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Knowledge Management Implementation in U.S. Army Headquarters: A Case Study

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Abstract

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MJA, Norwich University, 2009

MA, Kansas State University, 1994

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

This case study examined the U.S. Army's implementation of knowledge management (KM) as an integrating process within its command and control system. The research problem explored was the U.S. Army's attempts to measure knowledge transfer using the KM Maturity Model (KM3) and KM Assessment Tool (KMAT). The purpose was to determine levels of KM maturity and knowledge barriers that affected decision-making. The conceptual approach used Nonaka and Takeuchi's process theory for the knowledge-based firm, combined with Argote and Hora's framework of knowledge transfer as it applied to Moore's concept of public value. The central research questions explored the levels of KM maturity for U.S. Army headquarters and how their staff elements described knowledge transfer barriers. This study used a qualitative single case study design with eight embedded units of analysis. Analysis of archival data from the KM3 found that the average KM maturity level of the units of analysis indicated that some processes were repeatable but unlikely to be rigorous. Thematic analysis of archival data from the KMAT revealed four major knowledge transfer barriers: content management, personnel turnover, portal use, and anchoring KM in institutional governance. The findings may be used by the military to guide positive social change in its occupational structure, personnel management, training, KM policy, and technological approaches to content management. These changes, if instituted, may also enhance future decision-making by senior Army leaders, leading to efficient commitment of public resources.

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Dedication

I dedicate this to my teammates at the U.S. Army Knowledge Management Proponent Office. We literally traveled to the four corners of the globe trying to make our Army headquarters more efficient. Our accommodations ranged from plywood huts with no running water to four-star hotels. In each location, we met great people striving to make their organizations better. I always learned more from them than they ever could from me. This modest study is dedicated to them. They keep the Army humming across the globe.

Acknowledgments

To my family who put up with me on this longer than expected journey. The journey was full of stalls, stops, leaves of absence, and restarts caused by life events that were sorrowful, joyful, and stressful. My wife, Debbie, continuously encouraged me not to stop, but as the old Army saying goes, to "ruck up" and reach this goal.

I need to acknowledge the following people who made this study possible. First, my committee chair, Dr. Morris Bidjerano, who provided me excellent advice along the way. Second, my director and fellow travel companion, Mr. Joe Koskey, allowed me to do a case study on our organization and granted me use of our archival data. Third, I need to thank Dr. Michele Calton, formerly of the Army Research Institute and presently at the Department of Health and Human Services, who assisted me on getting my first research paper published. It served as a litmus test for this dissertation. Finally, to my workmate, Mr. Michael Kitchens, who developed the Knowledge Management Maturity Model, which is the subject of much of this study. He is a great teammate! Thanks to all of you for your support throughout this endeavor.

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Chapter 1: Introduction to the Study

Introduction

This case study explored the implementation of knowledge management (KM) as an integrating process within U.S. Army headquarters elements. The U.S. Army Knowledge Management Proponent Office (AKM-PO) is the office responsible to ensure that KM is developed across the force and within the Army's force modernization domains of doctrine, organizational structure, training, materiel, leader development, personnel, facilities, and policy (DOTMLPF-P).

KM is defined by the Army as "the process of enabling knowledge flow to enhance shared understanding, learning, and decision making" (Headquarters, Department of the Army, 2015b, p. 1-1). The Army's manual on command and control (Headquarters, Department of the Army, 2019a) further describes KM as an integrating process to aid in synchronizing complex data, information, and knowledge flows across a multitude of functions and organizations (pp. 3–26). KM was first introduced in Army doctrine for military staffs in 2008 with subsequent updates in 2012 and 2015. It is currently undergoing a third revision for 2023. Doctrinally, KM is used as a multidisciplinary approach for U.S. Army staff integration (Center for Army Lessons Learned, 2017; Headquarters, Department of the Army, 2019a). The implementation and the effort to measure the effectiveness of KM as an integrating process were the subject of this research study.

The Army's doctrinal approach to KM is conceptually similar to Nonaka and Takeuchi's (1995) seminal study of organizational knowledge creation. This work was

expanded by Nonaka and Toyama (2008) to include the organizational interaction with the environment as an essential element for knowledge creation. In addition, the Japanese government, through the Japan International Cooperation Agency, instituted the knowledge creation theory as a recommended approach for developing solutions for community development in Asia (Nonaka et al., 2018). Because the Army is a vast governmental defense enterprise with numerous subordinate headquarters elements, these headquarters elements must process vast amounts of data and information for innovation and decision-making as they encounter complex problems in constantly changing environments across the globe. This requires the Army enterprise to create new knowledge to remain competitive in the international security environment. Nonaka's concept of knowledge transfer and creation offers a model to confront these problems (Nonaka et al., 2008).

Recent research indicates a correlation between organizations that have adopted KM practices and increased productivity (Mendoza et al., 2017). However, there are no studies on the implementation and effectiveness of the Army's adoption of KM as a doctrinal integrating staff process using a KM maturity models and a KM assessment tool. Through this case study, I sought to fill this gap by exploring and analyzing the U.S. Army's adoption of KM as an integrating process. Results of this study may impact positive social change by informing future Army organizational designs in the Army's effort to accelerate the integration of data, information, and knowledge for enhanced decision-making. In this chapter, I will discuss the background, problem statement, and

purpose of the study. Additionally, I will review the theoretical framework and research questions, data sources, and limitations.

Background: The Research Gap

In early 2006, the Army established KM sections of two to six personnel within its key tactical and operational headquarters elements at the Division, Corps, and Army echelons of command (N. Knight, personal communication, June 28, 2018). The Army's deliberate insertion of KM positions into the Army organizational structure was done in conjunction with the integration of KM concepts into Army doctrine. This doctrinal integration resulted in a KM manual published in 2008 with updates in 2012 and 2015 (Headquarters, Department of the Army, 2015b). KM concepts were also published in higher level command and control manuals that designated KM as a key integrating process.

There are five U.S. Army doctrinal manuals that describe KM as an integrating process. *The Operations Process* (Headquarters, Department of the Army, 2019b) introduces KM to organizational operations officers as one of five integrating processes to synchronize tasks and functions throughout the organization. *Mission Command* (Headquarters, Department of the Army, 2019a) describes KM use by senior organizational leaders to align people, processes, and tools within an organization to achieve efficient decision-making capabilities. *Commander and Staff Organization Operations* (Headquarters, Department of the Army, 2015a) is a procedural manual for commanders and staff. It describes the staff responsibilities for the knowledge management officer (p. 2-21) and includes a chapter on the relationship between

knowledge management and information management (pp. 3-1–3-11). *Techniques for Knowledge Management* (Headquarters, Department of the Army, 2015b) is a practitioner's guide for implementing knowledge management assessments and techniques within an organization. *Executing Knowledge Management in Support of Mission Command* (Center for Army Lessons Learned, 2017) is a senior leader handbook explaining knowledge management and introduces the Knowledge Management Maturity Model (KM3) as an organizational self-assessment.

Within the business management field, there is a large body of research on the study of KM. This research includes scholars in the field of organizational behavior (Argote & Fahrenkopf, 2016; O'Dell & Hubert, 2011) and the use of KM maturity models (Vanini & Bochert, 2015) for measuring the maturity levels of KM in 10 German companies. Oliva (2014) developed a KM maturity model for examining companies in Brazil to include developing a typology of knowledge barriers.

Scholars have studied the use of KM as an integrating process in public administration. Nonaka et al. (2018) used the socialization, externalization, combination, and internalization (SECI) knowledge creation theory to provide a model for community development and public administration. Lindberg (2012) presented a case study of using KM to enhance evidence-based practices in the Santa Clara Social Services Agency. Winship (2012) examined the use of KM to inform decision-making in the Contra Costa County Employment and Human Services Department.

Scholars have also examined KM in military organizations. Gayton (2009) studied the use of KM systems to transfer knowledge about counterinsurgency

operations, and Gencer (2012) examined the use of KM for developing techniques to counter improvised explosive devices. Current research in the military includes studies by the Army Research Laboratory (Hawley & Swehla, 2017) that examined the Army's efforts to apply KM techniques to mitigate cognitive overload in Army command posts.

Although KM techniques have been developed and studied for use in many fields, few have attempted to measure the application of KM in organizations as an integrating staff process. This case study is an initial attempt to address this research gap by examining the U.S. Army Knowledge Management Proponent's effort to measure the knowledge flow and barriers in military headquarters elements as a means to improve staff integration. It applies to the body of research within public administration by examining the relationship of KM to the concept of public value (Bryson, 2018; Bryson et al., 2014). Findings from this case study may inform areas where the Army can improve its program implementation of KM and improve Army doctrine and organizational structure, thereby creating greater public value.

Keywords searched for this research included the following: *knowledge management*, *knowledge transfer*, *artificial intelligence*, *organizational science*, *organizational behavior*, *public value*, and *learning organization.*

Problem Statement

The ability to assess the effectiveness of information and knowledge flow within U.S. Army headquarters is a problem requiring closer examination. Recent studies have indicated that the complex information environment has increased the difficulty in processing data and information for effective decisions (Hawley & Swehla, 2017). The

complex demands of the digital information environment will continue to challenge organizations. Further assessment of the information and knowledge flow determines if KM is useful as an integrating process for enhanced decision-making. Mendoza et al. (2017) has indicated that government organizations that have adopted KM practices and capabilities have increased their service output. Schomaker and Bauer (2020) found that KM practices and resource sharing were key to successful performance in a public crisis. The Center for Army Lessons Learned (2018b) has identified that inadequate knowledge management inhibits shared understanding within its tactical organizational headquarters. The Army's implementation of KM and its attempt to assess data, information, and knowledge flow within organizations was the gap that this study examined.

Argote and Fahrenkopf (2016) also identified this gap by examining knowledge transfer across the organizational typology of members, tools, and networks and found that knowledge transfer can be difficult to measure. The Army's stated doctrinal position (Headquarters, Department of the Army, 2015a) is that effective use of data, information, and knowledge transfer enhances decision-making, yet there is no established method for measuring knowledge flow.

Since 2014, the Army has consistently listed staff integration and KM as an area of concern at the combat training centers. Published shortcomings include units struggling to successfully conduct information and knowledge management (Bohneman, 2014; Center Army Lessons Learned, 2018b). The U.S. Army published the KM3 in 2017 as a means to measure KM maturity levels within its headquarters (Center for Army Lessons Learned, 2017a). Currently, there is little research on measuring the

effectiveness of the Army's model. By examining the U.S. Army's attempt to assess information and knowledge flow, I sought to illuminate challenges in knowledge transfer in organizational headquarters.

Purpose of the Study

The purpose of this qualitative case study was to explore the U.S. Army's implementation of KM with attempts to measure knowledge transfer using the KM3 and Knowledge Management Assessment Tool (KMAT). This research builds on earlier research (Oliva, 2014; Ruiming & Qingan, 2013; Vanini & Bochert, 2015) to use KM maturity models to assess knowledge transfer in organizations and add to the KM literature by examining the use of KM assessment instruments in public administration organizations.

Research Questions

An organization's ability to quickly create new knowledge is key to remaining competitive in the operational environment (Nonaka & Takeuchi, 1995). The following research questions involved exploration of the use of two instruments to measure a knowledge-creating company. The first question involved measuring the organizational use of 42 established U.S. Army doctrinal standards that enable tacit and explicit knowledge flow using the KM3. The second question addressed the barriers to knowledge flow using the KMAT.

This exploratory study focused on the following main research questions:

RQ1: What are the KM maturity levels, as measured by the KM3, of U.S. Army headquarters?

RQ2: How do organizational staff members working in U.S. Army headquarters describe knowledge transfer barriers as collected by the KMAT?

Conceptual Framework for the Study

The conceptual framework for this study was a synthesis of two frameworks. The first was Nonaka and Takeuchi's (1995) seminal work on the theory of knowledge creation, which expanded into the process theory of the knowledge-based firm (Nonaka, et al., 2008) and is currently used in both the public administration and community development fields (Nonaka et al., 2018). The second framework was Argote and Hora's (2017) concept of knowledge transfer across the organizational typology of members, tasks, and tools.

Nonaka and Takeuchi (1994) stated that knowledge is created as it is transferred between the tacit and explicit domains when knowledge is socialized, externalized, combined, and internalized. This process has been abbreviated using the term SECI. This SECI organizational knowledge creation theory was later expanded by Nonaka (2008) to include the contextual social interaction of actors within the organization with new or different environments as an essential element in knowledge creation.

In addition, this study included the theory espoused by Argote and Hora's (2017) framework of knowledge transfer across the organizational typology of members, tasks, and tools but substituted the Army's typology of people, process, and tools, as articulated by Dalkir (2017) and the Army's doctrinal manual (Headquarters, Department of the Army, 2015b). Through this case study, I sought to describe the practical application of these theoretical concepts by the Army through using the KM3 and KMAT instruments

during the implementation of the Army's KM Program. This case study will explore the implementation of KM through these instruments.

The conceptual frameworks described above were the basis for this study and the Army's doctrinal construct of KM. The Army's doctrine describes KM as consisting of three components under the following typologies: people, process, tools, and the organization (Headquarters, Department of the Army, 2015b). Within these four components, the KM3 uses 42 doctrinal measures to evaluate KM practices for knowledge transfer. The KMAT identifies unit knowledge transfer barriers that may impede organizational KM maturity.

The study of maturity models to measure techniques for knowledge transfer resulting in KM maturity is firmly established in the business sector (O'Dell & Hubert, 2011; Oliva, 2014) but far less standard in the public administration sector. According to the Army's doctrine, efficient knowledge transfer results in effective decision-making (Headquarters, Department of the Army, 2015b). Although not explicitly stated in Army doctrine, it is implied that effective decision-making can result in greater public value as defined by Wallmeier et al. (2018). This will be discussed in greater detail in Chapter 2.

Nature of the Study

A qualitative case study with embedded units of analysis was the methodological approach of this study. This single case study design explored the U.S. Army's implementation of KM using the KM3 and KMAT within several different headquarters across three organizational levels. According to Yin (2018), a single case study may

involve embedded units of analysis. Archival program evaluation data were analyzed from semistructured focus group interviews conducted from 2016 to 2019.

This single case study used secondary data collected during field visits at organizations that requested assistance in implementing the Army's KM program. These data were collected during purposeful sampling focus groups of selected KM advocates within the existing organizational headquarters elements. During the focus group sessions, the participants completed both the Army's KM3 using Likert-scale responses and the KMAT with qualitative answers resulting in thematic analysis. A single case study design was selected to describe the implementation of the KM program and explore the data obtained from the units during the implementation.

Definitions

KM is a multidisciplinary field (Dalkir, 2017) viewed through many different scholarly lenses with different definitions. I use the definitions described below throughout this study.

Battle rhythm: A process to arrange the sequence and timing of reports, meetings, and briefings, based on the commander's preference, higher headquarters requirements, and type of operations. A battle rhythm facilitates shared understanding and decision-making. It is a deliberate cycle of command, staff, and unit activities to synchronize current and future activities (Headquarters, Department of the Army, 2019a).

Content management: A structured process to store and access enterprise content for collaboration (American Productivity & Quality Center [APQC], 2022). Content management organizes products for knowledge creation. The content management

process involves the four tasks of creating or capturing, organizing, applying, and transferring data, information, and knowledge products (Headquarters, Department of the Army, 2015b).

Explicit knowledge: Knowledge that has been rendered visible through transcription into a document or audio/visual recording (Dalkir, 2017). It is codified or formally documented knowledge organized and transferred to others through digital or nondigital means (Headquarters, Department of the Army, 2015b).

Institutional forces: The institutional force ensures the readiness of all Army forces through the following Title 10 USC tasks: recruiting, training, maintaining, educating, servicing, mobilizing, demobilizing, suppling, and equipping (Headquarters, Department of the Army, 2019e).

Knowledge: Information that has been analyzed and evaluated for operational implications (Headquarters, Department of the Army, 2019a). It is subjective and valuable information that has been validated and that has been organized into a mental model to make sense of the world; typically, it originates from accumulated experience and incorporates perceptions, beliefs, and values (Dalkir, 2017). Knowledge is information that has been analyzed through the organization's processes and the environment as justified true belief (Nonaka et al., 2008).

Knowledge management (KM): The process of enabling knowledge flow to enhance shared understanding, learning, and decision-making (Headquarters, Department of the Army, 2015b). It involves the deliberate and systematic coordination of an organization's people, technology, process, and organizational structure in order to add

value through reuse and innovation. KM is achieved through the promotion of creating, sharing, and applying knowledge as well as through the feeding of valuable lessons learned and best practices into corporate memory in order to foster organizational learning (Dalkir, 2017)

Knowledge Management Assessment Template (KMAT): This template is a tool to show knowledge and performance gaps. The completed KMAT lists KM barriers, performance gaps, knowledge gaps, KM component affected, and proposed solutions (Headquarters, Department of the Army, 2015b).

Knowledge management components: KM is composed of the following four components: (a) *people* who create, organize, apply, and transfer knowledge; (b) *processes*, which are methods of creating, organizing, applying, sharing, and transferring knowledge; (c) *tools*, which are the digital and nondigital knowledge tools used to put knowledge products and services into organized frameworks; and (d) *the organization*, which is the matrix in which people, processes, and tools function (Center for Army Lessons Learned, 2017).

Knowledge Management Maturity Model (KM3): Type of knowledge audit that looks at the overall maturity level or organizational readiness for KM (Dalkir, 2017). The KM3 is a matrix defining 42 KM efforts, grouped under the four components of KM: people, process, tools, and organization. By scoring these efforts with a standard Likert scale (higher is better), an organization's KM team can assess the status of its KM program, identify areas needing improvement, and track that improvement over time (Center for Army Lessons Learned, 2017).

Knowledge flow: The movement of knowledge between employees, teams, and business units, and/or across the entire enterprise (APQC, 2022).

Knowledge transfer: The successful movement of knowledge from one person or area to another (APQC, 2022).

Operation: A military action or the carrying out of a strategic, operational, tactical, service, training, or administrative military mission (Headquarters, Department of the Army, 2021, *FM 1-02.1, Operational Terms*).

Operational level of warfare: The level of warfare at which major operations are planned, conducted, and sustained to achieve strategic directives within theaters or other operational areas (Headquarters, Department of the Army, 2021a).

Organizational staff members: For the purposes of this study, organizational staff members are defined as those soldiers and Department of the Army civilians who are assigned to, and work at, a large Army headquarters design to command and control several subordinate organizations that share a common mission.

Public value: Producing what is valued by the public, is good for the public, or both (Bryson et al., 2014).

Shared understanding: The collaborative framing of the operational environment and its problems with visual approaches to solve those problems (Headquarters, Department of the Army, 2019a).

Staff integration: The process of having clearly defined staff functions in order to operate effectively and efficiently through an established organizational battle rhythm

consisting of meetings, working groups, and boards (Headquarters, Department of the Army, 2019a).

Strategic level of warfare: The level of warfare at which a nation determines strategic security objectives and guidance, and then develops and uses national resources to achieve those objectives (Headquarters, Department of the Army, 2021a).

Tactical level of warfare: The level of warfare at which battles and engagements are planned and executed to achieve military objectives assigned to tactical units or task forces (Headquarters, Department of the Army, 2021a).

Tacit knowledge: Highly internalized knowledge such as knowing how to do something or recognizing analogous situations (Dalkir, 2017). It is a unique, personal store of knowledge gained from life experiences, training, and networks of friends, acquaintances, and professional colleagues. (Headquarters, Department of the Army, 2015b).

Value proposition: A description of the reasons for an initiative or change, based on an estimation of benefits, costs, and risks (APQC, 2022).

Assumptions

For this study, several assumptions were made: The first was that the reality of knowledge is subjective and value laden as experienced by the participants in the case study. Nonaka et al. (2008) defined knowledge as a justified true belief, indicating that knowledge is in the mind of the knower and is socially created through the integration of the various views held by members of the organization. Second, was the assumption that knowledge within organizations is created through the interaction of tacit and explicit

knowledge (Nonaka & Takeuchi, 1995) and that this knowledge flow can be managed or influenced. This is a key assumption that the Army's doctrine and KM maturity model are built on (Center Army Lessons Learned, 2017; Headquarters, Department of the Army, 2015b). The third assumption was that knowledge flow is managed through the key organizational components of people, process, and tools, within the organization as described by the Army (Headquarters, Department of the Army, 2015b) and scholars Argote and Fahrenkopf (2016). A fourth assumption was that participants selected for focus group interviews in the Army's implementation of the maturity model were representative of their organizations and had a basic understanding of Army doctrine with an interest in information and knowledge management to improve their organizations. Finally, it was assumed that they provided truthful input to both the KM3 and the KMAT with the intent to improve their organization's performance.

Scope and Delimitations

The scope of this case study was the organization of the U.S. Army Knowledge Management Proponent as it implemented the KM program, enterprise wide, across the whole of the U.S. Army and attempted to measure KM maturity. This case study explored the KM maturity levels within U.S. Army headquarters elements and described the barriers that prevent obtaining optimal performance. This study included a wide variety of U.S. Army headquarters, including Active, Army National Guard, and Army Reserve across all echelons. It did not include other services or foreign military organizations.

Limitations

Limitations to this case study involved the use of data sources from focus group interviews, observations, and document analysis. Each of these data sources had limitations. Focus group interview limitations included misinterpreted responses and a bandwagon effect. Observations were limited by the possibility of the observer changing the behavior in the observed. Document analysis limitations included version control of digital documents and incomplete or inaccurate documents.

To mitigate limitations of interviews, a purposeful sampling technique was chosen to ensure that units that were selected had an intense interest in KM and a willingness to commit time and resources. Focus groups were facilitated to explain the data collection instruments used and answer questions about the approach. This mitigated distortion and provided detailed examples of the phenomenon of knowledge transfer within headquarters elements using doctrinal measures.

The limitation of observation was mitigated by ensuring that all participants understood the observer's role and that the context of the observation was in a non-attribution environment focusing only on program evaluation. The limitation of document analysis was mitigated through vetting the accuracy of documents with a senior organizational leader.

A final limitation of document analysis was the use of doctrinal measures outside of these specialized military units. This limitation was the military-specific syntax of the measures and the model. The measures were described using terms from U.S. Army doctrinal manuals. The measures show promise for generalized use across U.S. military

organizations and their mission partner allies (i.e., Canada, United Kingdom, Australia, and New Zealand) that share common doctrinal approaches. However, within the business community of practice, some measures may require lexical revisions using business management terms for use within civilian business organizations. For example, the measure "battle rhythm" could be revised to its synonyms in the business community such as "staff integration" or "meeting management" and "decision-making." To mitigate this, a civilian business model lexicon is provided in Appendix E for reference and transposition.

The combination of data types allowed for triangulation of data to compensate for weaknesses in each data source and increased the reliability of the data through member checking, corroboration, and collaborating with participants (Creswell, 2018).

Significance

The U.S. Army continually deploys organizational headquarters to meet worldwide operational contingencies across the globe in complex environments. During both predeployment training and contingency operations, KM is often assessed as an area of concern (Center Army Lessons Learned, 2018). This study explored and described reasons for this gap as expressed through the KM3 and KMAT by those practicing KM in the field. It may also highlight recommended organizational changes within the KM components of people, process, and tools. Finally, the stated definition of KM articulates that its purpose is to enhance decision-making, which commits public resources. Effective decision-making creates public value by ensuring that the military uses its

resources responsibly. These potential findings may lead to organizational processes, procedures, or policies that require a change to affect the organization in a positive way.

Summary

This chapter introduced the research gap of measuring KM as a multidisciplinary approach to optimize staff integration and the U.S. Army Knowledge Management Proponent's efforts to implement and measure a KM program enterprise wide. The problem of assessing and measuring knowledge flow was introduced within the context of the digital information environment. The research questions addressed the KM maturity levels of U.S. Army headquarters elements as measured by the KM3 to include the knowledge flow barriers described in the KMAT. Definitions were stated to properly scope this research within the multidisciplinary field of KM and the research limited to the U.S. Army and its doctrinal approach. Similarities may exist with other services or foreign armies but were beyond the scope of this research. In Chapter 2, I will review the literature in relation to KM and the problem as stated in this chapter. In Chapter 3, I will describe the case study research methodology, and in Chapters 4 and 5, I will explore the research findings and recommendations.

Chapter 2: Literature Review

Introduction

This chapter presents the extant literature relevant to this study. As introduced in Chapter 1, the ability to assess the information and knowledge flow within U.S. Army headquarters elements is essential to meet the complex demands of the information environment. Within an organization, the assessment of information and knowledge flow determines if KM is useful as an integrating process to enhance decision-making and organizational learning. The U.S. Army's doctrinal approach to integrate and measure KM will be reviewed and measured along with the existing research literature.

The scope of this literature review begins with the literature on KM in relation to an organizational theory framework, followed by a review of the challenges of defining KM across the military services and academia. KM is a multidisciplinary field of study that draws from several disciplines, including organizational science, information management, library science, and collaborative web technologies (Dalkir, 2017). Finding a consensus on the definition of KM is difficult due to this multidisciplinary approach (Dalkir, 2017) and the disciplinary lens used by researchers to interpret and define KM.

A literature review of the various KM definitions is necessary to scope this study to a manageable level of inquiry and set the stage for research. This literature review addresses research findings relevant to concepts of measuring knowledge flow across the typology of people, processes, and tools within the organization. Finally, this chapter concludes with a review of the literature relative to KM maturity models and KM assessments.

This literature review drew from a number of sources, including the following:

- Walden University Online Library, using the EBSCO, ProQuest, and Academic Complete search engines
- Ike Skelton Combined Arms Research Library, Ft. Leavenworth, Kansas
- Army Publication Directorate
- Google and Google Scholar search engines
- APQC website, a nonprofit research knowledge center

Key search terms and combinations of search terms used in this literature review included *knowledge management*, *knowledge transfer*, *KM assessments*, *KM maturity model*, *organizational knowledge*, *organizational assessments*, and *organizational science.*

Conceptual Frameworks

The foundations of KM are firmly rooted in the conceptual frameworks of organization science and organizational learning. The literature exemplifies the concept of knowledge flow from these disciplines to enable knowledge creation (Argote & Miron-Spektor, 2011; Nonaka & Nishihara, 2018; Nonaka & Takeuchi, 1995; Senge, 1990). This organizational approach is directly applicable to public policy and administration (Lindberg, 2012; Hodges, 2015; Nonaka & Nishihara, 2018) as public organizations strive for optimal performance, data-driven decisions, and innovation. It is also applicable within military organizations (Center Army Lessons Learned, 2018a). Military staffs use KM processes to share and analyze vast amounts of information to

enable organizational learning and knowledge creation for the proper employment of forces and resources (Headquarters, Department of the Army, 2015b).

Nonaka and Takeuchi's (1995) concepts of knowledge flow and organizational knowledge creation are currently used for public administration and community development by the Japan International Cooperation Agency. Their concept, first published in 1995, indicates that if organizational leaders wish to remain competitive in their environment, they must move beyond the traditional view of processing information efficiently. Competitive organizations must create new knowledge through a knowledge flow between tacit and explicit means across four modes of socialization, externalization, combination, and internalization (Nonaka & Takeuchi, 1995). One of their conditions for knowledge creation is a flat organizational structure connected with an information network to deal with a complex and constantly changing environment (Nonaka & Takeuchi, 1995).

Critics of Nonaka and Takeuchi's knowledge flow model, known as the SECI model, include Hong (2014), who explained that the concept of knowledge flow may be difficult to generalize across organizational cultures given the unique characteristics of Japanese culture that promote consensus and a unified approach to problem solving. The SECI model has withstood over three decades of debate and remains at the forefront of KM models discussed in the literature.

In the past several decades, senior organizational leaders have realized that the key to organizational learning and innovating is managing the organizational knowledge embedded in personnel and processes (Hilsop et al., 2018; Nonaka et al., 2008). Nonaka

also updated this concept with the idea of the organization's interaction with new or changing environments as a key catalyst for knowledge creation as organizational personnel interact with each other and the environment (Nonaka et al., 2008).

Argote and Hora (2017) described organizational learning and the management of technology (MOT) in a fashion similar to Nonoka. They described how organizations learn using both explicit and tacit knowledge within the processes of creating, retaining, and transferring knowledge. Although like Nonaka's knowledge creation theory, Argote and Hora separated the management of technology (MOT) from organizational learning as a separate field or area of study. Nonaka, as stated above, viewed an information network and its associated technology as essential and an integral part of knowledge creation.

Literature Review

The term *knowledge management* first appeared in 1975 as management scholars became interested in the use of information and knowledge to affect decision-making (Serenko & Bontis, 2004; Tzortzaki & Mihiotis, 2014). There is no formal consensus on a definition of KM (Serna, 2012), although several disciplines have similar definitions with only minor differences. Dalkir (2017) suggested that the definition used is often filtered by the perspective lenses of the author and cataloged over 100 different published definitions of KM. In this section, I compare and contrast the definitions of KM from different disciplinary perspectives. Dalkir defined KM as

> The deliberate and systematic coordination of an organization's people, technology, processes, and organizational structure in order to add value through

> reuse and innovation. This is achieved through the promotion of creating, sharing, and applying knowledge as well as through the feeding of valuable lessons learned and best practices into corporate memory in order to foster continued organizational learning. (p. 4)

Dalkir's (2017) definition included the organizational components of people, technology, processes, and organizational structure. These components are also included in, but further developed by, both U.S. Army and U.S. Air Force doctrinal literature. Dalkir also included lessons learned and best practices as part of organizational learning, which demonstrated an organizational science perspective.

Looking at KM from a business management perspective, O'Dell and Hubert (2011) defined knowledge management as

> A systematic effort to enable information and knowledge to grow, flow, and create value. The discipline is about creating and managing processes to get the right knowledge to the right people at the right time and help people share and act on information in order to improve organizational performance. (p. 2)

O'Dell and Hubert's business management approach to KM included creating value, which implies an increase in the company's stock or asset portfolio value. Both the Dalkir (2017) and O'Dell and Hurbert's definitions approach KM from an organizational science perspective through their explicit ideas of increasing organizational performance and learning. O'Dell and Hubert's definition was substantially close to Dalkir's definition but included the stated purpose of creating value. An increase in stock

performance or an asset portfolio is a crucial business management measurement of value and can justify KM initiatives through linkages to a return on investment (ROI).

Shifting to a public administration perspective, the U.S. Army defined KM as "the process of enabling knowledge flow to enhance shared understanding, learning, and decision making" (Headquarters, Department of the Army, 2015b, p. 1-1). The Army's definition recognized KM as a process, and it recognized the importance of organizational learning with the importance of knowledge flow to enhance decision-making. The enhancement of decision-making is the implied value created for public service organizations and may be used to establish an ROI for KM initiatives (Headquarters, Department of the Army, 2015b).

The U.S. Air Force, in contrast to the U.S. Army, has defined KM as a discipline rather than a process and stated that it is "focused on the integration of people and processes enabled by technology throughout the information life cycle to create shared understanding and increase organizational performance and decision making" (Headquarters, Department of the Air Force, 2019, p. 4). This perspective also differs from the Army's by explicitly stating the importance of technology. The Air Force's KM definition is similar to the Army's by implying that the value proposition is defined as an increase in organizational performance and decision-making. Within the armed forces, improvement in decision-making equates to public value through less public expenditure of resources for the accomplishment of legislated tasks.

Public value is a public administration concept that is defined as "producing what is valued by the public, is good for the public, or both (Bryson et al., 2014, p. 448).

Public value creation is composed of three parts: The purpose is publicly valuable, it is politically supported, and it is operationally feasible (Moore, 1995; Wallmeier et al., 2019). This fits with the stated purpose of knowledge management to optimize performance and increase efficiency through effective processes that enable timely and resource informed decision-making (Headquarters, Department of the Army, 2015b).

The idea of shared understanding, used by both the U.S. Army and the U.S. Air Force, is not included in definitions used by other disciplines. It is, however, very applicable to the public administration discipline if shared understanding is linked to increased public value and Nonaka's concept of "Ba" (Nonaka, 2008). The Army defines shared understanding as "the collaborative framing of the operational environment and its problems with visualized approaches to solve those problems" (Headquarters, Department of the Army, 2019a, p. 1-8). The Air Force defines shared understanding as "a collaborative organization approach to improve cross functional communication and increase organization wide situational awareness while reducing stovepipes making data, information and products available" (Headquarters, Department of the Air Force, 2019, p. 18). Both definitions describe a collaborative shared approach to a common understanding of a problem. Within a military context, this is a problem that requires a plan or order completed in a collaborative method to provide a way to overcome the problem. The primary difference between the military services KM definitions and other definitions is the concept of shared understanding.

This idea of shared understanding is comparable to Nonaka and Nishihara's (2018) idea of shared context in motion and is expressed with the Japanese word "Ba." It

is defined as a place where the organizational participants share their contexts and views. It can be a physical place or a virtual place. It is where organizational members engage in dialogue to grasp the essence, articulate, and conceptualize the organizational vision.

Examination of different KM definitions within the literature suggests agreement across multiple disciplines that KM consists of the components of people, processes, and technology within an organization (Argote & Fahrenkopf, 2016; Dalkir, 2017; Headquarters, Department of the Air Force, 2019; Headquarters, Department of the Army, 2015a). That KM is a process (e.g., Army) and in some organizations a discipline (e.g., Air Force) with the purpose to increase organizational learning and efficiency to create private or public value. The purpose of KM, according to the literature, is the proper alignment of the people, process, and technology (or tools) components of KM within the organizational matrix to increase both tacit and explicit knowledge flow for enhanced decision-making. This alignment of the KM components is one of the continual challenges for organizations.

Components of Knowledge Management

Dalkir's (2017) definition of KM explicitly mentions the components of people, processes, technology, and organizational structure. These are included in the Army's conceptual construct as the KM components (Headquarters, Department of the Army, 2015b). The difference is with the Army's use of the term tools in place of technology. The Army's doctrinal construct recognizes that technology at times fails through the loss of connection with information technology servers or the loss of power. Back-up tools are then required for continuity of operations (COOP). People, processes, and technology are

also mentioned within the U.S. Air Force definition of KM (Headquarters, Department of the Air Force, 2019). This service has adopted a doctrinal construct similar to the Army's. This study adopts the Army's doctrinal view of the KM components consisting of people, process, tools, and organization (Headquarters, Department of the Army, 2015b). This is similar to both Dalkir's (2017) concept and the U.S. Air Force's concept. Army doctrine states that the KM process enables the alignment of people, processes, and tools within the organization, thereby increasing collaboration, resulting in the shared understanding of the organizational vision and mission (Headquarters, Department of the Army, 2015b).

The people, process, tools, and organization components of KM offer a typology to measure knowledge transfer within an organization. Argote and Hora (2017) studied knowledge transfer in organizations across a similar typology called members, tasks, tools, and networks. Argote and Fahrenkopf (2015) found high levels of both tacit and explicit knowledge when people or members were transferred within the organization and an increased level of knowledge transfer when people transferred with technology. Kim et al., (2016) found that technology systems also contributed to knowledge transfer. A review of the current literature provides evidence to support the Army and Air Force's conceptual construct of people, process, tools, or technology. These KM components are reviewed in detail in the following sections.

People Component

An organization is a body of people with a particular purpose (*Oxford American Dictionary*, 2010, p. 1236). People, according to Argote and Hora (2017), are the social

network that offers a means to transfer both explicit and tacit knowledge. How people are organized and trained in the required processes and tasks is always of concern to leaders (Headquarters, Department of the Army, 2015b). Extensive research on social networks within organizations has shown that movement of people across organizational units may provide a positive transfer of knowledge (Argote & Fahrenkopf, 2016).

Tacit knowledge is essential to an organization, and much of an organization's tacit knowledge resides in its people. As a result, organizational leaders must engage their people to capture tacit knowledge and build knowledge networks with corresponding processes that improve organizational learning and reduce knowledge flow barriers. This enhances organizational performance (Headquarters, Department of the Army, 2015b). In Nonaka's (2008) process theory of the knowledge-based firm, people play a vital role in organizations. They create tacit knowledge through interaction with each other and the environment (Nonaka et al., 2008). Pyrko et al. (2017) examined how people exchanged knowledge in communities of practice (CoPs). They found that CoPs were more successful when people were encouraged and driven to solve a common problem. The process of people thinking together to solve organizational issues regardless of the tool or platform and driven by mutual interest is the best way to organize a CoP (Pryko et al., 2017). This tacit knowledge exchange becomes explicit as the organization vets and externalizes knowledge for sharing within the organization. Bartolacci et al. (2016) found that virtual CoPs can use Nonaka's SECI model for interorganizational knowledge creation.

Scholars have found that enabling the people component is the key to becoming a knowledge sharing and creating company (Henttonen et al., 2016). Tools and technology can enable knowledge sharing and creation, but technology alone cannot produce a knowledge sharing organization. It depends on the people and the level of trust they develop with colleagues that drives knowledge sharing, which in turn drives knowledge creation (Henttonen et al., 2016; McDermott, 1999). Successful organizational leaders connect people within the organization through networks to build trust that enables knowledge sharing and successful accomplishment of goals (Headquarters, Department of the Army, 2015a; Headquarters, Department of the Army, 2019a: Headquarters, Department of the Army, 2019c). Henttonen et al. (2016) examined knowledge sharing in public organizations and found knowledge sharing increased employees work performance, especially those with higher education levels.

Process Component

A process is a series of actions taken to achieve a particular end (Oxford American Dictionary, 2010, p. 1392). Central to Nonaka's SECI model is knowledge flow. This flow is a process as knowledge passes continuously between the tacit and explicit domains, often creating new knowledge (Nonaka, 2008). This knowledge flow enables knowledge creation either formally through established operational procedures or informally through collaboration and dialogue (Headquarters, Department of the Army 2015b,). This knowledge creation can move up from individuals and small groups through established processes that may be eventually validated as organizational

knowledge (Hilsop et al, 2018). Nonaka (2018) views knowledge creation as a process that is people centered and action oriented toward truth.

Within the U.S. Army's doctrinal framework, KM is viewed as a process that assesses and then aligns the organizational components of people, processes, and tools for efficient knowledge transfer (Headquarters, Department of the Army, 2015b). The Army's KM process consists of a series of actions to enable this alignment. These are the assess, design, develop, pilot, and implement steps to solution development for elimination of barriers to knowledge flow. The elimination of barriers with the proper alignment of the components results in optimal knowledge flow. The Army's KM process is often used to evaluate other operational processes within the organization to insure they are integrated for organizational mission accomplishment (Headquarters, Department of the Army, 2015b).

The Army has two main categories of processes. First, is the tactical operations process that consists of plan, prepare, and execute with continual assessment (Headquarters, Department of the Army, 2019b). In addition to the operations process, the Army also recognizes five integrating processes that move information and knowledge into the operations process. These are the intelligence preparation of the battlefield (Headquarters, Department of the Army, 2019d), information collection (Headquarters, Department of the Army, 2013), targeting (Headquarters, Department of the Army, 2015c), risk management (Headquarters, Department of the Army, 2021b),0 and knowledge management (Headquarters, Department of the Army, 2015b).

The second category of processes are the business management processes. These consist of activities under Title 10 of the U.S. Code to effectively and efficiently organize, man, train, equip, and sustain forces in accordance with strategic objectives (Headquarters, Department of the Army, 2019e). The Army uses recognized continuous process improvement techniques, within this second category of processes such as Lean Six-Sigma and the Baldridge Performance Excellence Program (Headquarters, Department of the Army, 2015a). The core values used to align organizational goals in the Baldrige system are leadership, strategic planning, customer focus, measurement analysis, and knowledge management (National Institute of Standards and Technology, 2015). Within the Army's doctrinal and regulatory literature, KM is viewed as an important integrating process for both tactical operations and business management operations. Whether organizational members recognize and adhere to these processes or use them appropriately is a separate area of scholarly concern and is addressed in the literature as process conformance.

Process conformance is the degree to which there is accordance with these prescribed steps (Wynen el al., 2019). Processes can effectively transfer knowledge and help mitigate personnel turnover (Ton & Huckman, 2008; Wynen et al., 2019). Wynen et al. (2019) found in a study of 30 divisions of a Belgian public service agency that process conformance can have a limited mitigating affect for personnel turnover by embedding knowledge within these routines or processes.

Tools Component

Some scholars (Argote & Hora, 2017) like the term "tools" versus "technology" similar to the U.S. Army's doctrinal approach. Argote and Ingram (2000) defines tools as both hardware and software. The U.S. Army defines tools as any material items, digital or analog, that aid in transferring knowledge (Headquarters, Department of the Army, 2015b,). These tools often process large amounts of data either digitally or analog and add context to data to create information (Matthias et al, 2015). Several scholars have found that knowledge embedded in tools such as knowledge management systems positively effects knowledge transfer (Argote & Hora, 2017). These studies include supply chain (Kim et al., 2016), and information technology (Hwang et al., 2015; Kornish & Hutchinson-Krupat, 2017).

Organization Component

The U.S. Army defines an organization as the matrix where people, processes, and tools function to integrate individual and organizational knowledge and learning strategies (Headquarters, Department of the Army, 2015a). The study of organizations is by nature multidisciplinary with several different approaches.

The field of organizational development views organizations as in need of constant and continual change to improve organizational effectiveness through humanistic-democratic values (Robbins & Judge, 2008). The U.S. Army first used this approach in the late 1970's to address the enormous change resulting in the transition from a draft army to an all-volunteer army (Deaner, 1991). The Chief of Staff of the Army, General William C. Westmoreland looked to the field of organizational

development to provide solutions to organizational turmoil resulting from this change in the Army's organizational paradigm (Deaner, 1991). This new approach trained officers called "Organizational Effectiveness" officers or OE officers to work with staffs of large headquarters elements to improve processes within their organizations. This approach was halted in 1985 as the demands of the Cold War called for the creation of two new Army Divisions and personnel authorizations dedicated to "Organizational Effectiveness" were shifted to other operational elements of the Army.

Following the end of the Cold War and the successful completion of the First Gulf War, the U.S Army began to see its organizations as increasingly dependent on the information network for decision-making and precision fires. In searching for a new model to view organizational challenges associated with the information network technology, the Army turned to organization science and the subfield of Knowledge Management (Nonaka & Peltokorpi, 2006). This new field provided a means to provide organizational solutions for efficiency. The Army viewed KM as an approach to exploit both its organizational knowledge and its soldiers' individual knowledge for an operational advantage (Headquarters, Department of the Army, 2015b). This approach set the Army's new organizational approach firmly within Nonoka's SECI knowledge spiral model (Nonaka et al., 2018).

Organization science and KM are both multidisciplinary fields of study that examine how organizations function and include viewpoints from organizational psychology, organizational decision-making, organizational learning, and resource management. The subfield of KM draws expertise from the fields of information

technology and data science. Consistent with Nonaka et al. (2021), Argote (2011) argued that interest in organizational learning and knowledge transfer is a result of changes in the organizational environment. The distributed work environment and the changing nature of organizations into multinational and global conglomerates resulted in organizations being matrixed across the expanse of the globe and a desire for efficient knowledge transfer techniques. Argote and Ingram (2000) began looking at knowledge transfer within the organizations across the different organizational components. The challenge for organizations is to properly assess this alignment of people, process, and technology to optimize knowledge transfer.

Assessing Knowledge Management

Scholars have often examined the ability to assess or measure KM within organizations (Hodges 2015; Khatibian et al., 2010; Oliva 2014). Assessment is often the first step organizations take to implement KM (Hodges, 2015). One way to assess KM is through an audit of information and knowledge requirements. This is often part of an overall assessment guiding a knowledge management strategy (Dalkir, 2017). The KM assessment may also include a gap analysis to determine knowledge gaps within the organization (Dalkir, 2017; Headquarters, Department of the Army, 2015b). Another means to assess KM within organizations is through productivity. Mendoza et al. (2017) measured productivity in government research and development organizations by comparing research publications before KM implementation with post KM implementation and found publications increased following implementation of KM processes and techniques. In contrast, other scholars have rejected the concept that

knowledge can be measured or managed. Schutt (2003) suggests that only conditions can be set within an organization where knowledge evolves.

Organizational leaders in both business and government have sought to assess the adoption of KM practices in their organizations to determine the return on investment (ROI) in implementing KM. One approach is through the use of Knowledge Management Maturity Models.

Knowledge Management Maturity Models

KM Maturity Models, sometimes called Organizational Maturity Models (Dalkir, 2017), have their roots in software design organizations to describe their organization's process maturity level. The most prevalent is the Capability Maturity Model (CMM) developed by Carnegie Mellon University (Dalkir, 2017; Oliva, 2014). There are several types of KM maturity models, with most describing five evolutionary stages or levels that progress toward an optimized performance or innovative practices level (Dalkir, 2017). At the final stage, the organization is able to leverage its highly developed integration of people, processes, and tools/technology to realize optimal, agile, and innovative performance results.

As a means of assessment, the literature on KM Maturity models and their implementation is sparse. Vanini and Bochert (2015) studied the use of maturity models in 10 German companies. They determined that five out of the 10 companies examined could reach only a level three and attributed their higher ranking to having an integrated suite of KM systems in place. Oliva (2014) conducted a quantitative analysis of KM maturity models and barriers to KM with 171 Brazilian companies. Using several

different statistical measures from 171 valid surveys, Oliva (2014) used factor analysis and multinomial logistics regression to develop categories of barriers that hinder organizational KM, to include levels of KM maturity for organizations. Oliva (2014) developed four maturity levels: insufficient KM, structured KM, oriented KM, and integrative KM.

The U.S. Army Knowledge Management Proponent Office introduced a version of a KM Maturity Model (KM3) in 2015. This was based on several field training visits over three years that indicated the Army needed a tailored KM self-assessment tool for its headquarters elements. The Army's approach conforms with Vanini and Bochert (2015) recommendations that organizations should not use a one size fits all maturity model but rather tailor a model to fit the organization. A tailored KM maturity model for the Army was piloted in 2016 (Hawley & Swehla, 2017) with an Army headquarters element at the Network Integration Evaluation located at Fort Bliss, Texas, and observed by the Army Research Laboratory's (ARL) Human Research and Engineering Directorate.

This pilot version of the KM Maturity Model was used as an initial benchmark before an ARL field evaluation to study the effects of cognitive overload in headquarters command posts. The pilot Army maturity model was used again with the same unit as a post evaluation. The purpose was to assess the effectiveness of KM training prior to the evaluation as a nontechnical solution to use KM techniques and procedures to mitigate the mental overload of information in participants during the evaluation. The second objective was to pilot the KM maturity model for further use in the field (Hawley & Swehla, 2017). The findings from the evaluation were mixed. Hawley and Swehla (2017)

found that the KM Maturity Model showed potential for future organizational assessments but stated care was needed in its application to prevent an organization's members from inflating the assessment (Hawley & Swehla, 2017). As a result of Hawley and Swehla's findings, the application of the KM Maturity Model to Army organizations was modified by using facilitated focus groups and normalization of the Likert scoring method to mitigate inflating assessments.

Knowledge Management Assessment Template

In addition to the KM3, The Army Knowledge Management Proponent developed a Knowledge Management Assessment Template (KMAT) as a qualitative instrument designed to capture data from Army Headquarters elements during field visits. As an instrument, the KMAT is a synthesis of the concepts described in the Army design methodology (Headquarters, Department of the Army, 2019b) and Bryson's (2018) strategic planning for nonprofit organizations. The purpose of the KMAT is to capture issues or knowledge flow barriers related to KM as described by organizational members in focus groups. It lists the KM issue, states whether the issue concerns people, process, tool, or organizational issue and then lists a member proposed solution with subsequent performance and effectiveness measures. It also ranks solutions by the amount of effort, both in time and resources, required by the organization to implement. In addition, it includes the level of impact on the organization.

The second part of the KMAT visually depicts the rank-ordered issues by effort and impact to assist organizational decision-makers in prioritizing solution development given their current organizational resources. This approach is consistent with the Army's

stated purpose for its doctrinal design methodology by applying critical thinking to stated problems and visualizing approaches to solving them (Headquarters, Department of the Army, 2019b). The KMAT also portrays a visual picture of knowledge barriers and issues within an organization and the desired end state with developed solutions. This approach is also similar to the strategic management approach as outlined by Bryson (2018). In his approach, organizational strategic planning is described as a deliberative approach to move the organization forward. It does this by analyzing information, developing achievable mission goals with integrated initiatives, addressing organizational challenges, continuous organizational learning and creating public value. The KM3 and KMAT is discussed in greater detail in Chapter 3.

Summary

This chapter has provided a review of the literature relating to knowledge management as it pertains to this study. It reviewed the literature regarding the conceptual frameworks of Nonaka and Takeuchi's (1995) SECI knowledge creating model and Argote and Hora's (2017) organizational learning model. In addition, it provided a comparative analysis of the definitions of knowledge management within the U.S. Army, U.S. Air Force, and business management fields. This chapter also discussed the relationship of KM to Public Administration and the relationship to the concept of public value. Further, it reviewed the literature's deep discussion of each of the KM components of people, process, tools, and organization. Finally, it explored the use of the KM maturity models and KM assessment tools within the literature. Chapter 3 examines

the research design and methodology for this study to include an in-depth discussion of the KM3 and KMAT instruments used for assessments.

Chapter 3: Research Method

Introduction

There is little research involving military organizations that deliberately and systematically implement a KM program with trained KM practitioners across organizational units and then attempt to measure knowledge flow and barriers within the organizational headquarters units. This study was designed to understand, describe, and explore this implementation.

The purpose of this qualitative embedded case study was to describe and explore the U.S. Army's effort in the implementation of KM as an integrating process within U.S. Army headquarters units. This single case study included multiple embedded units of analysis consisting of different U.S. Army headquarters units. This study explored efforts to measure levels of KM maturity across selected Army headquarters elements through established doctrinal measures and compared these levels with descriptions of knowledge transfer barriers as described by headquarters participants in archival KMAT data.

In this chapter, I discuss the outline of the research design and methodology for this qualitative case study with the rationale for selecting this method. Additionally, I discuss my role as the researcher, researcher biases, and participant selection. Further, the instrumentation used in the data collection, the data analysis plan, and issues of trustworthiness are presented. Finally, the chapter concludes with a description and mitigation of the ethical procedures and issues, followed by a summary.

Research Design and Rationale

This study used a qualitative single case study design with multiple embedded units of analysis. The case study was bounded by time, place, and scope. The case study integrated data analysis from the KM3 instrument and contextual information from the KMAT instrument across different sites and locations to provide a detailed description of the phenomena. The embedded case study provided an in-depth analysis of the Army's efforts to implement KM as an integrating process across a worldwide defense enterprise. This study employed a constructivist worldview through which I sought to establish the meaning of a phenomenon from the view of participants.

This exploratory single case study with embedded multiple units of analysis focused on the following main research questions:

RQ1: What are the KM maturity levels, as measured by the KM3, of selected U.S. Army headquarters?

RQ2: How do organizational staff members working in U.S. Army headquarters describe knowledge transfer barriers as collected by the KMAT?

The rationale for selecting this case study research design was the exploratory nature of determining the KM maturity levels of U.S. Army headquarters and the qualitative nature of determining how organizational members describe knowledge transfer barriers within their organization. Case study research can involve extensive analysis of a particular event and the ability to use different types of data (Schoch, 2016). Yin (2018) stated that case studies often use documents, artifacts, interviews, and direct observations to study contemporary events. Creswell (2018) explained that a case study is

used to explore a contemporary issue to illustrate an event or problem. The research questions and the contemporary phenomenon of implementation of the Army's KM program aligned with the methodology chosen for this study.

Role of the Researcher

The purpose of this section is to describe my role as the researcher. From 2015 to the present, the USAKM-PO has provided field visits to train and assist Army headquarters elements that have requested assistance with their KM program. During this time period, USAKM-PO has assisted over 30 headquarters elements in collecting program evaluation data. The anonymous program evaluation data collected during these field visits are stored on a secure military site and present an information-rich environment for analysis. In anticipation of a peer-reviewed paper publication (VanLaar et al., 2020), a formal institutional review board for the protection of human subjects was requested from the U.S. Army Command and General Staff College. On April 15, 2019, the use of these data for future studies was considered by the U.S. Army as exempt from Institutional Review Board approval because it was deemed that the study fell into the category of program evaluation.

As a senior military analyst with the U.S. Army Knowledge Management Proponent Office, I have the role of collecting and working with secondary data as an analyst in the implementation of the program. I used program evaluation data from site visit focus group discussions and examined artifacts of selected Army Headquarters where KM programs have been implemented. There is no supervisory relationship between myself and the units examined. All input into the KM3 and the KMAT data

instruments were completed during previous site visits. The data were member checked with both the participants and their organizational leadership prior to uploading into the data repository by the facilitators. The researcher relationship is one of consultancy to assist a U.S. Army headquarters in establishing a KM program according to U.S. Army doctrine. This study entailed the use of archived, anonymous, and aggregated KM program evaluation data from focus groups conducted during site visits. No personal data were collected, and all individual responses were aggregated as a focus group. This study minimized researcher bias by presenting focus group data openly with members prior to consolidation, documentation, and presentation to senior organizational leaders of assessed headquarters. This member checking allowed both participants and senior unit leaders to review the credibility of the data analysis and mitigated researcher bias (Creswell & Poth, 2018).

Participant Selection Logic

The trigger for studying a specific headquarters was a request for assistance. This was a single case study with multiple embedded units of analysis. Yin (2018) described this type of sampling as occurring at more than one level. This sampling consists of an organization at the top level, but attention is also paid to subunits at the lower echelons of the organization (Yin, 2018). The single case study in this research was the U.S. Army Knowledge Management Proponent Office (AKM-PO) and the program implementation of KM as an integrating process across multiple subunits within the U.S. Army. These subunits had multiple embedded units of analysis that consisted of several (n = 8) different types of U.S. Army headquarters units across four levels of analysis. The

sampling strategy was for maximum variation of subunits to allow for differing perspectives (Creswell, 2018) on the program implementation across the various subunits. This technique allowed for information-rich insights on the program implementation of KM as an integrating process.

The selection criteria for participation in this study followed the memorandum of agreement outlined by the U.S. Army Knowledge Management Proponent for field visits. To be the subject of a field visit, the subunit headquarters must volunteer for a visit, submit a request, have a certified KM practitioner on staff, and be willing to have senior key leaders attend an in-briefing and an out-briefing to member check and verify the results of the visit. The number of embedded subunit headquarters examined was approximately eight ($n = 8$). This number allowed for opportunities to explore knowledge transfer processes across various subunits concerning the implementation of the U.S. Army's doctrinal concept of KM.

Instrumentation

Data collection was accomplished by using two instruments—the Army Knowledge Management Maturity Model (KM3) in Appendix A and the KMAT in Appendix B. Each instrument used a focus group design to obtain quantitative and qualitative data on doctrinal performance measures and participant-perceived knowledge barriers. Research focus groups are often used in studies to acquire detailed information from small groups about a particular program (O'Sullivan et al., 2008). Focus groups provide valuable information by allowing participants to interact with each other to determine answers to highly conceptual questions (Creswell, 2018). The Likert-type scale

is typically used in individual survey questions but can be also used in focus group research to rate the effectiveness of behavioral prevention strategies and programs (Colucci, 2007).

As discussed in Chapter 2, the KM3 was developed in 2015 and piloted in 2016 for use by the Army to measure KM performance in headquarters elements. The KM3 measures are grouped under the four doctrinal KM components of people, process, tools, and organization/culture (Argote & Hora, 2017; Headquarters, Department of the Army, 2015b). Within these four KM component areas, 42 subareas are measured in accordance with the following assessment schema: people—six subareas; process—12 subareas; tools—14 subareas; and organization/culture—10 subareas. A cumulative score is derived by totaling the score achieved within each subcategory. These scores were assigned by the facilitated focus groups comprised of the headquarters participants. The participants were staff personnel who expressed an interest in KM and understood their section, branch, or division's staff and business processes within the organization.

Data Collection

This study used archival data that was collected during AKM-PO field visits and resulted in anonymous aggregated data on the use of knowledge management techniques within Army headquarters. These data consisted of a staff group's Likert scores for the AKM-PO's Knowledge Management Maturity Model and descriptions of knowledge barriers for the KMAT. The archival data were collected from 2015–2022 from several different Army headquarters organizations and across several echelons. The staff participants and units were anonymous within the data collection instruments.

Data Analysis Plan

This case study used multiple sources of data to include U.S. Army doctrinal documents, archival records consisting of semistructured focus groups using the KM3 and the KMAT, and observations conducted during the data collection process. This study used MS Excel data analysis software to analyze qualitative data for thematic analysis. U.S. Army doctrinal publications are used to describe the theoretical construct employed during the collection and analysis of data. The Center for Army Lessons Learned publications were used for trends analysis. Archival records that described the establishment of the U.S. Army Knowledge Management Proponent were reviewed to establish organizational dynamics that led to the creation the program.

This case study used secondary archival qualitative program evaluation data collected from field visits during the implementation of the KM program. The archival data were coded to explore themes that emerged from the KMAT instrument in focus groups that identified knowledge flow barriers. The archival qualitative data were coded using a codebook and thematic analysis (Braun & Clark, 2021) within the U.S. Army theoretical doctrinal constructs of people, process, tools, and organization. The six steps in Braun and Clark (2021) include familiarizing oneself with the data, generating initial codes, searching for themes, reviewing potential themes, defining and naming themes, and producing the report.

Table 1

Summative Coding Table

A priori codes	Open codes	Categories	Subcategories	Unit	Excerpts	Themes
People						
Process						
Tools						
Organization						

Secondary archived quantitative data collected during field visits were analyzed to describe the overall KM maturity of U.S. Army headquarters elements. These focus groups assigned Likert scores in each of the 42 measured subcategories through facilitated, structured discussions allowing focus group participants to debate and assign the organization's score candidly. These aggregated Likert ratings measured the underlying phenomena of knowledge management. The following criteria (Likert scale) were used:

- 1 = unit is not doing this effort at all
- 2 = unit has started this effort but is still in development
- 3 = effort is well developed but not fully implemented
- 4 = unit does this effort, and it is fully implemented
- 5 = unit has assessed effort and has validated its utility

The above criteria fully anchor each measure and represent interval levels of measurement, making them suitable for parametric levels of measurement (Harpe, 2015). This study explored these descriptive statistics to develop trends that are common across

the various headquarters. The quantitative trends derived from the KM3 were compared and analyzed with the qualitative themes from the KMAT.

This study's use of multiple sources of data provided the ability to use data triangulation from different lines of inquiry for a convergence of evidence to support conclusions (Yin, 2018). This multiple perspective data approach supported the construct validity of the case study. In addition, a detailed case description and cross-case synthesis of embedded units of analysis were employed within the analytical plan.

Issues of Trustworthiness

Trustworthiness involved establishing assurance in the findings of this study. The following paragraphs explain how trustworthiness and assurance in the findings were established through credibility, transferability, dependability, and confirmability.

Credibility

Credibility or internal validity within qualitative research consists of rigorous methods in field work resulting in systematic analysis of data and the credibility of the researcher (Patton, 2002). As a researcher, I remained aware of rival explanations within the data and looked for the best explanations concerning the data. Concern for credibility or internal validity in this case study involved guarding against improper references (Yin, 2018). To protect against credibility issues, I addressed possible rival explanations within the analysis of the data and ensured that the data had been member checked with participants to validate conclusions.

In addition, triangulation was used to establish credibility as Yin (2018) outlined using four types: data triangulation using multiple data sources, researcher triangulation

through the involvement of multiple evaluators, theory triangulation to explore different perspectives on the data, and finally methodological triangulation to ensure that the case study has portrayed the participants' view accurately.

Transferability

To address transferability or external validity, I analyzed the data to discern empirically based patterns that were present, highlight those that were similar, and present patterns to strengthen the presented analytical conclusions. Identification of these patterns provided for subsequent generalization (Quintao et al., 2020). Yin (2018) suggested that documenting trends in an organization—which essentially involves a "what" question—can make analyzing generalizations more difficult. To avoid this situation, Yin recommended augmenting a study with "how" or "why" questions. In developing the research design for this case study, I followed Yin's suggestion by establishing a "what" research question in relation to maturity levels, followed by a "how" research question in response to participants description of their organizational knowledge barriers.

Dependability

To address concerns for the dependability of this study, audit trails of both qualitative and quantitative data were retained and continuously crosschecked with participants and senior leaders of the organizations examined. The data were also continuously cross-checked with the research questions to ensure that the data were conceptually linked to the questions in the study. Quintao et al (2020) stated that a set process that can be replicated by multiple researchers should be followed, such as a set

protocol for rules that are followed in the field for the collection of data, coding of the data, and employment of analytical methods.

Confirmability

As a researcher, I constantly reflected on my role and position within the research as a military analyst to bracket and set aside my predispositions in the analysis of the data and presentations of resultant themes and conclusion. I disclosed to participants and senior organizational leaders my role as a researcher and author of published research articles. By employing this reflexivity, I was attentive to, and cognizant of, my own perspective as well as the cultural, social, and linguistic perspective of those being interviewed (Patton, 2002).

Ethical Procedures

Permission was granted by the U.S. Army to include previous and new data acquired through previous and future field visits (see Appendix C). I submitted the research design to the U.S. Army Command and General Staff College to provide a determination of research. The plan proposed that this study used purposeful sampling through focus groups interviews during completed field training visits that resulted in anonymous aggregated data on the use of knowledge management techniques and determination of knowledge barriers within U.S. Army headquarters. The quantitative and qualitative data was examined and used to determine a score on the KM3 and a determination of knowledge barriers within organizational headquarters elements. The individuals and the various headquarters elements are both anonymous as no personal or organizational identifiers are used in this study. The research design was submitted to the

Department of Army, Command and General Staff College's Human Protection Administrator, and it was determined that this research falls under the category of "Program Evaluation" and was not deemed human subjects' research.

To address ethical issues with my role as a researcher and participant, it should be noted that I had no power or influence over the participant headquarters elements, or the units and participants selected for field visits. The training branch of the U.S. Army Knowledge Management Proponent receives requests for field visits, and I participated as an instructor and facilitator during the focus groups involving program evaluation.

Summary

This chapter explained the rationale for the research design of this single case study with embedded units of analysis. The strength of this research is that it examines a multitude of U.S. Army headquarters units across several different echelons. It also uses multiple sources of secondary quantitative and qualitative data from focus group sessions to examine knowledge flow barriers within these large and complex headquarters. In addition, this chapter explained my role as researcher and the participation selection logic of embedded units of analysis. Further, this chapter explained the data collection method, data analysis plan, and the use of the KM3 and KMAT instruments for data collection and analysis. Finally, it reviewed issues of trustworthiness and ethical procedures. The next chapter will review the results of the data collection and analysis.

Chapter 4: Results

Introduction

The purpose of this qualitative case study was to explore the U.S. Army's implementation of KM with attempts to measure knowledge transfer using the KM3 and KMAT. This research explored the KM and organizational science gaps observed during implementation of KM as an organizational integrating process. It examined the Army's attempts to both measure knowledge transfer and describe knowledge transfer barriers using the KM3 and KMAT instruments. The analysis of the data collected for this study was an attempt to answer the following research questions.

Research Questions

RQ1: What are the KM maturity levels, as measured by the KM3, of U.S. Army headquarters?

RQ2: How do organizational staff members working in U.S. Army headquarters describe knowledge transfer barriers as collected by the KMAT?

This chapter presents the case study, the units of analysis, and levels of analysis selected from archival data. It describes the research setting, unit characteristics, and data collection. The levels of analysis are explained, and both descriptive statistics and qualitative thematic analysis are used to describe the findings. This chapter concludes with the study results and a summary of the findings.

Setting

As a military research analyst, I have worked with the AKM-PO since 2010. Since that time, the Army has undergone a tremendous amount of change. First, the

Army had to address the terrorism and counterinsurgency threat in the Middle East, followed by a second pivot to large-scale ground combat to address the Russian invasion of Ukraine. My primary responsibility is to review changes to organizational design and personnel career fields. In addition, I instruct classes in the KM Qualification Course and assist in teaching the KM electives at the Command and General Staff College. My role as a military research analyst has provided me a unique window into the Army's change efforts.

At the Army enterprise level, change is implemented through Force Modernization Proponent Offices (Headquarters, Department of the Army, 2015c) to manage a specific area of change within a specified functional area (e.g., safety) or a branch (e.g., infantry). In 2008, the U.S. Army created the AKM-PO located within the Combined Arms Center at Ft. Leavenworth, Kansas to develop and integrate KM throughout its institutional, strategic, operational, and tactical headquarters. The Army uses a "systems of systems" approach called the Army Force Management Model to generate and manage change within the specified domains of doctrine, organizational structure, training, material, leadership development, personnel, facilities, and policy throughout the U.S. Army. The Department of the Army designates the AKM-PO, through the Combined Arms Center at Ft. Leavenworth to generate and manage change for KM in each of the specified domains mentioned above.

KM doctrine was first published in 2008 to define KM, describe KM, and outline the duties and responsibilities of personnel assigned to KM sections that were simultaneously established in 2008 within select Army headquarters. This doctrine was

updated and republished in 2012 and 2015. The 2008 and 2012 editions defined and explained the importance of KM but left the practical application of KM to individual practitioners. The 2015 edition was updated to illustrate to practitioners how to apply KM to their organizational headquarters. As of this writing, the upcoming 2023 edition is in final draft in preparation for publication. It includes the KM3 and KMAT as data collection instruments on doctrinal performance measures.

Efforts within the training and leadership development domains resulted in the establishment of a 3-week KM Qualification Course in 2011. Three iterations of the pilot course were piloted in 2011, with extensive feedback from both students and instructors resulting in changes to the curriculum and final implementation following a quality assurance certification in 2012. Simultaneously with the creation of the KM Qualification Course, a 3-day exportable mobile training KM Representative Course (KMRC) and Senior Leader Executive Overview Course (SLEO) were created to train KM officers, senior leaders, and selected organizational staff on KM techniques for Army headquarters elements. The headquarters elements self-nominated themselves by contacting the KM Proponent Office and requesting assistance. Each headquarters element was instructed to sign a memorandum of understanding (MOU) stipulating its responsibility to designate 12–20 staff personnel to serve as KM Representatives (KMRs). These KMRs particpated in the program evaluation focus groups that completed the data collection instruments at Appendices B and C. The selected KMRs were midlevel staff personnel with knowledge of their staff section's processes and an interest in KM as a method to increase their staff

section's efficiency. The AKM-PO collected no demographic information other than name and duty position to track attendance during the program evaluation.

The MOU also stipulated that the organizational senior leaders must be available for both an in-brief and out-brief to member check the KM3 and KMAT data collected following the focus groups. Upon receipt of the MOU, the AKM-PO designated two military analysts to travel to the organization's location to conduct focus group sessions using the KM3 and KMAT data collection instruments. Upon arrival, the analysts broke down the selected KMRs into five-person focus groups to review each of the performance measures and assign a Likert-scale score for each measure. They were also asked to describe knowledge barriers within their organization. The two AKM-PO analysts were present to answer questions and provide clarification in the interpretation and application of the performance measures for the KM3 and assist in their description of knowledge barriers in the KMAT.

Within the personnel domain, a special skill identifier was established in 2008. Initially, this was documented on only the individual's personnel record. In 2012, it was approved for documentation of the actual positions on the Army's organizational authorization documents within the organizational structure. Designated classroom facilities were provided by the U.S. Army in 2014 to conduct training throughout the year. These facilities can handle an annual throughput of approximately 240 students. As of this writing, the AKM-PO has trained over 1,500 students since 2011.

Within the material domain, the U.S. Army established the Army Knowledge Online (AKO) platform in 1998. After the September 11, 2001, terrorist attacks, the

Army decreed that all military and civilian employees be given an AKO account for emergency status updates. The AKO system achieved its highest usage ever in 2019 during the COVID-19 pandemic, with over 1.5 million unique visitors monthly (U.S. Army, 2021). The COVID-19 pandemic accelerated the Army's rush to cloud technology with the adoption of Microsoft Teams and SharePoint Online as the platform of choice for collaboration, email, and teleconferencing in 2020.

Within the policy domain, Chief of Staff of the Army General Eric Shinseki and Secretary of the Army Thomas White issued *Army Knowledge Management Guidance Memorandum Number 1* on August 8, 2001, followed by *Army Knowledge Management Guidance Memorandum Number 2* on June 19, 2002 (Shinseki & White, 2002). These two memorandums stressed the need for universal access to Army knowledge using an enterprise network system. These guidance memorandums established goals for consolidating stand-alone networks and the reduction of redundant Army applications. These memorandums were followed by the publication of *The Army Knowledge Management Implementation Plan* in 2003. The Army's intent was to build upon the momentum established by the previous guidance memorandums with a goal of getting to one integrated network using an integrated database.

Within the setting described above, the AKM-PO continues the modernization efforts to implement KM as a staff-integrating process throughout the Army enterprise enabled by tools and technology. The research questions were designed to determine the KM maturity level of selected Army headquarters elements and explore barriers to knowledge transfer within these elements. In answering the research questions, I also

sought to gauge how successful the AKM-PO had been over the past 10 years in implementing KM as a staff-integrating process. Currently, the Army is facing budget cuts and personnel shortages (Spoehr, 2022). These shortages are due to a shifting of funds toward modernization to keep pace with the present adversarial threats from near-peer competitors such as Russia and China (Baldor, 2022; Beirnart, 2021). Building additional organizational capability through training (D. Komar, personal communication, July 17, 2013) can be a cost-effective means to achieve modernization. The AKM-PO uses the KMRC events to build KM capability through training while simultaneously collecting data on KM maturity levels and reported knowledge barriers across the Army enterprise. These data were archived and used to modify training and brief senior leaders. As a researcher and analyst, I saw the value in conducting a deeper analysis of the data for this study.

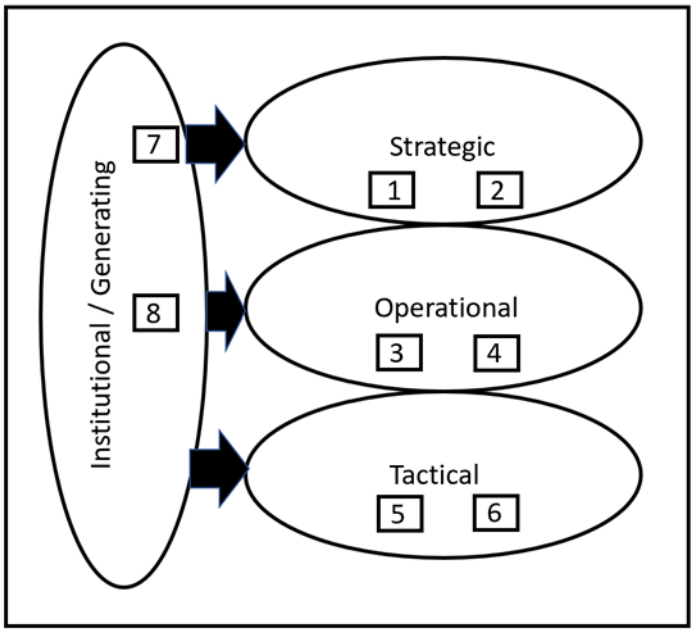
Embedded Units of Analysis Within a Single Case Study

This was a single case study of the AKM-PO. This office is designated by the Department of Army as the force modernization proponent for KM. This study included eight embedded units of analysis at four different levels or echelons. The Army headquarters elements examined are located at various echelons. These echelons are defined doctrinally as strategic, operational, and tactical (Headquarters, Department of the Army, 2021a). Parallel to the three different levels of war is the institutional force whose mission is to organize, supply, equip, and train the operational force (Headquarters, Department of the Army, 2019e) at the other three levels described above.

Yin (2018) explained that a single case study may involve different units of analysis at different levels. This case study examined two units of analysis at each of the three levels of war and two units of analysis from the generating force for a total of eight units of analysis spread across four levels of analysis (Figure 1). The units of analysis at the strategic level in this study were headquarters postured to support strategic commanders and ambassadors in implementing national policy objectives. These units have unique functions and capabilities and normally have subordinate units conducting missions across a large geographical area.

Figure 1

Embedded Units of Analysis Within the Institutional Force and Three Levels of War



At the operational level are theater armies that conduct and execute theater-level plans in support of a larger strategic-level plans. Data were collected from two theater army headquarters responsible for large geographical regions. At the tactical level are

headquarters elements responsible for executing assigned military objectives and maintaining a readiness level to deploy worldwide as required. The final level of analysis selected was the institutional level, which is charged by Congress to maintain, train, and educate Army forces in preparation for worldwide missions (Headquarters, Department of the Army, 2029e). The institutional level interfaces with the other three levels by providing maintenance for equipment and facilities, occupational training, and professional education.

Data Collection

Archival data sets from 37 headquarters elements comprising both quantitative and qualitative data were collected from 2016 to 2021 and were examined for possible inclusion in this study. The criteria for selecting units for deeper analysis across the four levels of analysis were based upon the quality of the data and the unit's location within each level of analysis. The data quality was reviewed to ensure there were complete data sets for both the KM3 and the KMAT instruments. Some units had data missing for one or both collection instruments. The units selected had complete data sets and were typical of like units operating within their level of analysis. The units that had both instruments completed by analysts during an assistance visit were then screened to select two units each at the tactical, the operational, the strategic, and the institutional levels. This was done to ensure representation across the three doctrinal levels of war and the institutional support force. Yin (2018) stated that a single case study may involve units of analysis at more than one level. In this study, the single case study addressed the AKM-PO's implementation of KM across the four levels of analysis. For this study, two headquarters

units at each of the following levels of analysis—strategic, operational, tactical, and institutional—were selected.

Participant Characteristics

No demographic data were available in the archives, but participant characteristics such as size of the unit in terms of personnel assigned and number of staff members participating were recorded. A review of the archival data indicated that the average size of the eight organizational headquarters assessed by the AKM-PO was 465 (n = 465) personnel. The average number of KMRs who completed both the KM3 and KMAT for the eight organizations was 23 participants (n = 23). The KMRs in the focus groups were equivalent to approximately .05% of their headquarters population. The section leaders purposely selected their KMRs for their interest in KM and organizational effectiveness. Table 2 displays each headquarters unit, its level of analysis (strategic, operational, tactical, or institutional), the number of personnel authorized for each headquarters, and the number of KMRs who attended the focus groups.

Table 2

Unit Characteristics

Unit	Level	Personnel	KMRS	Level of maturity
1	Strategic	632	25	2.9
2	Strategic	318	11	2.59
3	Operational	512	34	1.88
4	Operational	157	10	3.02
5	Tactical	524	12	3.14
6	Tactical	524	31	2.83
7	Institutional	441	30	2.47
8	Institutional	618	15	2.47
Total		3,726	183	
Mean		465.75	22.87	2.66

Data Analysis

Analysis of archival data was completed using a priori codes and deductive reasoning to apply a prescribed doctrinal approach, as outlined by U.S. Army doctrine, to the data. The data were collected using the KM3 and KMAT instruments. Analysis of the KM3 was done using descriptive statistics, and analysis of the KMAT was completed using qualitative thematic analysis.

Knowledge Management Maturity Model

Within the KM3 data collection instrument, the 42 doctrinal performance measures are categorized under the typology of the doctrinal KM components of People, Process, Tools, and Organization. Each of the 42 doctrinal measures are given a Likert score of 1 thru 5 based upon anchors describing the completion of a doctrinal performance measure (Table 3).

Table 3

Rating Scale Anchors

Likert-scale rating	Anchoring description
1	Unit is not doing this effort
2	Unit has started this effort but is still in development
3	Effort is well developed but not fully implemented
4	Effort is fully implemented
5	Effort is fully implemented and assessed

Table 3 provides a definition for each rating scale level. This anchors the levels to a describable standard. The standards aid participants in the focus groups to grade the level of completion of the performance measure against a definable state of being. The data analysis of the KM3 examines the average Likert score from several different perspectives. These perspectives are the Army enterprise aggregate, results by KM components (people, process, tools and organization), results by levels of analysis (strategic, operational, tactical and institutional) and results by unit.

Knowledge Management Assessment Tool

The data analysis of the KMAT examines the archival qualitative data using codebook and thematic deductive analysis within the a priori Army doctrinal typology or

codes of people, process, tools, and organization. Using these doctrinal codes participants were asked to list their organizations major knowledge barriers. The thematic analysis for this study used manual hand-coding aided by Microsoft Excel software. Using these a priori codes, subcategories were created based upon recognized patterns in the data. Major themes were then generated following analysis of these patterns under each of the KM components-based codes (people, process, tools, and organization). The coding and themes are presented in Table 4.

Table 4

A Priori Coding Table Using the Army Doctrinal Construct of People, Process, Tools, and Organization

	People	Process	Tools	Organization
Unit 1	"Personnel staff rosters"	"Content management"	"SharePoint training"	
Unit 2	"Battle roster"	"Life cycle/content management"	"Dashboard" "Master calendar on portal"	
Unit 3	"KM roles" "KM working group" "Training of personnel"	"Content management"	"SOPs"	"Organizational feedback"
Unit 4	"Personnel continuity"	"Records management"	"Dashboard on SharePoint"	
Unit 5	"Battle rostering of personnel to tool"	"Content management" "Meta-data tagging"	"Portal use" "SharePoint sites and pages" "Ownership of sites and pages"	"Operationalizing KM" "Command Inspection Program"
Unit 6	"Turnover of personnel"	"Unable to find digital files" "Meta-data for SharePoint"	"Training on digital systems" "Portal calendar"	
Unit 7		"Content management"	"Content management SOP" "Information and data governance"	
Unit 8		"Content management" "Meta-data"	"Standardization"	
Major themes	"Personnel turnover" "Roles/responsibilities" "KM training"	"Content management"	"Portal use and governance"	"Anchoring KM governance in regulations"

Evidence of Trustworthiness

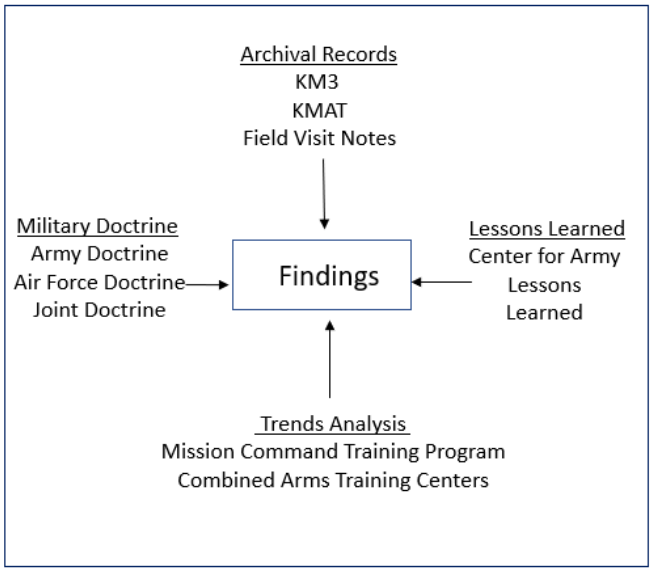
Trustworthiness is establishing assurance in the findings of this study. The following paragraphs will explain how trustworthiness and assurance in the findings were established through credibility, transferability, dependability and confirmability.

Credibility

In this study, credibility was established first through method triangulation. The archival quantitative data from the KM3 instrument was collected differently than archival qualitative data from the KMAT. Quantitative data were derived from the KM3 instrument using Likert scaling to quantify the data. The qualitative data from the KMAT instrument were collected by analysts using open ended questions on the nature of knowledge management issues and barriers. These methods yielded different perspectives on the analysis and further increased credibility (Patton, 2015). These findings were further compared to the archived field notes that gave characteristics of the headquarters elements studied. Second, this study used theory/perspective triangulation through multiple conceptual perspectives to interpret the data (Patton, 2015). Finally, analyst triangulation was conducted using published findings from the Center for Army Lessons Learned, the Mission Command Training Program and with document analysis from Army doctrinal publications, policies, memorandums, and instructions. It also included member checking to verify archival data captured in the past with analysts who collected the data. The figure below, adapted from Yin (2018) and modified for this study, illustrates the process used to establish credibility for the findings.

Figure 2

Data Triangulation



Transferability

Transferability or external validity was addressed through the research design of embedded levels of analysis at the strategic, operational, tactical, and institutional levels. Deep analysis at these four levels results in robust findings through answering the "how" and "what" questions (Yin, 2018). The detailed descriptions based upon army doctrinal performance measures allows the design to easily be transferred to other U.S. Army organizational headquarters elements and their mission partner allies. However, within public sector organizations or business organizations, some measures may require lexical revisions to ensure a common understanding of the terms within each sector (see Appendix E).

Dependability

The archival data and the organizational setting have been very consistent from 2016 to 2022. The KM3 and KMAT collection instruments were first published in 2017 by the Center for Army Lessons Learned and are being published again as data collection instruments and techniques in the upcoming 2023 update of *Army Techniques Publication 6-01.1 Knowledge Management*. The organizational members responsible for the data collection experienced very little turnover and the senior data collectors are still in place rendering the data collection process very stable. Data collection for both the KM3 and KMAT is ongoing with data continuing to be added to the archival records. The Department of Defense Information Systems Agency has approved the Army's KM3 for adoption worldwide using the same collection methodology. This has resulted in check coding where two or more teams of researchers agree that the data and codes used are dependable (Ellis, 2019, p. 111).

Confirmability

Confirmability is the degree to which researchers can confirm that given the same data they would have reached the same conclusions (Ellis, 2019, p. 111). This involves maintaining records of how data were collected, including researchers' notes and data with collection techniques. The archival data used for this study were collected over a period of six years and kept on a virtual digital knowledge center with a documented audit trail that is password protected. Findings from both data instruments were member-checked at time of collection with senior organizational leaders to ensure findings were

accurate within each organizational environment. The study results are presented in the following sections according to each collection instrument.

Study Results—Knowledge Management Maturity Model

The study results from the KM3 are based upon analysis of Likert Scale averages from several different data views. These include an Army average KM maturity level of embedded units of analysis, KM component strengths and weaknesses, maturity level by echelon, and the lowest doctrinal performance measures.

Some Processes Are Repeatable

The first research questioned focused on determining the KM maturity level within Army headquarters and asked: What are the KM maturity levels, as measured by the KM3, of U.S. Army headquarters? For this study maturity levels were determined by organizational members operating in the role of KMRC and assessing their organization's use of Army doctrinal process and best practices. Each level of maturity is anchored by definable doctrinal performance measures established by subject matter experts.

There are five levels of KM maturity (CALL 18-02) – (See Table 5). This study found the average maturity level of U.S. Army headquarters elements based upon the examined archival data is 2.66.

Table 5

Knowledge Management Maturity Level Definitions

KM maturity levels	
Level 5—Optimized	Focus is on continually improving performance through both incremental and innovative change
Level 4—Managed	Management use of metrics to effectively control the current state of the organization
Level 3—Defined	Sets of defined and documented practices and processes are established and subject to some degree of improvement over time
Level 2—Repeatable	Some processes are repeatable, possibly with consistent results. Process discipline is unlikely to be rigorous.
Level 1—Ad Hoc	Undocumented and in a state of dynamic change. Reactive in manner by users and events.

A maturity level of 2.66 places the average U.S. Army headquarters between repeatable and defined practices and processes but never reaches the managed and optimized level. At the managed and optimized level, organizations use metrics to improve knowledge flow thereby increasing organizational effectiveness. The KM3 is designed as a basic doctrinal assessment of a KM program to determine areas of strengths and weaknesses within an organization (CALL 18-02). At the selected Army headquarters elements, the KM3 found both strengths and weakness.

Strong Organizational Culture

The Likert scores by KM component reveals that the component with the highest maturity level is “Organization” with an average Likert score of 3.13. This component includes the performance measure of organizational culture.

Table 6

Knowledge Management Maturity Level Mean by Doctrinal Knowledge Management Component

A priori codes	KM3 mean
People	2.375
Process	2.479
Tools	2.616
Organization	3.13

Of the 12 highest performance measures across the KM3 over half were within the "Organization" component of the KM3 (see Table 7). The social interaction performance measure is explicitly stated in ATP 6-22.6, *Army Team Building*, that successful leaders build time for social interaction among their team members. This builds commitment and trust to organizational goals and allows for exchange of tacit knowledge between team members. Argote and Hora (2017) state that knowledge is embedded in organizational member to member interactions and these interactions contribute to organizational learning. The KM3 score of 3.62 for social interaction and 3.5 for culture of collaboration indicates a very high level of social interaction within the headquarters elements. Organizational trust is also high with a KM3 score of 3.5 indicating mutual trust among organizational members.

Table 7

Highest Ranked Doctrinal Performance Measures

Performance measure	KM3 score
Social interaction*	3.62
External SMEs	3.62
Organizational trust*	3.5
Culture of collaboration*	3.5
Virtual communities	3.5
Learning tool	3.5
Battle rhythm	3.5
CCIR/SIR management	3.5
Mission command*	3.375
Organizational feedback*	3.375
Cohesive teams*	3.375
Learning environment*	3.375

* denotes organizational performance measure.

The People Component Needs Improvement

The People component ranked the lowest of the four components. The aggregate KM3 score of 2.375 in the People Component (see Table 6) places this component as the lowest of the four KM Components. The three lowest performance measures were KM Working Group, KM Representatives and KM Roles and Responsibilities (see Table 8). The performance measures under the "People" component emphasize having the right

personnel in place and whether those personnel understand their roles in relation to KM. With a composite score of 1.65 the KMWG performance measure is between not functioning at all or just getting implemented according to the KM3 scale. The data also indicates that the roles of the KMO are not well understood by other headquarters staff members. This includes the use of KMRs working as members of a KM Working Group to assist the KMO in providing solutions to knowledge flow barriers and issues. A score of 1.75 also indicates that the role of KMR is not well understood and using them to aid in knowledge transfer within organizations may not be working as doctrinally intended.

Table 8

People Component

Performance measure	KM3 mean
KMWG	1.65
KMRs	1.75
KM roles and responsibilities	2.12
Battle rosters	2.375
Terms of reference	2.75
External SMES	3.625

Tactical-Level Headquarters Are the Most Mature

The level of analysis or echelon with the highest KM3 maturity level is the Tactical Level with a Likert score of 2.98. The tactical level of analysis included two Army Division headquarters. According to the KM3 levels of maturity, 3.0 indicates

these headquarters elements have defined and documented practices with well-established processes that are subject to some degree of improvement over time.

Table 9

Knowledge Management Maturity Model Mean by Levels of Analysis

Levels ofanalysis	KM3 mean
Strategic	2.745
Operational	2.45
Tactical	2.985
Institutional	2.47

Knowledge Management Doctrinal Approach Is Ad Hoc

The doctrinal performance measures with the lowest maturity level are listed in Table 10. Of these doctrinal performance measures the KM performance measures are the lowest. The KM performance measures listed below are explained in detail in the *Army Techniques Publication 6-01.1 Knowledge Management* (2015). Argote and Hora (2017) state that organizations do better when members or people who are qualified at doing complex tasks are trained and aligned appropriately with the required tools. The KM3 rating of 1.9 indicates a state of KM maturity between ad hoc and just below repeatable. It is also described as an approach that is reactive in manner and process discipline is unlikely to be rigorous (CALL 18-02).

Table 10

Knowledge Management Doctrinal Performance Measures

Performance measure	KM3 score
KM Planning Annex	1.5
KM Working Group	1.62
KMRs	1.75
Continuity	1.75
KM Process	1.75
Lessons Learned Repositories	2
KM Strategy	2
KM Vision	2
KM Roles and Responsibilities	2.125
KM/IM Tools Training	2.125
KM SOP	2.125
KM Staff Identified	2.125
Mean	1.9

Study Results—Knowledge Management Assessment Tool

The second research question focused on the knowledge barriers within organizations and asked: How do organizational staff members working in U.S. Army headquarters describe knowledge transfer barriers?

Content Management Is a Knowledge Barrier

The process component had the most knowledge barriers (N=48) (See Appendix F). The content management process within the process component is the knowledge barrier that was most often mentioned (N=12). Content management is defined as a structured process to store and access enterprise content for collaboration (APQC, 2018). It often includes the ability to find content, organize it for records management, and use it for decision-making.

Table 11

Qualitative Themes From Knowledge Management Assessment Tool

Knowledge barriers	*n*	KM component
Content management	12	Process
Personnel turnover	10	People
Portal use and ownership	10	Tools
Training	03	People
Anchoring KM in institutional governance	02	Organization

Comments such as “fire and forget content management”, “transferring information on the portal”, “categories and metadata tagging”, “inadequate and confusing

records management", "lack of a content management SOP" were often stated by participants in this study (Army Knowledge Management Proponent Office, 2016).

Personnel Turnover Impacts Knowledge Flow

Turnover of personnel and lack of a continuity process was common comment in the qualitative data (n=10). In addition, training personnel on the variety of different information systems was also a common comment. One of the comments in this area was the use of different information systems for day-to-day activities versus those used when deployed to contingency operations. This requires additional selection and training of personnel on contingency unique systems. Personnel continuity or a continuity process is defined by the Army's doctrinal publications as having "smart books" published on a collaborative site so critical information isn't lost when people rotate to other duties or positions.

Portal Use and Governance Cause Barriers

Portal use and governance was another common comment (n=10). In some organizations, portal governance is a subset of a KM standard operating procedure (SOP) and in other organizations portal governance is a higher directive that cuts across several subordinate organizations. The Army has yet to adopt an enterprise-wide governance policy for its new collaboration tools of Microsoft Teams and SharePoint online. The movement to mass telework and the Army's hasty adoption of Microsoft's Teams Commercial Virtual Remote (CVR) platform as the enterprise choice for communication and email during the Covid-19 pandemic (Mitchell, 2020) is an example of a quick shift to new technology tool with no governance or business rules for use. The CVR platform

was a quick fix for collaboration until the Army could migrate totally to the Army 365 platform which was completed in 2022 (Edwards, 2022). Previous case studies have revealed the importance of having an adequate governance policy for portal use in place as a key to success (APQC, 2020).

Knowledge Management Needs to Be Anchored in Institutional Governance

Two comments recorded in the KMAT indicate that KM needs to be anchored in institutional governance. This corresponds to data from the KM3 that many of the KM doctrinal performance measures were rated as ad hoc. Institutional governance in the Army is typically conducted through the publication of regulations, standard operating procedures, or directives. If explicitly stated in regulations, supervisors and leaders could use this as a forcing function for compliance (Army Knowledge Management Proponent Office, 2016). The Army doctrinal manual on KM is a descriptive guide on how KM techniques may be used to guide organizational effectiveness. An Army regulation is prescriptive and directs compliance. Currently KM is not address in an Army regulations or Army directives.

Summary

The first research questioned asked about the KM maturity levels of U.S. Army headquarters. This case study with eight embedded units of analysis across four levels of analysis was analyzed using archived data from the KM3 instrument. The data analysis consists of several different views. The first found that the Army average KM maturity level of 8 units of analysis was 2.66 indicating that KM was at the level described as “some processes are repeatable, possibly with consistent results. Process discipline is

unlikely to be rigorous". The second view of the data found that the KM component of "organization" is a strength with a rating of 3.13. This indicates a defined set of defined and documented processes. Thee the KM Component of "people" is the lowest with a rating of 2.37. This rating indicates process discipline unlikely to be rigorous. Third, the data indicates that units at the tactical division level had the highest KM with a rating of 2.985 indicating a set of refined and documented processes. Fourth the lowest doctrinal performance measures across all KM Components were the KM doctrinal performance measures with a rating of 1.9 indicating the state of KM doctrine is still ad hoc and chaotic within units.

The second research question asked how knowledge barriers are described in Army Headquarters. The knowledge barrier that was noted the most in the KMAT was content management. This indicates Army organizations do not have defined or document procedures for management of their data and information documents. Personnel turnover was listed as the second major knowledge barrier. Tacit knowledge resident in an organization's people is lost if there is not a process for establishing continuity and collaboration between in and outgoing personnel. Third, portal use and governance are mentioned by staff members as impeding knowledge flow. A lack of governance within a collaborative environment can impede team collaboration and retrieval of organizational knowledge from within these environments. Finally, the need to anchor KM in institutional governance such as regulations or directives is considered a knowledge barrier. The next chapter will interpret the findings relative to conceptual

framework, discuss the limitations of this study and provide recommendations for future study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this qualitative case study was to explore the U.S. Army's implementation of KM with attempts to measure knowledge transfer using the KM3 and KMAT. In addressing this study's research problem and purpose, I used KM3 and KMAT data archived within the AKM-PO collected during field visits to several Army headquarters elements. These data were triangulated using methods triangulation, analyst triangulation, and theory/perspective triangulation to establish credibility and trustworthiness. This case study consisted of eight embedded units of analysis, which allowed me to look at knowledge transfer within the Army enterprise across four levels of analysis—strategic, operational, tactical, and institutional.

Interpretation Relative to the Conceptual Framework

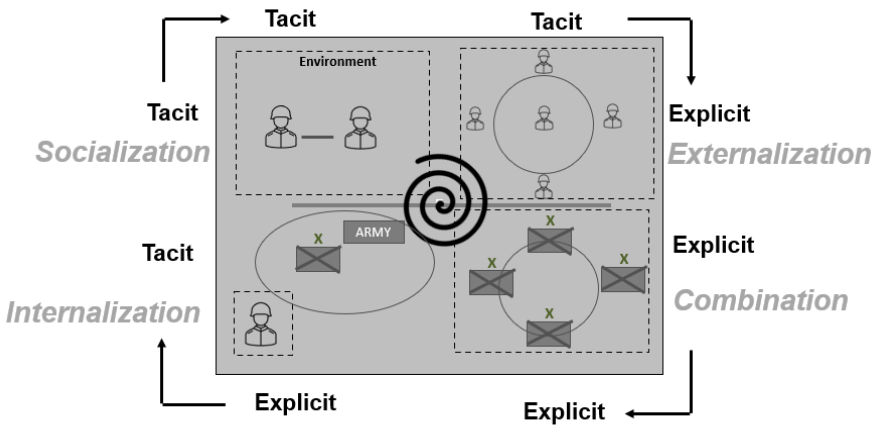
This study was framed by Nonaka and Takeuchi's (1995) knowledge creation theory and Argote and Hora's (2017) framework of knowledge transfer. Analysis of the findings provides evidence that the conceptual framework of knowledge embedded in members, tools, and tasks as first developed by Argote and Ingram (2000) and later refined by Argote and Hora is a meaningful framework for categorizing performance measures. The Army's doctrinal version of this framework organized as people, processes, tools, and organization (Headquarters, Department of Army, 2015b) provides a useful means to identify where knowledge transfer barriers occur within an organization. In this case study, the AKM-PO used the KM3 instrument to measure the level of KM maturity in headquarters elements from different perspectives and found evidence that

knowledge transfer is weakest in the people component of KM. This provides evidence to McGrath and Argote's (2001) finding that organizational effectiveness is enhanced when complex tasks are assigned to trained and qualified people. This allows for more effective knowledge transfer while performing assigned tasks (or processes). The KM people component's low KM3 rating provides strong evidence that increased training on KM tasks needs to occur in order to reach an optimized level of KM maturity. The low-scoring performance measures of KM officer responsibilities, the use of KM working groups, and trained KM representatives indicate that more attention needs to be paid to how the Army prepares these members to perform these roles. For effective knowledge transfer to occur, the Army may need to assess the KM training requirements to provide qualified people to perform these tasks (Argote & Ingram, 2000).

The headquarters elements examined in this study had an average score of 2.66. This score indicates that none of the headquarters elements were assessed at a level where they could achieve optimum performance using metrics to effect innovative change. This may be evidence that the Army enterprise needs improvement in the combination phase of Nonaka and Takeuchi's (1995) knowledge creation model. This theory states that knowledge is created when information is transferred between the tacit and explicit domains and knowledge is socialized, externalized, combined, and internalized. Using Nonaka and Takeuchi's conceptual framework, the findings from this study indicate that knowledge creation in Army headquarters is impeded in the combination step of knowledge creation (see Figure 3).

Figure 3

Knowledge Creation Model



Note. From *Managing Flow, a Process Theory of the Knowledge-Based Firm* (p. 19), by I. Nonaka, R. Toyama, and T. Hirata, 2008, Palgrave Macmillan.

The combination step consists of actions to take separate explicit knowledge and combine it for distribution to the enterprise for action and innovation. Data from trends analysis published by the Center for Army Lessons Learned (2017b) indicates that KM has been among the top five issues that need improvement over the past 7 years, yet no plan has been articulated to correct this deficiency by the Army enterprise.

Table 12

Trends Analysis

Publication	Findings/Observations
CALL Bulletin, No. 17-28, CTC Trends, FY 2016	Units are challenged with KM due to lack of an authorized KM in the Brigade *n* = 15
CALL Bulletin, No. 18-14 CTC Trends, FY 2017	Units are challenged to manage information and data *n* = 31
Center for Army Lessons Learned, Large Scale Combat Operations, Mission Command Training Program (MCTP) FY 2021	Planners struggled with knowledge management reducing shared understanding Knowledge management of intelligence products did not keep pace during large-scale ground combat operations
Center for Army Lessons Learned, Large Scale Combat Operations, Mission Command Training Program (MCTP) FY2022	Include command post computing environment instruction to include knowledge management process to facilitate shared understanding

Although KM was repeatedly listed as one of the top 5 issues that needed improvement over a period of 8 years, it never received senior Army leadership emphasis for increased resources either in manpower or in funding for training. This is evidence that the Army enterprise is unable to organize a conceptual approach in the combination phase of Nonaka's SECI model to address KM deficiencies within its headquarters elements.

The data from the KMAT reveal that the biggest knowledge barrier is content management. The ability to quickly access relevant information and turn it into combined explicit knowledge is the knowledge barrier expressed the most in the qualitative data.

Content management is a process that requires an explicit governance procedure for the technology in use by the enterprise at the time. The data indicated that this governance within the Army is not synchronized with the current technology to make content management possible across the enterprise, thereby inhibiting the ability to create new knowledge in the combination phase.

The following findings from the KM3 are supported by the qualitative data from the KMAT indicating that the knowledge embedded in personnel and the continual personnel turnover are affecting Army headquarters' KM maturity level, with a potential impact on readiness.

Interpretation of the Knowledge Management Maturity Model Findings

The interpretation of the findings from the KM3 are discussed below. These findings demonstrate that U.S. Army headquarters have both strengths and weaknesses in KM maturity levels.

Some Processes Are Repeatable

The KM maturity level of 2.66 indicates that the Army headquarters examined in this study struggle to use metrics to improve practices and processes. This also indicates these headquarters struggle in the combination phase of Nonaka's theory of knowledge. In the combination phase, several types of explicit knowledge are combined to create new knowledge. An example is applying validated measures of effectiveness to performance measures to create better processes for greater efficiency. The average score of 2.66 indicates that the Army headquarters elements have difficulty completing the process of applying metrics. It also seems low, especially when dealing with headquarters elements

that are making military decisions in the commitment of resources. An alternative explanation may be that commanders are satisfied with this score given the complexity of their tasks. Hasselbladh and Yden (2002) theorized that military units are under exceptional pressure to impose order on highly chaotic conditions that are constantly changing within an austere environment. This occurs both in peacetime exercises replicating combat operations and contingency missions across the spectrum of conflict. As a result, the score of 2.66 may be "good enough" in a highly charged environment as long as these headquarters elements do not have mission failure. A third explanation may be the turnover of personnel within the people component. Given one third of Army headquarters personnel turnover annually, it must exacerbate the ability of new personnel to conform to complex tasks associated with knowledge management.

Strong Organizational Culture

Each of the military services within the United States has its own unique culture (Monsoor & Murray, 2019). The culture of a military is a defining characteristic that is embedded in every servicemember regardless of service or nation. Almost all the participants felt that they belonged to an organization that had a sense of purpose, mutual trust, and an organizational vision. Participants also felt that the Army culture consisted of a positive learning environment with cohesive teams as outlined in the KM3 performance standards. The Army defines organizational culture (HQDA, 2015, ATP 6.01.1 Knowledge Management) as the perspective or lens through which information and goals are viewed. This includes a culture of collaboration coupled with disciplined initiative and mutual trust (HQDA, 2019, ADP 6-0 Mission Command). Participants

completing the KM3 ranked the organization component with the highest score, indicating that many of these organizational attributes are viewed favorably. This may be a case for optimism with regard to KM and Army headquarters. Donate and Guadamillas (2010) found through factor analysis that there is a positive relationship between KM and technology when an organization has a strong culture. The data suggest that the people component is holding KM back.

The People Component Needs Improvement

The "people" component had a rating of 2.37, placing it at the lowest average among the four KM components in need of improvement. This may be indicative of the lack of a formalized KM occupational specialty within the Army that would give this field of work a career path with continuing education and a career progression track for promotion within the field. Currently, as one Army senior leader commented in a meeting, "KM is a pickup game, having a good KM team happens accidently by having the right people at the right place and at the right time within your organization" (AKM-PO internal meeting notes). This feeling was shared by many KM practitioners in field as demonstrated by the concerted effort by members of the Defense Health Agency to lobby the Office of Personnel Management to designate KM as a separate civil service career field within the federal government. This effort made it to Congress during the 2022 finalization of the National Defense Authorization Act. However, during the legislative markup session between the U.S. House of Representatives and the U.S. Senate, all references to a KM career field were inexplicitly removed.

The performance measures listed under the "people" component require a high level of energy and staff experience to complete. In addition, the tasks associated with a KMO have a high degree of difficulty. Conducting a KM Working Group on a monthly or quarterly basis with designated KMRs requires a high degree of staff competence and considerable energy. A recent data query illustrates that KM sections within all Army headquarters elements are extremely understaffed (AKM-PO, 2023). High personnel turnover may also have an impact with military personnel subjected to periodic permanent change of station moves. The military experiences over 400,000 permanent change of station moves every year for a total active-duty force of approximately 1.1 million (Military OneSource, 2023). This annual personnel turnover rate exceeds 30%, resulting in one third of the workforce moving every year. This may contribute to the "people" component low score within the KM3. Persson and Stirna (2007) found that undertaking to implement KM is inherently difficult and the main problems are related to people starting at top management who must champion KM for it to be successful.

Knowledge Management Doctrinal Practice Is Ad Hoc

Data from the KM3 indicate that KM doctrinal practices are ad hoc, with the performance measures of "KMWG" and the "roles of the KM" receiving the lowest scores. The low data scores within the people component suggest that the explicit doctrinal approach is not sticking across the enterprise. Army doctrine explains how to organize KM within a headquarters, and Army authorization documents provide KM positions, yet the KM performance measures under the people component consistently score low. High personnel turnover and lack of a KM career field may limit the ability of

headquarters elements to have qualified KM personnel on hand. Possible alternate explanations for this include inadequate student throughput to fully train KM practitioners throughout the force, high turnover of KM practitioners in the field, and the lack of a designated career field for KM practitioners. Currently, only an additional skill code identifier is added to an individual's personnel record to designate those personnel trained in KM. There is no separate KM career field with an established KM career path for advancement. An Army senior leader commented in a staff meeting that good KM often happens by accident by having the right people with the right skills in the right place when needed (J. Mingus, personal communication, October 6, 2016). This comment illustrates that the published doctrine and a 3-week training course are not meeting the Army's needs in its headquarters elements. This could be due to inadequate student throughput, training the wrong students, and/or personnel turbulence within units.

Tactical Level Has the Highest Maturity Level

The analysis of the KM3 data indicates that tactical-level headquarters are the most mature, with a maturity level of 2.98. Although this finding was initially surprising, further analysis of the timing in requests for assistance and program evaluation resulted in the conclusion that tactical units were requesting assistance when they were near the end of their train and ready cycle and preparing for their deploy cycle. These cycles are two of the three cycles within the Army's past readiness model, the third cycle being reset (Feickert, 2022). As units enter their deploy cycle, they receive priority in the allocation of resources to include personnel, and the headquarters elements are at their optimal training and resource level to include manned at near 100%.

Interpretations of the Findings Relative to the Knowledge Management Assessment Tool

The significant findings from the KMAT are discussed below. The KMAT is a qualitative tool designed to capture major KM issues resulting in knowledge flow barriers. The knowledge barriers listed below are significant because they impact the ability to make informed decisions by organizational leaders.

Content Management

The qualitative data from the KMAT indicated that content management was the biggest knowledge-flow barrier within these headquarters. The ability to organize, apply, and transfer data, information, and knowledge is hindered by lack of enterprise content management governance. This lack of governance degrades the ability of the Army enterprise to find relevant data, information, and knowledge for effective decision-making. It also potentially hinders the search function on collaborative platforms due to information silos. One of the primary enablers of content management is the ability to have meta-tagging capabilities to enable data to be easily discovered. The Joint Lessons Learned Information System (JLLIS) reported in 2022 that a major Army headquarters could not achieve an exercise objective due to the inability to use or have meta-tagging capabilities within their command post computing environment. The lack of this capability caused the headquarters to not achieve the goal of "Make Data Linked" (JLLIS, 2022). Linking data can only occur if the data are discoverable through metadata.

Personnel Turnover

The theme of personnel turnover was expressed in the archived KMAT qualitative data as personnel continuity, qualifying and rostering personnel to information systems, and turnover of personnel. Army military personnel typically only spend one to two years in a position before they move on to another position, normally at the same geographical site. They can spend three to four years at a particular location before they move on to another location. This causes an approximate 30% turnover in units. In contrast, federal employees in 2021 had only a 6.1% turnover rate (Fedweek, 2023). Scholars have debated the effects of personnel turnover on organizations and whether turnover is negative or positive. Meier and Hicklin (2007) used autoregressive statistical modeling to show that the optimal turnover rate for teachers in a Texas public school system was 14.4 percent. In contrast, Lee (2018) used multivariate two-way least square to analyze federal employee turnover and found that the optimal turnover rate was 7.2%. Both these studies found empirical evidence that employee turnover had positive effects for organizational performance, but with a caveat. Turnover had an inverted U-shaped relationship that was nonlinear. At a certain point on the inverted U-shaped relationship turnover became detrimental to organizational performance. Although the contrast between these two studies is high at a difference of 7%, it is still 50% lower than the 30% experienced by military personnel in Army headquarters elements. A personnel turnover at 30% in a headquarters units, coupled with personnel fill rates of 70 – 80% to assigned KM positions in KM sections, is evidence to support the KM3 data that the People component of KM is the reason units cannot achieve higher ratings of KM Maturity.

Many organizations assume that staff turnover has negative effects, but the literature and research offer mixed reviews (Levine et al., 2005; Meier & Hicklin, 2007; Park & Shaw 2013; Wynen et al., 2019). Levine (2005) found that turnover affects highly specialized units differently than more conventional or general units. Meier and Hicklin (2008) determined that turnover may provide some positive benefits up to a certain point. Park and Shaw's (2013) meta-analysis found that turnover rates and performance are significantly and negatively related. Wynen et al. (2019) found that a six percent turnover rate had no effect on job tasks with higher process conformance because these tasks make the transfer of knowledge easier. Process conformance is a set of prescribed rules and standards related to the task. The performance measures under the "People" component are doctrinally based with a high process conformance however the 30% turnover rate in the Army versus the 6% in the Wynen study may have a detrimental effect requiring more study.

Portal Management

The KMAT found that units struggle with the networked portal and management of critical information requirements. The KMAT noted the areas of SharePoint training, dashboard visualization, master calendar display, and portal use are challenges that create knowledge barriers. This finding coincides with the trends analysis mentioned above. The trends analysis finds knowledge, information and data management as areas that need improvement consistently since 2016. While the KMAT knowledge barriers were raised with Army headquarters elements in their garrison locations, the trends analysis indicate

the same findings while the units were deployed to the combined training centers where they conducted realistic combat training.

Governance

The governance knowledge barrier relates to publishing a document that establishes policies and procedures for collaborative sites like SharePoint Online and Office 365. Since General Shinseki's first Army knowledge management memorandum in 2001 that created the catalyst to move away from stove piped information technology the primary restraint on this vision has been security. Military commanders are very reluctant to open their collaborative sites to scrutiny from across the enterprise. The recent Army enterprise move to TEAMS, SharePoint Online, and Office 356 with cloud storage without a governance document in place has caused some confusion. This move came in 2020 and a governance document three years later is still in draft (AKM-PO, 2023, Memo).

Limitations of the Study

The limitations of this study include the use of archival data from the KM3 and KMAT instruments. These data were collected over a six-year period by the AKM-PO from focus groups interviews. Limitations to focus group data includes group dynamics such as the "bandwagon effect", and dysfunctional groups. To mitigate this, the AKM-PO used trained facilitators well versed in small group dynamics. This training gave the facilitators knowledge on when to skillfully intervene when group dynamics were causing the group to get off track.

To mitigate limitations of interviews and to aid in ensuring the participants answered objectively, the AKM-PO facilitators explained to the participants the Likert scale ratings for the focus group questions on the KM3 instrument. In addition, each number on the Likert scale within the KM3 has a definition as to the degree of completion for each performance measure. This anchored their responses on a scale of 1-5 on whether the performance measure was completed. However, there is always the danger of regression towards the mean by groups. This occurs when group participants avoid selecting extreme measures and prefer a middle response (Theofanidis et al., 2018). This limitation may explain the extremely close Likert scale scores on the KM3. Another limitation of this study is the unique military lexicon used in the KM3 instrument which may present difficulty when trying to generalize the results to the broader business community. To mitigate this, a civilian version of the KM3 is provided at Appendix E with performance measures described in terms understood by civilian organizations.

Recommendations

From a conceptual perspective, KM is a multidisciplinary approach for leaders and managers to internally arrange their organizations for optimized efficiency across the components of people, process, tools and organization or as Argote and Ingram (2000) state members, tasks, and tools. Future research could examine how different organizations approach KM and whether there is an industry demand to create a more robust occupational discipline and if so, where should the KM discipline reside? Some organizations have opened a Chief KM Officer position under the Chief of Staff or Chief Management Officer, and some have placed the position under the Chief of Operations or

Chief of Information Technology. This research should include codification of the critical occupational tasks and key skills and attributes required for this occupation. The data from the KM3 reveal that the people component prevents the organizations from reaching an optimized level of KM maturity within their organizations. There is evidence that there may be a lack of training required to be successful as a KM Officer or KM representative. A qualitative occupational skills analysis would be beneficial to determine training requirements to determine what occupations are required in the future.

Another area of research that would benefit the management and public administration disciplines is to determine if the KM3 with lexical revisions included in Appendix E, is a useful maturity model for public administrators and business managers to determine their organizations maturity in the processing of knowledge and information. It could also determine what changes are required to make it an industry standard.

Finally, this study has discovered that content management within organizations is a considerable knowledge barrier. This is an area that requires additional research. The Defense Advanced Research Agency (DARPA) has a current research project called Knowledge Management at Scale and Speed (Senator, 2023). This DARPA project has awarded grants to research organizations for the development of technology regarding the sharing of organizational knowledge. Future research could also determine whether the commercial software industry could make content management easier using both prescribed organizational meta-data and user defined meta-data integrated with artificial intelligence like ChatGPT.

Implications

How a large organization like the U.S. Army postures itself to make use of relevant knowledge for change management is critically important. Changes made in organizational structure and policy and governance may have the largest impact on the success of KM being used as an integrating process.

Organization

This has the potential for positive social change by increasing the effectiveness of decision-making within the Public Administration discipline across the levels of local, state and federal governments. The near success of the AKM-PO working with the Office of Personnel Management and the Pentagon's Joint Staff KM Working Group to establish a federal occupational career series is evidence that there is some demand for a codified knowledge management job series across the Federal government. In addition, the U.S. Army should consider creating a separate military occupational specialty for military officers to manage the increasingly complex data, information and knowledge environment. Currently, data science positions have been created at major headquarters but how these positions are integrated into headquarters is still in the experimental stage. Data programs such as Game-Changer, Advana and Vantage are being used to provide commanders at the operational and strategic level increased decision-making efficiency through data analysis.

Policy and Governance

Although there has been attempts to convince the Pentagon to develop an enterprise-wide KM policy, it has been very difficult to gain acceptance with the current

infatuation of senior leaders with data science and artificial intelligence (https://www.army.mil/article/259730/army_data_scientists). The recently released Army data strategy only briefly discusses knowledge in relation to information and data. It mentions creating a robust knowledge base to enhance decision-making. It does mention a goal to create a data governance policy; yet the current lack of governance or policy with SharePoint Online and Teams has caused confusion with regards to content management and records management. The policy does mention that the warfighting domain is the most complex data environment, and a policy is required and is a stated goal within this document. Whether KM is included in this policy will remain to be seen. Currently the headquarters types examined in this study are being evaluated on their data-information and knowledge flow with less-than-optimal outcomes, resulting in the evaluators looking to the Army Knowledge Management Proponent Office for guidance (AKM-PO, 2023). This is an indication of the gap between policy and technology that must be closed in order for these headquarters to be successful.

Conclusions

The purpose of this qualitative case study was to explore the U.S. Army's implementation of KM with attempts to measure knowledge transfer using the Knowledge Management Maturity Model (KM3) and Knowledge Management Assessment Tool (KMAT). This study found that Army headquarters are not at the optimal level of performance with regards to data-information-knowledge flow, as verified by the levels of KM maturity and trends analysis from the Center for Army Lessons learned.

The trends analysis found that knowledge and information management has been a continual issue in Army headquarters dating back to 2016 based upon observations by the Center for Army Lessons Learned. The increasingly complex data, information, and knowledge systems coupled with security requirements requires people trained in these technical systems that continue to advance in complexity and capability.

This study found evidence that it is the people component of organizations that is preventing optimal knowledge flow. This is due to inadequate training for knowledge managers in the increasingly complex environment of data-information-knowledge and artificial intelligence. The AKM-PO, as the Army's force modernization lead, is currently at maximum capacity for training through its Knowledge Management Qualification Course. The Army may need to conduct a training needs analysis to examine the decades old occupational classification system and determine if new occupations are required to meet the challenges of an increasingly complex operational environment.

A final concluding note on this case study. As a discipline or field of multidisciplinary study, KM has been around for approximately 33 years; yet within the last few years there has been a notable weariness among senior organizational leaders in its application (Grant & Dumay, 2015). Some Army senior leaders have suggested that KM be rebranded and many of the Army headquarters examined in this case study have recently started to fold their KM sections into a larger data analytics branch. The reason for this as Nonaka and Peltokorpi (2006) explained more than a decade ago is that scholars and practitioners generally have a unified approach to the understanding of data and information. However, the concept of knowledge affords a larger and more complex

debate especially regarding tacit and explicit knowledge. This case study presented that it is the people component of KM that has prevented Army headquarters elements from achieving the optimal level of performance. It is this tacit knowledge within humans that requires inferences, intuition, and judgement about data and information. This tacit knowledge is typically a result of training and experience. It is time that the Army updates its decades old occupational classification system and institute new occupations with updated training for positive social change.

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Appendix A: Knowledge Management Maturity Model Performance Measures

Table A1

People Component Measures

Measure	Definition	Reference
Terms of Reference Memorandum	A document that is published to identify the roles, responsibilities, and authorities of senior leaders essential to an organization's mission.	FM 6.0 - *Commander and Staff Organization and Operations* (2014), para 2-28, p. 2-4
KM Roles and Responsibilities	A document such as a KM Charter or additional duty appointment that describes the duties and responsibilities of the Chief of Staff, the KM section, the KMRs and individuals in regard to organizational knowledge management.	ATP 6-01.1, *Techniques for Effective Knowledge Management*, (2015) para 1-52, p.1-11
Battle Rosters	A document tracking every individual assigned access to a technology information system, their level of training and certification	CALL 10-42, *Operations Handbook*, (2010) p. 54.
Knowledge Management Working Group (KMWG)	The KMWG is matrixed working group that identifies knowledge gaps, best practices and develops solutions for the Chief of Staff	ATP 6-01.1, *Techniques for Effective Knowledge Management*. (2015) para 1-53, p.1-11.
External SMEs	External Subject Matter Expertise Networks increases the depth of knowledge available to the organization. This is sometimes referred to as "reach back".	ATP 6-01.1, *Techniques for Effective Knowledge Management*. (2015) para 1-83, p.1-17.
Knowledge Management Representative (KMRs)s	KMRs participate in KMWGs to identifying the right knowledge gaps and developing effective solutions for their organization	ATP 6-01.1, *Techniques for Effective Knowledge Management*. (2015) para 2-7, p. 2-2.

Table A2

Process Component Measures

Measure	Definition	Reference
Onboarding	Onboarding integrates newcomers into the organization. It ensures people are equipped with the right technology tools and access to organizational knowledge to get started	CALL-17747-*News from the Front* (2018) p.13 CALL-18038-*Multi-Domain Task Force Special Study* (2019) p.37
Continuity Books	Staff turnover results in lost organizational knowledge and the need to develop continuity files so that critical information is not lost. Continuity books are an effective means to transfer knowledge to the new replacement.	CALL-15-01-*Command Deployment Discipline Program* (2014). p.12 AR 525-93, *Army Deployment and Redeployment.* (2019) p.33
After Action Reviews	AARs are documented lessons about a particular event which identifies key performance gaps that when corrected allows improved operations	FM 6-0, *Commander and Staff Organization and Operations*, p.16-1.
KM/Staff Rehearsals	A rehearsal of key staff for development of the meeting management battle rhythm prior to execution of a key operation to synchronize information and knowledge flow.	ADP 5-0, *The Operations Process* (2019). para 1-22, p. 1-6
KM Process	Application of the KM process of assess, design, develop, pilot and implement to identify knowledge and performance gaps	ATP 6-01.1, *Techniques for Effective Knowledge Management* (2015) para 1-2, p. 1-1.
KM/IM Tools Training	Training on information and collaboration technology systems to improve the organization's ability to share and transfer knowledge and maximize their capabilities.	ATP 6-01.1, *Techniques for Effective Knowledge Management* (2015). Para 1-23, p. 1-6
Commander Critical Information Requirements and Serious Incident Reporting Management	Staffs must know the requirements for CCIRs/SIRs to drive decision-making for an organization	ADP 6-0, *The Operations Process* (2019). Para 3-20, p. 3-6. AR 190-45, *Law Enforcement Reporting*, (2016) para 8-1, p.46
Operations Process	The staff uses KM techniques to facilitate the process of plan, prepare, execute and assess	ADP 5-0, *The Operations Process* (2019). para 1-16, p. 1-4.

Measure	Definition	Reference
COP/Dashboard Management	The Common Operational Picture is a single display of relevant information. Doctrine says that it can be either a graphical display, a written narrative, or verbal, and can be a combination of all three. The key to COP/Dashboard is it must contribute to 'shared understanding	FM 6-0, *Commander and Staff Organization and Operations* (2014) para 3-42, p. 3-8.
Time Management	The unit must have an effort to assess the utility and quality of meetings and ensure they are effective.	ATP 6-01.1, *Techniques for Effective Knowledge Management* (2015). para 3-17, p. 3-5.
Lessons Learned Management	Units must have a process to share those lessons learned with the Center for Army Lessons Learned (CALL) after a major deployment/exercise. This contributes to the Army becoming an effective "learning organization".	AR 11-33, *The Army Lessons Learned Program* (2017).
Task Management	Units must have a process and collaborative tool to manage taskings. Key to this effort is ensuring task progress is tracked and displayed so that individuals, sections or teams can request additional resources when the task is in jeopardy of failure.	ADP 6-0, *Mission Command* (2019). para 1-26, para 1-6.

Table A3

Tools Component Measures

Measure	Definition	Reference
Information Management Tools	How well an organization employs information management tools directly affects KM. A unit must understand and become proficient in the information management tools that are deemed critical to mission success.	FM 6-02, *Signal Support to Operations* (2019). para 2-114-2-116, p. 2-23.
Collaboration Tools	Doctrines states that for units to achieve "shared understanding" there must be collaboration. The unit must use collaborative tools such as MS Teams, Sharepoint, milSuite	ADP 6-0, *Mission Command*, (2019). para 1-3, p.1-8. ATP 6.01.1, Techniques for Effective KM (2015) p. C-3.
Lessons Learned Repositories	Units must manage a lessons learned program and feed lessons learned to the Center for Army Lessons Learned makes the Joint Army Lessons Learned Information System (JLLIS) available to review other units lessons learned.	AR 11-33, The Army Lessons Learned Program (2017).
KM SOP	SOP, contains policies and procedures on how the unit conducts KM	ATP 6-01.1, *Techniques for Effective KM* (2015). p. B-1 ATP 3-90.90 Army Tactical Standard Operating Procedure (2011).
KM Strategy	A document used to establish the unit's plan to fully implement a KM program. It should contain key goals and objectives and reviewed periodically	ATP 6-01.1, *Techniques for Effective KM* (2015). p. H-1.
Validated COP	A Common Operating Picture (COP) that has been validated through a major exercise or contingency deployment and facilitated decision-making.	ADP 5-0, *The Operations Process* (2019). para 5-11, p.5-2.
KM Planning Annex	Contains key KM information o that is specific to contingency operations and not provided for in the unit's SOP	ATP 6-01.1, *Techniques for Effective KM* (2015). p. A-1.
Battle Rhythm	BR is a functional process w/ mapped inputs and outputs for effective decision making.	ADP 5-0, *The Operations Process* (2019). para 1-82, p.1-17.

Measure	Definition	Reference
Working Groups & Boards	Working groups are events on the Battle Rhythm designed to solve complex problems and make recommendations. Boards have the authority to make decisions. Each working group must be linked to a board to ensure knowledge flow for effective decisions	ATP 6-0.5, *Command Post Organizations and Operations* (2017). para 2-36, p. 2-8. & p. A-1
PACE Plan	PACE is an acronym for Primary, Alternate, Contingency, Emergency. This is an established backup plan for the staff to communicate during a degraded communications environment.	FM 6-01, *Signal Support to Operations* (2019). para 1-19, p. 1-3.
Learning Tools	Organizations must have a range of tools to facilitate organizational learning. This includes scenario-based training, Warfighters Exercises, and simulations.	ADP 6-22, *Army Leadership and the Profession*. (2019). para 9-23, p. 9-4.
Expertise Location System	A collaborative platform to identify the total skill set a person brings to the organization in the event special expertise are required to accomplish the mission	APQC-K0759-*Expertise Location* (2017).
Virtual Communities	Virtual communities are online communities designed to bring people together electronically who are geographically displaced so they can share information, knowledge, and insights	ATP 6-01.1 *Effective Techniques for KM* (2015). para F-2, p. F-1
KM Governance Standard Operating Procedures/Policies	Adequate KM policies and standard operating procedures are essential to effective KM.	APQC-K09422-KM *Governance Framework Template* (2019) ATP 3-30.90 *Army Tactical Standard Operation Procedure* (2011)

Table A4

Organization Component Measures

Measure	Definition	Reference
Culture of Collaboration	The commander is responsible for establishing a culture of collaboration to enhance shared understanding and knowledge. This is critical for learning organizations	ATP 6-0, *Mission Command* (2019) para 1-39, p. 1-8. ATP 6-22.6 *Army Team Building* (2015). para 1-37, p. 1-6
Communities of Purpose	To improve communication and collaboration, especially with people who have specialized knowledge. Organizational Communities of practice should be established for specific organizational goals and projects.	ATP 6-01.1 *Effective Techniques for KM* (2015). para 1-23. p. 1-6.
Organizational Trust	The Mission Command philosophy relies heavily on the concept of mutual trust People are more willing to share knowledge when there is a culture of organizational trust	ADP 6-0, *Mission Command* (2019). para 1-30. p. 1-7.
KM Vision	There must be an explicitly established KM vision developed by the Deputy Director or Chief of Staff for KM for it to be effective	ATP 6-01.*1 Effective Techniques for KM* (2015). para 2-34. p. 2-7
Learning Environment	Units that regularly bring in subject matter experts and create multiple opportunities to learn are more effective.	ATP 6-22.6 *Army Team Building* (2015) para 1-71, p. 1-11
Cohesive Teams	A Principle of the Mission Command philosophy is "Build Cohesive Teams Through Mutual Trust".	ADP 6-22, *Army Leadership and the Profession*. (2019) para 1-99, p. 1-18 ATP 6-22.6 *Army Team Building* (2015) para 1-2, p. 1-1
Social Interaction	This results in proper socialization with the goals of commitment, internalization of team values, innovation and development of a cohesive bond	ATP 6-22.6 *Army Team Building* (2015). para 2-38, p. 2-6
Organizational Feedback	Feedback is a key factor in learning and improving organizational performance. In any initiative, it is important to actively seek and welcome feedback.	ATP 6-22.6 *Army Team Building* (2015). para 1-69, p. 1-11.

Measure	Definition	Reference
Mission Command	The unit must practice the mission command philosophy that empowers subordinate decision-making and decentralized execution.	ADP 6-0- *Mission Command* (2019). para 1-14, p. 1-3.
KM Chain of Command	People within an organization must have a clear understanding of who the key KM players are to include the KMO, KMWG and the KMRs	ATP 6-01.1, *Techniques for Effective KM* (2015). para 1-52, p. 1-11.

Note. Each measure on this table is assigned a Likert score: 1-Unit is not doing this effort at all; 2-Unit has started but is still in development; 3-Effort is well developed but not fully implemented; 4-Unit does this effort and is fully implemented; 5-Unit has assessed effort and has validated its utility.

Appendix B: Knowledge Management Maturity Model

Range: 1=Not Doing, 5 = Validated Effort (rate unit/organization for level of implementation of each effort)

A People		B Process		C Tools		D Organization/Culture	
Terms of Reference	1	Onboarding	1	IM Tools	1	Culture of Collaboration	1
KM Roles and Responsibilites	1	Continuity	1	Collaboration Tools	1	Communities of Purpose	1
Battle Rosters	1	After Action Reviews	1	Lessons Learned Repositories	1	Organizational Trust	1
KMWG	1	KM/Staff Rehearsals	1	KM SOP	1	KM Vision	1
External SMEs	1	KM Process	1	KM Strategy	1	Learning Environment	1
KMRs	1	KM/IM Tools Training	1	Validated COP	1	Cohesive Teams	1
		CCIR/SIR Management	1	KM Planning (Annex Q)	1	Social Interaction	1
		Operations Process	1	Battle Rhythm	1	Organizational Feedback	1
		COP/Dashboard Management	1	Working Groups and Boards	1	Mission Command	1
		Time Management	1	PACE Plan	1	KM Chain of Command	1
		Lessons Learned Management	1	Learning Tools	1		
		Task Management	1	Expertise Location System	1		
				Virtual Communities	1		
				ORG SOPs Policies	1		
Column Total (Max = 30 Points)	6	Column Total (Max = 60 Points)	12	Column Total (Max = 70 Points)	14	Column Total (Max = 50 Points)	10

KM Maturity Model Instructions:

Step 1. Select the page for each area of the assessment.

Step 2. Review the standard for each item.

Step 3. Rate the item 1-5 using the scale below.

Step 4. Provide a brief assessment of each item.

Step 5. Provide a plan of action to maintain or improve the item.

UNIT NAME HERE

KMR COMPONENT SCORE		MAX VALUE	AVG.
People	6	30	1.0
Process	12	60	1.0
Tools	14	70	1.0
Organization/Culture	10	50	1.0
TOTAL KM MATURITY VALUE	42	210	1.0

Overall Unit Maturity Value
1.00

Assessment Dates	KMRs	Score
6-Jun-19		
4-Sep-19		
3-Dec-19		

Comments
N/A

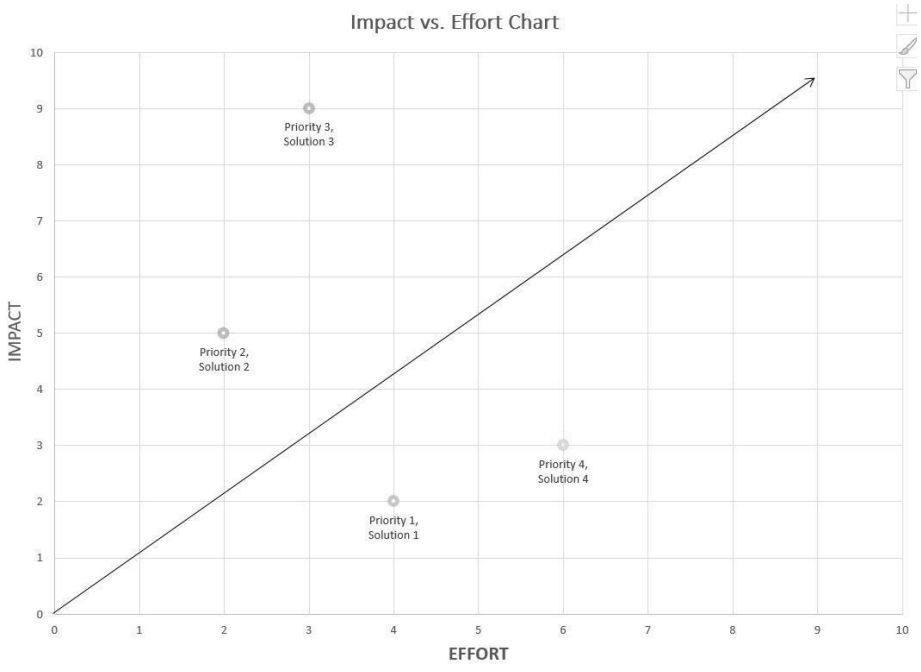
Rating SCALE:	
1 = Unit is not doing this effort at all	1
2 = Unit has started this effort but is still in development	2
3 = Effort is well developed but not fully implemented	3
4 = Unit does this effort and it is fully implemented	4
5 = Unit has assessed effort and has validated its utility	5

Quick Links	
Assessment Matrix:	TAB
KM Components/Efforts:	TAB
Sample Maturity Models:	TAB

Note. The main purpose of the KM3 is to provide Army headquarters organizations a means for organizational leaders to assess and visualize KM Maturity within their organizations. Each of these 42 measures are defined in Army doctrine and explained in Appendix A.

Appendix C: Knowledge Management Assessment Template

KM Working Group						KM Strategy / Action Plan					
Assess						Design / Develop / Pilot / Implement					
Operational Issue	Performance / Knowledge Gap	KM Component P	P	T	O	Solution	Required Action	MOP: MOE:	Impact	Effort	Priority
						Solution 1			2	4	1
						Solution 2			5	2	2
						Solution 3			9	3	3
						Solution 4			3	6	4
	f										



Note. The KMAT analyzes knowledge barriers which become operational issues. These can be deconstructed to determine: if they are a knowledge or performance issue or both; the affected KM component, and the proposed solutions. The solutions can then be prioritized by impact & effort.

Appendix D: Partner Organization's Data Use Permission

DEPARTMENT OF THE ARMY
MISSION COMMAND CENTER OF EXCELLENCE
FORCE MODERNIZATION PROPONENT CENTER
950 BLUNTVILLE AVE
FORT LEAVENWORTH, KANSAS 66027-2302

ATZL-MCF 13 January 2022

MEMORANDUM FOR RECORD

Subject: Data release for research and publication

1. Purpose: To allow the use of data collected during the research of the Knowledge Management Maturity Model (KM3) and Knowledge Management Assessment Template (KMAT) for research and publication by Mr. David M. Van Laar.

2. The data collection protocol was reviewed on 30 October 2018 by the Command and General Staff College Human Protections Administrator and determined not to be human subject's research. It was determined the data collected is part of *Program Evaluation.*

a. Initial data collected has been used and published in *Measuring knowledge management maturity in U.S. Army headquarters (2020) Knowledge and Process Management 27:4 311-321.*

b. The data and information for use in proposed publication has had an operational security review and public affairs review and determined to be releasable.

3. Any questions can be directed to the undersigned at (913) 684-6396 or joseph.t.koskey.civ@army.mil

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Appendix E: Knowledge Management Maturity Model With Lexical Revisions

Civilian Organization

KM Principles: Understand, Share, Integrate, Connect Learn, Trust

Range: 1=Not Doing, 5 = Validated Effort (rate unit/organization for level of implementation of each effort)

A People		B Process		C Tools		D Organization/Culture	
C-Suite role and Reponsibilities	2	Onboarding		IM Tools		Culture of Collaboration	
KM Roles and Responsibilites	3	Continuity	2	Collaboration Tools	2	Communities of Purpose	2
Information Systems Operators	4	After Action Reviews	3	Lessons Learned Repositorie	3	Organizational Trust	3
KM Working Group		KM/Staff Rehearsals	4	KM SOP	4	KM Vision	4
Mentorship Program	2	KM Process	5	KM Strategy	5	Learning Environment	5
KM Representatives	3	KM/IM Tools Training		Validated Dashboard		Cohesive Teams	
		CEO's Information Requirement	2	KM Long Range Planning	2	Social Interaction	2
		Decision Making Process	3	Organizational Meeting Mgt	3	Organizational Feedback	3
		COP/Dashboard Management	4	Working Groups and Boards	4	Culture of Individual Initati	4
		Time Management	5	COOP Plan	5	KM Chain of Command	5
		Lessons Learned Management		Learning Tools			
		Task Management	2	Expertise Location System	2		
				Virtual Communities	3		
				ORG Policies	4		
Column Total (Max = 30 Points)	15	Column Total (Max = 60 Points)	33	lumn Total (Max = 70 Points)	40	umn Total (Max = 50 Points)	30

KM Maturity Model Instructions:

Step 1. Select the page for each area of the assessment.

Step 2. Review the standard for each item.

Step 3. Rate the Item 1-5 using the scale below.

Step 4. Provide a brief assessment of each item.

Step 5. Provide a plan of action to maintain or improve the item.

Civilian Organization

KMR COMPONENT SCORE		MAX VALUE	AVG.
People	15	30	2.5
Process	33	60	2.8
Tools	40	70	2.9
Organization/Culture	30	50	3.0
TOTAL KM MATURITY VALUE	**118**	210	**2.8**

rall Unit Maturity V

2.8

Assessment D	KMRs	Score

Comments

N/A

Rating SCALE:	
1 = Unit is not doing this effort at all	1
2 = Unit has started this effort but is still in development	2
3 = Effort is well developed but not fully implemented	3
4 = Unit does this effort and it is fully implemented	4
5 = Unit has assessed effort and has validated its utility	5

Quick Links

Assessment Matrix:	TAB
KM Components/Efforts:	TAB
Sample Maturity Models:	TAB