2022

A Modern Game of Telephone: Knowledge Sharing, Remote Work, and Organizational Crisis in a Public Library System

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A dissertation submitted in partial fulfillment of the requirements for the degree of

Doctor of Education at Seattle University

2022

Abstract

Many organizations rapidly shifted to remote work operations as a result of the COVID-19 pandemic. This quantitative research study investigated how knowledge sharing within a public library system changed as a result of remote work operations and identified impacts to knowledge sharing, including barriers and catalysts. The participants in this study included staff within a large public library system, including librarians, regional managers, and members of the library system leadership team. Participants provided demographic data and responses to Likert scale agreement questions related to the concepts of communication, connection, and knowledge sharing. This data were analyzed using correlational and ANOVA tests. Additionally, participants provided narrative responses related to their experience with knowledge sharing during the transition to remote work. Responses were quantified based on inductively identified themes using an organizational learning framework as the basis for the analysis. Correlational analysis found that asynchronous communication had a positive relationship with knowledge sharing, while connection to staff outside the team and the organization was negatively related to knowledge sharing. Analysis of variance showed no statistically significant difference in ratings of knowledge sharing based on demographic groupings; however, the contextual theme analysis did indicate that participants experienced knowledge sharing in remote work operations differently across demographic factors. The study findings led to five recommendations for leaders of the partner organization and other leaders navigating organizational crisis onset by the abrupt transition to remote work operations coinciding with the COVID-19 global pandemic.

Keywords: knowledge sharing, remote work, libraries, organizational learning

Acknowledgements

We extend our humble gratitude and appreciation to each person who influenced our learning, research, and scholarly discourse. Our dissertation journey was arduous including a global health pandemic, professional role changes, and major life events on top of rigorous academic work. Along the way we were supported and guided by our community. While not exhaustive, we would be remiss without acknowledging the following:

- Jessica Anduiza, our colleague and teammate; she dove deep into the literature with us, explored research methodologies, and was a foundational contributor to our dissertation process and product.

- Our community partner; this organization modeled vulnerability and a commitment to growth in opening their (virtual) doors to our research team to explore complex topics during unprecedented times. Their humility will benefit many leaders and organizations.

- Our cohort mates: Keya Burks, Carleen Ratcliffe, Dr. Jaime Navetta, Marco Padilla, T Staley, Dr. Obed Kabanda, Dr. Chase Huffman, Dr. Haley Brown, Dr. Shafiga Abramova, Dr. Oruba Anthony, Dr. Angela Griffin, and Dr. Shukri Olow; they walked alongside us through this journey. Our interactions with each of these friends challenged and expanded our thinking to make us the leaders and scholars we are today.

- College of Education doctoral students of past and present; our alliances crossed time and space. Alumni provided guidance and encouragement when things got hard. Present students provided affirmations and perspective when we needed it.

- Researchers of past and present; their work guided us and shaped this research.

- Our dissertation committee, for your feedback and guidance, without which this dissertation would not have been possible.

Dedication

Crystal Hess

I dedicate this dissertation, first and foremost, to my supportive family. To my husband, Blake, you help me soar in all the ways I imagine. I couldn't have tackled this endeavor without your unwavering support and encouragement. I love you and thank you for choosing to live this eventful life with me. To my babies, Emerson and Oren, every day you remind me of the importance of joy, play, and silly nonsense. Every day you gift me with unconditional love that is independent of what I achieve and what titles I hold. Thank you for hugging and kissing me goodnight as I typed late into the night on this project, for bringing me breakfast during early morning team meetings, and for supporting my pursuit of this learning. I love you, so very much. I also dedicate this dissertation to the countless number of friends and colleagues who offered me their love and friendship when I felt discouraged, defeated, or elated. Without you, my community, we wouldn't have made it. I am thankful to love and be loved by so many.

Colin Watrin

I dedicate this dissertation to the family and friends who supported me throughout my doctoral journey. Your words of encouragement and support were invaluable in helping me find balance between school, work, and life's many adventures. In particular, to my fiancé Katie, for being a steadfast partner and supporter of my goals while we navigate this beautiful life together. I could not have achieved this goal without all the love and support I received along the way. To my research teammates, who I learned countless life and academic lessons from over the past 4 years, I am forever grateful for the friendships we have formed. I would also like to thank and dedicate this dissertation to my colleagues at Seattle University, who have been advocates and supporters of my professional development and continue to invest in my career and future.

Cal Erwin-Svoboda

I dedicate this dissertation to my family and those that have guided me along the way. To my mentors; David Lindsay, Dr. Mancuso, JEB Thornton, Dr. Torgerson, Dr. Walton, Dr. Brown, Ted Broussard, Dr. Dodson, and Dr. Latiolais. To those I have had the opportunity to serve and support while at Clover Park Technical College, Grays Harbor College, and the Council for Unions and Student Programs. To this research team, and our determination to just keep swimming. To my in-laws, for their encouragement, support, and belief in me. To my brothers, for their fellowship, camaraderie, and always challenging me to be my best self. A special feeling of gratitude to my parents for their love, life lessons, and illuminating a path for me to follow. To my daughters, Madison and Jordan—for your love and laughter. Being your dad is my greatest joy. To Ruth for being my superhero. Your commitment, encouragement and dedication to this journey—I was able to do this because of you. I love you.

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Chapter 1. Introduction

The world is constantly changing—technology evolves, societal needs shift, and crises arise (Ritchie, 2004; J. Wang, 2008). As a result, organizations and their leaders face the adaptive challenge of engaging in regular organizational change management (Heifetz & Linksy, 2017). However, an organization's ability to keep up with changing conditions is beset by its capacity to communicate and transfer knowledge across the organization broadly and deeply (Cabrera & Cabrera, 2005; S. Wang & Noe, 2010). Libraries, in particular, are often on the cusp of change (Düren, 2013; Jones, 2020; Tam & Robertson, 2002) because the public library sector serves as a community center and connection hub, which provides resources and services that meet evolving local community needs (Nicholson, 2019; Potnis et al., 2020; M. Smith, 2019; Stephens & Russell, 2004). As such, the library sector, possibly more so than other sectors, must engage in continuous change in the ways libraries operate and serve the public (Stephens & Russell, 2004). The crux here is that library leaders must rely on information, communication, and participation as organizational success factors, particularly during times of change (Düren, 2013).

A public library system located in the Pacific Northwest of the United States was used for the context of this study and is represented here under the pseudonym PLS. PLS is one of the largest and busiest public library systems in the United States and champions a mission to serve their local community through ideas, interaction, and information. In recent years, PLS leaders adopted a strategic focus to refresh their mission and goals to reaffirm their commitment to patrons and the community. Part of this refocus included goals related to organizational excellence and strategic communication. Essentially, PLS leaders developed a public commitment to remain relevant to their patrons and be an influential part of the fabric of society

by proactively engaging in change management for their organization, and consequently, their communities.

However, at the end of the first quarter of 2020, PLS faced a rapid onset of unanticipated changes to short- and long-term operations and strategy brought about by the public health mandates and restrictions enacted to combat the COVID-19 global pandemic. In March 2020, approximately 16-million U.S. industry professionals began working remotely in response to the COVID-19 global pandemic (Slack, 2020). As a result, PLS instituted a system-wide closure of all physical locations. This closure required all employees to shift to remote work operations and all patron services to be exclusively limited to online delivery. With buildings temporarily closed to the public and employees, PLS leaders and staff faced an organizational crisis requiring them to focus on adapting their organizational practices to continue to serve the public. As the pandemic evolved, so did PLS's organizational response to the evolving conditions. Thus, despite best-laid plans, PLS was forced to continuously reckon with unanticipated organizational change, which is known to negatively disrupt strategy and operations, adversely impacting organizational productivity, budgets, culture, and overall sustainability (Coombs & Holladay, 2010; McConnell & Drennan, 2006; Ritchie, 2004; J. Wang, 2008).

PLS adapted its library programs and services across all regions and branches that serve over 700,000 cardholders. The transition to remote work operations required changes in how staff communicated and shared knowledge between individual contributors (e.g., librarian-to-librarian) as well as between different groups (e.g., library service managers and the PLS leadership team). PLS initiated new modes, norms, and frequency of one-on-one, team, and organization-wide interactions to connect employees during remote working conditions. These changes included organization-wide virtual town halls intended to broadly share information as

well as the adoption of technology tools to facilitate online interactions. Although the organization altered their previously normalized routines in the wake of the transition to remote work operations, PLS leadership had not known the impact of the changes and, therefore, did not know which changed communication practices have helped or hindered their ability to meet their strategic goals. This research study produced data representing a snapshot of employees' experience related to the transition to remote work operations and identified barriers and catalysts of knowledge sharing. It was intended that findings and analysis from this research will inform recommendations for PLS leadership to enhance efforts in meeting their strategic goals.

Problem Statement

Organizational leaders rely on communication and knowledge sharing practices to meet their organizational mission and goals. However, it is difficult to transfer knowledge across an organization (Berends & Lammers, 2010; Bontis et al., 2002; Schilling & Kluge, 2008; Vela, 2018), particularly when responding to unexpected changes to internal and external environmental conditions (Balbastre et al., 2003; Elliott, 2009; Kuhn, 1970; Romanelli & Tushman, 1994; Roux-Dufort, 2000; D. Smith & Elliott, 2007). To serve their local communities, a public library system—represented under the pseudonym PLS—developed strategic goals in alignment with their recently refreshed mission, vision, and values. However, March 2020 complexified change management for leaders with an unexpected shift in operating conditions for organizations due to government-mandated closures and public health restrictions in response to the COVID-19 global pandemic (Ecklebe & Loffler, 2021). The shift to remote work operations created new challenges in the way that PLS employees and teams shared information because previously routine knowledge sharing practices ceased to exist. As the

organization navigated its modified work environment, PLS leadership sought to understand the impact of remote work operations on knowledge sharing across its library services hierarchy.

Libraries have a strong track record for embracing the adaptive challenge of reimagining work through rapid and complex change (Jones, 2020; M. Smith, 2019). Research has shown that in times of change, library leadership relies on information, communication, and participation as critical factors for successful change management (Düren, 2013). Research has also shown that learning from a crisis can create resiliency within organizations (Broekema et al., 2017; J. Wang, 2008), and failure to learn from a crisis can have detrimental effects on the social, political, financial, and individual aspects of an organization (Elliott, 2009). For PLS, the transition to remote work operations—stemming from the COVID-19 global pandemic—provided an opportunity to learn from exacerbated communication challenges to improve knowledge sharing practices and increase the organization's ability to achieve organizational goals. A participatory action research study was conducted to examine and describe how PLS's transition to remote work operations impacted the ways in which knowledge is shared within the organization.

Purpose Statement

The purpose of this study was to explore how knowledge sharing changed among PLS staff as a result of remote work operations and the organization's subsequent internal adaptations to the changing environment. The PLS library services hierarchy was identified as the specific population of study because this subset of employees was heavily dependent on exchanging knowledge to accomplish their job duties. Furthermore, PLS leadership recognized communication challenges among this population predate the remote work setting and may have been exacerbated by the unexpected transition. The library services hierarchy includes librarians, library service managers (LSMs), regional managers (RMs), and the PLS library leadership team

(LLT). These employees rely on knowledge sharing for tasks such as: the distribution of information between organizational levels, the ability to hear and share different perspectives, and the ability to share lessons learned at one library branch with the entire library system. Through a quantitative methodological approach, the specific research questions addressed in this study were:

1. How has the transition to remote work operations impacted the ways in which knowledge is shared along an organization's vertical hierarchy?

2. What are the barriers and catalysts for knowledge sharing as a result of an organization's transition to remote work operations?

Three key terms needed to be defined for this study: (a) organizational communication, (b) knowledge sharing, and (c) organizational learning. *Organizational communication* is the means by which people in an organization interact and exchange information (Gochhayat et al., 2017). *Knowledge sharing* is defined as the formal and informal mechanisms through which information is passed between individuals, groups, and the organization "to solve problems, develop new ideas, or implement policies or procedures" (S. Wang & Noe, 2010, p. 117). Knowledge sharing can be achieved through the process of *organizational learning*, defined as the dynamic, multilevel process in which knowledge is acquired, distributed, interpreted, and instilled across an organization through the commitment and intentional facilitation of management (Balbastre et al., 2003; Huber, 1991). There is a positive empirical relationship between organizational learning and knowledge sharing (Aizpurúa et al., 2011).

A quantitative approach was used to answer the two research questions. This approach allowed us to explore measured differences and similarities (Biddix, 2018) of employees' knowledge sharing experience related to the transition to remote work operations. Data were

collected by (a) measuring known factors—established in the literature review—which influence organizational change efforts, organizational communication, and sharing knowledge between organizational levels, and (b) providing an opportunity for participants to describe their experience so that context-based themes can be generated and quantified from the open-ended questions. Findings were intended to measure how knowledge sharing changed as a result of remote work operations and identify its impacts, including barriers and catalysts.

Conceptual Framework

To study how knowledge is shared within an organization and the barriers and catalysts that may exist within the knowledge sharing process, we applied the 4I framework of organizational learning (Crossan et al., 1999) as a guide. The 4I framework of organizational learning illustrates that organizational learning is a dynamic process where learning occurs over time and across organizational levels. The framework provides the ability to describe the structure and process through which knowledge moves. The framework consists of five key dimensions: three organizational levels (i.e., individual, group, and organization) and two learning processes (i.e., feedforward and feedback).

Each of the five dimensions of organizational learning were salient to a study on how knowledge is shared among PLS employees during a period of organizational change. Structurally, knowledge sits with and/or moves between individuals, groups, and organizational routines and practices. At the individual level, knowledge can be generated when employees have intuitive thoughts (Crossan et al., 1999). This knowledge is then shared and reinforced at the group level through conversations and collective action among teams, units, and subgroups to generate a shared group understanding (Crossan et al., 1999). With this progression, knowledge cements into organizational practices, which facilitates the achievement of strategic goals.

Process-wise, knowledge generated by individuals can be moved through groups to the entire

organization; however, if roadblocks exist along the knowledge transference process, the

knowledge may not become integrated as a part of the organizational practices, structure, and

culture (Crossan et al., 1999). Simultaneously, the reverse is true; barriers prevent key

knowledge at the organizational level from reaching groups and individuals. These bottom-up

and top-down macro learning processes are coined, respectively, as feedforward and feedback

processes (Crossan et al., 1999). The two macro learning processes are distilled into four social

and psychological subprocesses: intuiting, interpreting, integrating, and institutionalizing

(Crossan et al., 1999). *Intuiting* is identified as the recognition of patterns and/or possibilities by

an individual person. *Interpreting* is identified as the process of developing shared meaning

among a collective. *Integrating* is identified as the movement from shared understanding to a

"coherent, collective action" (Crossan et al., 1999, p. 528). Finally, *institutionalizing* is identified

as the development of routines that permeate systems, structures, procedures, and strategies

through embedded learning across the organization. Figure 1 presents the model from Crossan et

al.'s (1999) 4I framework of organizational learning.

Figure 1. Model of Organizational Learning

Organizational Learning as a Dynamic Process
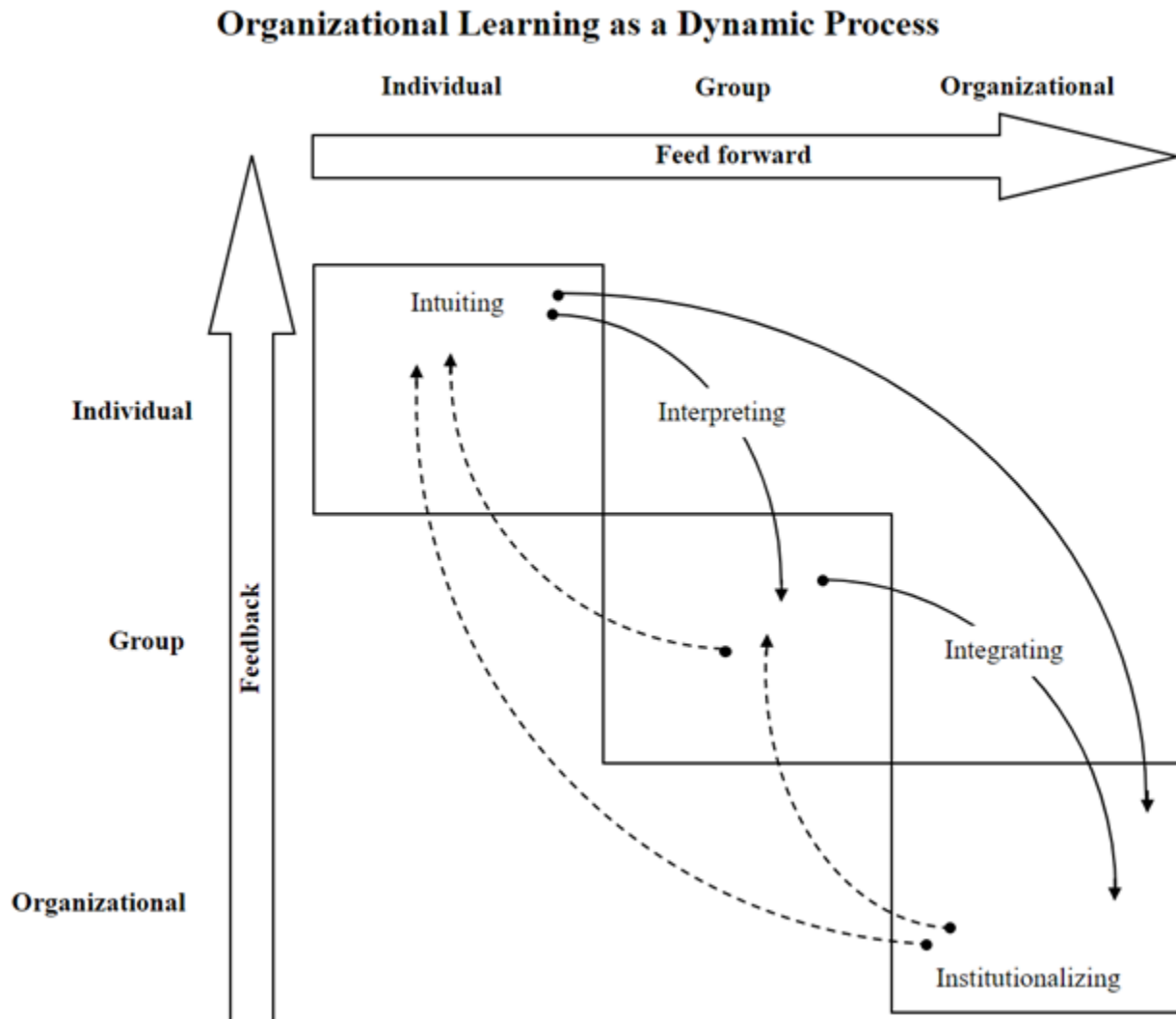
Note. The model depicts the four related learning subprocesses (i.e., intuiting, interpreting, integrating, and institutionalizing), the two learning macro-processes (i.e., feedforward and feedback), and the organizational levels (i.e., individual, group, and organizational). As represented by the multiple arrows, learning processes are interactive, happen concurrently, and can be simultaneously reinforced or restrained (Crossan et al., 1999). Reprinted from "An Organizational Learning Framework: From Intuition to Institution," by Crossan et al., 1999, p. 532.

It was appropriate to use this conceptual framework as a lens for analysis in this study for a variety of reasons. The purpose of this study was to explore how knowledge sharing changed among PLS staff as a result of remote work operations and the organization's subsequent internal adaptations to a changed external environment. To do so, it was important to be able to identify, describe, and interpret the experiences of employees in terms of both structural and process changes. For example, a breakdown in communication, and subsequently knowledge sharing, may occur when two individuals can no longer see each other and share ideas because they no longer work from the same library branch (i.e., structure: individual; process: interpreting). As another example, effective knowledge sharing may facilitate a team's ability to offer new programming for their branch patrons because the team received the latest protocols for remote services from their organizational leaders (i.e., structure: group and organization; process: institutionalizing). These examples show how the conceptual framework was used to identify "factors that facilitate and inhibit this process" (Crossan et al., 1999, p. 534) of knowledge sharing within the PLS library services hierarchy.

The 4I framework was the result of decades of research on organizational learning and has been extensively cited. Crossan et al. (1999) received the "Decade Award" as the most cited article from the Academy of Management Review (Crossan et al., 2011). This framework, therefore, provided the context, language, and credibility for identifying patterns in the movement of knowledge across the PLS library services hierarchy (Crossan et al., 1999).

Significance of the Study

This study was significant because it provided an opportunity to collect data regarding a key moment of organizational transition and develop practical data-driven recommendations related to organizational communication and knowledge sharing practices as PLS looks to the

future. This case study provided the community partner with comprehensive findings through measured and contextual data analysis, which can inform organizational modifications in service of their strategic goals. This study also provided other organizations with a roadmap for gathering data about the impact of crisis-induced change management, remote work operations, and knowledge sharing practices. We completed this study as a way for today's leaders to think about how the COVID-19 global pandemic impacted workplace environments and what they can do to prepare their organizations to meet their strategic goals while operating differently than before the COVID-19 global pandemic.

Summary

For the last few years, a public library system—referenced using the pseudonym PLS in this study—has been involved in efforts to improve communication efficiencies across the organizational hierarchy as a way to improve mission fulfillment and achieve organizational goals. However, normalized knowledge sharing routines and practices at PLS underwent a rapid change due to the transition to remote work operations as a result of government mandates and restrictions issued to address the COVID-19 global pandemic. As such, PLS leadership identified a desire to investigate the impact of these changes on knowledge sharing within the library services hierarchy, given the preexisting communication challenges which may have been exacerbated by the transition to remote work operations. Through a quantitative methodological approach, this study examined the ways in which knowledge sharing was impacted by the transition to remote work operations and identified barriers and catalysts for knowledge sharing. The study used the 4I framework of organizational learning as a basis for the analysis. This framework describes the structure and processes of how knowledge both moves and gets stuck across individuals, groups, and organizational routines and practices. This study generated data

on the experience of the library services hierarchy employees and how their ability to share

knowledge was contextualized by the transition to remote work operations. The study also

provided insights for PLS leaders who seek to improve organizational communication practices

and continued change management efforts to facilitate progress toward their strategic framework

goals. The findings may also prove useful for other organizations which seek to analyze the

impact of remote work operations on knowledge sharing practices in preparation for a post

COVID-19 global pandemic work environment.

Chapter 2. Literature Review

A review of literature is provided as a foundational context for examining the research questions that guided this study. Specifically, how an abrupt transition to fully remote work operations may have impacted communication and knowledge sharing practices across an organizational hierarchy. Much like the research problem itself, the topics of interest for the review of literature were multifaceted. For one, organizational change needed to be explored as our research analyzed the impact of unplanned change amid a planned change effort. Additionally, the study warranted the examination of crisis given that the transition under study was a result of physical distancing regulations onset by the COVID-19 global pandemic. The phenomenon of transitioning to remote work was also explored in the context of how leaders manage change and facilitate internal communication, particularly for virtual teams. Finally, organizational structure and culture warranted examination because they were identified as two key factors that influence how organizations share knowledge to function, develop strategy, and achieve organizational goals (S. Wang & Noe, 2010). Overall, this literature review provides context for analyzing the impact of remote work operations on knowledge sharing across a library services hierarchy, acknowledging that libraries are complex organizations (Stephens & Russell, 2004), which endure change continuously and profoundly (Tam & Robertson, 2002).

These topics of interest are underpinned by the premise that organizations are interconnected and dynamic systems where subsystems impact one another (Bolman & Deal, 2017; Nadler, 2006; Senge, 1990; Uhl-Bien et al., 2007). For this reason, it was necessary to conduct a broad review of each topic—and their interplay—with consideration of the nuanced contextual factors surrounding this research study. As evidence, research has noted that systems fail to facilitate knowledge sharing when there is a lack of consideration for the multiple factors

of influence, including organizational, interpersonal, and individual contexts (S. Wang & Noe, 2010). This acknowledgment supported the idea that the interactions within a system determine the system's operational effectiveness based on how closely components of the system fit together (Nadler, 2006). Taken together, system interdependence necessitated a broad understanding of multiple topics so they could be analyzed holistically and in consideration of one another. To this end, a conceptual framework of organizational learning is presented at the end of the chapter as the selected lens for applying the literature to the research analysis. Organizational learning provided the language to identify the structural and procedural facets of sharing knowledge to efficiently meet strategic goals. Also applicable to this research study, organizational learning described the learning that happens when unexpected and threatening changes in the external environment are positively managed (Moynihan, 2009). By way of the organizational learning framework, the interconnected topics of interest presented in this literature review were explored and applied to the research questions that guided the study.

The literature search strategy for this review began with an initial search for the key terms knowledge management, learning organization, and organizational learning. In consideration of discussions with the community partner and evolving conditions surrounding the research, the search specificity was nuanced to include the terms: remote work, remote teams, organizational crisis, learning and crisis, knowledge sharing, and libraries and change. The broad search was followed by concentration on literature with greater relevance to the problem of study and provided a strong foundation for the knowledge base guiding the study (Hopwood, 2014). Literature discovered through this search process was supplemented by literature previously explored in the Educational and Organizational Learning and Leadership (EOLL) doctoral program. The relevant topics included systems thinking, organizational

structure and culture, change management, and leadership best practices. The research questions

provided a lens to determine the relevance and applicability of the search findings for the

problem being studied. Search tools, such as the interdisciplinary article databases through

Seattle University's library and Google Scholar, facilitated the literature review process.

Organizational Change

Organizational systems are subject to their surrounding environment, their accessible

resources, and the history of their organization (Nadler, 2006). These factors, in addition to

others, require organizations to be nimble and flexible in their structure and culture to adapt to

changing conditions (Daft, 2016; Schein, 2010; Schmitt et al., 2018). Organizational change—or

the adoption of a new idea or behavior by an organization—allows organizations "not only to

prosper but merely to survive in a world of disruptive change and increasingly stiff competition"

(Daft, 2016, p. 422). As the context of this study, it was also important to recognize that libraries

have a history of continuously developing and redeveloping their services and programs based

on changing environments, external pressures, and the community's needs (Nicholson, 2019).

Subject to evolving societal trends and changes, libraries dramatically evolve to ensure long-term

health and vitality for the library sector (Stephens & Russell, 2004). This necessary evolution

requires library leaders to forecast and lead planned organizational change as well as react and

respond to unplanned organizational change.

External Environment

Contemporary organizations face different challenges than past organizations due to a

rapidly changing world and a need to quickly respond to altered external environmental

conditions (Bontis et al., 2002; Miles et al., 1995; Ritchie, 2004; Stuller, 2009; J. Wang, 2008).

Regardless of frequency, a shift in external conditions is one of the primary causes of

organizational change (Kuhn, 1970; Nadler, 2006; Romanelli & Tushman, 1994); in fact, nearly all large-scale change originates from the external environment (Nadler, 2006). Examples of environmental shifts include the introduction of disruptive new technology, governmental regulations, economic trends, natural disasters, and social movements (Potnis et al., 2020; M. Smith, 2019). It is important to note that change is not inherently bad nor good; environmental changes can present as both threats and opportunities for organizations (Raffaelli, 2017). Thus, as external changes occur, there is an opportunity for the organization's leaders to mitigate damage and promote positive learning from the situation. When assessing and responding to changed environmental factors, leaders should examine three primary dimensions of environmental influence: (a) *dynamism,* the stability of conditions (i.e., events remain relatively the same over time [stable], or events change rapidly [unstable]); (b) *complexity,* the number of external influences (i.e., fewer influences [simple environment] or many influences [complex environment]), and (c) *abundance,* the availability of resources to support the organization (Daft, 2016). Organizations that operate in an environment that is stable and simple have a low level of environmental uncertainty; in other words, these organizations do not encounter organizational change as frequently or to the same degree as other organizations. Conversely, a high level of environmental uncertainty (i.e., unstable and complex environment) presents multiple challenges to an organization necessitating frequent organizational change and adaptation (Daft, 2016; Duncan, 1972).

Public libraries could be considered unstable and complex organizations because they are rapidly changing and influenced by many external factors. As a result, libraries must engage in continuous organizational change to combat the high levels of environmental uncertainty. In the face of the specialized needs of complex and rapidly changing environments, organizations often

structurally differentiate how various functional departments operate (Daft, 2016).

Differentiation involves cultivating specialized departments or sectors within an organization, each with unique behaviors and structures (Daft, 2016; Lorsch & Lawrence, 1972). However, differentiation can create cultural challenges making communication and connection across the organization difficult. Combating these challenges requires dedicated time and resources to develop a culture of organizational integration (Kotter, 1995; Schein, 2010). As a compounding issue, abrupt change can create or exacerbate an unstable and complex environment that necessitates even greater levels of information sharing within the organization (Duncan, 1972).

Organizational Crisis

There is a difference between external environment shifts and organizational crises. An external shift—such as a health pandemic that instigates government mandated building closures—might destabilize conditions, complexify influencing factors, and restrict resources for an organization. In turn, the organization may experience an internal crisis related to identifying and implementing the adaptations needed to continue operating in the changed environment. Colloquially, crisis may refer to unprecedented times; but, for the purpose of this research study, a crisis refers to a situation where an organization experiences a triggering event that leads to a threat to the organization's stability and a perceived inability to cope with the changes (Keown-McCullan, 1997). More specifically, an *organizational crisis* is "a low-probability, high-impact event that threatens the viability of the organization and is characterized by ambiguity of cause, effect, and means of resolution, as well as by a belief that decisions must be made swiftly" (Pearson & Clair, 1998, p. 60). In other words, an organizational crisis is hard to define, resolve, and manage, which, in combination, can be detrimental to an organization.

Given the potential ramifications of an organizational crisis, leaders should strategically manage crisis situations. Change that occurs fast and at a system-wide scope creates pressure on the organization to adapt quickly and places large amounts of strain on the organization and its individuals (Raffaelli, 2017). This fast-paced and large-scale organizational change is described as frame-breaking change (Nadler & Tushman, 1989) or revolutionary change (Tushman & Romanelli, 1985). Often as the result of a crisis instigated by shifts in external conditions (Kuhn, 1970), revolutionary change "substantively disrupt[s] established activity patterns" (Romanelli & Tushman, 1994, p. 1141). For better or worse, this means that organizational crises can profoundly impact an organization and its employees (Barnett & Pratt, 2000; Broekema et al., 2017; Simon & Pauchant, 2000; J. Wang, 2008). The impact to organizations is often a result of the behavioral changes and culture shifts induced by organizations to mitigate the damage to the organization and its stakeholders through the process of crisis management (J. Wang, 2008).

Crisis management generally follows three distinct stages: precrisis, crisis response, and postcrisis (Coombs, 2010; Zamoum & Gorpe, 2018). The *precrisis stage* is focused on preparation, which involves identifying and reducing potential risks (Coombs, 2010). The second stage, *crisis response*, is characterized by the need to recognize and contain a crisis that is actively occurring (Coombs, 2010; Zamoum & Gorpe, 2018). The speed, accuracy, and consistency of information shared with internal and external stakeholders at this stage have a significant effect on the outcomes of the crisis (Coombs, 2010). The third stage, *postcrisis*, focuses on managing the crisis's lingering effects, evaluating the crisis response, and integrating learnings into processes as preparation for future crises (Coombs, 2010; Zamoum & Gorpe, 2018). These three stages of crisis management can frame the way organizations learn from a crisis and renew the organization in the process (Heath, 2010). The larger arena of crisis

management literature was vast and extended beyond the scope of this study; however, given that this study took place during an ongoing organizational crisis, the stages of crisis were used in the analysis and conclusions of this research study.

Organizational Communication

Organizational communication connects the structural components of an organization and sustains the organizational culture (Gochhayat et al., 2017; Schein, 2010). Communication occurs through a variety of modes (e.g., email, meeting, instant message, call) between individuals, teams, and departments to achieve the organization's desired outcomes (Neeley, 2018). As noted by Kanter (2006), "it takes people communicating directly with each other to strengthen shared knowledge, shared goals, and mutual respect. Strong relationships, it turns out, are what turn efficient routines into high performance" (p. 884). Alternately said, communication allows employees to connect in service of meeting an organization's strategic mission and goals. Moreover, a review of the intersections between library literature and change management indicates that communication is the fulcrum of change in libraries, acting as the pivot point essential for planning and implementation (Novak & Day, 2015).

The act of communication, however, is fraught with challenges (Patterson et al., 2012). In libraries, communication breakdowns can occur when there is a lack of accountability for reading written messages, difficulty in scheduling meetings and subsequently synchronous communication, and a withholding of information from management (Wakimoto, 2021). Challenges to organizational communication during a crisis includes the speed and frequency of disseminating substantial information to employees, a lack of openness in communication, resistance to vertical top-down communication, and a lack of accountability for the organization's actions or decisions (Ecklebe & Loffler, 2021). Taken together, there is an

opportunity for library leaders to alter organizational practices to address the communication

challenges for libraries in crisis. For example, during the COVID-19 global pandemic some

organizations found new ways to communicate with their employees, including changed

frequency and type of communication (Bojadjiev & Vaneva, 2021). Researchers also found

internal communication garnered positive employee perceptions during the COVID-19 global

pandemic through transparent communication, the dissemination of informative content, and a

participative communication process (Ecklebe & Loffler, 2021). Additionally, knowledge

sharing and job engagement improved during the COVID-19 global pandemic when leaders

intentionally solicited input about organizational changes from employees with diverse

backgrounds and characteristics (Lee et al., 2020).

Given that this research study explored a transition to remote work operations,

organizational communication was specifically considered in regard to the management of

transition and the nuances brought about by remote work.

Managing Transitions

The way in which leaders manage transition across an organization directly relates to the

quality and success of change outcomes (Kotter, 1995). Unfortunately, a universal strategy for

managing organizational change does not exist; however, foundational guidance for change

theory is provided through Lewin's (1947) work related to group and organizational dynamics.

Lewin focused on identifying forces that are either driving or restraining "movement toward a

goal" (Shirey, 2013, p. 69), which served as the basis of his widely influential theory of

Changing as Three Steps. Lewin's (1947) model of change includes: (a) unfreezing of

organizational norms, (b) moving (or transitioning) toward a new desired state, and (c) freezing

of new standards. While Lewin's (1947) model has been used and built upon by many scholars,

the simplicity of the three steps leaves ambiguity and critiques regarding how leaders practically implement it (Burnes & Bargal, 2017).

Kotter's (1995) eight-step process for effective change loosely parallels Lewin's (1947) model with three broad phases of change: creating a climate for change, engaging and enabling the whole organization, and implementing and sustaining the change. However, Kotter distilled these broad phases into sequential actionable steps (see Table 1). The implementation of Kotter's eight-step process hinges on the ability to share knowledge across an organization as Steps 1 through 4 require communication and dialogue. For example, when an organization adopts a new technology, leaders may communicate the need for new technology by establishing a sense of urgency for efficiently sharing information across the organization. Leaders and early adopters may then work together to create and communicate a vision for larger scope adoption. In this example, there is a convergence of organizational communication and organizational change.

Table 1. Lewin and Kotter Change Theory Comparison

Lewin's 3 steps	Kotter's 8 steps	Kotter's 3 phases
1 - Unfreeze	1 - Establish a sense of urgency 2 - Forming a powerful guiding coalition 3 - Creating a vision 4 - Communicating the vision	1 - Creating a climate for change
2 - Change	5 - Empowering others to act on the vision action 6 - Planning for and creating short-term wins 7 - Consolidating improvements and producing still more change	2 - Engaging and enabling the whole organization
3 - Freeze	8 - Institutionalizing new approaches	3 - Implementing and sustaining the change

Through the lens of Lewin (1947) and Kotter (1995), it is apparent that communicating across an organization is vital to managing transition and change. Afterall, communication is critical for successful organizations (Gochhayat et al., 2017); it facilitates information sharing, collaboration, and broadened participation by employees in decision-making processes (Neeley, 2018). Library leaders should incorporate change management theory into their process of helping library personnel understand what—and why—the organization must take on change (Novak & Day, 2015).

Remote Work

For over 25 years, leaders and teams who operate remotely have explored how to be most effective in virtual environments (Hart, 2016). Whereas location-based teams work together in close proximity, communicate face-to-face, and have repeated formal and informal interactions over time (Germain & McGuire, 2014; Krumm et al., 2016), *virtual teams* primarily use technology-mediated communications to correspond from different physical locations (Krumm et al., 2016; Neeley, 2018; Peñarroja et al., 2017). Ideally, virtual teams and workers are intentionally prepared and trained to develop new patterns of knowledge sharing and communication in the remote work environment (Zakaria et al., 2004). This is important as virtual teams have unique challenges that require organizations and their personnel to develop specialized norms and skillsets to thrive in a virtual environment (Bennett, 2014; Benson et al., 2002; Germain & McGuire, 2014; Krumm et al., 2016; Thomas, 2014). As such, leaders can directly cultivate the success of digital teamwork over time when they are aware of the distinct characteristics of virtual teams (Darics & Gatti, 2019; Martinez-Moreno et al., 2015; Robert & You, 2018).

Remote work makes it challenging for employees to connect, solve problems, and collaborate (Galanti et al., 2021; Germain & McGuire, 2014; Krumm et al., 2016). Due to the lack of in-person contact, emotional and cognitive connections suffer among virtual teams (Germaine & McGuire, 2014; Neeley, 2018). Lack of connection makes it difficult to develop traits needed for collaboration and shared understanding (Germain & McGuire, 2014; Neeley, 2018; Plotnick et al., 2016). Studies have found that working remotely and using technology-mediated communication is often associated with higher levels of task conflict and perceptions of reduced team effectiveness (Plotnick et al., 2016). As examples, virtual teams often experience "impaired performance, information lags, increased misunderstandings, and incoherent messages" (Neeley, 2018, p. 24). Trust is important to overcoming the geographic and psychological barriers for facilitating knowledge sharing (Germain & McGuire, 2014; Neeley, 2018; Newell et al., 2007; Staples & Webster, 2008).

Remote work also makes it challenging for employees to communicate (Morgan et al., 2014; Neeley, 2018; Staples & Webster, 2008). Staff need time and space to meet and engage in dialogue because knowledge sharing is facilitated through communication. Therefore, it is essential to establish forums for communication such as appropriate technology tools in a virtual setting (Schilling & Kluge, 2009). Although intentional activities (e.g., scheduled virtual meetings) facilitate formal modes of knowledge sharing in the virtual environment, the informal interactions among staff (e.g., conversations in hallways and breakrooms) are lost because there is "less opportunity for social or informal contact and spontaneous communication" (Morgan et al., 2014, p. 610). Informal communication is a significant source for innovation in organizations, facilitates social cohesion, and plays a crucial role in collaboration; therefore, a lack of communication can present challenges for organizations (Röcker, 2012). Additionally,

when communication occurs with technology-mediated methods, there is a greater likelihood for misinterpretations (Morgan et al., 2014), which dampen knowledge sharing efforts (Germain & McGuire, 2014; Newell et al., 2007; Staples & Webster, 2008).

Organizational Structure and Culture

Organizational structure and culture provide the ability for organizational adaptation and learning (Crossan et al., 1999). Essentially this means that leaders can use organizational structure and culture as levers for manipulating their organizations to change and improve. Broadly, four contextual factors impact the probability of adaptation and learning: "corporate culture conducive to learning, strategy that allows flexibility, an organizational structure that allows both innovativeness and new insights, and the environment" (Fiol & Lyles, 1985, pp. 803–804). As previously discussed, organizations do not control their environments (J. Wang, 2008), and thus, the environment is not an easy lever to adjust. Strategy is often preplanned and meticulously established by an organization over an extended period of time (Tam & Robertson, 2002), meaning that strategy is also a lever not primed for swift adjustments. Organizational structure and culture, on the other hand, can be vital levers of change even during crisis (Pearson & Clair, 1998; Shrivastava, 1993). Alterations to organizational structure and culture allow leaders to prioritize organizational growth and resource acquisition (Bontis et al., 2002; Chatman & Cha, 2003; Daft, 2016; Schilling & Kluge, 2009; Watkins & Dirani, 2013). Additionally, organizational structure and culture are identified as contextual factors which influence knowledge sharing in organizations (S. Wang & Noe, 2010).

Trends in the field of library management indicate that libraries can be structured and operated more efficiently (Stephens & Russell, 2004). Library leaders should try new approaches that might better serve their "fluid environment of evolving expectations, technological

influences, and institutional imperatives" (Stephens & Russell, 2004, p. 253). Although some

organizational leaders lean into adaptation and change, some tend to draw on past successful

behaviors to no avail (Sheaffer & Mano-Negrin, 2003, as cited in Antonacopoulou & Sheaffer,

2013) or do not relinquish their overconfidence in old methods of operating in favor of new ways

(Schwartz, 1987, as cited in Antonacopoulou & Sheaffer, 2013). Leaders should avoid the

pitfalls of doubling down on current organizational practices by considering how changes to

organizational structure and culture can serve as effective management practices that can

facilitate knowledge sharing (Cabrera & Cabrera, 2005). The following subsections provide

further context on organizational structure and culture in relation to organizational

communication and knowledge sharing.

Organizational Structure

The structure of an organization formalizes the lines of authority and communication

through the vertical and horizontal linkages across an organization (Daft, 2016; Galbraith, 2006).

It guides how people and their work interact to achieve the organization's mission (Hall & Saias,

1980; Ranson et al., 1980). Additionally, the organizational structure provides mechanisms for

making decisions and resolving conflicts with large groups of people (Galbraith, 2006). Different

organizational structures are optimal for different situations (Miles et al., 1995; Thompson,

1965). Specifically, the type of structure an organization needs depends on the intersection of

environment, resources, and strategy (Galbraith, 2006; Hall & Saias, 1980; Mintzberg, 1980;

Porter, 1996; Thompson, 1965). A misalignment of an organization's structure with the

environment causes inefficiencies and can lead to devastating effects such as difficulty

competing as a business (Hall & Saias, 1980; Miles et al., 1995).

As previously discussed, shifting environments often require leaders to adapt organizational structure to realign within the new landscape. Some organizational structures are more flexible than others; "a centralized, mechanistic structure tends to reinforce past behaviors, whereas an organic, more decentralized structure tends to allow shifts of beliefs and actions" (Fiol & Lyles, 1985, p. 805). In other words, well-established structures may provide efficiency for the organization but simultaneously stifle innovations. Therefore, leaders should remain open to adapting organizational structure as the environment changes (Hall & Saias, 1980; Miles et al., 1995). For example, an organization that needs to move information quickly may need a decentralized approach with less formality and a flatter hierarchy (Daft, 2016; Galbraith, 2006; Mintzberg, 1980).

Five dimensions can be considered to explicate organizational structure: (a) *specialization,* the extent to which each role performs a unique function; (b) *standardization,* whether the work performed is or is not primarily routine; (c) *formalization,* the extent to which routines and processes are written; (d) *centralization,* the extent to which power and authority are shared; and (e) *configuration,* the breadth and depth of the organization's hierarchy (Pugh et al., 1968). The typical structure of libraries is grouped by specialized area and differentiated by qualifications (e.g., educational background), responsibilities, and pay scale (Vela, 2018) even though departmentalization can be a barrier to knowledge sharing (Lant, 2000). Standardized routines and formalized processes aid in the ability to share information across a wide and deep structural configuration though they may decrease individual ownership regarding how an employee responds to and shares new knowledge (Lawrence et al., 2005; Stephens & Russell, 2004). Library literature has shown that social identity and organizational hierarchies influence the ability to share knowledge (Stephens & Russell, 2004; Vela, 2018). Moreover, a lack of

diversity at decision-making levels and organizational configurations obstructs knowledge from moving along hierarchies (Vela, 2018).

Organizational Culture

The culture of an organization is comprised of the interactions between the constituents in an organizational structure (Hall & Saias, 1980). Schein's (2010) definition of organizational culture is widely referenced and serves as the basis for this discourse. *Organizational culture* is defined as the patterns of shared assumptions learned by a group as it adapts to problems; these patterns manifest in observed routines, implicit rules, feelings, interactions, and mental models of how things are done (Schein, 2010). Though culture is intangible, it frames the way people and teams behave in an organization (Bolman & Deal, 2017). Organizational culture facilitates knowledge sharing and integration across an organization by encouraging both debate and dialogue from various individuals and levels of the organization (Nugroho, 2018). Public libraries, which focus on supporting the needs of their local communities, benefit from team-oriented cultures that maximize involvement from a variety of library staff (Kaarst-Brown et al., 2004). This, in turn, allows a greater number of viewpoints to be considered in the decision-making process, which must balance the needs of increasingly diverse groups of library patrons (Kaarst-Brown et al., 2004).

Attentiveness to culture can aid an organization's ability to weather rapid change and generate innovation to support an organization's long-term survival (Chatman & Cha, 2003; Detert et al., 2000; Kaarst-Brown, 2004; Miles et al., 1995; Weiss, 2006). Even further, some organizational cultures can hamper change efforts and lead to failed change efforts if not named and properly addressed (Chatman & Cha, 2003; Detert et al., 2000; Miles et al., 1995; Weiss, 2006). Aspects of organizational culture to consider, particularly when managing transitions,

include (a) understanding learning anxiety and how to encourage a learning mentality and (b) mitigating resistance to change through the cultivation of psychological safety.

Learning Anxiety. People face a general sense of ambiguity related to where change may take them or their organization (Weiss, 2006). This sense of ambiguity can manifest as a culture of anxiety related to learning new ways of operating within an organization. For example, individuals may fear a loss of power due to changed practices or fear potential embarrassment and consequences if they do not possess the skills necessary to perform new duties (Schein, 2010). Even the prospect of abandoning old ways of operating and learning new systems produces a sense of loss and the feeling of anxiety (Schein, 2010; Weiss, 2006). When left unaddressed, learning anxieties and ambiguity related to change initiatives often manifest as resistance (Schein, 2010; Weiss, 2006). As change cascades through an organization, leaders should encourage a culture of growth mindset (Dweck, 2006), sometimes referred to as a learning mentality (Schein, 2010). For example, at the onset of new working conditions, employees may need to relearn how to navigate relationships and systems. Leaders can support this act of cognitive restructuring by encouraging self-reflection and an openness to grow throughout the change process (Palmer, 2004; Senge, 2006).

Resistance to Change. People resist change, often without alternatives (Freed, 1998), particularly when they do not understand the reasoning behind the change (Ford & Ford, 2009; Trybus, 2011). Some leaders see resistance as a threat to forward progress when, in actuality, resistance can be a resource that generates buy-in, solutions, or better results for a change effort (Ford & Ford, 2009). Resistance sometimes embeds itself within organizational culture as a residual effect of past experiences with failed change efforts; "unacknowledged failures in past change efforts, questionable ethical incidents, and negative cultural tendencies are often invisible

backdrops to a newly planned change" (Ford & Ford, 2009, p. 103). Resistance is often the result

of failing to approach change from a multi-frame perspective; leaders tend to focus on structural

change without tending to the human, political, and symbolic elements of change (Bolman &

Deal, 2006). Increasing the sense of psychological safety is one of the primary ways leaders can

address learning anxiety and overcome resistance (Baer & Frese, 2003; Edmondson, 1999). To

develop psychological safety and reduce resistance to change, leaders should focus on the

purpose of a change effort, involve the individuals and groups impacted, reduce ambiguity, and

support learning (Ford & Ford, 2009; Schein, 2010; Trybus, 2011; Weiss, 2006).

Organizational Learning

This research study investigated the interlocking impacts of knowledge sharing, remote

work operations, and crisis-induced change management on an organizational system. Crossan et

al.'s (1999) 4I framework of organizational learning guides this investigation given that

organizational learning is the dynamic, multilevel process in which knowledge is acquired,

distributed, interpreted, and instilled across an organization through the commitment and

intentional facilitation of management (Balbastre et al., 2003; Huber, 1991). Furthermore, the 4I

framework of organizational learning describes the structure and process through which

knowledge moves. The following sections provide an overview of organizational learning, the

conceptual framework, and the applicability to knowledge sharing.

History of Organizational Learning

All organizations have structures and cultures that promote or restrict how knowledge

moves across an organization (Balbastre et al., 2003; Huber, 1991). Organizational learning is

"the process of improving actions through better knowledge and understanding" (Fiol & Lyles,

1985, p. 803) and has been a topic of academic discourse and research for the last 50 years

(Argyris & Shön, 1978; Cangelosi & Dill, 1965; Crossan et al., 1999; Huber, 1991). In alignment with organizational change scholars (Kotter, 1995; Lewin, 1947), organizational learning scholars have identified that organizations must be able to learn, unlearn, and relearn to maintain alignment with their external environment as an act of organizational survival and growth (Chakravarthy, 1982; Chandler, 1962; Cyert & Warch, 1963; Hambrick, 1963; Miles & Snow, 1978; Miller & Friesen, 1980, as cited in Fiol & Lyles, 1985). Further, organizational learning focuses on the relationship between cognition and action—what one knows impacts what one does and vice versa (Crossan et al., 1999). This concept of acting on knowledge differentiates the field of organizational learning from similar fields such as knowledge management and intellectual capital (Crossan et al., 1999).

Framework of Organizational Learning

Crossan et al.'s (1999) 4I framework of organizational learning consists of five primary dimensions: three organizational levels (i.e., individual, group, and organization) and two learning processes (i.e., feedforward and feedback). The three organizational levels used in the framework are congruent with the three levels of analysis identified in organizational behavior literature (Bauer & Erdogan, 2012) and acknowledge that organizational learning is similarly multilevel. The three organizational levels and their relationship to organizational learning follow.

Individual Level. Seen as the essential building block to an organization, an individual learns as a result of generating new knowledge and making tacit knowledge explicit (Bontis et al., 2002; Smirti, n.d.). At the individual level, learning is demonstrated by staff possessing "competency, capability, and motivation to undertake required tasks" (Bontis et al., 2002, p. 443).

Group Level. In an organization, people gather in groups or teams to build shared understanding to achieve a desired outcome (Bontis et al., 2002). Groups can be formal or informal, and experience group dynamics, power dynamics, conflict, decision-making processes, and various communication flows that may impact the development of shared understanding (Bontis et al., 2002). Learning at the group level is demonstrated in collective understanding and action (Crossan et al., 1999).

Organizational Level. Learning at the organizational level inserts individual and group learning into the "systems, structures, procedures, and strategy" of an organization (Bontis et al., 2002, p. 444). Although individual contributors to the organization may come and go, the systems and structures developed as part of organizational level learning remain "the non-human artifacts of the organization" (Bontis et al., 2002, p. 444). Organizational level learning, though, needs to be in alignment with the external environment to achieve a competitive edge (Bontis et al., 2002). In other words, learning for the sake of learning is not seen as organizational level learning (Bontis et al., 2002).

Knowledge is transferred across the organizational levels both as a bottom-up progression from individuals to groups to the overall organization and as a top-down progression from the organizational level back to individuals. These two macro learning processes are respectively referred to as feedforward and feedback. These processes highlight a tension between generating new learning and using what has been learned (Crossan et al., 1999; March 1991).

Feedforward. The *feedforward* learning process is defined as transferring knowledge from individuals and groups to the organization by cementing knowledge into systems, structures, strategies, and procedures (Hedberg, 1981; Shrivastava, 1983; as cited in Crossan et

al., 1999). Knowledge is generated through activities such as "risk taking, experimentation, play, flexibility, discovery, [and] innovation" (March, 1991, p. 71) and then moved forward through the organization by sharing and acting on the new knowledge (Crossan et al., 1999). This process can be thought of as an amplification of learning by widening the scope of impact for knowledge learned (Balbastre et al., 2003).

Feedback. The *feedback* learning process is defined as the way cemented knowledge affects the behavior of individuals and groups (Crossan et al., 1999). This process can be thought of as how organizations broadly disseminate institutionalized knowledge from the organizational level to individuals and groups. Feedback allows organizations to increase performance and create a convergence of practices for individuals or groups (March, 1991). The feedback process shapes the behaviors of individuals and groups by altering the "refinement, choice, production, efficiency, selection, implementation, [and] execution" of processes, routines, or practices that are carried out (March, 1991, p. 71).

The feedforward and feedback macro-processes are distilled into four subprocesses: intuiting, interpreting, integrating, and institutionalizing. These subprocesses provide granularity and clarity to the process of transferring knowledge within an organization.

Intuiting. *Intuiting* is identified as the recognition of patterns and/or possibilities by an individual person. This process is subconscious and can be thought of as "unconscious recollection" of knowledge that is "deeply rooted in individual experiences," making it "very difficult to surface, examine, and explain" (Crossan et al., 1999, p. 526). The process of intuiting is identified as the root of organizational learning in alignment with the fact that organizations are built by individuals.

Interpreting. *Interpreting* is identified as the process of developing shared meaning among a collective such as a group, team, or unit. Dialogue between individuals provides the space for mental models to be exposed and development of common language (Weick, 1979, as cited in Crossan et al., 1999). The process of engaging in dialogue can surface why different perspectives are derived from shared experiences, which can move a group beyond individual knowledge to generate shared understanding.

Integrating. *Integrating* is identified as the movement from shared understanding to a "coherent, collective action" (Crossan et al., 1999, p. 528). In this process, individuals adjust their behaviors to generate organizational change through continued conversations and shared practice at the group level. This process generates interactive systems that work toward the same goal.

Institutionalizing. *Institutionalizing* is identified as the development of routines that permeate systems, structures, procedures, and strategies through embedded knowledge. Beyond individual learnings and resulting group learnings, institutionalizing cements knowledge into organizational memory. This process results from "a certain degree of consensus or shared understanding among the influential members of the organization" (Crossan et al., 1999, p. 530). The result of this process manifests itself as changes to rules and procedures that guide the organization's actions and learning.

Knowledge Sharing Through a Lens of Organizational Learning

Knowledge movement along an organizational structure can be described using organizational learning processes. Bontis et al. (2002) used the terms knowledge stocks and learning flows for examining knowledge in organizations. *Knowledge stocks* are comprised of the intellectual capital and cognitive learnings that reside at organizational levels. *Learning flows*

are the connections between organizational levels which facilitate the transfer of knowledge from one stock to another through the macro- and sub-learning processes previously described (Bontis et al., 2002). An *alignment of organizational learning* occurs when each organizational level has access to the knowledge it needs because knowledge movement between structures, such as teams or organizational units, happens at the right time (Bontis et al., 2002). Disruption to learning flows can change how knowledge moves through the organizational levels and subsequently impact the alignment of organizational learning (Crossan et al., 1999). As pointed out by Berends and Lammers (2010), organizations experience "a changing delta of meandering flows, some of which get blocked, while new flows emerge and others get reinforced" (p. 1059). Alternately said, knowledge movement may encounter continuity and discontinuity at the same time. Ultimately, organizational leaders should promote continuous learning flows, which enable decisions to be made by the right person with the knowledge needed; and prevent *learning bottlenecks*, or misalignments of stocks and flows, which create discontinuity and undermine organizational performance (Bontis et al., 2002).

Summary

As explored in this literature review, there are multiple intersecting contextual topics that impact communication and knowledge sharing within libraries. Namely, organizational change, organizational communication, and organizational structure and culture. Organizational change is identified as foundational for progress, particularly during a crisis-induced environmental shift. Organizational communication is identified as the fulcrum of managing the transition to remote work operations. Organizational structure and culture are identified as levers, which organizational leaders can modify in service of surviving a changing environment and fulfilling organizational goals. As a guiding lens for the study, the 4I framework of organizational learning

served as a conceptual framework to analyze both the structure and processes of learning and sharing knowledge. The five key dimensions of the conceptual framework include three organizational levels (i.e., individual, group, and organization) and two learning processes (i.e., feedforward and feedback). Libraries as organizations have a specific history, structure, and culture, which contextualizes their ability to share knowledge.

Chapter 3. Method

Knowledge sharing facilitates the achievement of an organization's mission and goals. However, organizational leaders must cope with disruptions to normalized organizational practices, which are constant for today's organizations. For instance, in March 2020, organizations faced rapid change in the onset of the COVID-19 global pandemic. Many organizations were forced to transition to a remote work environment, which disrupted their standardized norms and routines related to sharing knowledge and communicating internally. This research study provided an opportunity to investigate the impacts of the transition to remote work. Specifically, we investigated how the transition to remote work operations affected knowledge sharing practices in a large public library system.

This chapter begins with a restatement of the research questions. The chapter continues with the methodology used in the study and an explanation of how data were collected and analyzed. Finally, it concludes with an overall summary of the chapter.

Research Questions

Research Question 1

How has the transition to remote work operations impacted the ways in which knowledge is shared along an organization's vertical hierarchy?

Research Question 2

What are the barriers and catalysts for knowledge sharing as a result of an organization's transition to remote work operations?

Methodology

This research study used quantitative data collected from an online survey questionnaire. The survey included both close-ended and open-ended questions about knowledge sharing,

specifically regarding communication, connection, and organizational structure across vertical and horizontal lines. This community partner-based case study focused on a large public library system in the Pacific Northwest of the United States, which is represented in this study under the pseudonym PLS. We intend to provide the community partner organization with results, which may enhance progress toward their strategic goals.

Participant responses to the online survey were quantitatively analyzed. The study used four types of quantitative analysis to answer the research questions. First, descriptive analysis was employed on critical variables, including participant demographics. Second, a correlational analysis was conducted to explore the relationship of connection and communication to knowledge sharing. Third, open-ended contextual question responses were quantified and analyzed for occurrence and frequency across total participants and disaggregated by structural organization (i.e., role and region). Lastly, an analysis of the variance was conducted to determine if there was a difference in knowledge sharing based on participant demographics.

Participants

Study participants were recruited as a purposeful sample of the following PLS library staff units associated with the library services hierarchy: librarians, library services managers (LSMs), regional managers (RMs), and the PLS library leadership team (LLT). This population was selected for this study based on the community partner's request to gather information for improving workflow processes along this specific vertical hierarchy. Furthermore, these staff units must share knowledge to carry out their essential job duties. PLS employees who received the invitation to participate and self-disclosed a title outside of the four groups listed here were coded as "Other role" in the findings. Additionally, respondents who were not employed at PLS before October 2019 were excluded from the research study; they would not have been

socialized to the organizational environment before the transition in work operations (Cable et al., 2013). To ensure data collected from the sample was generalizable to the population (i.e., library services hierarchy), the participant sample "accurately represent[ed] all sub-groups within the organization" (Mills & Gay, 2019, p. 202).

To ensure accurate representation, we identified the ideal minimum survey response rates to be 10%–20% of the total population (Mills & Gay, 2019). Prior research recently conducted by the community partner through similar data collection means and a similar population resulted in over 400 relevant responses. We anticipated a lower response rate due to the COVID-19 global pandemic, general survey fatigue identified by the community partner, workload constraints of potential participants, and organizational turnover during this time period. However, the minimum response needed to gather relevant data were achieved with a sample size of 53 participants, which is 38% of the population under study.

Description of the Participants

Demographic information and characteristics of participants relevant to the study included professional role within the library services hierarchy, region of employment, years worked at PLS, age, gender identity, and race/ethnicity of employees. Role and region were important for analyzing similarities and differences in experience across the organizational structure. In contrast, years worked at PLS, age, gender, and race/ethnicity were important for acknowledging experience based on the intersection of organizational culture and social identity.

Sampling Procedures and Data Collection

We used an online survey instrument with both open- and close-ended questions. Qualtrics, a digital-based questionnaire collection software, was used to administer the instrument and collect participant's answers. Responses were anonymous, though demographic

information was collected. Anonymity of respondents was guaranteed as only summary data were reported and disaggregated data with a sample size of less than 10 were combined and recoded into larger groups to protect anonymity. Participant responses to the survey were the only data source analyzed for this study.

The cross-sectional, single point-in-time survey was used to concurrently collect measured and contextual data related to the research questions. Interviews and focus groups were considered as potential data collection means but were ultimately eliminated. The research study was conducted at a time of high change and associated stress where participants may have had varying levels of comfort with participating in face-to-face meetings or adding additional synchronous virtual meetings to their schedules. Additionally, if the close- and open-ended questions were collected separately, a single participant may reflect different experiences simply because the conditions have changed between the data collection points. Such a scenario would have hindered triangulation and distorted findings. An online survey instrument allowed us to meet the community partner's needs by providing timely results with minimal intrusion into everyday work tasks because participants could complete the survey at their convenience within the given time frame.

IRB Agreement

Data collection did not begin until the Seattle University IRB determined the study to be exempt from IRB review in accordance with federal regulation criteria. An invitation to participate in the research study (see Appendix A) as distributed via email to personnel in the library services hierarchy. Included at the start of the survey was a participant consent notification (see Appendix B). There were no incentives or compensation to complete the survey.

Data Collection

We developed a survey, titled *Knowledge Sharing During Virtual and Hybrid Work*, to

collect data related to the research questions. As previously mentioned, the survey was

administered fully online using digital-based questionnaire software. An email invitation to

request participation, a link to the survey, and an email reminder message were shared with the

community partner representative for distribution through the organization's internal email

distribution lists. A prominent leader in the organization was selected to send this information.

Drafts of these messages were reviewed by the community partner, including the executive

director of the organization who supported this research. The window for completing the survey

was over about a 2-week period from Tuesday, January 11 to Friday, January 21, 2021. An initial

recruitment email was sent on a Monday. Leadership representatives at the community partner

organization gave verbal reminders during internal meetings throughout the participation

window. A follow-up reminder email was sent during the 2nd week. The community partner

representative asked for intermittent status reports on the number of participant responses

collected so that additional reminders could be sent if warranted.

Instrument Design

The instrument (see Appendix C) was used to collect data associated with the

independent variables (i.e., role, region, communication, and connection) in relation to the

dependent variable (i.e., knowledge sharing). Scholarly work identified in the literature review

influenced the development of the instrument. Appendix D aligns each survey item to the

research questions and the literature. The communication and connection portion of the

instrument included original researcher-developed items created specifically for this study based

on the review of literature. Thus, there was no pre-established reliability or validity for this

portion of the instrument. However, for the knowledge sharing portion of the instrument, permission was obtained (see Appendix E) to use items from a prominent organizational learning assessment tool—the Strategic Learning Assessment Map (SLAM), developed by Bontis et al. (2002). Use of the SLAM items allowed us to capitalize on previous research and survey instruments, which have been proven both credible and reliable (Bontis et al., 2002).

Of note, language in the instrument was localized to the colloquial needs of the community partner in two significant ways. First, remote work was referenced as "virtual and hybrid work" to capture the experiences of employees using technology-mediated communication streams broadly, even if while on-site at their local brick and mortar office location. This modification was necessary due to ongoing environmental changes and organizational adaptations to how employees worked remotely. The clarification in the language used for the survey instrument broadened participant understanding of the experience we intended to measure from narrowly "working from home" to broadly "using technology to communicate and collaborate with personnel located in various physical locations." Second, the community partner had no formal naming convention for the population under study in this research study. Under guidance from the community partner, we defined the term "librarian services" to represent the four-tier vertical hierarchy including librarians, library service managers, regional managers, and leadership team members.

Measures

As discussed previously, the survey instrument collected data associated with the dependent variable (i.e., knowledge sharing) in relation to the independent variables (i.e., role, region, communication, and connection). See Appendix F for a list of variables and their definitions. Each of these measures are now described in further detail.

Knowledge Sharing

The dependent variable for this study is knowledge sharing. Knowledge sharing is defined as the formal and informal mechanisms through which information is passed between individuals, groups, and the organization. For this study, we operationalized knowledge sharing using the five dimensions of organizational learning as defined by Crossan et al. (1999). Knowledge sharing was measured through 15 Likert-scale questions. These questions were developed based on a prominent organizational learning assessment tool SLAM developed by Bontis et al. (2002). Permission to use this tool was obtained from the authors (see Appendix E). Original SLAM questions were modified to fit the context of this study and the colloquial language of the community partner, while retaining their focus on measuring the five dimensions of organizational learning. The scale for the knowledge sharing questions on the survey instrument ranges from *strongly agree* (1) to *strongly disagree* (5). Collectively these 15 survey items were used to represent the construct of knowledge sharing by averaging the scores for all items, as they all measured as reliable and internally consistent (see Table 2).

Table 2. Sample Knowledge Sharing Measurements

Dimension of organizational learning	Survey items	Sample item
Individual	19–21	In the virtual and hybrid work environment, employees in Librarian Services have a clear sense of direction in their work.
Group	22–24	In the virtual and hybrid work environment, groups in Librarian Services have a common understanding of departmental issues.
Organization	25–27	In the virtual and hybrid work environment, the culture of the library system can be characterized as innovative.
Feed Forward	28–30	In the virtual and hybrid work environment, recommendations from the groups in Librarian Services are adopted by the organization as a whole.
Feedback	31–33	In the virtual and hybrid work environment, the library system's goals are communicated throughout the organization.

Communication

We identified communication as an independent variable for investigation in this study. *Communication* was defined as the way people dialogue, converse, and share information with others and the organization. The literature review process revealed communication as a potential factor of influence for remote working environments as demonstrated in Appendix D. For this study, we included items related to frequency for both (a) the type of communication (i.e., synchronous or asynchronous) and (b) the formality of communication (i.e., formal or informal; see Table 3). The scale for the communication questions on the survey instrument range from *strongly decreased* (1) to *strongly increased* (5).

Table 3. Communication Measurements

Communication measure	Survey item	Item text
Synchronous Communication	9	In the virtual or hybrid environment, has the frequency of your synchronous communications with staff at the library system primarily decreased or increased?
Asynchronous Communication	10	In the virtual and hybrid work environment, has the frequency of your asynchronous communications with staff at the library system primarily decreased or increased?
Formal Communication	11	In the virtual and hybrid work environment, has the frequency of your formal communications with staff at the library system primarily decreased or increased?
Informal Communication	12	In the virtual and hybrid work environment, has the frequency of your informal communications with staff at the library system primarily decreased or increased?

Connection

Connection was also identified as an independent variable for investigation in this study. *Connection* was defined as the sense of relationship, belonging, and understanding of others and

the organization. Connection emerged as another consistent factor within the literature review related to the unique challenges presented by remote work. For this study, we included items related to connection between (a) immediate team members, (b) staff outside the team, and (c) the organization as a whole (see Table 4). The scale for the connection questions on the survey instrument range from *strongly decreased* (1) to *strongly increased* (5).

Table 4. Connection Measurements

Connection measure	Survey item	Item text
Connection to team	13	In the virtual or hybrid environment, has your connection to your team at the library system primarily decreased or increased?
Connection to staff outside team	14	In the virtual and hybrid work environment, has your connection to staff outside your team at the library system primarily decreased or increased?
Connection to the organization	15	In the virtual and hybrid work environment, has your connection to the library system as an organization primarily decreased or increased?

Role

Professional role in the library system was an independent variable for this study. This categorical variable was measured by the four specific role options included in the population under study: librarians, LSMs, RMs, and LLT. This measurement was used to compare and contrast respondent experience at different structural levels of the organization. Differences in experience by organizational structure lines was identified in the literature. Additionally, the community partner was interested in this measurement as they noted that difference may or may not exist in the organization due to the vertical depth of the organization's structure. Categorizing respondents by role also facilitated the analysis of contextual experience through the conceptual framework.

Region

Region was the final independent variable measured in this study. The community partner has nine regions and a central administration. Similar to role, a measurement of region allowed us to compare and contrast experience across horizontal lines of structure in the organization. Additionally, the community partner was interested in this measurement as they noted that difference may or may not exist in the organization due to the horizontal breadth of the organization's structure. Categorizing respondents by region also facilitated the analysis of contextual experience through the conceptual framework.

Validity and Reliability

Evaluating validity and reliability was vital to ensure the scales' trustworthiness and measures used for the closed-ended survey questions (Pallant, 2016). The validity of these survey items was initially addressed during the development of the survey instrument to ensure "the degree to which [this] test measures what it is supposed to measure and thus permits appropriate interpretation of scores" (Mills & Gay, 2019, p. 178). Specifically, the instrument development process involved generating items that aligned with empirical and theoretical research on the topic (see Appendix D). The reliability of measurement from the close-ended survey items for variable constructs was tested using Cronbach's coefficient alpha to provide an average correlation of the items within the set (Pallant, 2016). Correlation coefficients in the range .70 and higher are considered reliable (Ivankova, 2015; Mills & Gay, 2019; Pallant, 2016). The reliability of measurement from the open-ended survey items were supported by inter-coder agreement during the analysis process.

Data Analysis

      Different perspectives of the research problem were provided through data produced from close- and open-ended items included in the survey instrument. The structured data collected from close-ended questions provided generalizability of literature-informed, known influences on knowledge sharing. The unstructured data from the open-ended items provided context and tangible examples of knowledge sharing and remote work. Following is a discussion of the analysis plan for each of the two research questions that guided this study.

Research Question 1 Analysis

      Multiple findings were generated to answer the first research question. Specifically, we sought to identify (a) if there was a correlation between communication or connection to knowledge sharing and (b) contextual themes about participant experience. Communication and connection constructs were tested for strength of relationship to knowledge sharing. Findings from this test generated conclusions that both support and contradict generalizations found in the literature review. Data related to each of the independent and dependent variables was generated through the quantification of contextual themes from the open-ended survey items. Contextual findings were intended to reveal information specific to the community partner.

      Reliability Check and Construct Score Generation. The analysis process began with a reliability check of the three construct variables, communication, connection, and knowledge sharing. Each of these variables were captured through multiple structured items on the survey (Mills & Gay, 2019). For these variables, it was necessary to confirm "the degree to which the items that make up the scale 'hang together'" (Pallant, 2016, p. 101). Alternately said, all items associated with a construct should be related to each other before being combined for further statistical testing. To do this, Cronbach's alpha was used to check the reliability of the scale and

internal consistency (Pallant, 2016; Urdan, 2017). Items were tested for reliability by checking

for coefficients in the range .70 and higher (Ivankova, 2015; Mills & Gay, 2019; Pallant, 2016).

Correlation of Variables. We conducted a correlational test between the communication

and connection scores and the scores for knowledge sharing. It was expected that communication

and connection scores would have a positive relationship with knowledge sharing scores. In

other words, we hypothesized that increased communication would result in increased

knowledge sharing, increased connection would result in increased knowledge sharing, and vice

versa for both. To do this, we identified the strength of the relationship between the continuous

independent and dependent variables using Pearson product-moment correlation coefficient

(Pallant, 2016; Urdan, 2017). The size of the correlation coefficient indicated the strength of the

relationship between our independent and dependent variables (Pallant, 2016).

Contextual Themes. We analyzed and quantified responses to the open-ended survey

items. It was expected that responses to the open-ended questions would surface some

observations of the participant experience that aligned with generalized themes from the

literature review; however, it was also expected that some unknown factors related to the

transition to remote work would surface. An inductive data analysis approach was used to

consolidate participants' open-ended responses into emergent coded categories and themes

(Ivankova, 2015). Specifically, the data were reviewed for significant statements that feature the

experience of the participants (Creswell & Poth, 2018). The significant statements were grouped

in clusters of meaning to generate themes (Creswell & Poth, 2018). Once themes have been

identified, we reviewed the data to quantify the occurrences of each theme. We controlled for

bias using research reflexivity and inter-coder agreement to mitigate potential bias throughout

the process of generating, clustering, and quantifying the contextual themes. We then analyzed

themes for frequency across total participants and disaggregated by the independent variables of role and region.

Research Question 2 Analysis

To answer the second research question, we (a) analyzed the data for between group difference and (b) analyzed the findings through the lens of the conceptual framework and literature review. Role, region, and other participant demographic categorizations were tested for between group differences. Findings from these tests highlighted characteristics that produced significant differences in how participants experience knowledge sharing. Finally, the conceptual framework and topics of interest from the literature review guided an analysis of barriers and catalysts for knowledge sharing during remote work operations.

Analysis of Difference Between Groups. We tested differences in knowledge sharing experience based on each of the participant demographic characteristics. It was expected that employee experience with knowledge sharing during remote work operations would not be uniform across participant categorizations. First, we identified if there was a difference in reported knowledge sharing scores disaggregated by the two categorical independent variables— role and region. Using one-way-analysis of the variance (ANOVA) tests, we determined if there was between-group variance (Biddix, 2018; Pallant, 2016). A significant difference between groups for a single independent categorical variable is indicated by a Sig. value less than or equal to 0.5 (Pallant, 2016). This test indicated whether a difference exists, but not what the difference is (Pallant, 2016). The same process was used to provide a between-group analysis of difference for each demographic variable.

Analysis Through the Conceptual Framework and Literature Review. We used the conceptual framework and topics of interest from the literature review to guide a holistic analysis

of the data using the strength of relationship findings, contextual theme findings, and analysis of difference findings. As described in the conceptual framework, knowledge sharing across an organization can encounter continuity or discontinuity based on structural and procedural dimensions. Through discussion and inter-coder agreement, we identified barriers and catalysts to knowledge sharing during remote work. The identification of differences in knowledge sharing scores by role or region indicated the presence of barriers and catalysts at the structural level, whereas contextual themes identified barriers and catalysts to the process of moving knowledge through an organization. Definitions and insights from both the conceptual framework and literature were considered in this process.

Controls for Bias

To minimize potential impacts of researcher biases during the collection and analysis of data, we incorporated the principles of research reflexivity through the examination of one's role in the research process and bracketing of professional experience, personal views, assumptions, and bias (Creswell & Poth, 2018; Ivankova, 2015). Incorporating reflexivity was particularly important for this study given the fact that members of the research team were simultaneously navigating various forms of remote work settings in their own professional roles. This process included disclosing related experiences and how our research background and social location intersected with the topic of study. The positionality statements included in the next section frame the lens of each researcher to account for potential bias in the analysis, conclusions, and recommendations (Creswell & Poth, 2018; Ivankova, 2015). We engaged in ongoing dialogue and reflection during all phases of the research study to minimize individual team members' biases and assumptions (Ivankova, 2015). Additionally, we used inter-coder agreement, which

involves multiple researchers viewing and analyzing the data to ensure consistency of analysis (Creswell & Poth, 2018; Ivankova, 2015).

Positionality

Cal Erwin-Svoboda has over 15 years of professional experience in the 2-year college environment in a broad range of student services areas, including three revenue generating facilities and student union building management. As the chief student affairs officer at a community college, he was acutely aware of the complexity of managing organizational change. As a senior level leader that worked at two different institutions during the COVID-19 global pandemic, Cal has led teams that have fluctuated between in-person support and the remote work environment. Additionally, while an associate dean at a technical college he assisted with a large-scale deployment of several Microsoft-based products to enhance communication and collaboration across the division. These experiences may have impacted how he analyzed the data. Cal regularly worked with the faculty librarian on his campus and had an eCard to his local community library. Cal has no known affiliations to the library system that is the context of this study.

Crystal Hess has over 15 years of education-related teaching and leadership experience spanning multiple contexts, including secondary education, adult retraining, and higher education. She believed innovation, learning, and community-centered collaboration should be pillars of organizational development. As a dean at a community college during the COVID-19 global pandemic, Crystal has led formal and informal collaboration and connection activities remotely for the division she works in as well as for cross-campus organizational change efforts. These experiences may have inadvertently influenced the way she analyzed the data. Additionally, Crystal has occasionally worked with faculty librarians and the associate dean of

library services on her campus. Crystal has no known affiliations to the library system associated with this research study.

Colin Watrin has worked within the higher education field for 10 years in enrollment management and student services with both undergraduate and professional student populations. Colin was employed by Seattle University as the Director of the Flex JD Program within the School of Law at the time of the study, where he worked with students in a primarily remote context. In this role, he regularly interacted with law library personnel regarding the provision of remote library services to law students. Colin had an immediate family member who was a librarian within the public education system and was personal acquaintances with a member of his local library system. These two personal connections may have influenced his perception of library staff and how he analyzed the data.

Summary

This quantitative research study investigated two research questions:

1. How has the transition to remote work operations impacted the ways in which knowledge is shared along an organization's vertical hierarchy?

2. What are the barriers and catalysts for knowledge sharing as a result of an organization's transition to remote work operations?

The study intended to generate findings with practical implications for the community partner, referenced in the study under the pseudonym PLS. As a complex organizational system that underwent significant changes in its operating environment, PLS was an appropriate setting for conducting this research study. Participants in this study were recruited as a convenience sample from within four specific staffing units identified by the community partner as part of the library services hierarchy: librarians, LSMs, RMs, and LLT. Data were collected using a single point in

time survey questionnaire, including both open- and close-ended questions. The survey items were developed with influence from scholarly work identified in the literature review of this study. Data from open- and close-ended questions were first analyzed separately. The findings were then analyzed together to generate results and recommendations.

Chapter 4. Results

The purpose of this research study was to examine how knowledge sharing within PLS changed as a result of remote work operations and identify impacts to knowledge sharing, including barriers and catalysts. The first three chapters introduced the organizational communication and knowledge sharing challenges faced by public library system leaders as they navigate a rapidly changing external environment and a transition to a remote work setting.

A review of the literature identified known challenges to sharing knowledge in a virtual environment (Germaine & McGuire, 2014; Neeley, 2018) as well as challenges created when navigating through crisis induced organizational change (Coombs, 2010; Zamoum & Gorpe, 2018). Additionally, the literature review focused on the ways in which the structure and culture of an organization impact organization systems and how leaders respond to change. The 4I framework of organizational learning was selected to provide a lens through which to analyze the structure and process of how knowledge moves between the levels of an organization.

Using a quantitative methodology, we gathered contextual and measured data to identify the impact of remote work on the organization's previously normalized practices for sharing knowledge and communicating internally. An online survey instrument was used to facilitate the collection of close-ended and open-ended responses from staff included in the library services hierarchy (i.e., librarians, library service managers, regional managers, and library leadership members).

This chapter begins with a review of the research design followed by a description of the study setting and participant sample. Findings from the response data—including descriptive statistics, correlational analysis, and identification of contextual themes—are presented in the context of the research questions guiding the study.

Summary of the Research Design

The research design served to address the study's research questions:

1. How has the transition to remote work operations impacted the ways in which knowledge is shared along an organization's vertical hierarchy?

2. What are the barriers and catalysts for knowledge sharing as a result of an organization's transition to remote work operations?

The research design included the use of a variety of statistical procedures to answer the guiding research questions. Descriptive statistics were used to identify characteristics of the sample. Correlational analysis, using Pearson product-moment r values, examined the relationship between communication, connection, and knowledge sharing. A One-Way Analysis of The Variance (ANOVA) was used to look for differences in measured knowledge sharing scores based on group membership, including role and region as well as demographic categories. Finally, inductive hand coding and frequency analysis were used for the open-ended questions on the survey to illuminate contextual impacts and differences in knowledge sharing.

Data Collection

Data was collected from participants between January 11, 2022, and January 21, 2022. The total sample was 53 after evaluation for response completeness and qualifications. Due to varied missingness in the close-ended and open-ended response data, there were 38 participant responses analyzed for the correlational analysis and 43 participant responses analyzed for contextual theme generation.

Data Analysis

After cleaning and observing the sample data, we began the data analysis process described in Chapter 3 of organizing and analyzing participant responses to identify patterns and

themes within the data. In checking the reliability and internal consistency of the communication, connection, and knowledge sharing constructs, there was a lack of internal consistency for the communication measures. As the construct variables did not "hang together" (Pallant, 2016, p. 101), we determined that each communication measure (i.e., Q9–Q12) would need to be analyzed separately for correlational analysis to knowledge sharing. For connection, there was internal consistency for Questions 14 and 15 without Question 13; however, because the communication measures needed to be separately analyzed, we decided to also separately measure the connection items (Q13–Q15) for consistency in reporting. For knowledge sharing, measures (Q19–Q33) were found to be internally consistent and, thus, were combined and averaged for correlational analysis purposes. Pearson product-moment correlation was used to determine the strength of the relationship between each of the survey items related to communication and connection measures (Q9–Q15) to knowledge sharing (i.e., averaged scores for Q19–Q33).

To organize the open-ended data into a quantifiable format, we used an inductive thematic coding approach to analyze the narrative survey items (i.e., Q16, Q17, Q18, Q34, and Q35). Initially, two members of our research team conducted an independent review of participant responses. This process resulted in approximately 75 unique codes across the open-ended survey responses. Similar codes were grouped together to generate clusters of meaning, which were further aggregated to generate contextual themes. Consideration was given to the frequency of occurrence, similarity to other codes and clusters, and relevance to our research questions. The third member of our research team then checked the validity of the generated clusters and themes by reviewing a random sample of participant responses. Once consensus was reached, each researcher independently reviewed the open-ended responses to generate counts of

each theme for each participant. The three independent reviews were compared to check for inter-coder reliability. Occurrences of themes counted by at least two of the three researchers were considered reliable. A second review was conducted in situations where only one researcher documented the presence of a theme. The final counts for each theme by participant were loaded into SPSS for frequency analysis.

Summary data for both the close-ended and open-ended responses was looked at for differences in knowledge sharing measurement and experience. We ran seven separate ANOVA tests for between-group differences in knowledge sharing measurements based on role, region, educational attainment, gender identity, age, race/ethnicity, length of employment, and length of time in current role. For each test, we verified we had not violated the assumption of homogeneity of variance before evaluating the resulting ANOVA significance values. In the case of between-group difference by gender identity, our data set did violate the assumption of homogeneity and, therefore, could not be tested for variance based on gender identity. For all other demographic characteristics, the assumption of homogeneity was not violated, and, thus, ANOVA significance values and effect sizes were evaluated. To investigate differences in knowledge sharing experience, frequencies of contextual themes were compared by role and region.

Study Setting and Participants

The following sections present background on the study setting and participants.

Study Setting

PLS is one of the most frequently used library systems in the United States and provides programs and services to a diverse county in the Pacific Northwest. Within the geographic area PLS services, the library system functions as an interconnected network of 50 individual library

branches that are organized into nine service regions and receive support from a central administration. Employees share knowledge and resources in service of the organization's goals. The data collection for this study took place in a virtual setting, necessitated by the community health regulations in place at the time, and the needs of the partner organization.

Participants

The population under study is reported to have approximately 120 personnel, as identified by a PLS representative. After assessment for disqualification and missingness, the total sample was 53. For the correlational analysis, there were 38 complete participant responses when accounting for pairwise deletion of missing knowledge sharing scores. For the contextual theme analysis, there were 43 complete participant responses when accounting for missing narrative responses. The total sample represents approximately 38% of the population under study.

No respondent declined the consent to participate. The only required question on the survey was regarding consent to participate; however, four respondents were removed from the sample via survey logic, which immediately ended the survey for any respondent who indicated they had worked at the library system for less than 2 years, as this was one of the criteria for disqualification. There were 11 participant responses that were deemed incomplete for analysis purposes and, thus, were removed from the sample. There were 12 respondents who self-described their role rather than choosing one of the options provided. One respondent self-described as "lead librarian" and was recoded into the librarian category. After this recoding, there were 11 remaining respondents who chose the option of "other" related to their professional role. These titles included labels such as "coordinator," "specialist," "associate," "assistant," and differently described "manager" roles. In consultation with a PLS representative,

five of these participants with self-described roles were deemed too ambiguous to recode (e.g., "manager") or outside the scope for the population under study (e.g., "library associate") and were removed from the sample. The remaining six participants were deemed to be roles strongly related to the population under study. These participants were kept in the sample coded as Other.

Participant Characteristics. Descriptive statistics were used to generate observations of the characteristics of the sample. The tables in this section present these findings related to employment, role and region, and identity-based demographics. A description of the notable sample characteristics follows.

Employment. Table 5 shows the frequencies of employment demographics for the sample including both time at PLS and in current role. Considering the complete sample ($N = 53$), longevity of tenure at PLS is demonstrated with a representation skewed toward longer lengths of employment. Specifically, 2 to 5 years of employment had the smallest representation ($n = 3$, 5.4%), 6 to 10 years slightly more ($n = 6$, 11.3%), 11 to 15 years even higher ($n = 16$, 30.2%), and participants with over 15 years employment at PLS reigned in as the majority ($n = 28$, 52.8%). Participants must have worked at PLS for at least 2 years per our qualification criteria; thus, any participant who responded with less than 2 years of employment was removed from the sample. The sample participants also demonstrated longevity in their current position with a similar skew to employment at the library system overall. Specifically, participants indicated 6 months to 1 year in their role ($n = 1$, 1.9%), 1 to 2 years ($n = 7$, 13.2%), 3 to 5 years ($n = 5$, 9.4%), 6 to 10 years ($n = 11$, 20.8%), 11 to 15 years ($n = 14$, 26.4%), and more than 15 years ($n = 15$, 28.3%). Though both employment questions had a negative skew in distribution, the distribution for time spent in the current role had flatter kurtosis. This demonstrated a wider

distribution or, put another way, an indication that participants have changed roles within the library system during their tenure of employment.

Table 5. Descriptive Statistics: Employment Demographics

Characteristic	Frequency	%
Employment at PLS		
2–5 years	3	5.4
6–10 years	6	11.3
11–15 years	16	30.2
More than 15 years	28	52.8
Decline to answer	0	0.0
Employment in current role		
6 months to 1 year	1	1.9
1–2 years	7	13.2
3–5 years	5	9.4
6–10 years	11	20.8
11–15 years	14	26.4
More than 15 years	15	28.3
Decline to answer	0	0.0

Note. N = 53.

Organizational Structure. Table 6 shows the frequencies of role and region demographics of the sample. Regarding role, most of the participants identified as librarians (*n* = 38, 71.7%). The other three preidentified categories for role in the vertical hierarchy (i.e., Library Service Manager, Regional Manager, and Library Leadership Team) were combined as "Management / Leadership" (*n* = 8, 15.1%) to protect the anonymity of the participants due to the small number of disaggregated responses in each category. Some participants who used the

option to self-disclose their role title were identified as falling into a category related to the population understudy ($n = 7$, 13.2%). We kept these participants in the sample after conversation with a PLS representative—the participants would have experienced the impact of the transition to remote work and we did not want to eliminate their perspective from the research. Regarding region, there was a widespread response across the library system. The sample had the highest response frequency from the library system's central services ($n = 14$, 20.8%) and the lowest response frequency from Region 2 ($n = 1$, 1.9%). One participant declined to answer the question ($n = 1$, 1.9%). Due to the small number of participant responses from several of the regions, reporting of regional between-group differences and thematic findings were categorized into two buckets: (a) regional responses and (b) central services responses.

Table 6. Descriptive Statistics: Organizational Structure Demographics

Characteristic	Frequency	%
Role at PLS		
Librarian	38	71.7
Library Service Manager	4	7.5
Regional Manager	1	1.9
Library Leadership Team	3	5.7
Management / Leadership*	8	15.1
Other – Related to Population Under Study	7	13.2
Region		
Region 1	5	9.6
Region 2	1	1.9
Region 3	4	7.5
Region 4	4	7.5
Region 5	3	5.7
Region 6	7	13.2

Characteristic	Frequency	%
Region 7	4	7.5
Region 8	8	15.1
Region 9	5	9.4
All regions combined (1–9)**	41	77.3
Central Services	11	20.8
Decline to answer	1	1.9

Note. $N = 53$; *For role, "Management / Leadership" includes library service managers, regional managers, and library leadership team members. **For region, each region is reported separately and then in the aggregate as "All regions combined (1–9)."

Participant Demographics. Table 7 shows the frequencies of the identity-based demographics of the sample. Most survey respondents held a master's degree ($n = 48$, 90.6%). Some participants indicated an educational attainment of a bachelors degree ($n = 4$, 7.5%) and one participant indicated having a doctorate or other professional degree ($n = 1$, 1.9%).

For age distribution, there was a positive kurtosis indicating a clustering of participant ages in the middle range of the age distribution. There were no participants aged 18 to 24 ($n = 0$, 0%) nor any participants aged 65 or older ($n = 0$, 0%). There was a single participant in the 25 to 34 age range ($n = 1$, 1.9%). Most participants indicated ages 35 to 44 ($n = 20$, 37.7%), 45 to 54 ($n = 20$, 37.7%), and 55 to 64 ($n = 11$, 20.8%). One participant declined to report their age ($n = 1$, 1.9%). Most participants reported identifying as a woman ($n = 46$, 86.8%). A few participants reported their gender identity as a man ($n = 3$, 5.7%) or gender expansive including nonbinary, gender fluid, genderqueer, gender nonconforming ($n = 1$, 1.9%). No participant self-described their gender identity ($n = 0$, 0.0%). A small number of participants declined to report gender identity ($n = 3$, 5.7%). Regarding race and ethnicity, the sample was largely skewed as White (n

= 45, 84.9%). In the survey, participants could choose to self-identify as multiple races or ethnicities. One participant self-described, using the term "mixed," and two participants checked multiple boxes. These three participants were recoded as "Multiracial" ($n = 3$, 5.7%). Additionally, a smaller number of participants identified as Hispanic or Latino ($n = 2$, 3.8%), Asian ($n = 1$, 1.9%), or declined to answer ($n = 2$, 3.8%).

Table 7. Descriptive Statistics: Identity-based Demographics

Characteristic	Frequency	%
Educational attainment		
Bachelors	4	7.5
Masters	48	90.6
Doctorate or other professional degree	1	1.9
Decline to answer	0	0.0
Age		
18–24	0	0.0
25–34	1	1.9
35–44	20	37.7
45–54	20	37.7
55–64	11	20.8
65 or older	0	0.0
Decline to answer	1	1.9
Gender identity		
Woman	46	86.8
Man	3	5.7
Nonbinary / gender fluid / genderqueer / gender nonconforming	1	1.9
Decline to answer	3	5.7
Race / ethnicity		

Characteristic	Frequency	%
Hispanic or Latino	2	3.8
American Indian or Alaskan Native	0	0.0
Asian	1	1.9
Native Hawaiian or Other Pacific Islander	0	0.0
Black or African American	0	0.0
White	45	84.9
Multiracial	3	5.7
Decline to answer	2	3.8

Note. $N = 53$.

Findings

The findings of the data analysis are presented in context of the research questions guiding the study.

Research Question 1 Findings

The first research question guiding this study focused on identifying the impact of the transition to remote work on knowledge sharing. Findings related to this question include (a) measurements of knowledge sharing, communication, and connection; (b) correlational findings among those measurements; and (c) contextual themes from participants' narrative responses. Details for each of these findings follow.

Table 8 shows the descriptive statistics of knowledge sharing, communication, and connection measures. For a visual of these findings, see Appendix G. These findings capture the changes, or impact, of the transition to remote work operations. The statistics are reported both for the complete sample ($N = 53$) and for the reduced sample ($n = 38$) when accounting for

pairwise deletion of missing data. This distinction is made because correlational inferences could only be generated from the reduced sample of participants who answered all closed-ended questions spanning communication, connection, and knowledge sharing. Knowledge sharing generated a mean of 3.1491 (n= 38) with the lowest standard deviation (SD = 0.65475) of all the measures. This finding showed respondent data were clustered closest to the mean for this measure, indicating the least amount of variance in reporting. Put another way, respondent data indicated the highest level of agreement on knowledge sharing scores. In contrast, reported measures for connection to other staff (M = 3.47, SD = 1.390, n = 38; M = 3.30, SD = 1.381, n = 53) had the highest standard deviation indicating the greatest variance, or lowest level of agreement, among sample participants.

Table 8. Descriptive Statistics: Communication, Connection, and Knowledge Sharing

Measure	n	M	Minimum	Maximum	SD
Knowledge Sharing	38	3.1491	1.87	4.40	.65475
Q9: Synchronous Communication	53	3.83	1	5	1.172
	38	3.82	1	5	1.249
Q10: Asynchronous Communication	53	3.62	2	5	.837
	38	3.71	2	5	.867
Q11: Formal Communication	53	3.77	1	5	.869
	38	3.84	2	5	.855
Q12: Informal Communication	53	3.43	1	5	1.264
	38	3.55	1	5	1.108
Q13: Connection to Team	53	3.08	1	5	1.071
	38	3.16	1	5	1.128
Q14: Connection to Other Staff	53	3.30	1	5	1.381
	38	3.47	1	5	1.390

Measure	n	M	Minimum	Maximum	SD
Q15: Connection to Organization	53	2.55	1	5	1.066
	38	2.63	1	5	1.125

Note. *N* = 53 represents the complete sample, *n* = 38 represents the sample when accounting for pairwise deletion of missing knowledge sharing scores.

Correlational analysis was used to assess the impact of changed communication practices and feelings of connection on knowledge sharing in the organization. Table 9 captures the resulting correlation (*r*) values with a significance level of $p < 0.05$. The results indicated that Q10 related to frequency of asynchronous communication had a statistically significant positive correlation to knowledge sharing ($r = .370, p < 0.05$). In other words, increased asynchronous communication in the remote work setting correlated to an increased report of knowledge sharing. Additionally, Q14 related to connection to staff outside the team and Q15 related to connection to the organization both have a statistically significant negative correlation to knowledge sharing ($r = -.379, p < 0.05$ and $r = -.386, p < 0.05$, respectively). These statistics indicated an increase in connection to staff outside the team or increase in connection to the organization both caused a decrease in reported knowledge sharing. All three significant correlations fell in the range of 0.30 to 0.49 indicating a medium level of strength rather than a small (0.10 to 0.29) or large (0.50 to 1.0) correlation (Pallant, 2016).

Table 9. Pearson Product-moment Correlations for Q9-15 and Knowledge Sharing (N=38)

Survey item	r
Q9: In the virtual and hybrid work environment, has the frequency of your synchronous communications with staff at the library system primarily decreased or increased?	-.146

Survey item	r
Q10: In the virtual and hybrid work environment, has the frequency of your asynchronous communications with staff at the library system primarily decreased or increased?	.370*
Q11: In the virtual and hybrid work environment, has the frequency of your formal communications with staff at the library system primarily decreased or increased?	-.034
Q12: In the virtual and hybrid work environment, has the frequency of your informal communications with staff at the library system primarily decreased or increased?	-.268
Q13: In the virtual and hybrid work environment, has your connection to your team at the library system primarily decreased or increased?	-.245
Q14: In the virtual and hybrid work environment, has your connection to staff outside your team at the library system primarily decreased or increased?	-.379*
Q15: In the virtual and hybrid work environment, has your connection to the library system as an organization primarily decreased or increased?	-.386*

Note. $*p < 0.05$

Contextual Themes Related to Research Question 1. From the inductive coding process, nine themes and clusters of meaning were generated (see Appendix H). Three of the themes are related to the first research question. These three themes were:

1. Adoption of New Technology

2. Changes to Organizational Structure

3. Changes in Organizational Culture

Theme 1 - Adoption of New Technology. Two of the narrative questions focused on how the transition to remote work operations impacted knowledge sharing. The data revealed employees had to use new technology while in remote work operations. This theme had the

highest rate of occurrence among survey respondents ($n = 38$, 88.4%). Clusters of meaning that were coded as *adoption of new technology* included (a) using new digital collaboration tools (e.g., Microsoft Teams and Zoom), (b) needing to learn how to use of new digital tools, and (c) refusing to adopt the new technology. Participants who mentioned new technology in manners such as these were coded for this theme. An example of a participant response coded under this theme was: "learning the new technology like Teams and Zoom were a little stressful at first, now I can't imagine not using these in my regular work." Another respondent detailed: "[Microsoft Teams] allowed an amazing new world of cross-team collaboration, and changed who I considered my 'team.'" Some respondents included how the new technology helped them do their job, like this quote:

> The only saving grace was being able to use tools such as Teams and Zoom to interact with my newfound colleagues. I would have been lost on how to basically do every aspect of my new position without virtual communication with them.

Additionally, there were responses associated with the importance of the development of norms of use to communicate and share knowledge while in remote work operations. As examples of this theme, respondents made statements such as, "we also created norms about what types of communication happen where," and "it was a little rocky at first since we didn't have any norms around how to use the tool." Answers described needing to know where to go to access information, share information, and when to use certain technology tools.

An additional cluster of meaning that appeared within this theme, although less noted, was employees' refusal to use technology tools to communicate and share knowledge. As seen in this response, "some staff who were working in person at the branch refused to use the tools that make it easier to effectively communicate with staff who are working remotely." Additionally, a comment made by a respondent summed up this theme: "my operations manager refused to use

teams. This made it difficult to communicate with staff working in the branch while I was working remotely."

Theme 2 - Changes to Organizational Structure. The next theme is oriented toward how employees experienced the adaptation of the organizational structure to the new landscape of remote work operations. This theme occurred in over a third of the participant responses ($n = 15$, 34.9%). Clusters of meaning that were coded as changes to organizational structure included (a) new committees and (b) personnel transitions. Respondents reported the formation of new teams and committees within the organization. A respondent described this accordingly, saying, "management created new programming teams, which changed the mix of people you would communicate with in the course of your work." Additionally, respondents detailed staff leaving and joining the organization and moving into new roles as explained in this response: "we've had a lot of new staff start including top levels of the organization." A good example of this theme was summed up by this respondent:

> We have lost a lot of staff to retirement and leaving for positions outside the library over the past 2 years. The loss of long-time colleagues, combined with social isolation and rapid changes in work and home life routines have also had an impact.

Theme 3 - Changes in Organizational Culture. The third theme detailed how interactions between individuals and groups changed as a result of the transition to remote work operations. This theme occurred in close to two thirds of the participant responses ($n = 28$, 65.1%). Clusters of meaning that were coded as changes in organizational culture included (a) shifting organizational practices, (b) the related psychological impacts of these shifts such as stress, confusion, and feelings of isolation, and (c) changes in the level of connection employees felt with their colleagues and organization. For example, respondents made statements such as, "we understood the tasks that we were supposed to perform, but we had to get used to all new

tools and procedures in order to complete the tasks." Additionally, respondents described changes in the level of connection employees felt with their colleagues and the organization, which included both increased and decreased connection. As an example, one respondent indicated: "increased collaboration with librarians across the county who I already knew." Other respondents made statements such as "I've lost a lot of informal connections," "it has been hard to recreate the conditions for informal sharing during large meetings, but I feel that much of this now happens asynchronously," or "informal sharing that wasn't solicited is often discouraged within organizational culture, which portrays it as a burden on staff time and capacity."

Research Question 2 Findings

The second research question guiding this study focused on identifying barriers and catalysts to knowledge sharing. Findings related to this question included (a) contextual themes from participants' narrative responses, (b) differences in measured knowledge sharing, and (c) differences in frequencies of contextual themes. Details for each of these findings follow.

Contextual Themes Related to Research Question 2. Six of the nine themes are related to the second research question. Four of these themes were identified as barriers to knowledge sharing:

4. Lack of Access to Technology

5. Lack of Clarity

6. Perceived Gaps Between Administration and Librarians

7. Information Overload

The remaining two themes were identified as catalysts for knowledge sharing:

8. Increased Options for Communication

9. Ability to Innovate

Theme 4 - Lack of Access to Technology. This theme focused on employees who lacked

access to technology. Theme 4 occurred with the least amount of frequency among survey

respondents ($n = 8$, 18.6%). Clusters of meaning that were coded as lack of access to technology

included (a) lack of access to physical technology and (b) lack of technology skills. Participants

who mentioned issues accessing technology were included in this theme. There were multiple

responses associated with respondent's lack of physical technology hardware or a lack of skills

to use the available technology. As one respondent disclosed, they lacked technology resources

at first but were "better off than others as [they] had an aging computer," and "[they knew] one

librarian who had only a cell phone." Another respondent noted the transition to the remote work

environment "highlighted gaps in technology skills among colleagues and between

departments." Finally, a respondent made this statement that summed up this theme: "I didn't

know which tool to use – all of a sudden everything was Microsoft Teams and I didn't know how

to use it (not sure I do now!)."

Theme 5 - Lack of Clarity. The next theme was oriented toward the ambiguity of

information being shared and received as a result of the transition to remote work operations.

This theme occurred in over half of the sample population ($n = 22$, 51.2%). Clusters of meaning

that were coded to lack of clarity included (a) not knowing the current policies and procedures,

(b) not knowing who to ask for help, (c) not knowing which digital tool or platform to use for

accessing information, (d) lack of support or guidance from management, and (e) sporadic

communications. As an example of this theme, a respondent noted: "sometimes it remains

difficult to figure out to whom you need to send something, as there have been so many changes

to duties and structures and even personnel." Additionally, narrative responses described

sporadic communications and a lack of support from management. A response example that

framed this idea well was: "we got long confusing emails from upper management at infrequent and unpredictable intervals." A respondent indicated, "directions are frequently changing and frequently contradictory." Finally, a respondent made statements about the "lack of protocols for using [new technology] platforms," "constant role changes to adapt to new service decisions," and "lack of a forum to discuss or[sic] clear direction on how programming teams should have been established and then operate." A good example of this theme was summed up by this respondent:

> I had moments of frustration when some colleagues did not log into to teams or recognize that being in teams makes you available to the team and others. Some members of our management team are still more reliant on email than MS teams.

Theme 6 - Perceived Gaps Between Administration and Librarians. The sixth theme generated from narrative responses indicated perceived gaps between administration and librarians. This theme occurred in nearly half the sample population ($n = 19$, 44.2%). Clusters of meaning that were coded to perceived gaps between administration and librarians included (a) limited avenues for providing input, (b) feeling that information shared upward was disregarded, (c) feelings of distrust between librarians and administration, (d) lack of transparency in decision making, and (e) fear of reprimand. This response captured core aspects of Theme 6:

> My communication with management beyond my immediate supervisor decreased and the siloing[sic] of administrative information got worse. My ability to share feedback with administrators working on organizational strategy went to zero. Administrative teams who were working on system-wide strategies never shared information down through the organization or asked for participation & feedback either synchronously or asynchronously.

Additionally, respondents made statements such as: "there seems to be a gap of knowledge sharing between administrators and librarian staff," "there was no trust or confidence that librarians know what works for their community," "the system level has made things more difficult and confusing, constantly changing the processes and erecting

barriers," or "the administrative team now is not sharing their thought processes."

Similarly, another respondent indicated, "we also must seek permission to pursue new

knowledge from many layers of management. Managers on different layers disagree on

what knowledge is needed by staff." A good example of this theme was summed up by

this respondent: "the administrative team now is not sharing their thought processes and

are dropping bombs on staff without sharing any background. It feels like decisions are

being made in the back room and presented as surprises."

  Theme 7 - Information Overload. The data revealed employees experienced information

overload as a result of the organization's transition to remote work operations. This theme

occurred for nearly a third of the sample population ($n = 13$, 30.2%). Clusters of meaning that

were coded as information overload included (a) increase in the frequency of meetings, (b) too

many communication tools, and (c) increase in the amount of information being shared.

Participants who mentioned information overload in such a manner were coded under this theme.

As examples of this theme, respondents made statements such as: "we had more frequent

meetings," "lots and lots of meetings," "sitting at a computer all day in back-to-back meetings is

exhausting," and "the meetings themselves had been present before, however, the frequency [of

virtual meetings] increased by 2 to 4 times." Additionally, some narrative responses indicated a

need among respondents to manage more communication streams. This was evident in the

following example: "I don't know whether to check Teams or email or the intranet for more

information." A good example that summed up this seventh theme well was: "it proliferated to

insane amounts as multiple platforms and multiple means of communication were implemented.

We were drowning in meetings and minutia. More was being said and less was being

understood."

Theme 8 - Increased Options for Communication. As a result of the organization's

transition to remote work operations, employees noted increased options for communication. The

theme surfaced in a high percentage of the sample population ($n = 32$, 74.4%). Clusters of

meaning that were coded as increased options for communication included (a) ability to

communicate more broadly across an organization, (b) increase of knowledge sharing between

individuals in similar roles, and (c) increase in knowledge sharing between groups with similar

functions. The data revealed employees were able to communicate more broadly across

geographic boundaries (e.g., regions) of the organization. For example, responses included

statements such as: "this allowed an amazing new world of cross-team collaboration,"

"collaborating with counterparts across the system that we would have never been able to work

with pre-pandemic," "having virtual and hybrid tools has helped us share knowledge across

geographical barriers," "I had more access to library staff that I did previously," and "efficiency

of online meetings is great for a staff spread across a county of this size." This quote provided a

summation of employee's ability to communicate more broadly across the organization:

> [I] was able to work with more staff across the system instead of staff working in
> the same building. I could share information and feedback which increased
> by[sic] ability to answer questions and support my own staff. Because I was able
> to check-in "online" I was able to meet with staff more often and stay up-to-date
> on their progress.

Additionally, included in this cluster of meaning were narrative responses that

indicated there was an increase in knowledge sharing between individuals with similar

roles and between groups with similar functions as described by this respondent:

"knowledge sharing has increased within job classes, regions and programming groups."

In the opposite manner, a respondent indicated: "connection increased locally by local

branch or region, however, I feel the silos at other branches and services continued." A

good example of this theme was summed up by this respondent: "I was able to

communicate with people outside of my region and I was able to reach out to people

more easily."

    Theme 9 - Ability to Innovate. The final category describes how the transition to remote

work operations created opportunities for employees to innovate. This theme occurred in over a

third of respondents (*n* = 15, 34.9%). Clusters of meaning that were coded as ability to innovate

included (a) developing new types of programs, (b) greater levels of schedule flexibility, and (c)

the ability to share ideas and brainstorm among colleagues. Participants who mentioned trying

innovative approaches to their work were coded for this theme. An example of a participant

response coded under this theme was: "we were able to talk as librarian teams much more, and

we had license to be creative and try to find new ways to serve people." Another statement

bundled in this theme was: "our creative work has increased, as has our ability to experiment

with new ways of communicating to the public." Similarly, a respondent indicated: "the

opportunity to create, learn and explore expanded exponentially." Respondents included

statements such as: "it offered us opportunities to discuss challenges and successes as a cohort

and learn from each other," and "I like the Teams app for sharing ideas, articles, processes, etc."

Additionally, there were significant responses associated with greater levels of schedule

flexibility that new technology tools provided, and the ability to share ideas and brainstorm

among colleagues. As an example, a respondent indicated: "it's exhilarating to work with like-

minded folks on new ideas." Another detailed that technology tools were a "very effective way

to quickly share information and get help in a variety of specialties." Respondent examples that

frame these ideas well included: "I miss the flexibility I had working from home. I had a lot

more freedom to do my work when I could and needed too. I felt more busy but was happy to be

at home and manage my time the way I wanted too[sic]" and "We missed the connections and

random meetings that then lead to new programs and services. Or sharing ideas that lead to us serving patrons better."

Between-Group Variance. Findings related to differences in knowledge sharing measurements and experience follow.

Measured Differences. Table 10 presents findings from the ANOVA tests used to identify barriers or catalysts to knowledge sharing based on the collected demographic characteristics. The results of the one-way ANOVA tests revealed there was not a statistically significant difference of measured knowledge sharing scores for any of the groups tested (i.e., role, region, educational attainment, age, gender identity, race/ethnicity, length of employment, or length of time in current role). The respective results for the ANOVA tests on knowledge sharing in relation to demographic groupings include $F(2,35) = 1.276$, $p = .292$ for role, $F(1,36) = 3.178$, $p = .083$ for region, $F(1,36) = 1.647$, $p = .209$ for educational attainment, $F(2,35) = .30$, $p = .74$ for age, $F(3,34) = .730$, $p = .541$ for race/ethnicity, $F(3,34) = .813$, $p = .496$ for length of employment with the library system, and $F(5,32) = 1.255$, $p = .307$ for length of time in current position. Even though the ANOVA results were not statistically significant, the effect size results were noted.

Length of current role at PLS was the only demographic variable to suggest a large effect size as indicated by its eta squared value above .138 (Length of current role $\eta^2 = .164$). Four of the variables suggested a medium effect size as indicated by their eta squared values above .06 (Race/Ethnicity $\eta^2 = .061$, Length of Employment $\eta^2 = .067$, Role $\eta^2 = .068$, Region $\eta^2 = .081$). Two of the variables suggested a small effect size as indicated by their eta squared value above .01 (Age $\eta^2 = .017$, Educational Attainment $\eta^2 = .043$). The strength of the relationship between gender and knowledge sharing could not be assessed due to a violation of the assumption of

homogeneity. Means and standard deviations are not presented due to instances of subsample

sizes below 10 in each grouping.

Table 10. ANOVA Findings

Between groups	η^2	F	Sig.
Role	.068	1.276	.292
Region	.081	3.178	.083
Educational attainment	.043	1.647	.209
Age	.017	.298	.744
Gender*	-	-	-
Race/ethnicity	.061	.730	.541
Length of employment	.067	.813	.496
Length of current role**	.164	1.255	.307

Note. $N = 38$; *Assumption of homogeneity was violated for gender; **Large effect size.

Contextual Differences. Using descriptive statistics, we also examined the difference in

occurrences of contextual themes based on role and region. Table 11 shows the frequency of

theme occurrence for participants who responded to the open-ended questions ($n = 43$).

"Adoption of new technology" (i.e., Theme 1) occurred most frequently ($n = 38$, 88.4%).

"Changes to organizational structure" (i.e., Theme 2) occurred in over a third of the participant

responses ($n = 15$, 34.9%). "Changes to organizational culture" (i.e., Theme 3) occurred in over

two thirds of the participant responses ($n = 28$, 65.1%). "Lack of access to technology" (i.e.,

Theme 4) occurred with the least frequency ($n = 8$, 18.6%). "Lack of clarity" (i.e., Theme 5)

occurred in over half of the sample population ($n = 22$, 51.2%). "Perceived gaps between

administration and librarians" (i.e., Theme 6) occurred in nearly half the sample population ($n =$

19, 44.2%). "Information overload" (i.e., Theme 7) occurred for nearly a third of the sample

population ($n = 13$, 30.2%). "Increased options for communication" (i.e., Theme 8) was noted by

close to three quarters of the sample population ($n = 32$, 74.4%). Finally, "ability to innovate"

(i.e., Theme 9) occurred in over a third of the participant responses ($n = 15$, 34.9%).

Table 11. Descriptive Statistics: Frequency of themes

Theme	Description	Frequency	%
Theme 1	Adoption of new technology	38	88.4
Theme 2	Changes to organizational structure	15	34.9
Theme 3	Changes to organizational culture	28	65.1
Theme 4	Lack of access to technology	8	18.6
Theme 5	Lack of clarity	22	51.2
Theme 6	Perceived gaps between administration and librarians	19	44.2
Theme 7	Information overload	13	30.2
Theme 8	Increased options for communication	32	74.4
Theme 9	Ability to innovate	15	34.9

Note. $n = 43$.

Table 12 and Table 13 provide a summary of the frequencies at which the nine core

contextual themes appeared in participants' open-ended responses in relation to their role and

region within the organization. "Lack of clarity" (i.e., Theme 5) appeared at a higher frequency

for the librarian group compared to the other groups (librarians: $n = 18$, 58.1%;

management/leadership: $n = 2$, 28.6%; other: $n = 2$, 40.0%). "Perceived gaps between

administration and librarians" (i.e., Theme 6) also exhibited the same pattern (librarians: $n = 18$,

58.1%; management/leadership: $n = 0$, 0.0%; other: $n = 1$, 20.0%). Additionally, both Themes 5

and 6 appeared at a higher frequency for all regions compared to central services (regions: $n =$

20, 57.1% and $n = 18$, 51.4%, respectively; central services: $n = 2$, 25.0% and $n = 1$, 12.5%,

respectively). Furthermore, there were discrepancies in responses by role presented in "ability to

innovate" (i.e., Theme 9) and "perceived gaps between administration and librarians" (i.e.,

Theme 6); both themes appeared regularly in librarian responses but neither theme appeared in

any management/leadership responses (librarians: $n = 13$, 41.9% and $n = 18$, 58.1%,

respectively; management/leadership: $n = 0$, 0.0% and $n = 0$, 0.0%, respectively). The last

notable observation was that "information overload" (i.e., Theme 7) appeared at nearly twice the

frequency for management/leadership compared to librarians (librarians: $n = 8$, 25.8%;

management/leadership: $n = 4$, 57.1%; other: $n = 1$, 20.0%).

Table 12. Descriptive Statistics: Themes Frequencies by Role

Theme	Librarians			Management / leadership*			Other		
	n	frequency	%	n	frequency	%	n	frequency	%
Theme 1	31	29	93.5	7	5	71.4	5	4	80.0
Theme 2	31	11	35.5	7	1	14.3	5	3	60.0
Theme 3	31	22	71.0	7	3	42.9	5	3	60.0
Theme 4	31	5	16.1	7	2	28.6	5	1	20.0
Theme 5	31	18	58.1	7	2	28.6	5	2	40.0
Theme 6	31	18	58.1	7	0	0.0	5	1	20.0
Theme 7	31	8	25.8	7	4	57.1	5	1	20.0
Theme 8	31	24	77.4	7	5	71.4	5	3	60.0
Theme 9	31	13	41.9	7	0	0.0	5	2	40.0

Note. $n = 43$; *For role, "Management / Leadership" includes library service managers, regional managers, and library leadership team members.

Table 13. Descriptive Statistics: Theme Frequencies by Region

Theme	All regions			Central services		
	n	frequency	%	*n*	frequency	%
Theme 1	35	32	91.4	8	6	75.0
Theme 2	35	12	34.3	8	3	37.5
Theme 3	35	24	68.6	8	4	50.0
Theme 4	35	6	17.1	8	2	25.0
Theme 5	35	20	57.1	8	2	25.0
Theme 6	35	18	51.4	8	1	12.5
Theme 7	35	11	31.4	8	2	25.0
Theme 8	35	28	80.0	8	4	50.0
Theme 9	35	13	37.1	8	2	25.0

Note. n = 43.

Summary

   After evaluating data collected from the electronic survey instrument for completeness of response, qualification for the study, and missingness in the data, we obtained a sample of 53 respondents. This number represented a healthy sampling of the overall population under study, which was identified as approximately 120 employees. To address inconsistent missingness within the closed-ended and open-ended response sections, two subsamples were used. A subsample of 38 was used for correlational analysis, and a subsample of 43 was used for the analysis of contextual themes. Tests for internal consistency revealed individual survey items related to knowledge sharing were measuring the same underlying construct, and thus, were combined into a composite knowledge sharing score. However, individual survey items related to communication and connection were not found to be measuring the same underlying construct and were, therefore, analyzed separately in relation to knowledge sharing. The results challenged

our initial hypotheses on the relationships between communication, connection, and knowledge sharing. An inductive approach was used to analyze the open-ended survey items, resulting in the generation of nine contextual themes. Each theme represents a broader umbrella comprised of several clusters of meaning derived from the inductive coding process. Finally, we examined differences in participants' knowledge sharing scores based on demographic characteristics for both the close-ended and open-ended data. The results of the thematic analysis aligned with our hypothesis that employees' experiences with knowledge sharing during remote work operations would not be uniform across role and region.

Chapter 5. Discussion

The purpose of this research study was to investigate how remote work operations impacted knowledge sharing as a result of an organization's internal adaptations to the changing environment. Specifically, the two research questions guiding this study were designed to uncover changes to the experience of knowledge sharing among library services personnel at PLS, including barriers and catalysts for knowledge sharing. Data was collected through an online survey questionnaire that was developed using the lens of the organizational learning conceptual framework guiding this study. The survey instrument included Likert scale ratings for items related to communication, connection, and knowledge sharing as well as narrative questions relating to participant experience. The research sample included library services personnel ($N = 53$) at PLS, a large public library system in the Pacific Northwest of the United States. A quantitative research methodology was used including correlational analysis of measured ratings for communication, connection, and knowledge sharing; quantified inductive hand-coding of participants' descriptions of their experience; and analysis of variance and frequencies by demographics. This chapter provides a discussion of the findings, limitations and strengths of the research, and based on what the research has shown, recommendations for PLS leaders and future researchers.

The research study yielded a variety of notable findings. Overall, descriptive statistics indicated participants measured the organization's level of knowledge sharing with the highest level of agreement compared to the communication and connection measurements. When disaggregated by demographics (i.e., role, region, tenure at PLS, educational attainment, age, gender identity, and race/ethnicity), there was no statistically significant difference in measured knowledge sharing scores. Participants' narrative responses indicated participants differently

experienced knowledge sharing in remote work operations across demographics. Put another way, participants similarly rated the amount of knowledge sharing happening at PLS but indicated differences in how they experienced the knowledge sharing. Several themes— specifically, lack of clarity, perceived gaps between administration and librarians, information overload, and ability to innovate—occurred at noticeably different frequencies when broken down by role and region. Librarians mentioned a lack of clarity at a higher frequency, whereas management mentioned information overload more frequently. No management/leadership participants indicated a gap between the administration and the librarian group; yet, over half of the librarian participants described a gap between the two groups. Furthermore, correlational analysis indicated (a) a positive relationship between asynchronous communication and knowledge sharing and (b) a negative relationship between connection (to staff outside the team and to the organization) and knowledge sharing. The following section discusses the study findings in more detail as connected to the research questions and literature.

Discussion

Several discussion points follow from the findings of this research study which illuminate conclusions related to the two research questions:

1. How has the transition to remote work operations impacted the ways in which knowledge is shared along an organization's vertical hierarchy?

2. What are the barriers and catalysts for knowledge sharing as a result of an organization's transition to remote work operations?

The discussion of study findings is contextualized in reference to the conceptual framework of organizational learning, which guided this study in conjunction with other organizational literature reviewed related to organizational change, organizational

communication, and organizational structure and culture. The discussion points are grouped by the independent variables—communication and connection—which are followed by other relevant organizational changes related to the dependent variable—knowledge sharing. Identified barriers and catalysts for knowledge sharing at PLS follow the presentation of general impacts. The following section is a high-level presentation of the notable findings in relation to the literature.

Connection to Literature

The resulting data from this study aligned with discourse in the literature in some respects and diverged in others. The literature suggested that communication, connection, and knowledge sharing are interrelated (Kanter, 2006; Plotnick et al., 2016), and, therefore, were likely to have a correlational relationship. We sought to identify if there was a correlation to knowledge sharing for communication or connection, and if so, the nature of the correlational directionality. The results of the correlational analysis show asynchronous communication to have a statistically significant positive correlation to knowledge sharing. This finding aligned with the literature review and supported the notions that communication provides the knowledge needed for action (Crossan et al., 1999) and can be the fulcrum of change for libraries (Novak & Day, 2015).

Resulting data also showed the level of one's connection to staff outside their team and the level of connection to the organization both had a statistically significant negative correlation to knowledge sharing. These findings diverged from the literature by revealing a new relationship between connection and knowledge sharing. The literature review identified a relationship related to feelings of disconnectedness and decreased knowledge sharing (Germain

& McGuire, 2014; Neeley, 2018; Plotnick et al., 2016); however, this study revealed feelings of connectedness, also, can be correlated with decreased knowledge sharing.

Resulting data from the ANOVA tests indicated there was not a statistically significant difference in measured knowledge sharing scores at PLS for any of the groups tested (i.e., role, region, educational attainment, gender identity, length of employment, and race/ethnicity). However, resulting data from the narrative theme quantification showed between-group differences in the frequency of contextual themes. These findings were consistent with the literature that indicated many factors influence the ability to share knowledge, including positionality within organizational structures, the dynamics between individuals and groups, the culture of an organization, and individual personnel demographics (Stephens & Russell, 2004; Vela, 2018).

This high-level presentation of notable findings showcases the complexity of the topic under investigation. The conceptual framework guiding this study allows for analysis of the intricacies of knowledge sharing across the organization by providing language to describe the structures and processes that can act as barriers and catalysts of knowledge sharing. Discussion of the findings in further detail is presented next grouped according to the two research questions.

Impact of the Transition to Remote Work on Knowledge Sharing

Communication. Findings from this study indicated communication practices related to knowledge sharing within the library services hierarchy changed as a result of the transition to remote work operations. As previously mentioned, it was found that asynchronous communication had a statistically significant positive correlation to knowledge sharing. As seen in the conceptual framework of organizational learning, there is a relationship between what one

knows and what one does (Crossan et al., 1999). In other words, participants indicated they experienced an increase in asynchronous communications (i.e., what one knows) and indicated increased knowledge sharing within the organization (i.e., what one does). This means that, for PLS, asynchronous communication appears to correlate to the strategic and operational work of the organization (Crossan et al., 1999; Kanter, 2006) through increased levels of knowledge sharing. Additionally, this finding supported the idea that communication is necessary for organizational change in libraries (Novak & Day, 2015), in the case of PLS, specifically asynchronous communication. Consequently, ongoing use of asynchronous communication at PLS will allow knowledge to be shared broadly and deeply throughout the organization as suggested by the literature and our study findings. Furthermore, leveraging this communication modality can support the speed, accuracy, and consistency of messaging (Ecklebe & Loffler, 2021) needed during a crisis response (Coombs, 2010). Top-down asynchronous communication aligns with the feedback processes seen in the conceptual framework of organizational learning, allowing for the institutionalizing of norms and procedures across the organization (Crossan et al., 1999). As PLS adapts the organization to meet environmental changes, this institutionalization of knowledge is key to keeping employees across the organization on the same page in how they do their jobs and serve their constituencies.

At PLS, synchronous, formal, and informal communication measures did not show a statistically significant correlation to knowledge sharing. However, descriptive statistics for these ratings had negative skews. This indicated participants experienced increased levels of communication as a result of the transition to remote work independent of knowledge sharing. The mean scores for communication measures further indicate synchronous, asynchronous, and formal communication increased more than informal communication in the remote work setting.

These findings are consistent with the literature that indicated informal communication, such as hallway and breakroom conversations, occur less frequently in virtual settings (Morgan et al., 2014). For PLS, this means that leadership should consider ways to create and sustain informal communication streams. The conceptual framework of organizational learning shows, to feed knowledge forward in an organization, people need to dialogue and create shared meaning through the process of interpreting (Crossan et al., 1999). Although formal communication streams provide one space for the feedforward organizational learning process to take place, informal communication is a significant source of innovation for organizations (Röcker, 2012). As PLS leaders continue to push their organization to innovate through changing environmental conditions, informal communication streams should be cultivated in support of the organization's ability to continue to innovate.

Findings from the contextual themes provided further perspectives on communication changes at PLS related to knowledge sharing. "Increased options for communication" (i.e., Theme 8) indicated a change in organizational culture related to communication practices at PLS, specifically through increased options for communication across geographic boundaries and between personnel with similar roles. "Information overload" (i.e., Theme 7) included participant comments related to too many digital tools and too many meetings. These themes were complemented by "lack of clarity" (i.e., Theme 5), which included participant comments related to not knowing where to get necessary information and indications that communications were, at times, sporadic. In unison, these themes support the concept that knowledge sharing can encounter continuity and discontinuity at the same time (Berends & Lammers, 2010). From the lens of organizational learning, increased options for communication within the organization may have supported the feedforward and feedback processes for amplifying and disseminating

institutional knowledge throughout the library services hierarchy because these processes translate cognition into action (Crossan et al., 1999). However, participants noted a lack of clarity from changed practices, which can create challenges to using knowledge to embrace organizational change (Kotter, 1995; Lewin, 1947) and institutionalizing individual learnings into organizational memory (Crossan et al., 1999). In the context of the conceptual framework guiding this study, this lack of clarity for PLS employees may demonstrate a learning bottleneck (Bontis et al., 2002), which prevents the right information from reaching the people who need that information. This bottleneck can prevent knowledge from moving forward or backward in the organization. Leaders should strategically allocate resources to explore and develop specialized norms and skillsets that create a thriving environment for employees using technology-mediated communications (Bennett, 2014; Benson et al., 2002; Germain & McGuire, 2014; Krumm et al., 2016; Thomas, 2014).

Furthermore, it is recommended that future research explore communication as related to knowledge sharing because our study found communication measures for formal, informal, synchronous, and asynchronous communication did not measure the same underlying construct. In other words, the type of communication used may differentially impact knowledge sharing levels. Further, this preliminary study sought to uncover impacts to knowledge sharing but not necessarily why those impacts occurred. Literature indicated remote work influences communication practices (Morgan et al., 2014; Neeley, 2018; Staples & Webster, 2008) and communication influences knowledge sharing (Berends & Lammers, 2010; Bontis et al., 2002; Crossan et al., 1999). Our study corroborated a link between remote work, knowledge sharing, and asynchronous communication, but not synchronous, formal, or informal communication.

Connection. Findings from this study indicated participants experienced changed levels of connection to people and PLS as a result of the transition to remote work operations. As previously mentioned, it was found the level of one's connection to staff outside their team and the level of connection to the organization both had a statistically significant negative correlation to knowledge sharing. In other words, participants' increased connection to staff outside of their team correlated to a decrease in their ratings of knowledge sharing. The same correlation was found for participants' connection to PLS. These findings showcase a relationship that extends the current literature related to connection and knowledge sharing.

Additionally, analysis of the descriptive statistics related to connection showed overall mean scores for connection to team and connection to other staff increased more than connection to the organization. This finding indicates that some group level organizational learning processes, such as interpreting and integrating which move people from individual to collective thinking and action (Crossan et al., 1999), may have been strengthened in the remote work environment. However, barriers may exist at the organizational level where knowledge moves beyond the people who make up the organization and, rather, situates the knowledge into the "systems, structures, procedures, and strategy" of an organization (Bontis et al., 2002, p. 444). Put another way, PLS employees may be experiencing some increased connectedness at the individual and group level, but some decreased connectedness to the organizational policies and procedures.

In regard to participant experience, narrative responses grouped under "changes to organizational culture" (i.e., Theme 3) included both the strengthening of preexisting connections and the loss of emotional and cognitive connections. Respondents noted threats to their psychological safety including stress, confusion, and feelings of isolation, but as seen in

"changes to organizational culture" (i.e., Theme 2), respondents also acknowledged the formation of new teams. In "ability to innovate" (i.e., Theme 9), some respondents noted the lack of ability to bounce early ideas around with their colleagues for the purposes of informal idea sharing and brainstorming. These findings painted a picture about how connection manifests in varied forms within PLS in relation to the interpreting and integrating learning processes required for overall organizational learning (Crossan et al., 1999). The findings also surfaced follow-up curiosities warranting further research related to how connection contributes to dialogue and shared meaning (Crossan et al., 1999) and the ability to develop trust (Germain & McGuire, 2014; Neeley, 2018; Newell et al., 2007; Staples & Webster, 2008) in service of knowledge sharing. Sharing this summary of employees' varied experiences with the organization may provide a foundation for soliciting input on organizational changes as a means for improved job engagement and knowledge sharing (Lee et al., 2020), given that transparent communication can garner positive employee perceptions (Ecklebe & Loffler, 2021). Additionally, PLS leaders may want to evaluate if the formal lines of authority and communication (i.e., the organizational structure and culture) are in alignment with the needs of an organization experiencing a crisis given that misalignment can impede success for the organization (Hall & Saias, 1980; Miles et al., 1995). Afterall, organizations going through large scale change can place large amounts of strain on the organization and its individuals (Raffaelli, 2017). Incremental changes to structure and culture can be used to combat this stress during crisis (Pearson & Clair, 1998; Shrivastava, 1993). In combination the correlational findings, the descriptive statistical findings, and contextual theme findings showed the complexity of the interplay between connection and knowledge sharing within an organization.

Literature discourse acknowledged it is challenging for employees to connect, solve problems, and collaborate in remote settings (Galanti et al., 2021; Germain & McGuire, 2014; Krumm et al., 2016). The literature also indicated that a lack of connection makes it difficult to develop collaboration and shared understanding (Germain & McGuire, 2014; Plotnick et al., 2016; Neeley, 2018). Our study findings foreground multiple aspects of the relationship between remote work, knowledge sharing, and connection: at PLS, increased connection is correlated to decreased ratings of knowledge sharing, and connection is experienced both positively and negatively in context according to the identified themes. Together, this introduces quandaries for PLS leaders. For one, lack of connection fosters challenges to knowledge sharing; yet, at PLS, increased connection correlates to decreased knowledge sharing. Additionally, the impacts of remote work have created both benefits and challenges to knowledge sharing at PLS. Using the conceptual framework of organizational learning as a guide, this conclusion further corroborates the simultaneous continuity and discontinuity of learning flows within organizations (Bontis et al., 2002; Crossan et al., 1999). Our study extends the understanding of the link between remote work, knowledge sharing, and connection by showing that connection (or lack thereof) may have both positive and negative correlations to knowledge sharing.

Organization. Findings from this study indicated PLS, as an organization, has changed in other ways too as a result of the transition to remote work operations. Several contextual theme findings demonstrated how participants perceived the organization's changes. "Adoption of new technology" (i.e., Theme 1) captured the organization's adoption of new digital tools as well as an associated learning curve for norming the new tools and, in some instances, a refusal to embrace these tools. One respondent described the changes as "an amazing new world," which aligned with the concept of frame-breaking (Nadler & Tushman, 1989), revolutionary change

that "substantively disrupt[s] established activity patterns" (Romanelli & Tushman, 1994, p. 1141). The wide-spread acknowledgment of this change is captured by 88% of the participants including significant statements related to this theme in their narrative responses. Congruent with a need to engage in behavioral changes and culture shifts to mitigate damage from crisis-situations (J. Wang, 2008), PLS experienced a shift in organizational structure (captured by 34.9% of participants with Theme 2) and organizational culture (captured by 65.1% of participants with Theme 3). As a necessary change for organizational survival (Daft, 2016), PLS demonstrated the continued ability for libraries to change and adapt to serve their constituents (Nicholson, 2019; Stephens & Russell, 2004). Through the lens of organizational learning, PLS did not learn for the sake of learning (Crossan et al., 1999), but, rather, actively engaged in a process of organizational renewal as a by-product of crisis management (Heath, 2010). This renewal was captured in "adoption of new technology" (i.e., Theme 1), but also "ability to innovate" (i.e., Theme 9) with participant statements such as: "we had license to be creative and try to find new ways to serve people" and "the opportunity to create, learn and explore expanded exponentially."

As noted in the literature, environmental changes can present as both threats and opportunities for organizations (Raffaelli, 2017). Although PLS was able to capitalize on opportunities for change such as the adoption of new technology and an ability to innovate, these changes are not the only noteworthy changes related to the ability to share knowledge. "Lack of access to technology" (i.e., Theme 4) was noted among 18.6% of the respondents. This finding captured the fact that nearly a fifth of the participants identified challenges in accessing and using technology. From an equity perspective, leaders should consider how restricted resources such as lack of access (Daft, 2016) may differentially impact employees' ability to share

knowledge (Bontis et al., 2002). Additionally, "information overload" (i.e., Theme 7) captured an increase in meetings and communication tools. Although this finding is directly related to communication practices, it also illuminated changes in the amount of information to which people have access. As noted in the literature, the process of organizational learning is a dynamic, multilevel process in which knowledge is acquired, distributed, interpreted, and instilled across an organization through the commitment and intentional facilitation of management (Balbastre et al., 2003; Huber, 1991). Therefore, when the amount of accessible knowledge is limited (e.g., through inequities) or increased (e.g., through added communication streams), the process of organizational learning may be impacted as the amount of knowledge funneling forward, backward, and between organizational levels (Crossan et al., 1999) is itself impacted. Accordingly, "adoption of new technology" (i.e., Theme 1), "information overload" (i.e., Theme 7), and "ability to innovate" (i.e., Theme 9) supported the premise that organizations are dynamic systems with interdependent influencing factors (Bolman & Deal, 2017; Nadler, 2006; Senge, 1990) particularly as knowledge sharing systems apply knowledge toward organizational success (Crossan et al., 1999; Fiol & Lyles, 1985). Therefore, the notion that abrupt change can create or exacerbate organizational crisis in an organization (Keown-McCullan, 1997) was corroborated by the collected data of this study and underscores the importance that leaders need to manage anxiety and cultivate a learning mentality within the organization.

Barriers and Catalysts for Knowledge Sharing

Barriers and catalysts for knowledge sharing were present in several of the research findings. As previously discussed regarding impacts to knowledge sharing, participants' narrative responses to open-ended questions were used to contextualize the experience of remote

work operations on knowledge sharing. Six of the nine contextual themes were categorized as barriers or catalysts by our research team. Barriers included (a) lack of access to technology, (b) lack of clarity in finding information, (c) perceived gaps between administration and librarians, and (d) information overload. Catalysts included (a) increased options for communication and (b) the ability to innovate.

ANOVA test results revealed there was not a statistically significant difference in measured ratings of knowledge sharing for any of the groups tested (i.e., role, region, educational attainment, age, gender identity, race/ethnicity, length of employment, or length of time in current role). However, analysis of the contextual theme frequencies resulted in difference of knowledge sharing experience by role. The next section details the barriers and catalysts for knowledge sharing at PLS.

Barriers. Findings from this study indicated some participants lacked access to technology. "Lack of access to technology" (i.e., Theme 4) occurred with the least frequency compared to the other themes. However, this observation should not be dismissed as it highlights inequities among the sample population. The statements coded for this theme describe lack of access to physical technology hardware or skills which serve as barriers to knowledge sharing.

Findings indicated participants experienced a lack of clarity. "Lack of clarity" (i.e., Theme 5) occurred in over half of the sample population. This finding was consistent with the assembled literature that suggested remote work makes it challenging for employees to communicate (Morgan et al., 2014; Neeley, 2018; Staples & Webster, 2008). The statements coded for this theme described sporadic communications and a need for more guidance from management, which was similarly found in other research literature (Ecklebe & Loffler, 2021; Wakimoto, 2021).

Additionally, findings from the generation of contextual themes indicated participants experienced information overload as a result of PLS's transition to remote work operations. "Information overload" (i.e., Theme 7) occurred for nearly a third of the sample population. This theme appeared at nearly twice the frequency for management/leadership compared to librarians. The literature indicated the way leaders manage transition across an organization directly relates to the quality and success of change outcomes (Kotter, 1995). Through the lens of Lewin (1947) and Kotter (1995), communication across an organization is vital to managing transition and change.

Participant responses indicated a perceived gap between administration and librarians. "Perceived gaps between administration and librarians" (i.e., Theme 6) occurred in nearly half of the sample population. This theme was not present for any participants in management or leadership roles. This theme could be the linchpin to decoding differences in how participants described their experience knowledge sharing. Additionally, librarians reported "Lack of clarity" (i.e., Theme 5) more frequently than management. Both Themes 5 and 6 appeared at a higher frequency for all regions compared to central administration. Overall, these findings showcased a difference in experience related to knowledge sharing by role and region. This exhibition of lived experience is consistent with the literature that indicated barriers in communication can create tension between employees and leaders (Ecklebe & Loffler, 2021; Wakimoto, 2021). It is worth considering the interconnection between "lack of clarity" (i.e., Theme 5), "information overload" (i.e., Theme 7), and "perceived gaps between administration and librarians" (i.e., Theme 6). The speed, accuracy, and consistency of information shared at PLS as they navigated their crisis response had the potential to have a significant effect on the outcomes of the crisis (Coombs, 2010). The findings suggested librarians and administration faced different barriers to knowledge

sharing during this crisis response period; librarians primarily experienced lack of clarity as a barrier and management primarily experienced information overload. This may contribute to "perceived gaps between administration and librarians" (i.e., Theme 6) considering each constituency described experiencing the transition differently.

  Catalysts. Findings indicated participants experienced increased options for communication. "Increased options for communication" (i.e., Theme 8) was noted by close to three quarters of the sample population. As surfaced in the literature review, individuals, teams, and departments communicate through a variety of modes when working in virtual teams (Neeley, 2018). Additionally, as discussed in the aforementioned section on communication, asynchronous communication was found to be positively correlated to knowledge sharing. In this way, asynchronous communication appears to be a catalyst for knowledge sharing at PLS and should be continued.

  The transition to remote work operations created opportunities for employees to innovate. "Ability to innovate" (i.e., Theme 9) occurred in over a third of the participant responses. This was promising data for PLS as studies have shown working remotely can make it difficult to develop traits needed for collaboration and shared understanding (Germain & McGuire, 2014; Neeley, 2018; Plotnick et al., 2016). However, this contextual theme appeared regularly in librarian responses but not in any management/leadership responses. This finding indicated librarians regularly engaged in or thought about innovation in the remote work setting compared to those in administration, which may also be an indicator that librarian work experienced a larger need for change. The literature indicated leaders often draw upon past behaviors and old methods of operating rather than leaning into adaptation and change (Sheaffer & Mano-Negrin, 2003, as cited in Antonacopoulou & Sheaffer, 2013; Schawartz, 1987, as cited in

Antonacopoulou & Sheaffer, 2013) can stifle organizational development. PLS leaders may consider reviewing their changed work practices with this in mind.

Limitations and Strengths

This study had a variety of limitations and strengths. The use of a purposeful sampling technique was a strength of the study in that it aligned with the goals of the community partner and provided sufficient data for analysis from both the open-ended and close-ended survey questions. Another strength of the study was the use of a previously developed survey instrument (i.e., Strategic Learning Assessment Map [SLAM]) to measure our dependent variable—knowledge sharing; whereas, a limitation was that the researcher-developed tools for measuring combined constructs of communication and connection were deemed unreliable for constructs and, thus, the measurements had to be analyzed separately. Another strength was the total participant sample was approximately 38% of the total population under study; however, a limitation was management and leadership subgroups had small sample sizes. Larger participation from these subsamples could have allowed the subgroups to remain separate rather than combined. The need to combine subgroups was a limitation of our study.

Additionally, the study was conducted at a time period when the research team was going through their own versions of the transition to remote work onset by the COVID-19 global pandemic. We used intercoder reliability and a focus on the research questions to bracket the experience of participants as separate from our own. Further, due to the on-going COIVD-19 global pandemic, the data collection happened after a second transition in work operations for PLS, which informed minor methodological design changes to account for evolving language and definitions for "remote work." The first transition was from completely in-person to fully online, and the second transition was from online to a mixture of online and in-person. Put

another way, this study was designed when the community partner organization was in a fully remote work environment; however, due to the rapidly changing external environment, the survey instrument was updated and administered when remote work had nuanced beyond "fully remote" to include situations such as remote communications from within the same building. A limitation of the study is participant responses may have been influenced due to the timing of this transition and the time of data collection. The limitations of the study may impact the generalizability of the results beyond the context of the community partner, PLS.

Recommendations

At the onset of the COVID-19 global pandemic and initial transition to remote work operations, organizations and their leaders may have predicted this transition to be temporary and ephemeral. However, the definition and implementation of remote work continues to evolve in organizations. Remote work is changing to include nuances such as fully remote, partially remote, and hybrid environments (Sokolic, 2022). Even over the course of this research study's design and implementation, PLS experienced multiple transitions in the way they approached remote work. Libraries have and will continue to evolve to meet environmental needs (Nicholson, 2019; Smith, 2019; Stephens & Russell, 2004). Thus, although this research study focused on knowledge sharing practices during a specific transition in working conditions, PLS will likely find itself navigating more organizational changes in the future due to a rapidly changing world and a need to quickly respond to changing external environmental conditions (Ritchie, 2004; Stuller, 2009; Wang, 2008). In light of this uncertain future, the recommendations generated for PLS leaders are presented not only as retrospective learnings from an organizational crisis but also as proactive strategies for preparing the organization for future challenges. The recommendations include (a) intentionally cultivating and communicating

their desired future for the organization, (b) recognizing and celebrating innovation, (c) enhancing feedback learning through training and norms, (d) enhancing feedforward learning through participatory input, and (e) nurturing trust throughout the organization. These recommendations are specific and contextual to the community partner associated with this case study and grounded in the period of time when this study took place. However, these recommendations are also grounded in change management and knowledge sharing literature, which may provide guidance on how leaders handle organizational changes and continued changing environmental conditions. The following sections present these recommendations in detail.

Intentionally Cultivate and Communicate Their Desired Future

This research study captured how the resulting transition to remote work operations impacted knowledge sharing practices with regard to communication, connection, and other organizational changes. These impacts resulted from the transition to remote work operations where PLS leaders navigated crisis management; including a crisis response where leaders contained an actively occurring crisis. Now, PLS leaders are nearing a postcrisis stage where they can focus on managing the crisis's lingering effects, evaluate their response, and integrate learnings into their organization (Coombs, 2010; Zamoum & Gorpe, 2018). To this end, the literature showed learning from crisis provides an opportunity for strategic renewal of an organization in alignment with the organizational learning framework, which guided this study (Crossan et al., 1999). By engaging in strategic renewal, PLS can prepare for inevitable future disruptions to organizational practices.

From this lens of organizational learning, institutionalizing learning occurs when routines permeate systems through embedded knowledge (Crossan et al., 1999). This study captured

changes to knowledge sharing practices including new tools for communicating and changed

connection levels among the employees themselves and with the organization. Now, PLS leaders

have the opportunity to use the findings of this study to determine which changes they wish to

freeze into the organization through modifications to the rules and procedures (i.e.,

institutionalizing) that guide the organization's actions and learning (Crossan et al., 1999; Lewin,

1947). Whereas positive changes may be fused into organizational memory, less desirable

impacts of the transition to remote work can be mitigated. Individual behavior adjustments allow

for the integration of knowledge, from an organizational learning lens, so change generated

works toward the organization's goals (Crossan et al., 1999).

As PLS leaders interpret and integrate their learnings from this study's findings to

cultivate the desired future for the organization, they will want to communicate the desired future

throughout the organization (Kotter, 1995). This process of cultivation and communication

should be iterative and dynamic, in mirror of the organizational learning process, where learning

is integrated into the process through concurrent feedforward and feedback processes, which

constantly move knowledge between individuals, groups, and the organization (Crossan et al.,

1999). Put another way, as PLS leaders begin to see a new future for their evolving library

system, they should work with their organizational community to intentionally cultivate and

communicate the desired future for the organization, which may strengthen their ability to

overcome other emergent challenges.

Recognize and Celebrate Innovation

New ways of sharing knowledge emerged at PLS as a result of the transition to remote

work operations. The study found connection was increased between team members and

individual employees outside their team. The study found, overall, there were increases in

synchronous, asynchronous, and formal communication modes. Participants noted the adoption

of new technology brought new opportunities for these communications and connection changes.

In fact, one participant noted: "now I can't imagine not using these [tools like Teams and Zoom]

in my regular work." Participants also noted that new teams were formed and collaboration

across the organization now exists without barriers instilled by traditional regions or individual

branches. Multiple participants noted a new ability to serve their library community; for

example, one participant stated: "the opportunity to create, learn and explore expanded

exponentially." These new innovations across the organization can be celebrated. Each finding

showcases changes that PLS leaders can continue and build upon as the organization continues to

adapt and change.

PLS demonstrated flexibility and innovation in the way that the organization approached

the crisis response to remote work operations. Several findings of this study demonstrated how

PLS leaders and employees catalyzed knowledge sharing, which demonstrated how

organizations can realign with changed conditions through multiple levels of innovation (Fiol &

Lyles, 1985). By nature, innovation includes risk taking and experimentation, which does not

come without challenges, but this process of learning is what generates knowledge (March,

1991). PLS leaders should recognize and celebrate the positive changes that resulted from the

transition to remote work operations, including new ways of sharing knowledge, opportunities to

work more easily across the regions and branches, and increases to some forms of

communication and connection throughout the organization. PLS leaders can also name the

challenges that occurred and what was learned from these challenges. Afterall, organizational

literature warns that change efforts can suffer if not named and properly addressed (Chatman &

Cha, 2003; Detert et al., 2000; Miles et al., 1995; Weiss, 2006).

Although some of the innovations from the transition to remote work were organic (e.g., new programming being created and shared by individual librarians) and other innovations were strategic (e.g., the rollout of new technology tools), many of the innovations showed positive impacts on moving knowledge within the organization in alignment with the process of organizational learning (Crossan et al., 1999). We recommend PLS leaders bring attention to these successful change impacts alongside opportunities for further refinement. By recognizing and celebrating innovation, PLS leaders may increase assurance to their employees that PLS is an institution where learning is valued and celebrated. This aligns with PLS's espoused commitment to remain relevant to their patrons as a means to be an influential component of society. By recognizing and celebrating innovation, even when there exist challenges in addition to successes, PLS leaders have the opportunity to ease fear and resistance by tending to the human and symbolic elements of change (Bolman & Deal, 2006). Through this effort, PLS can develop their internal ability to handle future changes.

Enhance Feedback Learning Through Training and Norms

Strategic renewal of an organization can be generated though feedforward and feedback organizational learning processes (Crossan et al., 1999). Remote work operations require specialized norms and skillsets (Germain & McGuire, 2014; Krumm et al., 2016), which is seen in the research data where participants experienced new learning associated with the adoption of new technology and an initial lack of clarity in how to operate in a new working environment. Further, the literature indicated people face a general sense of ambiguity related to where change may take them or their organization (Weiss, 2006), which leaders can mitigate through a culture of growth mindset (Dweck, 2006), sometimes referred to as a learning mentality (Schein, 2010). As seen in the data, participants indicated several organizational changes related to knowledge

sharing as a result of the transition to remote work operations such as the adoption of new technology, a lack of clarity related to finding information, some amount of information overload, increased options for communication, new opportunities for programming, and a lack of clarity in knowing the current policies and/or procedures. These findings showed the complexity of change that PLS has endured and the resulting innovations and challenges appear intertwined.

The literature indicated PLS leaders have the opportunity to address these findings through the development of training and norms related to new modes of remote working. PLS leaders may want to consider developing shared meaning across the organization in regard to how to use new digital tools, what information is stored in which tools, and which repositories of knowledge will be retired for new ones, if any. PLS leaders also have the opportunity to move the intuited knowledge of individuals into team norms and restructured organizational practices through organization-wide training and development through the organizational learning feedback process (Crossan et al., 1999). The framework of organizational learning shows amplification and dissemination of learning are created by fostering action through the acquisition of knowledge between individuals, groups, and organizational norms (Crossan et al., 1999). To this end, trainings developed by individual librarians, as an example, can help amplify knowledge to other regions and roles, whereas agreed upon organizational norms can disseminate knowledge back to individuals through structured guidance and procedures.

Enhance Feedforward Learning Through Participatory Input

The root of organizational learning resides in the power of collective individual knowledge. This stems from the premises that organizations are built by individuals and sustained by embedding individual knowledge into organizational systems and structures (Bontis

et al., 2002). This research study found some opportunities for enhancing the feedforward learning process of moving knowledge from individuals to PLS leaders and, subsequently, the organization. In congruence with organizational development literature (Ecklebe & Loffler, 2021), the research study findings highlighted that PLS employees value and seek transparent communication, dissemination of knowledge, and participative communication processes. Furthermore, literature in the library sector, specifically, showed that library personnel seek to understand both what and why their organization is taking on change (Novak & Day, 2015). This study found that librarians at PLS feel a disconnect between librarians and administration, which may be reticent of the fact that, especially during times of change, library leaders are called to rely on information, communication, and—as shown here—participation as organizational success factors (Duren, 2013).

The organizational learning process can be used as a guide for PLS leaders in enhancing the movement of knowledge from individuals to the organization. The framework for organizational learning shows that gathering people in formal or informal groups can generate shared understanding and action (Crossan et al., 1999) by allowing individuals to share dialogue which exposes mental models and the "why" behind different perspectives (Weick, 1979, as cited in Crossan et al., 1999). This process allows individuals to adjust their behaviors and work toward a common mission through sustained conversations and shared action (Crossan et al., 1999). Library literature has shown a shift toward a participatory library models where libraries act as collaborators and facilitators of learning as a system (Nicholson, 2019); extrapolating this concept to the context of internal operations opposed to external operations, PLS library leaders can model participation by explicitly creating and promoting avenues for individuals to share their thoughts and perspectives. These solutions occur when decision makers take into

consideration multiple factors of influence, including organizational, interpersonal, and individual contexts (S. Wang & Noe, 2010). At PLS, this means that participatory cross-sector collaboration between people from different roles, regions, and backgrounds may provide otherwise-elusive solutions to emerge for complex organizational challenges (Vela, 2018).

Nurture Trust Throughout the Organization

Vision for the future sets the direction for an organization, innovation helps the organization learn, and feedback and feedforward processes help organizations move knowledge through an organization. All these recommendations, though, rely on nurturing trust throughout the organization. As seen in the literature, trust is essential to overcoming barriers and facilitating the sharing of knowledge, particularly for teams working virtually (Germain & McGuire, 2014; Neeley, 2018; Newell et al., 2007; Staples & Webster, 2008). Trust can be built through transparency, communicating effectively, and standardizing internal processes; and, trust also requires understanding colleagues and understanding how others perceive your actions (Neeley, 2018). For PLS leaders, this means making intentional effort to increase social cohesion across the organization and acknowledging impacts of organizational changes. Resistance and challenges to change can, in fact, be resources for buy-in (Ford & Ford, 2009) and, subsequently, a building of trust, when library leaders kit together divergent perspectives and embrace a team-oriented culture (Kaarst-Brown et al., 2004). Put another way, each of the first four recommendations can be accomplished without centering trust and community building; however, the organization is likely to prosper if PLS leaders center trust in the way they approach each recommendation. To foster trust throughout the organization, PLS leaders should increase transparency in communication, standardize internal processes, broaden their understanding of different perspectives for challenging issues, and make intentional effort to

increase social cohesion. PLS will benefit from building an environment rooted in trust if and when new crises arise.

Future Research

This study provided a broad description of the impact of remote operations on knowledge sharing practices at PLS. Future research is warranted in service of (a) the academic discourse related to knowledge sharing and remote work and (b) understanding the experience of PLS employees as they adapt to changing organizational conditions.

As it relates to the scholarly investigation of knowledge sharing, future research is needed on the constructs of communication and connection. In our research, the combined measurements for these two constructs were determined unreliable and, thus, warranted separate analyses for each measured rating (i.e., four ratings on communication and three ratings on connection). Further research on these constructs may provide reliable aggregate measurements and new insights. Another area for future research is drawing a clearer distinction between fully remote operations and the hybrid work environment. A deep dive into the distinctions of knowledge sharing in each of these modalities may yield more nuanced recommendations for each. Additionally, in this research study, we analyzed the aggregate knowledge sharing score as measured by the SLAM developed by Bontis et al. (2002). This measurement tool is broken down into five distinct dimensions. Future research could use the subscores within these five dimensions to provide a more granular view of how participants measure and experience knowledge sharing within their organization.

As it relates to the community partner, PLS, future research should be conducted on the lasting impacts of remote work on knowledge sharing practices. This research study was conducted during the COVID-19 global pandemic and, notably, during a COVID-19 variant

surge around the time of data collection. Future research on knowledge sharing conducted at a time more distant from the transition may generate more reflective descriptions of the knowledge sharing experience. Furthermore, a qualitative study—to follow this preliminary quantitative study—including participant focus groups or individual interviews could generate a thick, rich description of the experience of knowledge sharing.

Summary

Nearly all large-scale organizational change originates from the external environment; thus, through this research study, we sought to gather data and produce findings related to the impact of the crisis-inducing transition to remote work operations in a pacific north west public library system. This quantitative research study gathered contextual and measured data to identify the impact of remote work on the organization's previously normalized practices for sharing knowledge and communication internally. Data collected from participants indicated employees at PLS rate knowledge sharing levels similarly, and experience knowledge sharing differently. Study findings showed communication, connection, and the amount of information within PLS were impacted as a result of the transition to remote work operations. Study findings indicated asynchronous communication is a catalyst for knowledge sharing at PLS, whereas connection to those outside the team and to the organization is a barrier. Six of the nine contextual themes were categorized as barriers and catalysts to knowledge sharing. Barriers included (a) lack of access to technology, (b) lack of clarity in finding information, (c) perceived gaps between administration and librarians, and (d) information overload. Catalysts included (a) increased options for communication and (b) the ability to innovate. The study's limitations included subgroup sample size, time constraints, and generalizability. The study's strengths included purposeful sampling, which yielded a 38% response rate from the total population;

building upon a credible organizational learning research instrument; and intercoder reliability for researcher bias checking.

Researcher recommendations include (a) intentionally cultivating and communicating their desired future for the organization, (b) recognizing and celebrating innovation, (c) enhancing feedback learning through training and norms, (d) enhancing feedforward learning through participatory input, and (e) nurturing trust throughout the organization. Future research is suggested both for the academic discourse on the topics of knowledge sharing and remote work as well as the opportunity for the case study's PLS leaders to expand their understanding of their employees' experience of knowledge sharing. PLS leaders have demonstrated a commitment to proactively engaging in change management for their organization, and subsequently how they serve local communities. This study provides an opportunity for PLS leaders to use the provided evidence and recommendations to further develop the organization's practices around change management, remote operations, and knowledge sharing.

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Appendix A

Invitation to Participate

Dear [first/last name],

You are receiving this email because you have been invited to participate in a research study that has been supported by the library system's executive director.

If you are a Librarian, Library Service Manager, Regional Manager or leadership team member at the library system, we are asking for your assistance in this research study by:

Completing the survey

The window for survey completion will begin on [start date], 2021 and end on [end date], 2021.

The online survey is designed to collect information related to your experience as a library system employee during the organization's transition to a remote work setting. The survey will take approximately 15-minutes to 30-minutes to complete. All responses will be kept confidential. You have the option of not answering questions and/or leaving the survey at any time. There are no incentives to participate in this study. The institutional review board of Seattle University approved the administration of this survey on [date].

About the researchers: We are a team of doctoral candidates in the Educational and Organizational Learning and Leadership Program at Seattle University, studying how knowledge sharing within Librarian Services was impacted by the abrupt transition to remote work operations due to the COVID-19 pandemic. This information will expand on existing literature about the impact of crisis-induced change management, virtual and hybrid work operations, and knowledge sharing practices.

Should you have any comments or questions, please contact Crystal Hess at xxxxx@seattleu.edu.

Sincerely,

Cal Erwin-Svoboda, Crystal Hess, Colin Watrin
Doctoral Candidates – Educational and Organizational Learning and Leadership
Seattle University

Appendix B

Consent to Participate in Research

Title
A Modern Game of Telephone: Knowledge Sharing, Remote Work, and Organizational Crisis in a Public Library System

Purpose
You are being asked to participate in a research study that seeks to investigate the impact of the transition to remote work operations due to the COVID-19 pandemic on knowledge sharing within Library Services at PLS. You will be asked 35-questions which will take approximately 15-minutes to 30-minutes to complete.

Source of Support
This study is being performed as partial fulfillment of the requirements for the doctoral degree in the Educational and Organizational Learning and Leadership program at Seattle University.

Risks
There are no known risks associated with this study. However, you will be asked to reflect on your personal experiences of the transition to a virtual and hybrid work environment since March 2020. This could bring up negative memories or experiences. To protect you, you have the option of not answering and/or leaving the survey at any time.

Benefits
While no direct benefits exist for completing this survey, it provides an opportunity to collect data and develop practical data-driven recommendations related to organizational communication and knowledge sharing practices. Researchers may also be able to provide organizations with a roadmap for gathering data about the impact of crisis-induced change management, remote work operations, and knowledge sharing practices.

Incentives
You will receive no incentives for this study.

Confidentiality
The study asks demographic questions to help the research team identify differentiated impacts to knowledge sharing practices at PLS. Responses will be confidential and only anonymized or grouped data will be reported in the final study. All research materials and consent forms will be stored in a password protected file to which only the investigators indicated on this form and their dissertation chair will have access. Human subjects research regulations require that data be kept for a *minimum* of three (3) years.

Right to Withdraw
Your participation in this study is *voluntary*. You may withdraw your consent to participate at any time without penalty. Your withdrawal will not influence any other services to which you may be otherwise entitled.

Summary of Results
A summary of the results of this research will be supplied to you, at no cost, upon request by calling [name of investigator] at [phone number] or email at [email address]. It is anticipated that the summary will be available to research participants in March 2022.

Voluntary Consent
I have read the above statements and understand what is being asked of me. I also understand that my participation is voluntary and that I am free to withdraw my consent at any time, for any reason, without penalty. On these terms, I certify that I am willing to participate in this research project.

I understand that should I have any concerns about my participation in this study, I may call [name of investigator], who is asking me to participate, at [phone number]. If I have any concerns that my rights are being violated, I may contact Dr. Michael Spinetta, Chair of Seattle University Institutional Review Board at (206) 296-2585.

I have read the above information, and consent to take part in the study.
- Yes
- No

Appendix C

Survey Instrument

Public library system employees rely on communication and knowledge sharing practices to function and achieve organizational mission and goals. As a library employee, your perspectives and experiences working in a virtual and hybrid environment will help inform our study.

Directions: Carefully read each of the following statements and respond by selecting the option that best reflects your personal experience while working in a virtual and hybrid environment.

1. How long have you worked at the library system?
   a. Less than 2 years
   b. 2-5 years
   c. 6-10 years
   d. 11-15 years
   e. More than 15 years
   f. Decline to answer

2. How long have you worked in your current role at the library system?
   a. Less than six months
   b. 6 months to 1 year
   c. 1-2 years
   d. 3-5 years
   e. 6-10 years
   f. 11-15 years
   g. More than fifteen-years

3. What is your role at the library system?
   a. Librarian
   b. Library Service Manager
   c. Regional Manager
   d. Leadership Team Member
   e. Other (please specify): _____

4. What region do you primarily work in?
   a. Region 1
   b. Region 2
   c. Region 3
   d. Region 4
   e. Region 5
   f. Region 6
   g. Region 7

        h. Region 8
        i. Region 9
        j. Central Services

5. What is your highest level of educational attainment?
   a. Bachelors
   b. Masters of Library and Information Science or Other Masters Degree
   c. Doctorate or Other Professional Degree
   d. Decline to answer

6. How would you describe your gender identity?
   a. Woman
   b. Man
   c. Non-binary/gender fluid/genderqueer/gender non-conforming
   d. Prefer to self-describe (please specify): _____
   e. Decline to answer

7. What is your age?
   a. 18-24
   b. 25-34
   c. 35-44
   d. 45-54
   e. 55-64
   f. 65 or older
   g. Decline to answer

8. How would you describe your race/ethnicity? select all that apply to you:
   a. Hispanic or Latino
   b. American Indian or Alaskan Native
   c. Asian or Asian American
   d. Native Hawaiian or Other Pacific Islander
   e. Black or African American
   f. White
   g. Prefer to self-describe (please specify): _____
   h. Decline to answer

Communication and Connection
Public library system employees rely on communication and knowledge sharing practices to function and achieve organizational mission and goals. The following statements relate to your experience while working in a virtual and hybrid environment.
Please indicate the level of agreement you have with the following statements.

*Key term: In a **virtual and hybrid work environment** employees use technology to communicate and collaborate with personnel located in various physical locations, such as working completely offsite, fluctuating between in-person and virtual environment, or working at a library system facility.*

*Key term: **Synchronous** communications are carried out in real-time, such as video conferencing, phone calls, and instant messaging platforms; **Asynchronous** communications are carried out across a time window, where responses are delayed, such as email and technology tools designed to improve collaboration and communication among individuals and groups.*

9. In the virtual and hybrid work environment, has the frequency of your **synchronous** communications with staff at the library system primarily decreased or increased?
   a. Strongly Decreased
   b. Decreased
   c. Stayed the Same
   d. Increased
   e. Strongly Increased

10. In the virtual and hybrid work environment, has the frequency of your **asynchronous** communications with staff at the library system primarily decreased or increased?
    a. Strongly Decreased
    b. Decreased
    c. Stayed the Same
    d. Increased
    e. Strongly Increased

*Key term: **Formal** communications include scheduled meetings with agendas; **Informal** communications include unplanned contact or collaborations.*

11. In the virtual and hybrid work environment, has the frequency of your **formal** communications with staff at the library system primarily decreased or increased?
    a. Strongly Decreased
    b. Decreased
    c. Stayed the Same
    d. Increased
    e. Strongly Increased

12. In the virtual and hybrid work environment, has the frequency of your **informal** communications with staff at the library system primarily decreased or increased?
    a. Strongly Decreased
    b. Decreased
    c. Stayed the Same
    d. Increased
    e. Strongly Increased

*Key term: **Connection** is the sense of relationship, belonging, and understanding of others and the organization.*

13. In the virtual and hybrid work environment, has your connection to **your team** at the library system primarily decreased or increased?
    a. Strongly Decreased
    b. Decreased
    c. Stayed the Same
    d. Increased
    e. Strongly Increased

14. In the virtual and hybrid work environment, has your connection to **staff outside your team** at the library system primarily decreased or increased?
    a. Strongly Decreased
    b. Decreased
    c. Stayed the Same
    d. Increased
    e. Strongly Increased

15. In the virtual and hybrid work environment, has your connection to the **library system as an organization** primarily decreased or increased?
    a. Strongly Decreased
    b. Decreased
    c. Stayed the Same
    d. Increased
    e. Strongly Increased

16. Describe how you experienced the transition to virtual and hybrid work environment at the library system.

17. How did communication among staff at the library system change while working in a hybrid and virtual environment?

18. How did connection among staff at the library system change while in the virtual and hybrid work environment?

Knowledge Sharing
Public library system employees rely on communication and knowledge sharing practices to function and achieve organizational mission and goals. The following statements relate to your experience while working in a virtual and hybrid work environment.

Please indicate the level of agreement you have with the following statements.

*Key term: For the purposes of this study, **Librarian Services** include Librarians, Library Service Managers, Regional Managers or leadership team member*s

Response scale for the following questions:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

19. In the virtual and hybrid work environment, employees in Librarian Services break out of traditional mindsets to see things in new and different ways.
20. In the virtual and hybrid work environment, employees in Librarian Services have a clear sense of direction in their work.
21. In the virtual and hybrid work environment, employees in Librarian Services feel confident in their work.
22. In the virtual and hybrid work environment, groups in Librarian Services have a common understanding of departmental issues.
23. In the virtual and hybrid work environment, groups in Librarian Services engage in effective dialogue by sharing and hearing one another's ideas.
24. In the virtual and hybrid work environment, groups in Librarian Services seek to understand everyone's point of view.
25. In the virtual and hybrid work environment, we have an organizational culture characterized by a high degree of trust.
26. In the virtual and hybrid work environment, the culture of the library system can be characterized as innovative.
27. In the virtual and hybrid work environment, the structure of the library system allows us to work effectively.
28. In the virtual and hybrid work environment, recommendations from the groups in Librarian Services are adopted by the organization as a whole.
29. In the virtual and hybrid work environment, lessons learned by one group in Librarian Services are actively shared with others.
30. In the virtual and hybrid work environment, the library system uses the intelligence of the workforce.
31. In the virtual and hybrid work environment, the library system's goals are communicated throughout the organization.
32. In the virtual and hybrid work environment, organizational decisions are supported by individuals.
33. In the virtual and hybrid work environment, training is readily available when it is needed to improve knowledge and skills.

*Key term: **knowledge sharing** is defined as the formal and informal mechanisms through which information is passed between individuals, groups, and the organization.*

34. How has knowledge sharing at the library system changed as a result of the transition to virtual and hybrid work environment?

35. What impacts your ability to share knowledge at the library system while working in a virtual and hybrid environment?

Appendix D

Questionnaire Alignment to Literature

Alignment of the Data Collection Tool

Questionnaire question	Connection to the literature
Qualitative questions	
Describe how you experienced the transition to virtual and hybrid work environment at the library system.	Structure and culture of libraries create opportunities and challenges for promoting knowledge creation and sharing (Vela, 2018).
	Organizations found new ways to communicate with their employees as a result of the transition to remote work environment (Bojadjiev & Vaneva, 2021).
	Ecklebe and Loffler (2021) studied employees' perceptions of the quality of internal communication during COVID-19.
	The coordination of tasks in a virtual environment is difficult due to the speed of communication and lack of interpersonal cues (Krumm et al., 2016).
	Germain and McGuire (2014) found that working in a virtual environment increases the chances of miscommunication and uncertainty.
	Asynchronous communication can be frustrating to team members due to reduced speed and lack of continuity and richness (Germain & McGuire, 2014).
How did communication among staff at the library system change while working in a hybrid and virtual environment?	Germain and McGuire (2014) found that working in a virtual environment increases the chances of miscommunication and uncertainty.
	Change efforts require regular and consistent communication and actions that align with the new vision (Kotter, 1995).
	The coordination of tasks in a virtual environment is difficult due to the speed of communication and lack of interpersonal cues (Krumm et al., 2016).

A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016).

Organizations found new ways to communicate with their employees as a result of the transition to remote work environment (Bojadjiev & Vaneva, 2021).

Ecklebe and Loffler (2021) studied employees' perceptions of the quality of internal communication during COVID-19.

| How did connection among staff at the library system change while in the virtual and hybrid work environment? | Asynchronous communication can be frustrating to team members due to reduced speed and lack of continuity and richness (Germain & McGuire, 2014). |

Virtual environments are more ambiguous, which require employees to seek out information, work independently and seek solutions for unclear tasks and responsibilities (Krumm et al., 2016).

Global teams are a source of innovation and growth while possessing unique challenges and opportunities to team effectiveness and cohesion (Neeley, 2018).

A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016).

Schein (2010) explores in-depth the interconnected nature of organizational culture and leadership with an emphasis on the nuances of organizational culture and its impact on an organization's performance.

How has knowledge sharing at the library system changed as a result of the transition to virtual and hybrid work environment?

The study develops a framework for organizational learning that includes four processes-- intuiting, interpreting, integrating, and institutionalizing--linked across the levels of individual, group, and organization (Crossan et al., 1999).

Bontis et al. (2002) study the way knowledge moves or gets stuck between organizational levels in the context of the intellectual capital residing within organizational levels and transfer of knowledge between levels through two learning processes.

Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.

A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016).

Structure and culture of libraries create opportunities and challenges for promoting knowledge creation and sharing (Vela, 2018).

What impacts your ability to share knowledge at the library system while working in a virtual and hybrid environment?

Kanter (2006) argues that generating a sense of community rather than silos encourages collaboration and creativity to improve organizational performance needed in e-culture.

Change efforts require regular and consistent communication and actions that align with the new vision (Kotter, 1995).

Germain and McGuire (2014) found that working in a virtual environment increases the chances of miscommunication and uncertainty.

Virtual environments are more ambiguous, which require employees to seek out information, work independently and seek solutions for unclear tasks and responsibilities (Krumm et al., 2016).

Global teams are a source of innovation and growth while possessing unique challenges and opportunities to team effectiveness and cohesion (Neeley, 2018).

A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016).

Quantitative questions

In the virtual and hybrid work environment, has the frequency of your synchronous communications with

The coordination of tasks in a virtual environment is difficult due to the speed of communication and lack of interpersonal cues (Krumm et al., 2016).

staff at the library system primarily decreased or increased?	Global teams are a source of innovation and growth, which require a combination of both instant and delayed technology-mediated communications (Neeley, 2018).
Synchronous communications are carried out in real-time, such as video conferencing, phone calls, and instant messaging platforms. (Neeley, 2018).	Organizations found new ways to communicate with their employees as a result of the transition to remote work environment (Bojadjiev & Vaneva, 2021).
	Ecklebe and Loffler (2021) studied employees' perceptions of the quality of internal communication during COVID-19.
In the virtual and hybrid work environment, has the frequency of your asynchronous communications with staff at the library system primarily decreased or increased?	The coordination of tasks in a virtual environment is difficult due to the speed of communication and lack of interpersonal cues (Krumm et al., 2016).
	Global teams are a source of innovation and growth, which require a combination of both instant and delayed technology-mediated communications (Neeley, 2018).
	Organizations found new ways to communicate with their employees as a result of the transition to remote work environment (Bojadjiev & Vaneva, 2021).
Asynchronous communications are carried out across a time window, where responses are delayed, such as email and technology tools designed to improve collaboration and communication among individuals and groups (Neeley, 2018).	Ecklebe and Loffler (2021) studied employees' perceptions of the quality of internal communication during COVID-19.
In the virtual and hybrid work environment, has the frequency of your formal communications with staff at the library system primarily decreased or increased?	Germain and McGuire (2014) found that working in a virtual environment increases the chances of miscommunication and uncertainty.
	The coordination of tasks in a virtual environment is difficult due to the speed of communication and lack of interpersonal cues (Krumm et al., 2016).

Formal communications include scheduled meetings with agendas (Neeley, 2018).	Organizations found new ways to communicate with their employees as a result of the transition to remote work environment (Bojadjiev & Vaneva, 2021).
	Ecklebe and Loffler (2021) studied employees' perceptions of the quality of internal communication during COVID-19.
In the virtual and hybrid work environment, has the frequency of your informal communications with staff at the library system primarily decreased or increased?	Working in a virtual environment increases the chances of miscommunications and uncertainty (Germain & McGuire, 2014).
	The coordination of tasks in a virtual environment is difficult due to the speed of communication and lack of interpersonal cues (Krumm et al., 2016).
	Organizations found new ways to communicate with their employees as a result of the transition to remote work environment (Bojadjiev & Vaneva, 2021).
Informal communications include unplanned contact or collaborations (Neeley, 2018).	Ecklebe and Loffler (2021) studied employees' perceptions of the quality of internal communication during COVID-19.
In a virtual or hybrid environment, has your connection to your team at the library system primarily decreased or increased?	Asynchronous communication can be frustrating to team members due to reduced speed and lack of continuity and richness (Germain & McGuire, 2014).
	Global teams are a source of innovation and growth while possessing unique challenges and opportunities to team effectiveness and cohesion (Neeley, 2018).
	A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016).
In a virtual or hybrid environment, has your connection to staff outside your team at the library system primarily decreased or increased?	Asynchronous communication can be frustrating to team members due to reduced speed and lack of continuity and richness (Germain & McGuire, 2014).
	Global teams are a source of innovation and growth while possessing unique challenges and opportunities to team effectiveness and cohesion (Neeley, 2018).

A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016).

To minimize the impact of an inter-group perspective, trust-building and relationship management are important to facilitating knowledge sharing and collaborative work (Newell et al., 2007).

In a virtual or hybrid environment, has your connection to the library system as an organization primarily decreased or increased?	Virtual environments are more ambiguous, which require employees to seek out information, work independently and seek solutions for unclear tasks and responsibilities (Krumm et al., 2016).

Global teams are a source of innovation and growth while possessing unique challenges and opportunities to team effectiveness and cohesion (Neeley, 2018).

A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016).

Schein (2010) explores in-depth the interconnected nature of organizational culture and leadership with an emphasis on the nuances of organizational culture and its impact on an organization's performance.

In the virtual and hybrid work environment, employees in Librarian Services break out of traditional mindsets to see things in new and different ways.	Schein (2010) explores in-depth the interconnected nature of organizational culture and leadership with an emphasis on the nuances of organizational culture and its impact on an organization's performance (Schein, 2010).

To be a learning organization, leaders and employees need to use the disciplines of personal mastery, mental models, shared vision, team learning, and systems thinking, where system thinking unites all the other disciplines (Senge, 1990).

Hilden and Tikkamaki (2013) studied how reflective practices at three levels and within 4I sub-processes serve as a catalyst for the organizational learning process.

In the virtual and hybrid work environment, employees in Librarian Services have a clear sense of direction in their work.	To be a learning organization, leaders and employees need to use the disciplines of personal mastery, mental models, shared vision, team learning, and systems thinking, where system thinking unites all the other disciplines (Senge, 1990).
	Ranson et al. (1980) proposes a more holistic analysis of organizational structure to include concepts of power and the mitigating factors of size, technology, and the environment (Ranson et al., 1980).
	Hall and Saias (1980) study the interplay between organizational strategy and structure and the interconnected factors of culture and the environment.
In the virtual and hybrid work environment, employees in Librarian Services, feel confident in their work.	Schein (2010) explores in-depth the interconnected nature of organizational culture and leadership with an emphasis on the nuances of organizational culture and its impact on an organization's performance.
	Edmondson (1999) explores practices leaders can use to foster knowledge sharing, idea development, learning from mistakes and, holistic thinking.
	Ford and Ford (2009) identify five ways leaders can navigate resistance to change among employees.
In the virtual and hybrid work environment, groups in Librarian Services have a common understanding of departmental issues.	There are two types of learning, single-loop which detects and corrects an error, and double-loop, which digs deeper to uncover the reason for the error and works to resolve it (Argryis, 2003, 2004).
	Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.
	Cabrera and Cabrera (2005) explore the people management practices that encourage and foster knowledge sharing in organizations.
	To be a learning organization, leaders and employees need to use the disciplines of personal mastery, mental models, shared vision, team learning, and systems thinking, where

	system thinking unites all the other disciplines (Senge, 1990).
In the virtual and hybrid work environment, groups in Librarian Services ngage in effective dialogue by sharing and hearing one another's ideas.	Cabrera and Cabrera (2005) explore the people management practices that encourage and foster knowledge sharing in organizations.

Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.

Global teams are a source of innovation and growth while possessing unique challenges and opportunities to team effectiveness and cohesion (Neeley, 2018). |
| In the virtual and hybrid work environment, groups in Librarian Services seek to understand everyone's point of view. | Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization. |
| In the virtual and hybrid work environment, we have an organizational culture characterized by a high degree of trust. | A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016).

Global teams are a source of innovation and growth while possessing unique challenges and opportunities to team effectiveness and cohesion (Neeley, 2018).

Staples and Webster (2008) studied the effects of trust, task interdependence, and aspects of virtuality on knowledge sharing in teams.

To minimize the impact of an inter-group perspective, trust-building and relationship management are important to facilitating knowledge sharing and collaborative work (Newell et al., 2007). |
| In the virtual and hybrid work environment, the culture of the library system can be | Organizational culture is powerful, and it needs to be strategically and intentionally developed to enhance performance long-term (Chatman & Cha, 2003). |

characterized as innovative.	Detert et al. (2000) theorizes a framework for organizational culture related to systemic improvement initiatives.
	Kaarst-Brown et al. (2004) discusses how libraries can leverage organizational culture as a strategic asset to enhance personal and organizational success, including innovation capabilities.
In the virtual and hybrid work environment, the structure of the library system allows us to work effectively.	Hall and Saias (1980) reviews the interplay between organizational strategy and structure and the interconnected factor of culture and environment.
	Miles et al. (1995) makes the argument that companies need to redesign themselves to align with changes in the market environment and the keys to a successful redesign.
	Pugh et al. (1968) studied differences in organizational structure with a sample of diverse companies to determine the key dimensions.
In the virtual and hybrid work environment, recommendations from the groups in Librarian Services are adopted by the organization as a whole.	Politics and power transform learning from individuals and groups to the organization and, more specifically, different forms of power impede or enhance the organizational learning process (Lawrence et al., 2005).
	Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.
	Kaarst-Brown et al. (2004) discusses how libraries can leverage organizational culture as a strategic asset to enhance personal and organizational success, including innovation capabilities.
In the virtual and hybrid work environment, lessons learned by one group in Librarian Services are actively shared with others.	Global teams are a source of innovation and growth while possessing unique challenges and opportunities to team effectiveness and cohesion (Neeley, 2018).
	Kanter (2006) argues that generating a sense of community rather than silos encourages collaboration and creativity to improve organizational performance needed in e-culture.

Staples and Webster (2008) studied the effects of trust, task interdependence, and aspects of virtuality on knowledge sharing in teams.

Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.

In the virtual and hybrid work environment, the library system uses the intelligence of the workforce.	Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.
	Structure and culture of libraries create opportunities and challenges for promoting knowledge creation and sharing (Vela, 2018).
	Politics and power transform learning from individuals and groups to the organization and, more specifically, different forms of power impede or enhance the organizational learning process (Lawrence et al., 2005).
In the virtual and hybrid work environment, the library system's goals are communicated throughout the organization.	Change efforts require regular and consistent communication and actions that align with the new vision (Kotter, 1995).
	Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.
In the virtual and hybrid work environment, organizational decisions are supported by individuals.	Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.

Change efforts require regular and consistent communication and actions that align with the new vision (Kotter, 1995).

In the virtual and hybrid work environment, training is readily available when it is needed to improve knowledge and skills.	Schein (2010) explores in-depth the interconnected nature of organizational culture and leadership with an emphasis on the nuances of organizational culture and its impact on an organization's performance.
	Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.

Demographic questions

How long have you worked at the library system?	Cable et al. (2013) studied organizational socialization and personal identity impacts on work engagement and performance.
How long have you worked in your current role at the library system?	Cable et al. (2013) studied organizational socialization and personal identity impacts on work engagement and performance.
What is your role at PLS?	Pugh et al. (1968) studied differences in organizational structure with a sample of diverse companies to determine the key dimensions.
	Structure and culture of libraries create opportunities and challenges for promoting knowledge creation and sharing (Vela, 2018).
	Schein (2010) explores in-depth the interconnected nature of organizational culture and leadership with an emphasis on the nuances of organizational culture and its impact on an organization's performance.
	A core group of employees from across the organization develop a shared commitment and vision to be able to implement and sustain change (Kotter, 2005).
	Kaarst-Brown et al. (2004) applied the main concepts of the competing values framework to the six dimensions of the

Organizational Culture Assessment to explore the mission and culture of public libraries.

What region do you currently work in?	The stronger the connection to the sub-group, the higher probability of us vs. them mentality, which impacts knowledge sharing and team identification (Neeley, 2018). Schein (2010) explores in-depth the interconnected nature of organizational culture and leadership with an emphasis on the nuances of organizational culture and its impact on an organization's performance. A strong negative relationship exists between in-group dynamics and the perceived effectiveness of partially distributed teams (Plotnick et al., 2016). Structure and culture of libraries create opportunities and challenges for promoting knowledge creation and sharing (Vela, 2018). Kaarst-Brown et al. (2004) applied the main concepts of the competing values framework to the six dimensions of the Organizational Culture Assessment to explore the mission and culture of public libraries.
What is your highest level of educational attainment?	The professional designations of staff in libraries can create challenges to knowledge sharing (Vela, 2018) Politics and power transform learning from individuals and groups to the organization and, more specifically, different forms of power impede or enhance the organizational learning process (Lawrence et al., 2005). Schilling and Kluge (2009) explores barriers to organizational learning through the lens of three forms of impediments actional-personal, structural-organizational, and societal-environmental, and how they are interconnected with the processes of the 4Is, intuiting, interpretation, integration, and institutionalization.
How would you describe your gender identity?	Libraries lack diversity due to organizational culture, practices, and assumptions (Vinopal, 2016). Structure and culture of libraries create opportunities and challenges for promoting knowledge creation and sharing (Vela, 2018).

	Politics and power transform learning from individuals and groups to the organization and, more specifically, different forms of power impede or enhance the organizational learning process (Lawrence et al., 2005).
What is your age?	Understanding workforce generations helps organizations design communication strategies that get employees better engaged and connected (Philip & Netra, 2021).
How would you describe your race/ethnicity? Select all that apply to you	Libraries lack diversity due to organizational culture, practices, and assumptions (Vinopal, 2016).
	Structure and culture of libraries create opportunities and challenges for promoting knowledge creation and sharing (Vela, 2018).
	Politics and power transform learning from individuals and groups to the organization and, more specifically, different forms of power impede or enhance the organizational learning process (Lawrence et al., 2005).

Appendix E

Permission to use SLAM Survey

Requesting permission to use SLAM Survey Tool

Crossan, Mary
Mon 4/19/2021 12:53 PM
To: Erwin-Svoboda, Cal

SLAM Survey Items.pdf
191 KB

Yes, you have my permission. Best wishes with your project.

Mary

...

Bontis, Nick
Mon 4/19/2021 7:09 AM
To: Erwin-Svoboda, Cal

Hi Cal, please contact Mary Crossan.

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From: Erwin-Svoboda, Cal
Sent: Sunday, April 18, 2021 3:20 PM
To: Bontis, Nick
Subject: Requesting permission to use SLAM Survey Tool

Good afternoon Dr. Bontis,

Hello from a team of doctoral candidates in the Educational and Organizational Learning and Leadership Program at Seattle University in Washington State!

Completing a dissertation during a pandemic isn't ideal, but it has provided us the opportunity to research an area of interest with a relevant lens. Specifically, we are exploring how knowledge sharing in our local county library system was impacted by the abrupt transition to remote work operations due to the COVID-19 pandemic. Through our intensive literature review, we have, of course, run across your name in much of the related literature. In fact, we are utilizing the 4I framework as the conceptual framework guiding our study.

We're writing to you today to seek permission to utilize sample items from the Strategic Learning Assessment Map (SLAM) in your 2002 publication with Crossan and Hulland as part of the data collection tool in our research study.

Thank you in advance for your consideration,

Jessica Anduiza, Cal Erwin-Svoboda, Crystal Hess, Colin Watrin

Seattle University, Educational and Organizational Learning and Leadership Doctoral Candidates

Appendix F

Variables

Definitions of Variables

Variable	Type	Description
Role	Independent, Demographic	Professional role in the Library System, i.e., Librarian, Library Services Manager, Regional Manager, Library Leadership Team Member
Region	Independent, Demographic	Region in the Library System
Communication	Independent	The way people have dialogued, conversed, and shared information with others and the organization.
Connection	Independent	The sense of relationship, belonging, and understanding of others and the organization.
Knowledge Sharing	Dependent	The formal and informal mechanisms through which information is passed between individuals, groups, and the organization. Knowledge sharing is operationalized in this study using the 5 Dimensions of Organizational Learning (Crossan et al., 1999)
Individual Level		One can learn within the organizational structure and culture
Group Level		Teams can learn from each other and create shared meaning within the organizational structure and culture
Organizational Level		The organizational structure and culture support learning
Feed Forward		The movement of knowledge from an individual level to the organizational level
Feedback		The movement of knowledge from the organizational level to the individual level
Gender	Demographic	Gender of the employee
Education	Demographic	Highest degree or level of school completed
Race/Ethnicity	Demographic	Race/ethnicity of the employee

Appendix G

Measured Response Data Summary

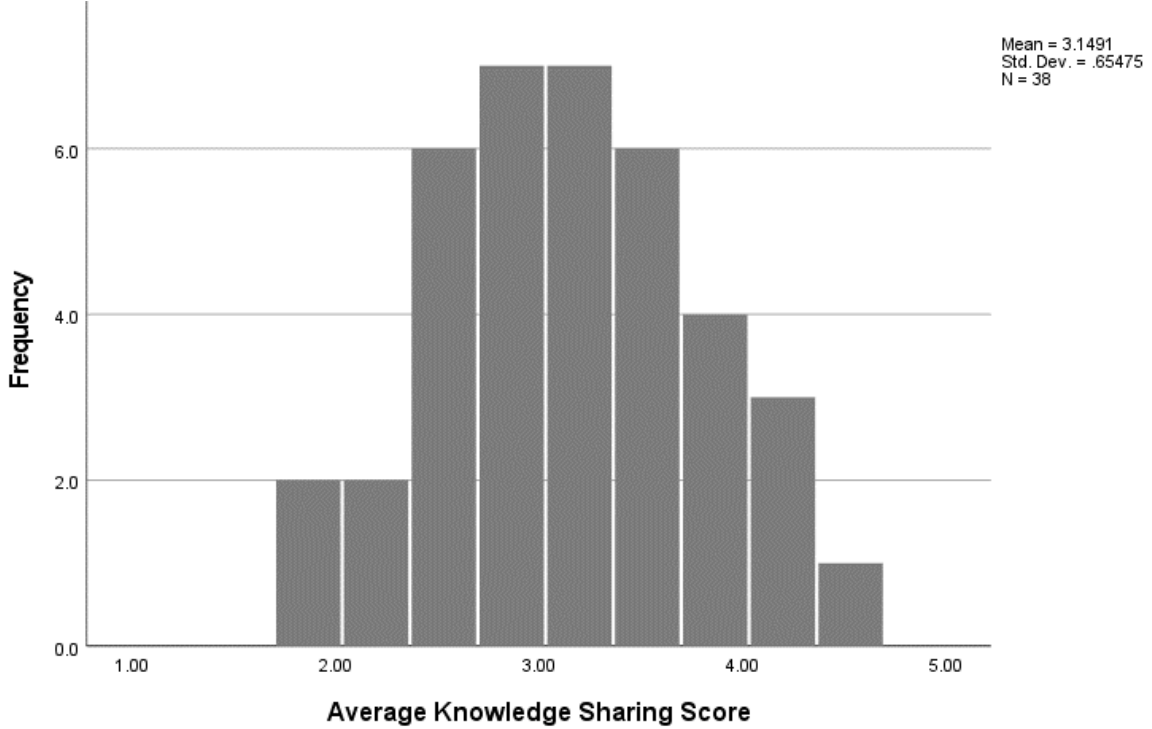Figure G1. Respondent Data: Knowledge Sharing scores

Figure G2. Respondent Data: Q9: In the virtual and hybrid work environment, has the frequency of your synchronous communications with staff at the library system primarily decreased or increased?
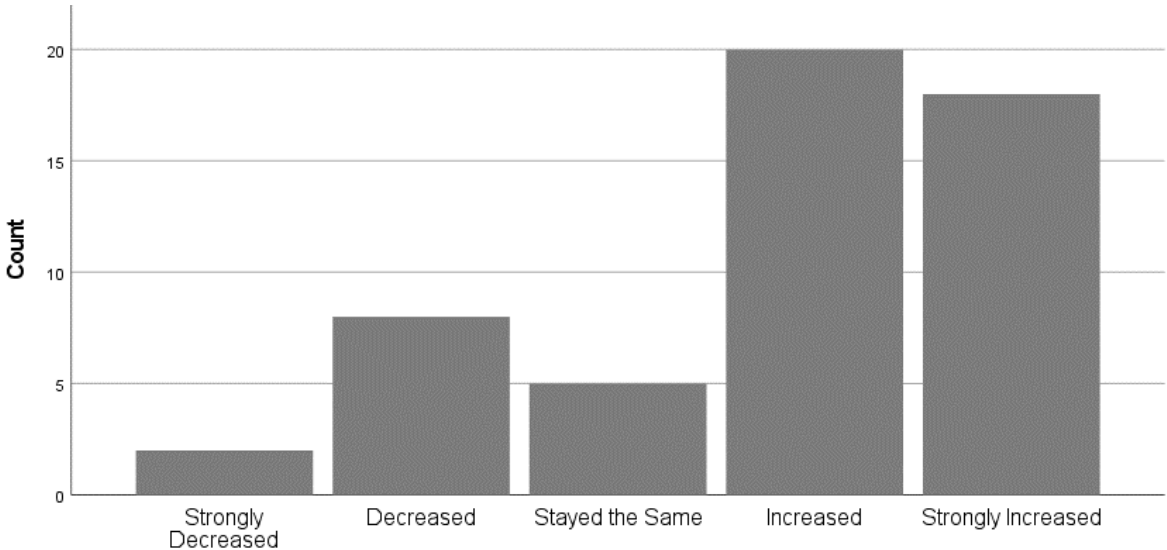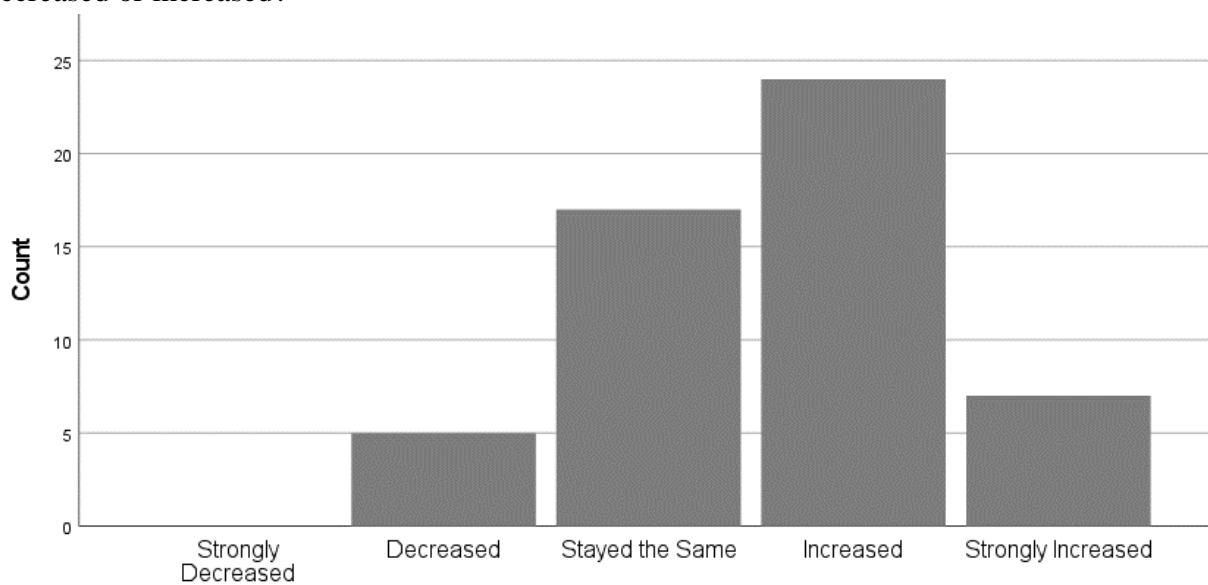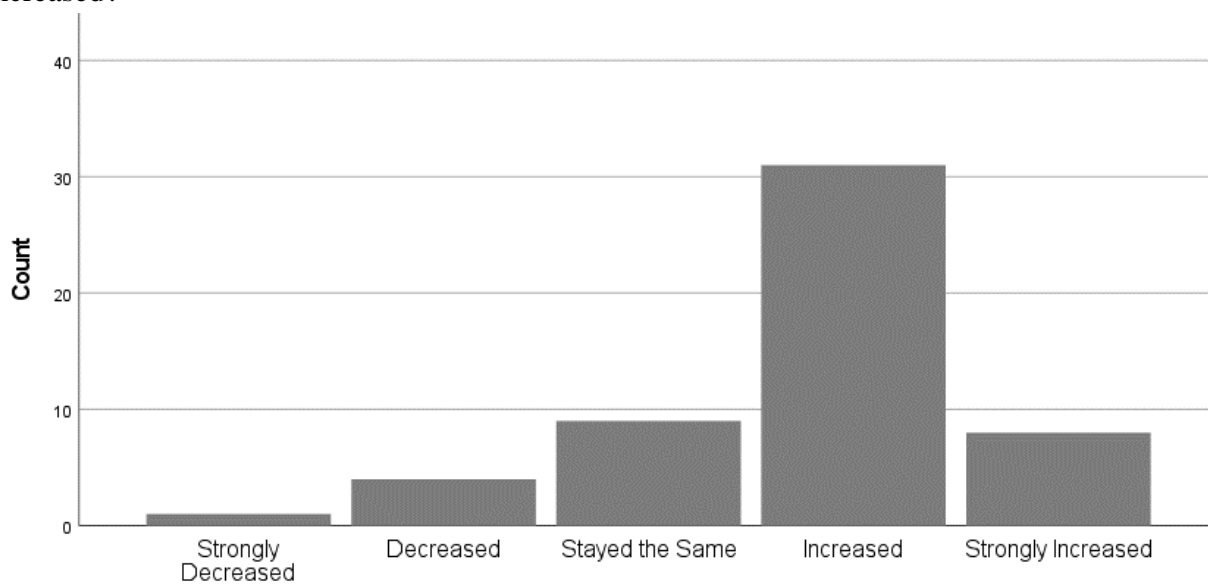
Figure G3. Respondent Data: Q10: In the virtual and hybrid work environment, has the frequency of your asynchronous communications with staff at the library system primarily decreased or increased?

Figure G4. Respondent Data: Q11: In the virtual and hybrid work environment, has the frequency of your formal communications with staff at the library system primarily decreased or increased?

Figure G5. Respondent Data: Q12: In the virtual and hybrid work environment, has the frequency of your informal communications with staff at the library system primarily decreased or increased?
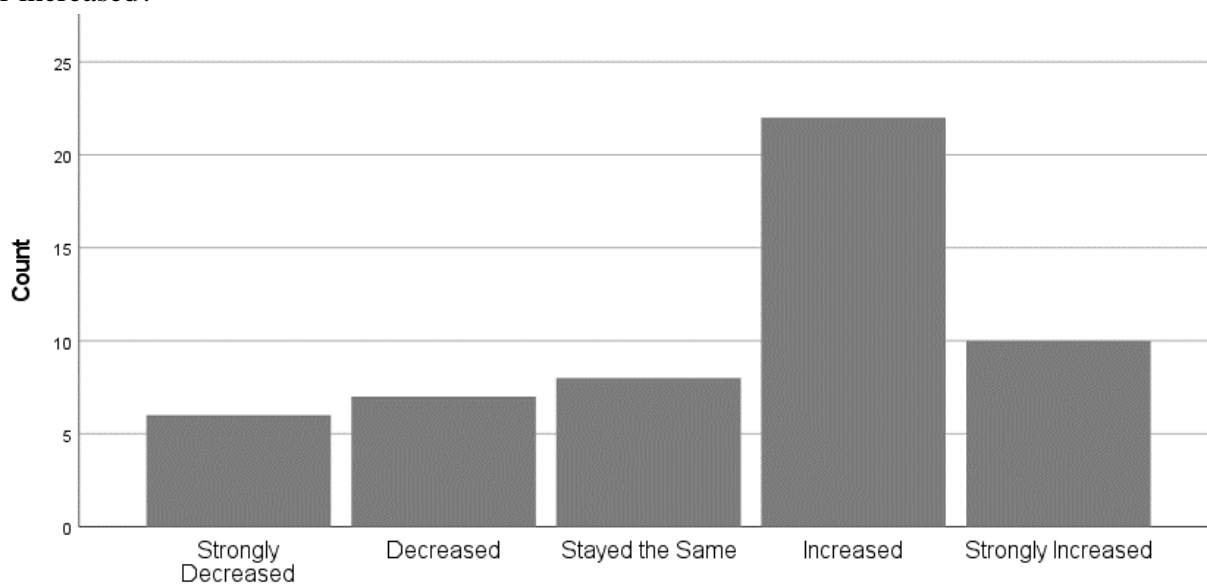

Figure G6. Respondent Data: Q13: In the virtual and hybrid work environment, has your connection to your team at the library system primarily decreased or increased?
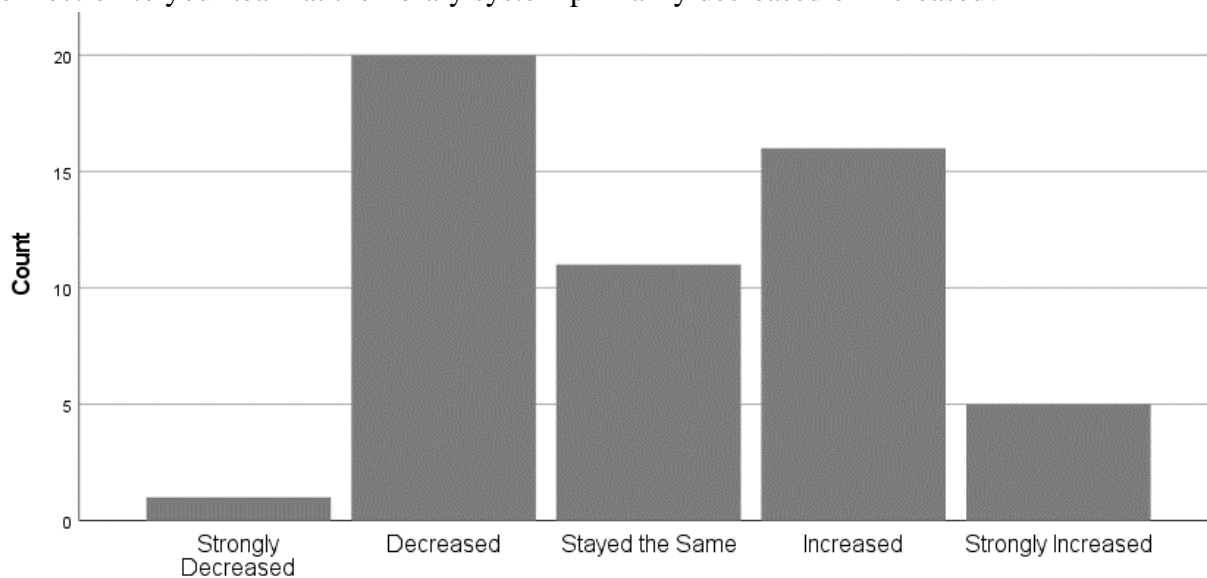
Figure G7. Respondent Data: Q14: In the virtual and hybrid work environment, has your connection to staff outside your team at the library system primarily decreased or increased?
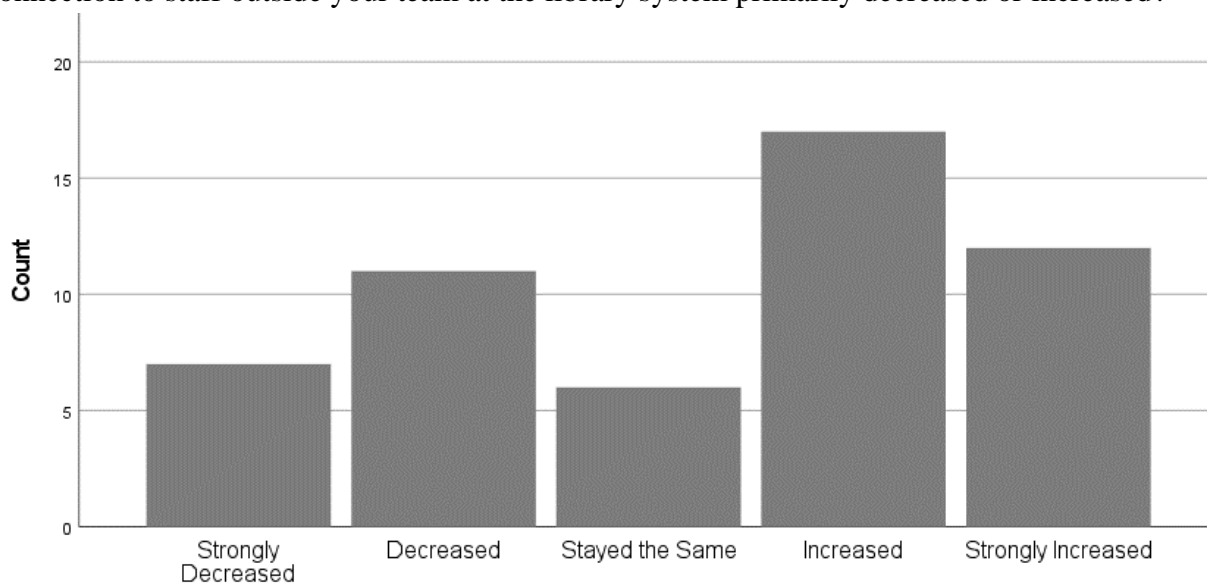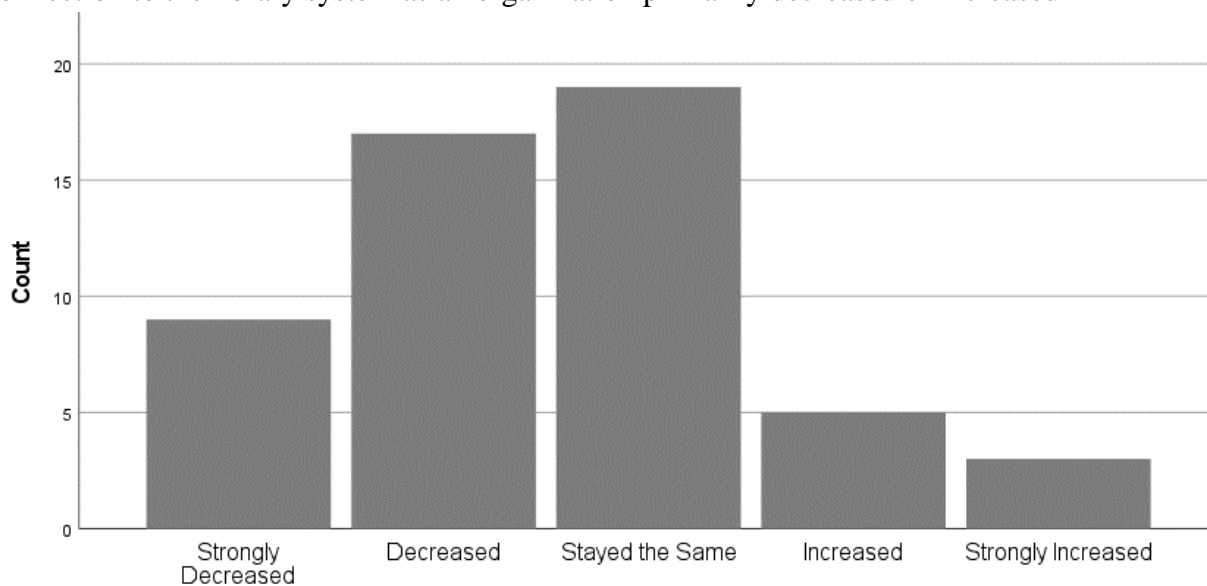

Figure G8. Respondent Data: Q 15: In the virtual and hybrid work environment, has your connection to the library system as an organization primarily decreased or increased

Appendix H

Contextual Themes

Theme	Description	Clusters of meaning
Theme 1	Adoption of new technology	Introduction of new digital collaboration tools (Teams, Zoom)
		Associated learning re: new digital tools (including norms)
		Refusal to use tech tools (whether working in building or remotely)
Theme 2	Changes to organizational structure	New committees and/or teams formed
		Staff transitions (including joining or leaving the organization, or changing roles)
Theme 3	Changes to organizational culture	Shifts in organizational policies and/or procedures
		Threats to psychological safety (including stress, confusion, and isolation)
		Strengthening of some pre-existing connections
		Lack of informal, emotional, and/or cognitive connections
		Lack of in-person contact
Theme 4	Lack of access to technology	Lack of access to physical technology
		Lack of technology skills
Theme 5	Lack of clarity	Not knowing the current policies and/or procedures
		Not knowing who to ask for help, assistance, or information
		Not knowing which digital tool or platform to use for accessing information
		Lack of support or guidance from management
		Sporadic communications
Theme 6	Perceived gaps between administration and librarians	Avenues for providing input was limited or nonexistent; Or shared information was disregarded
		Feelings of distrust between librarians and administration
		Fear (including punishment or reprimand)
		Lack of transparency in decision-making process
Theme 7	Information overload	"More being said and less being understood;" Exhausting meetings
		Too many tools; old communication streams were not retired
		Too many meetings; had more meetings
Theme 8	Increased options for communication	Ability to communicate more broadly (across geography)
		Increase of knowledge sharing between individuals in similar roles
		Increase in knowledge sharing between groups with similar functions

		New organizational meetings (townhalls)
Theme 9	Ability to innovate	New programming
		Lack of ability to bounce early ideas around (informal idea sharing, brainstorming)
		Flexibility to work on own schedule (new tools allow work to be done outside typical work hours)