study’s research tradition and research design, which are foundational to this study. It then details steps for site and participant selection, data collection, and data analysis. The closing sections discuss efforts to improve the study’s trustworthiness and protect human subjects.

Research Tradition

This qualitative study employed a descriptive case study approach. Creswell (2012) stated that a qualitative approach to research is appropriate when the researcher plans on “exploring a problem and developing a detailed understanding of a central phenomenon” (p. 16). Additionally, Creswell identified other characteristics of qualitative research that were appropriate for this study, including relying on participant views and opinions on the scenario and using flexible, evaluative criteria in interpreting the data. The researcher is a “key instrument” in qualitative research (Creswell, 2013, p. 45). The final product of qualitative research includes both the data collected from the subjects as well as the “researchers’ subjective reflexivity and bias” (Creswell, 2012, p. 26).

The core question in this research study lent itself well to a descriptive case study, in that it focused on a “single issue or idea”—collaborative knowledge sharing practices—and utilized
one bounded case to explore those concepts (Creswell, 2013, p. 99). In this study, the bounded case was the Information Technology Leadership Council (ITLC) at a large, distributed research university, here called Large Northeast Research University (LNRU). A case study approach “enables the researcher to gain a holistic view of a certain phenomenon or series of events” and can help to provide a full picture of the scenario because “many sources of evidence were used” (Noor, 2008, p. 1603). Yin (2003) stated that a case study should be used when the researcher (1) is trying to answer questions of “how” or “why,” (2) cannot manipulate the behavior of study participants, and (3) focuses on contemporary (as opposed to historical) events (p. 9).

**Overview of Research Design**

The research design involved three phases of data collection, with each phase for a different source of data, followed by a phase for data analysis. The first phase involved the collection of data from documents addressing collaborative knowledge creation practices, including the ITLC charter, the institution’s mission statement, and other relevant documentation. Next, one-on-one semistructured interviews were conducted around collaborative knowledge creation practices with 12 individuals from the ITLC who represented a cross-section of the types of units (campuses, colleges, and administrative units) comprising the ITLC membership. Finally, data were gathered through the observation of four ITLC meetings: two full council meetings, a subcommittee meeting, and a board meeting. Once all data were collected, data from each source were analyzed, with a focus on identifying salient phrases. An inductive analysis process was performed on the salient phrases, followed by a cross-source analysis of insights from document reviews, meeting observations, and interviews to explore collaborative knowledge sharing practices within a distributed IT system.
Table 3.1 provides an overview of the data collection and analysis process. Both inductive and deductive approaches were used to analyze the collected data. Eisenhardt and Graebner (2008) described deductive research as “using data to test theory” (p. 25). Data were coded inductively and then analyzed through the lens of Crossan et al.’s (1999) 4I framework through a round of cross-source analysis, intended to help identify any recurring themes across the source types.

Table 3.1  
Overview of Data Collection and Analysis Methods

<table>
<thead>
<tr>
<th>Stage</th>
<th>Phase</th>
<th>Description</th>
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<tbody>
<tr>
<td>Data collection</td>
<td>Documentation</td>
<td>Collected key documents, including</td>
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<tr>
<td></td>
<td></td>
<td>• ITLC charter and meeting minutes</td>
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<td>• IT assessment</td>
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<td></td>
<td></td>
<td>• University strategic plans</td>
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<td></td>
<td>Semi-structured</td>
<td>Conducted 12 semistructured interviews:</td>
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<td></td>
<td>interviews</td>
<td>• Used purposeful sampling to ensure representation from each unit type</td>
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<tr>
<td></td>
<td></td>
<td>• Used random selection to choose members from each unit type group</td>
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<tr>
<td></td>
<td>Meeting observations</td>
<td>Observed four ITLC meetings, including</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Two full council meetings</td>
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<tr>
<td></td>
<td></td>
<td>• One subcommittee meeting</td>
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<tr>
<td></td>
<td></td>
<td>• One ITLC board meeting</td>
</tr>
<tr>
<td>Data analysis</td>
<td>Single source</td>
<td>Once all data were collected, identified salient phrases in each data source</td>
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<tr>
<td></td>
<td></td>
<td>and/or created summary data to allow for interpretation of data</td>
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<tr>
<td></td>
<td>Cross-source</td>
<td>After key phrases and/or summary data had been used to organize gathered data</td>
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<tr>
<td></td>
<td></td>
<td>used a blended approach (inductive and deductive methods) plus a blend of</td>
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<td></td>
<td></td>
<td>hand-coding and qualitative software to analyze data across all sources and</td>
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<td></td>
<td></td>
<td>identify recurring themes</td>
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Site and Participant Selection

The sample population for this study consisted of a bounded system comprising the university’s ITLC, which consists of the most senior IT leaders from each of the university’s
colleges, campuses, and administrative units. The researcher is a member of the ITLC and has
direct access to its membership. This study site agreed to participate. After institutional review
board (IRB) approval was secured at the researcher’s home institution, the IRB application was
reviewed by the IRB office of the study site institution, and it determined that no additional
approval was needed.

To ensure that units of all types and sizes were represented in this study, the researcher
utilized maximal variation sampling, which is a “purposeful sampling strategy in which the
researcher samples cases or individuals that differ on some characteristic or trait” (Creswell,
2012, p. 208). In this case, the unique trait was unit type. Once the member population was
broken down into the three unit types, interviewees were selected at random, with four
individuals selected from each group.

No remuneration was offered for participation in the study. However, it was expected
that participants would be willing to participate, as having an opportunity to provide feedback
relating to the ITLC is generally viewed as desirable by the membership. An announcement
regarding the research was made by the researcher at a full council ITLC meeting, informing the
general membership of the research and that some members would be randomly selected for an
interview. An e-mail (see Appendix B) that explained the purpose of the research and requested
their participation was sent to those selected.

No demographic information was collected in this study, for two reasons. The first is that
this study was interested in the collective phenomenon of collaborative knowledge sharing
practices of IT leaders in a distributed organization. Therefore, there was more interest in the
participants’ responses as a whole, as opposed to the participants as individuals. The second, but
no less important, reason for not detailing demographics was the need to protect the study
participants. Because the ITLC is a relatively small community, identifying members by gender, home unit, length of time at the university, and other characteristics—even in summary form—could result in this study inadvertently revealing the identity of the participants. To avoid this, none of the participants were asked for demographic information, and all participants were given a pseudonym (assigned regardless of gender). The pseudonym was assigned after the interview was completed; the first time the participants knew their pseudonym was when they received a copy of the interview transcript for review. Table 3.2 identifies the pseudonyms for participant by unit type.

Table 3.2
Study Participants

<table>
<thead>
<tr>
<th>Unit type</th>
<th>Pseudonym</th>
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<tbody>
<tr>
<td>Campus</td>
<td>Beaker</td>
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<td></td>
<td>Bunsen</td>
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<td></td>
<td>Rowlf</td>
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<td></td>
<td>Zoot</td>
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<td>College</td>
<td>Animal</td>
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<td></td>
<td>Gonzo</td>
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<td></td>
<td>Rizzo</td>
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<td></td>
<td>Scooter</td>
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<td>Administrative unit</td>
<td>Fozzie</td>
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<td></td>
<td>Kermit</td>
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<td></td>
<td>Statler</td>
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<td></td>
<td>Waldorf</td>
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</tbody>
</table>

**Data Collection**

Data were collected sequentially from three sources: documents, interviews, and meeting observations.

**Documentation.** Documents relating to both the study site (LNRU) and the ITLC were gathered for analysis. The artifacts were used to gain an objective understanding of the context
of the ITLC within the larger organization, as well as the structure and purpose of the ITLC, as described by the ITLC itself. All of the documentation needed for this phase was obtained through online sources that were available to all ITLC members and/or LNRU staff members; no additional materials and/or permissions were needed. The researcher identified key documents or sections of documents (for example, the portion of the LNRU strategic plan relating to IT) and downloaded them for analysis. Documents reviewed included the ITLC charter, ITLC meeting minutes, an assessment of LNRU’s IT operations, and the institution’s most recent strategic plans.

**Semistructured interviews.** Semistructured one-on-one interviews were held using online meeting software; the audio was recorded and transcribed, and the interviewer also took notes during the course of the interview. To ensure the audio was recorded as expected, the researcher used three recording devices for each interview: the audio recorder application on her mobile phone (primary), a digital audio recorder, and the audio recording application on her computer. (After each interview, the researcher reviewed the audio recording from her mobile phone. If it was complete, she deleted the other two recordings.) The interview questions were prepared as open-ended questions that allowed the participant to express his or her perspectives.

The interviews were done in a one-on-one format so that participants felt more comfortable expressing their opinions about their current work environment. Before the interview began, but after the recording started, the researcher confirmed with each participant that he or she had received and reviewed the unsigned consent form (Appendix C). The complete interview script can be found in Appendix D.

A pilot of the semistructured interviews took place with two participants who were current members of the ITLC. The data gathered in these pilot interviews were not used as part
of the study data. Rather, the pilot was intended to test the effectiveness of the interview process. Pilot participants were asked to provide feedback on the process. This feedback was used to refine the final process for study participants. Additionally, pilot participants were asked to share their opinions on the intention of each interview question (i.e., “what kind of information is each question trying to gather?”); this feedback was used by the researcher to refine the interview script and inform the analysis of the interview question data during the study.

**Meeting observations.** Marshall and Rossman (1989) defined observation as “the systematic description of events, behaviors, and artifacts in the social setting chosen for study” (p. 79). Meeting observations were used to gain an understanding of how ITLC members interacted with one another during various meetings. Two full council meetings, a subcommittee meeting, and an ITLC board meeting were observed, for a total of approximately 12 hours of observation at the research site. In all of the meetings, the researcher was a participant observer (Creswell, 2013, pp. 166-167).

During these observations, the researcher recorded the frequency and type of interactions among ITLC members and/or invited speakers. The result is a sociogram, which can “intuitively unveil interaction patterns” by allowing the researcher to create a visualization of communications and exchanges among group members (Martinez, Dimitriadis, Rubia-Avi, Gomez-Sanchez, & De La Fuente, 2003, p. 14). This approach, coupled with notes taken during the meeting observations, allowed the researcher to gain a better understanding of how individuals in the group worked with one another.

Two pilot observations were performed before using the approach to gather data for the study. The pilot allowed the researcher to refine her approach to recording observation data.
Additionally, it allowed her to expand upon her initial thoughts about interactions that would need to be recorded, based on the types of interactions she observed.

Interactions were classified as “present topic,” “question,” “answer,” “comment,” or “vote,” while also noting which attendees interacted with the others. Note that this was done confidentially; while the researcher knows the ITLC members, no names were recorded and each participant was denoted simply as a box, which represented a seat at the table. Social interactions such as casual conversations during meals or breaks were noted as well. The content of the discussion was not recorded or analyzed; rather, participant behaviors (i.e., asking questions, making comments, and/or socializing with colleagues) was the primary area of interest. Figure 3.1 depicts a sample meeting recording summary for a small subcommittee meeting.

Figure 3.1. Sample meeting observation instrument with sample data. C indicates comment; Q, question; PT, present topic; A, answer.

Data Analysis

The researcher analyzed the collected data through inductive and deductive methods. The goal of this analysis was to gain an understanding of the collaborative knowledge sharing practices of the senior leaders of a distributed IT organization.
**Documentation.** First, all of the documents were printed out and salient phrases were identified by using a highlighter pen. The highlighted documents were then scanned and reviewed again, this time with the researcher copying and pasting previously identified key phrases into a summary table in Microsoft Word. In the table, each row was a data source, and the data source was mapped against two columns: one for the study’s purpose (particularly the latter half of the statement, which focuses on the organization) and another for the research question (which relates to the collaborative knowledge sharing practices of the ITLC members).

Due to the nature of the documentation sources, some concepts were summarized for more useful analysis. One example of this was repetitive actions recorded in the meeting notes, but with different wording in each document. For example, the introduction of new members at the start of meetings was noted in the various meeting minute documents, but it was recorded with different wording each time. To allow for easier analysis, repetitive actions with different phrasings were assigned a standard summary phrase. In the example of introducing new members, “welcomed new members” was used in the summary table.

In reviewing meeting minutes, the content that was discussed was not the main area of interest. Rather, the researcher was interested in learning how the meetings were organized. In this situation, analysis of the raw data would not result in data relevant to the purpose of this study. To address this, three categories of meeting “segments” were identified: “presentation with question and answer,” “group discussion,” and “table exercises with report out.” For each meeting, a count of each segment type was taken to explore how the structure of ITLC meetings allowed for member engagement. A “meeting segment summary” table was created in Microsoft Excel to show the frequency of each meeting segment type (presentation with question and answer, table exercises with report out, and group discussion). The purpose of this summary was
to get a better understanding of how the ITLC meeting agendas were organized, and by extension, how ITLC members spent their time in meetings.

**Interviews.** Audio recordings of the interviews were sent to a third-party transcription service (Rev.com) to create transcripts of the interviews. Interviewees were given an opportunity to review their transcripts. Once all data were collected, the interview transcripts were reviewed by printing out all of the transcripts and identifying salient phrases by highlighting key quotes relating to collaborative knowledge sharing practices from the interviews.

The highlighted documents were then scanned and reviewed again. During the second review, the same summary table was completed with relevant data from each of the interviews, mapping the data source against the purpose statement and the research question. The key phrases identified through the highlighting process were then copied and pasted into the table. During this process, the researcher noted that certain interview questions mapped better to either the purpose statement or the research question. (See Appendix E for details on how the questions were sorted.)

Additionally, an Excel spreadsheet summarizing the interview questions and all answers provided by participants was created to more effectively link the interview questions to the key phrases identified. To do this, all previously identified salient phrases from the data summary table were copied and pasted into Excel, mapping the questions against the answers provided by each participant. An example of the table format is shown in Figure 3.2. Further, the master interview table was then used to create snapshots, such as “interview responses by unit type” (1- to 2-page summary by unit type—campus, college, and administrative unit), “interview responses by interviewee” (1- to 2-page summary for each interview participant), and “interview
responses by question” (1- to 2-page summary for each question). By doing this, the researcher could view the data in a variety of ways, including looking at all of the answers for a given question, all of the answers by a given interviewee, and all of the answers grouped by the interviewee unit type.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1a</th>
<th>2</th>
<th>2a</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zoot</strong></td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>...</td>
</tr>
<tr>
<td><strong>RowIf</strong></td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>...</td>
</tr>
<tr>
<td><strong>Bunsen</strong></td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>Salient phrases</td>
<td>...</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

*Figure 3.2. Sample interview master table.*

The snapshot views were then imported into NVivo for further analysis. The first step of the analysis was a simple read-through of each of the snapshot views to determine which method of organization was most useful for analysis. Through this process, it was determined that the “interview responses by question” view was most useful because it had already been determined that each question helped to address specific aspects of this research (purpose or research question). Therefore, being able to see the collected salient phrases from all participants for each question was particularly useful in data analysis.

**Meeting observations.** To allow for data analysis, the data were summarized (e.g., total number of attendees, number of attendees actively engaged in the meeting, number of questions, comments, and social interactions). This was done by reviewing the completed meeting
observation instruments and creating a summary page for each meeting. These data were then stored in the same summary table used to organize data from the documents and interviews. As described above, the table included a column for the purpose statement and research question, and data was mapped against one of the two concepts.

The data were further analyzed using Microsoft Excel to create a summary table of attendance and number of active participants (indicating attendee engagement). The table broke down this data by meeting segment for each of the observed meetings (see Appendix G). This summary view of the data helped to create a snapshot of the level of member engagement for each meeting.

**Cross-comparison of data and concluding steps.** Once the summary table was completed (with all sources—documents, interviews, and meeting observations), it was imported into NVivo. One node was created for all sources, for the purposes of allowing use of NVivo’s analysis tools. By creating this node, the researcher could then use NVivo to run queries against the summary node—such as the word count query to identify frequently used words. The query could also automatically generate a word cloud based on its results (see an example in Appendix H). Separate nodes were also created for documents and interviews.

The final stage of analysis contained two parts. First, the NVivo node encapsulating the identified salient phrases from all sources was reviewed, which resulted in the development of three inductive codes. The final step was a deductive analysis based on the 4I premises (see Appendix F for the deductive codes used), using the documentation notes from the data summary table and the “interview responses by question” views to code the interviews. Additionally, the summary table for the meeting observations was used to gauge if what was being described in
documents and interview data aligned with observation data. The data generated through this analysis allowed for the creation of several deductive themes, which are discussed in chapter 4.

Table 3.3 provides a detailed summary of the steps taken in the data collection and analysis process.

Table 3.3  
Detailed Summary of Data Collection and Analysis Process

<table>
<thead>
<tr>
<th></th>
<th>Documents</th>
<th>Interviews</th>
<th>Meeting observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collected data throughout spring 2016</td>
<td>Documents gathered from LNRU online resources</td>
<td>Twelve one-on-one semistructured interviews</td>
<td>Two ITLC meetings, one subcommittee meeting, and one board meeting</td>
</tr>
<tr>
<td>Printed out files</td>
<td>X</td>
<td>X</td>
<td>Meeting templates already paper-based</td>
</tr>
<tr>
<td>Highlighted key phrases</td>
<td>X</td>
<td>X</td>
<td>Meeting observations captured only interactions; no phrases to analyze</td>
</tr>
<tr>
<td>Created summary page based on diagrams</td>
<td>—</td>
<td>—</td>
<td>X</td>
</tr>
<tr>
<td>Scanned documents to create digital versions</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Created a summary table in Word</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Populated summary table with data from source</td>
<td>Direct quotes and summary phrases</td>
<td>Direct quotes</td>
<td>Summary data based on diagrams</td>
</tr>
<tr>
<td>Imported summary table into NVivo</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Used NVivo coding function to pull out salient phrases (as described for each data source type)</td>
<td>Direct quotes and summary phrases</td>
<td>Direct quotes</td>
<td>—</td>
</tr>
<tr>
<td>Based on summary data from previous steps, developed three inductive codes</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ran word count queries against summary nodes</td>
<td>X</td>
<td>X</td>
<td>—</td>
</tr>
<tr>
<td><strong>Documents</strong></td>
<td><strong>Interviews</strong></td>
<td><strong>Meeting observations</strong></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>---------------</td>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>Used Excel to create additional views of the data for analysis</td>
<td>Created “meeting segment summary” table to summarize the types of meeting segments, drawn from meeting minutes</td>
<td>Created a “master interview table,” which was used to create snapshots: “interview responses by unit type,” “interview responses by interviewee,” and “interview responses by question”</td>
<td></td>
</tr>
<tr>
<td>Created a “meeting observation summary” table that provides a snapshot of all meetings observed (broken down by segment), number of attendees, and number of engaged attendees</td>
<td>Created a “meeting observation summary” table; reviewed last and compared to data culled from document and interview review</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trustworthiness**

To ensure the trustworthiness, quality, and validity of data collected and the conclusions drawn from that data, the researcher had to consider threats to these factors and take steps to mitigate those risks:
• The researcher benefited from a *prolonged engagement* with the participant body. As a colleague of the participants, the researcher was able to build trust relationships with much of the ITLC membership.

• Researcher bias and familiarity could have been an issue in this study, as the researcher is a member of the IT community being studied. To mitigate this risk, the use of *triangulation of sources*—with document review, semistructured interviews, and meeting observations—helped to limit the extent to which the researcher’s personal experience with the group and individual participants was imposed upon the data.

• To help ensure validity of data collected through interviews, the researcher allowed for *member checking* of the collected data. In order to confirm that the data collected accurately reflected what took place through the interview process, each participant was asked to review the interview transcripts for accuracy.

• The researcher held two web-based meetings with outside sources to review the collected data and coding process for *intrarater reliability*.

• A *researcher journal* was used to record the researcher’s “thoughts and feelings” through the process; this helped “to safeguard against becoming deductive” and/or “too driven by the framework” (Baxter & Jack, 2008, p. 11). The researcher journal involved a combination of a log in NVivo and handwritten notes made throughout the data collection and analysis process to help document the researcher’s thought process throughout the study.

• *Field notes*, “the researcher’s written documentation of participant observation,” were taken during meeting observation phases of data collection (Saldaña, 2013, p. 42). Field notes allow for the researcher to capture observations that may not be directly related to
the protocol or process, but are worth noting in the context of the study. The field notes were stored with the interview transcripts and meeting observation instrument.

**Protection of Human Subjects**

Creswell (2012) pointed out that “educational researchers need to anticipate ethical issues throughout the research process, but they are especially important during data collection and in writing and disseminating reports” (p. 27). In order to ensure that the participants in this study were shielded from harm, a number of steps were taken to protect their well-being.

The participants in this study were IT professionals from across a large, geographically distributed university. Prior to commencement of data collection, permission from the IRBs of Northeastern University and LNRU was requested. (LNRU determined that Northeastern University’s IRB approval was sufficient for the research to be conducted at LNRU.) Results of the analysis are presented under the participants’ pseudonyms, and any quotes that included self-referential statements (for example, the participant referring to his or her work unit) were edited so that the identifying information was redacted from any published data.

Participants were provided with an informed consent form along with the e-mail notification of their selection for an interview (see Appendices B and C). Participants were asked to confirm their receipt and review of the informed consent form at the start of their recorded interview and prior to the start of data collection. The informed consent form clearly stated that participation in the study was voluntary and that individuals could choose to leave the study at any time. It should be noted that the researcher is a peer of the IT professionals who made up the subject pool; however, none of the participants reported to the researcher, either directly or indirectly, or vice versa. This peer relationship helped to eliminate coercion, actual or perceived, of or by study participants.
Once collected, the data were encoded in such a way that only the researcher knew the original source; information that identified an individual (by name, work unit, etc.) was encoded so that it was anonymous beyond the researcher through the use of a pseudonym for all participants. All interview materials, including audio files, transcriptions, and notes, were stored digitally and securely; all files were stored on computers with full disk encryption installed. The data was synced for backup purposes to a secure online storage system. Only the researcher had access to the computers and storage site on which the files relating to this research were stored.

Audio files were provided to a third-party transcriber (Rev.com); the audio files were named in code, so that the transcriber was not privy to the subject’s name. Once transcribed, the interview transcripts were shared with the interviewees via e-mail (each interviewee had access to only his or her own transcript). The data, free of any identifying information, was also shared with two outside sources (for interrater reliability) during a secure web conference interface. Handwritten notes taken by the researcher were scanned and stored digitally, and original paper versions were shredded once the digital files were created.

Summary

This chapter has provided a description of this study’s approach to research design, data collection, and data analysis. This study used a qualitative case study approach and collected data through documents, semistructured one-on-one interviews, and meeting observations. Once all data were collected, they were organized and analyzed both inductively and deductively. Finally, steps were taken to protect the privacy of participants and collected data, as well as to ensure trustworthiness. Chapter 4 discusses the findings derived from this research design, data collection, and data analysis process.
Chapter 4: Research Findings

This chapter presents the findings from the data collected regarding the collaborative knowledge sharing practices of information technology (IT) professionals in a distributed organization. The data sources that inform the findings are documents relating to the Information Technology Leadership Council (ITLC) and the larger university (Large Northeast Research University, LNRU; a pseudonym for the study site), meeting observations, and interviews with ITLC members. The data were analyzed through inductive and deductive methods, resulting in the identification of three inductive and seven deductive themes. The themes speak to the study’s purpose, exploring how senior IT leaders describe collaborative knowledge sharing practices in a distributed IT system, and research question, *How do senior IT leaders describe their collaborative knowledge sharing practices?*

The chapter contains both summary data and direct quotes from documents and interviews. Any information that could be used to identity either individuals (including individual names or department names) or the institution has been redacted from any direct quotes. To ensure that this chapter focuses on the collective knowledge sharing practices of IT leaders, as well as to protect the identities of the interview participants, participant profiles are not included in this chapter. Instead, the chapter focuses on the identified themes that emerged from the analysis of collected data.

**Inductive Themes**

The inductive data analysis process resulted in three key themes (Table 4.1). The first, “individual’s connection to multiple groups,” highlights the fact that ITLC members not only associated with the ITLC but also identified with other groups, such as other communities of
practice (CoPs) and/or their home unit. The second, “distributed IT structure’s impact on collaboration,” focuses on the organizational structure of IT at LNRU and how it impacts collaborative knowledge sharing practices among ITLC members. Finally, the “misalignment of the ITLC’s stated purpose versus implementation” theme centers on the gap between ITLC’s stated goals and actions and how that gap impacts the ITLC’s role in collaborative knowledge sharing.

Table 4.1
Inductive Themes

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual’s connection to multiple groups</td>
<td>Individual IT leaders were connected to multiple groups, including communities of practice and their home unit.</td>
</tr>
<tr>
<td>Distributed IT structure’s impact on collaboration</td>
<td>LNRU had a distributed organizational structure for its IT operations, which impacted how ITLC members were able to collaborate.</td>
</tr>
<tr>
<td>Misalignment of the ITLC’s stated purpose versus implementation</td>
<td>Based on the document review as well as feedback from ITLC members, there was an expectation that the ITLC would have a hand in IT governance for the university; however, that was not demonstrated in practice.</td>
</tr>
</tbody>
</table>

*Note. IT indicates information technology, ITLC, Information Technology Leadership Council; LNRU, Large Northeast Research University.*

1. **Individual’s connection to multiple groups.** Through inductive analysis of the interview transcripts, it became apparent that the IT leaders at LNRU who were members of ITLC counted themselves as members of multiple groups within the university structure. These groups often complemented one another, providing the IT leaders with an opportunity to share knowledge and broaden their perspective. Each IT leader in ITLC came from a unit (college, campus, or administrative unit), with which the IT leader identified. For campus and college leaders, there were CoPs specifically for members of these like-type units (administrative units
did not have a similar CoP at this time). Finally, the IT leader was a member of ITLC, a CoP within the university.

A common tendency among interview participants was that, when asked about interactions with their peers, they often began to talk about different situations that they encountered within each of these different groups. Their answers could include situations that happened in ITLC, in CoPs for specific unit types, or in the individual’s home unit. The interviewees regularly switched among these two or three settings when answering questions regarding collaborative knowledge sharing practices:

It was . . . more the “LC” [“leadership council”] part that was helpful to me understanding how many cogs are in this big university and all the hands that have to work together there. I did kind of take some of that mentality back here at a local level as well. (Bunsen)

The colleges meet separate now, the . . . campuses meet separately than us and it’s kind of broken down into “like” groups. (Animal)

When ITLC members were asked to describe instances in which they learned about a new idea through ITLC, many of the participants could recall a time when they learned something new but they were unable to cite from which group setting the idea emanated. In some cases, the membership overlap among the CoPs (ITLC and the unit-type CoPs) added to the confusion about the source of the idea:

Talking to all those other people gives you so many things to talk about, so many other ideas and, I guess, they ran together and I’m not good at keeping track of what I’ve learned from where necessarily. But I know that in talking to other colleagues from there, both at campus and college, and the administrative unit levels up there, we’ve shared ideas, we’ve collaborated, we’ve talked about things we’ve done in our unit. (Rowlf)

Some interview participants asked during the interview if their answers had to be specific to ITLC, while others switched among the two or three group settings while giving their
responses, seemingly without realizing that they were shifting their focus from one group to another:

   Well, would our colleagues at the CITL [Campus IT Leaders] count for some? Because there’s plenty of that. (Bunsen)

   Individuals who were members of both the ITLC and unit-type CoPs highlighted how the two groups complemented one another. Specifically, they felt that ITLC provided them with a more holistic view of the university, while the unit-type CoP provided a forum to share ideas with others who were in similar situations:

   I have established relationships with other IT leaders. I have numerous people that I can call if I have an issue or need to figure something out. . . . The makeup has impact because there are representatives from various different units, and divided into the three pieces of campuses, colleges, and administrative support. Because otherwise, I wouldn’t necessarily have contact with people in some of those other areas and would never be able to gain their insight or perspective. (Waldorf)

   The colleges meet separate now, the . . . campuses meet separately than us and it’s kind of broken down into “like” groups. I think that’s very valuable in the way that information gets shared because now you’re conversing with like entities. When you [have] that, you get information. You get collaboration. You get cost savings. There’s all kinds of benefits to doing that. And I think that’s key when you’re working with your direct peers. (Animal)

   ITLC documentation, including the charter and meeting minutes, focused primarily on the ITLC itself and secondarily on individual units (though mention of individual units centered mainly around membership rules). There was no mention of the unit-type CoPs (Campus IT Leaders and College IT Directors), which—based on the responses of interview participants—appeared to be very important to many members of the ITLC. Further, ITLC documentation indicated that the ITLC focused on strategic leadership (the charter stated, “ITLC . . . provides a forum for [LNRU] IT leaders to plan and collaborate on initiatives to implement policies, improve services, develop the workforce, and improve governance practices”), while the unit-
level CoPs focused more on tactical work. There may be an opportunity for the ITLC to create formal linkages with these unit-type CoPs so that the strategic and tactical work can become more integrated.

2. Distributed IT structure’s impact on collaboration. Whereas the distributed structure of IT at LNRU resulted in a number of CoPs that helped IT leaders do their jobs more effectively by creating connections, interviewees noted that the competing interests of the needs of the local unit compared to the goals of CoPs created complexity for the unit-level IT leaders. ITLC participants cited the challenge of both effectively working with their colleagues across the university within the university’s highly distributed organizational structure while still making the best decisions for their unit and direct customers.

Participants indicated that they were open to collaboration and adopting new ideas. They identified the time for informal interactions, such as lunch and breaks, at ITLC meetings as being the most productive time for establishing and building relationships with other ITLC members. The ITLC members interviewed were able to cite examples of collaboration with other ITLC members (and/or other unit-type CoP members):

I love the idea that these leaders come together to talk about . . . strategic direction, especially of where we’re going and what we’re doing. (Rizzo)

Networking opportunity with other individuals from other units. (Zoot)

I got guidance and I got where I needed to go and when I asked questions back then I was brand new and I wasn’t really getting information. It’s from the folks in ITLC and not so much the ITLC as an organization. (Bunsen)

However, sometimes the logistics of working within a distributed organization negatively impacted unit-level IT leaders’ ability to adopt ideas, even if they believed the ideas were good and would benefit their local unit. In many cases, the ITLC members expressed that they might not have an issue with the new ideas or services being presented for adoption by local units, but
they were limited by their unit-level resources—including staff (expertise and/or time) and budget. In these situations, the IT leaders might abandon the idea due to these limitations or they might use the information gained through their work with the ITLC to advocate within their unit for additional resources to support the initiative:

When there are concepts or ideas . . . that come from . . . ITLC, if we can’t do it, maybe verbatim, because of cost, we do at least try to put it in the ear of my boss to let her know, “Hey, this is what other [units] are doing, so maybe next year we can take a look at it.” And sometimes it works. Sometimes that gets us the funding that we need or at the very least we talk about it. (Bunsen)

If it’s something that can help us, save us time, save us money, and provide better support or customer service or whatever it may be, that’s great, but if it’s not going to do that, then it’s probably not going to happen. (Rowlf)

Further, sometimes university-wide initiatives presented to unit IT leaders through ITLC did not appeal to ITLC members. In these cases, the initiatives were presented to the ITLC with the support of ITLC leadership or might be proposed by the university’s central IT unit or as a coalition of multiple groups, and ITLC members could choose to opt in to these initiatives or not. ITLC members interviewed cited their home units as a major influence on what and how they collaborated with other ITLC members and the rest of the IT structure across LNRU.

The individuals’ connection with their local unit had the strongest influence on decisions about what new ideas learned through ITLC were brought back to the work unit to be implemented:

There have been times when we’ve been there [at ITLC] and we’ve talked about ideas and things that other people are using, and it just isn’t a good fit for my unit. . . . I will say that it’s usually something that we’re already doing, and I feel like we’re doing it well, so it can be a case of . . . why reinvent the wheel? If we have something that’s working and working well for us, why not use it? . . . Typically, I tend to bring things back and talk to them about my staff, but there are definitely times where an idea or something that somebody’s talking about, it definitely just hits you and you say, “No, that’s just really isn’t going to work for us.” (Rowlf)
When the local unit was able to provide a service and/or service level that IT leaders believed was superior to the new initiative, they were less willing to adopt the initiative in their own unit.

3. Misalignment of the ITLC’s stated purpose versus implementation. Inductive analysis of the collected documentation, interview transcripts, and meeting observations revealed a disconnect between the stated purpose of the ITLC and what the ITLC did in reality. ITLC members were aware of the stated purpose. The misalignment between the CoP’s stated goals and the work it did was a point of frustration for many of the ITLC members who were interviewed.

The ITLC’s 2015 charter stated that the organization “provides a forum for [university] IT leaders to plan and collaborate on initiatives to implement policies, improve services, develop the workforce, and improve governance practices.” Additionally, the ITLC charter stated that the organization had a role in university-wide IT governance: “The ITLC maintains connections to IT governance bodies to ensure its practices are aligned with and responsive to the needs of the research, instruction, and administrative communities.” Further, the IT assessment report both reviewed the state of IT at LNRU and also made a recommendation for a university-wide IT governance structure, which included ITLC as a key component:

To maximize governance’s effectiveness [the university] should . . . leverage the IT Leadership Council (ITLC) to bring together the University’s IT community to share best practices, seek expertise and input to improve solutions, and foster communication among IT units.

As a result, ITLC members expressed that they expected that the ITLC would play an active role in the university’s IT governance. It appeared that the ITLC had made an attempt to respond to the recommendations of the IT assessment. Early versions of the ITLC charter did not reference “governance,” while later (post–IT assessment) versions included a revision to the ITLC purpose statement, weaving the concept of university-wide IT governance—and the
ITLC’s role in it—into the charter. However, while the ITLC was poised to become part of the governance process, the university had not yet implemented the overall IT governance structure recommended by the IT assessment.

Because the overarching IT governance structure was not implemented by the university but the ITLC took steps to integrate its anticipated role in IT governance into its charter, there was a gap between the ITLC members’ expectations of the work ITLC should do and what the ITLC actually did. Interview participants cited a need for clarity on the purpose of ITLC:

The purpose of the group needs to be clearly defined, and what abilities the group has, specifically in the way of governance. I think that’s been one of our biggest struggles. It seems like has shifted a little bit from where we thought it was going and it shifted and we are really not sure; we have this identity crisis. (Zoot)

Is it just a place that we come to get informed or are we truly an action committee? (Statler)

This gap between expectation and reality resulted in some members being disillusioned with the ITLC as an organization, and ITLC participants shared that they did not think the ITLC was a results-driven organization.

When interview participants were asked to compare ITLC to an animal, nearly every respondent replied with animals that could be characterized as slow-moving and, in many cases, ineffective:

Sloth . . . It’s a kind of a friendly, cute looking thing that gives you warm and fuzzy, but ultimately it takes forever to get from here to there. (Scooter)

Elephant . . . It’s a very large organization and it just lumbers along. We accomplish things. . . . It definitely takes time and it’s just this large, lumbering beast. (Rowlf)

Sloth . . . It moves slowly and it’ll never really seem to get anything done. (Gonzo)

While there was member dissatisfaction relating to the gap identified between the purpose and reality of ITLC, with respondents indicating frustration with the slow pace and lack
of direction, some responses indicated that the ITLC members did not think that the ITLC was a lost cause and believed that it had potential to evolve in the future:

Sloth . . . I don’t think that it’s slow because it wants to be. I would consider it that at least at certain points. I like to see movement and then course correction afterwards. If we screw up, “Like, okay, we won’t do that anymore.” And move on. (Bunsen)

Cow . . . Because the animal does have something to offer that is valuable, but at the same time it kind of does its own thing and doesn’t move very fast. (Beaker)

Frog . . . I think ITLC has the potential to turn into the prince; it just hasn’t done it yet. (Kermit)

The ITLC interviewees recognized the gap between the ITLC’s stated purpose and the reality of how the ITLC really worked. While this gap between expectation and reality caused frustration for many of the members, they did see the potential for the ITLC to do important work for the university. There was also an opportunity for the university to follow up on the recommendations of the IT assessment to create a university-wide IT governance structure, which would provide ITLC members with a yet-unrealized opportunity to collaborate and drive the overall direction of IT at LNRU.

**Deductive Themes**

Through the deductive data analysis process, in which the collected data were analyzed through the lens of the 4I framework, seven themes were identified. Table 4.2 lists and describes each theme.
First, the theme “affiliation of IT leaders with multiple groups” takes into account that there were two or three groups (depending on the individual’s primary unit type) with which an IT leader may identify. For campus and college IT leaders, individuals linked themselves to their home unit, their peer group (i.e., CoPs for campus or college leaders), and the ITLC; administrative unit IT leaders had two groups, their home unit and ITLC. The theme “lack of a university-wide IT structure” includes observations regarding the organizational IT structure at LNRU, specifically the lack of a unified, university-wide IT structure. The theme “lack of consensus on ITLC purpose” examines the lack of alignment between the ITLC’s stated purpose and how its members interpreted the purpose of the group in practice. Additionally, the “member view of ITLC efficacy” explores the overall lack of satisfaction of ITLC members in regards to

<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affiliation of IT leaders with multiple groups</td>
<td>IT leaders belonged to two or three groups.</td>
</tr>
<tr>
<td>Lack of a university-wide IT structure</td>
<td>The university lacked a unified university-wide IT structure.</td>
</tr>
<tr>
<td>Lack of consensus on ITLC purpose</td>
<td>There was a lack of consensus among ITLC members regarding the purpose of ITLC, as well as misalignment between the declared purpose of ITLC and what the ITLC did.</td>
</tr>
<tr>
<td>Member view of ITLC efficacy</td>
<td>Overall, participants expressed a lack of satisfaction regarding the effectiveness of the ITLC.</td>
</tr>
<tr>
<td>ITLC members’ interactions with ITLC peers</td>
<td>Although ITLC members obtained new knowledge from the ITLC, they tended to place more value on informal interactions with ITLC peers, and they engaged more in smaller than in larger meetings.</td>
</tr>
<tr>
<td>ITLC members’ interactions with unit-type peers</td>
<td>ITLC members found the Campus and College IT Leader groups to be another important forum for sharing knowledge.</td>
</tr>
<tr>
<td>ITLC members’ interactions within their unit</td>
<td>Participants identified several ways the collaborative knowledge sharing practices seen in ITLC impacted their work at their local unit levels.</td>
</tr>
</tbody>
</table>

*Note.* IT indicates information technology, ITLC, Information Technology Leadership Council.
the effectiveness of ITLC. The final three themes focus on the ITLC members’ interactions with different types of peers: peers in ITLC, peers in other CoPs that coordinated the effort of individuals from like units (i.e., all campus IT leaders or all college IT leaders), and people (including peers, direct reports, and supervisors) within the individual’s unit.

1. Affiliation of IT leaders with multiple groups. The 4I framework highlights the relationship among individuals, groups, and the larger organization. Organizational learning takes place through the feed-forward and feedback loops of the framework, with social and psychological functions such as interpreting (at the individual level) and integrating (at the group level) influencing the transfer of knowledge. At LNRU, the distributed nature of the university resulted in IT leaders who were members of ITLC (individuals) being linked to multiple groups.

ITLC members identified with the CoP, and the participants valued the ITLC and their affiliation with the community. Several cited as an advantage of the ITLC the relationships that could be built across units and with other IT leaders they would not have engaged with otherwise. Notable responses from interviewees include the following:

Building relationships, understanding how the university functions at a different level, has been pretty valuable to me in how I operate. (Animal)

The role of the networking, shared communication, and just getting us all in the same room is valuable. (Beaker)

Being able to connect with the rest of [the university, ITLC] was just kind of the conduit to that. (Bunsen)

The individual members identified with their ITLC colleagues and credited ITLC for providing a forum in which they could work together.

Examples of ties to additional groups emerged when asking interviewees about their experiences with sharing knowledge. Interviewees from the campuses and colleges noted their unit-type CoP groups (Campus IT Leaders and College IT Directors). In addition to noting the
existence of the groups, some interviewees also thought that sharing was more challenging in the ITLC meetings than in the smaller CoP groups:

The College IT Leaders have followed the lead of the Campus IT Leaders, and we’ve started to get together. (Gonzo)

I will say at times, I still think that we don’t as a group feel quite as free to share our opinions at . . . the large [ITLC] meetings. (Scooter)

Notably, some ITLC members found it difficult to identify times when knowledge sharing in ITLC helped them to adopt new ideas, but could easily identify examples of that from their unit-type CoPs:

I see it more on the Campus ITL [IT Leader] level. (Zoot)

Well, would our colleagues at the CITL [Campus IT Leaders] count for some? Because there’s plenty of that. (Bunsen)

Further, individuals expressed that ITLC could only help to influence their decision making to a certain degree, but eventually unit-level perspectives would ultimately determine the course of action they took. Examples of this arose when asking interviewees about when they heard about a new idea and considered implementing it within their own units. Interviewee responses indicted that, while ITLC allowed them to get new information about potential services or products, it was the state of their own unit and the IT services already provided that informed their final decision:

I would say that that would be because of the needs of my specific unit. (Waldorf)

It just goes back to the scope of the organization [unit] and whether that idea applies to this scope of the organization [unit]. (Kermit)

Yeah, we didn’t see that being a benefit so we just politely abstained from jumping into that. (Scooter)

I didn’t want to lose what we already had to participate in something that . . . I saw minimal benefit of or minimal difference in how it performed. (Fozzie)
While all IT leaders interviewed identified as members of ITLC, when it came to decision making, there was a strong link between the IT leaders and the units in which they worked; this link directly influenced decisions made by the ITLC members within their own units.

2. Lack of a university-wide IT structure. This study focused on the collaborative knowledge sharing practices of IT leaders in a distributed organization. However, the collected data revealed that the overall structure of the IT organization at LNRU directly impacted how individuals used information and knowledge gained through their participation in ITLC. Interviewees alluded to the organizational structure (including reporting lines, unit customer base, and logistical aspects of the structure such as budget) as an influence on how individuals could respond to new knowledge.

Interviewees cited their unit’s established, well-run services as one reason to avoid central services they might learn about through ITLC. In particular, they had concerns that opting for a one-size-fits-all solution would hinder their ability to continue providing bespoke services for their unit’s faculty, staff, and students:

You have to weigh the good of the entire university but . . . it’s hard to lower your level of service to your local customers just for a small gain. . . . Your local customers, . . . they’re the ones that come directly back to us. They’re the ones we see on the daily basis. They’re the ones that we are supporting. (Rowlf)

The help desk initiative just really did not excite me because, again, our unit does do things quite a bit differently than some of the units that [are] . . . more closely tied to the way that [central IT unit] does it. We thought it was an abstraction away from our users, keep the IT people away from the users and running it through a central help desk. (Scooter)

However, at least one interviewed member of ITLC saw this unit-level focus and believed it hindered the ITLC’s collective ability to provide leadership in the IT space for the university:
I think we could lead. I don’t think we are leading. Even though I’m as much of a consensus guy as the other person, there comes a time where you can’t water down the solution. . . . We’ve got to agree to put [the university’s] interests at number one and let go of [unit-] “isms” and work what’s best for [the university]. (Rizzo)

Further, the participants identified that, due to the distributed nature of the overall IT organization, ideas that were presented to the ITLC membership often came with a price tag attached, and those costs were the responsibility of the units that participated in the initiative.

When asked for factors that affected their decisions whether or not to implement an idea (such as a new project, service, or initiative) introduced through ITLC, cost and budget were mentioned by many of the interviewees:

It’s typically . . . something that just right off the bat that [is] not cost prohibitive. (Zoot)

I’m initially opposed to it because I think it’s against the direction [university] wants to go. I think it’s additional funds that are not necessary. (Waldorf)

Well, we had a pressure in the one idea. . . . Money is what was sort of driving the issue there. When there are concepts or ideas that come from either our group [Campus IT Leaders] or ITLC, if we can’t do it . . . because of cost, we do at least try to put it in the ear of my boss to let [them] know. . . . And sometimes it works. Sometimes that gets us the funding that we need or at the very least we talk about it later. (Bunsen)

Over time it was going to become a very expensive thing. (Scooter)

After really learning about the pricing model [for a central service] where my unit doesn’t incur any direct costs from the service desk that I’m running . . . I’m not so sure that [the central service] would fit into what we're trying to accomplish here. I haven't really bought into that and it's not something that I've tried. (Animal)

Because all ITLC members had different levels of resources (IT staff, budget, etc.) in their own units, projects that came with a cost to the unit also came with an additional set of considerations for the unit IT leaders.

A review of the ITLC meeting minutes revealed that, in the first years of the ITLC, several goals for university-wide solutions and services were identified through the IT assessment process. The ITLC adopted these goals as their own, created working groups around
the goals, and then worked to move the ideas forward. Notably, the IT assessment summary document included funding as a key feature of a number of the proposed solutions.

Addressing the organizational structure was a recurring theme when interviewees were asked about their vision of an optimal state of ITLC. Along with the concepts already discussed, a need for leadership and/or executive sponsorship was a recurring subject. Multiple interviewees identified two positions that, at the time, were vacant and posted—the chief information officer and chief information security officer—as possible leaders and/or sponsors for the efforts of ITLC:

ITLC’s involved . . . of course, you would see it at the higher levels within the university, [provost] and [VP of finance]. (Kermit)

Part of this could . . . have a lot to do with the new CISO [chief information security officer] and CIO [chief information officer] that we’re hopefully going to be hiring for the university and their leadership in this matter. Maybe they can bring in some new ideas and direction and support and changes that would help build this. (Rowlf)

Larger story [5 years from now] is that there’s a CIO that really is the chief information officer of the university, of all the university, and the ITLC is the go-to advisory council and governance board for most of the decisions that the CIO needs to make. (Fozzie)

In addition to a need for leadership, one ITLC member suggested that an optimal state would be that the ITLC was not only a forum for sharing information about new initiatives, but also had a budget to give the group the ability to move initiatives forward without having to appeal for funding:

I don’t know if it’s a funding model or something that allows ITLC to have some power, something that they’re able to move initiatives forward without going to the provost or to [VP of finance] and saying: Hey, we need funding for this. (Kermit)

3. Lack of consensus on ITLC purpose. Data collected from various ITLC- and university-related documents, as well as interviews with ITLC members, helped to inform the contextual theme of ITLC purpose. A review of documentation revealed that, officially, both
ITLC and the broader university leadership viewed ITLC as having a role in IT governance. However, interviews with members indicated that the group was more focused on collaboration and networking.

The ITLC charter is the document that guides the ITLC and its members. The charter creation process included an opportunity for ITLC members to review it and provide input, and each charter revision included a member review process and had to be voted on and approved by a majority of the ITLC members. The charter changed over the years, but each iteration included verbiage about the purpose of the council:

The Council exists for the purposes of: ensuring that Information Technology (IT) goals and strategic plans complement those of the University, fostering collaborations, and facilitating the delivery of services that meet the academic and administrative needs of the University. (ITLC Charter, 2012)

ITLC fosters collaboration, and facilitates delivery of services that meet the academic and administrative needs of the University. The ITLC provides a forum for [university] IT leaders to plan and collaborate on initiatives to implement policies, improve services, develop the workforce, and improve governance practices. The ITLC maintains connections to IT governance bodies to ensure its practices are aligned with and responsive to the needs of the research, instruction, and administrative communities. (ITLC Charter, 2015)

Earlier versions of the charter primarily focused on collaboration and alignment of work efforts. The more recent versions included those concepts, but added references to “IT governance bodies.”

The 2012 IT assessment process and resulting documentation stressed the importance of ITLC as a key part of the LNRU IT governance model. The IT assessment had several recommendations:

To oversee the implementation of these changes and provide on-going, proactive management of IT at [university], the University should implement a revised IT governance model . . . establish the ITLC and the ITLC Board as a sounding board for
major [central IT unit] decisions and a coordinating body to foster collaboration among all IT units.

To maximize governance’s effectiveness [the university] should . . . leverage the IT Leadership Council (ITLC) to bring together the University’s IT community to share best practices, seek expertise and input to improve solutions, and foster communication among IT units.

To improve IT governance, [the university] should adopt the model depicted. . . . Actions required to create the revised governance structures and processes include: . . . establish the ITLC and the ITLC Board as a sounding board for major [central IT unit] decisions and a coordinating body to foster collaboration among all IT units.

The IT assessment document’s proposed IT governance structure included the ITLC and the ITLC board as key decision-making bodies within the overall IT governance process. Notably, the 2016-2020 university strategic plan cited “the most recent IT assessment” as a key document upon which the university could “build and manage state-of-the-art IT.”

However, ITLC participants explained that there was a disconnection between the advertised purpose and intention of the group and its actual purpose:

My first impression of the ITLC was that it was actually some type of a governing board, which is not true at all, and I just didn’t know that at the time. (Rowlf)

Its actual purpose seemed to be in participating in meetings, getting to know people. So my understanding has shifted in that I had the understanding it was more of a governance board with power before I became a member. (Beaker)

Further, when asked about an optimal future state of ITLC, interviewees talked about ITLC involvement in governance as a goal; they did not necessarily see it as a component of what ITLC did currently:

In 5 years, do I think that we’re going to be the governing body for all of IT? I don’t know if that’s going to happen, but I think that this would be a good stepping stone. (Animal)

I think there needs to be a clearly defined vision and leader who has the power to help affect change. (Waldorf)
One of the things, the key features I think they need to have is I want to say a good board or governance body within the ITLC. . . . I think they have to make sure that they not only touch on the broad topics, but they have to have some in-depth discussions about the really critical issues that they’re facing. (Statler)

[The headline is:] “ITLC sets Governance Model for Higher Ed” . . . the larger story is that there’s a CIO that really is the chief information officer of the university—of all the university—and the ITLC is the go-to advisory council and governance board for most of the decisions that the CIO needs to make. (Fozzie)

Though ITLC, through its charter and other documents, purported that was part of the university’s IT governance structure, ITLC members did not see governance as an active component of the group’s work.

4. **Member view of ITLC efficacy.** While members did not view the ITLC as an active part of the IT governance structure, as the ITLC charter stated it should be, that did not mean that the members did not value ITLC and the functions it performed. Members observed that the ITLC provided them with a community that allowed them to work with others that they would not have worked with otherwise. As discussed in the first deductive theme (distinct groups), the IT leaders interviewed identified as being part of the ITLC community and cited its existence as being the reason members have an opportunity to network and build relationships with others across the university.

All available meeting minutes from 2010 to 2016 (51 meetings) were reviewed to gain an understanding of what kind of structure for interaction ITLC meetings provided to its members; Table 4.3 provides a summary of this data. Three types of meeting segments were identified: presentations with question and answer, table exercises with a report out to the larger group, and group discussions. The latter two provided the greatest opportunity for members to interact with each other. However, most meeting segments (258 of 291) were presentation with question and
answer, which limited the amount of time individuals could spend in the meeting interacting with their ITLC colleagues.

Table 4.3
ITLC Full Council Meeting Segments by Type: 2010 to 2016

<table>
<thead>
<tr>
<th>Segment Type</th>
<th>Number of Segments</th>
<th>Percentage of Total Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation with question &amp; answer</td>
<td>258</td>
<td>88.7%</td>
</tr>
<tr>
<td>Table exercises with report out</td>
<td>28</td>
<td>9.6%</td>
</tr>
<tr>
<td>Group discussion</td>
<td>5</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

Perhaps as a result of this misalignment between the aspect of ITLC identified as most valuable to members and the format of the ITLC meetings, members recognized that they acquired new information as a result of ITLC, but did not credit ITLC for that knowledge transfer:

ITLC [is] what actually brings us together and gets all those people together in the room. . . . It [the value] was more of a talking one-on-one with somebody else while I was there and sharing ideas in that manner than something that was directly facilitated by ITLC. (Rowlf)

I typically never leave ITLC with all the information. . . . I need to know a little bit more about this and I want to know a little bit more about it, so I’m going to follow up with the individual who presented or I’m going to follow up and maybe have the conversation with somebody that I’ve talked to about it. (Rizzo)

While ITLC provided the forum for interaction, the fact that so much of that face-to-face time was spent in noninteractive segments impacted ITLC members’ interpretation of the ITLC’s role in creating that environment for sharing. Perhaps the most revealing data on the views of ITLC members regarding the efficacy of ITLC were the responses from interview participants when asked to compare ITLC to an animal (Table 4.4).
<table>
<thead>
<tr>
<th>Participant</th>
<th>Animal</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waldorf</td>
<td>Chameleon</td>
<td>It seems as though the tenor and color is changing, depending on the day, the speaker, the issue. . . . Sometimes it’s positive, sometimes it’s not positive.</td>
</tr>
<tr>
<td>Beaker</td>
<td>Cow</td>
<td>Because the animal does have something to offer that is valuable, but at the same time it kind of does its own thing and doesn’t move very fast.</td>
</tr>
<tr>
<td>Animal</td>
<td>Elephant</td>
<td>It’s a big, slow animal that has a lot of knowledge. They say elephants have a memory that’s really good. I feel like ITLC is kind of big, clunky, and moves kind of slow at things.</td>
</tr>
<tr>
<td>Rowlf</td>
<td>Elephant</td>
<td>It’s a very large organization and it just lumbers along. We accomplish things. . . . It definitely takes time and it’s just this large, lumbering beast.</td>
</tr>
<tr>
<td>Scooter</td>
<td>Elephant</td>
<td>Stomping off in a direction and trumpeting the wonders of it, good, bad or otherwise, and trampling the forest in its wake.</td>
</tr>
<tr>
<td>Kermit</td>
<td>Frog</td>
<td>I think ITLC has the potential to turn into the prince; it just hasn’t done it yet.</td>
</tr>
<tr>
<td>Zoot</td>
<td>Headless octopus</td>
<td>Lot of arms, lot of limbs with a lot of movement, but not a whole lot of collaboration or insight that are bringing everything together there.</td>
</tr>
<tr>
<td>Bunsen</td>
<td>Human</td>
<td>When you say animal, you think of instinct, you think of this is what it does and it always does it. We’re not quite that. We can be liquid, we can be malleable and fit somewhere.</td>
</tr>
<tr>
<td>Scooter</td>
<td>Human family</td>
<td>Both functional and dysfunctional.</td>
</tr>
<tr>
<td>Fozzie</td>
<td>Hydra</td>
<td>Multiheaded. . . . The fact that there’s the same one overall direction but when you get near the top all the heads can do whatever they want.</td>
</tr>
<tr>
<td>Statler</td>
<td>Monkey</td>
<td>Inquisitive. . . . We want to find out what’s going on out there.</td>
</tr>
<tr>
<td>Scooter</td>
<td>Owl</td>
<td>Carefully contemplating and thinking about things and reaching out for additional lessons to make a hopefully good decisions.</td>
</tr>
<tr>
<td>Gonzo</td>
<td>Sloth</td>
<td>It moves slowly and it’ll never really seem to get anything done.</td>
</tr>
<tr>
<td>Bunsen</td>
<td>Sloth</td>
<td>I don’t think that it’s slow because it wants to be. I would consider it that at least at certain points. I like to see movement and then course correction afterwards. If we screw up, “Like, okay, we won’t do that anymore.” And move on.</td>
</tr>
<tr>
<td>Scooter</td>
<td>Sloth</td>
<td>It’s a kind of a friendly cute looking thing that gives you warm and fuzzy, but ultimately it takes forever to get from here to there.</td>
</tr>
</tbody>
</table>
Most answers indicated a lack of satisfaction by participants regarding the effectiveness of ITLC. Slow-moving animals such as elephants, sloths, and cows were mentioned numerous times. Members also indicated that there was a lack of clear direction by citing animals such as “a headless octopus” and a mythical multiheaded hydra. However, ITLC members also cited positive traits such as knowledge and inquisitiveness. A few indicated that, while the ITLC was not yet perfect, it had the potential to become a more effective organization.

5. ITLC members’ interactions with ITLC peers. IT leaders at LNRU interacted with three distinct groups: their peers in ITLC, their peers in similar units (i.e., campuses, colleges, or administrative units), and people (including peers, direct reports, and supervisors) within their home units. Collaborative knowledge sharing practices took place between the individual and each of these three groups.

Within the ITLC, individuals cited knowledge sharing in the informal moments of ITLC (that is, during meals or breaks) as some of the most valuable time spent at ITLC meetings:

In the discussions you pick up little notes of who’s doing what and who you might be able to discuss common interests, common challenges both technical and political, and those strategies on how to effectively approach those with the larger group. (Scooter)

Directly, [ITLC] didn’t [help to facilitate]. The people did, but it wasn’t like this was a program or something or this was something that ITLC had something in place like a module. (Bunsen)

It was the idea that I had people all in the same room that helped. During the breaks, I would get together with different people. I would say “Hey, how is this going? What would work better for you?”—that kind of thing. It was the informal piece of it, not the formal presentation piece of it. (Kermit)

From ITLC, in relationship we’ve built there with [head of unit], getting some more insights on the practices with [project name], actually meeting with her on some projects related to the [project name], and even getting engaged with that. Some of those stem, initially, from conversation rather than from the ITLC. (Zoot)

I’ve met most of the people that I work with, as far as on a peer level, throughout the university, at ITLC. (Animal)
Without the ITLC I would not have been in the room with these people that I’ve learned things from. I mean, I just wouldn’t have the opportunity to interact with them without the assistance of the ITLC. (Beaker)

During the 2016 spring semester, LNRU faced financial uncertainty due to delays in LNRU receiving its state budget appropriation. As a result, the free (to members) buffet lunch was eliminated and replaced with a bring-your-own lunch spot on the agenda. Though some time for socializing during what had previously been the lunch hour remained on the agenda, only 25% of the membership (about 20 people) arrived during this lunch and networking time, with the majority of those attending not arriving until the start of the meeting content (see Appendix G). This was a distinct departure from past meetings.

Further, during the budget crunch, campus ITLC members were under a “travel ban” and would not be reimbursed for travel to Central Campus for the ITLC meetings. This resulted in about half of the membership from the campuses attending by videoconference connection during the April 2016 meeting. The limitations on spending for lunch and travel may have had an impact on the ITLC’s ability to foster collaborative knowledge sharing:

I think just the consistent buy-in of going and sitting in that room at the meetings to be present and to network and to talk and to participate in some way is really the key. Because without being in that room, . . . this is not something that can be done virtually, I think. . . . For as much trouble and expensive it can be sometimes, physically getting everyone in the room is one of the keys to making the group work. (Beaker)

Summary statistics from meeting observations (see Appendix G for full summary) align with the interview data regarding the importance of time for informal communication among ITLC members. As discussed previously, most ITLC meeting agenda items were primarily one-way communication, in the form of presentations, with some time for question and answer. Member engagement (as measured by the number of people in the room compared to the number of people who participated in the meeting, i.e., with questions, answers, comments, and voting)
during planned meeting segments was quite low when compared to the informal interactions that occurred during meeting breaks. Table 4.5 shows the difference between engagement during planned meeting segments and breaks.

Table 4.5
*ITLC Full Council Meeting Engagement Levels*

<table>
<thead>
<tr>
<th>Engagement %</th>
<th>Low</th>
<th>High</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned agenda segments</td>
<td>3%</td>
<td>27%</td>
<td>13%</td>
</tr>
<tr>
<td>Breaks</td>
<td>92%</td>
<td>95%</td>
<td>93.5%</td>
</tr>
</tbody>
</table>

When managing meetings for a large group, such as the ITLC, a meeting structure with a planned agenda is necessary. Given that so many of the members interviewed identified the informal exchanges as valuable in the knowledge sharing process, finding ways for members to have more of those opportunities is important. Interview participants recommended, when describing a future optimal state of the ITLC, that the council make better use of its subcommittees to allow for forward motion on initiatives:

I would have them think about being more active from the get go in terms of committees and working groups, and then I would suggest some of the ones that we have. (Fozzie)

Some of these committees with having good, fully developed processes of here’s a new technology that’s coming out. This goes here, it gets looked at, it gets studied. There’s a working group. They come back. (Rowlf)

There needs to be subgroups or conversations or structured working teams or something outside of just the ITLC group and meetings. (Waldorf)

These suggestions aligned with observations of two smaller ITLC-related meetings, a subcommittee meeting and a board meeting. In these meetings, the smaller number of attendees provided an opportunity for the meetings to be more discussion-based, and more individuals were able to participate (see Appendix G for full summary). Table 4.6 shows the percentages of
attendees active in smaller ITLC-related meetings. Compared to the level of engagement in large, full council meetings (Table 4.5), small meeting attendees had higher participation rates. This not only allowed them to contribute their opinions on the agenda topics, but also allowed them an opportunity to interact with their ITLC peers.

Table 4.6
*ITLC Member Engagement for Subcommittee and Board Meetings*

<table>
<thead>
<tr>
<th>Engagement %</th>
<th>Low</th>
<th>High</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcommittee</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Board</td>
<td>33%</td>
<td>100%</td>
<td>71%</td>
</tr>
</tbody>
</table>

Finally, IT leaders identified trust as a key aspect of the ITLC’s success. However, there was a difference of opinion as to whether the ITLC had reached a place in which trust was established. As demonstrated by the statements below, some participants felt that there was already a level of trust within the group, while others cited it as a criterion for future success:

Now there seems to be a lot more trust in the room than there was previously, . . . which I think is good. (Gonzo)

Over my time in the ITLC, there has been a fairly consistent building of camaraderie and trust with the other participants. I’ve also seen growth both in myself and in the other participants, and there is a willingness to collaborate, to share. (Scooter)

You’ve got to be able to have open and honest conversations and trust each other that we’re going to do what’s best in the interest of the whole versus the parts. . . . Building the trust to have those conversations, be able to take criticism, . . . it’s just the opportunity to do something better and differently are super key. (Rizzo)

I think that there would be a lot about trust and the building of trust between departments, individuals, units, that sort of thing and then collaborative work. Not meaning talking to each other and getting ideas but actually sharing work, sharing time, sharing knowledge back and forth actively between units to build things and to collaborate and to work on things together. (Rowlf)
6. ITLC members’ interactions with unit-type peers. One of the recurring themes in interviewee responses was that the ITLC provided them a forum to interact with IT leaders from units with which they might not otherwise interact. Many of the IT leaders interviewed saw value in getting broader perspectives about other types of units:

It’s the broad spectrum of the different areas that are covered by ITLC, just understanding that a campus has different things influencing them than a college or an administrative unit. It’s, again, taking the broad spectrum of IT at [university] and looking at those different areas in a cohesive manner instead of an individual manner. (Kermit)

Definitely the representation from all of the different units is something that’s important because it gives you such a huge cross-section and there’s so many different people with so many different experiences. (Rowlf)

If you don’t have that collaboration and understand how all of the units works together and how all of IT functions at [university]—I think it’s difficult to make decisions in a vacuum. (Animal)

The makeup has impact because there are representatives from various different units, and divided into the three pieces of campuses, colleges, and administrative support. Because otherwise, I wouldn’t necessarily have contact with people in some of those other areas, and would never be able to gain their insight or perspective. (Waldorf)

While having a broader, cross-sectional view of the university and its various units was seen by ITLC members as advantageous, many interviewees also identified separate unit-type groups as another forum for collaboration. Administrative unit IT leaders primarily worked with ITLC and their home units, while campus and college leaders also had groups (Campus IT Leaders for the campuses, College IT Directors for the colleges) that met regularly. These groups provided forums for leaders of like-type units to collaborate on common opportunities and challenges. While these organizations were not part of the original scope of this study, through the interview process, it quickly became apparent that these groups played a key role in collaborative knowledge sharing for these IT leaders.
In some cases, IT leaders had difficulty differentiating between ITLC and Campus IT Leaders as the source of their collaboration. Participants were either hard-pressed to give examples of how the ITLC helped to facilitate their collaborative practices or were unable to recall from which group their example of collaboration originated:

I’m trying to think of a specific one because I know that I’ve got several good ones, although I’ve got to make sure this is from ITLC not CITL [Campus IT Leaders]. (Rowlf)

That group [Campus IT Leaders], we’re all virtually in the same boat, but with minor differences here and there relating to size and shape. That was helpful to get good guidance right away as opposed to just kind of learning the job as I went. (Bunsen)

Campus IT Leaders had evolved over the years, but the campus leaders had met as a group longer than ITLC had. It was apparent that this group influenced how the Campus IT Leaders collaborated and learned.

College IT Leaders cited the campus group, which has existed for several years, as the model for the College IT Leaders group that has recently formed to facilitate collaboration among the colleges:

The colleges meet separate now, the . . . campuses meet separately than us and it’s kind of broken down into “like” groups. I think that’s very valuable in the way that information gets shared because now you’re conversing with like entities. When you [have] that, you get information. You get collaboration. You get cost savings. There’s all kinds of benefits to doing that. And I think that’s key when you’re working with your direct peers. (Animal)

The College IT Leaders have followed the lead of the Campus IT Leaders, and we’ve started to get together. I think that’s been beneficial, and it helps all of us be more active participants. (Gonzo)

Further, one IT leader viewed the type of collaboration happening at the campus and college level as essential to creating an optimal state for the ITLC in the future:

The larger story would have to do something with collaboration amongst many units. Who’s involved would probably be the college and campus IT people; they seem to be driving a lot of initiatives these days. (Gonzo)
Given the focus that both campus and college IT leaders had on these groups, it is important to include them when considering the broader collaborative knowledge sharing processes used by IT leaders.

7. ITLC members’ interactions within their unit. A word count cloud generated from the inductive codes of the interview transcripts showed that unit was one of participants’ most frequently used words during their interviews (see Appendix H). Of interest to this study is how IT leaders transferred the knowledge learned through their participation in ITLC back to their home units. Nearly all interview participants were able to identify a number of ways in which the ITLC impacted their work at their local unit levels, including (1) gaining new or additional information, (2) gaining a larger perspective from the diverse makeup of ITLC, (3) gaining new information and/or perspectives influencing decision-making at the unit level, (4) changing how IT leaders interacted with unit-level IT staff, and (5) changing how IT leaders interacted with unit-level peers and/or supervisors.

IT leaders identified the new information they were able to gather via their participation in ITLC as an example of how ITLC impacted their work. As discussed previously, when members were asked to articulate the most valuable part of the ITLC experience, they noted the informal interactions, but that did not mean that the formal agenda was devoid of value. In the examples provided by interviewees, it appeared that the ITLC’s formal agenda provided its members with a method to gain new knowledge about initiatives and projects that may impact individual units:

I have experienced some changes, basically on how I receive information from the ITLC. I use it as a source of information to be able to report back to my unit on global initiatives that are happening throughout the university that I may not be informed of otherwise. . . . The way that I do business has changed because of that. Before, I didn’t really have that information. (Animal)
I’m able to bring information back to my unit, which does affect the way we operate because I gain information that we otherwise wouldn’t have had. (Beaker)

[ITLC] really hasn’t changed on how I’m bringing things back, it’s just what I’m bringing back. (Statler)

You pick up all of these different ideas and little pieces that you can take back to your own [unit], use, or that you can file away when something changes in the future that they may be helpful to you. (Rowlf)

Additionally, the diverse representation of colleges, campuses, and administrative units in the ITLC membership helped to influence the IT leaders’ decision-making processes within their unit. Several IT leaders pointed to new perspectives gained by interacting with people from other types of units as a key influence on the decisions they made at the unit level.

The makeup is not just people from units that I interact with. I really like that it has IT across the whole university. . . . We’re in our own comfort area with people that we interact with all the time. I really appreciate hearing the insights from others, just their perspective. Having that different viewpoint, that different lens to see it from, really does change how we make decisions back here. (Statler)

So the multiple perspectives of a single issue, due to the variety of people in the room and the background and the units they come from, it is valuable—because even though it may not directly relate to us, just being able to think about it differently, it helps you make better decisions, I think. (Beaker)

When we talk about different ways to approach ideas, solutions, services, we have a broader landscape to take a look at, and ITLC helps facilitate being able to look at that broader landscape. (Kermit)

The IT leaders identified the new knowledge and perspective gained through their participation in ITLC as key to their ability to make informed decisions at the unit level. Multiple members noted that this broader perspective not only influenced how they made decisions, but also improved the quality of decisions they made at the unit level:

I don’t think it’s changed any way that I’ve explored opportunities, but it’s expanded on them. . . . It’s made me investigate more places, more things than I would have. . . . It does change on how we make decisions because the more informed you are, the better decisions you make. (Statler)
If I know that there is a global movement at [university] toward a certain initiative or a certain way of doing things, and then I hear something contrary to that within my unit, I try to discourage the activity within my unit. I try to direct us more toward what [university] is trying to do overall. (Waldorf)

If it wasn’t for ITLC and providing that information to me and updates, I probably would’ve made some bad decisions along the way. (Animal)

Before the participation started, we were operating pretty much in a vacuum and sort of made decisions strictly based on the needs of the local level and didn’t look ahead to where IT as a whole university is trying to, the direction it’s moving in. (Beaker)

Another key behavioral change influenced by ITLC was how ITLC members interacted with and shared knowledge with unit-level IT staff who reported to them. A number of the IT leaders noted that their decision-making process included their unit-level IT staff. This sharing of knowledge allowed unit-level IT staff to learn about how other IT units function, as well as learn about new university-wide initiatives. Additionally, at least one IT leader believed that, due to this additional knowledge, unit-level IT staff were becoming more open to new ideas.

Even if I didn’t agree with it, I probably did bring it back just to get a discussion with my folks here. (Bunsen)

I provide feedback to the key IT leaders in my area. I don’t necessarily send a newsletter to everybody in IT, but if there’s something very pertinent we try to share it with all of our departmental IT throughout the college. (Scooter)

Privileged enough to hear the different discussions that have gone on and have the opportunity to keep my staff informed of really what’s happening in not just [my unit], but IT at [the university]. (Kermit)

Because of the things I brought back from ITLC, we really have . . . a very open shared governance model within my department. . . . We collaborate and we talk about everything. I try as little as possible to be the person who makes the decision and goes to my staff and says you’re going to do this. . . . Because of the ideas I’ve brought back, over time, my staff has become somewhat more open-minded to some things, somewhat more willing to consider things that they wouldn’t have earlier, think outside the box, that sort of thing. (Rowlf)

Similarly, the IT leaders noted a number of changes resulting from their work with ITLC in how they and their unit-level IT teams interacted with the larger local unit. Beaker and Rizzo
expressed that they would share knowledge learned with their unit leadership. Gonzo saw a
direct influence from ITLC on how IT interacted with the unit faculty, working towards a
consensus-based process. Finally, Bunsen noted that seeing how IT leaders interacted with each
other at ITLC broadened his perspective on how to interact with unit peers.

I usually bring everything back and discuss it at a unit level. (Beaker)

We’ve been putting together committees that sort of try to get faculty and IT staff
engaged together within the college to make decisions, rather than being unilateral about
it. I guess there’s some ITLC influence there, trying to build a consensus. (Gonzo)

It [ITLC] helped me understand trust a lot better around here [at the local unit].
Understanding that everybody’s got their thing to do and just because this person might
be distant or might not be talking doesn’t mean that they’re not doing their part for our
goal locally. . . . That’s something that stuck out for me with ITLC and something that I
could strongly say that I did bring back. (Bunsen)

I try to share at a minimum everything that we discuss at, at least high level, with the
[unit] leadership team. (Rizzo)

Getting a better sense of what should and shouldn’t be shared, and with whom, in my
unit. I’m not a . . . verbose communicator. I tend not to share information with people
easily because I give short answers to things, and I’ve figured out that sometimes that
doesn’t work. (Gonzo)

Summary

This chapter has presented the findings from data gathered through a documentation
review, meeting observations, and semistructured interviews with members of ITLC. To protect
the identity of the ITLC participants, no demographic information was gathered or shared as part
of the data collection and analysis process. Instead, this chapter focused on discussing the
identified themes and cataloging the data that most directly helped to inform the development of
these themes, in response to the study’s research question: How do senior IT leaders describe
their collaborative knowledge sharing practices?
Data were analyzed both inductively and deductively. The inductive analysis resulted in three key themes, and the deductive analysis resulted in seven key themes. Table 4.7 summarizes the themes and key examples drawn from collected data.

Table 4.7
Identified Themes and Key Examples

<table>
<thead>
<tr>
<th>Type</th>
<th>Theme</th>
<th>Key examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inductive</td>
<td>Individual’s connection to multiple groups</td>
<td>Well, would our colleagues at the CITL [Campus IT Leaders] count for some? Because there’s plenty of that. (Bunsen)</td>
</tr>
<tr>
<td></td>
<td>Distributed IT structure’s impact on collaboration</td>
<td>Typically, I tend to bring things back and talk to them about my staff, but there are definitely times where an idea or something that somebody’s talking about, it definitely just hits you and you say, “No, that’s just really isn’t going to work for us.” (Rowlf)</td>
</tr>
<tr>
<td></td>
<td>Misalignment of the ITLC’s stated purpose versus implementation</td>
<td>The purpose of the group needs to be clearly defined . . . I think that’s been one of our biggest struggles . . . we have this identity crisis. (Zoot)</td>
</tr>
<tr>
<td>Deductive</td>
<td>Affiliation of IT leaders with multiple groups</td>
<td>The College IT Leaders have followed the lead of the Campus IT Leaders, and we’ve started to get together. (Gonzo)</td>
</tr>
<tr>
<td></td>
<td>Lack of a university-wide IT structure</td>
<td>Larger story [5 years from now] is that there’s a CIO that really is the chief information officer of the university, of all the university, and the ITLC is the go-to advisory council and governance board for most of the decisions that the CIO needs to make. (Fozzie)</td>
</tr>
<tr>
<td></td>
<td>Lack of consensus on ITLC purpose</td>
<td>Is it just a place that we come to get informed or are we truly an action committee? (Statler)</td>
</tr>
<tr>
<td></td>
<td>Member view of ITLC efficacy</td>
<td>I think ITLC has the potential to turn into the prince; it just hasn’t done it yet. (Kermit)</td>
</tr>
<tr>
<td></td>
<td>ITLC members’ interactions with ITLC peers</td>
<td>Without the ITLC, I would not have been in the room with these people that I’ve learned things from. I mean, I just wouldn’t have the opportunity to interact with them without the assistance of the ITLC. (Beaker)</td>
</tr>
<tr>
<td></td>
<td>ITLC members’ interactions with unit-type peers</td>
<td>That group [Campus IT Leaders], we’re all virtually in the same boat, but with minor differences here and there relating to size and shape. (Bunsen)</td>
</tr>
<tr>
<td></td>
<td>ITLC members’ interactions within their unit</td>
<td>I try to share at a minimum everything that we discuss at, at least high level, with the [unit] leadership team. (Rizzo)</td>
</tr>
</tbody>
</table>
The first inductive theme, “individual’s connection to multiple groups,” focused on how ITLC members’ association with not only ITLC, but other CoPs and/or their home units, impacted their collaborative knowledge sharing practices. The second theme, “distributed IT structure’s impact on collaboration,” examined the distributed organizational structure of IT at LNRU and its impact on ITLC members’ collaboration. Finally, the theme “misalignment of the ITLC’s stated purpose versus implementation” noted the gap between the ITLC’s stated purpose and the work it actually performed and assessed how that gap impacted the members’ view of ITLC.

Among the seven deductive themes, “affiliation of IT leaders with multiple groups” and “lack of a university-wide IT structure” examined how the LNRU’s organizational structure influenced collaborative knowledge sharing practices among IT leaders who were members of ITLC. First, the IT leaders were strongly connected to two or three groups (depending on their home-unit affiliation). Further, LNRU was highly distributed organizationally in that that there was not a single IT leader for the whole university. These two structural aspects had a direct impact on how IT leaders applied knowledge learned to their decision-making processes. In particular, there was a tension between making decisions that benefited the university as a whole versus an individual unit.

The themes “lack of consensus on ITLC purpose” and “member view of ITLC efficacy” examined the ITLC members’ understanding of ITLC’s objectives and how successful the organization was in meeting its goals. A review of documentation relating to ITLC and the larger university revealed that the advertised purpose included its role in IT governance at the university. However, ITLC members did not see ITLC as having achieved that role in the university and viewed the organization as more of a forum for collaboration. Participants
expressed optimism that ITLC could eventually mature and play a role in university IT governance, but they did not believe that it was currently effective in that regard.

Finally, the three themes, “ITLC members’ interactions with ITLC peers,” “ITLC members’ interactions with unit-type peers,” and “ITLC members’ interactions within their unit” addressed the behaviors exhibited by individuals when interacting with each of the three main groups available to them in the context of IT leadership. Data from meeting observations and interviews provided the primary support for these concepts. Key to these themes was the idea that individuals were not only transferring knowledge from the ITLC to themselves, but also had other groups that they interacted with. Interactions within each of these groups had an impact on what knowledge was shared, how it was shared, and how it was adopted and integrated by each individual. Further, each of those individuals interacted with unit-level supervisors, colleagues, and direct reports who relied on the IT leader to effectively integrate and translate knowledge learned at ITLC and like unit groups into their local units.
Chapter 5: Interpretations, Conclusions, and Recommendations

Chapter 5 begins by connecting the study conclusions to the research question, conceptual framework, and literature that guided this research. It then discusses the study’s scholarly contribution, recommendations for future research, and implications for both practice and the study site.

Integrated Data Analysis with Scholarly Frame

Analysis of the data collected for this study resulted in three key conclusions:

1. Information Technology Leadership Council (ITLC) members cited the informal aspects of the ITLC as best supporting collaborative knowledge sharing practices among information technology (IT) leaders; they did not see the formal structure and actions of the ITLC as being conducive to collaborative knowledge sharing.

2. The distributed organizational structure of IT at Large Northeast Research University (LNRU) is a barrier to collaborative knowledge sharing practices among IT leaders.

3. ITLC members identified with two to three groups, which impacted the collaborative knowledge sharing practices of IT leaders.

Each of these conclusions is explored, drawing connections with the research question, as well as relevant literature.

**Conclusion 1.** *ITLC members cited the informal aspects of the ITLC as best supporting collaborative knowledge sharing practices among IT leaders; they did not see the formal structure and actions of the ITLC as being conducive to collaborative knowledge sharing.*

Conclusion 1 speaks to the research question in that it identifies the processes by, and forum in which, collaborative knowledge sharing takes place among the IT leaders in a
distributed IT organization. Based on feedback from interviewed ITLC members, there was consensus that ITLC was valuable for the collaborative knowledge sharing process in its ability to assemble IT leaders from across the university on a regular basis. However, beyond recognizing that without the ITLC they would not necessarily have had an opportunity to interact regularly, the IT leaders interviewed did not directly credit the ITLC for helping to drive collaborative knowledge sharing. When asked to share examples of times when they learned about a new idea from the ITLC, most respondents stated that collaborative knowledge sharing occurred as a result of the informal conversations during unscheduled time in meetings, such as lunch or breaks, and not as a result of formal ITLC activities.

Notably, the ITLC charter clearly included “fostering collaborations” as a component of its purpose. It could be argued that by providing unstructured time—such as breaks—during meetings, the ITLC was using its formal constructs to help foster collaboration. However, while ITLC members were familiar with the charter (since the charter itself must be approved by the ITLC membership), and likely were familiar with the stated goal of fostering collaboration, they did not immediately see the connection between this informal relationship building during meetings and the stated goals of the group. This seemed to be at the root of the discontent some interview participants cited when discussing the ITLC.

The interviewed ITLC members were very focused on the aspect of the charter that stated that the ITLC would play a role in the university’s IT governance. While the university as a whole had not adopted the IT governance structure recommended by the IT assessment, the ITLC had taken steps to prepare itself to be part of that recommended structure. Most notably, the ITLC adapted its charter to include verbiage about IT governance (as recommended by the IT assessment). As a result, ITLC members expressed that their understanding of and expectation
for the ITLC was that it had some role in IT governance at the university. However, as noted by the ITLC members interviewed, there was a significant gap between the stated purpose of the ITLC and what the community of practice (CoP) actually did.

One of the premises of the 4I framework is that cognition affects action, and action affects cognition; however, Crossan et al. (1999) noted that, in practice, “changes in knowledge do not necessarily lead to changes in action” (p. 535). This was demonstrated in LNRU’s collective behavior around IT governance and the ITLC. With the IT assessment, LNRU invested time and effort into examining how its IT operations work, but the university had not yet implemented the recommendations made in the IT assessment regarding a university-wide governance structure.

The cognition-action link highlighted in the 4I framework seemed to be somewhat broken within the ITLC. Optimally, an organization with a strong link between knowledge and action would provide a foundation for collaborative knowledge sharing among its members. When there is a disconnect between the expectations (cognition) of the members and the outcomes (action) of the group, the role of the group in the collaborative knowledge sharing practices of IT leaders may be limited.

Crossan et al. (1999) stated, “Coherent action is achieved with the help of plans and other formal systems. If the plan produces favorable outcomes, then the actions deemed to be consistent with the plan become routines” (p. 530). Conversely, it stands to reason, in situations in which plans are not successfully converted into action, a barrier to what is viewed as “routine” may be created. In the case of the ITLC, the gap between expectation and action regarding the ITLC’s role in IT governance created frustration within the membership. Group members became discontent, as demonstrated by the responses by ITLC members when asked to describe
the ITLC as an animal (with many citing slow-moving creatures, such as a sloth or an elephant), and collaborative work may be done outside the formal structure of the group.

This is not to say that this disconnection between cognition and action means the demise of the ITLC. Rather, the 4I framework addresses the need for mutual adjustment to help in the organizational learning process. There was evidence of this kind of adjustment among ITLC members. While they expressed frustration with the lack of a role in IT governance, they also expressed their hope that the ITLC could play such a role in the future. When asked to describe an optimal future state, many interview participants expressed that they believed the ITLC could be successful in playing an important role in IT governance at the university in the future.

The ITLC played an important role in the collaborative knowledge sharing practices of IT leaders at LNRU in that it provided the IT leaders from campuses, colleges, and administrative units an opportunity to build relationships through informal conversations and relationship building. However, because of other stated goals in the ITLC’s charter, the ITLC’s success in this regard was somewhat overshadowed by an inability to meet those other goals. While ITLC members have adjusted their expectations and behaviors so that collaborative knowledge sharing can take place via the formal channels provided by the ITLC structure, there is an opportunity for ITLC leadership to clarify the present goals of the group and perhaps provide opportunities for collaboration that help to formalize these informal structures that have naturally evolved.

**Conclusion 2.** The distributed organizational structure of IT at LNRU was a barrier to collaborative knowledge sharing practices among IT leaders.

Conclusion 2 addresses the research question by identifying a barrier to the collaborative knowledge sharing practices of the IT leaders in a distributed IT organization. LNRU’s IT organization consists of unit-specific IT departments informally connected through their leaders
who serve as members of the ITLC; beyond the ITLC and other CoPs, there were no formal linkages among the IT leaders. When new ideas or knowledge was shared among IT leaders through ITLC, most IT leaders (based on the responses of those interviewed) were not only open to new ideas, but actively sought out opportunities to learn more about how other units addressed similar situations or problems. A number of IT leaders shared examples of how independent IT units worked together to solve common problems, and in some cases were able to make those solutions available more broadly across the university to other IT units. In these cases, coalitions of willing participants were able to get important work done through collaborative knowledge sharing.

However, there were times when new university-wide services and solutions were presented to IT leaders in the form of unfunded mandates, or even just unfunded but recommended central services and solutions; they were generally presented to ITLC members through the formal channel of ITLC meetings, in the form of a presentation by the project or service leader(s), and with a question-and-answer period after the presentation. As highlighted by a number of interview participants, how IT leaders responded to, processed, and considered these services and solutions could be impacted by logistical concerns. Because of the distributed nature of the IT organization across disparate units, organizational logistics such as budget and/or staffing levels could differ from unit to unit. These differences in resource levels among the IT units might be a barrier to collaborative knowledge sharing practices; interviewed ITLC members expressed that resource limitations, most often budgetary concerns, influenced how they made decisions about new offerings.

The distributed nature of the IT organization created new complexity when considering collaborative knowledge sharing practices through the lens of the 4I framework. This came to
light when evaluating the ITLC’s capacity to provide a forum in which knowledge could move from the individual, or interpreting, level to the group, or integrating level. The integration of knowledge requires “shared understanding” and “mutual adjustment” (Crossan et al., 1999, p. 525). While the participants expressed that they were open to learning new ideas and sharing their own knowledge with their comrades, they also cited logistical barriers (such as budget and staffing levels) that emanated from the distributed organizational structure as limiting factors in their ability to fully adopt new ideas.

Additionally, a key premise of the 4I framework is that organizational learning is a multilevel process, including the individual, group, and organization. In this research, the focus was on the movement of knowledge from the individual to the group level. When many individuals working with the same group have the same barrier to adopting an idea, it is worth considering how to remove the barrier to better allow for collaborative knowledge sharing practices among the IT leaders in the ITLC.

In cases where IT leaders for given units would have to use more of their resources (budget or staff time) for a service or solution that was comparable (or, in their view, perhaps even subpar) to what they already had in place for their unit and its customers, they likely did not consider adopting the initiative within their own unit. At a large university such as LNRU, economies of scale could lower the total cost for a given service, but the current organizational model did not encourage IT leaders to think about the costs and/or resources for the university as a whole. This barrier could be addressed most simply by taking individual unit resources out of the decision process by providing centralized funding and staff support (i.e., paid for and managed) by the central IT unit at LNRU for proposed university-wide services.
Conclusion 3. *ITLC members identified with two to three groups, which impacted the collaborative knowledge sharing practices of IT leaders.*

Conclusion 3 addresses the collaborative knowledge sharing practices of IT leaders by identifying the groups in which and with which these individuals gained and shared knowledge. From the perspective of the 4I framework, this phenomenon is notable due to the fact that the framework focuses on the feed-forward and feedback processes among an individual, a group, and the organization (with this research focusing on the individual and group levels). In the case of a distributed structure within a larger organization, the link between an individual and a group is not a one-to-one relationship, but a one-to-many relationship. In the case of the ITLC, individual members identified with (1) the ITLC, (2) their home unit, and (3) in the cases of college and campus members, an additional unit-type–based CoP.

ITLC members repeatedly cited the informal interactions with their ITLC peers during ITLC meetings as essential to the collaborative knowledge sharing process. Crossan et al. (1999) stated that “interpreting is a social activity that creates and refines a common language, clarifies images, and creates shared meaning and understanding” (p. 528). While some of this social process can be done through more formal and/or structured meeting activities, member feedback indicated that the planned agenda did not provide a lot of opportunity for collaborative knowledge sharing. Analysis of the ITLC meeting minutes and full council meeting observations corroborated this perspective and indicated that the structure of the meetings did not provide ample opportunity for ITLC member interaction, which would help to foster collaborative knowledge sharing within the more formal ITLC construct.

In the case of ITLC members working in other CoPs with their unit-type peers, those interviewed cited the ability to work with others who were in situations similar to their own as
being beneficial to their collaborative knowledge sharing practices. Notably, the ITLC members thought that these additional CoPs complemented, and did not compete with, the ITLC. From the perspective of the 4I framework, one can see how it may be easier for individuals with common experiences to share knowledge when they already have a common language (essential for the individual’s interpreting process) and, as a group, the unit-type CoPs can more quickly come to shared understandings.

ITLC members were also leaders within their own units. Interestingly, the ITLC members noted that they were able to apply concepts they learned from their colleagues in ITLC within their own units to improve their work and interactions with their unit colleagues (including direct supervisors, unit peers, and direct reports). In this scenario, in terms of the feed-forward and feedback process, knowledge does not move just between an individual and a single group. In a distributed organization, an individual can also be a conduit through which knowledge is transferred and integrated into other groups within the organization.

One of the key premises of the 4I framework is the “tension between new learning (exploration) and using what has been learned (exploitation)” (Crossan et al., 1999, p. 523). In the case of a distributed organization such as the IT organization at LNRU, the lines between what is exploration and what is exploitation become blurred and depend on the situation in which the knowledge is being shared and learned. As described above, knowledge learned at ITLC (exploitation within ITLC) can then be taken back, shared, and built on at the unit level (exploitation). While the use of any knowledge that is contained within the overall LNRU organization could be considered exploitation of existing knowledge at a whole-organization level, one must consider how knowledge gained in one group and brought back to another within the organization impacts those groups and how they perform.
Scholarly Contribution

The conclusions of this research contribute to the conceptual framework upon which the study was designed. Crossan et al.’s (1999) 4I framework considers the components and processes that make up organizational learning. This study applied the framework to a distributed organization and found that the nature of collaborative knowledge sharing in a distributed organization creates some intricacies that are not fully accounted for in the 4I framework. Understanding that individuals in a distributed organization have strong connections to more than one group creates a more complex picture when it comes to collaborative knowledge sharing and its role in organizational learning.

Of particular interest to the 4I framework is the fact that there are multiple lateral groups at the “group” level of the framework. Before knowledge can be institutionalized across the organization, it may actually move laterally across a number of groups. As described in the 4I framework, organizational learning is multilevel, but at the group level individuals working in a distributed organization may have more than one group in which they share and gain knowledge. Notably, the findings and conclusions of this research established that knowledge gained in one group may move to another through the conduit of the individual.

Collaborative knowledge sharing practices among IT leaders in this distributed organization not only resulted in knowledge sharing among the ITLC CoP, but also resulted in IT leaders bringing knowledge back to other groups. These individuals can be viewed as linchpins in a process by which collaborative knowledge sharing results in knowledge being moved from group to group. Due to the structure of the 4I framework diagram, this type of organizational learning is not fully addressed in the original model.
To address this phenomenon specific to distributed organizations, adaptations were made to the 4I framework diagram to include the possibility of individuals relating to multiple groups at the group level. In this study, the number of observed groups linked to a given individual was two or three, depending on the individual’s home unit type; it is possible that in other distributed organizations this number may vary. The adapted framework includes an ellipsis at the group level to indicate that the number of group may be two or more, with no prescribed number. The adapted framework is shown in Figure 5.1.

![4I framework in a distributed organization](image)

**Figure 5.1.** 4I framework in a distributed organization (adapted from Crossan et al., 1999).

This adapted framework diagram helps to visualize the role of the individual in moving knowledge from group to group by including the linkages to each group and demonstrating that
the individual is a hub among those groups. It is important to note that this development in no way conflicts with the original premises of the 4I framework and only demonstrates the complexity at the group level found within distributed organizations. The four social and psychological processes—intuiting, interpreting, integrating, and institutionalizing—remain in place and are essential to the movement of knowledge from level to level.

Individuals interviewed in this study explained that they collaborate and share knowledge with other individuals in a number of group settings. For example, an ITLC member whose home unit is a college may share and gain knowledge within the CoP, then take the newly learned knowledge back to his or her unit-type CoP (the College IT Directors) where other members have also learned similar information through ITLC; therefore, this shared knowledge is being exploited within the two CoPs. If that same college IT leader takes information back to his or her home unit, this might be viewed as an exploration of knowledge, in that it is new information that may impact how the organization works or behaves.

This observed phenomenon contributes to the 4I framework in that the framework highlights the tension between exploitation and exploration of knowledge. In the example described above, the tension between exploration and exploitation happens at both an organizational and a group level. What is established knowledge in one group (exploitation) may be a new perspective when transferred by an individual to a new group (exploration). The individual’s interactions with multiple groups not only helps to move knowledge, but also highlights the tension between exploitation and exploration of knowledge within a distributed organization.

Nonaka (1994), when talking about knowledge creation, discussed “communities of interaction” as fertile grounds for knowledge creation and as a scenario in which his knowledge
creation spiral can be applied (p. 15). CoPs are one example of Nonaka’s communities of interaction. As a result, in addition to the 4I framework, Brown and Duguid’s (1991) work on CoPs served as a supporting framework for this study. CoPs are “groups of people informally bound together by shared expertise and passion for a joint enterprise” (p. 139); the ITLC is a CoP within the distributed IT structure at LNRU.

This study examined a CoP in a distributed organization and corroborated the idea that CoPs (both the primary CoP examined, the ITLC, and the unit-type CoPs discussed) can in fact serve as a group setting in which knowledge creation and sharing occur. The observation of this phenomenon supports Nonaka’s idea of communities of interaction and their relationship to the knowledge creation spiral and collaborative knowledge sharing practices. This observation provides support of these concepts in a real-world setting.

Overall, this study provided new insights to organizational learning in a distributed organizational setting by utilizing a well-established framework and applying it to a practical scenario. By utilizing the 4I framework in a distributed organizational setting, new perspectives about how knowledge is shared among groups, with an individual as a conduit, were established. Further, this study’s conclusions align with established concepts about knowledge creation and the role of CoPs in organizational learning.

**Recommendations for Future Research**

This study explored the collaborative knowledge sharing practices of IT leaders in a distributed IT organization. The research was done with a qualitative case study approach. The approach was successful in that it allowed the researcher to better understand the collaborative knowledge sharing practices of ITLC members, based on a review of existing documentation relating to the ITLC, meeting observations, and one-on-one semistructured interviews with a
representative sample of the membership. Several recommendations are offered for future research that will expand and build upon this research.

**Recommendation 1.** This research established that, in terms of the 4I framework, collaborative knowledge sharing among IT leaders in a distributed IT organization results not only in knowledge sharing among the IT leaders, but also in knowledge sharing across all the groups with which an individual IT leader is associated. It is recommended that future research further examine how knowledge moves among these groups. Specifically, understanding what types of knowledge (tacit versus explicit, exploitation versus exploration, etc.) move laterally from one group to another, and of those types, what knowledge becomes institutionalized across the organization, would contribute to the field of knowledge sharing.

**Recommendation 2.** As this study progressed through the data analysis, findings, and conclusions stages, the researcher identified additional questions that could be further explored within the LNRU study site. In particular, future research could explore the variances in collaborative knowledge sharing practices among IT leaders depending on their home-unit affiliation. Future research could examine if home-unit affiliation—that is, whether the individual comes from a campus, college, or administrative unit—has any impact on how IT leaders engage with others in terms of collaborative knowledge sharing.

**Recommendation 3.** New executive leadership for IT at LNRU—the vice provost for IT and chief information officer (VPIT/CIO) and chief information security officer (CISO)—take their positions starting in late 2016 and early 2017. Before posting the vacancy, the VPIT/CIO position was revised to include direct responsibility for all IT at the university, and the CISO role is a newly created position. Both of these positions will have a direct impact on the IT structure and operations at LNRU. A follow-up study to see what changes in collaborative knowledge
sharing practices, if any, occur after new leadership has been established could yield new insights into organizational learning and collaborative knowledge sharing.

**Recommendation 4.** This study focused on the collaborative knowledge sharing practices of a distributed IT organization in a single institution. A number of other institutions in the United States are comparable to LNRU in size and organizational structure, and several of them have created a CoP similar to the ITLC. It is recommended that this study be reproduced as it was performed at LNRU so that the validity and repeatability of this study can be tested.

**Recommendation 5.** In addition to testing the validity and reliability of this research through additional case studies at individual comparable study sites, future research could also include a comparative case study of two institutions. Since the focus of this research was on collaborative knowledge sharing in distributed organizations, a comparative case study should include two or more large research higher education institutions that are comparable to LNRU in their organizational complexity. Alternatively, collaborative knowledge sharing practices of IT leaders at LNRU could be further explored by being compared to those at other comparable institutions.

**Recommendation 6.** This study utilized the setting of higher education to examine collaborative knowledge sharing practices among IT leaders in a distributed organization. Future research could expand on the conclusions of this study by replicating this research in other distributed organizational settings, such as private industry or government agencies. Examining collaborative knowledge sharing practices in a variety of industries would help to determine if the conclusions of this study can be generalized for all types of distributed organizations, regardless of industry.
Implications for Practice

In addition to its scholarly contribution, this research has implications for practitioners who are interested in collaborative knowledge sharing practices within a distributed organization. Three key implications, drawn from the conclusions of this research, may help practitioners understand and enhance the collaboration and knowledge sharing within their organizations.

**Implication 1.** *Formal structures must provide opportunity for collaboration among members.* One of the participants’ most frequently cited frustrations about the ITLC was the disconnection between the ITLC’s stated purpose and the work done by the council. This frustration resulted in ITLC members being reluctant to credit the ITLC with helping to create opportunities for collaborative knowledge sharing—despite the fact that many of the participants recognized that they would not have had the opportunity to interact with IT leaders from other units without the ITLC. It seems that the frustrations ITLC members had regarding one aspect of the ITLC (specifically, its role—or lack thereof—in university-wide IT governance) inhibited their willingness to recognize other positive aspects of the CoP.

To address this, any organization with a CoP similar to the ITLC should make a concerted effort to create more opportunities for its members to work together. This might include both formal and informal opportunities. For example, meetings should be designed with more interaction in mind. Rather than a series of presentations with a question-and-answer period at the meeting itself, CoP leadership should create agendas that provide more tabletop and/or small group discussions. Additionally, more informal opportunities for interaction, such as brown bag lunches, longer break times during meetings, and so on, could help CoP members better recognize the role of the CoP in creating an environment in which collaborative knowledge sharing can happen.
**Implication 2.** *The stated purpose of a group must accurately reflect the actions of the group.* The ITLC members interviewed felt the ITLC had the capacity for leading and playing a role in IT governance across the university, but believed that the CoP was not yet performing at that level. Part of the reason for this belief was that the ITLC moved to respond to the recommendations of the IT assessment sooner than the rest of the university. As a result, there was an expectation among many ITLC members that the CoP should have a role in governance, as the ITLC charter stated, and a view of the organization as falling short of its stated goals.

Practitioners forming or leading a CoP similar to the ITLC should ensure that this dilemma is avoided by making certain that the stated goals of the group match the work actually performed by the group. Having stated goals that align with the work of the CoP helps to set appropriate expectations for the membership and helps to eliminate frustration caused by a misalignment of expectations and reality. Appropriately aligned purpose and action will create an environment more conducive to collaborative knowledge sharing among CoP membership.

**Implication 3.** *There must be awareness of how logistical features of the distributed organization impact collaborative knowledge sharing among CoP members.* One barrier to collaborative knowledge sharing in a distributed organization identified through this study is the impact of logistical features of a distributed organizational structure (such as budget and staffing levels) on the capacity of individual members to be open to new ideas. To address this, practitioners considering the implementation of a CoP with the goal of encouraging collaborative knowledge sharing should consider the broader organizational context in which the CoP operates. If barriers such as a distributed budget exist, the CoP should be aware of that issue and work to find ways to address the barrier, such as providing centralized funding for university-wide projects.
Implications for LNRU

There are three key implications, which align with the broader implications for practice, specifically for LNRU. These implications, along with a summary of this research study, will be shared with LNRU’s IT leadership. This includes the university-wide executive IT leaders (the CIO and CISO), the ITLC leadership, and the ITLC itself.

Implication 1. The ITLC leadership should make a concerted effort to include more informal collaboration opportunities for its members. ITLC members indicated that they recognized that the ITLC provides them with an opportunity to collaborate with colleagues from across the university, with whom they may not otherwise have a chance to build a relationship. This scenario aligns with the ITLC’s stated goal of “fostering collaboration.” However, much of this opportunity to build relationships and collaborate was done, according to those interviewed, during informal moments of ITLC meetings, such as breaks.

Prior to the spring of 2016, ITLC provided a catered lunch to all attendees. According to meeting minutes, these lunches provided members with about 30 minutes of informal networking time. The catered lunches were canceled in early 2016 due to budget constraints, and the time was replaced on the agenda with 30 minutes during which members could bring their own lunch and network. Meeting observations revealed that fewer than 25% of members who attended a meeting showed up for the “brown bag” lunch; most of the attendees arrived just in time for the scheduled agenda to start. As a result of removing the catered lunch from the agenda, the ITLC meeting agendas have lost 30 minutes of informal collaboration time for members.

Given that there is already a significant investment by the university for the ITLC (including the salaries of every ITLC member for a half-day meeting, salaries of staff who support the meeting space, travel time and reimbursement for individuals who travel from the
impairments, and so on), LNRU might want to consider reinstating the catered lunch (even if it is reduced to a less expensive option, such as boxed lunches), because without its inclusion on the formal ITLC agenda, an important opportunity for collaborative knowledge sharing is lost.

**Implication 2.** *Adjust the ITLC charter to reflect the current state of IT governance at LNRU.* The IT assessment laid out a plan for IT governance that includes the ITLC as an important component of the governance structure. When the IT assessment was released, the ITLC responded by incorporating its anticipated role in the university-wide IT governance into a charter revision. This move set expectations for ITLC members, and for the broader IT community across LNRU, that the ITLC had a role in IT governance. However, several years later, the university leadership has not yet enacted the changes recommended by the IT assessment, and there is now a misalignment between the ITLC charter and the work actually done by the council, which has resulted in frustration with the council for many ITLC members. To address this, the ITLC charter should be revised to accurately reflect its current state, and any mention of a role in IT governance should be removed. This will help to align expectations of ITLC with its reality.

That is not to say that the ITLC should not be prepared for when the university implements the IT governance plan laid out by the IT assessment. The ITLC should have a governance-centric charter ready and waiting for when a governance structure is implemented. However, by making it clear that this version of the charter is for a future state of the ITLC and the larger university, frustration on the part of ITLC members who have expectations based on the current charter may be assuaged, as well as the negative impact that the frustration has on how they view the ITLC’s role in their collaborative knowledge sharing practices.
Finally, the ITLC should consider reorganizing itself as an organizational CoP instead of a CoP. Organizational CoPs have executive sponsorship and a more formal structure; while CoPs are voluntary organizations, organizational CoPs have clear expectations for members. Through such a change, the ITLC might be better positioned to work with the new executive IT leadership at the university, which by extension may provide the ITLC with an opportunity to influence decisions on how university-wide IT governance is implemented.

Implication 3. *Consider funding centrally managed IT services and resources so that budget is not a barrier to collaborative knowledge sharing.* One of the most significant barriers to collaborative knowledge sharing among IT leaders at LNRU identified in this study was the logistical features of a distributed organization (such as differences in budget and staffing levels among the different units), which impact the IT leaders’ capacity for considering new ideas. Budget was the most frequently mentioned barrier to considering and adopting new ideas. Often, new services and solutions were proposed with the expectation that each unit would not only adopt the service, but also pay for it.

In these situations, a number of factors (such as whether or not the IT leaders’ unit already had a similar service or solution, how much the proposed solution cost compared with their existing solution, and the potential impact on service levels) were considered by the ITLC members. While addressing the budget issue would not completely eliminate these concerns, it would help to make the ITLC members more open to discussing collaborative solutions. Further, while the university may have to initially spend more to fund these solutions centrally, over time there would be cost savings in that these individual units would no longer have to pay for their own versions of a service. By finding a way to centrally pay for proposed university-wide solutions, a significant barrier to collaboration among IT leaders at LNRU would be mitigated.
Summary and Concluding Remarks

This study explored the collaborative knowledge sharing practices among IT leaders in a distributed organization in higher education by examining the ITLC (a CoP for IT leaders at LNRU) and its membership. Three key conclusions emerged. First, ITLC members cited the informal aspects of the ITLC as best supporting collaborative knowledge sharing practices among IT leaders; they did not see the formal structure and actions of the ITLC as being conducive to collaborative knowledge sharing. Second, the distributed organizational structure of IT at LNRU was a barrier to collaborative knowledge sharing practices among IT leaders. Third, the ITLC members identified with two to three groups, which impacted the collaborative knowledge sharing practices of IT leaders.

These conclusions are significant, in that they support and build on the 4I framework for organizational learning by Crossan et al. (1999) and draw connections between theory and practice. Additionally, by applying the 4I framework to a distributed organization, this study identified key features of distributed organizations that create new complexities that can be addressed with a minor adaptation to the 4I framework diagram. This research also supports Nonaka’s (1994) concept of communities of interaction and their role in knowledge creation, along with Brown and Duguid’s (1991) work on CoPs.

Further, understanding collaborative knowledge sharing among IT leaders in a higher education setting is significant for practice because collaborative knowledge sharing provides an opportunity for resource optimization. Many public higher education institutions are enduring significant reductions to their budgets (see Appendix A). At the same time, spending to support IT services is a significant portion of institutional budgets, at 3.2% to 5.2% (Lang, 2014, p. 5).
Practical understanding of collaborative knowledge sharing practices among IT leaders may help institutions find ways to enhance collaborative knowledge sharing in their own institutions.
References


Yin, R. K. (2014). To add or change date in text


### Appendix A: Timeline of Macro- and Micro-Level Events

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<th>Date</th>
<th>Higher education</th>
<th>Institution (relating to IT and/or ITLC)</th>
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| December 2015 | • Western Illinois University announces plan to cut 50 faculty jobs and considers eliminating programs due to “declines in state appropriations and tuition revenue” (Huckabee, 2015). | • Vice provost and CIO for university announces resignation.  
• University advertises job posting for the institution’s first-ever CISO (information security function split from IT function earlier in 2015). |
| January 2016  | • *Chronicle of Higher Education* runs profile on the impact of state spending on higher education and its negative impact on higher education institutions in several states (Kelderman, 2016). | • Interim VP/CIO appointed through end of August 2016. |
| February 2016 | • Federal 2017 budget’s focus on community colleges causes concerns for 4-year schools (Field, Basken, & Read, 2016).  
• Credit ratings for three Illinois universities (Northeastern Illinois University, Northern Illinois University, and Eastern Illinois University) downgraded by Moody’s Investors Service (Brown, 2016a). | • State budget impasse continues; state’s contribution to higher education funding for 2015-16 is uncertain.  
• LNRU administrators make contingency plans to address possibility of no state funding. |
| March 2016   | • Chicago State University affected by state budget impasse; it ends its semester early and announces that all faculty/staff and students must turn in keys by April 4, 2016 (Huckabee, 2016a).  
• Kansas governor announces plan to cut $17 million in state funds for Kansas public colleges for remainder of fiscal year (March—June 2016) (Huckabee, 2016b). | • Due to budget restrictions, campus IT leaders not allowed to travel for university business.  
• At end of month, 2015-16 state budget becomes law; LNRU sees 5% appropriation increase (LNRU, 2016b). |
| April 2016   | • Citing financial instability, Berkeley cuts 6% of its staff jobs (Kueppers, 2016).  
• Illinois state releases $20 million in funding to Chicago State University (among a release of stopgap funding to its public | • Citing budget concerns, ITLC stops providing lunch to members during its monthly meetings. |
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<td>universities), but that figure is less than 60% of its expected appropriation; due to lack of funding, university lays off over 300 employees (Lipka, 2016).</td>
<td>• Interim VP/CIO announces Plan-Build-Run initiative to ITLC; initiative is intended to streamline and optimize project-level efforts to, in part, reduce costs.</td>
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<td>May 2016 • Moody’s downgrades the University of Akron’s financial outlook from “stable” to “negative”; cites “enrollment declines and high debt and pension burdens.” This comes a year after the university eliminated 200 positions in July 2015 (Zamudio-Suaréz, 2016b). • After its governor proposed an $18 million cut in state appropriations for public higher education institutions in the state (a move rejected by the legislature), a Kentucky state judge rules that the governor can unilaterally cut university budgets without the approval of the legislature (Zamudio-Suaréz, 2016a).</td>
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<td>June 2016 • University of Wyoming declares financial crisis and announces plans to “reduce or cut academic programs and review the institution’s structure”; the announcement comes after a reduction in state appropriations for the university (Zamudio-Suaréz, 2016c). • State of Illinois has not passed 2015-16 budget, continuing to negatively impact operations at its public universities (Brown, 2016b).</td>
<td>• Announcement that the VP/CIO role will become “Vice President &amp; CIO” with responsibility for all IT at LNRU.</td>
</tr>
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<td>July 2016 • Temple University president steps down after a merit scholarship program is cited as the cause of a $22 million university deficit (Zamudio-Suaréz, 2016d).</td>
<td>• Job posting for VP/CIO position is advertised.</td>
</tr>
<tr>
<td>Higher education</td>
<td>Institution (relating to IT and/or ITLC)</td>
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| • New Mexico State University, citing budget gap, announces plans to eliminate 126 positions; the causes of the budget deficit are identified as reduced state budget appropriations and declining enrollments (Pettit, 2016). | • Interim VP/CIO announces major reorganization of central IT unit; steps down as scheduled.  
• New interim VP/CIO appointed.  
• CISO and VP/CIO searches continue. |
| August 2016 | • Berkeley cites budget deficit in its decision to suspend a global campus program; this comes after staff cuts earlier in the year and the chancellor’s resignation earlier in the month (Martinez, 2016). |

*Note: CIO indicates chief information officer; CISO, chief information security officer; IT, information technology; ITLC, Information Technology Leadership Council; LNRU, Large Northeast Research University; VP, vice president.*
Appendix B: Interview Subject E-mail

Dear _____:

My name is Joanne Peca and I am a doctoral student at Northeastern University. I am conducting research for my doctoral thesis on the collaborative knowledge sharing practices in a higher education setting; in particular, the IT Leadership Council (ITLC) and its membership will be examined.

As part of this research, I plan to interview a number of ITLC members. Your name has been selected at random to participate in one of these interviews.

The interview should last approximately 30-45 minutes, and will be recorded (audio only). In addition to participating in the interview, I ask that you also participate in a follow-up transcript review of the interview to help ensure its accuracy.

Throughout this process, your identity will be kept confidential; any information you share will be analyzed by me and presented in combination with responses from others. Should any direct quotes be used in the final report, they will be attributed to a pseudonym and any information that could identify an individual (for example, the name of your unit) will be redacted.

Please note that your participation is completely voluntary, and you may choose to discontinue your participation at any time. If you agree to participate in this research, please review attached document; you will be asked to confirm that you have received and reviewed the document at the start of our interview.

Should you have any questions or would like to volunteer to participate, please feel free to contact me at [LNRU phone number] or at [LNRU e-mail address].

Thank you,
Joanne Peca
Appendix C: Consent Document

Northeastern University, Department of: College of Professional Studies

Name of Investigator(s): Principal Investigator, Dr. Margaret Gorman; Student Researcher, Joanne Peca

Title of Project: Collaboration in a Distributed Information Technology Organization: A Descriptive Case Study Exploring Senior Information Technology Leaders’ Knowledge Sharing Practices in a Large Public Higher Education Institution in the Northeast

Request to Participate in Research

We would like to invite you to take part in a research project. The purpose of this research is to gain an understanding of the collaborative knowledge sharing practices of members of the IT Leadership Council.

You must be at least 18 years old to be in this research project.

The study will take place via an online meeting tool and will take about 30 to 45 minutes. If you decide to take part in this study, we will ask you to answer a series of questions about your experiences with the IT Leadership Council relating to collaborative knowledge sharing practices.

There are no foreseeable risks or discomforts to you for taking part in this study.

There are no direct benefits to you for participating in the study. However, your answers may help us to learn more about collaborative knowledge sharing practices within the ITLC.

Your part in this study will be handled in a confidential manner. Only the researchers will know that you participated in this study. Any reports or publications based on this research will use only group data and will not identify you or any individual as being part of this project.

The decision to participate in this research project is up to you. You do not have to participate and you can refuse to answer any question. Even if you begin the study, you may withdraw at any time.

You will not be paid for your participation in this study.

If you have any questions about this study, please feel free to call Joanne Peca ([LNRU phone number]), the person mainly responsible for the research. You can also contact Dr. Margaret Gorman (202-425-7111), the Principal Investigator.

If you have any questions about your rights in this research, you may contact Nan C. Regina, Director, Human Subject Research Protection, 490 Renaissance Park, Northeastern University, Boston, MA 02115. Tel: 617.373.4588, Email: n.regina@neu.edu. You may call anonymously if you wish.

You may keep this form for yourself.

Thank you.

Joanne Peca
Appendix D: Interview Protocol Form

Institution: _________________________________________________________________

Interviewee Name: _____________________________________________________________

Interviewer: _________________________________________________________________

Date:   _________________________________________________________________

Location of Interview: __________________________________________________________

Introductory Protocol

You have been selected to speak with me today because you are a member of the IT Leadership Council. My research project focuses on the experience of ITLC members with a particular interest in understanding your perceptions of the ITLC. Through this study, I hope to gain more insight into how members of the ITLC work collaboratively and share knowledge. The information learned through this study may help to influence the ITLC and will perhaps help to guide other distributed IT organizations in higher education.

Because your responses are important and I want to make sure to capture everything you say, I would like to record the audio during our conversation today (no video will be recorded). Do I have your permission to record this interview? [If yes, thank the participant and turn on the recording equipment.] I will also be taking written notes during the interview. I can assure you that all responses will be confidential and only a pseudonym will be used when quoting from the transcripts. I and a third-party transcriber will be the only ones privy to the recordings, and the recordings will be eventually destroyed after they are transcribed. To meet our human subjects requirements at the university, I have asked you to read the informed consent document that I e-mailed to you. To review, this document states that (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) you are not expected to experience any physical harm. Can you please confirm that you’ve received and reviewed this form? Do you have any questions about the form or this interview process?

I have planned this interview to last about 30 minutes. During this time, I have several questions that I would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning. Do you have any questions at this time?

Introduction

Prefatory Statement: I would like to hear about your experience with the ITLC in your own words. To do this, I am going to ask you some questions about the key experiences that you encountered as a member of ITLC and your perspectives. Your responses may include both aspects of your work at your unit-level and university-wide, as appropriate.
**Background information:**

First, I’d like to get a little bit of background about your current role at the university, your membership on the IT Leadership Council, and any links between those two.

1) Reflecting on your time on the ITLC, have you experienced any changes in how you understand the advantages of the ITLC or any changes in terms of how you share insights from ITLC back in your unit?

**Script:** One of the things I am interested in learning about is the collaborative knowledge sharing process within the ITLC. The questions that follow will ask you to discuss the ways in which you have participated in or experienced collaborative knowledge sharing as part of your participation in the ITLC.

**Perception of the IT Leadership Council (ITLC):**

2) Can you tell me about a time when you got a great new idea from one of your colleagues on an innovative IT practice?
   a. Did the ITLC help to facilitate this in any way?

3) Could you talk about a time that you heard about a new idea or initiative and you decided—without taking it back and trying it in your unit—that it just wasn’t something you’d like to try in your unit?
   a. What made you decide the idea or initiative wasn’t best for your unit?

4) Thinking about each of the examples you just gave—one in which you tried an idea and another where you didn’t try it—can you identify the reason (or reasons) behind why you decided to try one idea and not another?
   a. Reflecting on the ideas shared in ITLC, have you experienced any changes in the way you explore opportunities or make decisions back in your unit?
      i. **probe:** In what ways does the makeup of the ITLC impact how you understand the IT options back in your unit?

5) If you were to think about the ITLC and compare it to an animal, what would that animal be?
   a. Why did you choose that animal?

6) Assume it is 5 years from now, and the ITLC is being held up as a standard for how a community of professionals can work together. What’s the headline, what’s the larger story, and who is involved?

7) Assume it’s 5 years from now, and you’re invited to consult with another large, geographically dispersed institution about creating an ITLC. What would be the key features that you feel this institution needs to develop in order that this group to enhance their sharing of best practices amongst each other AND transferring of best practices back to their own unit?

*Ask participant if they have any questions and thank them for their participation.*
**Appendix E: Interview Questions’ Link to Purpose Statement and Research Question**

<table>
<thead>
<tr>
<th>Interview questions that map to purpose statement</th>
<th>Interview questions that map to research question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Reflecting on your time on the ITLC, have you experienced any changes in how you understand the advantages of the ITLC or . . .</td>
<td>1a) . . . any changes in terms of how you share insights from ITLC back in your unit?</td>
</tr>
<tr>
<td>5) If you were to think about the ITLC and compare it to an animal, what would that animal be? a) Why did you choose that animal?</td>
<td>2) Can you tell me about a time when you got a great new idea from one of your colleagues on an innovative IT practice? 2a) Did the ITLC help to facilitate this in any way?</td>
</tr>
<tr>
<td>6) Assume it is 5 years from now, and the ITLC is being held up as a standard for how a community of professionals can work together. What’s the headline, what’s the larger story, and who is involved?</td>
<td>3) Could you talk about a time that you heard about a new idea or initiative and you decided—without taking it back and trying it in your unit—that it just wasn’t something you’d like to try in your unit? a. What made you decide the idea or initiative wasn’t best for your unit?</td>
</tr>
<tr>
<td>7) Assume it’s 5 years from now, and you’re invited to consult with another large, geographically dispersed institution about creating an ITLC. What would be the key features that you feel this institution needs to develop in order that this group to enhance their sharing of best practices amongst each other . . . 7a) . . . AND transferring of best practices back to their own unit?</td>
<td>4) Thinking about each of the examples you just gave—one in which you tried an idea and another where you didn’t try it—can you identify the reason (or reasons) behind why you decided to try one idea and not another? 4a) Reflecting on the ideas shared in ITLC, have you experienced any changes in the way you explore opportunities or make decisions back in your unit? 4ai) probe: In what ways does the makeup of the ITLC impact how you understand the IT options back in your unit?</td>
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## Appendix F: Deductive Coding Nodes in NVivo

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<thead>
<tr>
<th>P1—Strategic Renewal</th>
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<tbody>
<tr>
<td>1—Exploration</td>
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<td>2—Exploitation</td>
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<tr>
<th>P2—Organizational Level</th>
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<tbody>
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<td>1—Individual</td>
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<td>2—Group</td>
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<td>3—Organization</td>
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<th>P3—Organizational Learning Level</th>
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<td>1—Intuiting</td>
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<td>2—Interpreting</td>
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<td>3—Integrating</td>
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<td>4—Institutionalizing</td>
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<th>P4—Dynamic Process</th>
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<tbody>
<tr>
<td>1—Action</td>
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<td>2—Cognition</td>
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## Appendix G: Meeting Observation Summary

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